September 2016

# MULTILAYER CERAMIC CAPACITORS

SAMSUNG ELECTRO-MECHANICS

Carbon Emission 1.86g $CO_2$
MLCC(02A104M) 1piece

## RoHS Compliance and restriction of Br

The following restricted materials are not used in packaging materials as well as products in compliance with the law and restriction.

– Cd, Pb, Hg, Cr6+, As, Br and the compounds, PCB, asbestos

## No use of materials breaking Ozone layer

The following ODS materials are not used in our fabrication process.

– ODS material : Freon, Haron, 1 – 1 – 1 TCE, CCl4, HCFC

If you want more detailed Information, Please Visit Samsung Electro – mechanics Website
http://www.semlcr.com

※ In order to move to the contents directly, please click each content icon

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※ Remarks : Symbols in this catalog have the following definition.

**Derating** This capacitor with derating is designed for 70% of the rated voltage or less.

**dv/dt** dv/dt means Pulse(dv/dt) Guarantee Capacitor, 10,000V/us(=10V/ns) max.10,000 cycles guarantee(@Vr, Room temp)

**Ref.** Reference means that CAP & TCC have the exceptional measurement conditions for Capacitance and Temperature Characteristics of Capacitance.
So please refer to the individual specification for CAP and the individual characteristics data for TCC on Website.

# Part Numbering System

| CL | 10 | A | 106 | M | Q | 8 | N | N | N | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

## 1 SERIES CODE

CL = Multilayer Ceramic Capacitors

## 2 SIZE CODE

| Code | inch(mm) | Code | inch(mm) | Code | inch(mm) | Code | inch(mm) |
|---|---|---|---|---|---|---|---|
| 02 | 01005(0402) | 10 | 0603(1608) | 32 | 1210(3225) | 55 | 2220(5750) |
| 03 | 0201(0603) | 21 | 0805(2012) | 42 | 1808(4520) | | |
| 05 | 0402(1005) | 31 | 1206(3216) | 43 | 1812(4532) | | |

## 3 DIELECTRIC CODE

Class I (Temperature Compensation)

| Symbol | EIA Code | Operation Temperature Range(℃) | Temperature Coeffcient(ppm / ℃) |
|---|---|---|---|
| C | C0G | -55 ~ +125 | 0±30 |

Class II (High Dielectric Constant)

| Symbol | EIA Code | Operation Temperature Range(℃) | Capacitance Change(%) |
|---|---|---|---|
| A | X5R | -55 ~ +85 | ±15 |
| B | X7R | -55 ~ +125 | ±15 |
| X | X6S | -55 ~ +105 | ±22 |
| F | Y5V | -30 ~ +85 | -82 ~ +22 |
| Y | X7S | -55 ~ +125 | ±22 |
| Z | X7T | -55 ~ +125 | -33 ~ +22 |

## 4 CAPACITANCE CODE

Capacitance expressed in pF. 2 significant digits plus number of zeros.
example) 106=10×$10^6$=10,000,000pF

For Values <10pF, Letter R denotes decimal point
example) 1R5 =1.5pF

## 5 CAPACITANCE TOLERANCE CODE

| Code | Tolerance | Code | Tolerance | Code | Tolerance | Code | Tolerance |
|---|---|---|---|---|---|---|---|
| N | ±0.03pF | H | +0.25pF | F* | ±1% | V | -5% |
| A | ±0.05pF | L | -0.25pF | G | ±2% | K | ±10% |
| B | ±0.1pF | D | ±0.5pF | J | ±5% | M | ±20% |
| C | ±0.25pF | F | ±1pF | U | +5% | Z | -20, +80% |

* For Values < 10pF, F = ±1pF / Values ≥ 10pF, F = ±1%

| Series | Capacitance Step | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-3 | 1.0 | | | | 2.2 | | | | 4.7 | | | |
| E-6 | 1.0 | | 1.5 | | 2.2 | | 3.3 | | 4.7 | | 6.8 | |
| E-12 | 1.0 | 1.2 | 1.5 | 1.8 | 2.2 | 2.7 | 3.3 | 3.9 | 4.7 | 5.6 | 6.8 | 8.2 |
| E-24 | 1.0 | 1.2 | 1.5 | 1.8 | 2.2 | 2.7 | 3.3 | 3.9 | 4.7 | 5.6 | 6.8 | 8.2 |
| | 1.1 | 1.3 | 1.6 | 2.0 | 2.4 | 3.0 | 3.6 | 4.3 | 5.1 | 6.2 | 7.5 | 9.1 |

## 6 RATED VOLTAGE CODE

| Code | Voltage | Code | Voltage | Code | Voltage | Code | Voltage |
|---|---|---|---|---|---|---|---|
| S | 2.5Vdc | O | 16Vdc | C | 100Vdc | H | 630Vdc |
| R | 4.0Vdc | A | 25Vdc | D | 200Vdc | I | 1kVdc |
| Q | 6.3Vdc | L | 35Vdc | E | 250Vdc | J | 2kVdc |
| P | 10Vdc | B | 50Vdc | G | 500Vdc | K | 3kVdc |

## 7 THICKNESS CODE

(Unit:mm)

| Size inch(mm) | Code | Thickness | Tolerance |
|---|---|---|---|
| 01005(0402) | 2 | 0.20 | ±0.02 |
| 0201(0603) | 3 | 0.30 | ±0.03 |
| 0402(1005) | 3 | 0.30 | ±0.03* |
| | 5 | 0.50 | ±0.05 |
| 0603(1608) | 5 | 0.50 | +0.0 / −0.1* |
| | 8 | 0.80 | ±0.10 |
| 0805(2012) | A | 0.65 | ±0.10 |
| | C | 0.85 | ±0.10* |
| | C | 0.85 | ±0.10 |
| | M | 1.15 | ±0.10 |
| | F | 1.25 | ±0.10 |
| | Q | 1.25 | ±0.15 |
| | Y | 1.25 | ±0.20 |
| 1206(3216) | C | 0.85 | ±0.15 |
| | C | 0.85 | ±0.10* |
| | E | 1.10 | ±0.15 |
| | E | 1.10 | ±0.10* |
| | P | 1.15 | ±0.10* |
| | M | 1.15 | ±0.15 |
| | F | 1.25 | ±0.15 |
| | H | 1.60 | ±0.20 |

| Size inch(mm) | Code | Thickness | Tolerance |
|---|---|---|---|
| 1210(3225) | C | 0.85 | ±0.10* |
| | 9 | 0.90 | ±0.10* |
| | F | 1.25 | ±0.20 |
| | S | 1.35 | ±0.15* |
| | H | 1.60 | ±0.20 |
| | U | 1.80 | ±0.20* |
| | I | 2.00 | ±0.20 |
| | J | 2.50 | ±0.20 |
| | V | 2.50 | ±0.30 |
| 1808(4520) | F | 1.25 | ±0.20 |
| | G | 1.40 | ±0.20 |
| | I | 2.00 | ±0.20 |
| 1812(4532) | F | 1.25 | ±0.20 |
| | H | 1.60 | ±0.20 |
| | I | 2.00 | ±0.20 |
| | J | 2.50 | ±0.20 |
| | L | 3.20 | ±0.30 |
| 2220(5750) | H | 1.60 | ±0.20 |
| | I | 2.00 | ±0.20 |
| | J | 2.50 | ±0.20 |
| | L | 3.20 | ±0.30 |

* Mark is only applicable to "L","Y","F", 12th code in part number.

## 8 INNER ELECTRODE / TERMINATION / PLATING CODE

| Code | Thickness division | Inner electrode | Termination | Plating material |
|---|---|---|---|---|
| N | Normal | Ni | Cu | Ni / Sn _100% |
| G | Normal | Cu | Cu | Ni / Sn _100% |
| S | Normal | Ni | Soft Termination | Ni / Sn _100% |
| C | Normal | Ni | Control Code | Ni / Sn _100% |
| L | Low profile | Ni | Cu | Ni / Sn _100% |
| Y | Low profile | Ni | Soft Termination | Ni / Sn _100% |
| Z | Normal | Ni | Soft Termination | Ni / Sn _100% |
| F | Low profile | Ni | Soft Termination | Ni / Sn _100% |

## 9 PRODUCT CODE OR SIZE CONTROL CODE

N = Normal
A = Array (2 – element)
B = Array (4 – element)
L = LICC
J = SLIC

(Unit:mm)

| Code | 01005(0402) | 0201(0603) | 0402(1005) | 0603(1608) | 0805(2012) | 1206(3216) |
|---|---|---|---|---|---|---|
| S | ±0.03 | ±0.05 | ±0.07 | ±0.07 | | ±0.30 |
| Q | ±0.05 | ±0.07 | ±0.10 | ±0.15 | ±0.15 | |
| R | ±0.07 | ±0.09 | ±0.15 | ±0.20 | ±0.20 | |
| U | ±0.09 | | ±0.20 | ±0.25 | ±0.25 | |
| Z | | | ±0.40 | ±0.30 | ±0.30 | |
| 9 | | | ±0.30 | | | |

## 10 CONTROL CODE

N = Reserved for future use

## 11 PACKAGING CODE

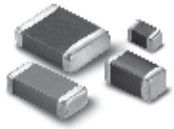
| Cardboard Tape (Paper) | |
|---|---|
| Code | Taping Type |
| 8 / C / H | Normal, 7"reel (Quantity option) |
| J | 1mm Pitch, 7"reel |
| Z | Chip aligned for horizontal, 7"reel |
| Y | Chip aligned for vertical, 7"reel |
| O | Normal, 10"reel |
| 3 / D / L | Normal, 13"reel (Quantity option) |
| 2 | 1mm Pitch, 13"reel |
| 7 | Chip aligned for vertical, 13"reel |

| Embossed Tape (Plastic) | |
|---|---|
| Code | Taping Type |
| E / G | Normal, 7"reel (Quantity option) |
| R | Chip aligned for horizontal, 7"reel |
| W | Chip aligned for vertical, 7"reel |
| S | Normal, 10"reel |
| F | Normal, 13"reel (Quantity option) |

※ If you want to learn the code or quantity in detail, please see p.148
In order to move to the page directly, please click the here. ↑

# Standard & High Capacitors

## Feature

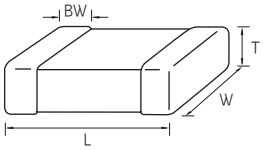


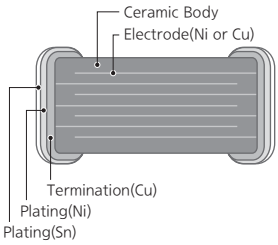
- Wide selection of size : from 0402(Inch) to 2220(Inch)
- Highly reliable tolerance and high speed automatic chip placement on PCBs
- Wide capacitance range
- Highly reliable performance
- Highly resistant termination metal
- Tape & reel for surface mount assembly

## Application

- Mobile Phone
- DC-DC Converter
- Tablet devices
- PC (Laptop, Desktop)
- HDD/SSD board
- Display

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.0975±0.0125(*) | L | 0.25±0.075 |
| | | 1.00±0.10 | 0.50±0.05 | 0.19±0.03(*) | X | 0.25±0.10 |
| | | 1.00±0.05 | 0.50±0.05 | 0.30±0.03(*) | 3 | |
| | | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.50+0.0/-0.1(*) | 5 | 0.30±0.20 |
| | | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.70±0.10(*) | 7 | 0.50+0.20/-0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 0.80±0.10(*) | 8 | |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 0.90±0.10(*) | 9 | |
| | | 2.00±0.10 | 1.25±0.10 | 1.15±0.10 | M | |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| | | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 | Q | |
| | | 2.00±0.20 | 1.25±0.20 | 1.25±0.20 | Y | |
| 31 | 1206 | 3.20±0.20 | 1.60±0.20 | 0.60±0.10(*) | 6 | 0.50±0.30 |
| | | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | |
| | | 3.20±0.20 | 1.60±0.20 | 0.85±0.10(*) | C | |
| | | 3.20±0.20 | 1.60±0.20 | 0.90±0.10(*) | 9 | |
| | | 3.20±0.20 | 1.60±0.20 | 1.10±0.10(*) | E | |
| | | 3.20±0.20 | 1.60±0.20 | 1.15±0.10(*) | M | |
| | | 3.20±0.20 | 1.60±0.20 | 1.15±0.10(*) | P | |
| | | 3.20±0.15 | 1.60±0.15 | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 0.85±0.10(*) | C | 0.60±0.30 |
| | | 3.20±0.30 | 2.50±0.20 | 0.90±0.10(*) | 9 | |
| | | 3.20±0.30 | 2.50±0.20 | 1.60±0.20 | H | |
| | | 3.20±0.30 | 2.50±0.20 | 1.80±0.20(*) | U | |
| | | 3.20±0.30 | 2.50±0.20 | 2.00±0.20 | I | |
| | | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | |
| | | 3.20±0.40 | 2.50±0.30 | 2.50±0.30 | V | |
| 42 | 1808 | 4.50±0.40 | 2.00±0.20 | 1.25±0.20 | F | 0.80±0.30 |
| | | 4.50±0.40 | 2.00±0.20 | 1.40±0.20 | G | |
| | | 4.50±0.40 | 2.00±0.20 | 2.00±0.20 | I | |
| 43 | 1812 | 4.50±0.40 | 3.20±0.30 | 1.25±0.20 | F | 0.80±0.30 |
| | | 4.50±0.40 | 3.20±0.30 | 2.50±0.20 | J | |
| | | 4.50±0.40 | 3.20±0.30 | 3.20±0.30 | L | |
| 55 | 2220 | 5.70±0.40 | 5.00±0.40 | 2.50±0.20 | J | 1.00±0.30 |
| | | 5.70±0.40 | 5.00±0.40 | 3.20±0.30 | L | |

* Mark is only applicable to "L","F", 12th code in part number.

## Standard & High Capacitance Table (C0G)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pF | | | | | | | | | | | | | | | | | | | nF | | | | | | | | | | | | | | | | |
| | | 0.5 | 1.0 | 10 | 15 | 27 | 33 | 56 | 68 | 120 | 180 | 220 | 270 | 330 | 470 | 560 | 750 | 910 | 1.0 | 1.2 | 1.5 | 1.8 | 2.2 | 3.9 | 4.7 | 6.8 | 8.2 | 10 | 15 | 27 | 33 | 39 | 47 | 68 | 100 | 120 | |
| 0402 (1005) | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603 (1608) | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0805 (2012) | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1206 (3216) | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1210 (3225) | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

# Standard & High Capacitors

## Standard & High Capacitance Table (X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | uF | | | | | | | |
| | | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 | 220 |
| 0402 (1005) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| | 35 | | | | | | | | | | | |
| 0603 (1608) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| | 35 | | | | | | | | | | | |
| | 50 | | | | | | | | | | | |
| 0805 (2012) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| | 35 | | | | | | | | | | | |
| | 50 | | | | | | | | | | | |
| 1206 (3216) | 6.3 | | | | | | | | | | 150 | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| | 35 | | | | | | | | | | | |
| | 50 | | | | | | | | | | | |
| 1210 (3225) | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| | 35 | | | | | | | | | | | |
| | 50 | | | | | | | | | | | |
| 1812(4532) | 6.3 | | | | | | | | | | | |
| 2220(5750) | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |

## Standard & High Capacitance Table (X6S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | uF | | | | | | |
| | | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 |
| 0402 (1005) | 2.5 | | | | | | | | | | |
| | 4.0 | | | | | | | | | | |
| | 6.3 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| 0603 (1608) | 4.0 | | | | | | | | | | |
| | 6.3 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 16 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| 0805 (2012) | 2.5 | | | | | | | | | | |
| | 4.0 | | | | | | | | | | |
| | 6.3 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 16 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| 1206 (3216) | 4.0 | | | | | | | | | | |
| | 6.3 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 16 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| 1210 (3225) | 4.0 | | | | | | | | | | |
| | 6.3 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 16 | | | | | | | | | | |
| | 25 | | | | | | | | | | |

# Standard & High Capacitors

## Standard & High Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | uF | | | | | | | |
| | | 47 | 100 | 220 | 330 | 470 | 1.0 | 2.2 | 3.3 | 4.7 | 10 | 22 | 47 | 100 |
| 0402 (1005) | 6.3 | | | | | | X7S | | | | | | | |
| | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| 0603 (1608) | 6.3 | | | | | | | | | | X7S | | | |
| | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| 0805 (2012) | 6.3 | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| 1206 (3216) | 6.3 | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| 1210 (3225) | 6.3 | | | | | | | | | | | | | X7T |
| | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |

## Product Line Up (C0G)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 10Vdc | 560pF | ±5% | CL05C561JP5NNN□ |
| | 16Vdc | 33pF | ±5% | CL05C330JO5NNN□ |
| | | 100pF | ±5% | CL05C101JO5NNN□ |
| | | 150pF | ±5% | CL05C151JO5NNN□ |
| | | 220pF | ±5% | CL05C221JO5NNN□ |
| | | 470pF | ±5% | CL05C471JO5NNN□ |
| | | 1.0nF | ±5% | CL05C102JO5NNN□ |
| | 25Vdc | 10pF | ±0.5pF | CL05C100DA5NNN□ |
| | | 10pF | ±5% | CL05C100JA5NNN□ |
| | | 11pF | ±5% | CL05C110JA5NNN□ |
| | | 12pF | ±5% | CL05C120JA5NNN□ |
| | | 13pF | ±5% | CL05C130JA5NNN□ |
| | | 15pF | ±5% | CL05C150JA5NNN□ |
| | | 18pF | ±2% | CL05C180GA5NNN□ |
| | | 20pF | ±5% | CL05C200JA5NNN□ |
| | | 22pF | ±5% | CL05C220JA5NNN□ |
| | | 27pF | ±2% | CL05C270GA5NNN□ |
| | | 27pF | ±5% | CL05C270JA5NNN□ |
| | | 33pF | ±5% | CL05C330JA5NNN□ |
| | | 39pF | ±5% | CL05C390JA5NNN□ |
| | | 43pF | ±5% | CL05C430JA5NNN□ |
| | | 47pF | ±5% | CL05C470JA5NNN□ |
| | | 68pF | ±5% | CL05C680JA5NNN□ |
| | | 82pF | ±5% | CL05C820JA5NNN□ |
| | | 91pF | ±5% | CL05C910JA5NNN□ |
| | | 100pF | ±5% | CL05C101JA5NNN□ |
| | | 100pF | ±10% | CL05C101KA5NNN□ |
| | | 120pF | ±5% | CL05C121JA5NNN□ |
| | | 150pF | ±5% | CL05C151JA5NNN□ |
| | | 180pF | ±5% | CL05C181JA5NNN□ |
| | | 220pF | ±1% | CL05C221FA5NNN□ |
| | | 220pF | ±5% | CL05C221JA5NNN□ |
| | | 270pF | ±5% | CL05C271JA5NNN□ |
| | | 560pF | ±5% | CL05C561JA5NNN□ |
| | | 1.0nF | ±5% | CL05C102JA5NNN□ |
| | 50Vdc | 0.2pF | ±0.1pF | CL05C0R2BB5NNN□ |
| | | 0.3pF | ±0.1pF | CL05C0R3BB5NNN□ |
| | | 0.3pF | ±0.25pF | CL05C0R3CB5NNN□ |
| | | 0.5pF | ±0.1pF | CL05C0R5BB5NNN□ |
| | | 0.5pF | ±0.25pF | CL05C0R5CB5NNN□ |
| | | 0.7pF | ±0.1pF | CL05C0R7BB5NNN□ |
| | | 0.75pF | ±0.1pF | CL05CR75BB5NNN□ |
| | | 0.75pF | ±0.25pF | CL05CR75CB5NNN□ |
| | | 1.0pF | ±0.1pF | CL05C010BB5NNN□ |
| | | 1.0pF | ±0.25pF | CL05C010CB5NNN□ |
| | | 1.2pF | ±0.1pF | CL05C1R2BB5NNN□ |
| | | 1.2pF | ±0.25pF | CL05C1R2CB5NNN□ |
| | | 1.3pF | ±0.1pF | CL05C1R3BB5NNN□ |
| | | 1.5pF | ±0.1pF | CL05C1R5BB5NNN□ |
| | | 1.5pF | ±0.25pF | CL05C1R5CB5NNN□ |
| | | 1.8pF | ±0.1pF | CL05C1R8BB5NNN□ |
| | | 1.8pF | ±0.25pF | CL05C1R8CB5NNN□ |
| | | 2.0pF | ±0.1pF | CL05C020BB5NNN□ |
| | | 2.0pF | ±0.25pF | CL05C020CB5NNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 2.2pF | ±0.1pF | CL05C2R2BB5NNN□ |
| | | 2.2pF | ±0.25pF | CL05C2R2CB5NNN□ |
| | | 2.4pF | ±0.1pF | CL05C2R4BB5NNN□ |
| | | 2.4pF | ±0.25pF | CL05C2R4CB5NNN□ |
| | | 2.5pF | ±0.1pF | CL05C2R5BB5NNN□ |
| | | 2.5pF | ±0.25pF | CL05C2R5CB5NNN□ |
| | | 2.7pF | ±0.1pF | CL05C2R7BB5NNN□ |
| | | 2.7pF | ±0.25pF | CL05C2R7CB5NNN□ |
| | | 3.0pF | ±0.1pF | CL05C030BB5NNN□ |
| | | 3.0pF | ±0.25pF | CL05C030CB5NNN□ |
| | | 3.3pF | ±0.1pF | CL05C3R3BB5NNN□ |
| | | 3.3pF | ±0.25pF | CL05C3R3CB5NNN□ |
| | | 3.5pF | ±0.25pF | CL05C3R5CB5NNN□ |
| | | 3.6pF | ±0.25pF | CL05C3R6CB5NNN□ |
| | | 3.9pF | ±0.1pF | CL05C3R9BB5NNN□ |
| | | 3.9pF | ±0.25pF | CL05C3R9CB5NNN□ |
| | | 4.0pF | ±0.1pF | CL05C040BB5NNN□ |
| | | 4.0pF | ±0.25pF | CL05C040CB5NNN□ |
| | | 4.3pF | ±0.25pF | CL05C4R3CB5NNN□ |
| | | 4.7pF | ±0.1pF | CL05C4R7BB5NNN□ |
| | | 4.7pF | ±0.25pF | CL05C4R7CB5NNN□ |
| | | 4.7pF | ±0.5pF | CL05C4R7DB5NNN□ |
| | | 5.0pF | ±0.1pF | CL05C050BB5NNN□ |
| | | 5.0pF | ±0.25pF | CL05C050CB5NNN□ |
| | | 5.0pF | ±0.5pF | CL05C050DB5NNN□ |
| | | 5.1pF | ±0.25pF | CL05C5R1CB5NNN□ |
| | | 5.6pF | ±0.1pF | CL05C5R6BB5NNN□ |
| | | 5.6pF | ±0.25pF | CL05C5R6CB5NNN□ |
| | | 5.6pF | ±0.5pF | CL05C5R6DB5NNN□ |
| | | 6.0pF | ±0.25pF | CL05C060CB5NNN□ |
| | | 6.0pF | ±0.5pF | CL05C060DB5NNN□ |
| | | 6.2pF | ±0.25pF | CL05C6R2CB5NNN□ |
| | | 6.2pF | ±0.5pF | CL05C6R2DB5NNN□ |
| | | 6.8pF | ±0.1pF | CL05C6R8BB5NNN□ |
| | | 6.8pF | ±0.25pF | CL05C6R8CB5NNN□ |
| | | 6.8pF | ±0.5pF | CL05C6R8DB5NNN□ |
| | | 7.0pF | ±0.1pF | CL05C070BB5NNN□ |
| | | 7.0pF | ±0.25pF | CL05C070CB5NNN□ |
| | | 7.0pF | ±0.5pF | CL05C070DB5NNN□ |
| | | 8.0pF | ±0.25pF | CL05C080CB5NNN□ |
| | | 8.0pF | ±0.5pF | CL05C080DB5NNN□ |
| | | 8.2pF | ±0.1pF | CL05C8R2BB5NNN□ |
| | | 8.2pF | ±0.25pF | CL05C8R2CB5NNN□ |
| | | 8.2pF | ±0.5pF | CL05C8R2DB5NNN□ |
| | | 9.0pF | ±0.25pF | CL05C090CB5NNN□ |
| | | 9.0pF | ±0.5pF | CL05C090DB5NNN□ |
| | | 9.1pF | ±0.1pF | CL05C9R1BB5NNN□ |
| | | 9.1pF | ±0.25pF | CL05C9R1CB5NNN□ |
| | | 10pF | ±0.25pF | CL05C100CB5NNN□ |
| | | 10pF | ±0.5pF | CL05C100DB5NNN□ |
| | | 10pF | ±5% | CL05C100JB5NNN□ |
| | | 11pF | ±5% | CL05C110JB5NNN□ |
| | | 12pF | ±2% | CL05C120GB5NNN□ |
| | | 12pF | ±5% | CL05C120JB5NNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Standard & High Capacitors

## Product Line Up (C0G)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 13pF | ±5% | CL05C130JB5NNN□ |
| | | 14pF | ±5% | CL05C140JB5NNN□ |
| | | 15pF | ±5% | CL05C150JB5NNN□ |
| | | 16pF | ±5% | CL05C160JB5NNN□ |
| | | 17pF | ±5% | CL05C170JB5NNN□ |
| | | 18pF | ±2% | CL05C180GB5NNN□ |
| | | 18pF | ±5% | CL05C180JB5NNN□ |
| | | 20pF | ±2% | CL05C200GB5NNN□ |
| | | 20pF | ±5% | CL05C200JB5NNN□ |
| | | 22pF | ±1% | CL05C220FB5NNN□ |
| | | 22pF | ±2% | CL05C220GB5NNN□ |
| | | 22pF | ±5% | CL05C220JB5NNN□ |
| | | 24pF | ±5% | CL05C240JB5NNN□ |
| | | 26pF | ±5% | CL05C260JB5NNN□ |
| | | 27pF | ±1% | CL05C270FB5NNN□ |
| | | 27pF | ±5% | CL05C270JB5NNN□ |
| | | 30pF | ±5% | CL05C300JB5NNN□ |
| | | 33pF | ±1% | CL05C330FB5NNN□ |
| | | 33pF | ±5% | CL05C330JB5NNN□ |
| | | 36pF | ±5% | CL05C360JB5NNN□ |
| | | 39pF | ±2% | CL05C390GB5NNN□ |
| | | 39pF | ±5% | CL05C390JB5NNN□ |
| | | 43pF | ±2% | CL05C430GB5NNN□ |
| | | 43pF | ±5% | CL05C430JB5NNN□ |
| | | 47pF | ±1% | CL05C470FB5NNN□ |
| | | 47pF | ±5% | CL05C470JB5NNN□ |
| | | 51pF | ±5% | CL05C510JB5NNN□ |
| | | 56pF | ±1% | CL05C560FB5NNN□ |
| | | 56pF | ±5% | CL05C560JB5NNN□ |
| | | 62pF | ±2% | CL05C620GB5NNN□ |
| | | 62pF | ±5% | CL05C620JB5NNN□ |
| | | 68pF | ±5% | CL05C680JB5NNN□ |
| | | 75pF | ±5% | CL05C750JB5NNN□ |
| | | 82pF | ±5% | CL05C820JB5NNN□ |
| | | 91pF | ±5% | CL05C910JB5NNN□ |
| | | 100pF | ±1% | CL05C101FB5NNN□ |
| | | 100pF | ±2% | CL05C101GB5NNN□ |
| | | 100pF | ±5% | CL05C101JB5NNN□ |
| | | 100pF | ±10% | CL05C101KB5NNN□ |
| | | 110pF | ±5% | CL05C111JB5NNN□ |
| | | 120pF | ±2% | CL05C121GB5NNN□ |
| | | 120pF | ±5% | CL05C121JB5NNN□ |
| | | 130pF | ±5% | CL05C131JB5NNN□ |
| | | 150pF | ±5% | CL05C151JB5NNN□ |
| | | 160pF | ±5% | CL05C161JB5NNN□ |
| | | 180pF | ±5% | CL05C181JB5NNN□ |
| | | 200pF | ±5% | CL05C201JB5NNN□ |
| | | 220pF | ±1% | CL05C221FB5NNN□ |
| | | 220pF | ±2% | CL05C221GB5NNN□ |
| | | 220pF | ±5% | CL05C221JB5NNN□ |
| | | 240pF | ±5% | CL05C241JB5NNN□ |
| | | 270pF | ±5% | CL05C271JB5NNN□ |
| | | 300pF | ±5% | CL05C301JB5NNN□ |
| | | 330pF | ±5% | CL05C331JB5NNN□ |
| | | 390pF | ±5% | CL05C391JB5NNN□ |
| | | 470pF | ±1% | CL05C471FB5NNN□ |
| | | 470pF | ±5% | CL05C471JB5NNN□ |
| | | 560pF | ±5% | CL05C561JB5NNN□ |
| | | 680pF | ±5% | CL05C681JB5NNN□ |
| | | 820pF | ±5% | CL05C821JB5NNN□ |
| | | 1.0nF | ±1% | CL05C102FB5NNN□ |
| | | 1.0nF | ±5% | CL05C102JB5NNN□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 16Vdc | 68pF | ±1% | CL10C680FO8NNN□ |
| | | 68pF | ±2% | CL10C680GO8NNN□ |
| | | 100pF | ±2% | CL10C101GO8NNN□ |
| | | 820pF | ±5% | CL10C821JO8NNN□ |
| | | 1.0nF | ±5% | CL10C102JO8NNN□ |
| | | 2.2nF | ±5% | CL10C222JO8NNN□ |
| | | 3.9nF | ±5% | CL10C392JO8NNN□ |
| | 25Vdc | 10pF | ±0.5pF | CL10C100DA8NNN□ |
| | | 10pF | ±5% | CL10C100JA8NNN□ |
| | | 15pF | ±5% | CL10C150JA8NNN□ |
| | | 20pF | ±5% | CL10C200JA8NNN□ |
| | | 33pF | ±5% | CL10C330JA8NNN□ |
| | | 47pF | ±5% | CL10C470JA8NNN□ |
| | | 68pF | ±5% | CL10C680JA8NNN□ |
| | | 100pF | ±5% | CL10C101JA8NNN□ |
| | | 100pF | ±10% | CL10C101KA8NNN□ |
| | | 120pF | ±5% | CL10C121JA8NNN□ |
| | | 150pF | ±5% | CL10C151JA8NNN□ |
| | | 180pF | ±5% | CL10C181JA8NNN□ |
| | | 270pF | ±10% | CL10C271KA8NNN□ |
| | | 330pF | ±10% | CL10C331KA8NNN□ |
| | | 390pF | ±5% | CL10C391JA8NNN□ |
| | | 470pF | ±5% | CL10C471JA8NNN□ |
| | | 560pF | ±5% | CL10C561JA8NNN□ |
| | | 680pF | ±5% | CL10C681JA8NNN□ |
| | | 820pF | ±5% | CL10C821JA8NNN□ |
| | | 1.5nF | ±2% | CL10C152GA8NNN□ |
| | | 1.5nF | ±5% | CL10C152JA8NNN□ |
| | | 1.8nF | ±5% | CL10C182JA8NNN□ |
| | | 10nF | ±5% | CL10C103JA8NNN□ |
| | | 1.0nF | ±2% | CL10C102GA8NNN□ |
| | | 1.0nF | ±5% | CL10C102JA8NNN□ |
| | | 2.2nF | ±2% | CL10C222GA8NNN□ |
| | | 2.2nF | ±5% | CL10C222JA8NNN□ |
| | | 3.3nF | ±2% | CL10C332GA8NNN□ |
| | | 3.3nF | ±5% | CL10C332JA8NNN□ |
| | | 3.9nF | ±5% | CL10C392JA8NNN□ |
| | 50Vdc | 0.2pF | ±0.1pF | CL10C0R2BB8NNN□ |
| | | 0.2pF | ±0.25pF | CL10C0R2CB8NNN□ |
| | | 0.3pF | ±0.1pF | CL10C0R3BB8NNN□ |
| | | 0.3pF | ±0.25pF | CL10C0R3CB8NNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (C0G)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 0.47pF | ±0.1pF | CL10CR47BB8NNN□ |
| | | 0.5pF | ±0.1pF | CL10C0R5BB8NNN□ |
| | | 0.5pF | ±0.25pF | CL10C0R5CB8NNN□ |
| | | 0.56pF | ±0.1pF | CL10CR56BB8NNN□ |
| | | 0.68pF | ±0.1pF | CL10CR68BB8NNN□ |
| | | 0.75pF | ±0.1pF | CL10CR75BB8NNN□ |
| | | 0.75pF | ±0.25pF | CL10CR75CB8NNN□ |
| | | 0.8pF | ±0.1pF | CL10C0R8BB8NNN□ |
| | | 0.82pF | ±0.1pF | CL10CR82BB8NNN□ |
| | | 1.0pF | ±0.1pF | CL10C010BB8NNN□ |
| | | 1.0pF | ±0.25pF | CL10C010CB8NNN□ |
| | | 1.2pF | ±0.1pF | CL10C1R2BB8NNN□ |
| | | 1.2pF | ±0.25pF | CL10C1R2CB8NNN□ |
| | | 1.5pF | ±0.1pF | CL10C1R5BB8NNN□ |
| | | 1.5pF | ±0.25pF | CL10C1R5CB8NNN□ |
| | | 1.8pF | ±0.1pF | CL10C1R8BB8NNN□ |
| | | 1.8pF | ±0.25pF | CL10C1R8CB8NNN□ |
| | | 2.0pF | ±0.1pF | CL10C020BB8NNN□ |
| | | 2.0pF | ±0.25pF | CL10C020CB8NNN□ |
| | | 2.2pF | ±0.1pF | CL10C2R2BB8NNN□ |
| | | 2.2pF | ±0.25pF | CL10C2R2CB8NNN□ |
| | | 2.4pF | ±0.1pF | CL10C2R4BB8NNN□ |
| | | 2.4pF | ±0.25pF | CL10C2R4CB8NNN□ |
| | | 2.5pF | ±0.1pF | CL10C2R5BB8NNN□ |
| | | 2.5pF | ±0.25pF | CL10C2R5CB8NNN□ |
| | | 2.7pF | ±0.1pF | CL10C2R7BB8NNN□ |
| | | 2.7pF | ±0.25pF | CL10C2R7CB8NNN□ |
| | | 3.0pF | ±0.1pF | CL10C030BB8NNN□ |
| | | 3.0pF | ±0.25pF | CL10C030CB8NNN□ |
| | | 3.3pF | ±0.1pF | CL10C3R3BB8NNN□ |
| | | 3.3pF | ±0.25pF | CL10C3R3CB8NNN□ |
| | | 3.5pF | ±0.25pF | CL10C3R5CB8NNN□ |
| | | 3.6pF | ±0.1pF | CL10C3R6BB8NNN□ |
| | | 3.6pF | ±0.25pF | CL10C3R6CB8NNN□ |
| | | 3.9pF | ±0.1pF | CL10C3R9BB8NNN□ |
| | | 3.9pF | ±0.25pF | CL10C3R9CB8NNN□ |
| | | 4.0pF | ±0.1pF | CL10C040BB8NNN□ |
| | | 4.0pF | ±0.25pF | CL10C040CB8NNN□ |
| | | 4.3pF | ±0.1pF | CL10C4R3BB8NNN□ |
| | | 4.3pF | ±0.25pF | CL10C4R3CB8NNN□ |
| | | 4.7pF | ±0.1pF | CL10C4R7BB8NNN□ |
| | | 4.7pF | ±0.25pF | CL10C4R7CB8NNN□ |
| | | 5.0pF | ±0.1pF | CL10C050BB8NNN□ |
| | | 5.0pF | ±0.25pF | CL10C050CB8NNN□ |
| | | 5.0pF | ±0.5pF | CL10C050DB8NNN□ |
| | | 5.1pF | ±0.25pF | CL10C5R1CB8NNN□ |
| | | 5.6pF | ±0.1pF | CL10C5R6BB8NNN□ |
| | | 5.6pF | ±0.25pF | CL10C5R6CB8NNN□ |
| | | 5.6pF | ±0.5pF | CL10C5R6DB8NNN□ |
| | | 6.0pF | ±0.25pF | CL10C060CB8NNN□ |
| | | 6.0pF | ±0.5pF | CL10C060DB8NNN□ |
| | | 6.2pF | ±0.25pF | CL10C6R2CB8NNN□ |
| | | 6.2pF | ±0.5pF | CL10C6R2DB8NNN□ |
| | | 6.8pF | ±0.1pF | CL10C6R8BB8NNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 6.8pF | ±0.25pF | CL10C6R8CB8NNN□ |
| | | 6.8pF | ±0.5pF | CL10C6R8DB8NNN□ |
| | | 7.0pF | ±0.1pF | CL10C070BB8NNN□ |
| | | 7.0pF | ±0.25pF | CL10C070CB8NNN□ |
| | | 7.0pF | ±0.5pF | CL10C070DB8NNN□ |
| | | 7.5pF | ±0.1pF | CL10C7R5BB8NNN□ |
| | | 7.5pF | ±0.25pF | CL10C7R5CB8NNN□ |
| | | 7.5pF | ±0.5pF | CL10C7R5DB8NNN□ |
| | | 8.0pF | ±0.25pF | CL10C080CB8NNN□ |
| | | 8.0pF | ±0.5pF | CL10C080DB8NNN□ |
| | | 8.2pF | ±0.1pF | CL10C8R2BB8NNN□ |
| | | 8.2pF | ±0.25pF | CL10C8R2CB8NNN□ |
| | | 8.2pF | ±0.5pF | CL10C8R2DB8NNN□ |
| | | 9.0pF | ±0.25pF | CL10C090CB8NNN□ |
| | | 9.0pF | ±0.5pF | CL10C090DB8NNN□ |
| | | 9.1pF | ±0.25pF | CL10C9R1CB8NNN□ |
| | | 9.1pF | ±0.5pF | CL10C9R1DB8NNN□ |
| | | 10pF | ±0.1pF | CL10C100BB8NNN□ |
| | | 10pF | ±0.25pF | CL10C100CB8NNN□ |
| | | 10pF | ±0.5pF | CL10C100DB8NNN□ |
| | | 10pF | ±1% | CL10C100FB8NNN□ |
| | | 10pF | ±2% | CL10C100GB8NNN□ |
| | | 10pF | ±5% | CL10C100JB8NNN□ |
| | | 10pF | ±10% | CL10C100KB8NNN□ |
| | | 11pF | ±2% | CL10C110GB8NNN□ |
| | | 11pF | ±5% | CL10C110JB8NNN□ |
| | | 12pF | ±1% | CL10C120FB8NNN□ |
| | | 12pF | ±2% | CL10C120GB8NNN□ |
| | | 12pF | ±5% | CL10C120JB8NNN□ |
| | | 13pF | ±2% | CL10C130GB8NNN□ |
| | | 13pF | ±5% | CL10C130JB8NNN□ |
| | | 14pF | ±5% | CL10C140JB8NNN□ |
| | | 15pF | ±1% | CL10C150FB8NNN□ |
| | | 15pF | ±2% | CL10C150GB8NNN□ |
| | | 15pF | ±5% | CL10C150JB8NNN□ |
| | | 15pF | ±10% | CL10C150KB8NNN□ |
| | | 16pF | ±5% | CL10C160JB8NNN□ |
| | | 17pF | ±5% | CL10C170JB8NNN□ |
| | | 18pF | ±1% | CL10C180FB8NNN□ |
| | | 18pF | ±2% | CL10C180GB8NNN□ |
| | | 18pF | ±5% | CL10C180JB8NNN□ |
| | | 19pF | ±5% | CL10C190JB8NNN□ |
| | | 20pF | ±1% | CL10C200FB8NNN□ |
| | | 20pF | ±2% | CL10C200GB8NNN□ |
| | | 20pF | ±5% | CL10C200JB8NNN□ |
| | | 21pF | ±5% | CL10C210JB8NNN□ |
| | | 22pF | ±1% | CL10C220FB8NNN□ |
| | | 22pF | ±2% | CL10C220GB8NNN□ |
| | | 22pF | ±5% | CL10C220JB8NNN□ |
| | | 22pF | ±10% | CL10C220KB8NNN□ |
| | | 23pF | ±5% | CL10C230JB8NNN□ |
| | | 24pF | ±2% | CL10C240GB8NNN□ |
| | | 24pF | ±5% | CL10C240JB8NNN□ |
| | | 25pF | ±5% | CL10C250JB8NNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Standard & High Capacitors

## Product Line Up (C0G)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 26pF | ±5% | CL10C260JB8NNN□ |
| | | 27pF | ±1% | CL10C270FB8NNN□ |
| | | 27pF | ±2% | CL10C270GB8NNN□ |
| | | 27pF | ±5% | CL10C270JB8NNN□ |
| | | 28pF | ±2% | CL10C280GB8NNN□ |
| | | 28pF | ±5% | CL10C280JB8NNN□ |
| | | 30pF | ±1% | CL10C300FB8NNN□ |
| | | 30pF | ±5% | CL10C300JB8NNN□ |
| | | 32pF | ±2% | CL10C320GB8NNN□ |
| | | 32pF | ±5% | CL10C320JB8NNN□ |
| | | 33pF | ±1% | CL10C330FB8NNN□ |
| | | 33pF | ±2% | CL10C330GB8NNN□ |
| | | 33pF | ±5% | CL10C330JB8NNN□ |
| | | 33pF | ±10% | CL10C330KB8NNN□ |
| | | 35pF | ±2% | CL10C350GB8NNN□ |
| | | 35pF | ±5% | CL10C350JB8NNN□ |
| | | 36pF | ±2% | CL10C360GB8NNN□ |
| | | 36pF | ±5% | CL10C360JB8NNN□ |
| | | 39pF | ±1% | CL10C390FB8NNN□ |
| | | 39pF | ±2% | CL10C390GB8NNN□ |
| | | 39pF | ±5% | CL10C390JB8NNN□ |
| | | 41pF | ±2% | CL10C410GB8NNN□ |
| | | 41pF | ±5% | CL10C410JB8NNN□ |
| | | 42pF | ±5% | CL10C420JB8NNN□ |
| | | 43pF | ±5% | CL10C430JB8NNN□ |
| | | 47pF | ±1% | CL10C470FB8NNN□ |
| | | 47pF | ±2% | CL10C470GB8NNN□ |
| | | 47pF | ±5% | CL10C470JB8NNN□ |
| | | 47pF | ±10% | CL10C470KB8NNN□ |
| | | 50pF | ±5% | CL10C500JB8NNN□ |
| | | 51pF | ±2% | CL10C510GB8NNN□ |
| | | 51pF | ±5% | CL10C510JB8NNN□ |
| | | 56pF | ±1% | CL10C560FB8NNN□ |
| | | 56pF | ±2% | CL10C560GB8NNN□ |
| | | 56pF | ±5% | CL10C560JB8NNN□ |
| | | 56pF | ±10% | CL10C560KB8NNN□ |
| | | 60pF | ±5% | CL10C600JB8NNN□ |
| | | 62pF | ±2% | CL10C620GB8NNN□ |
| | | 62pF | ±5% | CL10C620JB8NNN□ |
| | | 68pF | ±1% | CL10C680FB8NNN□ |
| | | 68pF | ±2% | CL10C680GB8NNN□ |
| | | 68pF | ±5% | CL10C680JB8NNN□ |
| | | 68pF | ±10% | CL10C680KB8NNN□ |
| | | 70pF | ±2% | CL10C700GB8NNN□ |
| | | 70pF | ±5% | CL10C700JB8NNN□ |
| | | 75pF | ±2% | CL10C750GB8NNN□ |
| | | 75pF | ±5% | CL10C750JB8NNN□ |
| | | 80pF | ±2% | CL10C800GB8NNN□ |
| | | 80pF | ±5% | CL10C800JB8NNN□ |
| | | 82pF | ±1% | CL10C820FB8NNN□ |
| | | 82pF | ±2% | CL10C820GB8NNN□ |
| | | 82pF | ±5% | CL10C820JB8NNN□ |
| | | 90pF | ±5% | CL10C900JB8NNN□ |
| | | 91pF | ±2% | CL10C910GB8NNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 91pF | ±5% | CL10C910JB8NNN□ |
| | | 95pF | ±5% | CL10C950JB8NNN□ |
| | | 100pF | ±1% | CL10C101FB8NNN□ |
| | | 100pF | ±2% | CL10C101GB8NNN□ |
| | | 100pF | ±5% | CL10C101JB8NNN□ |
| | | 100pF | ±10% | CL10C101KB8NNN□ |
| | | 110pF | ±5% | CL10C111JB8NNN□ |
| | | 120pF | ±1% | CL10C121FB8NNN□ |
| | | 120pF | ±2% | CL10C121GB8NNN□ |
| | | 120pF | ±5% | CL10C121JB8NNN□ |
| | | 120pF | ±10% | CL10C121KB8NNN□ |
| | | 130pF | ±1% | CL10C131FB8NNN□ |
| | | 130pF | ±5% | CL10C131JB8NNN□ |
| | | 140pF | ±5% | CL10C141JB8NNN□ |
| | | 150pF | ±2% | CL10C151GB8NNN□ |
| | | 150pF | ±5% | CL10C151JB8NNN□ |
| | | 160pF | ±5% | CL10C161JB8NNN□ |
| | | 170pF | ±2% | CL10C171GB8NNN□ |
| | | 170pF | ±5% | CL10C171JB8NNN□ |
| | | 180pF | ±1% | CL10C181FB8NNN□ |
| | | 180pF | ±2% | CL10C181GB8NNN□ |
| | | 180pF | ±5% | CL10C181JB8NNN□ |
| | | 190pF | ±5% | CL10C191JB8NNN□ |
| | | 200pF | ±1% | CL10C201FB8NNN□ |
| | | 200pF | ±5% | CL10C201JB8NNN□ |
| | | 220pF | ±1% | CL10C221FB8NNN□ |
| | | 220pF | ±2% | CL10C221GB8NNN□ |
| | | 220pF | ±5% | CL10C221JB8NNN□ |
| | | 220pF | ±10% | CL10C221KB8NNN□ |
| | | 240pF | ±5% | CL10C241JB8NNN□ |
| | | 250pF | ±5% | CL10C251JB8NNN□ |
| | | 270pF | ±1% | CL10C271FB8NNN□ |
| | | 270pF | ±2% | CL10C271GB8NNN□ |
| | | 270pF | ±5% | CL10C271JB8NNN□ |
| | | 280pF | ±5% | CL10C281JB8NNN□ |
| | | 300pF | ±5% | CL10C301JB8NNN□ |
| | | 330pF | ±0.25pF | CL10C331CB8NNN□ |
| | | 330pF | ±1% | CL10C331FB8NNN□ |
| | | 330pF | ±2% | CL10C331GB8NNN□ |
| | | 330pF | ±5% | CL10C331JB8NNN□ |
| | | 350pF | ±5% | CL10C351JB8NNN□ |
| | | 360pF | ±5% | CL10C361JB8NNN□ |
| | | 390pF | ±1% | CL10C391FB8NNN□ |
| | | 390pF | ±2% | CL10C391GB8NNN□ |
| | | 390pF | ±5% | CL10C391JB8NNN□ |
| | | 390pF | ±10% | CL10C391KB8NNN□ |
| | | 430pF | ±5% | CL10C431JB8NNN□ |
| | | 470pF | ±1% | CL10C471FB8NNN□ |
| | | 470pF | ±2% | CL10C471GB8NNN□ |
| | | 470pF | ±5% | CL10C471JB8NNN□ |
| | | 470pF | ±10% | CL10C471KB8NNN□ |
| | | 500pF | ±5% | CL10C501JB8NNN□ |
| | | 510pF | ±5% | CL10C511JB8NNN□ |
| | | 560pF | ±1% | CL10C561FB8NNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (C0G)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 560pF | ±2% | CL10C561GB8NNN□ |
| | | 560pF | ±5% | CL10C561JB8NNN□ |
| | | 560pF | ±10% | CL10C561KB8NNN□ |
| | | 620pF | ±5% | CL10C621JB8NNN□ |
| | | 680pF | ±1% | CL10C681FB8NNN□ |
| | | 680pF | ±2% | CL10C681GB8NNN□ |
| | | 680pF | ±5% | CL10C681JB8NNN□ |
| | | 680pF | ±10% | CL10C681KB8NNN□ |
| | | 720pF | ±5% | CL10C721JB8NNN□ |
| | | 750pF | ±5% | CL10C751JB8NNN□ |
| | | 820pF | ±1% | CL10C821FB8NNN□ |
| | | 820pF | ±2% | CL10C821GB8NNN□ |
| | | 820pF | ±5% | CL10C821JB8NNN□ |
| | | 820pF | ±10% | CL10C821KB8NNN□ |
| | | 910pF | ±5% | CL10C911JB8NNN□ |
| | | 1.0nF | ±1% | CL10C102FB8NNN□ |
| | | 1.0nF | ±2% | CL10C102GB8NNN□ |
| | | 1.0nF | ±5% | CL10C102JB8NNN□ |
| | | 1.2nF | ±5% | CL10C122JB8NNN□ |
| | | 1.5nF | ±5% | CL10C152JB8NNN□ |
| | | 1.8nF | ±5% | CL10C182JB8NNN□ |
| | | 2.2nF | ±5% | CL10C222JB8NNN□ |
| | | 2.7nF | ±5% | CL10C272JB8NNN□ |
| | | 3.3nF | ±5% | CL10C332JB8NNN□ |
| | | 4.7nF | ±5% | CL10C472JB8NNN□ |
| | | 5.6nF | ±5% | CL10C562JB8NNN□ |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 25Vdc | 220pF | ±2% | CL21C221GAANNN□ |
| | | 220pF | ±5% | CL21C221JAANNN□ |
| | | 270pF | ±5% | CL21C271JAANNN□ |
| | | 680pF | ±5% | CL21C681JAANNN□ |
| | | 1.5nF | ±5% | CL21C152JAANNN□ |
| | | 3.9nF | ±5% | CL21C392JAANNN□ |
| | 50Vdc | 0.47pF | ±0.1pF | CL21CR47BBANNN□ |
| | | 0.47pF | ±0.25pF | CL21CR47CBANNN□ |
| | | 0.5pF | ±0.1pF | CL21C0R5BBANNN□ |
| | | 0.5pF | ±0.25pF | CL21C0R5CBANNN□ |
| | | 0.68pF | ±0.1pF | CL21CR68BBANNN□ |
| | | 0.75pF | ±0.1pF | CL21CR75BBANNN□ |
| | | 0.82pF | ±0.1pF | CL21CR82BBANNN□ |
| | | 0.82pF | ±0.25pF | CL21CR82CBANNN□ |
| | | 1.0pF | ±0.1pF | CL21C010BBANNN□ |
| | | 1.0pF | ±0.25pF | CL21C010CBANNN□ |
| | | 1.2pF | ±0.1pF | CL21C1R2BBANNN□ |
| | | 1.2pF | ±0.25pF | CL21C1R2CBANNN□ |
| | | 1.5pF | ±0.1pF | CL21C1R5BBANNN□ |
| | | 1.5pF | ±0.25pF | CL21C1R5CBANNN□ |
| | | 1.8pF | ±0.1pF | CL21C1R8BBANNN□ |
| | | 1.8pF | ±0.25pF | CL21C1R8CBANNN□ |
| | | 1.8pF | ±0.5pF | CL21C1R8DBANNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 50Vdc | 2.0pF | ±0.25pF | CL21C020CBANNN□ |
| | | 2.2pF | ±0.1pF | CL21C2R2BBANNN□ |
| | | 2.2pF | ±0.25pF | CL21C2R2CBANNN□ |
| | | 2.4pF | ±0.25pF | CL21C2R4CBANNN□ |
| | | 2.5pF | ±0.25pF | CL21C2R5CBANNN□ |
| | | 2.7pF | ±0.1pF | CL21C2R7BBANNN□ |
| | | 2.7pF | ±0.25pF | CL21C2R7CBANNN□ |
| | | 3.0pF | ±0.1pF | CL21C030BBANNN□ |
| | | 3.0pF | ±0.25pF | CL21C030CBANNN□ |
| | | 3.2pF | ±0.25pF | CL21C3R2CBANNN□ |
| | | 3.3pF | ±0.1pF | CL21C3R3BBANNN□ |
| | | 3.3pF | ±0.25pF | CL21C3R3CBANNN□ |
| | | 3.6pF | ±0.1pF | CL21C3R6BBANNN□ |
| | | 3.6pF | ±0.25pF | CL21C3R6CBANNN□ |
| | | 3.9pF | ±0.1pF | CL21C3R9BBANNN□ |
| | | 3.9pF | ±0.25pF | CL21C3R9CBANNN□ |
| | | 4.0pF | ±0.1pF | CL21C040BBANNN□ |
| | | 4.0pF | ±0.25pF | CL21C040CBANNN□ |
| | | 4.7pF | ±0.1pF | CL21C4R7BBANNN□ |
| | | 4.7pF | ±0.25pF | CL21C4R7CBANNN□ |
| | | 5.0pF | ±0.1pF | CL21C050BBANNN□ |
| | | 5.0pF | ±0.25pF | CL21C050CBANNN□ |
| | | 5.1pF | ±0.25pF | CL21C5R1CBANNN□ |
| | | 5.6pF | ±0.25pF | CL21C5R6CBANNN□ |
| | | 5.6pF | ±0.5pF | CL21C5R6DBANNN□ |
| | | 6.0pF | ±0.25pF | CL21C060CBANNN□ |
| | | 6.0pF | ±0.5pF | CL21C060DBANNN□ |
| | | 6.2pF | ±0.25pF | CL21C6R2CBANNN□ |
| | | 6.8pF | ±0.25pF | CL21C6R8CBANNN□ |
| | | 6.8pF | ±0.5pF | CL21C6R8DBANNN□ |
| | | 7.0pF | ±0.25pF | CL21C070CBANNN□ |
| | | 7.0pF | ±0.5pF | CL21C070DBANNN□ |
| | | 7.5pF | ±0.25pF | CL21C7R5CBANNN□ |
| | | 7.5pF | ±0.5pF | CL21C7R5DBANNN□ |
| | | 8.0pF | ±0.25pF | CL21C080CBANNN□ |
| | | 8.0pF | ±0.5pF | CL21C080DBANNN□ |
| | | 8.2pF | ±0.1pF | CL21C8R2BBANNN□ |
| | | 8.2pF | ±0.25pF | CL21C8R2CBANNN□ |
| | | 8.2pF | ±0.5pF | CL21C8R2DBANNN□ |
| | | 9.0pF | ±0.25pF | CL21C090CBANNN□ |
| | | 9.0pF | ±0.5pF | CL21C090DBANNN□ |
| | | 10pF | ±0.1pF | CL21C100BBANNN□ |
| | | 10pF | ±0.25pF | CL21C100CBANNN□ |
| | | 10pF | ±0.5pF | CL21C100DBANNN□ |
| | | 10pF | ±1% | CL21C100FBANNN□ |
| | | 10pF | ±2% | CL21C100GBANNN□ |
| | | 10pF | ±5% | CL21C100JBANNN□ |
| | | 12pF | ±1% | CL21C120FBANNN□ |
| | | 12pF | ±2% | CL21C120GBANNN□ |
| | | 12pF | ±5% | CL21C120JBANNN□ |
| | | 13pF | ±5% | CL21C130JBANNN□ |
| | | 14pF | ±5% | CL21C140JBANNN□ |
| | | 15pF | ±2% | CL21C150GBANNN□ |
| | | 15pF | ±5% | CL21C150JBANNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Standard & High Capacitors

## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 50Vdc | 15pF | ±10% | CL21C150KBANNN□ |
| | | 16pF | ±5% | CL21C160JBANNN□ |
| | | 17pF | ±5% | CL21C170JBANNN□ |
| | | 18pF | ±1% | CL21C180FBANNN□ |
| | | 18pF | ±2% | CL21C180GBANNN□ |
| | | 18pF | ±5% | CL21C180JBANNN□ |
| | | 20pF | ±2% | CL21C200GBANNN□ |
| | | 20pF | ±5% | CL21C200JBANNN□ |
| | | 22pF | ±1% | CL21C220FBANNN□ |
| | | 22pF | ±2% | CL21C220GBANNN□ |
| | | 22pF | ±5% | CL21C220JBANNN□ |
| | | 22pF | ±10% | CL21C220KBANNN□ |
| | | 23pF | ±5% | CL21C230JBANNN□ |
| | | 24pF | ±2% | CL21C240GBANNN□ |
| | | 24pF | ±5% | CL21C240JBANNN□ |
| | | 25pF | ±5% | CL21C250JBANNN□ |
| | | 27pF | ±1% | CL21C270FBANNN□ |
| | | 27pF | ±2% | CL21C270GBANNN□ |
| | | 27pF | ±5% | CL21C270JBANNN□ |
| | | 28pF | ±5% | CL21C280JBANNN□ |
| | | 30pF | ±5% | CL21C300JBANNN□ |
| | | 32pF | ±2% | CL21C320GBANNN□ |
| | | 32pF | ±5% | CL21C320JBANNN□ |
| | | 33pF | ±1% | CL21C330FBANNN□ |
| | | 33pF | ±2% | CL21C330GBANNN□ |
| | | 33pF | ±5% | CL21C330JBANNN□ |
| | | 33pF | ±10% | CL21C330KBANNN□ |
| | | 36pF | ±5% | CL21C360JBANNN□ |
| | | 38pF | ±2% | CL21C380GBANNN□ |
| | | 38pF | ±5% | CL21C380JBANNN□ |
| | | 39pF | ±2% | CL21C390GBANNN□ |
| | | 39pF | ±5% | CL21C390JBANNN□ |
| | | 40pF | ±2% | CL21C400GBANNN□ |
| | | 40pF | ±5% | CL21C400JBANNN□ |
| | | 43pF | ±5% | CL21C430JBANNN□ |
| | | 47pF | ±1% | CL21C470FBANNN□ |
| | | 47pF | ±2% | CL21C470GBANNN□ |
| | | 47pF | ±5% | CL21C470JBANNN□ |
| | | 47pF | ±10% | CL21C470KBANNN□ |
| | | 50pF | ±5% | CL21C500JBANNN□ |
| | | 51pF | ±2% | CL21C510GBANNN□ |
| | | 51pF | ±5% | CL21C510JBANNN□ |
| | | 56pF | ±1% | CL21C560FBANNN□ |
| | | 56pF | ±2% | CL21C560GBANNN□ |
| | | 56pF | ±5% | CL21C560JBANNN□ |
| | | 60pF | ±5% | CL21C600JBANNN□ |
| | | 62pF | ±5% | CL21C620JBANNN□ |
| | | 68pF | ±1% | CL21C680FBANNN□ |
| | | 68pF | ±2% | CL21C680GBANNN□ |
| | | 68pF | ±5% | CL21C680JBANNN□ |
| | | 68pF | ±10% | CL21C680KBANNN□ |
| | | 70pF | ±5% | CL21C700JBANNN□ |
| | | 70pF | ±10% | CL21C700KBANNN□ |
| | | 75pF | ±2% | CL21C750GBANNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 50Vdc | 75pF | ±5% | CL21C750JBANNN□ |
| | | 80pF | ±2% | CL21C800GBANNN□ |
| | | 80pF | ±5% | CL21C800JBANNN□ |
| | | 82pF | ±1% | CL21C820FBANNN□ |
| | | 82pF | ±2% | CL21C820GBANNN□ |
| | | 82pF | ±5% | CL21C820JBANNN□ |
| | | 90pF | ±5% | CL21C900JBANNN□ |
| | | 91pF | ±5% | CL21C910JBANNN□ |
| | | 100pF | ±1% | CL21C101FBANNN□ |
| | | 100pF | ±2% | CL21C101GBANNN□ |
| | | 100pF | ±5% | CL21C101JBANNN□ |
| | | 100pF | ±10% | CL21C101KBANNN□ |
| | | 110pF | ±5% | CL21C111JBANNN□ |
| | | 120pF | ±1% | CL21C121FBANNN□ |
| | | 120pF | ±2% | CL21C121GBANNN□ |
| | | 120pF | ±5% | CL21C121JBANNN□ |
| | | 130pF | ±5% | CL21C131JBANNN□ |
| | | 150pF | ±1% | CL21C151FBANNN□ |
| | | 150pF | ±2% | CL21C151GBANNN□ |
| | | 150pF | ±5% | CL21C151JBANNN□ |
| | | 160pF | ±5% | CL21C161JBANNN□ |
| | | 180pF | ±1% | CL21C181FBANNN□ |
| | | 180pF | ±2% | CL21C181GBANNN□ |
| | | 180pF | ±5% | CL21C181JBANNN□ |
| | | 200pF | ±5% | CL21C201JBANNN□ |
| | | 220pF | ±1% | CL21C221FBANNN□ |
| | | 220pF | ±2% | CL21C221GBANNN□ |
| | | 220pF | ±5% | CL21C221JBANNN□ |
| | | 220pF | ±10% | CL21C221KBANNN□ |
| | | 240pF | ±5% | CL21C241JBANNN□ |
| | | 250pF | ±5% | CL21C251JBANNN□ |
| | | 260pF | ±5% | CL21C261JBANNN□ |
| | | 270pF | ±1% | CL21C271FBANNN□ |
| | | 270pF | ±2% | CL21C271GBANNN□ |
| | | 270pF | ±5% | CL21C271JBANNN□ |
| | | 300pF | ±5% | CL21C301JBANNN□ |
| | | 330pF | ±1% | CL21C331FBANNN□ |
| | | 330pF | ±2% | CL21C331GBANNN□ |
| | | 330pF | ±5% | CL21C331JBANNN□ |
| | | 360pF | ±5% | CL21C361JBANNN□ |
| | | 390pF | ±1% | CL21C391FBANNN□ |
| | | 390pF | ±2% | CL21C391GBANNN□ |
| | | 390pF | ±5% | CL21C391JBANNN□ |
| | | 430pF | ±5% | CL21C431JBANNN□ |
| | | 470pF | ±1% | CL21C471FBANNN□ |
| | | 470pF | ±2% | CL21C471GBANNN□ |
| | | 470pF | ±5% | CL21C471JBANNN□ |
| | | 470pF | ±10% | CL21C471KBANNN□ |
| | | 510pF | ±5% | CL21C511JBANNN□ |
| | | 560pF | ±1% | CL21C561FBANNN□ |
| | | 560pF | ±2% | CL21C561GBANNN□ |
| | | 560pF | ±5% | CL21C561JBANNN□ |
| | | 680pF | ±5% | CL21C681JBANNN□ |
| 0.95mm | 50Vdc | 5.0pF | ±0.25pF | CL21C050CBCNNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 50Vdc | 10pF | ±0.1pF | CL21C100BBCNNN□ |
| | | 10pF | ±5% | CL21C100JBCNNN□ |
| | | 11pF | ±2% | CL21C110GBCNNN□ |
| | | 11pF | ±5% | CL21C110JBCNNN□ |
| | | 12pF | ±2% | CL21C120GBCNNN□ |
| | | 12pF | ±5% | CL21C120JBCNNN□ |
| | | 13pF | ±2% | CL21C130GBCNNN□ |
| | | 15pF | ±2% | CL21C150GBCNNN□ |
| | | 15pF | ±5% | CL21C150JBCNNN□ |
| | | 16pF | ±2% | CL21C160GBCNNN□ |
| | | 18pF | ±2% | CL21C180GBCNNN□ |
| | | 18pF | ±5% | CL21C180JBCNNN□ |
| | | 20pF | ±2% | CL21C200GBCNNN□ |
| | | 20pF | ±5% | CL21C200JBCNNN□ |
| | | 22pF | ±2% | CL21C220GBCNNN□ |
| | | 22pF | ±5% | CL21C220JBCNNN□ |
| | | 24pF | ±2% | CL21C240GBCNNN□ |
| | | 30pF | ±2% | CL21C300GBCNNN□ |
| | | 30pF | ±5% | CL21C300JBCNNN□ |
| | | 36pF | ±2% | CL21C360GBCNNN□ |
| | | 36pF | ±5% | CL21C360JBCNNN□ |
| | | 39pF | ±5% | CL21C390JBCNNN□ |
| | | 43pF | ±2% | CL21C430GBCNNN□ |
| | | 43pF | ±5% | CL21C430JBCNNN□ |
| | | 47pF | ±5% | CL21C470JBCNNN□ |
| | | 51pF | ±5% | CL21C510JBCNNN□ |
| | | 51pF | ±10% | CL21C510KBCNNN□ |
| | | 56pF | ±2% | CL21C560GBCNNN□ |
| | | 56pF | ±5% | CL21C560JBCNNN□ |
| | | 68pF | ±5% | CL21C680JBCNNN□ |
| | | 82pF | ±5% | CL21C820JBCNNN□ |
| | | 100pF | ±5% | CL21C101JBCNNN□ |
| | | 120pF | ±1% | CL21C121FBCNNN□ |
| | | 120pF | ±5% | CL21C121JBCNNN□ |
| | | 120pF | ±10% | CL21C121KBCNNN□ |
| | | 150pF | ±5% | CL21C151JBCNNN□ |
| | | 180pF | ±5% | CL21C181JBCNNN□ |
| | | 220pF | ±5% | CL21C221JBCNNN□ |
| | | 300pF | ±5% | CL21C301JBCNNN□ |
| | | 330pF | ±2% | CL21C331GBCNNN□ |
| | | 470pF | ±5% | CL21C471JBCNNN□ |
| | | 510pF | ±5% | CL21C511JBCNNN□ |
| | | 560pF | ±5% | CL21C561JBCNNN□ |
| | | 600pF | ±5% | CL21C601JBCNNN□ |
| | | 620pF | ±5% | CL21C621JBCNNN□ |
| | | 680pF | ±1% | CL21C681FBCNNN□ |
| | | 680pF | ±2% | CL21C681GBCNNN□ |
| | | 680pF | ±5% | CL21C681JBCNNN□ |
| | | 750pF | ±5% | CL21C751JBCNNN□ |
| | | 820pF | ±1% | CL21C821FBCNNN□ |
| | | 820pF | ±2% | CL21C821GBCNNN□ |
| | | 820pF | ±5% | CL21C821JBCNNN□ |
| | | 910pF | ±5% | CL21C911JBCNNN□ |
| | | 1.0nF | ±1% | CL21C102FBCNNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 50Vdc | 1.0nF | ±2% | CL21C102GBCNNN□ |
| | | 1.0nF | ±5% | CL21C102JBCNNN□ |
| | | 1.0nF | ±10% | CL21C102KBCNNN□ |
| 1.35mm | 25Vdc | 270pF | ±5% | CL21C271JAFNNN□ |
| | | 2.7nF | ±5% | CL21C272JAFNNN□ |
| | | 3.3nF | ±5% | CL21C332JAFNNN□ |
| | | 3.9nF | ±5% | CL21C392JAFNNN□ |
| | | 4.7nF | ±5% | CL21C472JAFNNN□ |
| | | 4.7nF | ±10% | CL21C472KAFNNN□ |
| | | 8.2nF | ±5% | CL21C822JAFNNN□ |
| | | 10nF | ±2% | CL21C103GAFNNN□ |
| | | 10nF | ±5% | CL21C103JAFNNN□ |
| | 50Vdc | 1.2nF | ±1% | CL21C122FBFNNN□ |
| | | 1.2nF | ±2% | CL21C122GBFNNN□ |
| | | 1.2nF | ±5% | CL21C122JBFNNN□ |
| | | 1.3nF | ±5% | CL21C132JBFNNN□ |
| | | 1.5nF | ±1% | CL21C152FBFNNN□ |
| | | 1.5nF | ±2% | CL21C152GBFNNN□ |
| | | 1.5nF | ±5% | CL21C152JBFNNN□ |
| | | 1.6nF | ±5% | CL21C162JBFNNN□ |
| | | 1.8nF | ±2% | CL21C182GBFNNN□ |
| | | 1.8nF | ±5% | CL21C182JBFNNN□ |
| | | 2.0nF | ±5% | CL21C202JBFNNN□ |
| | | 2.2nF | ±2% | CL21C222GBFNNN□ |
| | | 2.2nF | ±5% | CL21C222JBFNNN□ |
| | | 2.7nF | ±5% | CL21C272JBFNNN□ |
| | | 3.3nF | ±5% | CL21C332JBFNNN□ |
| | | 3.9nF | ±5% | CL21C392JBFNNN□ |
| | | 4.7nF | ±5% | CL21C472JBFNNN□ |
| | | 5.6nF | ±5% | CL21C562JBFNNN□ |
| | | 6.8nF | ±5% | CL21C682JBFNNN□ |
| | | 10nF | ±5% | CL21C103JBFNNN□ |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 25Vdc | 330pF | ±5% | CL31C331JACNNN□ |
| | | 470pF | ±10% | CL31C471KACNNN□ |
| | 50Vdc | 0.5pF | ±0.25pF | CL31C0R5CBCNNN□ |
| | | 1.0pF | ±0.25pF | CL31C010CBCNNN□ |
| | | 1.2pF | ±0.25pF | CL31C1R2CBCNNN□ |
| | | 1.8pF | ±0.25pF | CL31C1R8CBCNNN□ |
| | | 2.0pF | ±0.25pF | CL31C020CBCNNN□ |
| | | 2.2pF | ±0.25pF | CL31C2R2CBCNNN□ |
| | | 2.7pF | ±0.1pF | CL31C2R7BBCNNN□ |
| | | 2.7pF | ±0.25pF | CL31C2R7CBCNNN□ |
| | | 3.0pF | ±0.25pF | CL31C030CBCNNN□ |
| | | 3.3pF | ±0.25pF | CL31C3R3CBCNNN□ |
| | | 3.9pF | ±0.1pF | CL31C3R9BBCNNN□ |
| | | 4.3pF | ±0.1pF | CL31C4R3BBCNNN□ |
| | | 4.7pF | ±0.25pF | CL31C4R7CBCNNN□ |
| | | 5.6pF | ±0.25pF | CL31C5R6CBCNNN□ |
| | | 5.6pF | ±0.5pF | CL31C5R6DBCNNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Standard & High Capacitors

## Product Line Up (C0G)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 50Vdc | 6.0pF | ±0.5pF | CL31C060DBCNNN□ |
| | | 6.8pF | ±0.25pF | CL31C6R8CBCNNN□ |
| | | 8.0pF | ±0.25pF | CL31C080CBCNNN□ |
| | | 8.2pF | ±0.25pF | CL31C8R2CBCNNN□ |
| | | 10pF | ±0.5pF | CL31C100DBCNNN□ |
| | | 10pF | ±5% | CL31C100JBCNNN□ |
| | | 11pF | ±5% | CL31C110JBCNNN□ |
| | | 12pF | ±5% | CL31C120JBCNNN□ |
| | | 13pF | ±5% | CL31C130JBCNNN□ |
| | | 15pF | ±5% | CL31C150JBCNNN□ |
| | | 15pF | ±10% | CL31C150KBCNNN□ |
| | | 16pF | ±5% | CL31C160JBCNNN□ |
| | | 18pF | ±5% | CL31C180JBCNNN□ |
| | | 20pF | ±2% | CL31C200GBCNNN□ |
| | | 20pF | ±5% | CL31C200JBCNNN□ |
| | | 22pF | ±1% | CL31C220FBCNNN□ |
| | | 22pF | ±5% | CL31C220JBCNNN□ |
| | | 24pF | ±2% | CL31C240GBCNNN□ |
| | | 24pF | ±5% | CL31C240JBCNNN□ |
| | | 25pF | ±5% | CL31C250JBCNNN□ |
| | | 27pF | ±1% | CL31C270FBCNNN□ |
| | | 27pF | ±2% | CL31C270GBCNNN□ |
| | | 27pF | ±5% | CL31C270JBCNNN□ |
| | | 30pF | ±5% | CL31C300JBCNNN□ |
| | | 33pF | ±1% | CL31C330FBCNNN□ |
| | | 33pF | ±5% | CL31C330JBCNNN□ |
| | | 36pF | ±5% | CL31C360JBCNNN□ |
| | | 38pF | ±2% | CL31C380GBCNNN□ |
| | | 39pF | ±2% | CL31C390GBCNNN□ |
| | | 39pF | ±5% | CL31C390JBCNNN□ |
| | | 43pF | ±2% | CL31C430GBCNNN□ |
| | | 43pF | ±5% | CL31C430JBCNNN□ |
| | | 47pF | ±5% | CL31C470JBCNNN□ |
| | | 47pF | ±10% | CL31C470KBCNNN□ |
| | | 51pF | ±5% | CL31C510JBCNNN□ |
| | | 56pF | ±2% | CL31C560GBCNNN□ |
| | | 56pF | ±5% | CL31C560JBCNNN□ |
| | | 62pF | ±5% | CL31C620JBCNNN□ |
| | | 68pF | ±2% | CL31C680GBCNNN□ |
| | | 68pF | ±5% | CL31C680JBCNNN□ |
| | | 82pF | ±5% | CL31C820JBCNNN□ |
| | | 91pF | ±5% | CL31C910JBCNNN□ |
| | | 100pF | ±2% | CL31C101GBCNNN□ |
| | | 100pF | ±5% | CL31C101JBCNNN□ |
| | | 100pF | ±10% | CL31C101KBCNNN□ |
| | | 110pF | ±5% | CL31C111JBCNNN□ |
| | | 120pF | ±5% | CL31C121JBCNNN□ |
| | | 130pF | ±5% | CL31C131JBCNNN□ |
| | | 150pF | ±5% | CL31C151JBCNNN□ |
| | | 160pF | ±5% | CL31C161JBCNNN□ |
| | | 160pF | ±10% | CL31C161KBCNNN□ |
| | | 180pF | ±1% | CL31C181FBCNNN□ |
| | | 180pF | ±2% | CL31C181GBCNNN□ |
| | | 180pF | ±5% | CL31C181JBCNNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 50Vdc | 200pF | ±5% | CL31C201JBCNNN□ |
| | | 220pF | ±1% | CL31C221FBCNNN□ |
| | | 220pF | ±2% | CL31C221GBCNNN□ |
| | | 220pF | ±5% | CL31C221JBCNNN□ |
| | | 240pF | ±5% | CL31C241JBCNNN□ |
| | | 270pF | ±5% | CL31C271JBCNNN□ |
| | | 300pF | ±5% | CL31C301JBCNNN□ |
| | | 330pF | ±1% | CL31C331FBCNNN□ |
| | | 330pF | ±2% | CL31C331GBCNNN□ |
| | | 330pF | ±5% | CL31C331JBCNNN□ |
| | | 360pF | ±1% | CL31C361FBCNNN□ |
| | | 360pF | ±5% | CL31C361JBCNNN□ |
| | | 390pF | ±1% | CL31C391FBCNNN□ |
| | | 390pF | ±2% | CL31C391GBCNNN□ |
| | | 390pF | ±5% | CL31C391JBCNNN□ |
| | | 430pF | ±5% | CL31C431JBCNNN□ |
| | | 470pF | ±1% | CL31C471FBCNNN□ |
| | | 470pF | ±2% | CL31C471GBCNNN□ |
| | | 470pF | ±5% | CL31C471JBCNNN□ |
| | | 470pF | ±10% | CL31C471KBCNNN□ |
| | | 510pF | ±5% | CL31C511JBCNNN□ |
| | | 560pF | ±1% | CL31C561FBCNNN□ |
| | | 560pF | ±5% | CL31C561JBCNNN□ |
| | | 620pF | ±5% | CL31C621JBCNNN□ |
| | | 680pF | ±1% | CL31C681FBCNNN□ |
| | | 680pF | ±2% | CL31C681GBCNNN□ |
| | | 680pF | ±5% | CL31C681JBCNNN□ |
| | | 750pF | ±5% | CL31C751JBCNNN□ |
| | | 820pF | ±5% | CL31C821JBCNNN□ |
| | | 910pF | ±5% | CL31C911JBCNNN□ |
| | | 1.0nF | ±1% | CL31C102FBCNNN□ |
| | | 1.0nF | ±2% | CL31C102GBCNNN□ |
| | | 1.0nF | ±5% | CL31C102JBCNNN□ |
| | | 1.2nF | ±2% | CL31C122GBCNNN□ |
| | | 1.2nF | ±5% | CL31C122JBCNNN□ |
| | | 1.5nF | ±2% | CL31C152GBCNNN□ |
| | | 1.5nF | ±5% | CL31C152JBCNNN□ |
| | | 1.8nF | ±2% | CL31C182GBCNNN□ |
| | | 1.8nF | ±5% | CL31C182JBCNNN□ |
| | | 2.0nF | ±5% | CL31C202JBCNNN□ |
| | | 2.2nF | ±1% | CL31C222FBCNNN□ |
| | | 2.2nF | ±2% | CL31C222GBCNNN□ |
| | | 2.2nF | ±5% | CL31C222JBCNNN□ |
| 1.40mm | 25Vdc | 4.7nF | ±2% | CL31C472GAFNNN□ |
| | | 8.2nF | ±2% | CL31C822GAFNNN□ |
| | | 8.2nF | ±5% | CL31C822JAFNNN□ |
| | | 10nF | ±2% | CL31C103GAFNNN□ |
| | | 10nF | ±5% | CL31C103JAFNNN□ |
| | 50Vdc | 2.7nF | ±5% | CL31C272JBFNNN□ |
| | | 3.0nF | ±5% | CL31C302JBFNNN□ |
| | | 3.3nF | ±1% | CL31C332FBFNNN□ |
| | | 3.3nF | ±2% | CL31C332GBFNNN□ |
| | | 3.3nF | ±5% | CL31C332JBFNNN□ |
| | | 3.3nF | ±10% | CL31C332KBFNNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.40mm | 50Vdc | 3.6nF | ±5% | CL31C362JBFNNN□ |
| | | 3.9nF | ±5% | CL31C392JBFNNN□ |
| | | 4.7nF | ±1% | CL31C472FBFNNN□ |
| | | 4.7nF | ±2% | CL31C472GBFNNN□ |
| | | 4.7nF | ±5% | CL31C472JBFNNN□ |
| 1.80mm | 16Vdc | 120nF | ±5% | CL31C124JOHNNN□ |
| | 25Vdc | 6.8nF | ±2% | CL31C682GAHNNN□ |
| | | 8.2nF | ±5% | CL31C822JAHNNN□ |
| | | 10nF | ±5% | CL31C103JAHNNN□ |
| | | 39nF | ±5% | CL31C393JAHNNN□ |
| | | 47nF | ±5% | CL31C473JAHNNN□ |
| | | 56nF | ±5% | CL31C563JAHNNN□ |
| | | 68nF | ±5% | CL31C683JAHNNN□ |
| | | 82nF | ±5% | CL31C823JAHNNN□ |
| | | 100nF | ±5% | CL31C104JAHNNN□ |
| | 50Vdc | 5.6nF | ±5% | CL31C562JBHNNN□ |
| | | 6.8nF | ±5% | CL31C682JBHNNN□ |
| | | 10nF | ±2% | CL31C103GBHNNN□ |
| | | 15nF | ±5% | CL31C153JBHNNN□ |
| | | 18nF | ±5% | CL31C183JBHNNN□ |
| | | 22nF | ±5% | CL31C223JBHNNN□ |
| | | 27nF | ±5% | CL31C273JBHNNN□ |
| | | 33nF | ±5% | CL31C333JBHNNN□ |
| | | 47nF | ±5% | CL31C473JBHNNN□ |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.45mm | 25Vdc | 10nF | ±5% | CL32C103JAFNNN□ |
| | 50Vdc | 1.0nF | ±5% | CL32C102JBFNNN□ |
| | | 1.2nF | ±5% | CL32C122JBFNNN□ |
| | | 1.5nF | ±5% | CL32C152JBFNNN□ |
| | | 1.8nF | ±5% | CL32C182JBFNNN□ |
| | | 2.7nF | ±5% | CL32C272JBFNNN□ |
| | | 3.9nF | ±5% | CL32C392JBFNNN□ |
| | | 4.7nF | ±5% | CL32C472JBFNNN□ |
| | | 5.6nF | ±5% | CL32C562JBFNNN□ |
| | | 6.8nF | ±5% | CL32C682JBFNNN□ |
| | | 8.2nF | ±1% | CL32C822FBFNNN□ |
| | | 8.2nF | ±5% | CL32C822JBFNNN□ |
| | | 10nF | ±1% | CL32C103FBFNNN□ |
| | | 10nF | ±2% | CL32C103GBFNNN□ |
| | | 10nF | ±5% | CL32C103JBFNNN□ |
| 1.80mm | 50Vdc | 11nF | ±5% | CL32C113JBHNNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Standard & High Capacitors

## Product Line Up (X5R)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.11mm | 6.3Vdc | 220nF | ±20% | CL05A224MQLHEC□ | Derating Ref. |
| 0.22mm | 6.3Vdc | 470nF | ±20% | CL05A474MQXLNN□ | Derating Ref. |
| | | 1.0uF | ±20% | CL05A105MQXLNN□ | Derating Ref. |
| 0.33mm | 4.0Vdc | 2.2uF | ±20% | CL05A225MR3LRN□ | Derating Ref. |
| | 6.3Vdc | 1.0uF | ±20% | CL05A105MQ3LNN□ | Derating |
| | | 2.2uF | ±20% | CL05A225MQ3LRN□ | Derating Ref. |
| 0.35mm | 6.3Vdc | 4.7uF | ±20% | CL05A475MQ3LUN□ | Derating Ref. |
| 0.55mm | 4.0Vdc | 100nF | ±20% | CL05A104MR5NNN□ | |
| | | 1.0uF | ±20% | CL05A105MR5NNN□ | Derating |
| | | 1.3uF | ±10% | CL05A135KR5NNN□ | Derating |
| | | 1.4uF | ±10% | CL05A145KR5NNN□ | Derating |
| | | 1.5uF | ±10% | CL05A155KR5NNN□ | Derating |
| | | 1.7uF | ±10% | CL05A175KR5NNN□ | Derating |
| | | 1.8uF | ±10% | CL05A185KR5NNN□ | Derating |
| | | 2.2uF | ±20% | CL05A225MR5NNN□ | Derating Ref. |
| | | 3.3uF | ±20% | CL05A335MR5NNN□ | Derating Ref. |
| | 6.3Vdc | 100nF | ±10% | CL05A104KQ5NNN□ | |
| | | 100nF | ±20% | CL05A104MQ5NNN□ | |
| | | 120nF | ±10% | CL05A124KQ5NNN□ | |
| | | 150nF | ±10% | CL05A154KQ5NNN□ | |
| | | 220nF | ±5% | CL05A224JQ5NNN□ | |
| | | 220nF | ±10% | CL05A224KQ5NNN□ | |
| | | 220nF | ±20% | CL05A224MQ5NNN□ | |
| | | 330nF | ±10% | CL05A334KQ5NNN□ | |
| | | 330nF | ±20% | CL05A334MQ5NNN□ | |
| | | 470nF | ±10% | CL05A474KQ5NNN□ | |
| | | 680nF | ±10% | CL05A684KQ5NNN□ | |
| | | 1.0uF | ±5% | CL05A105JQ5NNN□ | Derating |
| | | 1.0uF | ±10% | CL05A105KQ5NNN□ | Derating |
| | | 1.0uF | ±20% | CL05A105MQ5NNN□ | Derating |
| | | 2.2uF | ±10% | CL05A225KQ5NNN□ | Derating Ref. |
| | | 2.2uF | ±20% | CL05A225MQ5NNN□ | Derating Ref. |
| | 10Vdc | 10nF | ±10% | CL05A103KP5NNN□ | |
| | | 47nF | ±10% | CL05A473KP5NNN□ | |
| | | 47nF | ±20% | CL05A473MP5NNN□ | |
| | | 68nF | ±10% | CL05A683KP5NNN□ | |
| | | 82nF | ±10% | CL05A823KP5NNN□ | |
| | | 100nF | ±10% | CL05A104KP5NNN□ | |
| | | 100nF | ±20% | CL05A104MP5NNN□ | |
| | | 150nF | ±10% | CL05A154KP5NNN□ | |
| | | 220nF | ±10% | CL05A224KP5NNN□ | |
| | | 220nF | ±20% | CL05A224MP5NNN□ | |
| | | 330nF | ±10% | CL05A334KP5NNN□ | |
| | | 330nF | ±20% | CL05A334MP5NNN□ | |
| | | 470nF | ±10% | CL05A474KP5NNN□ | |
| | | 1.0uF | ±5% | CL05A105JP5NNN□ | |
| | | 1.0uF | ±10% | CL05A105KP5NNN□ | |
| | | 1.0uF | ±20% | CL05A105MP5NNN□ | |
| | | 2.2uF | ±10% | CL05A225KP5NNN□ | Derating Ref. |
| | | 2.2uF | ±20% | CL05A225MP5NNN□ | Derating Ref. |
| | 16Vdc | 4.7nF | ±10% | CL05A472KO5NNN□ | |
| | | 22nF | ±10% | CL05A223KO5NNN□ | |
| | | 47nF | ±10% | CL05A473KO5NNN□ | |
| | | 47nF | ±20% | CL05A473MO5NNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 16Vdc | 100nF | ±5% | CL05A104JO5NNN□ | |
| | | 100nF | ±10% | CL05A104KO5NNN□ | |
| | | 100nF | ±20% | CL05A104MO5NNN□ | |
| | | 220nF | ±10% | CL05A224KO5NNN□ | |
| | | 470nF | ±10% | CL05A474KO5NNN□ | Derating |
| | | 1.0uF | ±10% | CL05A105KO5NNN□ | Derating |
| | | 4.2uF | ±10% | CL05A425KO5LUN□ | Derating Ref. |
| | 25Vdc | 100nF | ±10% | CL05A104KA5NNN□ | |
| | | 220nF | ±10% | CL05A224KA5NNN□ | |
| | | 330nF | ±10% | CL05A334KA5NNN□ | |
| | | 330nF | ±20% | CL05A334MA5NNN□ | |
| | | 470nF | ±10% | CL05A474KA5NNN□ | |
| | | 1.0uF | ±10% | CL05A105KA5NNN□ | Derating |
| 0.57mm | 4.0Vdc | 2.2uF | ±20% | CL05A225MR5NSN□ | Derating Ref. |
| | 6.3Vdc | 2.2uF | ±10% | CL05A225KQ5NSN□ | Ref. |
| | | 2.2uF | ±20% | CL05A225MQ5NSN□ | Ref. |
| | 10Vdc | 2.2uF | ±10% | CL05A225KP5NSN□ | Derating Ref. |
| | | 2.2uF | ±20% | CL05A225MP5NSN□ | Derating Ref. |
| 0.60mm | 4.0Vdc | 4.7uF | ±20% | CL05A475MR5NQN□ | Derating Ref. |
| | 6.3Vdc | 4.7uF | ±20% | CL05A475MQ5NQN□ | Derating Ref. |
| | 16Vdc | 2.2uF | ±10% | CL05A225KO5NQN□ | Derating Ref. |
| | | 2.2uF | ±20% | CL05A225MO5NQN□ | Derating Ref. |
| | 25Vdc | 1uF | ±10% | CL05A105KA5NQN□ | Derating |
| | | 1uF | ±20% | CL05A105MA5NQN□ | Derating |
| 0.65mm | 4.0Vdc | 10uF | ±20% | CL05A106MR5NRN□ | Derating Ref. |
| | 6.3Vdc | 4.7uF | ±10% | CL05A475KQ5NRN□ | Derating Ref. |
| | | 4.7uF | ±20% | CL05A475MQ5NRN□ | Derating Ref. |
| | | 10uF | ±20% | CL05A106MQ5NRN□ | Derating Ref. |
| | | 13uF | ±20% | CL05A136MQ5NRN□ | Derating Ref. |
| | 10Vdc | 4.7uF | ±10% | CL05A475KP5NRN□ | Derating Ref. |
| | | 4.7uF | ±20% | CL05A475MP5NRN□ | Derating Ref. |
| | | 10uF | ±20% | CL05A106MP5NRN□ | Derating Ref. |
| | 35Vdc | 1uF | ±10% | CL05A105KL5NRN□ | Derating |
| 0.70mm | 4.0Vdc | 2.2uF | ±20% | CL05A225MR5NUN□ | Derating |
| | | 10uF | ±20% | CL05A106MR5NUN□ | Derating Ref. |
| | 6.3Vdc | 10uF | ±20% | CL05A106MQ5NUN□ | Derating Ref. |
| | | 22uF | ±20% | CL05A226MQ5QUN□ | Derating |
| | 10Vdc | 10uF | ±20% | CL05A106MP5NUN□ | Derating Ref. |
| | 16Vdc | 4.7uF | ±20% | CL05A475MO5NUN□ | Derating Ref. |
| | 25Vdc | 2.2uF | ±10% | CL05A225KA5NUN□ | Derating Ref. |
| | | 2.2uF | ±20% | CL05A225MA5NUN□ | Derating Ref. |
| 0.75mm | 6.3Vdc | 22uF | ±20% | CL05A226MQ5N6J□ | Derating |
| 0.80mm | 6.3Vdc | 22uF | ±20% | CL05A226MQ6NUN□ | Derating |
| | 10Vdc | 10uF | ±20% | CL05A106MP6NUN□ | Derating Ref. |
| 0.85mm | 6.3Vdc | 22uF | ±20% | CL05A226MQ6N6J□ | Derating |
| 0.90mm | 4.0Vdc | 22uF | ±20% | CL05A226MR5NZN□ | Derating Ref. |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (X5R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.50mm | 4.0Vdc | 10uF | ±20% | CL10A106MR5LQN□ | Derating Ref. |
| | 6.3Vdc | 2.2uF | ±10% | CL10A225KQ5LNN□ | |
| | | 4.7uF | ±10% | CL10A475KQ5LNN□ | |
| | | 4.7uF | ±20% | CL10A475MQ5LNN□ | |
| | | 10uF | ±20% | CL10A106MQ5LRN□ | Derating Ref. |
| | 10Vdc | 1.0uF | ±10% | CL10A105KP5LNN□ | |
| | | 2.2uF | ±10% | CL10A225KP5LNN□ | |
| | | 4.7uF | ±10% | CL10A475KP5LNN□ | Derating |
| | | 4.7uF | ±20% | CL10A475MP5LNN□ | Derating |
| | 16Vdc | 1.0uF | ±10% | CL10A105KO5LNN□ | |
| | | 2.2uF | ±10% | CL10A225KO5LNN□ | Derating |
| | 25Vdc | 1.0uF | ±10% | CL10A105KA5LNN□ | Derating |
| | | 2.2uF | ±10% | CL10A225KA5LNN□ | Derating |
| 0.60mm | 6.3Vdc | 4.7uF | ±10% | CL10A475KQ5NNN□ | |
| | | 4.7uF | ±20% | CL10A475MQ5NNN□ | |
| 0.80mm | 6.3Vdc | 22uF | ±20% | CL10A226MQ7LUN□ | Derating |
| | 10Vdc | 22uF | ±20% | CL10A226MP7LUN□ | Derating |
| | 16Vdc | 22uF | ±20% | CL10A226MO7JZN□ | Derating |
| 0.90mm | 4.0Vdc | 2.2uF | ±20% | CL10A225MR8NNN□ | |
| | | 4.7uF | ±20% | CL10A475MR8NNN□ | Derating |
| | | 10uF | ±10% | CL10A106KR8NNN□ | Derating Ref. |
| | | 10uF | ±20% | CL10A106MR8NNN□ | Derating Ref. |
| | | 22uF | ±20% | CL10A226MR8NNN□ | Derating |
| | 6.3Vdc | 470nF | ±10% | CL10A474KQ8NNN□ | |
| | | 470nF | ±20% | CL10A474MQ8NNN□ | |
| | | 680nF | ±10% | CL10A684KQ8NNN□ | |
| | | 1.0uF | ±10% | CL10A105KQ8NNN□ | |
| | | 1.0uF | ±20% | CL10A105MQ8NNN□ | |
| | | 2.2uF | ±10% | CL10A225KQ8NNN□ | |
| | | 2.2uF | ±20% | CL10A225MQ8NNN□ | |
| | | 3.3uF | ±10% | CL10A335KQ8NNN□ | |
| | | 3.3uF | ±20% | CL10A335MQ8NNN□ | |
| | | 4.7uF | ±10% | CL10A475KQ8NNN□ | |
| | | 4.7uF | ±20% | CL10A475MQ8NNN□ | |
| | | 10uF | ±10% | CL10A106KQ8NNN□ | Ref. |
| | | 10uF | ±20% | CL10A106MQ8NNN□ | Ref. |
| | | 22uF | ±20% | CL10A226MQ7NRN□ | Ref. |
| | 10Vdc | 220nF | ±10% | CL10A224KP8NNN□ | |
| | | 330nF | ±10% | CL10A334KP8NNN□ | |
| | | 470nF | ±10% | CL10A474KP8NNN□ | |
| | | 680nF | ±10% | CL10A684KP8NNN□ | |
| | | 820nF | ±10% | CL10A824KP8NNN□ | |
| | | 1.0uF | ±10% | CL10A105KP8NNN□ | |
| | | 1.0uF | ±20% | CL10A105MP8NNN□ | |
| | | 2.2uF | ±10% | CL10A225KP8NNN□ | |
| | | 2.2uF | ±20% | CL10A225MP8NNN□ | |
| | | 3.3uF | ±10% | CL10A335KP8NNN□ | |
| | | 3.3uF | ±20% | CL10A335MP8NNN□ | |
| | | 4.7uF | ±10% | CL10A475KP8NNN□ | |
| | | 4.7uF | ±20% | CL10A475MP8NNN□ | |
| | | 10uF | ±10% | CL10A106KP8NNN□ | Derating Ref. |
| | | 10uF | ±20% | CL10A106MP8NNN□ | Derating Ref. |
| | 16Vdc | 330nF | ±10% | CL10A334KO8NNN□ | |
| | | 470nF | ±10% | CL10A474KO8NNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 16Vdc | 1.0uF | ±10% | CL10A105KO8NNN□ | |
| | | 1.0uF | ±20% | CL10A105MO8NNN□ | |
| | | 2.2uF | ±10% | CL10A225KO8NNN□ | |
| | | 4.7uF | ±10% | CL10A475KO8NNN□ | Derating |
| | | 4.7uF | ±20% | CL10A475MO8NNN□ | Derating |
| | 25Vdc | 100nF | ±10% | CL10A104KA8NNN□ | |
| | | 220nF | ±10% | CL10A224KA8NNN□ | |
| | | 220nF | ±20% | CL10A224MA8NNN□ | |
| | | 330nF | ±10% | CL10A334KA8NNN□ | |
| | | 470nF | ±10% | CL10A474KA8NNN□ | |
| | | 1.0uF | ±10% | CL10A105KA8NNN□ | |
| | | 2.2uF | ±10% | CL10A225KA8NNN□ | Derating |
| | 35Vdc | 1.0uF | ±10% | CL10A105KL8NNN□ | |
| | | 2.2uF | ±10% | CL10A225KL8NNN□ | Derating |
| | 50Vdc | 100nF | ±10% | CL10A104KB8NNN□ | |
| | | 220nF | ±10% | CL10A224KB8NNN□ | |
| | | 470nF | ±10% | CL10A474KB8NNN□ | |
| | | 1.0uF | ±10% | CL10A105KB8NNN□ | |
| | | 2.2uF | ±10% | CL10A225KB8NNN□ | Derating |
| 0.95mm | 4.0Vdc | 22uF | ±20% | CL10A226MR8NQN□ | Derating |
| | 6.3Vdc | 4.7uF | ±20% | CL10A475MQ8NQN□ | |
| | | 10uF | ±20% | CL10A106MQ8NQN□ | |
| | 16Vdc | 4.7uF | ±10% | CL10A475KO8NQN□ | Derating |
| | | 10uF | ±10% | CL10A106KO8NQN□ | Derating Ref. |
| | | 10uF | ±20% | CL10A106MO8NQN□ | Derating Ref. |
| | 25Vdc | 4.7uF | ±10% | CL10A475KA8NQN□ | Derating |
| | | 4.7uF | ±20% | CL10A475MA8NQN□ | Derating |
| 1.00mm | 4.0Vdc | 47uF | ±20% | CL10A476MR8NRN□ | Derating Ref. |
| | 6.3Vdc | 10uF | ±20% | CL10A106MQ8NRN□ | Ref. |
| | | 22uF | ±10% | CL10A226KQ8NRN□ | Derating |
| | | 22uF | ±20% | CL10A226MQ8NRN□ | Derating |
| | | 47uF | ±20% | CL10A476MQ8QRN□ | Derating |
| | 10Vdc | 22uF | ±20% | CL10A226MP8NRN□ | Derating |
| | 25Vdc | 10uF | ±20% | CL10A106MA8NRN□ | Derating Ref. |
| | 35Vdc | 4.7uF | ±10% | CL10A475KL8NRN□ | Derating |
| 1.05mm | 6.3Vdc | 22uF | ±20% | CL10A226MQ8NUN□ | Derating |
| | 10Vdc | 22uF | ±20% | CL10A226MP8NUN□ | Derating |
| 1.10mm | 4.0Vdc | 47uF | ±20% | CL10A476MR8NZN□ | Derating Ref. |
| | 6.3Vdc | 47uF | ±20% | CL10A476MQ8CZN□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Standard & High Capacitors

## Product Line Up (X5R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.70mm | 10Vdc | 2.2uF | ±10% | CL21A225KP6LNN□ | |
| | 16Vdc | 1.0uF | ±20% | CL21A105MO6LNN□ | |
| | | 2.2uF | ±10% | CL21A225KO6LNN□ | |
| 0.80mm | 6.3Vdc | 10uF | ±10% | CL21A106KQ7LQN□ | |
| | | 47uF | ±20% | CL21A476MQ7FRN□ | Derating |
| | | 47uF | ±20% | CL21A476MQ7LRN□ | Derating |
| | 10Vdc | 10uF | ±10% | CL21A106KP7LQN□ | Derating |
| 0.90mm | 6.3Vdc | 47uF | ±20% | CL21A476MQ8LRN□ | Derating |
| 0.95mm | 4.0Vdc | 22uF | ±20% | CL21A226MRCLRN□ | Derating |
| | | 47uF | ±20% | CL21A476MRCLRP□ | Derating |
| | 6.3Vdc | 1.0uF | ±10% | CL21A105KQCLNN□ | |
| | | 1.0uF | ±10% | CL21A105KQCNNN□ | |
| | | 4.7uF | ±10% | CL21A475KQCLNN□ | |
| | | 4.7uF | ±20% | CL21A475MQCLNN□ | |
| | | 10uF | ±10% | CL21A106KQCLNN□ | |
| | | 10uF | ±10% | CL21A106KQCLRN□ | |
| | | 10uF | ±20% | CL21A106MQCLNN□ | |
| | | 22uF | ±10% | CL21A226KQCLRN□ | Derating |
| | | 22uF | ±20% | CL21A226MQCLQN□ | Derating |
| | | 22uF | ±20% | CL21A226MQCLRN□ | Derating |
| | | 47uF | ±20% | CL21A476MQCLRN□ | Derating |
| | 10Vdc | 2.2uF | ±10% | CL21A225KPCLNN□ | |
| | | 4.7uF | ±10% | CL21A475KPCLNN□ | |
| | | 4.7uF | ±20% | CL21A475MPCLNN□ | |
| | | 10uF | ±10% | CL21A106KPCLNN□ | Derating |
| | | 10uF | ±10% | CL21A106KPCLQN□ | Derating |
| | | 10uF | ±20% | CL21A106MPCLNN□ | Derating |
| | | 10uF | ±20% | CL21A106MPCLQN□ | Derating |
| | | 22uF | ±10% | CL21A226KPCLRN□ | Derating |
| | | 22uF | ±20% | CL21A226MPCLRN□ | Derating |
| | | 22uF | +80/-20% | CL21A226ZPCLRN□ | Derating |
| | 16Vdc | 2.2uF | ±10% | CL21A225KOCLNN□ | |
| | | 4.7uF | ±10% | CL21A475KOCLNN□ | |
| | | 4.7uF | ±10% | CL21A475KOCLRN□ | |
| | | 10uF | ±10% | CL21A106KOCLNN□ | Derating |
| | | 10uF | ±10% | CL21A106KOCLRN□ | Derating |
| | | 10uF | ±10% | CL21A106KOCLSN□ | Derating |
| | | 22uF | ±20% | CL21A226MOCLRN□ | Derating |
| | 25Vdc | 1.0uF | ±10% | CL21A105KACLNN□ | |
| | | 1.0uF | ±10% | CL21A105KACNNN□ | |
| | | 2.2uF | ±10% | CL21A225KACLNN□ | Derating |
| | | 4.7uF | ±10% | CL21A475KACLRN□ | Derating |
| | | 10uF | ±10% | CL21A106KACLRN□ | Derating |
| | 35Vdc | 4.7uF | ±10% | CL21A475KLCLQN□ | Derating |
| | 50Vdc | 1.0uF | ±10% | CL21A105KBCFNN□ | |
| | | 1.0uF | ±10% | CL21A105KBCLNN□ | |
| 1.00mm | 6.3Vdc | 33uF | ±20% | CL21A336MQ9LRN□ | Derating |
| | | 47uF | ±20% | CL21A476MQ9LRN□ | Derating |
| | 50Vdc | 2.2uF | ±10% | CL21A225KB9LNN□ | Derating |
| 1.20mm | 6.3Vdc | 33uF | ±20% | CL21A336MQELRN□ | Derating |
| | 10Vdc | 2.2uF | ±10% | CL21A225KPENNN□ | |
| 1.25mm | 6.3Vdc | 47uF | ±20% | CL21A476MQMNRN□ | Derating |
| 1.35mm | 4.0Vdc | 10uF | ±20% | CL21A106MRFNNN□ | |
| | 6.3Vdc | 2.2uF | ±10% | CL21A225KQFNNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 6.3Vdc | 2.2uF | ±20% | CL21A225MQFNNN□ | |
| | | 3.3uF | ±10% | CL21A335KQFNNN□ | |
| | | 3.3uF | ±20% | CL21A335MQFNNN□ | |
| | | 4.7uF | ±10% | CL21A475KQFNNN□ | |
| | | 4.7uF | ±20% | CL21A475MQFNNN□ | |
| | | 6.8uF | ±10% | CL21A685KQFNNN□ | |
| | | 10uF | ±10% | CL21A106KQFNNN□ | |
| | | 10uF | ±20% | CL21A106MQFNNN□ | |
| | | 22uF | ±20% | CL21A226MQFNNN□ | |
| | 10Vdc | 1.0uF | ±10% | CL21A105KPFNNN□ | |
| | | 2.2uF | ±10% | CL21A225KPFNNN□ | |
| | | 2.2uF | ±20% | CL21A225MPFNNN□ | |
| | | 3.3uF | ±10% | CL21A335KPFNNN□ | |
| | | 4.7uF | ±10% | CL21A475KPFNNN□ | |
| | | 4.7uF | ±20% | CL21A475MPFNNN□ | |
| | | 10uF | ±10% | CL21A106KPFNNN□ | |
| | | 10uF | ±20% | CL21A106MPFNNN□ | |
| | 16Vdc | 680nF | ±10% | CL21A684KOFNNN□ | |
| | | 1.0uF | ±10% | CL21A105KOFNNN□ | |
| | | 2.2uF | ±10% | CL21A225KOFNNN□ | |
| | | 2.2uF | ±20% | CL21A225MOFNNN□ | |
| | | 3.3uF | ±10% | CL21A335KOFNNN□ | |
| | | 4.7uF | ±10% | CL21A475KOFNNN□ | |
| | | 10uF | ±10% | CL21A106KOFNNN□ | Derating |
| | 25Vdc | 470nF | ±20% | CL21A474MAFNNN□ | |
| | | 1.0uF | ±10% | CL21A105KAFNNN□ | |
| | | 2.2uF | ±10% | CL21A225KAFNNN□ | |
| | 50Vdc | 1.0uF | ±10% | CL21A105KBFNNN□ | Derating |
| | | 2.2uF | ±10% | CL21A225KBFNNN□ | Derating |
| 1.40mm | 4.0Vdc | 22uF | ±20% | CL21A226MRQNNN□ | |
| | | 47uF | ±20% | CL21A476MRQNNN□ | Derating |
| | 6.3Vdc | 4.7uF | ±10% | CL21A475KQQNNN□ | Derating |
| | | 10uF | ±10% | CL21A106KQQNNN□ | Derating |
| | | 22uF | ±10% | CL21A226KQQNNN□ | |
| | | 22uF | ±20% | CL21A226MQQNNN□ | |
| | 10Vdc | 22uF | ±20% | CL21A226MPQNNN□ | |
| | 16Vdc | 10uF | ±10% | CL21A106KOQNNN□ | Derating |
| | | 22uF | ±10% | CL21A226KOQNNN□ | Derating |
| | | 22uF | ±20% | CL21A226MOQNNN□ | Derating |
| | 25Vdc | 4.7uF | ±10% | CL21A475KAQNNN□ | Derating |
| | | 4.7uF | ±20% | CL21A475MAQNNN□ | Derating |
| | | 22uF | ±20% | CL21A226MAQNNN□ | Derating |
| | 50Vdc | 2.2uF | ±10% | CL21A225KBQNNN□ | Derating |
| | | 4.7uF | ±10% | CL21A475KBQNNN□ | Derating |
| 1.45mm | 4.0Vdc | 47uF | ±20% | CL21A476MRYNNN□ | |
| | 6.3Vdc | 47uF | ±10% | CL21A476KQYNNN□ | Derating |
| | | 47uF | ±20% | CL21A476MQYNNN□ | Derating |
| | 25Vdc | 10uF | ±10% | CL21A106KAYNNN□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (X5R)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 6.3Vdc | 10uF | ±20% | CL31A106MQCLNN□ | |
| | | 22uF | ±10% | CL31A226KQCLNN□ | Derating |
| | | 22uF | ±20% | CL31A226MQCLNN□ | Derating |
| | 10Vdc | 10uF | ±10% | CL31A106KPCLNN□ | |
| | | 10uF | ±20% | CL31A106MPCLNN□ | |
| | 16Vdc | 2.2uF | ±10% | CL31A225KOCLNN□ | |
| | | 4.7uF | ±10% | CL31A475KOCLNN□ | |
| | | 4.7uF | ±20% | CL31A475MOCLNN□ | |
| | | 10uF | ±10% | CL31A106KOCLNN□ | |
| | | 22uF | ±10% | CL31A226KOCLNN□ | Derating |
| | | 22uF | ±20% | CL31A226MOCLNN□ | Derating |
| | 25Vdc | 4.7uF | ±10% | CL31A475KACLNN□ | |
| | | 10uF | ±10% | CL31A106KACLNN□ | Derating |
| 1.00mm | 35Vdc | 4.7uF | ±10% | CL31A475KL9LNN□ | Derating |
| | 50Vdc | 1.0uF | ±10% | CL31A105KB9LNN□ | |
| | | 2.2uF | ±10% | CL31A225KB9LNN□ | |
| | | 4.7uF | ±10% | CL31A475KB9LNN□ | Derating |
| | 100Vdc | 2.2uF | ±10% | CL31A225KC9LNN□ | Derating |
| 1.20mm | 16Vdc | 4.7uF | ±10% | CL31A475KOELNN□ | |
| 1.25mm | 10Vdc | 10uF | ±10% | CL31A106KPPLNN□ | |
| | | 10uF | ±20% | CL31A106MPPLNN□ | |
| | 16Vdc | 4.7uF | ±10% | CL31A475KOPLNN□ | |
| | | 4.7uF | ±20% | CL31A475MOPLNN□ | |
| | 25Vdc | 1.0uF | ±10% | CL31A105KAPLNN□ | |
| | | 2.2uF | ±10% | CL31A225KAPLNN□ | |
| | | 4.7uF | ±10% | CL31A475KAPLNN□ | |
| 1.70mm | 50Vdc | 2.2uF | ±10% | CL31A225KBTLNN□ | |
| 1.80mm | 6.3Vdc | 3.3uF | ±10% | CL31A335KQHNNN□ | |
| | | 10uF | ±10% | CL31A106KQHNNN□ | |
| | | 10uF | ±20% | CL31A106MQHNNN□ | |
| | | 15uF | ±10% | CL31A156KQHNNN□ | |
| | | 15uF | ±20% | CL31A156MQHNNN□ | |
| | | 22uF | ±10% | CL31A226KQHNNN□ | |
| | | 22uF | ±20% | CL31A226MQHNNN□ | |
| | | 33uF | ±20% | CL31A336MQHNNN□ | |
| | | 47uF | ±10% | CL31A476KQHNNN□ | |
| | | 47uF | ±20% | CL31A476MQHNNN□ | |
| | | 100uF | ±20% | CL31A107MQHNNN□ | Derating |
| | 10Vdc | 3.3uF | ±10% | CL31A335KPHNNN□ | |
| | | 4.7uF | ±10% | CL31A475KPHNNN□ | |
| | | 10uF | ±10% | CL31A106KPHNNN□ | |
| | | 10uF | ±20% | CL31A106MPHNNN□ | |
| | | 22uF | ±10% | CL31A226KPHNNN□ | |
| | | 22uF | ±20% | CL31A226MPHNNN□ | |
| | | 47uF | ±20% | CL31A476MPHNNN□ | Derating |
| | | 100uF | ±20% | CL31A107MPHNNN□ | Derating |
| | 16Vdc | 2.2uF | ±10% | CL31A225KOHNNN□ | |
| | | 3.3uF | ±10% | CL31A335KOHNNN□ | |
| | | 3.3uF | ±20% | CL31A335MOHNNN□ | |
| | | 4.7uF | ±10% | CL31A475KOHNNN□ | |
| | | 4.7uF | ±20% | CL31A475MOHNNN□ | |
| | | 10uF | ±10% | CL31A106KOHNNN□ | |
| | | 10uF | ±20% | CL31A106MOHNNN□ | |
| | | 22uF | ±10% | CL31A226KOHNNN□ | Derating |
| 1.80mm | 16Vdc | 22uF | ±20% | CL31A226MOHNNN□ | Derating |
| | 25Vdc | 2.2uF | ±10% | CL31A225KAHNNN□ | |
| | | 3.3uF | ±10% | CL31A335KAHNNN□ | |
| | | 4.7uF | ±10% | CL31A475KAHNNN□ | |
| | | 10uF | ±10% | CL31A106KAHNNN□ | |
| | | 10uF | ±20% | CL31A106MAHNNN□ | |
| | | 22uF | ±10% | CL31A226KAHNNN□ | Derating |
| | | 22uF | ±20% | CL31A226MAHNNN□ | Derating |
| | 35Vdc | 2.2uF | ±10% | CL31A225KLHNNN□ | |
| | 50Vdc | 2.2uF | ±10% | CL31A225KBHNNN□ | |
| | | 4.7uF | ±10% | CL31A475KBHNNN□ | |
| | | 10uF | ±10% | CL31A106KBHNNN□ | |
| | | 10uF | ±20% | CL31A106MBHNNN□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 16Vdc | 10uF | ±10% | CL32A106KOCLNN□ | |
| | | 22uF | ±20% | CL32A226MOCLNN□ | Derating |
| 1.00mm | 25Vdc | 10uF | ±10% | CL32A106KA9LNN□ | |
| 1.25mm | 16Vdc | 10uF | ±10% | CL32A106KOMLNN□ | |
| 1.50mm | 10Vdc | 22uF | ±10% | CL32A226KPSLNN□ | |
| | | 22uF | ±20% | CL32A226MPSLNN□ | |
| | 25Vdc | 6.8uF | ±10% | CL32A685KASLNN□ | |
| 1.70mm | 16Vdc | 22uF | ±10% | CL32A226KOTFNN□ | Derating |
| | | 22uF | ±20% | CL32A226MOTLNN□ | Derating |
| | 25Vdc | 10uF | ±10% | CL32A106KATLNN□ | |
| | | 10uF | ±20% | CL32A106MATLNN□ | |
| 2.00mm | 25Vdc | 4.7uF | ±10% | CL32A475KAULNN□ | |
| | | 10uF | ±10% | CL32A106KAULNN□ | |
| | 35Vdc | 4.7uF | ±10% | CL32A475KLULNN□ | |
| | | 10uF | ±10% | CL32A106KLULNN□ | |
| | | 10uF | ±20% | CL32A106MLULNN□ | |
| 2.20mm | 10Vdc | 10uF | ±10% | CL32A106KPINNN□ | |
| | 16Vdc | 10uF | ±10% | CL32A106KOILNN□ | |
| | 25Vdc | 2.2uF | ±20% | CL32A225MAINNN□ | |
| | | 4.7uF | ±10% | CL32A475KAINNN□ | |
| | | 10uF | ±10% | CL32A106KAILNN□ | |
| | | 10uF | ±20% | CL32A106MAILNN□ | |
| 2.70mm | 6.3Vdc | 22uF | ±10% | CL32A226KQJNNN□ | |
| | | 22uF | ±20% | CL32A226MQJNNN□ | |
| | | 33uF | ±20% | CL32A336MQJNNN□ | |
| | | 47uF | ±10% | CL32A476KQJNNN□ | |
| | | 47uF | ±20% | CL32A476MQJNNN□ | |
| | 10Vdc | 22uF | ±10% | CL32A226KPJNNN□ | |
| | | 22uF | ±20% | CL32A226MPJNNN□ | Derating |
| | | 47uF | ±10% | CL32A476KPJNNN□ | Derating |
| | | 47uF | ±20% | CL32A476MPJNNN□ | |
| | 16Vdc | 10uF | ±10% | CL32A106KOJNNN□ | |
| | | 10uF | ±20% | CL32A106MOJNNN□ | |
| | | 22uF | ±10% | CL32A226KOJNNN□ | |
| | | 22uF | ±20% | CL32A226MOJNNN□ | |
| | | 47uF | ±10% | CL32A476KOJNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Standard & High Capacitors

## Product Line Up (X5R)

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 16Vdc | 47uF | ±20% | CL32A476MOJNNN□ | |
| | 25Vdc | 10uF | ±10% | CL32A106KAJNNN□ | |
| | | 10uF | ±20% | CL32A106MAJNNN□ | |
| | | 22uF | ±10% | CL32A226KAJNNN□ | |
| | | 22uF | ±20% | CL32A226MAJNNN□ | |
| | 35Vdc | 10uF | ±10% | CL32A106KLJNNN□ | |
| | 50Vdc | 2.2uF | ±10% | CL32A225KBJNNN□ | |
| | | 10uF | ±10% | CL32A106KBJNNN□ | |
| | | 10uF | ±20% | CL32A106MBJNNN□ | |
| 2.80mm | 6.3Vdc | 100uF | ±20% | CL32A107MQVNNN□ | Derating |
| | | 150uF | ±20% | CL32A157MQVNNN□ | Derating |
| | | 220uF | ±20% | CL32A227MQVNNN□ | Derating |
| | 10Vdc | 100uF | ±20% | CL32A107MPVNNN□ | Derating |

■ Size : 4.50 X 3.20mm (inch : 1812)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 6.3Vdc | 33uF | ±20% | CL43A336MQJNNN□ | |
| | | 47uF | ±10% | CL43A476KQJNNN□ | |
| | | 47uF | ±20% | CL43A476MQJNNN□ | |
| 3.50mm | 6.3Vdc | 100uF | ±20% | CL43A107MQLNNN□ | |

■ Size : 5.70 X 5.00mm (inch : 2220)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 6.3Vdc | 47uF | ±20% | CL55A476MQJNNN□ | |
| | | 68uF | ±20% | CL55A686MQJNNN□ | |
| | | 100uF | ±20% | CL55A107MQJNNN□ | |
| | 10Vdc | 47uF | ±10% | CL55A476KPJNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X6S)

### ■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 6.3Vdc | 1.0uF | ±20% | CL05X105MQ3LNN□ | Derating |
| 0.55mm | 4.0Vdc | 2.2nF | ±20% | CL05X222MR5NNN□ | |
| | | 15nF | ±20% | CL05X153MR5NNN□ | |
| | | 47nF | ±20% | CL05X473MR5NNN□ | |
| | | 220nF | ±20% | CL05X224MR5NNN□ | |
| | | 2.2uF | ±20% | CL05X225MR5NNN□ | Derating |
| | 6.3Vdc | 680nF | ±5% | CL05X684JQ5NNN□ | |
| | | 1.0uF | ±10% | CL05X105KQ5NNN□ | Derating |
| | 10Vdc | 1.0uF | ±10% | CL05X105KP5NNN□ | Derating |
| 0.57mm | 2.5Vdc | 2.2uF | ±20% | CL05X225MS5NSN□ | Derating Ref. |
| 0.60mm | 25Vdc | 1.0uF | ±10% | CL05X105KA5NQN□ | Derating |
| 0.70mm | 4.0Vdc | 4.7uF | ±20% | CL05X475MR5NUN□ | Derating Ref. |
| | | 10uF | ±20% | CL05X106MR5NUN□ | Derating Ref. |

### ■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 4.0Vdc | 1.0uF | ±20% | CL10X105MR8NNN□ | |
| | | 4.7uF | ±20% | CL10X475MR8NNN□ | Derating |
| | | 10uF | ±10% | CL10X106KR8NNN□ | Derating Ref. |
| | | 10uF | ±20% | CL10X106MR8NNN□ | Derating Ref. |
| | 6.3Vdc | 1.0uF | ±20% | CL10X105MQ8NNN□ | |
| | | 2.2uF | ±10% | CL10X225KQ8NNN□ | |
| | | 2.2uF | ±20% | CL10X225MQ8NNN□ | |
| | | 4.7uF | ±10% | CL10X475KQ8NNN□ | Derating |
| | | 4.7uF | ±20% | CL10X475MQ8NNN□ | Derating |
| | | 10uF | ±10% | CL10X106KQ8NNN□ | Derating Ref. |
| | | 10uF | ±20% | CL10X106MQ8NNN□ | Derating Ref. |
| | 10Vdc | 2.2uF | ±10% | CL10X225KP8NNN□ | |
| | 25Vdc | 1.0uF | ±10% | CL10X105KA8NNN□ | |
| 0.95mm | 25Vdc | 4.7uF | ±10% | CL10X475KA8NQN□ | Derating |
| 1.00mm | 10Vdc | 10uF | ±20% | CL10X106MP8NRN□ | Derating Ref. |
| | 16Vdc | 4.7uF | ±10% | CL10X475KO8NRN□ | Derating |
| | | 10uF | ±20% | CL10X106MO8NRN□ | Derating Ref. |

### ■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 2.5Vdc | 22uF | ±20% | CL21X226MSCLRN□ | Derating |
| | 4.0Vdc | 10uF | ±10% | CL21X106KRCLRN□ | Derating |
| | 10Vdc | 10uF | ±10% | CL21X106KPCLRN□ | Derating |
| 1.35mm | 4.0Vdc | 4.7uF | ±10% | CL21X475KRFNNN□ | |
| | | 10uF | ±10% | CL21X106KRFNNN□ | |
| | | 10uF | ±20% | CL21X106MRFNNN□ | |
| | 16Vdc | 2.2uF | ±10% | CL21X225KOFNNN□ | |
| 1.40mm | 4.0Vdc | 22uF | ±20% | CL21X226MRQNNN□ | Derating |
| | 6.3Vdc | 10uF | ±10% | CL21X106KQQNNN□ | Derating |
| | | 22uF | ±20% | CL21X226MQQNNN□ | Derating |
| | 16Vdc | 10uF | ±10% | CL21X106KOQNNN□ | |
| | | 10uF | ±20% | CL21X106MOQNNN□ | |
| | 25Vdc | 4.7uF | ±10% | CL21X475KAQNNN□ | Derating |
| | | 4.7uF | ±20% | CL21X475MAQNNN□ | Derating |
| 1.45mm | 2.5Vdc | 47uF | ±20% | CL21X476MSYNNN□ | Derating |
| | 4.0Vdc | 47uF | ±20% | CL21X476MRYNNN□ | Derating |
| | 10Vdc | 10uF | ±10% | CL21X106KPYNNN□ | |
| | 25Vdc | 10uF | ±10% | CL21X106KAYNNN□ | Derating |
| | | 10uF | ±20% | CL21X106MAYNNN□ | Derating |

### ■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 25Vdc | 4.7uF | ±10% | CL31X475KACLNN□ | |
| 1.80mm | 4.0Vdc | 10uF | ±10% | CL31X106KRHNNN□ | |
| | | 10uF | ±20% | CL31X106MRHNNN□ | |
| | | 22uF | ±10% | CL31X226KRHNNN□ | |
| | | 22uF | ±20% | CL31X226MRHNNN□ | |
| | | 47uF | ±20% | CL31X476MRHNNN□ | Derating |
| | 6.3Vdc | 10uF | ±10% | CL31X106KQHNNN□ | |
| | | 10uF | ±20% | CL31X106MQHNNN□ | |
| | | 22uF | ±10% | CL31X226KQHNNN□ | |
| | | 47uF | ±10% | CL31X476KQHNNN□ | Derating |
| | | 47uF | ±20% | CL31X476MQHNNN□ | Derating |
| | 16Vdc | 22uF | ±10% | CL31X226KOHNNN□ | Derating |
| | 25Vdc | 10uF | ±10% | CL31X106KAHNNN□ | |

### ■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 6.3Vdc | 22uF | ±20% | CL32X226MQJNNN□ | |
| | 10Vdc | 47uF | ±10% | CL32X476KPJNNN□ | |
| | 16Vdc | 10uF | ±10% | CL32X106KOJNNN□ | |
| 2.80mm | 4.0Vdc | 100uF | ±10% | CL32X107KRVNNN□ | |
| | 6.3Vdc | 100uF | ±20% | CL32X107MQVNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Standard & High Capacitors

## Product Line Up (X7R)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 16Vdc | 100nF | ±10% | CL05B104KO3LNN□ | |
| 0.55mm | 6.3Vdc | 68nF | ±10% | CL05B683KQ5NNN□ | |
| | | 100nF | ±10% | CL05B104KQ5NNN□ | |
| | | 470nF | ±10% | CL05B474KQ5NNN□ | Ref. |
| | 10Vdc | 1.0nF | ±10% | CL05B102KP5NNN□ | |
| | | 2.2nF | ±20% | CL05B222MP5NNN□ | |
| | | 6.8nF | ±20% | CL05B682MP5NNN□ | |
| | | 10nF | ±10% | CL05B103KP5NNN□ | |
| | | 15nF | ±20% | CL05B153MP5NNN□ | |
| | | 18nF | ±10% | CL05B183KP5NNN□ | |
| | | 22nF | ±10% | CL05B223KP5NNN□ | |
| | | 27nF | ±10% | CL05B273KP5NNN□ | |
| | | 33nF | ±10% | CL05B333KP5NNN□ | |
| | | 47nF | ±10% | CL05B473KP5NNN□ | |
| | | 47nF | ±20% | CL05B473MP5NNN□ | |
| | | 56nF | ±10% | CL05B563KP5NNN□ | |
| | | 68nF | ±10% | CL05B683KP5NNN□ | |
| | | 82nF | ±10% | CL05B823KP5NNN□ | |
| | | 100nF | ±5% | CL05B104JP5NNN□ | |
| | | 100nF | ±10% | CL05B104KP5NNN□ | |
| | | 100nF | ±20% | CL05B104MP5NNN□ | |
| | | 220nF | ±10% | CL05B224KP5NNN□ | Ref. |
| | | 470nF | ±10% | CL05B474KP5NNN□ | |
| | 16Vdc | 220pF | ±10% | CL05B221KO5NNN□ | |
| | | 330pF | ±10% | CL05B331KO5NNN□ | |
| | | 820pF | ±10% | CL05B821KO5NNN□ | |
| | | 1.0nF | ±10% | CL05B102KO5NNN□ | |
| | | 2.2nF | ±10% | CL05B222KO5NNN□ | |
| | | 2.7nF | ±10% | CL05B272KO5NNN□ | |
| | | 3.9nF | ±10% | CL05B392KO5NNN□ | |
| | | 4.7nF | ±10% | CL05B472KO5NNN□ | |
| | | 4.7nF | ±20% | CL05B472MO5NNN□ | |
| | | 5.6nF | ±10% | CL05B562KO5NNN□ | |
| | | 6.8nF | ±10% | CL05B682KO5NNN□ | |
| | | 8.2nF | ±10% | CL05B822KO5NNN□ | |
| | | 10nF | ±5% | CL05B103JO5NNN□ | |
| | | 10nF | ±10% | CL05B103KO5NNN□ | |
| | | 10nF | ±20% | CL05B103MO5NNN□ | |
| | | 12nF | ±10% | CL05B123KO5NNN□ | |
| | | 15nF | ±5% | CL05B153JO5NNN□ | |
| | | 15nF | ±10% | CL05B153KO5NNN□ | |
| | | 18nF | ±5% | CL05B183JO5NNN□ | |
| | | 18nF | ±10% | CL05B183KO5NNN□ | |
| | | 22nF | ±5% | CL05B223JO5NNN□ | |
| | | 22nF | ±10% | CL05B223KO5NNN□ | |
| | | 22nF | ±20% | CL05B223MO5NNN□ | |
| | | 27nF | ±5% | CL05B273JO5NNN□ | |
| | | 27nF | ±10% | CL05B273KO5NNN□ | |
| | | 33nF | ±5% | CL05B333JO5NNN□ | |
| | | 33nF | ±10% | CL05B333KO5NNN□ | |
| | | 33nF | ±20% | CL05B333MO5NNN□ | |
| | | 39nF | ±10% | CL05B393KO5NNN□ | |
| | | 47nF | ±5% | CL05B473JO5NNN□ | |
| | | 47nF | ±10% | CL05B473KO5NNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 16Vdc | 47nF | ±20% | CL05B473MO5NNN□ | |
| | | 56nF | ±10% | CL05B563KO5NNN□ | |
| | | 68nF | ±10% | CL05B683KO5NNN□ | |
| | | 82nF | ±10% | CL05B823KO5NNN□ | |
| | | 100nF | ±5% | CL05B104JO5NNN□ | |
| | | 100nF | ±10% | CL05B104KO5NNN□ | |
| | | 100nF | ±20% | CL05B104MO5NNN□ | |
| | | 150nF | ±10% | CL05B154KO5NNN□ | |
| | | 220nF | ±10% | CL05B224KO5NNN□ | Ref. |
| | 25Vdc | 220pF | ±10% | CL05B221KA5NNN□ | |
| | | 270pF | ±10% | CL05B271KA5NNN□ | |
| | | 330pF | ±10% | CL05B331KA5NNN□ | |
| | | 470pF | ±10% | CL05B471KA5NNN□ | |
| | | 560pF | ±10% | CL05B561KA5NNN□ | |
| | | 1.0nF | ±10% | CL05B102KA5NNN□ | |
| | | 1.5nF | ±10% | CL05B152KA5NNN□ | |
| | | 1.8nF | ±10% | CL05B182KA5NNN□ | |
| | | 2.2nF | ±10% | CL05B222KA5NNN□ | |
| | | 2.2nF | ±20% | CL05B222MA5NNN□ | |
| | | 3.3nF | ±5% | CL05B332JA5NNN□ | |
| | | 3.3nF | ±10% | CL05B332KA5NNN□ | |
| | | 3.9nF | ±10% | CL05B392KA5NNN□ | |
| | | 4.7nF | ±5% | CL05B472JA5NNN□ | |
| | | 4.7nF | ±10% | CL05B472KA5NNN□ | |
| | | 5.6nF | ±10% | CL05B562KA5NNN□ | |
| | | 6.8nF | ±10% | CL05B682KA5NNN□ | |
| | | 8.2nF | ±10% | CL05B822KA5NNN□ | |
| | | 10nF | ±5% | CL05B103JA5NNN□ | |
| | | 10nF | ±10% | CL05B103KA5NNN□ | |
| | | 10nF | ±20% | CL05B103MA5NNN□ | |
| | | 12nF | ±10% | CL05B123KA5NNN□ | |
| | | 15nF | ±10% | CL05B153KA5NNN□ | |
| | | 18nF | ±10% | CL05B183KA5NNN□ | |
| | | 22nF | ±10% | CL05B223KA5NNN□ | |
| | | 33nF | ±10% | CL05B333KA5NNN□ | |
| | | 47nF | ±10% | CL05B473KA5NNN□ | |
| | | 100nF | ±10% | CL05B104KA5NNN□ | |
| | 50Vdc | 12pF | ±5% | CL05B120JB5NNN□ | |
| | | 47pF | ±5% | CL05B470JB5NNN□ | |
| | | 100pF | ±10% | CL05B101KB5NNN□ | |
| | | 120pF | ±10% | CL05B121KB5NNN□ | |
| | | 150pF | ±10% | CL05B151KB5NNN□ | |
| | | 180pF | ±10% | CL05B181KB5NNN□ | |
| | | 200pF | ±10% | CL05B201KB5NNN□ | |
| | | 220pF | ±5% | CL05B221JB5NNN□ | |
| | | 220pF | ±10% | CL05B221KB5NNN□ | |
| | | 240pF | ±10% | CL05B241KB5NNN□ | |
| | | 270pF | ±5% | CL05B271JB5NNN□ | |
| | | 270pF | ±10% | CL05B271KB5NNN□ | |
| | | 300pF | ±10% | CL05B301KB5NNN□ | |
| | | 320pF | ±10% | CL05B321KB5NNN□ | |
| | | 330pF | ±5% | CL05B331JB5NNN□ | |
| | | 330pF | ±10% | CL05B331KB5NNN□ | |
| | | 360pF | ±10% | CL05B361KB5NNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X7R)

### ■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 50Vdc | 390pF | ±5% | CL05B391JB5NNN□ | |
| | | 390pF | ±10% | CL05B391KB5NNN□ | |
| | | 470pF | ±5% | CL05B471JB5NNN□ | |
| | | 470pF | ±10% | CL05B471KB5NNN□ | |
| | | 510pF | ±10% | CL05B511KB5NNN□ | |
| | | 560pF | ±5% | CL05B561JB5NNN□ | |
| | | 560pF | ±10% | CL05B561KB5NNN□ | |
| | | 620pF | ±10% | CL05B621KB5NNN□ | |
| | | 680pF | ±5% | CL05B681JB5NNN□ | |
| | | 680pF | ±10% | CL05B681KB5NNN□ | |
| | | 750pF | ±10% | CL05B751KB5NNN□ | |
| | | 820pF | ±10% | CL05B821KB5NNN□ | |
| | | 1.0nF | ±5% | CL05B102JB5NNN□ | |
| | | 1.0nF | ±10% | CL05B102KB5NNN□ | |
| | | 1.2nF | ±5% | CL05B122JB5NNN□ | |
| | | 1.2nF | ±10% | CL05B122KB5NNN□ | |
| | | 1.5nF | ±5% | CL05B152JB5NNN□ | |
| | | 1.5nF | ±10% | CL05B152KB5NNN□ | |
| | | 1.8nF | ±10% | CL05B182KB5NNN□ | |
| | | 2.0nF | ±10% | CL05B202KB5NNN□ | |
| | | 2.2nF | ±5% | CL05B222JB5NNN□ | |
| | | 2.2nF | ±10% | CL05B222KB5NNN□ | |
| | | 2.2nF | ±20% | CL05B222MB5NNN□ | |
| | | 2.4nF | ±10% | CL05B242KB5NNN□ | |
| | | 2.7nF | ±10% | CL05B272KB5NNN□ | |
| | | 3.0nF | ±10% | CL05B302KB5NNN□ | |
| | | 3.3nF | ±5% | CL05B332JB5NNN□ | |
| | | 3.3nF | ±10% | CL05B332KB5NNN□ | |
| | | 3.9nF | ±5% | CL05B392JB5NNN□ | |
| | | 3.9nF | ±10% | CL05B392KB5NNN□ | |
| | | 4.7nF | ±5% | CL05B472JB5NNN□ | |
| | | 4.7nF | ±10% | CL05B472KB5NNN□ | |
| | | 4.7nF | ±20% | CL05B472MB5NNN□ | |
| | | 5.6nF | ±10% | CL05B562KB5NNN□ | |
| | | 6.8nF | ±5% | CL05B682JB5NNN□ | |
| | | 6.8nF | ±10% | CL05B682KB5NNN□ | |
| | | 8.2nF | ±10% | CL05B822KB5NNN□ | |
| | | 10nF | ±5% | CL05B103JB5NNN□ | |
| | | 10nF | ±10% | CL05B103KB5NNN□ | |
| | | 10nF | ±20% | CL05B103MB5NNN□ | |
| | | 15nF | ±10% | CL05B153KB5NNN□ | |
| | | 22nF | ±10% | CL05B223KB5NNN□ | |

### ■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 6.3Vdc | 4.7nF | ±10% | CL10B472KQ8NNN□ | |
| | | 470nF | ±10% | CL10B474KQ8NNN□ | |
| | | 680nF | ±10% | CL10B684KQ8NNN□ | |
| | | 820nF | ±10% | CL10B824KQ8NNN□ | |
| | | 1.0uF | ±10% | CL10B105KQ8NNN□ | |
| | | 1.0uF | ±20% | CL10B105MQ8NNN□ | |
| | | 2.2uF | ±10% | CL10B225KQ8NNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 10Vdc | 100nF | ±10% | CL10B104KP8NNN□ | |
| | | 150nF | ±10% | CL10B154KP8NNN□ | |
| | | 220nF | ±5% | CL10B224JP8NNN□ | |
| | | 220nF | ±10% | CL10B224KP8NNN□ | |
| | | 330nF | ±10% | CL10B334KP8NNN□ | |
| | | 470nF | ±10% | CL10B474KP8NNN□ | |
| | | 1.0uF | ±10% | CL10B105KP8NNN□ | |
| | | 2.2uF | ±10% | CL10B225KP8NNN□ | Ref. |
| | 16Vdc | 470pF | ±10% | CL10B471KO8NNN□ | |
| | | 820pF | ±10% | CL10B821KO8NNN□ | |
| | | 1.0nF | ±10% | CL10B102KO8NNN□ | |
| | | 2.2nF | ±10% | CL10B222KO8NNN□ | |
| | | 3.3nF | ±10% | CL10B332KO8NNN□ | |
| | | 3.9nF | ±10% | CL10B392KO8NNN□ | |
| | | 10nF | ±10% | CL10B103KO8NNN□ | |
| | | 15nF | ±10% | CL10B153KO8NNN□ | |
| | | 16nF | ±10% | CL10B163KO8NNN□ | |
| | | 18nF | ±10% | CL10B183KO8NNN□ | |
| | | 22nF | ±10% | CL10B223KO8NNN□ | |
| | | 27nF | ±10% | CL10B273KO8NNN□ | |
| | | 33nF | ±10% | CL10B333KO8NNN□ | |
| | | 39nF | ±10% | CL10B393KO8NNN□ | |
| | | 47nF | ±10% | CL10B473KO8NNN□ | |
| | | 56nF | ±10% | CL10B563KO8NNN□ | |
| | | 68nF | ±10% | CL10B683KO8NNN□ | |
| | | 68nF | ±20% | CL10B683MO8NNN□ | |
| | | 75nF | ±10% | CL10B753KO8NNN□ | |
| | | 82nF | ±10% | CL10B823KO8NNN□ | |
| | | 100nF | ±5% | CL10B104JO8NNN□ | |
| | | 100nF | ±10% | CL10B104KO8NNN□ | |
| | | 100nF | ±20% | CL10B104MO8NNN□ | |
| | | 120nF | ±10% | CL10B124KO8NNN□ | |
| | | 150nF | ±10% | CL10B154KO8NNN□ | |
| | | 180nF | ±10% | CL10B184KO8NNN□ | |
| | | 220nF | ±5% | CL10B224JO8NNN□ | |
| | | 220nF | ±10% | CL10B224KO8NNN□ | |
| | | 220nF | ±20% | CL10B224MO8NNN□ | |
| | | 330nF | ±10% | CL10B334KO8NNN□ | |
| | | 470nF | ±10% | CL10B474KO8NNN□ | |
| | | 470nF | ±20% | CL10B474MO8NNN□ | |
| | | 680nF | ±10% | CL10B684KO8NNN□ | |
| | | 1.0uF | ±10% | CL10B105KO8NNN□ | |
| | 25Vdc | 220pF | ±10% | CL10B221KA8NNN□ | |
| | | 390pF | ±10% | CL10B391KA8NNN□ | |
| | | 470pF | ±10% | CL10B471KA8NNN□ | |
| | | 1.0nF | ±5% | CL10B102JA8NNN□ | |
| | | 1.0nF | ±10% | CL10B102KA8NNN□ | |
| | | 2.2nF | ±10% | CL10B222KA8NNN□ | |
| | | 4.7nF | ±10% | CL10B472KA8NNN□ | |
| | | 5.6nF | ±10% | CL10B562KA8NNN□ | |
| | | 6.8nF | ±10% | CL10B682KA8NNN□ | |
| | | 8.2nF | ±10% | CL10B822KA8NNN□ | |
| | | 10nF | ±10% | CL10B103KA8NNN□ | |
| | | 12nF | ±10% | CL10B123KA8NNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Standard & High Capacitors

## Product Line Up (X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 25Vdc | 15nF | ±5% | CL10B153JA8NNN□ | |
| | | 15nF | ±10% | CL10B153KA8NNN□ | |
| | | 18nF | ±10% | CL10B183KA8NNN□ | |
| | | 18nF | ±20% | CL10B183MA8NNN□ | |
| | | 22nF | ±5% | CL10B223JA8NNN□ | |
| | | 22nF | ±10% | CL10B223KA8NNN□ | |
| | | 27nF | ±10% | CL10B273KA8NNN□ | |
| | | 33nF | ±5% | CL10B333JA8NNN□ | |
| | | 33nF | ±10% | CL10B333KA8NNN□ | |
| | | 39nF | ±10% | CL10B393KA8NNN□ | |
| | | 47nF | ±10% | CL10B473KA8NNN□ | |
| | | 56nF | ±5% | CL10B563JA8NNN□ | |
| | | 56nF | ±10% | CL10B563KA8NNN□ | |
| | | 68nF | ±10% | CL10B683KA8NNN□ | |
| | | 82nF | ±10% | CL10B823KA8NNN□ | |
| | | 100nF | ±5% | CL10B104JA8NNN□ | |
| | | 100nF | ±10% | CL10B104KA8NNN□ | |
| | | 100nF | ±20% | CL10B104MA8NNN□ | |
| | | 150nF | ±10% | CL10B154KA8NNN□ | |
| | | 220nF | ±10% | CL10B224KA8NNN□ | |
| | | 470nF | ±10% | CL10B474KA8NNN□ | |
| | | 1.0uF | ±10% | CL10B105KA8NNN□ | |
| | 50Vdc | 100pF | ±10% | CL10B101KB8NNN□ | |
| | | 120pF | ±10% | CL10B121KB8NNN□ | |
| | | 150pF | ±10% | CL10B151KB8NNN□ | |
| | | 180pF | ±10% | CL10B181KB8NNN□ | |
| | | 200pF | ±10% | CL10B201KB8NNN□ | |
| | | 220pF | ±5% | CL10B221JB8NNN□ | |
| | | 220pF | ±10% | CL10B221KB8NNN□ | |
| | | 270pF | ±5% | CL10B271JB8NNN□ | |
| | | 270pF | ±10% | CL10B271KB8NNN□ | |
| | | 300pF | ±10% | CL10B301KB8NNN□ | |
| | | 330pF | ±5% | CL10B331JB8NNN□ | |
| | | 330pF | ±10% | CL10B331KB8NNN□ | |
| | | 360pF | ±10% | CL10B361KB8NNN□ | |
| | | 390pF | ±10% | CL10B391KB8NNN□ | |
| | | 430pF | ±10% | CL10B431KB8NNN□ | |
| | | 470pF | ±5% | CL10B471JB8NNN□ | |
| | | 470pF | ±10% | CL10B471KB8NNN□ | |
| | | 500pF | ±10% | CL10B501KB8NNN□ | |
| | | 510pF | ±10% | CL10B511KB8NNN□ | |
| | | 560pF | ±5% | CL10B561JB8NNN□ | |
| | | 560pF | ±10% | CL10B561KB8NNN□ | |
| | | 620pF | ±5% | CL10B621JB8NNN□ | |
| | | 680pF | ±5% | CL10B681JB8NNN□ | |
| | | 680pF | ±10% | CL10B681KB8NNN□ | |
| | | 750pF | ±10% | CL10B751KB8NNN□ | |
| | | 820pF | ±5% | CL10B821JB8NNN□ | |
| | | 820pF | ±10% | CL10B821KB8NNN□ | |
| | | 910pF | ±5% | CL10B911JB8NNN□ | |
| | | 1.0nF | ±10% | CL10B102KB8NNN□ | |
| | | 1.0nF | ±20% | CL10B102MB8NNN□ | |
| | | 1.2nF | ±5% | CL10B122JB8NNN□ | |
| | | 1.2nF | ±10% | CL10B122KB8NNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 50Vdc | 1.4nF | ±5% | CL10B142JB8NNN□ | |
| | | 1.5nF | ±5% | CL10B152JB8NNN□ | |
| | | 1.5nF | ±10% | CL10B152KB8NNN□ | |
| | | 1.8nF | ±5% | CL10B182JB8NNN□ | |
| | | 1.8nF | ±10% | CL10B182KB8NNN□ | |
| | | 2.0nF | ±10% | CL10B202KB8NNN□ | |
| | | 2.2nF | ±5% | CL10B222JB8NNN□ | |
| | | 2.2nF | ±10% | CL10B222KB8NNN□ | |
| | | 2.2nF | ±20% | CL10B222MB8NNN□ | |
| | | 2.4nF | ±10% | CL10B242KB8NNN□ | |
| | | 2.7nF | ±5% | CL10B272JB8NNN□ | |
| | | 2.7nF | ±10% | CL10B272KB8NNN□ | |
| | | 2.9nF | ±10% | CL10B292KB8NNN□ | |
| | | 3.0nF | ±10% | CL10B302KB8NNN□ | |
| | | 3.0nF | ±20% | CL10B302MB8NNN□ | |
| | | 3.3nF | ±5% | CL10B332JB8NNN□ | |
| | | 3.3nF | ±10% | CL10B332KB8NNN□ | |
| | | 3.3nF | ±20% | CL10B332MB8NNN□ | |
| | | 3.6nF | ±5% | CL10B362JB8NNN□ | |
| | | 3.6nF | ±10% | CL10B362KB8NNN□ | |
| | | 3.9nF | ±10% | CL10B392KB8NNN□ | |
| | | 4.7nF | ±5% | CL10B472JB8NNN□ | |
| | | 4.7nF | ±10% | CL10B472KB8NNN□ | |
| | | 4.7nF | ±20% | CL10B472MB8NNN□ | |
| | | 5.1nF | ±10% | CL10B512KB8NNN□ | |
| | | 5.6nF | ±5% | CL10B562JB8NNN□ | |
| | | 5.6nF | ±10% | CL10B562KB8NNN□ | |
| | | 5.6nF | ±20% | CL10B562MB8NNN□ | |
| | | 6.2nF | ±5% | CL10B622JB8NNN□ | |
| | | 6.2nF | ±10% | CL10B622KB8NNN□ | |
| | | 6.8nF | ±5% | CL10B682JB8NNN□ | |
| | | 6.8nF | ±10% | CL10B682KB8NNN□ | |
| | | 6.8nF | ±20% | CL10B682MB8NNN□ | |
| | | 7.5nF | ±5% | CL10B752JB8NNN□ | |
| | | 8.2nF | ±5% | CL10B822JB8NNN□ | |
| | | 8.2nF | ±10% | CL10B822KB8NNN□ | |
| | | 9.1nF | ±5% | CL10B912JB8NNN□ | |
| | | 10nF | ±5% | CL10B103JB8NNN□ | |
| | | 10nF | ±10% | CL10B103KB8NNN□ | |
| | | 10nF | ±20% | CL10B103MB8NNN□ | |
| | | 12nF | ±5% | CL10B123JB8NNN□ | |
| | | 12nF | ±10% | CL10B123KB8NNN□ | |
| | | 15nF | ±5% | CL10B153JB8NNN□ | |
| | | 15nF | ±10% | CL10B153KB8NNN□ | |
| | | 15nF | ±20% | CL10B153MB8NNN□ | |
| | | 18nF | ±5% | CL10B183JB8NNN□ | |
| | | 18nF | ±10% | CL10B183KB8NNN□ | |
| | | 20nF | ±10% | CL10B203KB8NNN□ | |
| | | 22nF | ±5% | CL10B223JB8NNN□ | |
| | | 22nF | ±10% | CL10B223KB8NNN□ | |
| | | 22nF | ±20% | CL10B223MB8NNN□ | |
| | | 27nF | ±10% | CL10B273KB8NNN□ | |
| | | 33nF | ±5% | CL10B333JB8NNN□ | |
| | | 33nF | ±10% | CL10B333KB8NNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 50Vdc | 39nF | ±5% | CL10B393JB8NNN□ | |
| | | 39nF | ±10% | CL10B393KB8NNN□ | |
| | | 47nF | ±5% | CL10B473JB8NNN□ | |
| | | 47nF | ±10% | CL10B473KB8NNN□ | |
| | | 47nF | ±20% | CL10B473MB8NNN□ | |
| | | 56nF | ±5% | CL10B563JB8NNN□ | |
| | | 56nF | ±10% | CL10B563KB8NNN□ | |
| | | 68nF | ±5% | CL10B683JB8NNN□ | |
| | | 68nF | ±10% | CL10B683KB8NNN□ | |
| | | 82nF | ±5% | CL10B823JB8NNN□ | |
| | | 82nF | ±10% | CL10B823KB8NNN□ | |
| | | 100nF | ±5% | CL10B104JB8NNN□ | |
| | | 100nF | ±10% | CL10B104KB8NNN□ | |
| | | 100nF | ±20% | CL10B104MB8NNN□ | |
| | | 220nF | ±10% | CL10B224KB8NNN□ | |
| | | 330nF | ±10% | CL10B334KB8NNN□ | |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.75mm | 16Vdc | 15nF | ±10% | CL21B153KOANNN□ | |
| | | 22nF | ±10% | CL21B223KOANNN□ | |
| | | 33nF | ±10% | CL21B333KOANNN□ | |
| | | 39nF | ±10% | CL21B393KOANNN□ | |
| | | 47nF | ±10% | CL21B473KOANNN□ | |
| | | 56nF | ±10% | CL21B563KOANNN□ | |
| | | 68nF | ±10% | CL21B683KOANNN□ | |
| | | 100nF | ±5% | CL21B104JOANNN□ | |
| | | 100nF | ±10% | CL21B104KOANNN□ | |
| | | 100nF | ±20% | CL21B104MOANNN□ | |
| | | 120nF | ±5% | CL21B124JOANNN□ | |
| | | 150nF | ±10% | CL21B154KOANNN□ | |
| | | 180nF | ±10% | CL21B184KOANNN□ | |
| | 25Vdc | 220pF | ±20% | CL21B221MAANNN□ | |
| | | 1.0nF | ±10% | CL21B102KAANNN□ | |
| | | 1.0nF | ±20% | CL21B102MAANNN□ | |
| | | 2.2nF | ±10% | CL21B222KAANNN□ | |
| | | 2.2nF | ±20% | CL21B222MAANNN□ | |
| | | 4.7nF | ±10% | CL21B472KAANNN□ | |
| | | 5.6nF | ±10% | CL21B562KAANNN□ | |
| | | 6.8nF | ±10% | CL21B682KAANNN□ | |
| | | 6.8nF | ±20% | CL21B682MAANNN□ | |
| | | 10nF | ±10% | CL21B103KAANNN□ | |
| | | 12nF | ±10% | CL21B123KAANNN□ | |
| | | 15nF | ±5% | CL21B153JAANNN□ | |
| | | 15nF | ±10% | CL21B153KAANNN□ | |
| | | 18nF | ±10% | CL21B183KAANNN□ | |
| | | 22nF | ±10% | CL21B223KAANNN□ | |
| | | 27nF | ±10% | CL21B273KAANNN□ | |
| | | 33nF | ±10% | CL21B333KAANNN□ | |
| | | 39nF | ±10% | CL21B393KAANNN□ | |
| | | 47nF | ±10% | CL21B473KAANNN□ | |
| | | 56nF | ±10% | CL21B563KAANNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.75mm | 25Vdc | 68nF | ±10% | CL21B683KAANNN□ | |
| | 50Vdc | 18pF | ±5% | CL21B180JBANNN□ | |
| | | 22pF | ±5% | CL21B220JBANNN□ | |
| | | 56pF | ±5% | CL21B560JBANNN□ | |
| | | 100pF | ±5% | CL21B101JBANNN□ | |
| | | 100pF | ±10% | CL21B101KBANNN□ | |
| | | 150pF | ±10% | CL21B151KBANNN□ | |
| | | 180pF | ±10% | CL21B181KBANNN□ | |
| | | 200pF | ±10% | CL21B201KBANNN□ | |
| | | 220pF | ±5% | CL21B221JBANNN□ | |
| | | 220pF | ±10% | CL21B221KBANNN□ | |
| | | 270pF | ±10% | CL21B271KBANNN□ | |
| | | 300pF | ±10% | CL21B301KBANNN□ | |
| | | 330pF | ±5% | CL21B331JBANNN□ | |
| | | 330pF | ±10% | CL21B331KBANNN□ | |
| | | 360pF | ±10% | CL21B361KBANNN□ | |
| | | 390pF | ±5% | CL21B391JBANNN□ | |
| | | 390pF | ±10% | CL21B391KBANNN□ | |
| | | 470pF | ±5% | CL21B471JBANNN□ | |
| | | 470pF | ±10% | CL21B471KBANNN□ | |
| | | 500pF | ±10% | CL21B501KBANNN□ | |
| | | 510pF | ±10% | CL21B511KBANNN□ | |
| | | 560pF | ±5% | CL21B561JBANNN□ | |
| | | 560pF | ±10% | CL21B561KBANNN□ | |
| | | 620pF | ±10% | CL21B621KBANNN□ | |
| | | 680pF | ±5% | CL21B681JBANNN□ | |
| | | 680pF | ±10% | CL21B681KBANNN□ | |
| | | 750pF | ±10% | CL21B751KBANNN□ | |
| | | 820pF | ±10% | CL21B821KBANNN□ | |
| | | 910pF | ±10% | CL21B911KBANNN□ | |
| | | 1.0nF | ±5% | CL21B102JBANNN□ | |
| | | 1.0nF | ±10% | CL21B102KBANNN□ | |
| | | 1.0nF | ±20% | CL21B102MBANNN□ | |
| | | 1.2nF | ±10% | CL21B122KBANNN□ | |
| | | 1.3nF | ±5% | CL21B132JBANNN□ | |
| | | 1.5nF | ±5% | CL21B152JBANNN□ | |
| | | 1.5nF | ±10% | CL21B152KBANNN□ | |
| | | 1.8nF | ±5% | CL21B182JBANNN□ | |
| | | 1.8nF | ±10% | CL21B182KBANNN□ | |
| | | 2.0nF | ±5% | CL21B202JBANNN□ | |
| | | 2.0nF | ±10% | CL21B202KBANNN□ | |
| | | 2.2nF | ±5% | CL21B222JBANNN□ | |
| | | 2.2nF | ±10% | CL21B222KBANNN□ | |
| | | 2.2nF | ±20% | CL21B222MBANNN□ | |
| | | 2.4nF | ±10% | CL21B242KBANNN□ | |
| | | 2.4nF | ±20% | CL21B242MBANNN□ | |
| | | 2.7nF | ±5% | CL21B272JBANNN□ | |
| | | 2.7nF | ±10% | CL21B272KBANNN□ | |
| | | 3.0nF | ±5% | CL21B302JBANNN□ | |
| | | 3.0nF | ±20% | CL21B302MBANNN□ | |
| | | 3.3nF | ±5% | CL21B332JBANNN□ | |
| | | 3.3nF | ±10% | CL21B332KBANNN□ | |
| | | 3.6nF | ±10% | CL21B362KBANNN□ | |
| | | 3.9nF | ±5% | CL21B392JBANNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Standard & High Capacitors

## Product Line Up (X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.75mm | 50Vdc | 3.9nF | ±10% | CL21B392KBANNN□ | |
| | | 4.7nF | ±5% | CL21B472JBANNN□ | |
| | | 4.7nF | ±10% | CL21B472KBANNN□ | |
| | | 5.0nF | ±10% | CL21B502KBANNN□ | |
| | | 5.1nF | ±10% | CL21B512KBANNN□ | |
| | | 5.6nF | ±5% | CL21B562JBANNN□ | |
| | | 5.6nF | ±10% | CL21B562KBANNN□ | |
| | | 6.8nF | ±5% | CL21B682JBANNN□ | |
| | | 6.8nF | ±10% | CL21B682KBANNN□ | |
| | | 7.5nF | ±10% | CL21B752KBANNN□ | |
| | | 8.2nF | ±5% | CL21B822JBANNN□ | |
| | | 8.2nF | ±10% | CL21B822KBANNN□ | |
| | | 9.1nF | ±10% | CL21B912KBANNN□ | |
| | | 10nF | ±5% | CL21B103JBANNN□ | |
| | | 10nF | ±10% | CL21B103KBANNN□ | |
| | | 10nF | ±20% | CL21B103MBANNN□ | |
| | | 12nF | ±5% | CL21B123JBANNN□ | |
| | | 12nF | ±10% | CL21B123KBANNN□ | |
| | | 12nF | ±20% | CL21B123MBANNN□ | |
| | | 15nF | ±5% | CL21B153JBANNN□ | |
| | | 15nF | ±10% | CL21B153KBANNN□ | |
| | | 15nF | ±20% | CL21B153MBANNN□ | |
| | | 18nF | ±10% | CL21B183KBANNN□ | |
| | | 20nF | ±10% | CL21B203KBANNN□ | |
| | | 22nF | ±5% | CL21B223JBANNN□ | |
| | | 22nF | ±10% | CL21B223KBANNN□ | |
| | | 27nF | ±5% | CL21B273JBANNN□ | |
| | | 27nF | ±10% | CL21B273KBANNN□ | |
| | | 33nF | ±5% | CL21B333JBANNN□ | |
| | | 33nF | ±10% | CL21B333KBANNN□ | |
| | | 33nF | ±20% | CL21B333MBANNN□ | |
| | | 39nF | ±5% | CL21B393JBANNN□ | |
| | | 39nF | ±10% | CL21B393KBANNN□ | |
| | | 47nF | ±10% | CL21B473KBANNN□ | |
| 0.95mm | 16Vdc | 150nF | ±10% | CL21B154KOCNNN□ | |
| | | 220nF | ±5% | CL21B224JOCNNN□ | |
| | | 220nF | ±10% | CL21B224KOCNNN□ | |
| | | 220nF | ±20% | CL21B224MOCNNN□ | |
| | | 270nF | ±5% | CL21B274JOCNNN□ | |
| | | 270nF | ±10% | CL21B274KOCNNN□ | |
| | | 330nF | ±5% | CL21B334JOCNNN□ | |
| | | 330nF | ±10% | CL21B334KOCNNN□ | |
| | | 1.0uF | ±10% | CL21B105KOCNNN□ | |
| | 25Vdc | 47nF | ±10% | CL21B473KACNNN□ | |
| | | 68nF | ±10% | CL21B683KACNNN□ | |
| | | 82nF | ±10% | CL21B823KACNNN□ | |
| | | 100nF | ±5% | CL21B104JACNNN□ | |
| | | 100nF | ±10% | CL21B104KACNNN□ | |
| | | 100nF | ±20% | CL21B104MACNNN□ | |
| | | 120nF | ±5% | CL21B124JACNNN□ | |
| | | 120nF | ±10% | CL21B124KACNNN□ | |
| | | 150nF | ±10% | CL21B154KACNNN□ | |
| | 50Vdc | 1.0nF | ±10% | CL21B102KBCNNN□ | |
| | | 2.2nF | ±10% | CL21B222KBCNNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 50Vdc | 2.7nF | ±10% | CL21B272KBCNNN□ | |
| | | 3.3nF | ±10% | CL21B332KBCNNN□ | |
| | | 4.7nF | ±5% | CL21B472JBCNNN□ | |
| | | 6.8nF | ±10% | CL21B682KBCNNN□ | |
| | | 10nF | ±5% | CL21B103JBCNNN□ | |
| | | 10nF | ±10% | CL21B103KBCNNN□ | |
| | | 18nF | ±5% | CL21B183JBCNNN□ | |
| | | 22nF | ±10% | CL21B223KBCNNN□ | |
| | | 24nF | ±5% | CL21B243JBCNNN□ | |
| | | 33nF | ±5% | CL21B333JBCNNN□ | |
| | | 39nF | ±5% | CL21B393JBCNNN□ | |
| | | 39nF | ±10% | CL21B393KBCNNN□ | |
| | | 47nF | ±5% | CL21B473JBCNNN□ | |
| | | 47nF | ±10% | CL21B473KBCNNN□ | |
| | | 47nF | ±20% | CL21B473MBCNNN□ | |
| | | 51nF | ±10% | CL21B513KBCNNN□ | |
| | | 56nF | ±5% | CL21B563JBCNNN□ | |
| | | 56nF | ±10% | CL21B563KBCNNN□ | |
| | | 68nF | ±5% | CL21B683JBCNNN□ | |
| | | 68nF | ±10% | CL21B683KBCNNN□ | |
| | | 82nF | ±5% | CL21B823JBCNNN□ | |
| | | 82nF | ±10% | CL21B823KBCNNN□ | |
| | | 100nF | ±5% | CL21B104JBCNNN□ | |
| | | 100nF | ±10% | CL21B104KBCNNN□ | |
| | | 100nF | ±20% | CL21B104MBCNNN□ | |
| 1.35mm | 6.3Vdc | 1.0uF | ±10% | CL21B105KQFNNN□ | |
| | | 2.2uF | ±5% | CL21B225JQFNNN□ | |
| | | 2.2uF | ±10% | CL21B225KQFNNN□ | |
| | | 3.3uF | ±10% | CL21B335KQFNNN□ | |
| | | 3.3uF | ±20% | CL21B335MQFNNN□ | |
| | | 4.7uF | ±10% | CL21B475KQFNNN□ | Ref. |
| | 10Vdc | 470nF | ±10% | CL21B474KPFNNN□ | |
| | | 680nF | ±10% | CL21B684KPFNNN□ | |
| | | 820nF | ±10% | CL21B824KPFNNN□ | |
| | | 1.0uF | ±5% | CL21B105JPFNNN□ | |
| | | 1.0uF | ±10% | CL21B105KPFNNN□ | |
| | | 1.0uF | ±20% | CL21B105MPFNNN□ | |
| | | 2.2uF | ±10% | CL21B225KPFNNN□ | |
| | | 2.2uF | ±20% | CL21B225MPFNNN□ | |
| | | 3.3uF | ±10% | CL21B335KPFNNN□ | |
| | | 4.7uF | ±10% | CL21B475KPFNNN□ | Ref. |
| | 16Vdc | 150nF | ±10% | CL21B154KOFNNN□ | |
| | | 220nF | ±10% | CL21B224KOFNNN□ | |
| | | 330nF | ±10% | CL21B334KOFNNN□ | |
| | | 390nF | ±10% | CL21B394KOFNNN□ | |
| | | 470nF | ±5% | CL21B474JOFNNN□ | |
| | | 470nF | ±10% | CL21B474KOFNNN□ | |
| | | 470nF | ±20% | CL21B474MOFNNN□ | |
| | | 680nF | ±5% | CL21B684JOFNNN□ | |
| | | 680nF | ±10% | CL21B684KOFNNN□ | |
| | | 1.0uF | ±10% | CL21B105KOFNNN□ | |
| | | 2.2uF | ±10% | CL21B225KOFNNN□ | |
| | | 2.2uF | ±20% | CL21B225MOFNNN□ | |
| | | 4.7uF | ±10% | CL21B475KOFNNN□ | Ref. |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 25Vdc | 18nF | ±10% | CL21B183KAFNNN□ | |
| | | 47nF | ±10% | CL21B473KAFNNN□ | |
| | | 100nF | ±10% | CL21B104KAFNNN□ | |
| | | 150nF | ±10% | CL21B154KAFNNN□ | |
| | | 180nF | ±10% | CL21B184KAFNNN□ | |
| | | 220nF | ±5% | CL21B224JAFNNN□ | |
| | | 220nF | ±10% | CL21B224KAFNNN□ | |
| | | 220nF | ±20% | CL21B224MAFNNN□ | |
| | | 270nF | ±10% | CL21B274KAFNNN□ | |
| | | 330nF | ±10% | CL21B334KAFNNN□ | |
| | | 390nF | ±10% | CL21B394KAFNNN□ | |
| | | 470nF | ±5% | CL21B474JAFNNN□ | |
| | | 470nF | ±10% | CL21B474KAFNNN□ | |
| | | 1.0uF | ±10% | CL21B105KAFNNN□ | |
| | | 1.5uF | ±10% | CL21B155KAFNNN□ | |
| | | 2.2uF | ±10% | CL21B225KAFNNN□ | |
| | | 4.7uF | ±10% | CL21B475KAFNNN□ | Ref. |
| | 35Vdc | 1.0uF | ±10% | CL21B105KLFNNN□ | |
| | 50Vdc | 560pF | ±10% | CL21B561KBFNNN□ | |
| | | 47nF | ±10% | CL21B473KBFNNN□ | |
| | | 68nF | ±5% | CL21B683JBFNNN□ | |
| | | 68nF | ±10% | CL21B683KBFNNN□ | |
| | | 75nF | ±10% | CL21B753KBFNNN□ | |
| | | 82nF | ±10% | CL21B823KBFNNN□ | |
| | | 100nF | ±5% | CL21B104JBFNNN□ | |
| | | 100nF | ±10% | CL21B104KBFNNN□ | |
| | | 100nF | ±20% | CL21B104MBFNNN□ | |
| | | 120nF | ±10% | CL21B124KBFNNN□ | |
| | | 150nF | ±10% | CL21B154KBFNNN□ | |
| | | 220nF | ±5% | CL21B224JBFNNN□ | |
| | | 220nF | ±10% | CL21B224KBFNNN□ | |
| | | 270nF | ±10% | CL21B274KBFNNN□ | |
| | | 330nF | ±10% | CL21B334KBFNNN□ | |
| | | 470nF | ±10% | CL21B474KBFNNN□ | |
| | | 680nF | ±10% | CL21B684KBFNNN□ | |
| | | 1.0uF | ±10% | CL21B105KBFNNN□ | |
| | | 1.0uF | ±20% | CL21B105MBFNNN□ | |
| 1.40mm | 6.3Vdc | 4.7uF | ±10% | CL21B475KQQNNN□ | Ref. |
| | | 10uF | ±10% | CL21B106KQQNNN□ | |
| | 10Vdc | 4.7uF | ±10% | CL21B475KPQNNN□ | Ref. |
| | | 10uF | ±10% | CL21B106KPQNNN□ | |
| | 16Vdc | 10uF | ±10% | CL21B106KOQNNN□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 10Vdc | 1.0uF | ±10% | CL31B105KPCNNN□ | |
| | | 1.2uF | ±10% | CL31B125KPCNNN□ | |
| | 16Vdc | 22nF | ±5% | CL31B223JOCNNN□ | |
| | | 100nF | ±10% | CL31B104KOCNNN□ | |
| | | 220nF | ±10% | CL31B224KOCNNN□ | |
| | | 270nF | ±10% | CL31B274KOCNNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 16Vdc | 270nF | ±20% | CL31B274MOCNNN□ | |
| | | 330nF | ±10% | CL31B334KOCNNN□ | |
| | | 330nF | ±20% | CL31B334MOCNNN□ | |
| | | 390nF | ±10% | CL31B394KOCNNN□ | |
| | | 470nF | ±10% | CL31B474KOCNNN□ | |
| | | 560nF | ±10% | CL31B564KOCNNN□ | |
| | | 680nF | ±10% | CL31B684KOCNNN□ | |
| | 25Vdc | 4.7nF | ±10% | CL31B472KACNNN□ | |
| | | 22nF | ±10% | CL31B223KACNNN□ | |
| | | 47nF | ±10% | CL31B473KACNNN□ | |
| | | 68nF | ±10% | CL31B683KACNNN□ | |
| | | 100nF | ±10% | CL31B104KACNNN□ | |
| | | 120nF | ±10% | CL31B124KACNNN□ | |
| | | 150nF | ±10% | CL31B154KACNNN□ | |
| | | 180nF | ±10% | CL31B184KACNNN□ | |
| | | 220nF | ±5% | CL31B224JACNNN□ | |
| | | 220nF | ±10% | CL31B224KACNNN□ | |
| | | 270nF | ±10% | CL31B274KACNNN□ | |
| | | 330nF | ±10% | CL31B334KACNNN□ | |
| | | 390nF | ±10% | CL31B394KACNNN□ | |
| | 50Vdc | 120pF | ±10% | CL31B121KBCNNN□ | |
| | | 180pF | ±10% | CL31B181KBCNNN□ | |
| | | 220pF | ±10% | CL31B221KBCNNN□ | |
| | | 270pF | ±10% | CL31B271KBCNNN□ | |
| | | 330pF | ±10% | CL31B331KBCNNN□ | |
| | | 390pF | ±5% | CL31B391JBCNNN□ | |
| | | 390pF | ±10% | CL31B391KBCNNN□ | |
| | | 470pF | ±10% | CL31B471KBCNNN□ | |
| | | 560pF | ±10% | CL31B561KBCNNN□ | |
| | | 680pF | ±10% | CL31B681KBCNNN□ | |
| | | 820pF | ±10% | CL31B821KBCNNN□ | |
| | | 1.0nF | ±5% | CL31B102JBCNNN□ | |
| | | 1.0nF | ±10% | CL31B102KBCNNN□ | |
| | | 1.0nF | ±20% | CL31B102MBCNNN□ | |
| | | 1.2nF | ±10% | CL31B122KBCNNN□ | |
| | | 1.5nF | ±5% | CL31B152JBCNNN□ | |
| | | 1.5nF | ±10% | CL31B152KBCNNN□ | |
| | | 1.8nF | ±10% | CL31B182KBCNNN□ | |
| | | 2.0nF | ±10% | CL31B202KBCNNN□ | |
| | | 2.2nF | ±10% | CL31B222KBCNNN□ | |
| | | 2.4nF | ±10% | CL31B242KBCNNN□ | |
| | | 3.0nF | ±10% | CL31B302KBCNNN□ | |
| | | 3.3nF | ±5% | CL31B332JBCNNN□ | |
| | | 3.3nF | ±10% | CL31B332KBCNNN□ | |
| | | 3.9nF | ±5% | CL31B392JBCNNN□ | |
| | | 3.9nF | ±10% | CL31B392KBCNNN□ | |
| | | 4.7nF | ±5% | CL31B472JBCNNN□ | |
| | | 4.7nF | ±10% | CL31B472KBCNNN□ | |
| | | 5.0nF | ±20% | CL31B502MBCNNN□ | |
| | | 5.6nF | ±5% | CL31B562JBCNNN□ | |
| | | 5.6nF | ±10% | CL31B562KBCNNN□ | |
| | | 6.8nF | ±5% | CL31B682JBCNNN□ | |
| | | 6.8nF | ±10% | CL31B682KBCNNN□ | |
| | | 8.2nF | ±10% | CL31B822KBCNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Standard & High Capacitors

## Product Line Up (X7R)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 50Vdc | 10nF | ±5% | CL31B103JBCNNN□ | |
| | | 10nF | ±10% | CL31B103KBCNNN□ | |
| | | 10nF | ±20% | CL31B103MBCNNN□ | |
| | | 15nF | ±5% | CL31B153JBCNNN□ | |
| | | 15nF | ±10% | CL31B153KBCNNN□ | |
| | | 18nF | ±10% | CL31B183KBCNNN□ | |
| | | 22nF | ±5% | CL31B223JBCNNN□ | |
| | | 22nF | ±10% | CL31B223KBCNNN□ | |
| | | 27nF | ±5% | CL31B273JBCNNN□ | |
| | | 27nF | ±10% | CL31B273KBCNNN□ | |
| | | 33nF | ±5% | CL31B333JBCNNN□ | |
| | | 33nF | ±10% | CL31B333KBCNNN□ | |
| | | 39nF | ±5% | CL31B393JBCNNN□ | |
| | | 39nF | ±10% | CL31B393KBCNNN□ | |
| | | 47nF | ±5% | CL31B473JBCNNN□ | |
| | | 47nF | ±10% | CL31B473KBCNNN□ | |
| | | 56nF | ±5% | CL31B563JBCNNN□ | |
| | | 56nF | ±10% | CL31B563KBCNNN□ | |
| | | 68nF | ±10% | CL31B683KBCNNN□ | |
| | | 82nF | ±10% | CL31B823KBCNNN□ | |
| | | 100nF | ±5% | CL31B104JBCNNN□ | |
| | | 100nF | ±10% | CL31B104KBCNNN□ | |
| | | 100nF | ±20% | CL31B104MBCNNN□ | |
| | | 120nF | ±10% | CL31B124KBCNNN□ | |
| | | 150nF | ±10% | CL31B154KBCNNN□ | |
| | | 220nF | ±10% | CL31B224KBCNNN□ | |
| 1.20mm | 16Vdc | 4.7uF | ±10% | CL31B475KOELNN□ | |
| 1.25mm | 10Vdc | 2.2uF | ±10% | CL31B225KPENNN□ | |
| | | 2.2uF | ±20% | CL31B225MPENNN□ | |
| | 25Vdc | 1.0uF | ± 10 % | CL31B105KAPLNN□ | |
| 1.40mm | 10Vdc | 1.5uF | ±10% | CL31B155KPFNNN□ | |
| | | 2.2uF | ±10% | CL31B225KPFNNN□ | |
| | | 2.2uF | ±20% | CL31B225MPFNNN□ | |
| | 16Vdc | 820nF | ±10% | CL31B824KOFNNN□ | |
| | | 1.0uF | ±5% | CL31B105JOFNNN□ | |
| | | 1.0uF | ±10% | CL31B105KOFNNN□ | |
| | | 1.0uF | ±20% | CL31B105MOFNNN□ | |
| | | 1.5uF | ±10% | CL31B155KOFNNN□ | |
| | 25Vdc | 10nF | ±2% | CL31B103GAFNNN□ | |
| | | 470nF | ±5% | CL31B474JAFNNN□ | |
| | | 470nF | ±10% | CL31B474KAFNNN□ | |
| | | 470nF | ±20% | CL31B474MAFNNN□ | |
| | | 560nF | ±10% | CL31B564KAFNNN□ | |
| | 50Vdc | 100nF | ±10% | CL31B104KBFNNN□ | |
| | | 180nF | ±10% | CL31B184KBFNNN□ | |
| | | 200nF | ±10% | CL31B204KBFNNN□ | |
| | | 220nF | ±5% | CL31B224JBFNNN□ | |
| | | 220nF | ±10% | CL31B224KBFNNN□ | |
| | | 220nF | ±20% | CL31B224MBFNNN□ | |
| | | 270nF | ±10% | CL31B274KBFNNN□ | |
| | | 330nF | ±5% | CL31B334JBFNNN□ | |
| | | 330nF | ±10% | CL31B334KBFNNN□ | |
| 1.80mm | 6.3Vdc | 3.3uF | ±10% | CL31B335KQHNNN□ | |
| | | 6.8uF | ±10% | CL31B685KQHNNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 6.3Vdc | 10uF | ±10% | CL31B106KQHNNN□ | |
| | | 10uF | ±20% | CL31B106MQHNNN□ | |
| | | 22uF | ±10% | CL31B226KQHNNN□ | |
| | 10Vdc | 4.7uF | ±10% | CL31B475KPHNNN□ | |
| | | 6.8uF | +80/-20% | CL31B685ZPHNNN□ | |
| | | 10uF | ±10% | CL31B106KPHNNN□ | |
| | | 22uF | ±10% | CL31B226KPHNNN□ | |
| | | 22uF | ±20% | CL31B226MPHNNN□ | |
| | 16Vdc | 1.0uF | ±20% | CL31B105MOHNNN□ | |
| | | 2.2uF | ±10% | CL31B225KOHNNN□ | |
| | | 2.2uF | ±20% | CL31B225MOHNNN□ | |
| | | 3.3uF | ±10% | CL31B335KOHNNN□ | |
| | | 4.7uF | ±10% | CL31B475KOHNNN□ | |
| | | 10uF | ±10% | CL31B106KOHNNN□ | |
| | | 10uF | ±20% | CL31B106MOHNNN□ | |
| | 25Vdc | 680nF | ±10% | CL31B684KAHNNN□ | |
| | | 1.0uF | ±5% | CL31B105JAHNNN□ | |
| | | 1.0uF | ±10% | CL31B105KAHNNN□ | |
| | | 1.0uF | ±20% | CL31B105MAHNNN□ | |
| | | 1.2uF | ±20% | CL31B125MAHNNN□ | |
| | | 2.2uF | ±10% | CL31B225KAHNNN□ | |
| | | 2.2uF | ±20% | CL31B225MAHNNN□ | |
| | | 4.7uF | ±10% | CL31B475KAHNNN□ | |
| | | 4.7uF | ±20% | CL31B475MAHNNN□ | |
| | | 10uF | ±10% | CL31B106KAHNNN□ | |
| | 35Vdc | 10uF | ±10% | CL31B106KLHNNN□ | Ref. |
| | 50Vdc | 4.7nF | ±10% | CL31B472KBHNNN□ | |
| | | 390nF | ±10% | CL31B394KBHNNN□ | |
| | | 470nF | ±5% | CL31B474JBHNNN□ | |
| | | 470nF | ±10% | CL31B474KBHNNN□ | |
| | | 680nF | ±10% | CL31B684KBHNNN□ | |
| | | 1.0uF | ±10% | CL31B105KBHNNN□ | |
| | | 2.2uF | ±10% | CL31B225KBHNNN□ | |
| | | 4.7uF | ±10% | CL31B475KBHNNN□ | |
| | | 10uF | ±10% | CL31B106KBHNNN□ | Ref. |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X7R)

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 16Vdc | 100nF | ±10% | CL32B104KOFNNN□ | |
| | | 220nF | ±10% | CL32B224KOFNNN□ | |
| | | 470nF | ±10% | CL32B474KOFNNN□ | |
| | | 680nF | ±10% | CL32B684KOFNNN□ | |
| | | 1.0uF | ±10% | CL32B105KOFNNN□ | |
| | | 2.2uF | ±10% | CL32B225KOFNNN□ | |
| | 25Vdc | 220nF | ±5% | CL32B224JAFNNN□ | |
| | | 220nF | ±10% | CL32B224KAFNNN□ | |
| | | 470nF | ±20% | CL32B474MAFNNN□ | |
| | | 560nF | ±5% | CL32B564JAFNNN□ | |
| | | 1.0uF | ±10% | CL32B105KAFNNN□ | |
| | 50Vdc | 47nF | ±10% | CL32B473KBFNNN□ | |
| | | 100nF | ±5% | CL32B104JBFNNN□ | |
| | | 100nF | ±10% | CL32B104KBFNNN□ | |
| | | 100nF | ±20% | CL32B104MBFNNN□ | |
| | | 120nF | ±5% | CL32B124JBFNNN□ | |
| | | 120nF | ±10% | CL32B124KBFNNN□ | |
| | | 120nF | ±20% | CL32B124MBFNNN□ | |
| | | 150nF | ±5% | CL32B154JBFNNN□ | |
| | | 150nF | ±10% | CL32B154KBFNNN□ | |
| | | 220nF | ±5% | CL32B224JBFNNN□ | |
| | | 220nF | ±10% | CL32B224KBFNNN□ | |
| | | 270nF | ±10% | CL32B274KBFNNN□ | |
| | | 330nF | ±5% | CL32B334JBFNNN□ | |
| | | 330nF | ±10% | CL32B334KBFNNN□ | |
| | | 390nF | ±10% | CL32B394KBFNNN□ | |
| | | 470nF | ±5% | CL32B474JBFNNN□ | |
| | | 470nF | ±10% | CL32B474KBFNNN□ | |
| 1.80mm | 16Vdc | 3.3uF | ±10% | CL32B335KOHNNN□ | |
| | 25Vdc | 330nF | ±10% | CL32B334KAHNNN□ | |
| | | 2.2uF | ±10% | CL32B225KAHNNN□ | |
| | 50Vdc | 820nF | ±10% | CL32B824KBHNNN□ | |
| | | 1.0uF | ±10% | CL32B105KBHNNN□ | |
| | | 1.0uF | ±20% | CL32B105MBHNNN□ | |
| 2.00mm | 16Vdc | 10uF | ±10% | CL32B106KOULNN□ | |
| | 25Vdc | 10uF | ±10% | CL32B106KAULNN□ | |
| | 35Vdc | 4.7uF | ±10% | CL32B475KLULNN□ | |
| | | 10uF | ±10% | CL32B106KLULNN□ | |
| 2.20mm | 10Vdc | 4.7uF | ±10% | CL32B475KPINNN□ | |
| | | 10uF | ±10% | CL32B106KPINNN□ | |
| | 16Vdc | 4.7uF | ±10% | CL32B475KOINNN□ | |
| | 25Vdc | 2.2uF | ±10% | CL32B225KAINNN□ | |
| 2.70mm | 6.3Vdc | 22uF | ±20% | CL32B226MQJNNN□ | |
| | | 47uF | ±20% | CL32B476MQJNNN□ | Ref. |
| | 10Vdc | 22uF | ±10% | CL32B226KPJNNN□ | |
| | | 47uF | ±20% | CL32B476MPJNNN□ | Ref. |
| | 16Vdc | 10uF | ±10% | CL32B106KOJNNN□ | |
| | | 22uF | ±10% | CL32B226KOJNNN□ | |
| | | 22uF | ±20% | CL32B226MOJNNN□ | |
| | 25Vdc | 3.3uF | ±10% | CL32B335KAJNNN□ | |
| | | 10uF | ±10% | CL32B106KAJNNN□ | |
| | | 22uF | ±10% | CL32B226KAJNNN□ | |
| | 35Vdc | 10uF | ±10% | CL32B106KLJNNN□ | |
| | 50Vdc | 2.2uF | ±10% | CL32B225KBJNNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 50Vdc | 4.7uF | ±10% | CL32B475KBJNNN□ | |
| | | 10uF | ±10% | CL32B106KBJNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Low Profile Capacitors

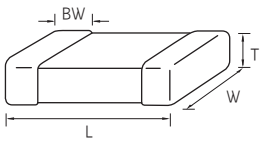
## Feature

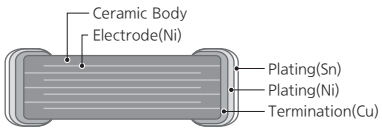
- Decoupling and filterng application where the thickness is limited
- A range of low-profile products as thin as 0.11mm in 1005mm

## Application

- Mobile phone
- Smart watch
- IC Package

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.0975±0.0125 | L | 0.25±0.075 |
| | | 1.00±0.10 | 0.50±0.05 | 0.19±0.03 | X | 0.25±0.10 |
| | | 1.00±0.05 | 0.50±0.05 | 0.30±0.03 | 3 | |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.50+0.0/-0.10 | 5 | 0.30±0.20 |
| | | 1.60±0.10 | 0.80±0.10 | 0.60±0.10 | 6 | |
| | | 1.60±0.10 | 0.80±0.10 | 0.70±0.10 | 7 | |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.60±0.10 | 6 | 0.50+0.20/-0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 0.70±0.10 | 7 | |
| | | 2.00±0.10 | 1.25±0.10 | 0.80±0.10 | 8 | |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 0.90±0.10 | 9 | |
| | | 2.00±0.10 | 1.25±0.10 | 1.10±0.10 | E | |
| 31 | 1206 | 3.20±0.20 | 1.60±0.20 | 0.85±0.10 | C | 0.50±0.30 |
| | | 3.20±0.20 | 1.60±0.20 | 0.90±0.10 | 9 | |
| | | 3.20±0.20 | 1.60±0.20 | 1.10±0.10 | E | |
| | | 3.20±0.20 | 1.60±0.20 | 1.15±0.10 | M | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 0.85±0.10 | C | 0.60±0.30 |
| | | 3.20±0.30 | 2.50±0.20 | 0.90±0.10 | 9 | |
| | | 3.20±0.30 | 2.50±0.20 | 1.15±0.10 | M | |
| | | 3.20±0.30 | 2.50±0.20 | 1.35±0.15 | S | |
| | | 3.20±0.30 | 2.50±0.20 | 1.60±0.10 | T | |
| | | 3.20±0.30 | 2.50±0.20 | 1.80±0.20 | U | |
| | | 3.20±0.30 | 2.50±0.20 | 2.00±0.20 | I | |

## Low Profile Capacitance Table (X5R)

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.22 | 0.47 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 68 | 100 |
| 0402 (1005) | 0.11 | 6.3 | | | | | | | | | | |
| | 0.22 | 6.3 | | | | | | | | | | |
| | 0.33 | 4.0 | | | | | | | | | | |
| | | 6.3 | | | | | 0.35 T max. | | | | | |
| 0603 (1608) | 0.50 | 4.0 | | | | | | | | | | |
| | | 6.3 | | | | | | | | | | |
| | | 10 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| | | 25 | | | | | | | | | | |
| | 0.60 | 6.3 | | | | | | | | | | |
| | 0.80 | 6.3 | | | | | | | | | | |
| | | 10 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| 0805 (2012) | 0.70 | 10 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| | 0.80 | 6.3 | | | | | | | | | | |
| | | 10 | | | | | | | | | | |
| | 0.90 | 6.3 | | | | | | | | | | |
| | 0.95 | 4.0 | | | | | | | | | | |
| | | 6.3 | | | | | | | | | | |
| | | 10 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| | | 25 | | | | | | | | | | |
| | | 35 | | | | | | | | | | |
| | | 50 | | | | | | | | | | |
| | 1.00 | 6.3 | | | | | | | | | | |
| | | 50 | | | | | | | | | | |
| | 1.20 | 6.3 | | | | | | | 33uF | | | |
| 1206 (3216) | 0.95 | 6.3 | | | | | | | | | | |
| | | 10 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| | | 25 | | | | | | | | | | |
| | 1.00 | 35 | | | | | | | | | | |
| | | 50 | | | | | | | | | | |
| | | 100 | | | | | | | | | | |
| | 1.20 | 16 | | | | | | | | | | |
| | 1.25 | 10 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| | | 25 | | | | | | | | | | |

# Low Profile Capacitors

## Low Profile Capacitance Table (X5R)

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.22 | 0.47 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 68 | 100 |
| 1210 (3225) | 0.95 | 16 | | | | | | | | | | |
| | 1.00 | 25 | | | | | | | | | | |
| | 1.25 | 16 | | | | | | | | | | |
| | 1.50 | 10 | | | | | | | | | | |
| | | 25 | | | | | 6.8uF | | | | | |
| | 1.70 | 16 | | | | | | | | | | |
| | | 25 | | | | | | | | | | |
| | 2.00 | 25 | | | | | | | | | | |
| | | 35 | | | | | | | | | | |
| | 2.20 | 10 | | | | | | | | | | |
| | | 16 | | | | | | | | | | |
| | | 25 | | | | | | | | | | |

## Low Profile Capacitance Table (X6S)

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.22 | 0.47 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 68 | 100 |
| 0402(1005) | 0.33 | 6.3 | | | X6S | | | | | | | |
| 0805 (2012) | 0.95 | 2.5 | | | | | | | X6S | | | |
| | | 4.0 | | | | | | X6S | | | | |
| | | 10 | | | | | | X6S | | | | |
| 1206(3216) | 0.95 | 25 | | | | | X6S | | | | | |

## Product Line Up (X5R)

### ■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.11mm | 6.3Vdc | 220nF | ±20% | CL05A224MQLHEC□ | Derating Ref. |
| 0.22mm | 6.3Vdc | 470nF | ±20% | CL05A474MQXLNN□ | Derating Ref. |
| | | 1.0uF | ±20% | CL05A105MQXLNN□ | Derating Ref. |
| 0.33mm | 4.0Vdc | 2.2uF | ±20% | CL05A225MR3LRN□ | Derating Ref. |
| | 6.3Vdc | 1.0uF | ±20% | CL05A105MQ3LNN□ | Derating |
| | | 2.2uF | ±20% | CL05A225MQ3LRN□ | Derating Ref. |
| 0.35mm | 6.3Vdc | 4.7uF | ±20% | CL05A475MQ3LUN□ | Derating Ref. |

### ■ Size: 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.50mm | 4.0Vdc | 10uF | ±20% | CL10A106MR5LQN□ | Derating Ref. |
| | 6.3Vdc | 2.2uF | ±10% | CL10A225KQ5LNN□ | |
| | | 4.7uF | ±10% | CL10A475KQ5LNN□ | |
| | | 4.7uF | ±20% | CL10A475MQ5LNN□ | |
| | | 10uF | ±20% | CL10A106MQ5LRN□ | Derating Ref. |
| | 10Vdc | 1.0uF | ±10% | CL10A105KP5LNN□ | |
| | | 2.2uF | ±10% | CL10A225KP5LNN□ | |
| | | 4.7uF | ±10% | CL10A475KP5LNN□ | Derating |
| | | 4.7uF | ±20% | CL10A475MP5LNN□ | Derating |
| | 16Vdc | 1.0uF | ±10% | CL10A105KO5LNN□ | |
| | | 2.2uF | ±10% | CL10A225KO5LNN□ | Derating |
| | 25Vdc | 1.0uF | ±10% | CL10A105KA5LNN□ | Derating |
| | | 2.2uF | ±10% | CL10A225KA5LNN□ | Derating |
| 0.60mm | 6.3Vdc | 4.7uF | ±10% | CL10A475KQ5NNN□ | |
| | | 4.7uF | ±20% | CL10A475MQ5NNN□ | |
| 0.80mm | 6.3Vdc | 22uF | ±20% | CL10A226MQ7LUN□ | Derating |
| | 10Vdc | 22uF | ±20% | CL10A226MP7LUN□ | Derating |
| | 16Vdc | 22uF | ±20% | CL10A226MO7JZN□ | Derating |

### ■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.70mm | 10Vdc | 2.2uF | ±10% | CL21A225KP6LNN□ | |
| | 16Vdc | 1.0uF | ±20% | CL21A105MO6LNN□ | |
| | | 2.2uF | ±10% | CL21A225KO6LNN□ | |
| 0.80mm | 6.3Vdc | 10uF | ±10% | CL21A106KQ7LQN□ | |
| | | 47uF | ±20% | CL21A476MQ7FRN□ | Derating |
| | | 47uF | ±20% | CL21A476MQ7LRN□ | Derating |
| | 10Vdc | 10uF | ±10% | CL21A106KP7LQN□ | Derating |
| 0.90mm | 6.3Vdc | 47uF | ±20% | CL21A476MQ8LRN□ | Derating |
| 0.95mm | 4.0Vdc | 22uF | ±20% | CL21A226MRCLRN□ | Derating |
| | | 47uF | ±20% | CL21A476MRCLRP□ | Derating |
| | 6.3Vdc | 1.0uF | ±10% | CL21A105KQCLNN□ | |
| | | 1.0uF | ±10% | CL21A105KQCNNN□ | |
| | | 4.7uF | ±10% | CL21A475KQCLNN□ | |
| | | 4.7uF | ±20% | CL21A475MQCLNN□ | |
| | | 10uF | ±10% | CL21A106KQCLNN□ | |
| | | 10uF | ±10% | CL21A106KQCLRN□ | |
| | | 10uF | ±20% | CL21A106MQCLNN□ | |
| | | 22uF | ±10% | CL21A226KQCLRN□ | Derating |
| | | 22uF | ±20% | CL21A226MQCLQN□ | Derating |
| | | 22uF | ±20% | CL21A226MQCLRN□ | Derating |
| | | 47uF | ±20% | CL21A476MQCLRN□ | Derating |
| | 10Vdc | 2.2uF | ±10% | CL21A225KPCLNN□ | |
| | | 4.7uF | ±10% | CL21A475KPCLNN□ | |
| | | 4.7uF | ±20% | CL21A475MPCLNN□ | |
| | | 10uF | ±10% | CL21A106KPCLNN□ | Derating |
| | | 10uF | ±10% | CL21A106KPCLQN□ | Derating |
| | | 10uF | ±20% | CL21A106MPCLNN□ | Derating |
| | | 10uF | ±20% | CL21A106MPCLQN□ | Derating |
| | | 22uF | ±10% | CL21A226KPCLRN□ | Derating |
| | | 22uF | ±20% | CL21A226MPCLRN□ | Derating |
| | | 22uF | +80/-20% | CL21A226ZPCLRN□ | Derating |
| | 16Vdc | 2.2uF | ±10% | CL21A225KOCLNN□ | |
| | | 4.7uF | ±10% | CL21A475KOCLNN□ | |
| | | 4.7uF | ±10% | CL21A475KOCLRN□ | |
| | | 10uF | ±10% | CL21A106KOCLNN□ | Derating |
| | | 10uF | ±10% | CL21A106KOCLRN□ | Derating |
| | | 10uF | ±10% | CL21A106KOCLSN□ | Derating |
| | | 22uF | ±20% | CL21A226MOCLRN□ | Derating |
| | 25Vdc | 1.0uF | ±10% | CL21A105KACLNN□ | |
| | | 1.0uF | ±10% | CL21A105KACNNN□ | |
| | | 2.2uF | ±10% | CL21A225KACLNN□ | Derating |
| | | 4.7uF | ±10% | CL21A475KACLRN□ | Derating |
| | | 10uF | ±10% | CL21A106KACLRN□ | Derating |
| | 35Vdc | 4.7uF | ±10% | CL21A475KLCLQN□ | Derating |
| | 50Vdc | 1.0uF | ±10% | CL21A105KBCFNN□ | |
| | | 1.0uF | ±10% | CL21A105KBCLNN□ | |
| 1.00mm | 6.3Vdc | 33uF | ±20% | CL21A336MQ9LRN□ | Derating |
| | | 47uF | ±20% | CL21A476MQ9LRN□ | Derating |
| | 50Vdc | 2.2uF | ±10% | CL21A225KB9LNN□ | Derating |
| 1.20mm | 6.3Vdc | 33uF | ±20% | CL21A336MQELRN□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Low Profile Capacitors

## Product Line Up (X5R)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 6.3Vdc | 10uF | ±20% | CL31A106MQCLNN□ | |
| | | 22uF | ±10% | CL31A226KQCLNN□ | Derating |
| | | 22uF | ±20% | CL31A226MQCLNN□ | Derating |
| | 10Vdc | 10uF | ±10% | CL31A106KPCLNN□ | |
| | | 10uF | ±20% | CL31A106MPCLNN□ | |
| | 16Vdc | 2.2uF | ±10% | CL31A225KOCLNN□ | |
| | | 4.7uF | ±10% | CL31A475KOCLNN□ | |
| | | 4.7uF | ±20% | CL31A475MOCLNN□ | |
| | | 10uF | ±10% | CL31A106KOCLNN□ | |
| | | 22uF | ±10% | CL31A226KOCLNN□ | Derating |
| | | 22uF | ±20% | CL31A226MOCLNN□ | Derating |
| | 25Vdc | 4.7uF | ±10% | CL31A475KACLNN□ | |
| | | 10uF | ±10% | CL31A106KACLNN□ | Derating |
| 1.00mm | 35Vdc | 4.7uF | ±10% | CL31A475KL9LNN□ | Derating |
| | 50Vdc | 1.0uF | ±10% | CL31A105KB9LNN□ | |
| | | 2.2uF | ±10% | CL31A225KB9LNN□ | |
| | | 4.7uF | ±10% | CL31A475KB9LNN□ | Derating |
| | 100Vdc | 2.2uF | ±10% | CL31A225KC9LNN□ | Derating |
| 1.20mm | 16Vdc | 4.7uF | ±10% | CL31A475KOELNN□ | |
| 1.25mm | 10Vdc | 10uF | ±10% | CL31A106KPPLNN□ | |
| | | 10uF | ±20% | CL31A106MPPLNN□ | |
| | 16Vdc | 4.7uF | ±10% | CL31A475KOPLNN□ | |
| | | 4.7uF | ±20% | CL31A475MOPLNN□ | |
| | 25Vdc | 1.0uF | ±10% | CL31A105KAPLNN□ | |
| | | 2.2uF | ±10% | CL31A225KAPLNN□ | |
| | | 4.7uF | ±10% | CL31A475KAPLNN□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 16Vdc | 10uF | ±10% | CL32A106KOCLNN□ | |
| | | 22uF | ±20% | CL32A226MOCLNN□ | Derating |
| 1.00mm | 25Vdc | 10uF | ±10% | CL32A106KA9LNN□ | |
| 1.25mm | 16Vdc | 10uF | ±10% | CL32A106KOMLNN□ | |
| 1.50mm | 10Vdc | 22uF | ±10% | CL32A226KPSLNN□ | |
| | | 22uF | ±20% | CL32A226MPSLNN□ | |
| | 25Vdc | 6.8uF | ±10% | CL32A685KASLNN□ | |
| 1.70mm | 16Vdc | 22uF | ±10% | CL32A226KOTFNN□ | Derating |
| | | 22uF | ±20% | CL32A226MOTLNN□ | Derating |
| | 25Vdc | 10uF | ±10% | CL32A106KATLNN□ | |
| | | 10uF | ±20% | CL32A106MATLNN□ | |
| 2.00mm | 25Vdc | 4.7uF | ±10% | CL32A475KAULNN□ | |
| | | 10uF | ±10% | CL32A106KAULNN□ | |
| | 35Vdc | 4.7uF | ±10% | CL32A475KLULNN□ | |
| | | 10uF | ±10% | CL32A106KLULNN□ | |
| | | 10uF | ±20% | CL32A106MLULNN□ | |
| 2.20mm | 10Vdc | 10uF | ±10% | CL32A106KPINNN□ | |
| | 16Vdc | 10uF | ±10% | CL32A106KOILNN□ | |
| | 25Vdc | 2.2uF | ±20% | CL32A225MAINNN□ | |
| | | 4.7uF | ±10% | CL32A475KAINNN□ | |
| | | 10uF | ±10% | CL32A106KAILNN□ | |
| | | 10uF | ±20% | CL32A106MAILNN□ | |

## Product Line Up ( X6S )

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 6.3Vdc | 1.0uF | ±20% | CL05X105MQ3LNN□ | Derating |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 2.5Vdc | 22uF | ±20% | CL21X226MSCLRN□ | Derating |
| | 4.0Vdc | 10uF | ±10% | CL21X106KRCLRN□ | Derating |
| | 10Vdc | 10uF | ±10% | CL21X106KPCLRN□ | Derating |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 25Vdc | 4.7uF | ±10% | CL31X475KACLNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Super Small Size Capacitors



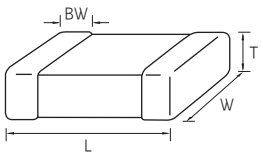
## Feature

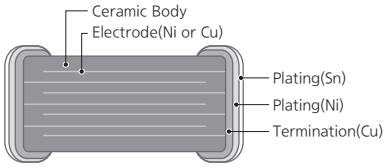
- Small size chip
- 02 and 03 Series (High – Q) MLCC shows very low ESR value
- 02 and 03 Series are suited to only reflow soldering
- 02 and 03 Series are suited to miniature RF module, portable equipment and high frequency circuit

## Application

- DC – DC Converter
- Mobile phone, Tablet devices
- PC (Laptop, Desktop)
- HDD / SSD Board

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 02 | 01005 | 0.40±0.02 | 0.20±0.02 | 0.20±0.02 | 2 | 0.10±0.03 |
| 03 | 0201 | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 3 | 0.15±0.05 |

# Super Small Size Capacitors

## Super Small Size Capacitance Table (C0G)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(pF) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0.2 | 0.5 | 1.0 | 10 | 22 | 47 | 100 |
| 01005 (0402) | 6.3 | | | | | | | |
| | 16 | | | | | | | |
| | 25 | | | | | 27pF | | |
| 0201 (0603) | 6.3 | | | | | | | |
| | 25 | | | | | | | |
| | 50 | | | | | | | |

## Super Small Size Capacitance Table (X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pF | | | | nF | | | | | | | | | | | | | uF | |
| | | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 10 | 15 | 22 | 33 | 47 | 68 | 100 | 220 | 470 | 1.0 | 2.2 |
| 01005 (0402) | 4.0 | | | | | | | | | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | |
| 0201 (0603) | 4.0 | | | | | | | | | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | |

## Super Small Size Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pF | | | | | nF | | | | | |
| | | 100 | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 6.8 | 10 |
| 01005(0402) | 10 | | | | | | | | | | | |
| 0201 (0603) | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| | 50 | | | | | | | | | | | |

## Super Small Size Capacitance Table (X6S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(nF) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 22 | 47 | 100 |
| 01005(0402) | 2.5 | | | | | | | | |
| 0201 (0603) | 4.0 | | | | | | | | |
| | 6.3 | | | | | | | | |

## Product Line Up (C0G)

■ Size : 0.40 X 0.20mm (inch : 01005)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.22mm | 16Vdc | 0.2pF | ±0.1pF | CL02C0R2BO2GNN□ |
| | | 0.3pF | ±0.1pF | CL02C0R3BO2GNN□ |
| | | 0.4pF | ±0.1pF | CL02C0R4BO2GNN□ |
| | | 0.5pF | ±0.1pF | CL02C0R5BO2GNN□ |
| | | 0.6pF | ±0.1pF | CL02C0R6BO2GNN□ |
| | | 0.7pF | ±0.1pF | CL02C0R7BO2GNN□ |
| | | 0.8pF | ±0.1pF | CL02C0R8BO2GNN□ |
| | | 0.9pF | ±0.1pF | CL02C0R9BO2GNN□ |
| | | 1.0pF | ±0.1pF | CL02C010BO2GNN□ |
| | | 1.1pF | ±0.1pF | CL02C1R1BO2GNN□ |
| | | 1.2pF | ±0.1pF | CL02C1R2BO2GNN□ |
| | | 1.3pF | ±0.1pF | CL02C1R3BO2GNN□ |
| | | 1.4pF | ±0.1pF | CL02C1R4BO2GNN□ |
| | | 1.5pF | ±0.1pF | CL02C1R5BO2GNN□ |
| | | 1.6pF | ±0.1pF | CL02C1R6BO2GNN□ |
| | | 1.7pF | ±0.1pF | CL02C1R7BO2GNN□ |
| | | 1.8pF | ±0.1pF | CL02C1R8BO2GNN□ |
| | | 1.9pF | ±0.1pF | CL02C1R9BO2GNN□ |
| | | 2.0pF | ±0.1pF | CL02C020BO2GNN□ |
| | | 2.1pF | ±0.1pF | CL02C2R1BO2GNN□ |
| | | 2.2pF | ±0.1pF | CL02C2R2BO2GNN□ |
| | | 2.3pF | ±0.1pF | CL02C2R3BO2GNN□ |
| | | 2.4pF | ±0.1pF | CL02C2R4BO2GNN□ |
| | | 2.5pF | ±0.1pF | CL02C2R5BO2GNN□ |
| | | 2.6pF | ±0.1pF | CL02C2R6BO2GNN□ |
| | | 2.7pF | ±0.1pF | CL02C2R7BO2GNN□ |
| | | 2.8pF | ±0.1pF | CL02C2R8BO2GNN□ |
| | | 2.9pF | ±0.1pF | CL02C2R9BO2GNN□ |
| | | 3.0pF | ±0.1pF | CL02C030BO2GNN□ |
| | | 3.1pF | ±0.1pF | CL02C3R1BO2GNN□ |
| | | 3.2pF | ±0.1pF | CL02C3R2BO2GNN□ |
| | | 3.3pF | ±0.1pF | CL02C3R3BO2GNN□ |
| | | 3.3pF | ±0.25pF | CL02C3R3CO2GNN□ |
| | | 3.4pF | ±0.1pF | CL02C3R4BO2GNN□ |
| | | 3.5pF | ±0.1pF | CL02C3R5BO2GNN□ |
| | | 3.5pF | ±0.25pF | CL02C3R5CO2GNN□ |
| | | 3.6pF | ±0.1pF | CL02C3R6BO2GNN□ |
| | | 3.7pF | ±0.1pF | CL02C3R7BO2GNN□ |
| | | 3.7pF | ±0.25pF | CL02C3R7CO2GNN□ |
| | | 3.8pF | ±0.1pF | CL02C3R8BO2GNN□ |
| | | 3.9pF | ±0.1pF | CL02C3R9BO2GNN□ |
| | | 4.0pF | ±0.1pF | CL02C040BO2GNN□ |
| | | 4.1pF | ±0.1pF | CL02C4R1BO2GNN□ |
| | | 4.2pF | ±0.1pF | CL02C4R2BO2GNN□ |
| | | 4.3pF | ±0.1pF | CL02C4R3BO2GNN□ |
| | | 4.4pF | ±0.1pF | CL02C4R4BO2GNN□ |
| | | 4.5pF | ±0.1pF | CL02C4R5BO2GNN□ |
| | | 4.6pF | ±0.1pF | CL02C4R6BO2GNN□ |
| | | 4.7pF | ±0.1pF | CL02C4R7BO2GNN□ |
| | | 4.8pF | ±0.1pF | CL02C4R8BO2GNN□ |
| | | 4.9pF | ±0.1pF | CL02C4R9BO2GNN□ |
| | | 5.0pF | ±0.1pF | CL02C050BO2GNN□ |
| | | 5.0pF | ±0.25pF | CL02C050CO2GNN□ |
| | | 5.1pF | ±0.1pF | CL02C5R1BO2GNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.22mm | 16Vdc | 5.1pF | ±0.25pF | CL02C5R1CO2GNN□ |
| | | 5.2pF | ±0.1pF | CL02C5R2BO2GNN□ |
| | | 5.3pF | ±0.1pF | CL02C5R3BO2GNN□ |
| | | 5.4pF | ±0.1pF | CL02C5R4BO2GNN□ |
| | | 5.5pF | ±0.1pF | CL02C5R5BO2GNN□ |
| | | 5.6pF | ±0.1pF | CL02C5R6BO2GNN□ |
| | | 5.6pF | ±0.25pF | CL02C5R6CO2GNN□ |
| | | 5.7pF | ±0.1pF | CL02C5R7BO2GNN□ |
| | | 5.7pF | ±0.25pF | CL02C5R7CO2GNN□ |
| | | 5.8pF | ±0.1pF | CL02C5R8BO2GNN□ |
| | | 5.9pF | ±0.1pF | CL02C5R9BO2GNN□ |
| | | 6.0pF | ±0.1pF | CL02C060BO2GNN□ |
| | | 6.1pF | ±0.1pF | CL02C6R1BO2GNN□ |
| | | 6.2pF | ±0.1pF | CL02C6R2BO2GNN□ |
| | | 6.3pF | ±0.1pF | CL02C6R3BO2GNN□ |
| | | 6.4pF | ±0.1pF | CL02C6R4BO2GNN□ |
| | | 6.5pF | ±0.1pF | CL02C6R5BO2GNN□ |
| | | 6.6pF | ±0.1pF | CL02C6R6BO2GNN□ |
| | | 6.7pF | ±0.1pF | CL02C6R7BO2GNN□ |
| | | 6.8pF | ±0.1pF | CL02C6R8BO2GNN□ |
| | | 6.9pF | ±0.1pF | CL02C6R9BO2GNN□ |
| | | 7.0pF | ±0.1pF | CL02C070BO2GNN□ |
| | | 7.1pF | ±0.1pF | CL02C7R1BO2GNN□ |
| | | 7.2pF | ±0.1pF | CL02C7R2BO2GNN□ |
| | | 7.3pF | ±0.1pF | CL02C7R3BO2GNN□ |
| | | 7.4pF | ±0.1pF | CL02C7R4BO2GNN□ |
| | | 7.5pF | ±0.1pF | CL02C7R5BO2GNN□ |
| | | 7.6pF | ±0.1pF | CL02C7R6BO2GNN□ |
| | | 7.7pF | ±0.1pF | CL02C7R7BO2GNN□ |
| | | 7.8pF | ±0.1pF | CL02C7R8BO2GNN□ |
| | | 7.9pF | ±0.1pF | CL02C7R9BO2GNN□ |
| | | 8.0pF | ±0.1pF | CL02C080BO2GNN□ |
| | | 8.0pF | ±0.25pF | CL02C080CO2GNN□ |
| | | 8.1pF | ±0.1pF | CL02C8R1BO2GNN□ |
| | | 8.2pF | ±0.1pF | CL02C8R2BO2GNN□ |
| | | 8.2pF | ±0.25pF | CL02C8R2CO2GNN□ |
| | | 8.3pF | ±0.1pF | CL02C8R3BO2GNN□ |
| | | 8.4pF | ±0.1pF | CL02C8R4BO2GNN□ |
| | | 8.4pF | ±0.25pF | CL02C8R4CO2GNN□ |
| | | 8.5pF | ±0.1pF | CL02C8R5BO2GNN□ |
| | | 8.6pF | ±0.1pF | CL02C8R6BO2GNN□ |
| | | 8.7pF | ±0.1pF | CL02C8R7BO2GNN□ |
| | | 8.8pF | ±0.1pF | CL02C8R8BO2GNN□ |
| | | 8.9pF | ±0.1pF | CL02C8R9BO2GNN□ |
| | | 9.0pF | ±0.1pF | CL02C090BO2GNN□ |
| | | 9.1pF | ±0.1pF | CL02C9R1BO2GNN□ |
| | | 9.2pF | ±0.1pF | CL02C9R2BO2GNN□ |
| | | 9.3pF | ±0.1pF | CL02C9R3BO2GNN□ |
| | | 9.4pF | ±0.1pF | CL02C9R4BO2GNN□ |
| | | 9.5pF | ±0.1pF | CL02C9R5BO2GNN□ |
| | | 9.5pF | ±0.25pF | CL02C9R5CO2GNN□ |
| | | 9.6pF | ±0.1pF | CL02C9R6BO2GNN□ |
| | | 9.7pF | ±0.1pF | CL02C9R7BO2GNN□ |
| | | 9.8pF | ±0.1pF | CL02C9R8BO2GNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Super Small Size Capacitors

## Product Line Up (C0G)

■ Size : 0.40 X 0.20mm (inch : 01005)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.22mm | 16Vdc | 9.9pF | ±0.1pF | CL02C9R9BO2GNN□ |
| | | 10pF | ±5% | CL02C100JO2GNN□ |
| | | 18pF | ±2% | CL02C180GO2GNN□ |
| | | 22pF | ±2% | CL02C220GO2GNN□ |

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 16Vdc | 33pF | ±5% | CL03C330JO3GNN□ |
| | | 33pF | ±5% | CL03C330JO3NNN□ |
| | 25Vdc | 0.2pF | ±0.1pF | CL03C0R2BA3GNN□ |
| | | 0.2pF | ±0.25pF | CL03C0R2CA3GNN□ |
| | | 0.2pF | ±0.03pF | CL03C0R2NA3GNN□ |
| | | 0.3pF | ±0.1pF | CL03C0R3BA3GNN□ |
| | | 0.3pF | ±0.25pF | CL03C0R3CA3GNN□ |
| | | 0.3pF | ±0.03pF | CL03C0R3NA3GNN□ |
| | | 0.4pF | ±0.1pF | CL03C0R4BA3GNN□ |
| | | 0.4pF | ±0.25pF | CL03C0R4CA3GNN□ |
| | | 0.4pF | ±0.03pF | CL03C0R4NA3GNN□ |
| | | 0.5pF | ±0.1pF | CL03C0R5BA3GNN□ |
| | | 0.5pF | ±0.25pF | CL03C0R5CA3GNN□ |
| | | 0.5pF | ±0.03pF | CL03C0R5NA3GNN□ |
| | | 0.6pF | ±0.1pF | CL03C0R6BA3GNN□ |
| | | 0.6pF | ±0.25pF | CL03C0R6CA3GNN□ |
| | | 0.6pF | ±0.03pF | CL03C0R6NA3GNN□ |
| | | 0.7pF | ±0.1pF | CL03C0R7BA3GNN□ |
| | | 0.7pF | ±0.03pF | CL03C0R7NA3GNN□ |
| | | 0.75pF | ±0.1pF | CL03CR75BA3GNN□ |
| | | 0.8pF | ±0.1pF | CL03C0R8BA3GNN□ |
| | | 0.8pF | ±0.25pF | CL03C0R8CA3GNN□ |
| | | 0.8pF | ±0.03pF | CL03C0R8NA3GNN□ |
| | | 0.9pF | ±0.1pF | CL03C0R9BA3GNN□ |
| | | 0.9pF | ±0.25pF | CL03C0R9CA3GNN□ |
| | | 0.9pF | ±0.03pF | CL03C0R9NA3GNN□ |
| | | 1.0pF | ±0.1pF | CL03C010BA3GNN□ |
| | | 1.0pF | ±0.25pF | CL03C010CA3GNN□ |
| | | 1.0pF | ±0.03pF | CL03C010NA3GNN□ |
| | | 1.1pF | ±0.1pF | CL03C1R1BA3GNN□ |
| | | 1.1pF | ±0.03pF | CL03C1R1NA3GNN□ |
| | | 1.2pF | ±0.1pF | CL03C1R2BA3GNN□ |
| | | 1.2pF | ±0.25pF | CL03C1R2CA3GNN□ |
| | | 1.2pF | ±0.03pF | CL03C1R2NA3GNN□ |
| | | 1.3pF | ±0.1pF | CL03C1R3BA3GNN□ |
| | | 1.3pF | ±0.25pF | CL03C1R3CA3GNN□ |
| | | 1.3pF | ±0.03pF | CL03C1R3NA3GNN□ |
| | | 1.4pF | ±0.03pF | CL03C1R4NA3GNN□ |
| | | 1.5pF | ±0.1pF | CL03C1R5BA3GNN□ |
| | | 1.5pF | ±0.25pF | CL03C1R5CA3GNN□ |
| | | 1.5pF | ±0.03pF | CL03C1R5NA3GNN□ |
| | | 1.6pF | ±0.05pF | CL03C1R6AA3GNN□ |
| | | 1.6pF | ±0.1pF | CL03C1R6BA3GNN□ |
| | | 1.6pF | ±0.25pF | CL03C1R6CA3GNN□ |
| | | 1.7pF | ±0.05pF | CL03C1R7AA3GNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 1.7pF | ±0.1pF | CL03C1R7BA3GNN□ |
| | | 1.7pF | ±0.25pF | CL03C1R7CA3GNN□ |
| | | 1.8pF | ±0.05pF | CL03C1R8AA3GNN□ |
| | | 1.8pF | ±0.1pF | CL03C1R8BA3GNN□ |
| | | 1.8pF | ±0.25pF | CL03C1R8CA3GNN□ |
| | | 1.9pF | ±0.05pF | CL03C1R9AA3GNN□ |
| | | 1.9pF | ±0.1pF | CL03C1R9BA3GNN□ |
| | | 1.9pF | ±0.25pF | CL03C1R9CA3GNN□ |
| | | 2.0pF | ±0.05pF | CL03C020AA3GNN□ |
| | | 2.0pF | ±0.1pF | CL03C020BA3GNN□ |
| | | 2.0pF | ±0.25pF | CL03C020CA3GNN□ |
| | | 2.0pF | ±0.1pF | CL03C2R0BA3GNN□ |
| | | 2.1pF | ±0.05pF | CL03C2R1AA3GNN□ |
| | | 2.1pF | ±0.1pF | CL03C2R1BA3GNN□ |
| | | 2.2pF | ±0.05pF | CL03C2R2AA3GNN□ |
| | | 2.2pF | ±0.1pF | CL03C2R2BA3GNN□ |
| | | 2.2pF | ±0.25pF | CL03C2R2CA3GNN□ |
| | | 2.3pF | ±0.05pF | CL03C2R3AA3GNN□ |
| | | 2.3pF | ±0.1pF | CL03C2R3BA3GNN□ |
| | | 2.4pF | ±0.05pF | CL03C2R4AA3GNN□ |
| | | 2.4pF | ±0.1pF | CL03C2R4BA3GNN□ |
| | | 2.4pF | ±0.25pF | CL03C2R4CA3GNN□ |
| | | 2.5pF | ±0.05pF | CL03C2R5AA3GNN□ |
| | | 2.5pF | ±0.1pF | CL03C2R5BA3GNN□ |
| | | 2.6pF | ±0.05pF | CL03C2R6AA3GNN□ |
| | | 2.6pF | ±0.1pF | CL03C2R6BA3GNN□ |
| | | 2.7pF | ±0.05pF | CL03C2R7AA3GNN□ |
| | | 2.7pF | ±0.1pF | CL03C2R7BA3GNN□ |
| | | 2.7pF | ±0.25pF | CL03C2R7CA3GNN□ |
| | | 2.8pF | ±0.05pF | CL03C2R8AA3GNN□ |
| | | 2.8pF | ±0.1pF | CL03C2R8BA3GNN□ |
| | | 2.9pF | ±0.05pF | CL03C2R9AA3GNN□ |
| | | 2.9pF | ±0.1pF | CL03C2R9BA3GNN□ |
| | | 3.0pF | ±0.05pF | CL03C030AA3GNN□ |
| | | 3.0pF | ±0.1pF | CL03C030BA3GNN□ |
| | | 3.0pF | ±0.25pF | CL03C030CA3GNN□ |
| | | 3.1pF | ±0.05pF | CL03C3R1AA3GNN□ |
| | | 3.1pF | ±0.1pF | CL03C3R1BA3GNN□ |
| | | 3.2pF | ±0.05pF | CL03C3R2AA3GNN□ |
| | | 3.2pF | ±0.1pF | CL03C3R2BA3GNN□ |
| | | 3.2pF | ±0.25pF | CL03C3R2CA3GNN□ |
| | | 3.3pF | ±0.05pF | CL03C3R3AA3GNN□ |
| | | 3.3pF | ±0.1pF | CL03C3R3BA3GNN□ |
| | | 3.3pF | ±0.25pF | CL03C3R3CA3GNN□ |
| | | 3.4pF | ±0.05pF | CL03C3R4AA3GNN□ |
| | | 3.4pF | ±0.1pF | CL03C3R4BA3GNN□ |
| | | 3.4pF | ±0.25pF | CL03C3R4CA3GNN□ |
| | | 3.5pF | ±0.05pF | CL03C3R5AA3GNN□ |
| | | 3.6pF | ±0.05pF | CL03C3R6AA3GNN□ |
| | | 3.6pF | ±0.1pF | CL03C3R6BA3GNN□ |
| | | 3.6pF | ±0.25pF | CL03C3R6CA3GNN□ |
| | | 3.7pF | ±0.05pF | CL03C3R7AA3GNN□ |
| | | 3.8pF | ±0.05pF | CL03C3R8AA3GNN□ |
| | | 3.8pF | ±0.1pF | CL03C3R8BA3GNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 3.8pF | ±0.25pF | CL03C3R8CA3GNN□ |
| | | 3.9pF | ±0.05pF | CL03C3R9AA3GNN□ |
| | | 3.9pF | ±0.1pF | CL03C3R9BA3GNN□ |
| | | 3.9pF | ±0.25pF | CL03C3R9CA3GNN□ |
| | | 4.0pF | ±0.05pF | CL03C040AA3GNN□ |
| | | 4.0pF | ±0.1pF | CL03C040BA3GNN□ |
| | | 4.0pF | ±0.25pF | CL03C040CA3GNN□ |
| | | 4.1pF | ±0.05pF | CL03C4R1AA3GNN□ |
| | | 4.2pF | ±0.05pF | CL03C4R2AA3GNN□ |
| | | 4.3pF | ±0.05pF | CL03C4R3AA3GNN□ |
| | | 4.3pF | ±0.1pF | CL03C4R3BA3GNN□ |
| | | 4.3pF | ±0.25pF | CL03C4R3CA3GNN□ |
| | | 4.4pF | ±0.05pF | CL03C4R4AA3GNN□ |
| | | 4.5pF | ±0.05pF | CL03C4R5AA3GNN□ |
| | | 4.6pF | ±0.05pF | CL03C4R6AA3GNN□ |
| | | 4.7pF | ±0.05pF | CL03C4R7AA3GNN□ |
| | | 4.7pF | ±0.1pF | CL03C4R7BA3GNN□ |
| | | 4.7pF | ±0.25pF | CL03C4R7CA3GNN□ |
| | | 4.8pF | ±0.05pF | CL03C4R8AA3GNN□ |
| | | 4.9pF | ±0.05pF | CL03C4R9AA3GNN□ |
| | | 5.0pF | ±0.05pF | CL03C050AA3GNN□ |
| | | 5.0pF | ±0.1pF | CL03C050BA3GNN□ |
| | | 5.0pF | ±0.25pF | CL03C050CA3GNN□ |
| | | 5.1pF | ±0.05pF | CL03C5R1AA3GNN□ |
| | | 5.1pF | ±0.1pF | CL03C5R1BA3GNN□ |
| | | 5.1pF | ±0.25pF | CL03C5R1CA3GNN□ |
| | | 5.1pF | ±0.25pF | CL03C5R1CA3NNN□ |
| | | 5.2pF | ±0.05pF | CL03C5R2AA3GNN□ |
| | | 5.3pF | ±0.05pF | CL03C5R3AA3GNN□ |
| | | 5.4pF | ±0.05pF | CL03C5R4AA3GNN□ |
| | | 5.5pF | ±0.05pF | CL03C5R5AA3GNN□ |
| | | 5.6pF | ±0.05pF | CL03C5R6AA3GNN□ |
| | | 5.6pF | ±0.1pF | CL03C5R6BA3GNN□ |
| | | 5.6pF | ±0.25pF | CL03C5R6CA3GNN□ |
| | | 5.7pF | ±0.05pF | CL03C5R7AA3GNN□ |
| | | 5.8pF | ±0.05pF | CL03C5R8AA3GNN□ |
| | | 5.9pF | ±0.05pF | CL03C5R9AA3GNN□ |
| | | 6.0pF | ±0.05pF | CL03C060AA3GNN□ |
| | | 6.0pF | ±0.1pF | CL03C060BA3GNN□ |
| | | 6.0pF | ±0.25pF | CL03C060CA3GNN□ |
| | | 6.0pF | ±0.5pF | CL03C060DA3GNN□ |
| | | 6.1pF | ±0.05pF | CL03C6R1AA3GNN□ |
| | | 6.2pF | ±0.05pF | CL03C6R2AA3GNN□ |
| | | 6.2pF | ±0.1pF | CL03C6R2BA3GNN□ |
| | | 6.2pF | ±0.25pF | CL03C6R2CA3GNN□ |
| | | 6.3pF | ±0.05pF | CL03C6R3AA3GNN□ |
| | | 6.4pF | ±0.05pF | CL03C6R4AA3GNN□ |
| | | 6.4pF | ±0.25pF | CL03C6R4CA3GNN□ |
| | | 6.5pF | ±0.05pF | CL03C6R5AA3GNN□ |
| | | 6.6pF | ±0.05pF | CL03C6R6AA3GNN□ |
| | | 6.7pF | ±0.05pF | CL03C6R7AA3GNN□ |
| | | 6.8pF | ±0.05pF | CL03C6R8AA3GNN□ |
| | | 6.8pF | ±0.1pF | CL03C6R8BA3GNN□ |
| | | 6.8pF | ±0.1pF | CL03C6R8BA3NNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 6.8pF | ±0.25pF | CL03C6R8CA3GNN□ |
| | | 6.9pF | ±0.05pF | CL03C6R9AA3GNN□ |
| | | 7.0pF | ±0.05pF | CL03C070AA3GNN□ |
| | | 7.0pF | ±0.1pF | CL03C070BA3GNN□ |
| | | 7.0pF | ±0.25pF | CL03C070CA3GNN□ |
| | | 7.1pF | ±0.05pF | CL03C7R1AA3GNN□ |
| | | 7.2pF | ±0.05pF | CL03C7R2AA3GNN□ |
| | | 7.2pF | ±0.1pF | CL03C7R2BA3GNN□ |
| | | 7.3pF | ±0.05pF | CL03C7R3AA3GNN□ |
| | | 7.4pF | ±0.05pF | CL03C7R4AA3GNN□ |
| | | 7.5pF | ±0.05pF | CL03C7R5AA3GNN□ |
| | | 7.5pF | ±0.1pF | CL03C7R5BA3GNN□ |
| | | 7.5pF | ±0.25pF | CL03C7R5CA3GNN□ |
| | | 7.6pF | ±0.05pF | CL03C7R6AA3GNN□ |
| | | 7.7pF | ±0.05pF | CL03C7R7AA3GNN□ |
| | | 7.8pF | ±0.05pF | CL03C7R8AA3GNN□ |
| | | 7.9pF | ±0.05pF | CL03C7R9AA3GNN□ |
| | | 8.0pF | ±0.05pF | CL03C080AA3GNN□ |
| | | 8.0pF | ±0.25pF | CL03C080CA3GNN□ |
| | | 8.0pF | ±0.5pF | CL03C080DA3GNN□ |
| | | 8.1pF | ±0.05pF | CL03C8R1AA3GNN□ |
| | | 8.2pF | ±0.05pF | CL03C8R2AA3GNN□ |
| | | 8.2pF | ±0.1pF | CL03C8R2BA3GNN□ |
| | | 8.2pF | ±0.25pF | CL03C8R2CA3GNN□ |
| | | 8.2pF | ±0.5pF | CL03C8R2DA3GNN□ |
| | | 8.3pF | ±0.05pF | CL03C8R3AA3GNN□ |
| | | 8.4pF | ±0.05pF | CL03C8R4AA3GNN□ |
| | | 8.5pF | ±0.05pF | CL03C8R5AA3GNN□ |
| | | 8.5pF | ±0.25pF | CL03C8R5CA3GNN□ |
| | | 8.6pF | ±0.05pF | CL03C8R6AA3GNN□ |
| | | 8.7pF | ±0.05pF | CL03C8R7AA3GNN□ |
| | | 8.8pF | ±0.05pF | CL03C8R8AA3GNN□ |
| | | 8.9pF | ±0.05pF | CL03C8R9AA3GNN□ |
| | | 9.0pF | ±0.05pF | CL03C090AA3GNN□ |
| | | 9.0pF | ±0.1pF | CL03C090BA3GNN□ |
| | | 9.0pF | ±0.25pF | CL03C090CA3GNN□ |
| | | 9.0pF | ±0.5pF | CL03C090DA3GNN□ |
| | | 9.1pF | ±0.05pF | CL03C9R1AA3GNN□ |
| | | 9.1pF | ±0.1pF | CL03C9R1BA3GNN□ |
| | | 9.1pF | ±0.25pF | CL03C9R1CA3GNN□ |
| | | 9.1pF | ±0.5pF | CL03C9R1DA3GNN□ |
| | | 9.2pF | ±0.05pF | CL03C9R2AA3GNN□ |
| | | 9.3pF | ±0.05pF | CL03C9R3AA3GNN□ |
| | | 9.4pF | ±0.05pF | CL03C9R4AA3GNN□ |
| | | 9.5pF | ±0.05pF | CL03C9R5AA3GNN□ |
| | | 9.6pF | ±0.05pF | CL03C9R6AA3GNN□ |
| | | 9.7pF | ±0.05pF | CL03C9R7AA3GNN□ |
| | | 9.8pF | ±0.05pF | CL03C9R8AA3GNN□ |
| | | 9.9pF | ±0.05pF | CL03C9R9AA3GNN□ |
| | | 10pF | ±0.05pF | CL03C100AA3GNN□ |
| | | 10pF | ±0.25pF | CL03C100CA3GNN□ |
| | | 10pF | ±0.5pF | CL03C100DA3GNN□ |
| | | 10pF | ±2% | CL03C100GA3GNN□ |
| | | 10pF | ±5% | CL03C100JA3GNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Super Small Size Capacitors

## Product Line Up (C0G)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 11pF | ±2% | CL03C110GA3GNN□ |
| | | 11pF | ±5% | CL03C110JA3GNN□ |
| | | 12pF | ±2% | CL03C120GA3GNN□ |
| | | 12pF | ±5% | CL03C120JA3GNN□ |
| | | 12pF | ±5% | CL03C120JA3NNN□ |
| | | 13pF | ±2% | CL03C130GA3GNN□ |
| | | 13pF | ±5% | CL03C130JA3GNN□ |
| | | 15pF | ±2% | CL03C150GA3GNN□ |
| | | 15pF | ±5% | CL03C150JA3GNN□ |
| | | 15pF | ±5% | CL03C150JA3NNN□ |
| | | 16pF | ±2% | CL03C160GA3GNN□ |
| | | 16pF | ±5% | CL03C160JA3GNN□ |
| | | 16pF | +5% | CL03C160UA3GNN□ |
| | | 18pF | ±2% | CL03C180GA3GNN□ |
| | | 18pF | ±5% | CL03C180JA3GNN□ |
| | | 18pF | ±5% | CL03C180JA3NNN□ |
| | | 20pF | ±2% | CL03C200GA3GNN□ |
| | | 20pF | ±5% | CL03C200JA3GNN□ |
| | | 22pF | ±2% | CL03C220GA3GNN□ |
| | | 22pF | ±5% | CL03C220JA3GNN□ |
| | | 22pF | ±5% | CL03C220JA3NNN□ |
| | | 24pF | ±5% | CL03C240JA3GNN□ |
| | | 27pF | ±5% | CL03C270JA3GNN□ |
| | | 27pF | ±5% | CL03C270JA3NNN□ |
| | | 30pF | ±5% | CL03C300JA3GNN□ |
| | | 33pF | ±5% | CL03C330JA3GNN□ |
| | | 33pF | ±5% | CL03C330JA3NNN□ |
| | | 39pF | ±5% | CL03C390JA3NNN□ |
| | | 47pF | ±5% | CL03C470JA3NNN□ |
| | | 56pF | ±5% | CL03C560JA3NNN□ |
| | | 68pF | ±5% | CL03C680JA3NNN□ |
| | | 82pF | ±5% | CL03C820JA3NNN□ |
| | | 100pF | ±5% | CL03C101JA3NNN□ |
| | 50Vdc | 0.5pF | ±0.25pF | CL03C0R5CB3GNN□ |
| | | 0.75pF | ±0.1pF | CL03CR75BB3GNN□ |
| | | 0.8pF | ±0.25pF | CL03C0R8CB3GNN□ |
| | | 1.0pF | ±0.1pF | CL03C010BB3GNN□ |
| | | 1.2pF | ±0.1pF | CL03C1R2BB3GNN□ |
| | | 1.2pF | ±0.25pF | CL03C1R2CB3GNN□ |
| | | 1.5pF | ±0.1pF | CL03C1R5BB3GNN□ |
| | | 1.5pF | ±0.25pF | CL03C1R5CB3GNN□ |
| | | 1.8pF | ±0.1pF | CL03C1R8BB3GNN□ |
| | | 2.0pF | ±0.1pF | CL03C020BB3GNN□ |
| | | 2.0pF | ±0.25pF | CL03C020CB3GNN□ |
| | | 2.2pF | ±0.05pF | CL03C2R2AB3GNN□ |
| | | 2.7pF | ±0.1pF | CL03C2R7BB3GNN□ |
| | | 3.0pF | ±0.1pF | CL03C030BB3GNN□ |
| | | 3.0pF | ±0.25pF | CL03C030CB3GNN□ |
| | | 3.3pF | ±0.1pF | CL03C3R3BB3GNN□ |
| | | 4.0pF | ±0.1pF | CL03C040BB3GNN□ |
| | | 4.7pF | ±0.1pF | CL03C4R7BB3GNN□ |
| | | 5.0pF | ±0.1pF | CL03C050BB3GNN□ |
| | | 5.6pF | ±0.1pF | CL03C5R6BB3GNN□ |
| | | 6.0pF | ±0.1pF | CL03C060BB3GNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 50Vdc | 6.0pF | ±0.5pF | CL03C060DB3GNN□ |
| | | 6.2pF | ±0.1pF | CL03C6R2BB3GNN□ |
| | | 6.5pF | ±0.1pF | CL03C6R5BB3GNN□ |
| | | 7.0pF | ±0.1pF | CL03C070BB3GNN□ |
| | | 7.0pF | ±0.5pF | CL03C070DB3GNN□ |
| | | 7.5pF | ±0.1pF | CL03C7R5BB3GNN□ |
| | | 8.0pF | ±0.1pF | CL03C080BB3GNN□ |
| | | 8.0pF | ±0.5pF | CL03C080DB3GNN□ |
| | | 8.2pF | ±0.1pF | CL03C8R2BB3GNN□ |
| | | 8.2pF | ±0.5pF | CL03C8R2DB3GNN□ |
| | | 10pF | ±5% | CL03C100JB3GNN□ |
| | | 10pF | ±5% | CL03C100JB3NNN□ |
| | | 12pF | ±5% | CL03C120JB3NNN□ |
| | | 15pF | ±5% | CL03C150JB3NNN□ |
| | | 33pF | ±5% | CL03C330JB3NNN□ |
| | | 100pF | ±5% | CL03C101JB3NNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (X5R)

### ■ Size : 0.40 X 0.20mm (inch : 01005)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.22mm | 4.0Vdc | 15nF | ±10% | CL02A153KR2NNN□ | |
| | | 33nF | ±10% | CL02A333KR2NNN□ | |
| | | 47nF | ±10% | CL02A473KR2NNN□ | |
| | | 100nF | ±10% | CL02A104KR2NNN□ | Derating |
| | | 100nF | ±20% | CL02A104MR2NNN□ | Derating |
| | 6.3Vdc | 680pF | ±10% | CL02A681KQ2NNN□ | |
| | | 820pF | ±10% | CL02A821KQ2NNN□ | |
| | | 1.0nF | ±10% | CL02A102KQ2NNN□ | |
| | | 1.2nF | ±10% | CL02A122KQ2NNN□ | |
| | | 1.8nF | ±10% | CL02A182KQ2NNN□ | |
| | | 2.2nF | ±10% | CL02A222KQ2NNN□ | |
| | | 2.7nF | ±10% | CL02A272KQ2NNN□ | |
| | | 3.9nF | ±10% | CL02A392KQ2NNN□ | |
| | | 5.6nF | ±10% | CL02A562KQ2NNN□ | |
| | | 10nF | ±10% | CL02A103KQ2NNN□ | |
| | | 15nF | ±10% | CL02A153KQ2NNN□ | Derating |
| | | 33nF | ±10% | CL02A333KQ2NNN□ | Derating |
| | | 47nF | ±10% | CL02A473KQ2NNN□ | Derating |
| | | 68nF | ±10% | CL02A683KQ2NNN□ | Derating |
| | | 100nF | ±10% | CL02A104KQ2NNN□ | Derating |
| | | 100nF | ±20% | CL02A104MQ2NNN□ | Derating |
| | 10Vdc | 470pF | ±10% | CL02A471KP2NNN□ | |
| | | 820pF | ±10% | CL02A821KP2NNN□ | |
| | | 1.0nF | ±10% | CL02A102KP2NNN□ | |
| | | 2.2nF | ±10% | CL02A222KP2NNN□ | |
| | | 5.6nF | ±10% | CL02A562KP2NNN□ | |
| | | 10nF | ±10% | CL02A103KP2NNN□ | |

### ■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 4.0Vdc | 100nF | ±10% | CL03A104KR3NNN□ | |
| | | 470nF | ±10% | CL03A474KR3NNN□ | Ref. |
| | | 470nF | ±20% | CL03A474MR3NNN□ | Ref. |
| | 6.3Vdc | 330pF | ±10% | CL03A331KQ3NNN□ | |
| | | 10nF | ±10% | CL03A103KQ3NNN□ | |
| | | 12nF | ±10% | CL03A123KQ3NNN□ | |
| | | 15nF | ±10% | CL03A153KQ3NNN□ | |
| | | 22nF | ±5% | CL03A223JQ3NNN□ | |
| | | 22nF | ±10% | CL03A223KQ3NNN□ | |
| | | 33nF | ±10% | CL03A333KQ3NNN□ | |
| | | 47nF | ±10% | CL03A473KQ3NNN□ | |
| | | 82nF | ±10% | CL03A823KQ3NNN□ | |
| | | 100nF | ±5% | CL03A104JQ3NNN□ | Derating |
| | | 100nF | ±10% | CL03A104KQ3NNN□ | Derating |
| | | 100nF | ±20% | CL03A104MQ3NNN□ | Derating |
| | | 220nF | ±10% | CL03A224KQ3NNN□ | Derating Ref. |
| | | 220nF | ±20% | CL03A224MQ3NNN□ | Derating Ref. |
| | | 470nF | ±5% | CL03A474JQ3NNN□ | Derating Ref. |
| | | 470nF | ±10% | CL03A474KQ3NNN□ | Derating Ref. |
| | | 470nF | ±20% | CL03A474MQ3NNN□ | Derating Ref. |
| | | 1.5uF | ±20% | CL03A155MQ3NNN□ | Derating Ref. |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 6.3Vdc | 1.0uF | ±10% | CL03A105KQ3CNN□ | Derating Ref. |
| | | 1.0uF | ±10% | CL03A105MQ3CNN□ | Derating Ref. |
| | 10Vdc | 330pF | ±20% | CL03A331KP3NNN□ | |
| | | 1.5nF | ±10% | CL03A152KP3NNN□ | |
| | | 2.2nF | ±20% | CL03A222KP3NNN□ | |
| | | 3.3nF | ±5% | CL03A332KP3NNN□ | |
| | | 4.7nF | ±10% | CL03A472KP3NNN□ | |
| | | 8.2nF | ±20% | CL03A822KP3NNN□ | |
| | | 10nF | ±10% | CL03A103KP3NNN□ | |
| | | 15nF | ±10% | CL03A153KP3NNN□ | |
| | | 22nF | ±10% | CL03A223KP3NNN□ | Derating |
| | | 33nF | ±10% | CL03A333KP3NNN□ | Derating |
| | | 47nF | ±20% | CL03A473KP3NNN□ | Derating |
| | | 100nF | ±5% | CL03A104KP3NNN□ | Derating |
| | | 100nF | ±10% | CL03A104MP3NNN□ | Derating |
| | | 220nF | ±10% | CL03A224KP3NNN□ | Derating Ref. |
| | | 220nF | ±5% | CL03A224MP3NNN□ | Derating Ref. |
| | | 470nF | ±10% | CL03A474KP3NNN□ | Derating Ref. |
| | | 470nF | ±20% | CL03A474MP3NNN□ | Derating Ref. |
| | 16Vdc | 220pF | ±10% | CL03A221KO3NNN□ | Derating |
| | | 330pF | ±10% | CL03A331KO3NNN□ | Derating |
| | | 470pF | ±10% | CL03A471KO3NNN□ | Derating |
| | | 10nF | ±10% | CL03A103KO3NNN□ | Derating |
| | | 22nF | ±10% | CL03A223KO3NNN□ | Derating |
| | | 47nF | ±20% | CL03A473KO3NNN□ | Derating |
| | | 100nF | ±10% | CL03A104KO3NNN□ | Derating |
| | | 100nF | ±10% | CL03A104MO3NNN□ | Derating |
| | 25Vdc | 1.0nF | ±10% | CL03A102KA3NNN□ | Derating |
| | | 4.7nF | ±10% | CL03A472KA3NNN□ | Derating |
| | | 10nF | ±20% | CL03A103KA3NNN□ | Derating |
| | | 22nF | ±10% | CL03A223KA3NNN□ | Derating |
| | | 100nF | ±10% | CL03A104KA3NNN□ | Derating |
| | | 100nF | ±10% | CL03A104MA3NNN□ | Derating |
| 0.35mm | 4.0Vdc | 1.0uF | ±20% | CL03A105MR3CSN□ | Derating Ref. |
| | 6.3Vdc | 1.0uF | ±10% | CL03A105KQ3CSN□ | Derating Ref. |
| | | 1.0uF | ±20% | CL03A105MQ3NSN□ | Derating Ref. |
| | | 2.2uF | ±20% | CL03A225MQ3CSN□ | Derating Ref. |
| | 10Vdc | 1.0uF | ±20% | CL03A105MP3NSN□ | Derating Ref. |
| 0.39mm | 6.3Vdc | 2.2uF | ±20% | CL03A225MQ3CRN□ | Derating Ref. |
| | | 2.2uF | ±20% | CL03A225MQ3CR6□ | Derating Ref. |
| | 10Vdc | 2.2uF | ±20% | CL03A225MP3CRN□ | Derating Ref. |
| | 16Vdc | 1.0uF | ±20% | CL03A105MO3NRN□ | Derating Ref. |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Super Small Size Capacitors

## Product Line Up (X6S)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 4.0Vdc | 2.2nF | ±20% | CL03X222MR3NNN□ | |
| | | 4.7nF | ±20% | CL03X472MR3NNN□ | |
| | | 6.8nF | ±20% | CL03X682MR3NNN□ | |
| | | 15nF | ±20% | CL03X153MR3NNN□ | |
| | | 22nF | ±20% | CL03X223MR3NNN□ | |
| | | 47nF | ±20% | CL03X473MR3NNN□ | |
| | | 100nF | ±10% | CL03X104KR3NNN□ | Derating |
| | 6.3Vdc | 100nF | ±10% | CL03X104KQ3NNN□ | Derating |
| 0.39mm | 4.0Vdc | 1.0uF | ±20% | CL03X105MR3NRN□ | Derating Ref. |

## Product Line Up (X7R)

■ Size : 0.40 X 0.20mm (inch : 01005)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.22mm | 6.3Vdc | 1.0nF | ±10% | CL02B102KQ2NNN□ | |
| | 10Vdc | 100pF | ±10% | CL02B101KP2NNN□ | |
| | | 120pF | ±10% | CL02B121KP2NNN□ | |
| | | 180pF | ±10% | CL02B181KP2NNN□ | |
| | | 220pF | ±10% | CL02B221KP2NNN□ | |
| | | 330pF | ±10% | CL02B331KP2NNN□ | |
| | | 390pF | ±10% | CL02B391KP2NNN□ | |
| | | 1.0nF | ±10% | CL02B102KP2NNN□ | |

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 6.3Vdc | 2.2nF | ±10% | CL03B222KQ3NNN□ | |
| | | 3.3nF | ±10% | CL03B332KQ3NNN□ | |
| | | 4.7nF | ±10% | CL03B472KQ3NNN□ | |
| | | 6.8nF | ±10% | CL03B682KQ3NNN□ | |
| | | 10nF | ±10% | CL03B103KQ3NNN□ | |
| | 10Vdc | 470pF | ±10% | CL03B471KP3NNN□ | |
| | | 1.5nF | ±10% | CL03B152KP3NNN□ | |
| | | 2.2nF | ±10% | CL03B222KP3NNN□ | |
| | | 3.3nF | ±10% | CL03B332KP3NNN□ | |
| | | 4.7nF | ±10% | CL03B472KP3NNN□ | |
| | | 6.8nF | ±10% | CL03B682KP3NNN□ | |
| | | 10nF | ±10% | CL03B103KP3NNN□ | |
| | | 10nF | ±20% | CL03B103MP3NNN□ | |
| | 16Vdc | 100pF | ±10% | CL03B101KO3NNN□ | |
| | | 120pF | ±10% | CL03B121KO3NNN□ | |
| | | 150pF | ±10% | CL03B151KO3NNN□ | |
| | | 180pF | ±10% | CL03B181KO3NNN□ | |
| | | 220pF | ±10% | CL03B221KO3NNN□ | |
| | | 270pF | ±10% | CL03B271KO3NNN□ | |
| | | 330pF | ±10% | CL03B331KO3NNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 16Vdc | 390pF | ±10% | CL03B391KO3NNN□ | |
| | | 470pF | ±10% | CL03B471KO3NNN□ | |
| | | 560pF | ±10% | CL03B561KO3NNN□ | |
| | | 820pF | ±10% | CL03B821KO3NNN□ | |
| | | 1.0nF | ±10% | CL03B102KO3NNN□ | |
| | | 3.3nF | ±10% | CL03B332KO3NNN□ | |
| | | 10nF | ±10% | CL03B103KO3NNN□ | |
| | 25Vdc | 120pF | ±10% | CL03B121KA3NNN□ | |
| | | 150pF | ±10% | CL03B151KA3NNN□ | |
| | | 180pF | ±10% | CL03B181KA3NNN□ | |
| | | 200pF | ±10% | CL03B201KA3NNN□ | |
| | | 220pF | ±10% | CL03B221KA3NNN□ | |
| | | 270pF | ±10% | CL03B271KA3NNN□ | |
| | | 330pF | ±10% | CL03B331KA3NNN□ | |
| | | 390pF | ±10% | CL03B391KA3NNN□ | |
| | | 470pF | ±10% | CL03B471KA3NNN□ | |
| | | 680pF | ±5% | CL03B681JA3NNN□ | |
| | | 680pF | ±10% | CL03B681KA3NNN□ | |
| | | 1.0nF | ±5% | CL03B102JA3NNN□ | |
| | | 1.0nF | ±10% | CL03B102KA3NNN□ | |
| | 50Vdc | 220pF | ±10% | CL03B221KB3NNN□ | |
| | | 330pF | ±10% | CL03B331KB3NNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# High Q Capacitors

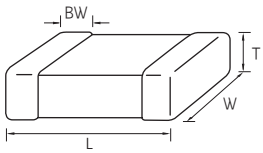
## Feature

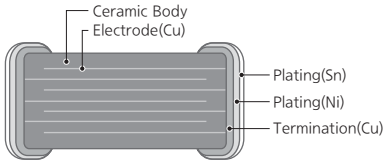
- High Q and low ESR in high frequency range
- Tight tolerance available
- High efficiency and low power consumption in RF circuit

## Application

- Mobile Phone
- Set Top Box
- Wireless Equipment
- GPS, Bluetooth

## Structure and Dimensions




| Size Code | EIA Code | Rated Voltage (Vdc) | Dimension(mm) | | | |
|---|---|---|---|---|---|---|
| | | | L | W | T | BW |
| 02 | 01005 | 16 | 0.40±0.02 | 0.20±0.02 | 0.20±0.02 | 0.10±0.03 |
| 03 | 0201 | 25 / 50 | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 0.15±0.05 |

## High Q Capacitance Table (C0G)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(pF) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 3.0 | 3.2 | 3.4 | 3.6 | 3.8 | 4.0 |
| 01005(0402) | 16 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 0201 (0603) | 25 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | 50 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(pF) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4.2 | 4.4 | 4.6 | 4.8 | 5.0 | 5.2 | 5.4 | 5.6 | 5.8 | 6.0 | 6.2 | 6.4 | 6.6 | 6.8 | 7.0 | 7.2 | 7.4 | 7.6 | 7.8 | 8.0 |
| 01005(0402) | 16 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| 0201 (0603) | 25 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(pF) | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 8.2 | 8.4 | 8.6 | 8.8 | 9.0 | 9.2 | 9.4 | 9.7 | 10 | 11 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 27 | 30 | 33 |
| 01005(0402) | 16 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| 0201 (0603) | 25 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | |

# High Q Capacitors

## Product Line Up (C0G)

■ Size : 0.40 X 0.20mm (inch : 01005)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.22mm | 16Vdc | 0.2pF | ±0.1pF | CL02C0R2BO2GNN□ |
| | | 0.3pF | ±0.1pF | CL02C0R3BO2GNN□ |
| | | 0.4pF | ±0.1pF | CL02C0R4BO2GNN□ |
| | | 0.5pF | ±0.1pF | CL02C0R5BO2GNN□ |
| | | 0.6pF | ±0.1pF | CL02C0R6BO2GNN□ |
| | | 0.7pF | ±0.1pF | CL02C0R7BO2GNN□ |
| | | 0.8pF | ±0.1pF | CL02C0R8BO2GNN□ |
| | | 0.9pF | ±0.1pF | CL02C0R9BO2GNN□ |
| | | 1.0pF | ±0.1pF | CL02C010BO2GNN□ |
| | | 1.1pF | ±0.1pF | CL02C1R1BO2GNN□ |
| | | 1.2pF | ±0.1pF | CL02C1R2BO2GNN□ |
| | | 1.3pF | ±0.1pF | CL02C1R3BO2GNN□ |
| | | 1.4pF | ±0.1pF | CL02C1R4BO2GNN□ |
| | | 1.5pF | ±0.1pF | CL02C1R5BO2GNN□ |
| | | 1.6pF | ±0.1pF | CL02C1R6BO2GNN□ |
| | | 1.7pF | ±0.1pF | CL02C1R7BO2GNN□ |
| | | 1.8pF | ±0.1pF | CL02C1R8BO2GNN□ |
| | | 1.9pF | ±0.1pF | CL02C1R9BO2GNN□ |
| | | 2.0pF | ±0.1pF | CL02C020BO2GNN□ |
| | | 2.1pF | ±0.1pF | CL02C2R1BO2GNN□ |
| | | 2.2pF | ±0.1pF | CL02C2R2BO2GNN□ |
| | | 2.3pF | ±0.1pF | CL02C2R3BO2GNN□ |
| | | 2.4pF | ±0.1pF | CL02C2R4BO2GNN□ |
| | | 2.5pF | ±0.1pF | CL02C2R5BO2GNN□ |
| | | 2.6pF | ±0.1pF | CL02C2R6BO2GNN□ |
| | | 2.7pF | ±0.1pF | CL02C2R7BO2GNN□ |
| | | 2.8pF | ±0.1pF | CL02C2R8BO2GNN□ |
| | | 2.9pF | ±0.1pF | CL02C2R9BO2GNN□ |
| | | 3.0pF | ±0.1pF | CL02C030BO2GNN□ |
| | | 3.1pF | ±0.1pF | CL02C3R1BO2GNN□ |
| | | 3.2pF | ±0.1pF | CL02C3R2BO2GNN□ |
| | | 3.3pF | ±0.1pF | CL02C3R3BO2GNN□ |
| | | 3.3pF | ±0.25pF | CL02C3R3CO2GNN□ |
| | | 3.4pF | ±0.1pF | CL02C3R4BO2GNN□ |
| | | 3.5pF | ±0.1pF | CL02C3R5BO2GNN□ |
| | | 3.5pF | ±0.25pF | CL02C3R5CO2GNN□ |
| | | 3.6pF | ±0.1pF | CL02C3R6BO2GNN□ |
| | | 3.7pF | ±0.1pF | CL02C3R7BO2GNN□ |
| | | 3.7pF | ±0.25pF | CL02C3R7CO2GNN□ |
| | | 3.8pF | ±0.1pF | CL02C3R8BO2GNN□ |
| | | 3.9pF | ±0.1pF | CL02C3R9BO2GNN□ |
| | | 4.0pF | ±0.1pF | CL02C040BO2GNN□ |
| | | 4.1pF | ±0.1pF | CL02C4R1BO2GNN□ |
| | | 4.2pF | ±0.1pF | CL02C4R2BO2GNN□ |
| | | 4.3pF | ±0.1pF | CL02C4R3BO2GNN□ |
| | | 4.4pF | ±0.1pF | CL02C4R4BO2GNN□ |
| | | 4.5pF | ±0.1pF | CL02C4R5BO2GNN□ |
| | | 4.6pF | ±0.1pF | CL02C4R6BO2GNN□ |
| | | 4.7pF | ±0.1pF | CL02C4R7BO2GNN□ |
| | | 4.8pF | ±0.1pF | CL02C4R8BO2GNN□ |
| | | 4.9pF | ±0.1pF | CL02C4R9BO2GNN□ |
| | | 5.0pF | ±0.1pF | CL02C050BO2GNN□ |
| | | 5.0pF | ±0.25pF | CL02C050CO2GNN□ |
| | | 5.1pF | ±0.1pF | CL02C5R1BO2GNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.22mm | 16Vdc | 5.1pF | ±0.25pF | CL02C5R1CO2GNN□ |
| | | 5.2pF | ±0.1pF | CL02C5R2BO2GNN□ |
| | | 5.3pF | ±0.1pF | CL02C5R3BO2GNN□ |
| | | 5.4pF | ±0.1pF | CL02C5R4BO2GNN□ |
| | | 5.5pF | ±0.1pF | CL02C5R5BO2GNN□ |
| | | 5.6pF | ±0.1pF | CL02C5R6BO2GNN□ |
| | | 5.6pF | ±0.25pF | CL02C5R6CO2GNN□ |
| | | 5.7pF | ±0.1pF | CL02C5R7BO2GNN□ |
| | | 5.7pF | ±0.25pF | CL02C5R7CO2GNN□ |
| | | 5.8pF | ±0.1pF | CL02C5R8BO2GNN□ |
| | | 5.9pF | ±0.1pF | CL02C5R9BO2GNN□ |
| | | 6.0pF | ±0.1pF | CL02C060BO2GNN□ |
| | | 6.1pF | ±0.1pF | CL02C6R1BO2GNN□ |
| | | 6.2pF | ±0.1pF | CL02C6R2BO2GNN□ |
| | | 6.3pF | ±0.1pF | CL02C6R3BO2GNN□ |
| | | 6.4pF | ±0.1pF | CL02C6R4BO2GNN□ |
| | | 6.5pF | ±0.1pF | CL02C6R5BO2GNN□ |
| | | 6.6pF | ±0.1pF | CL02C6R6BO2GNN□ |
| | | 6.7pF | ±0.1pF | CL02C6R7BO2GNN□ |
| | | 6.8pF | ±0.1pF | CL02C6R8BO2GNN□ |
| | | 6.9pF | ±0.1pF | CL02C6R9BO2GNN□ |
| | | 7.0pF | ±0.1pF | CL02C070BO2GNN□ |
| | | 7.1pF | ±0.1pF | CL02C7R1BO2GNN□ |
| | | 7.2pF | ±0.1pF | CL02C7R2BO2GNN□ |
| | | 7.3pF | ±0.1pF | CL02C7R3BO2GNN□ |
| | | 7.4pF | ±0.1pF | CL02C7R4BO2GNN□ |
| | | 7.5pF | ±0.1pF | CL02C7R5BO2GNN□ |
| | | 7.6pF | ±0.1pF | CL02C7R6BO2GNN□ |
| | | 7.7pF | ±0.1pF | CL02C7R7BO2GNN□ |
| | | 7.8pF | ±0.1pF | CL02C7R8BO2GNN□ |
| | | 7.9pF | ±0.1pF | CL02C7R9BO2GNN□ |
| | | 8.0pF | ±0.1pF | CL02C080BO2GNN□ |
| | | 8.0pF | ±0.25pF | CL02C080CO2GNN□ |
| | | 8.1pF | ±0.1pF | CL02C8R1BO2GNN□ |
| | | 8.2pF | ±0.1pF | CL02C8R2BO2GNN□ |
| | | 8.2pF | ±0.25pF | CL02C8R2CO2GNN□ |
| | | 8.3pF | ±0.1pF | CL02C8R3BO2GNN□ |
| | | 8.4pF | ±0.1pF | CL02C8R4BO2GNN□ |
| | | 8.4pF | ±0.25pF | CL02C8R4CO2GNN□ |
| | | 8.5pF | ±0.1pF | CL02C8R5BO2GNN□ |
| | | 8.6pF | ±0.1pF | CL02C8R6BO2GNN□ |
| | | 8.7pF | ±0.1pF | CL02C8R7BO2GNN□ |
| | | 8.8pF | ±0.1pF | CL02C8R8BO2GNN□ |
| | | 8.9pF | ±0.1pF | CL02C8R9BO2GNN□ |
| | | 9.0pF | ±0.1pF | CL02C090BO2GNN□ |
| | | 9.1pF | ±0.1pF | CL02C9R1BO2GNN□ |
| | | 9.2pF | ±0.1pF | CL02C9R2BO2GNN□ |
| | | 9.3pF | ±0.1pF | CL02C9R3BO2GNN□ |
| | | 9.4pF | ±0.1pF | CL02C9R4BO2GNN□ |
| | | 9.5pF | ±0.1pF | CL02C9R5BO2GNN□ |
| | | 9.5pF | ±0.25pF | CL02C9R5CO2GNN□ |
| | | 9.6pF | ±0.1pF | CL02C9R6BO2GNN□ |
| | | 9.7pF | ±0.1pF | CL02C9R7BO2GNN□ |
| | | 9.8pF | ±0.1pF | CL02C9R8BO2GNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up ( C0G)

■ Size : 0.40 X 0.20mm (inch : 01005)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.22mm | 16Vdc | 9.9pF | ±0.1pF | CL02C9R9BO2GNN□ |
| | | 10pF | ±5% | CL02C100JO2GNN□ |
| | | 18pF | ±2% | CL02C180GO2GNN□ |
| | | 22pF | ±2% | CL02C220GO2GNN□ |

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 0.2pF | ±0.1pF | CL03C0R2BA3GNN□ |
| | | 0.2pF | ±0.25pF | CL03C0R2CA3GNN□ |
| | | 0.2pF | ±0.03pF | CL03C0R2NA3GNN□ |
| | | 0.3pF | ±0.1pF | CL03C0R3BA3GNN□ |
| | | 0.3pF | ±0.25pF | CL03C0R3CA3GNN□ |
| | | 0.3pF | ±0.03pF | CL03C0R3NA3GNN□ |
| | | 0.4pF | ±0.1pF | CL03C0R4BA3GNN□ |
| | | 0.4pF | ±0.25pF | CL03C0R4CA3GNN□ |
| | | 0.4pF | ±0.03pF | CL03C0R4NA3GNN□ |
| | | 0.5pF | ±0.1pF | CL03C0R5BA3GNN□ |
| | | 0.5pF | ±0.25pF | CL03C0R5CA3GNN□ |
| | | 0.5pF | ±0.03pF | CL03C0R5NA3GNN□ |
| | | 0.6pF | ±0.1pF | CL03C0R6BA3GNN□ |
| | | 0.6pF | ±0.25pF | CL03C0R6CA3GNN□ |
| | | 0.6pF | ±0.03pF | CL03C0R6NA3GNN□ |
| | | 0.7pF | ±0.1pF | CL03C0R7BA3GNN□ |
| | | 0.7pF | ±0.03pF | CL03C0R7NA3GNN□ |
| | | 0.75pF | ±0.1pF | CL03CR75BA3GNN□ |
| | | 0.8pF | ±0.1pF | CL03C0R8BA3GNN□ |
| | | 0.8pF | ±0.25pF | CL03C0R8CA3GNN□ |
| | | 0.8pF | ±0.03pF | CL03C0R8NA3GNN□ |
| | | 0.9pF | ±0.1pF | CL03C0R9BA3GNN□ |
| | | 0.9pF | ±0.25pF | CL03C0R9CA3GNN□ |
| | | 0.9pF | ±0.03pF | CL03C0R9NA3GNN□ |
| | | 1.0pF | ±0.1pF | CL03C010BA3GNN□ |
| | | 1.0pF | ±0.25pF | CL03C010CA3GNN□ |
| | | 1.0pF | ±0.03pF | CL03C010NA3GNN□ |
| | | 1.1pF | ±0.1pF | CL03C1R1BA3GNN□ |
| | | 1.1pF | ±0.03pF | CL03C1R1NA3GNN□ |
| | | 1.2pF | ±0.1pF | CL03C1R2BA3GNN□ |
| | | 1.2pF | ±0.25pF | CL03C1R2CA3GNN□ |
| | | 1.2pF | ±0.03pF | CL03C1R2NA3GNN□ |
| | | 1.3pF | ±0.1pF | CL03C1R3BA3GNN□ |
| | | 1.3pF | ±0.25pF | CL03C1R3CA3GNN□ |
| | | 1.3pF | ±0.03pF | CL03C1R3NA3GNN□ |
| | | 1.4pF | ±0.03pF | CL03C1R4NA3GNN□ |
| | | 1.5pF | ±0.1pF | CL03C1R5BA3GNN□ |
| | | 1.5pF | ±0.25pF | CL03C1R5CA3GNN□ |
| | | 1.5pF | ±0.03pF | CL03C1R5NA3GNN□ |
| | | 1.6pF | ±0.05pF | CL03C1R6AA3GNN□ |
| | | 1.6pF | ±0.1pF | CL03C1R6BA3GNN□ |
| | | 1.6pF | ±0.25pF | CL03C1R6CA3GNN□ |
| | | 1.7pF | ±0.05pF | CL03C1R7AA3GNN□ |
| | | 1.7pF | ±0.1pF | CL03C1R7BA3GNN□ |
| | | 1.7pF | ±0.25pF | CL03C1R7CA3GNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 1.8pF | ±0.05pF | CL03C1R8AA3GNN□ |
| | | 1.8pF | ±0.1pF | CL03C1R8BA3GNN□ |
| | | 1.8pF | ±0.25pF | CL03C1R8CA3GNN□ |
| | | 1.9pF | ±0.05pF | CL03C1R9AA3GNN□ |
| | | 1.9pF | ±0.1pF | CL03C1R9BA3GNN□ |
| | | 1.9pF | ±0.25pF | CL03C1R9CA3GNN□ |
| | | 2.0pF | ±0.05pF | CL03C020AA3GNN□ |
| | | 2.0pF | ±0.1pF | CL03C020BA3GNN□ |
| | | 2.0pF | ±0.25pF | CL03C020CA3GNN□ |
| | | 2.0pF | ±0.1pF | CL03C2R0BA3GNN□ |
| | | 2.1pF | ±0.05pF | CL03C2R1AA3GNN□ |
| | | 2.1pF | ±0.1pF | CL03C2R1BA3GNN□ |
| | | 2.2pF | ±0.05pF | CL03C2R2AA3GNN□ |
| | | 2.2pF | ±0.1pF | CL03C2R2BA3GNN□ |
| | | 2.2pF | ±0.25pF | CL03C2R2CA3GNN□ |
| | | 2.3pF | ±0.05pF | CL03C2R3AA3GNN□ |
| | | 2.3pF | ±0.1pF | CL03C2R3BA3GNN□ |
| | | 2.4pF | ±0.05pF | CL03C2R4AA3GNN□ |
| | | 2.4pF | ±0.1pF | CL03C2R4BA3GNN□ |
| | | 2.4pF | ±0.25pF | CL03C2R4CA3GNN□ |
| | | 2.5pF | ±0.05pF | CL03C2R5AA3GNN□ |
| | | 2.5pF | ±0.1pF | CL03C2R5BA3GNN□ |
| | | 2.6pF | ±0.05pF | CL03C2R6AA3GNN□ |
| | | 2.6pF | ±0.1pF | CL03C2R6BA3GNN□ |
| | | 2.7pF | ±0.05pF | CL03C2R7AA3GNN□ |
| | | 2.7pF | ±0.1pF | CL03C2R7BA3GNN□ |
| | | 2.7pF | ±0.25pF | CL03C2R7CA3GNN□ |
| | | 2.8pF | ±0.05pF | CL03C2R8AA3GNN□ |
| | | 2.8pF | ±0.1pF | CL03C2R8BA3GNN□ |
| | | 2.9pF | ±0.05pF | CL03C2R9AA3GNN□ |
| | | 2.9pF | ±0.1pF | CL03C2R9BA3GNN□ |
| | | 3.0pF | ±0.05pF | CL03C030AA3GNN□ |
| | | 3.0pF | ±0.1pF | CL03C030BA3GNN□ |
| | | 3.0pF | ±0.25pF | CL03C030CA3GNN□ |
| | | 3.1pF | ±0.05pF | CL03C3R1AA3GNN□ |
| | | 3.1pF | ±0.1pF | CL03C3R1BA3GNN□ |
| | | 3.2pF | ±0.05pF | CL03C3R2AA3GNN□ |
| | | 3.2pF | ±0.1pF | CL03C3R2BA3GNN□ |
| | | 3.2pF | ±0.25pF | CL03C3R2CA3GNN□ |
| | | 3.3pF | ±0.05pF | CL03C3R3AA3GNN□ |
| | | 3.3pF | ±0.1pF | CL03C3R3BA3GNN□ |
| | | 3.3pF | ±0.25pF | CL03C3R3CA3GNN□ |
| | | 3.4pF | ±0.05pF | CL03C3R4AA3GNN□ |
| | | 3.4pF | ±0.1pF | CL03C3R4BA3GNN□ |
| | | 3.4pF | ±0.25pF | CL03C3R4CA3GNN□ |
| | | 3.5pF | ±0.05pF | CL03C3R5AA3GNN□ |
| | | 3.6pF | ±0.05pF | CL03C3R6AA3GNN□ |
| | | 3.6pF | ±0.1pF | CL03C3R6BA3GNN□ |
| | | 3.6pF | ±0.25pF | CL03C3R6CA3GNN□ |
| | | 3.7pF | ±0.05pF | CL03C3R7AA3GNN□ |
| | | 3.8pF | ±0.05pF | CL03C3R8AA3GNN□ |
| | | 3.8pF | ±0.1pF | CL03C3R8BA3GNN□ |
| | | 3.8pF | ±0.25pF | CL03C3R8CA3GNN□ |
| | | 3.9pF | ±0.05pF | CL03C3R9AA3GNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# High Q Capacitors

## Product Line Up (C0G)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 3.9pF | ±0.1pF | CL03C3R9BA3GNN□ |
| | | 3.9pF | ±0.25pF | CL03C3R9CA3GNN□ |
| | | 4.0pF | ±0.05pF | CL03C040AA3GNN□ |
| | | 4.0pF | ±0.1pF | CL03C040BA3GNN□ |
| | | 4.0pF | ±0.25pF | CL03C040CA3GNN□ |
| | | 4.1pF | ±0.05pF | CL03C4R1AA3GNN□ |
| | | 4.2pF | ±0.05pF | CL03C4R2AA3GNN□ |
| | | 4.3pF | ±0.05pF | CL03C4R3AA3GNN□ |
| | | 4.3pF | ±0.1pF | CL03C4R3BA3GNN□ |
| | | 4.3pF | ±0.25pF | CL03C4R3CA3GNN□ |
| | | 4.4pF | ±0.05pF | CL03C4R4AA3GNN□ |
| | | 4.5pF | ±0.05pF | CL03C4R5AA3GNN□ |
| | | 4.6pF | ±0.05pF | CL03C4R6AA3GNN□ |
| | | 4.7pF | ±0.05pF | CL03C4R7AA3GNN□ |
| | | 4.7pF | ±0.1pF | CL03C4R7BA3GNN□ |
| | | 4.7pF | ±0.25pF | CL03C4R7CA3GNN□ |
| | | 4.8pF | ±0.05pF | CL03C4R8AA3GNN□ |
| | | 4.9pF | ±0.05pF | CL03C4R9AA3GNN□ |
| | | 5.0pF | ±0.05pF | CL03C050AA3GNN□ |
| | | 5.0pF | ±0.1pF | CL03C050BA3GNN□ |
| | | 5.0pF | ±0.25pF | CL03C050CA3GNN□ |
| | | 5.1pF | ±0.05pF | CL03C5R1AA3GNN□ |
| | | 5.1pF | ±0.1pF | CL03C5R1BA3GNN□ |
| | | 5.1pF | ±0.25pF | CL03C5R1CA3GNN□ |
| | | 5.2pF | ±0.05pF | CL03C5R2AA3GNN□ |
| | | 5.3pF | ±0.05pF | CL03C5R3AA3GNN□ |
| | | 5.4pF | ±0.05pF | CL03C5R4AA3GNN□ |
| | | 5.5pF | ±0.05pF | CL03C5R5AA3GNN□ |
| | | 5.6pF | ±0.05pF | CL03C5R6AA3GNN□ |
| | | 5.6pF | ±0.1pF | CL03C5R6BA3GNN□ |
| | | 5.6pF | ±0.25pF | CL03C5R6CA3GNN□ |
| | | 5.7pF | ±0.05pF | CL03C5R7AA3GNN□ |
| | | 5.8pF | ±0.05pF | CL03C5R8AA3GNN□ |
| | | 5.9pF | ±0.05pF | CL03C5R9AA3GNN□ |
| | | 6.0pF | ±0.05pF | CL03C060AA3GNN□ |
| | | 6.0pF | ±0.1pF | CL03C060BA3GNN□ |
| | | 6.0pF | ±0.25pF | CL03C060CA3GNN□ |
| | | 6.0pF | ±0.5pF | CL03C060DA3GNN□ |
| | | 6.1pF | ±0.05pF | CL03C6R1AA3GNN□ |
| | | 6.2pF | ±0.05pF | CL03C6R2AA3GNN□ |
| | | 6.2pF | ±0.1pF | CL03C6R2BA3GNN□ |
| | | 6.2pF | ±0.25pF | CL03C6R2CA3GNN□ |
| | | 6.3pF | ±0.05pF | CL03C6R3AA3GNN□ |
| | | 6.4pF | ±0.05pF | CL03C6R4AA3GNN□ |
| | | 6.4pF | ±0.25pF | CL03C6R4CA3GNN□ |
| | | 6.5pF | ±0.05pF | CL03C6R5AA3GNN□ |
| | | 6.6pF | ±0.05pF | CL03C6R6AA3GNN□ |
| | | 6.7pF | ±0.05pF | CL03C6R7AA3GNN□ |
| | | 6.8pF | ±0.05pF | CL03C6R8AA3GNN□ |
| | | 6.8pF | ±0.1pF | CL03C6R8BA3GNN□ |
| | | 6.8pF | ±0.25pF | CL03C6R8CA3GNN□ |
| | | 6.9pF | ±0.05pF | CL03C6R9AA3GNN□ |
| | | 7.0pF | ±0.05pF | CL03C070AA3GNN□ |
| | | 7.0pF | ±0.1pF | CL03C070BA3GNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 7.0pF | ±0.25pF | CL03C070CA3GNN□ |
| | | 7.1pF | ±0.05pF | CL03C7R1AA3GNN□ |
| | | 7.2pF | ±0.05pF | CL03C7R2AA3GNN□ |
| | | 7.2pF | ±0.1pF | CL03C7R2BA3GNN□ |
| | | 7.3pF | ±0.05pF | CL03C7R3AA3GNN□ |
| | | 7.4pF | ±0.05pF | CL03C7R4AA3GNN□ |
| | | 7.5pF | ±0.05pF | CL03C7R5AA3GNN□ |
| | | 7.5pF | ±0.1pF | CL03C7R5BA3GNN□ |
| | | 7.5pF | ±0.25pF | CL03C7R5CA3GNN□ |
| | | 7.6pF | ±0.05pF | CL03C7R6AA3GNN□ |
| | | 7.7pF | ±0.05pF | CL03C7R7AA3GNN□ |
| | | 7.8pF | ±0.05pF | CL03C7R8AA3GNN□ |
| | | 7.9pF | ±0.05pF | CL03C7R9AA3GNN□ |
| | | 8.0pF | ±0.05pF | CL03C080AA3GNN□ |
| | | 8.0pF | ±0.25pF | CL03C080CA3GNN□ |
| | | 8.0pF | ±0.5pF | CL03C080DA3GNN□ |
| | | 8.1pF | ±0.05pF | CL03C8R1AA3GNN□ |
| | | 8.2pF | ±0.05pF | CL03C8R2AA3GNN□ |
| | | 8.2pF | ±0.1pF | CL03C8R2BA3GNN□ |
| | | 8.2pF | ±0.25pF | CL03C8R2CA3GNN□ |
| | | 8.2pF | ±0.5pF | CL03C8R2DA3GNN□ |
| | | 8.3pF | ±0.05pF | CL03C8R3AA3GNN□ |
| | | 8.4pF | ±0.05pF | CL03C8R4AA3GNN□ |
| | | 8.5pF | ±0.05pF | CL03C8R5AA3GNN□ |
| | | 8.5pF | ±0.25pF | CL03C8R5CA3GNN□ |
| | | 8.6pF | ±0.05pF | CL03C8R6AA3GNN□ |
| | | 8.7pF | ±0.05pF | CL03C8R7AA3GNN□ |
| | | 8.8pF | ±0.05pF | CL03C8R8AA3GNN□ |
| | | 8.9pF | ±0.05pF | CL03C8R9AA3GNN□ |
| | | 9.0pF | ±0.05pF | CL03C090AA3GNN□ |
| | | 9.0pF | ±0.1pF | CL03C090BA3GNN□ |
| | | 9.0pF | ±0.25pF | CL03C090CA3GNN□ |
| | | 9.0pF | ±0.5pF | CL03C090DA3GNN□ |
| | | 9.1pF | ±0.05pF | CL03C9R1AA3GNN□ |
| | | 9.1pF | ±0.1pF | CL03C9R1BA3GNN□ |
| | | 9.1pF | ±0.25pF | CL03C9R1CA3GNN□ |
| | | 9.1pF | ±0.5pF | CL03C9R1DA3GNN□ |
| | | 9.2pF | ±0.05pF | CL03C9R2AA3GNN□ |
| | | 9.3pF | ±0.05pF | CL03C9R3AA3GNN□ |
| | | 9.4pF | ±0.05pF | CL03C9R4AA3GNN□ |
| | | 9.5pF | ±0.05pF | CL03C9R5AA3GNN□ |
| | | 9.6pF | ±0.05pF | CL03C9R6AA3GNN□ |
| | | 9.7pF | ±0.05pF | CL03C9R7AA3GNN□ |
| | | 9.8pF | ±0.05pF | CL03C9R8AA3GNN□ |
| | | 9.9pF | ±0.05pF | CL03C9R9AA3GNN□ |
| | | 10pF | ±0.05pF | CL03C100AA3GNN□ |
| | | 10pF | ±0.25pF | CL03C100CA3GNN□ |
| | | 10pF | ±0.5pF | CL03C100DA3GNN□ |
| | | 10pF | ±2% | CL03C100GA3GNN□ |
| | | 10pF | ±5% | CL03C100JA3GNN□ |
| | | 11pF | ±2% | CL03C110GA3GNN□ |
| | | 11pF | ±5% | CL03C110JA3GNN□ |
| | | 12pF | ±2% | CL03C120GA3GNN□ |
| | | 12pF | ±5% | CL03C120JA3GNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (C0G)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 13pF | ±2% | CL03C130GA3GNN□ |
| | | 13pF | ±5% | CL03C130JA3GNN□ |
| | | 15pF | ±2% | CL03C150GA3GNN□ |
| | | 15pF | ±5% | CL03C150JA3GNN□ |
| | | 16pF | ±2% | CL03C160GA3GNN□ |
| | | 16pF | ±5% | CL03C160JA3GNN□ |
| | | 16pF | ±5% | CL03C160UA3GNN□ |
| | | 18pF | ±2% | CL03C180GA3GNN□ |
| | | 18pF | ±5% | CL03C180JA3GNN□ |
| | | 20pF | ±2% | CL03C200GA3GNN□ |
| | | 20pF | ±5% | CL03C200JA3GNN□ |
| | | 22pF | ±2% | CL03C220GA3GNN□ |
| | | 22pF | ±5% | CL03C220JA3GNN□ |
| | | 24pF | ±5% | CL03C240JA3GNN□ |
| | | 27pF | ±5% | CL03C270JA3GNN□ |
| | | 30pF | ±5% | CL03C300JA3GNN□ |
| | | 33pF | ±5% | CL03C330JA3GNN□ |
| | 50Vdc | 0.5pF | ±0.25pF | CL03C0R5CB3GNN□ |
| | | 0.75pF | ±0.1pF | CL03CR75BB3GNN□ |
| | | 0.8pF | ±0.25pF | CL03C0R8CB3GNN□ |
| | | 1.0pF | ±0.1pF | CL03C010BB3GNN□ |
| | | 1.2pF | ±0.1pF | CL03C1R2BB3GNN□ |
| | | 1.2pF | ±0.25pF | CL03C1R2CB3GNN□ |
| | | 1.5pF | ±0.1pF | CL03C1R5BB3GNN□ |
| | | 1.5pF | ±0.25pF | CL03C1R5CB3GNN□ |
| | | 1.8pF | ±0.1pF | CL03C1R8BB3GNN□ |
| | | 2.0pF | ±0.1pF | CL03C020BB3GNN□ |
| | | 2.0pF | ±0.25pF | CL03C020CB3GNN□ |
| | | 2.2pF | ±0.05pF | CL03C2R2AB3GNN□ |
| | | 2.7pF | ±0.1pF | CL03C2R7BB3GNN□ |
| | | 3.0pF | ±0.1pF | CL03C030BB3GNN□ |
| | | 3.0pF | ±0.25pF | CL03C030CB3GNN□ |
| | | 3.3pF | ±0.1pF | CL03C3R3BB3GNN□ |
| | | 4.0pF | ±0.1pF | CL03C040BB3GNN□ |
| | | 4.7pF | ±0.1pF | CL03C4R7BB3GNN□ |
| | | 5.0pF | ±0.1pF | CL03C050BB3GNN□ |
| | | 5.6pF | ±0.1pF | CL03C5R6BB3GNN□ |
| | | 6.0pF | ±0.1pF | CL03C060BB3GNN□ |
| | | 6.0pF | ±0.5pF | CL03C060DB3GNN□ |
| | | 6.2pF | ±0.1pF | CL03C6R2BB3GNN□ |
| | | 6.5pF | ±0.1pF | CL03C6R5BB3GNN□ |
| | | 7.0pF | ±0.1pF | CL03C070BB3GNN□ |
| | | 7.0pF | ±0.5pF | CL03C070DB3GNN□ |
| | | 7.5pF | ±0.1pF | CL03C7R5BB3GNN□ |
| | | 8.0pF | ±0.1pF | CL03C080BB3GNN□ |
| | | 8.0pF | ±0.5pF | CL03C080DB3GNN□ |
| | | 8.2pF | ±0.1pF | CL03C8R2BB3GNN□ |
| | | 8.2pF | ±0.5pF | CL03C8R2DB3GNN□ |
| | | 10pF | ±5% | CL03C100JB3GNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Medium – High Voltage Capacitors

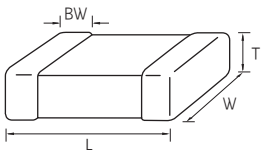
## Feature

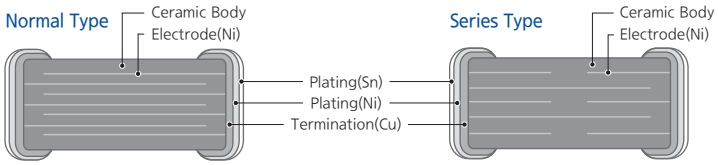
- Highly reliable performance
- Operating at high voltage level
- Wide voltage level : from 100V to 3kV
- High withstanding voltage
- Tape & reel surface mount assembly

## Application

- Switching Power Circuit (SMPS)
- Lighting Ballast, LCD Back Lighting Inverter
- DC – DC converter input filter, Snubber Circuit
- Network (IEEE802.3)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.65±0.10 | A | 0.50+0.20/−0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 1.15±0.10 | M | |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| 31 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | 0.50±0.30 |
| | | 3.20±0.15 | 1.60±0.15 | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 1.25±0.20 | F | 0.60±0.30 |
| | | 3.20±0.30 | 2.50±0.20 | 1.60±0.20 | H | |
| | | 3.20±0.30 | 2.50±0.20 | 2.00±0.20 | I | |
| | | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | |
| 42 | 1808 | 4.50±0.40 | 2.00±0.20 | 1.25±0.20 | F | 0.80±0.30 |
| | | 4.50±0.40 | 2.00±0.20 | 1.60±0.20 | H | |
| | | 4.50±0.40 | 2.00±0.20 | 2.00±0.20 | I | |
| 43 | 1812 | 4.50±0.40 | 3.20±0.30 | 1.25±0.20 | F | 0.80±0.30 |
| | | 4.50±0.40 | 3.20±0.30 | 1.60±0.20 | H | |
| | | 4.50±0.40 | 3.20±0.30 | 2.00±0.20 | I | |
| | | 4.50±0.40 | 3.20±0.30 | 2.50±0.20 | J | |
| 55 | 2220 | 5.70±0.40 | 5.00±0.40 | 2.50±0.20 | J | 1.00±0.30 |

## Medium – High Voltage Capacitance Table (C0G)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | |
|---|---|---|---|
| | | pF | nF |
| | | 47 100 120 150 180 220 270 330 390 470 560 680 820 | 1.0 1.2 1.5 1.8 2.2 2.7 3.3 3.9 4.7 5.6 6.8 8.2 10 12 15 18 22 27 33 47 56 68 |
| 0402(1005) | 100 | | |
| 0603 (1608) | 100 | | |
| | 200 | | |
| | 250 | | |
| 0805 (2012) | 100 | | |
| | 200 | | |
| | 250 | | |
| | 500 | | |
| | 630 | | |
| 1206 (3216) | 100 | | |
| | 200 | | |
| | 250 | | |
| | 500 | | |
| | 630 | | |
| | 1k | | |
| | 2k | | |
| 1210 (3225) | 100 | | |
| | 200 | | |
| | 250 | | |
| | 500 | | |
| | 630 | | |
| | 1k | | |
| | 2k | | |
| 1808 (4520) | 2k | | |
| | 3k | | |
| 1812 (4532) | 100 | | |
| | 200 | | |
| | 250 | | |
| | 500 | | |
| | 630 | | |
| | 1k | | |
| | 2k | | |
| | 3k | | |
| 2220 (5750) | 100 | | |
| | 200 | | |
| | 250 | | |
| | 500 | | |
| | 630 | | |
| | 1k | | 3.6 |
| | 2k | | |
| | 3k | | |

# Medium – High Voltage Capacitors

## Medium – High Voltage Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | | | | | | | | | | uF | | | | | |
| | | 1.0 | 1.5 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 15 | 22 | 33 | 47 | 68 | 100 | 150 | 220 | 330 | 470 | 680 | 1.0 | 1.5 | 2.2 | 3.3 | 4.7 |
| 0603(1608) | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| 0805 (2012) | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | | |
| 1206 (3216) | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | | | | | | | | | | | | |
| | 1k | | | | | | | | | | | | | | | | | | | | | | | |
| | 2k | | | | | | | | | | | | | | | | | | | | | | | |
| 1210 (3225) | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | | | | | | | | | | | | |
| | 1k | | | | | | | | | | | | | | | | | | | | | | | |
| | 2k | | | | | | | | | | | | | | | | | | | | | | | |
| 1808 (4520) | 2k | | | | | | | | | | | | | | | | | | | | | | | |
| | 3k | | | | | | | | | | | | | | | | | | | | | | | |
| 1812 (4532) | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | | | | | | | | | | | | |
| | 1k | | | | | | | | | | | | | | | | | | | | | | | |
| | 2k | | | | | | | | | | | | | | | | | | | | | | | |
| 2220 (5750) | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | | | | | | | | | | | | |
| | 1k | | | | | | | | | | | | | | | | | | | | | | | |
| | 2k | | | | | | | | | | | | | | | | | | | | | | | |

## Product Line Up (C0G)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 100Vdc | 1.8pF | ±0.25pF | CL05C1R8CC5NNN□ |
| | | 2.2pF | ±0.25pF | CL05C2R2CC5NNN□ |
| | | 3.0pF | ±0.25pF | CL05C030CC5NNN□ |
| | | 3.3pF | ±0.25pF | CL05C3R3CC5NNN□ |
| | | 4.0pF | ±0.25pF | CL05C040CC5NNN□ |
| | | 15pF | ±5% | CL05C150JC5NNN□ |
| | | 33pF | ±5% | CL05C330JC5NNN□ |
| | | 39pF | ±5% | CL05C390JC5NNN□ |
| | | 47pF | ±5% | CL05C470JC5NNN□ |
| | | 82pF | ±5% | CL05C820JC5NNN□ |
| | | 100pF | ±5% | CL05C101JC5NNN□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 100Vdc | 10pF | ±0.25pF | CL10C100CC8NNN□ |
| | | 10pF | ±0.5pF | CL10C100DC8NNN□ |
| | | 10pF | ±5% | CL10C100JC8NNN□ |
| | | 12pF | ±5% | CL10C120JC8NNN□ |
| | | 13pF | ±5% | CL10C130JC8NNN□ |
| | | 15pF | ±5% | CL10C150JC8NNN□ |
| | | 18pF | ±5% | CL10C180JC8NNN□ |
| | | 20pF | ±5% | CL10C200JC8NNN□ |
| | | 22pF | ±5% | CL10C220JC8NNN□ |
| | | 24pF | ±5% | CL10C240JC8NNN□ |
| | | 27pF | ±5% | CL10C270JC8NNN□ |
| | | 30pF | ±5% | CL10C300JC8NNN□ |
| | | 32pF | ±2% | CL10C320GC8NNN□ |
| | | 33pF | ±1% | CL10C330FC8NNN□ |
| | | 33pF | ±5% | CL10C330JC8NNN□ |
| | | 39pF | ±1% | CL10C390FC8NNN□ |
| | | 39pF | ±5% | CL10C390JC8NNN□ |
| | | 47pF | ±5% | CL10C470JC8NNN□ |
| | | 50pF | ±5% | CL10C500JC8NNN□ |
| | | 52pF | ±5% | CL10C520JC8NNN□ |
| | | 56pF | ±5% | CL10C560JC8NNN□ |
| | | 62pF | ±5% | CL10C620JC8NNN□ |
| | | 62pF | ±10% | CL10C620KC8NNN□ |
| | | 68pF | ±2% | CL10C680GC8NNN□ |
| | | 68pF | ±5% | CL10C680JC8NNN□ |
| | | 82pF | ±5% | CL10C820JC8NNN□ |
| | | 91pF | ±5% | CL10C910JC8NNN□ |
| | | 95pF | ±5% | CL10C950JC8NNN□ |
| | | 100pF | ±5% | CL10C101JC8NNN□ |
| | | 110pF | ±5% | CL10C111JC8NNN□ |
| | | 120pF | ±5% | CL10C121JC8NNN□ |
| | | 150pF | ±5% | CL10C151JC8NNN□ |
| | | 180pF | ±5% | CL10C181JC8NNN□ |
| | | 180pF | ±10% | CL10C181KC8NNN□ |
| | | 190pF | ±5% | CL10C191JC8NNN□ |
| | | 200pF | ±5% | CL10C201JC8NNN□ |
| | | 220pF | ±5% | CL10C221JC8NNN□ |
| | | 220pF | ±10% | CL10C221KC8NNN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 100Vdc | 270pF | ±5% | CL10C271JC8NNN□ |
| | | 330pF | ±5% | CL10C331JC8NNN□ |
| | | 390pF | ±5% | CL10C391JC8NNN□ |
| | | 470pF | ±5% | CL10C471JC8NNN□ |
| | | 1.0nF | ±5% | CL10C102JC8NNN□ |
| | 200Vdc | 220pF | ±10% | CL10C221KD8NNN□ |
| | 250Vdc | 470pF | ±5% | CL10C471JE8NNN□ |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 100Vdc | 2.7pF | ±0.25pF | CL21C2R7CCANNN□ |
| | | 4.7pF | ±0.1pF | CL21C4R7BCANNN□ |
| | | 10pF | ±0.25pF | CL21C100CCANNN□ |
| | | 10pF | ±5% | CL21C100JCANNN□ |
| | | 11pF | ±2% | CL21C110GCANNN□ |
| | | 11pF | ±5% | CL21C110JCANNN□ |
| | | 12pF | ±2% | CL21C120GCANNN□ |
| | | 13pF | ±2% | CL21C130GCANNN□ |
| | | 13pF | ±5% | CL21C130JCANNN□ |
| | | 14pF | ±5% | CL21C140JCANNN□ |
| | | 15pF | ±5% | CL21C150JCANNN□ |
| | | 16pF | ±2% | CL21C160GCANNN□ |
| | | 16pF | ±5% | CL21C160JCANNN□ |
| | | 17pF | ±5% | CL21C170JCANNN□ |
| | | 18pF | ±2% | CL21C180GCANNN□ |
| | | 18pF | ±5% | CL21C180JCANNN□ |
| | | 20pF | ±5% | CL21C200JCANNN□ |
| | | 22pF | ±5% | CL21C220JCANNN□ |
| | | 24pF | ±2% | CL21C240GCANNN□ |
| | | 24pF | ±5% | CL21C240JCANNN□ |
| | | 25pF | ±5% | CL21C250JCANNN□ |
| | | 27pF | ±5% | CL21C270JCANNN□ |
| | | 30pF | ±5% | CL21C300JCANNN□ |
| | | 33pF | ±2% | CL21C330GCANNN□ |
| | | 33pF | ±5% | CL21C330JCANNN□ |
| | | 36pF | ±5% | CL21C360JCANNN□ |
| | | 38pF | ±2% | CL21C380GCANNN□ |
| | | 39pF | ±2% | CL21C390GCANNN□ |
| | | 39pF | ±5% | CL21C390JCANNN□ |
| | | 39pF | ±10% | CL21C390KCANNN□ |
| | | 40pF | ±2% | CL21C400GCANNN□ |
| | | 43pF | ±2% | CL21C430GCANNN□ |
| | | 43pF | ±5% | CL21C430JCANNN□ |
| | | 47pF | ±5% | CL21C470JCANNN□ |
| | | 51pF | ±2% | CL21C510GCANNN□ |
| | | 51pF | ±5% | CL21C510JCANNN□ |
| | | 56pF | ±5% | CL21C560JCANNN□ |
| | | 62pF | ±5% | CL21C620JCANNN□ |
| | | 68pF | ±5% | CL21C680JCANNN□ |
| | | 75pF | ±5% | CL21C750JCANNN□ |
| | | 82pF | ±5% | CL21C820JCANNN□ |
| | | 91pF | ±2% | CL21C910GCANNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Medium – High Voltage Capacitors

## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 100Vdc | 91pF | ±5% | CL21C910JCANNN□ |
| | | 100pF | ±5% | CL21C101JCANNN□ |
| | | 110pF | ±5% | CL21C111JCANNN□ |
| | | 120pF | ±5% | CL21C121JCANNN□ |
| | | 130pF | ±5% | CL21C131JCANNN□ |
| | | 150pF | ±1% | CL21C151FCANNN□ |
| | | 150pF | ±5% | CL21C151JCANNN□ |
| | | 160pF | ±5% | CL21C161JCANNN□ |
| | | 180pF | ±2% | CL21C181GCANNN□ |
| | | 180pF | ±5% | CL21C181JCANNN□ |
| | | 200pF | ±5% | CL21C201JCANNN□ |
| | | 220pF | ±5% | CL21C221JCANNN□ |
| | | 240pF | ±5% | CL21C241JCANNN□ |
| | | 270pF | ±5% | CL21C271JCANNN□ |
| | | 270pF | ±10% | CL21C271KCANNN□ |
| | | 300pF | ±5% | CL21C301JCANNN□ |
| | | 330pF | ±5% | CL21C331JCANNN□ |
| | | 360pF | ±5% | CL21C361JCANNN□ |
| | | 390pF | ±5% | CL21C391JCANNN□ |
| | 200Vdc | 100pF | ±5% | CL21C101JDANNN□ |
| 0.95mm | 100Vdc | 15pF | ±5% | CL21C150JCCNNN□ |
| | | 470pF | ±2% | CL21C471GCCNNN□ |
| | | 470pF | ±5% | CL21C471JCCNNN□ |
| | | 510pF | ±5% | CL21C511JCCNNN□ |
| | | 560pF | ±1% | CL21C561FCCNNN□ |
| | | 620pF | ±5% | CL21C621JCCNNN□ |
| | | 680pF | ±5% | CL21C681JCCNNN□ |
| | 200Vdc | 10pF | ±0.5pF | CL21C100DDCNNN□ |
| | | 15pF | ±5% | CL21C150JDCNNN□ |
| | | 18pF | ±2% | CL21C180GDCNNN□ |
| | | 18pF | ±5% | CL21C180JDCNNN□ |
| | | 20pF | ±2% | CL21C200GDCNNN□ |
| | | 36pF | ±2% | CL21C360GDCNNN□ |
| | | 39pF | ±2% | CL21C390GDCNNN□ |
| | | 43pF | ±2% | CL21C430GDCNNN□ |
| | | 47pF | ±5% | CL21C470JDCNNN□ |
| | | 51pF | ±5% | CL21C510JDCNNN□ |
| | | 56pF | ±2% | CL21C560GDCNNN□ |
| | | 56pF | ±5% | CL21C560JDCNNN□ |
| | | 62pF | ±2% | CL21C620GDCNNN□ |
| | | 100pF | ±2% | CL21C101GDCNNN□ |
| | | 100pF | ±5% | CL21C101JDCNNN□ |
| | | 120pF | ±5% | CL21C121JDCNNN□ |
| | | 150pF | ±5% | CL21C151JDCNNN□ |
| | | 200pF | ±5% | CL21C201JDCNNN□ |
| | | 220pF | ±5% | CL21C221JDCNNN□ |
| | 250Vdc | 100pF | ±10% | CL21C101KECNNN□ |
| 1.35mm | 100Vdc | 100pF | ±5% | CL21C101JCFNNN□ |
| | | 1.0nF | ±2% | CL21C102GCFNNN□ |
| | | 1.0nF | ±5% | CL21C102JCFNNN□ |
| | | 1.2nF | ±5% | CL21C122JCFNNN□ |
| | | 2.2nF | ±5% | CL21C222JCFNNN□ |
| | 200Vdc | 470pF | ±5% | CL21C471JDFNNN□ |
| | | 1.0nF | ±5% | CL21C102JDFNNN□ |
| 1.35mm | 250Vdc | 1.0nF | ±5% | CL21C102JEFNNN□ |
| | 630Vdc | 27pF | ±5% | CL21C270JHFNNN□ |
| | | 33pF | ±5% | CL21C330JHFNNN□ |
| | | 68pF | ±5% | CL21C680JHFNNN□ |
| | | 150pF | ±5% | CL21C151JHFNNN□ |
| | | 560pF | ±5% | CL21C561JHFNNN□ |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 100Vdc | 10pF | ±0.25pF | CL31C100CCCNNN□ |
| | | 10pF | ±0.5pF | CL31C100DCCNNN□ |
| | | 10pF | ±5% | CL31C100JCCNNN□ |
| | | 11pF | ±5% | CL31C110JCCNNN□ |
| | | 12pF | ±2% | CL31C120GCCNNN□ |
| | | 12pF | ±5% | CL31C120JCCNNN□ |
| | | 15pF | ±2% | CL31C150GCCNNN□ |
| | | 15pF | ±5% | CL31C150JCCNNN□ |
| | | 18pF | ±2% | CL31C180GCCNNN□ |
| | | 18pF | ±5% | CL31C180JCCNNN□ |
| | | 20pF | ±5% | CL31C200JCCNNN□ |
| | | 22pF | ±5% | CL31C220JCCNNN□ |
| | | 24pF | ±5% | CL31C240JCCNNN□ |
| | | 27pF | ±1% | CL31C270FCCNNN□ |
| | | 27pF | ±2% | CL31C270GCCNNN□ |
| | | 27pF | ±5% | CL31C270JCCNNN□ |
| | | 30pF | ±2% | CL31C300GCCNNN□ |
| | | 30pF | ±5% | CL31C300JCCNNN□ |
| | | 30pF | ±10% | CL31C300KCCNNN□ |
| | | 33pF | ±5% | CL31C330JCCNNN□ |
| | | 36pF | ±5% | CL31C360JCCNNN□ |
| | | 39pF | ±5% | CL31C390JCCNNN□ |
| | | 43pF | ±5% | CL31C430JCCNNN□ |
| | | 51pF | ±5% | CL31C510JCCNNN□ |
| | | 56pF | ±5% | CL31C560JCCNNN□ |
| | | 62pF | ±5% | CL31C620JCCNNN□ |
| | | 68pF | ±5% | CL31C680JCCNNN□ |
| | | 75pF | ±5% | CL31C750JCCNNN□ |
| | | 82pF | ±5% | CL31C820JCCNNN□ |
| | | 91pF | ±1% | CL31C910FCCNNN□ |
| | | 91pF | ±2% | CL31C910GCCNNN□ |
| | | 91pF | ±5% | CL31C910JCCNNN□ |
| | | 100pF | ±5% | CL31C101JCCNNN□ |
| | | 110pF | ±5% | CL31C111JCCNNN□ |
| | | 120pF | ±5% | CL31C121JCCNNN□ |
| | | 130pF | ±5% | CL31C131JCCNNN□ |
| | | 180pF | ±1% | CL31C181FCCNNN□ |
| | | 180pF | ±5% | CL31C181JCCNNN□ |
| | | 200pF | ±5% | CL31C201JCCNNN□ |
| | | 220pF | ±5% | CL31C221JCCNNN□ |
| | | 240pF | ±5% | CL31C241JCCNNN□ |
| | | 270pF | ±5% | CL31C271JCCNNN□ |
| | | 300pF | ±5% | CL31C301JCCNNN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (C0G)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 100Vdc | 330pF | ±1% | CL31C331FCCNNN□ | |
| | | 330pF | ±5% | CL31C331JCCNNN□ | |
| | | 360pF | ±5% | CL31C361JCCNNN□ | |
| | | 390pF | ±5% | CL31C391JCCNNN□ | |
| | | 390pF | ±10% | CL31C391KCCNNN□ | |
| | | 470pF | ±1% | CL31C471FCCNNN□ | |
| | | 470pF | ±2% | CL31C471GCCNNN□ | |
| | | 470pF | ±5% | CL31C471JCCNNN□ | |
| | | 470pF | ±10% | CL31C471KCCNNN□ | |
| | | 510pF | ±5% | CL31C511JCCNNN□ | |
| | | 560pF | ±5% | CL31C561JCCNNN□ | |
| | | 680pF | ±5% | CL31C681JCCNNN□ | |
| | | 750pF | ±5% | CL31C751JCCNNN□ | |
| | | 820pF | ±1% | CL31C821FCCNNN□ | |
| | | 910pF | ±5% | CL31C911JCCNNN□ | |
| | | 1.0nF | ±5% | CL31C102JCCNNN□ | |
| | | 1.2nF | ±5% | CL31C122JCCNNN□ | |
| | | 1.5nF | ±5% | CL31C152JCCNNN□ | |
| | | 1.8nF | ±5% | CL31C182JCCNNN□ | |
| | | 2.2nF | ±5% | CL31C222JCCNNN□ | |
| | 200Vdc | 10pF | ±0.5pF | CL31C100DDCNNN□ | |
| | | 15pF | ±5% | CL31C150JDCNNN□ | |
| | | 36pF | ±5% | CL31C360JDCNNN□ | |
| | | 51pF | ±5% | CL31C510JDCNNN□ | |
| | | 100pF | ±5% | CL31C101JDCNNN□ | |
| | | 200pF | ±5% | CL31C201JDCNNN□ | |
| | | 220pF | ±5% | CL31C221JDCNNN□ | |
| 1.30mm | 630Vdc | 1.0nF | ±5% | CL31C102JHMLNN□ | |
| 1.40mm | 200Vdc | 1.0nF | ±5% | CL31C102JDFNNN□ | |
| | | 1.5nF | ±5% | CL31C152JDFNNN□ | |
| | 500Vdc | 10pF | ±5% | CL31C100JGFNNN□ | |
| | | 15pF | ±2% | CL31C150GGFNNN□ | |
| | | 15pF | ±5% | CL31C150JGFNNN□ | |
| | | 20pF | ±5% | CL31C200JGFNNN□ | |
| | | 22pF | ±5% | CL31C220JGFNNN□ | |
| | | 39pF | ±2% | CL31C390GGFNNN□ | |
| | | 39pF | ±5% | CL31C390JGFNNN□ | |
| | | 47pF | ±2% | CL31C470GGFNNN□ | |
| | | 47pF | ±5% | CL31C470JGFNNN□ | |
| | | 68pF | ±2% | CL31C680GGFNNN□ | |
| | | 68pF | ±5% | CL31C680JGFNNN□ | |
| | | 82pF | ±5% | CL31C820JGFNNN□ | |
| | | 100pF | ±2% | CL31C101GGFNNN□ | |
| | | 100pF | ±5% | CL31C101JGFNNN□ | |
| | | 100pF | ±10% | CL31C101KGFNNN□ | |
| | | 150pF | ±5% | CL31C151JGFNNN□ | |
| | | 220pF | ±2% | CL31C221GGFNNN□ | |
| | | 220pF | ±5% | CL31C221JGFNNN□ | |
| | | 220pF | ±10% | CL31C221KGFNNN□ | |
| | | 270pF | ±2% | CL31C271GGFNNN□ | |
| | | 270pF | ±5% | CL31C271JGFNNN□ | |
| | | 330pF | ±5% | CL31C331JGFNNN□ | |
| | | 470pF | ±2% | CL31C471GGFNNN□ | |
| | | 470pF | ±5% | CL31C471JGFNNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.40mm | 500Vdc | 470pF | ±10% | CL31C471KGFNNN□ | |
| | | 560pF | ±2% | CL31C561GGFNNN□ | |
| | | 560pF | ±5% | CL31C561JGFNNN□ | |
| | 630Vdc | 10pF | ±5% | CL31C100JHFNNN□ | |
| | | 12pF | ±5% | CL31C120JHFNNN□ | |
| | | 15pF | ±5% | CL31C150JHFNNN□ | |
| | | 18pF | ±5% | CL31C180JHFNNN□ | |
| | | 22pF | ±5% | CL31C220JHFNNN□ | |
| | | 22pF | ±5% | CL31C220JHFNNC□ | dv/dt |
| | | 27pF | ±5% | CL31C270JHFNNN□ | |
| | | 33pF | ±5% | CL31C330JHFNNN□ | |
| | | 39pF | ±5% | CL31C390JHFNNN□ | |
| | | 47pF | ±2% | CL31C470GHFNNN□ | |
| | | 47pF | ±5% | CL31C470JHFNNN□ | |
| | | 47pF | ±5% | CL31C470JHFNNC□ | dv/dt |
| | | 47pF | ±10% | CL31C470KHFNNN□ | |
| | | 56pF | ±5% | CL31C560JHFNNN□ | |
| | | 68pF | ±5% | CL31C680JHFNNN□ | |
| | | 82pF | ±5% | CL31C820JHFNNN□ | |
| | | 100pF | ±5% | CL31C101JHFNNN□ | |
| | | 120pF | ±5% | CL31C121JHFNNN□ | |
| | | 150pF | ±5% | CL31C151JHFNNN□ | |
| | | 180pF | ±5% | CL31C181JHFNNN□ | |
| | | 220pF | ±5% | CL31C221JHFNNN□ | |
| | | 220pF | ±10% | CL31C221KHFNNN□ | |
| | | 330pF | ±5% | CL31C331JHFNNN□ | |
| | | 390pF | ±5% | CL31C391JHFNNN□ | |
| | | 470pF | ±5% | CL31C471JHFNNN□ | |
| | 1kVdc | 10pF | ±5% | CL31C100JIFNNN□ | |
| | | 12pF | ±5% | CL31C120JIFNNN□ | |
| | | 15pF | ±5% | CL31C150JIFNNN□ | |
| | | 18pF | ±5% | CL31C180JIFNNN□ | |
| | | 22pF | ±5% | CL31C220JIFNNN□ | |
| | | 33pF | ±5% | CL31C330JIFNNN□ | |
| | | 39pF | ±5% | CL31C390JIFNNN□ | |
| | | 47pF | ±5% | CL31C470JIFNNN□ | |
| | | 56pF | ±5% | CL31C560JIFNNN□ | |
| | | 68pF | ±5% | CL31C680JIFNNN□ | |
| | | 82pF | ±5% | CL31C820JIFNNN□ | |
| | | 100pF | ±5% | CL31C101JIFNNN□ | |
| | | 100pF | ±5% | CL31C101JIFNNC□ | dv/dt |
| | | 120pF | ±5% | CL31C121JIFNNN□ | |
| | | 150pF | ±5% | CL31C151JIFNNN□ | |
| | | 470pF | ±5% | CL31C471JIFNNN□ | |
| 1.80mm | 100Vdc | 3.9nF | ±5% | CL31C392JCHNNN□ | |
| | | 4.7nF | ±5% | CL31C472JCHNNN□ | |
| | | 10nF | ±5% | CL31C103JCHNNN□ | |
| | 200Vdc | 2.2nF | ±5% | CL31C222JDHNNN□ | |
| | | 2.2nF | ±10% | CL31C222KDHNNN□ | |
| | 250Vdc | 2.2nF | ±5% | CL31C222JEHNNN□ | |
| | | 3.9nF | ±5% | CL31C392JEHNNN□ | |
| | | 4.7nF | ±5% | CL31C472JEHNNN□ | |
| | | 5.6nF | ±5% | CL31C562JEHNNN□ | |
| | | 6.8nF | ±5% | CL31C682JEHNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Medium – High Voltage Capacitors

## Product Line Up (C0G)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 250Vdc | 8.2nF | ±5% | CL31C822JEHNNN□ | |
| | 500Vdc | 1.0nF | ±2% | CL31C102GGHNNN□ | |
| | | 1.0nF | ±5% | CL31C102JGHNNN□ | |
| | | 1.5nF | ±5% | CL31C152JGHNNN□ | |
| | | 2.2nF | ±5% | CL31C222JGHNNN□ | |
| | 630Vdc | 680pF | ±5% | CL31C681JHHNNN□ | |
| | | 1.0nF | ±5% | CL31C102JHHNNN□ | |
| | | 1.0nF | ±5% | CL31C102JHHNNC□ | dv/dt |
| | | 1.2nF | ±5% | CL31C122JHHNNN□ | |
| | | 1.5nF | ±5% | CL31C152JHHNNN□ | |
| | | 2.2nF | ±5% | CL31C222JHHNNN□ | |
| | | 2.7nF | ±5% | CL31C272JHHNNN□ | |
| | | 3.3nF | ±5% | CL31C332JHHNNN□ | |
| | 1kVdc | 33pF | ±5% | CL31C330JIHNNN□ | |
| | | 150pF | ±5% | CL31C151JIHNNN□ | |
| | | 180pF | ±5% | CL31C181JIHNNN□ | |
| | | 220pF | ±5% | CL31C221JIHNNN□ | |
| | | 220pF | ±5% | CL31C221JIHNNC□ | dv/dt |
| | | 270pF | ±5% | CL31C271JIHNNN□ | |
| | | 270pF | ±5% | CL31C271JIHNNC□ | dv/dt |
| | | 330pF | ±5% | CL31C331JIHNNN□ | |
| | | 330pF | ±5% | CL31C331JIHNNC□ | dv/dt |
| | | 470pF | ±5% | CL31C471JIHNNN□ | |
| | | 470pF | ±5% | CL31C471JIHNNC□ | dv/dt |
| | 2kVdc | 10pF | ±5% | CL31C100JJHNNN□ | |
| | | 10pF | ±5% | CL31C100JJHNNC□ | dv/dt |
| | | 15pF | ±5% | CL31C150JJHNNN□ | |
| | | 22pF | ±5% | CL31C220JJHNNN□ | |
| | | 33pF | ±5% | CL31C330JJHNNN□ | |
| | | 47pF | ±5% | CL31C470JJHNNN□ | |
| | | 47pF | ±5% | CL31C470JJHNNC□ | dv/dt |
| | | 68pF | ±5% | CL31C680JJHNNN□ | |
| | | 100pF | ±5% | CL31C101JJHNNN□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 100Vdc | 1.0nF | ±10% | CL32C102KCFNNN□ | |
| | | 1.5nF | ±10% | CL32C152KCFNNN□ | |
| | | 4.7nF | ±5% | CL32C472JCFNNN□ | |
| | 500Vdc | 680pF | ±5% | CL32C681JGFNNN□ | |
| | 1kVdc | 330pF | ±5% | CL32C331JIFNNN□ | |
| | 2kVdc | 100pF | ±5% | CL32C101JJFNNN□ | |
| | | 100pF | ±10% | CL32C101KJFNNN□ | |
| | | 150pF | ±5% | CL32C151JJFNNN□ | |
| 1.80mm | 630Vdc | 1.8nF | ±5% | CL32C182JHHNNN□ | |
| | 1kVdc | 470pF | ±5% | CL32C471JIHNNN□ | |
| | 2kVdc | 220pF | ±5% | CL32C221JJHNNN□ | |
| 2.20mm | 2kVdc | 330pF | ±5% | CL32C331JJINNN□ | |
| 2.70mm | 630Vdc | 6.8nF | ±10% | CL32C682KHJNNN□ | |
| | | 8.2nF | ±5% | CL32C822JHJNNN□ | |
| | 2kVdc | 470pF | ±5% | CL32C471JJJNNN□ | |

■ Size : 4.50 X 2.00mm (inch : 1808)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 3kVdc | 5pF | ±5% | CL42C050JKFNNN□ | |
| | | 10pF | ±5% | CL42C100JKFNNN□ | |
| | | 12pF | ±5% | CL42C120JKFNNN□ | |
| | | 15pF | ±5% | CL42C150JKFNNN□ | |
| | | 18pF | ±5% | CL42C180JKFNNN□ | |
| | | 22pF | ±5% | CL42C220JKFNNN□ | |
| | | 27pF | ±5% | CL42C270JKFNNN□ | |
| | | 33pF | ±5% | CL42C330JKFNNN□ | |
| | | 47pF | ±5% | CL42C470JKFNNN□ | |
| | | 68pF | ±5% | CL42C680JKFNNN□ | |
| | | 100pF | ±5% | CL42C101JKFNNN□ | |
| 1.80mm | 2kVdc | 220pF | ±5% | CL42C221JJHNNN□ | |
| 2.20mm | 3kVdc | 150pF | ±5% | CL42C151JKINNN□ | |

■ Size : 4.50 X 3.20mm (inch : 1812)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 100Vdc | 10nF | ±5% | CL43C103JCFNNN□ | |
| 1.80mm | 1kVdc | 820pF | ±5% | CL43C821JIHNNN□ | |
| | | 1.0nF | ±5% | CL43C102JIHNNN□ | |
| 2.20mm | 1kVdc | 1.2nF | ±5% | CL43C122JIINNN□ | |
| 2.70mm | 630Vdc | 22nF | ±5% | CL43C223JHJNNN□ | |
| | 1kVdc | 1.3nF | ±5% | CL43C132JIJNNN□ | |
| | | 1.5nF | ±5% | CL43C152JIJNNN□ | |
| | | 1.6nF | ±5% | CL43C162JIJNNN□ | |
| | | 1.8nF | ±5% | CL43C182JIJNNN□ | |

■ Size : 5.70 X 5.00mm (inch : 2220)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 3kVdc | 1.0nF | ±5% | CL55C102JKJNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 100Vdc | 220pF | ±10% | CL10B221KC8NNN□ | |
| | | 470pF | ±10% | CL10B471KC8NNN□ | |
| | | 680pF | ±5% | CL10B681JC8NNN□ | |
| | | 1.0nF | ±10% | CL10B102KC8NNN□ | |
| | | 1.5nF | ±10% | CL10B152KC8NNN□ | |
| | | 1.8nF | ±10% | CL10B182KC8NNN□ | |
| | | 2.2nF | ±10% | CL10B222KC8NNN□ | |
| | | 2.7nF | ±10% | CL10B272KC8NNN□ | |
| | | 3.3nF | ±5% | CL10B332JC8NNN□ | |
| | | 3.3nF | ±10% | CL10B332KC8NNN□ | |
| | | 3.9nF | ±10% | CL10B392KC8NNN□ | |
| | | 4.7nF | ±10% | CL10B472KC8NNN□ | |
| | | 10nF | ±10% | CL10B103KC8NNN□ | |
| | | 100nF | ±10% | CL10B104KC8NNN□ | |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.75mm | 100Vdc | 100pF | ±5% | CL21B101JCANNN□ | |
| | | 220pF | ±10% | CL21B221KCANNN□ | |
| | | 270pF | ±10% | CL21B271KCANNN□ | |
| | | 330pF | ±5% | CL21B331JCANNN□ | |
| | | 330pF | ±10% | CL21B331KCANNN□ | |
| | | 470pF | ±10% | CL21B471KCANNN□ | |
| | | 1.0nF | ±5% | CL21B102JCANNN□ | |
| | | 1.0nF | ±10% | CL21B102KCANNN□ | |
| | | 1.5nF | ±10% | CL21B152KCANNN□ | |
| | | 2.2nF | ±10% | CL21B222KCANNN□ | |
| | | 3.3nF | ±10% | CL21B332KCANNN□ | |
| | | 3.9nF | ±10% | CL21B392KCANNN□ | |
| | | 4.7nF | ±10% | CL21B472KCANNN□ | |
| | | 6.8nF | ±10% | CL21B682KCANNN□ | |
| | | 8.2nF | ±10% | CL21B822KCANNN□ | |
| | | 10nF | ±5% | CL21B103JCANNN□ | |
| | | 10nF | ±10% | CL21B103KCANNN□ | |
| 0.95mm | 100Vdc | 15nF | ±10% | CL21B153KCCNNN□ | |
| | 200Vdc | 330pF | ±10% | CL21B331KDCNNN□ | |
| | | 470pF | ±10% | CL21B471KDCNNN□ | |
| | | 560pF | ±10% | CL21B561KDCNNN□ | |
| | | 1.0nF | ±5% | CL21B102JDCNNN□ | |
| | | 1.0nF | ±10% | CL21B102KDCNNN□ | |
| | | 1.5nF | ±10% | CL21B152KDCNNN□ | |
| | | 2.2nF | ±10% | CL21B222KDCNNN□ | |
| | | 3.3nF | ±10% | CL21B332KDCNNN□ | |
| | | 4.7nF | ±10% | CL21B472KDCNNN□ | |
| | | 6.8nF | ±10% | CL21B682KDCNNN□ | |
| | | 10nF | ±10% | CL21B103KDCNNN□ | |
| | 250Vdc | 560pF | ±10% | CL21B561KECNNN□ | |
| 1.35mm | 100Vdc | 22nF | ±10% | CL21B223KCFNNN□ | |
| | | 27nF | ±10% | CL21B273KCFNNN□ | |
| | | 33nF | ±10% | CL21B333KCFNNN□ | |
| | | 47nF | ±10% | CL21B473KCFNNN□ | |
| | | 68nF | ±10% | CL21B683KCFNNN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 100Vdc | 100nF | ±10% | CL21B104KCFNNN□ | |
| | | 220nF | ±10% | CL21B224KCFNNN□ | |
| | 250Vdc | 4.7nF | ±10% | CL21B472KEFNNN□ | |
| | | 10nF | ±10% | CL21B103KEFNNN□ | |
| | | 15nF | ±10% | CL21B153KEFNNN□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 100Vdc | 330pF | ±10% | CL31B331KCCNNN□ | |
| | | 470pF | ±10% | CL31B471KCCNNN□ | |
| | | 1.0nF | ±10% | CL31B102KCCNNN□ | |
| | | 1.5nF | ±10% | CL31B152KCCNNN□ | |
| | | 2.2nF | ±10% | CL31B222KCCNNN□ | |
| | | 2.7nF | ±5% | CL31B272JCCNNN□ | |
| | | 3.3nF | ±10% | CL31B332KCCNNN□ | |
| | | 3.9nF | ±10% | CL31B392KCCNNN□ | |
| | | 4.7nF | ±10% | CL31B472KCCNNN□ | |
| | | 6.8nF | ±10% | CL31B682KCCNNN□ | |
| | | 10nF | ±10% | CL31B103KCCNNN□ | |
| | | 18nF | ±10% | CL31B183KCCNNN□ | |
| | | 22nF | ±10% | CL31B223KCCNNN□ | |
| | | 33nF | ±10% | CL31B333KCCNNN□ | |
| | | 47nF | ±5% | CL31B473JCCNNN□ | |
| | | 47nF | ±10% | CL31B473KCCNNN□ | |
| | | 47nF | ±20% | CL31B473MCCNNN□ | |
| | 200Vdc | 470pF | ±10% | CL31B471KDCNNN□ | |
| | | 680pF | ±10% | CL31B681KDCNNN□ | |
| | | 1.0nF | ±10% | CL31B102KDCNNN□ | |
| | | 2.2nF | ±10% | CL31B222KDCNNN□ | |
| | | 3.3nF | ±10% | CL31B332KDCNNN□ | |
| | | 4.7nF | ±10% | CL31B472KDCNNN□ | |
| | | 6.8nF | ±10% | CL31B682KDCNNN□ | |
| | | 10nF | ±10% | CL31B103KDCNNN□ | |
| | | 15nF | ±10% | CL31B153KDCNNN□ | |
| | | 18nF | ±10% | CL31B183KDCNNN□ | |
| | | 22nF | ±5% | CL31B223JDCNNN□ | |
| | | 22nF | ±10% | CL31B223KDCNNN□ | |
| 1.40mm | 100Vdc | 470pF | ±10% | CL31B471KCFNNN□ | |
| | | 100nF | ±5% | CL31B104JCFNNN□ | |
| | | 100nF | ±10% | CL31B104KCFNNN□ | |
| | 200Vdc | 33nF | ±10% | CL31B333KDFNNN□ | |
| | | 47nF | ±10% | CL31B473KDFNNN□ | |
| | 250Vdc | 22nF | ±10% | CL31B223KEFNNN□ | |
| | 500Vdc | 220pF | ±10% | CL31B221KGFNNN□ | |
| | | 470pF | ±10% | CL31B471KGFNNN□ | |
| | | 470pF | ±20% | CL31B471MGFNNN□ | |
| | | 560pF | ±10% | CL31B561KGFNNN□ | |
| | | 680pF | ±10% | CL31B681KGFNNN□ | |
| | | 1.0nF | ±10% | CL31B102KGFNNN□ | |
| | | 1.0nF | ±20% | CL31B102MGFNNN□ | |
| | | 1.5nF | ±10% | CL31B152KGFNNN□ | |
| | | 1.8nF | ±5% | CL31B182JGFNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Medium – High Voltage Capacitors

## Product Line Up (X7R)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.40mm | 500Vdc | 1.8nF | ±10% | CL31B182KGFNNN□ | |
| | | 2.2nF | ±10% | CL31B222KGFNNN□ | |
| | | 2.2nF | ±20% | CL31B222MGFNNN□ | |
| | | 2.7nF | ±10% | CL31B272KGFNNN□ | |
| | | 3.3nF | ±10% | CL31B332KGFNNN□ | |
| | | 4.7nF | ±10% | CL31B472KGFNNN□ | |
| | | 6.8nF | ±10% | CL31B682KGFNNN□ | |
| | | 8.2nF | ±10% | CL31B822KGFNNN□ | |
| | | 10nF | ±10% | CL31B103KGFNNN□ | |
| | | 12nF | ±10% | CL31B123KGFNNN□ | |
| | | 15nF | ±10% | CL31B153KGFNNN□ | |
| | 630Vdc | 220pF | ±10% | CL31B221KHFNNN□ | |
| | | 330pF | ±10% | CL31B331KHFNNN□ | |
| | | 470pF | ±10% | CL31B471KHFNNN□ | |
| | | 560pF | ±10% | CL31B561KHFNNN□ | |
| | | 680pF | ±10% | CL31B681KHFNNN□ | |
| | | 1.0nF | ±10% | CL31B102KHFNNN□ | |
| | | 1.5nF | ±10% | CL31B152KHFNNN□ | |
| | | 2.2nF | ±10% | CL31B222KHFNNN□ | |
| | | 3.3nF | ±10% | CL31B332KHFNNN□ | |
| | | 4.7nF | ±10% | CL31B472KHFNNN□ | |
| | | 6.8nF | ±10% | CL31B682KHFNNN□ | |
| | | 8.2nF | ±5% | CL31B822JHFNNN□ | |
| | | 10nF | ±10% | CL31B103KHFNNN□ | |
| | | 15nF | ±10% | CL31B153KHFNNN□ | |
| | 1kVdc | 680pF | ±10% | CL31B681KIFNNN□ | Derating |
| | | 1.0nF | ±10% | CL31B102KIFNNN□ | Derating |
| | | 2.2nF | ±10% | CL31B222KIFNNN□ | Derating |
| | | 2.5nF | ±10% | CL31B252KIFNNN□ | Derating |
| | | 3.3nF | ±5% | CL31B332JIFNNN□ | Derating |
| | | 4.7nF | ±10% | CL31B472KIFNNN□ | Derating |
| 1.80mm | 100Vdc | 150nF | ±10% | CL31B154KCHNNN□ | |
| | | 220nF | ±10% | CL31B224KCHNNN□ | |
| | | 470nF | ±10% | CL31B474KCHNNN□ | |
| | | 1.0uF | ±10% | CL31B105KCHNNN□ | |
| | 200Vdc | 68nF | ±10% | CL31B683KDHNNN□ | |
| | | 100nF | ±10% | CL31B104KDHNNN□ | |
| | 250Vdc | 33nF | ±10% | CL31B333KEHNNN□ | |
| | | 39nF | ±10% | CL31B393KEHNNN□ | |
| | | 47nF | ±10% | CL31B473KEHNNN□ | |
| | | 100nF | ±10% | CL31B104KEHNNN□ | |
| | 500Vdc | 33nF | ±10% | CL31B333KGHNNN□ | |
| | 630Vdc | 22nF | ±10% | CL31B223KHHNNN□ | |
| | 2kVdc | 220pF | ±10% | CL31B221KJHNNN□ | Derating |
| | | 470pF | ±10% | CL31B471KJHNNN□ | Derating |
| | | 1.0nF | ±10% | CL31B102KJHNNN□ | Derating |
| | | 1.0nF | ±20% | CL31B102MJHNNN□ | Derating |
| | | 1.5nF | ±10% | CL31B152KJHNNN□ | Derating |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 100Vdc | 2.2nF | ±10% | CL32B222KCFNNN□ | |
| | | 4.7nF | ±10% | CL32B472KCFNNN□ | |
| | | 10nF | ±10% | CL32B103KCFNNN□ | |
| | | 47nF | ±10% | CL32B473KCFNNN□ | |
| | | 100nF | ±5% | CL32B104JCFNNN□ | |
| | | 100nF | ±10% | CL32B104KCFNNN□ | |
| | | 150nF | ±10% | CL32B154KCFNNN□ | |
| | 200Vdc | 10nF | ±10% | CL32B103KDFNNN□ | |
| | 500Vdc | 1.8nF | ±5% | CL32B182JGFNNN□ | |
| | | 10nF | ±10% | CL32B103KGFNNN□ | |
| | | 10nF | ±20% | CL32B103MGFNNN□ | |
| | | 15nF | ±20% | CL32B153MGFNNN□ | |
| | | 22nF | ±10% | CL32B223KGFNNN□ | |
| | 630Vdc | 4.7nF | ±20% | CL32B472MHFNNN□ | |
| | 1kVdc | 4.7nF | ±10% | CL32B472KIFNNN□ | Derating |
| | 2kVdc | 1.0nF | ±10% | CL32B102KJFNNN□ | |
| 1.80mm | 100Vdc | 220nF | ±5% | CL32B224JCHNNN□ | |
| | | 220nF | ±10% | CL32B224KCHNNN□ | |
| | | 330nF | ±10% | CL32B334KCHNNN□ | |
| | 250Vdc | 47nF | ±10% | CL32B473KEHNNN□ | |
| | 500Vdc | 47nF | ±10% | CL32B473KGHNNN□ | |
| | 630Vdc | 33nF | ±10% | CL32B333KHHNNN□ | |
| 2.20mm | 100Vdc | 330nF | ±10% | CL32B334KCINNN□ | |
| | | 470nF | ±10% | CL32B474KCINNN□ | |
| 2.70mm | 100Vdc | 430nF | ±10% | CL32B434KCJNNN□ | |
| | | 430nF | ±20% | CL32B434MCJNNN□ | |
| | | 470nF | ±10% | CL32B474KCJNNN□ | |
| | | 1.0uF | ±10% | CL32B105KCJNNN□ | |
| | 250Vdc | 100nF | ±10% | CL32B104KEJNNN□ | |
| | | 150nF | ±10% | CL32B154KEJNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X7R)

### ■ Size : 4.50 X 2.00mm (inch : 1808)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 1kVdc | 1.0nF | ±10% | CL42B102KIFNNN□ | Derating |
| | 2kVdc | 1.0nF | ±10% | CL42B102KJFNNN□ | Derating |

### ■ Size : 4.50 X 3.20mm (inch : 1812)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 100Vdc | 100nF | ±10% | CL43B104KCFNNN□ | |
| | | 100nF | ±20% | CL43B104MCFNNN□ | |
| | | 220nF | ±10% | CL43B224KCFNNN□ | |
| | | 330nF | ±10% | CL43B334KCFNNN□ | |
| | 200Vdc | 1.0nF | ±10% | CL43B102KDFNNN□ | |
| | | 47nF | ±10% | CL43B473KDFNNN□ | |
| | | 47nF | ±20% | CL43B473MDFNNN□ | |
| | | 100nF | ±10% | CL43B104KDFNNN□ | |
| | 500Vdc | 3.3nF | ±10% | CL43B332KGFNNN□ | |
| | | 10nF | ±10% | CL43B103KGFNNN□ | |
| | | 22nF | ±10% | CL43B223KGFNNN□ | |
| | | 33nF | ±10% | CL43B333KGFNNN□ | |
| | | 47nF | ±10% | CL43B473KGFNNN□ | |
| | 1kVdc | 1.0nF | ±10% | CL43B102KIFNNN□ | Derating |
| | | 1.5nF | ±10% | CL43B152KIFNNN□ | Derating |
| | | 2.2nF | ±10% | CL43B222KIFNNN□ | Derating |
| | | 2.7nF | ±10% | CL43B272KIFNNN□ | Derating |
| | | 3.3nF | ±10% | CL43B332KIFNNN□ | Derating |
| | | 4.7nF | ±10% | CL43B472KIFNNN□ | Derating |
| | | 5.0nF | ±10% | CL43B502KIFNNN□ | Derating |
| | | 10nF | ±10% | CL43B103KIFNNN□ | Derating |
| | | 10nF | ±20% | CL43B103MIFNNN□ | Derating |
| | 2kVdc | 1.0nF | ±10% | CL43B102KJFNNN□ | Derating |
| | | 1.5nF | ±10% | CL43B152KJFNNN□ | Derating |
| | | 2.2nF | ±10% | CL43B222KJFNNN□ | Derating |
| 1.80mm | 100Vdc | 470nF | ±10% | CL43B474KCHNNN□ | |
| | | 470nF | ±20% | CL43B474MCHNNN□ | |
| 2.20mm | 500Vdc | 100nF | ±10% | CL43B104KGINNN□ | |
| 2.70mm | 100Vdc | 680nF | ±10% | CL43B684KCJNNN□ | |
| | | 820nF | ±10% | CL43B824KCJNNN□ | |
| | | 1.0uF | ±10% | CL43B105KCJNNN□ | |
| | 200Vdc | 470nF | ±10% | CL43B474KDJNNN□ | |
| | 250Vdc | 220nF | ±10% | CL43B224KEJNNN□ | |
| | | 220nF | ±20% | CL43B224MEJNNN□ | |
| | | 470nF | ±10% | CL43B474KEJNNN□ | |

### ■ Size : 5.70 X 5.00mm (inch : 2220)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 100Vdc | 820nF | ±10% | CL55B824KCHNNN□ | |
| | 2kVdc | 10nF | ±10% | CL55B103KJHNNN□ | Derating |
| 2.70mm | 100Vdc | 470nF | ±10% | CL55B474KCJNNN□ | |
| | | 2.2uF | ±10% | CL55B225KCJNNN□ | |
| | | 3.3uF | ±10% | CL55B335KCJNNN□ | |
| | | 4.7uF | ±10% | CL55B475KCJNNN□ | |
| | 630Vdc | 220nF | ±10% | CL55B224KHJNNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Soft – term Capacitors

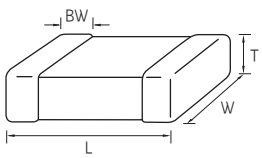
## Feature

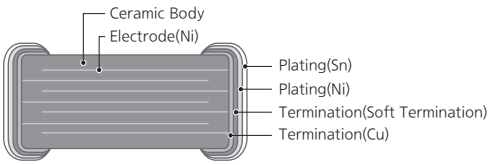
- Soft – Termination relaxes the applied thermal/mechanical stresses by ductile properties of metal–polymer composites.
- Excellent bending strength
- Durability against thermal shock / cycles.

## Application

- Mobile Phone
- DC – DC Converter
- Tablet devices
- PC (Laptop, Desktop)
- HDD / SSD board
- Display

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 03 | 0201 | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 3 | 0.15±0.05 |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| | | 1.00±0.05 | 0.50±0.05 | 0.60±0.10 | 6 | |
| | | 1.00±0.05 | 0.50±0.05 | 0.70±0.10 | 7 | |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.60±0.10 | 6 | 0.50+0.2/–0.3 |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| | | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 | Q | |
| | | 2.00±0.20 | 1.25±0.20 | 1.25±0.20 | Y | |
| 31 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | 0.50±0.30 |
| | | 3.20±0.15 | 1.60±0.15 | 1.10±0.15 | E | |
| | | 3.20±0.15 | 1.60±0.15 | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| | | 3.20±0.15 | 1.60±0.15 | 1.15±0.10 | P | |

## Soft – term Capacitance Table (X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | uF | | | | | | | | | | | |
| | | 100 | 150 | 220 | 330 | 470 | 680 | 1.0 | 1.5 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 15 | 22 | 33 | 47 | 68 | 100 |
| 0201 (0603) | 6.3 | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | |
| 0402 (1005) | 6.3 | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | |
| 0603 (1608) | 6.3 | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | |
| 1206(3216) | 25 | | | | | | | | | | | | | | | | | | | |

## Soft – term Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | | | | | | | | uF | | | | | |
| | | 1.0 | 1.5 | 6.8 | 10 | 15 | 22 | 33 | 47 | 68 | 100 | 150 | 220 | 330 | 470 | 680 | 1.0 | 1.5 | 2.2 | 3.3 | 4.7 | 6.8 | 10 |
| 0805(2012) | 250 | | | | | | | | | | | | | | | | | | | | | | |
| 1206 (3216) | 25 | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | |
| | 350 | | | | | | | | | | | | | | | | | | | | | | |
| 1210 (3225) | 35 | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | |

# Soft – term Capacitors

## Product Line Up (X5R)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 10Vdc | 100nF | ±10% | CL03A104KP3ZNN□ | Derating |
| 0.35mm | 6.3Vdc | 1.0uF | ±20% | CL03A105MQ3ZSN□ | Derating Ref. |
| | 10Vdc | 1.0uF | ±20% | CL03A105MP3ZSN□ | Derating Ref. |
| 0.39mm | 6.3Vdc | 2.2uF | ±20% | CL03A225MQ3ZRN□ | Derating Ref. |

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.57mm | 10Vdc | 2.2uF | ±10% | CL05A225KP5ZSN□ | Derating Ref. |
| 0.65mm | 6.3Vdc | 4.7uF | ±20% | CL05A475MQ5ZRN□ | Derating Ref. |
| | 10Vdc | 4.7uF | ±10% | CL05A475KP5ZRN□ | Derating Ref. |
| 0.70mm | 6.3Vdc | 10uF | ±20% | CL05A106MQ5ZUN□ | Derating Ref. |
| | 10Vdc | 10uF | ±20% | CL05A106MP5ZUN□ | Derating Ref. |
| 0.80mm | 6.3Vdc | 22uF | ±20% | CL05A226MQ6ZUN□ | Derating |
| 0.90mm | 6.3Vdc | 22uF | ±20% | CL05A226MQ7ZUN□ | Derating |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 6.3Vdc | 10uF | ±20% | CL10A106MQ8ZQN□ | Ref. |
| 1.05mm | 6.3Vdc | 22uF | ±20% | CL10A226MQ8ZUN□ | Derating |
| | 10Vdc | 22uF | ±20% | CL10A226MP8ZUN□ | Derating |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 25Vdc | 22uF | ±10% | CL31A226KAHSNN□ | |
| | | 22uF | ±10% | CL31A226KAHZNN□ | |

## Product Line Up (X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 250Vdc | 1.0nF | ±10% | CL21B102KECSNN□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 350Vdc | 10nF | ±10% | CL31B103KFCSNN□ | |
| | | 22nF | ±10% | CL31B223KFCSNN□ | |
| 1.25mm | 350Vdc | 33nF | ±10% | CL31B333KFESNN□ | |
| 1.80mm | 25Vdc | 10uF | ±10% | CL31B106KAHSNN□ | |
| | 50Vdc | 1.0uF | ±10% | CL31B105KBHSNN□ | |
| | 100Vdc | 220nF | ±10% | CL31B224KCHSNN□ | |
| | | 1.0uF | ±10% | CL31B105KCHSNN□ | |
| | | 2.2uF | ±10% | CL31B225KCHSNN□ | |
| | 250Vdc | 100nF | ±10% | CL31B104KEHSNN□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.00mm | 35Vdc | 4.7uF | ±10% | CL32B475KLUYNN□ | |
| | 50Vdc | 4.7uF | ±10% | CL32B475KBUYNN□ | |
| 2.70mm | 100Vdc | 1.0uF | ±10% | CL32B105KCJSNN□ | |
| | | 2.2uF | ±10% | CL32B225KCJSNN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Low Acoustic Noise Capacitor



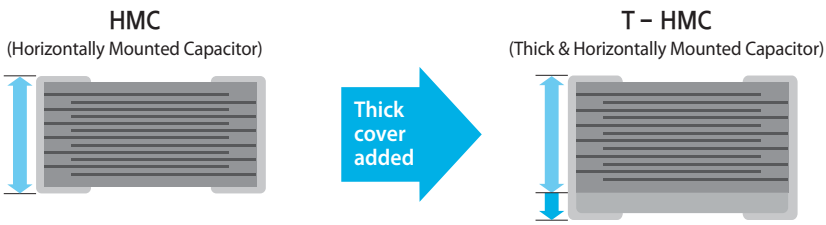
## Feature

- Equivalent electrical characteristics as general products.
- Reduced acoustic noise due to the thick bottom cover.
- Pin-to-pin replacement without changing the substrate land pattern.

## Application

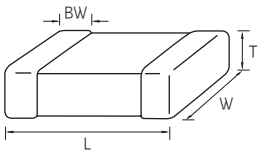
- PAM (GSM / TD-SCDMA / TDD-LTE)
- PMIC
- DC-DC Converter
- Tablet devices
- PC (Laptop, Desktop)
- HDD / SSD board

## Structure and Dimensions




| Structure (Size & Thickness) | |
|---|---|
| Same Dielectric Thickness as Standard MLCC Normal Bottom Cover | Same Dielectric Thickness as Standard MLCC Thick Bottom Cover |

| Performance | |
|---|---|
| Acoustic Noise Reduction without Changing Layout | Significant Acoustic Noise Reduction without Changing Layout |




| Size Code | EIA Code | Dimension(mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | Size Tol. Code | BW |
| 03 | 0201 | 0.60±0.05 | 0.30±0.05 | 0.30±0.05 | 3 | S | 0.15±0.05 |
| 05 | 0402 | 1.00±0.07 | 0.50±0.07 | 0.50±0.07 | 5 | S | 0.25±0.10 |
| | | 1.00±0.15 | 0.50±0.15 | 0.50±0.15 | 5 | R | |
| | | 1.00±0.20 | 0.50±0.20 | 0.50±0.20 | 5 | U | |
| | | 1.00±0.07 | 0.50±0.07 | 0.70±0.10 | 7 | S | |
| | | 1.00±0.15 | 0.50±0.15 | 0.70±0.10 | 7 | R | |
| | | 1.00±0.20 | 0.50±0.20 | 0.80±0.10 | 8 | U | |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | N | 0.30±0.20 |
| | | 1.60±0.20 | 0.80±0.20 | 0.80±0.20 | 8 | R | |
| | | 1.60±0.25 | 0.80±0.25 | 0.80±0.25 | 8 | U | |
| | | 1.60±0.10 | 0.80±0.10 | 0.90±0.10 | 9 | H | |
| | | 1.60±0.20 | 0.80±0.20 | 0.85±0.10 | C | R | |
| | | 1.60±0.25 | 0.80±0.25 | 0.85±0.10 | C | U | |
| | | 1.60±0.10 | 0.80±0.10 | 0.95±0.10 | N | H | |
| | | 1.60±0.25 | 0.80±0.25 | 1.05±0.10 | O | U | |
| | | 1.60±0.20 | 0.80±0.20 | 1.10±0.10 | E | R | |
| | | 1.60±0.25 | 0.80±0.25 | 1.15±0.10 | M | U | |
| 21 | 0805 | 2.00±0.20 | 1.25±0.20 | 1.10±0.10 | E | R | 0.50 +0.20 / -0.30 |
| | | 2.00±0.20 | 1.25±0.20 | 1.15±0.10 | M | R | |
| | | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 | Q | N | |

# Low Acoustic Noise Capacitor

## Low Acoustic Noise Capacitance Table (HMC* / X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | |
|---|---|---|---|---|---|---|
| | | 2.2 | 4.7 | 10 | 22 | 47 |
| 0402 (1005) | 6.3 | ■ | ■ | ■ | | |
| | 10 | ■ | ■ | ■ | | |
| 0603 (1608) | 6.3 | | ■ | ■ | ■ | |
| | 10 | ■ | ■ | ■ | ■ | |
| 0805 (2012) | 6.3 | | | | ■ | ■ |
| | 25 | | ■ | | | |

* HMC : Horizontally Mounted Capacitor

## Low Acoustic Noise Capacitance Table (T – HMC* / X5R)

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 2.2 | 4.7 | 10 | 22 | 47 |
| 0402 (1005) | 0.8 | 6.3 | ■ | ■ | | | |
| | | 10 | ■ | ■ | | | |
| | 0.9 | 6.3 | | | ■ | | |
| | | 10 | | | ■ | | |
| 0603 (1608) | 0.95 | 10 | | | | ■ | |
| | 1.0 | 10 | | ■ | | | |
| | 1.05 | 6.3 | | | ■ | | |
| | | 10 | | | ■ | | |
| | 1.2 | 6.3 | | | | ■ | ■ |
| | 1.25 | 10 | | | | ■ | |
| 0805 (2012) | 1.2 | 25 | | | ■ | | |
| | 1.7 | 25 | | | ■ | | |

* T– HMC : Thick & Horizontally Mounted Capacitor

## Product Line Up (HMC* / X5R)

| Size L × W (mm / inch) | Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|---|
| 0.6 × 0.3 (0201) | 0.35mm | 10Vdc | 1.0uF | ±20% | CL03A105MP3NSNZ | Derating Ref. |
| 1.0 × 0.5 (0402) | 0.57mm | 6.3Vdc | 2.2uF | ±20% | CL05A225MQ5NSNZ | Ref. |
| | | 10Vdc | 2.2uF | ±10% | CL05A225KP5NSNZ | Derating Ref. |
| | 0.65mm | 6.3Vdc | 4.7uF | ±20% | CL05A475MQ5NRNZ | Derating Ref. |
| | | 10Vdc | 4.7uF | ±10% | CL05A475KP5NRNZ | Derating Ref. |
| | 0.70mm | 6.3Vdc | 10uF | ±20% | CL05A106MQ5NUNZ | Derating Ref. |
| | | 10Vdc | 10uF | ±20% | CL05A106MP5NUNZ | Derating Ref. |
| | | 25Vdc | 2.2uF | ±20% | CL05A225MA5NUNZ | Derating Ref. |
| 1.6 × 0.8 (0603) | 0.90mm | 6.3Vdc | 2.2uF | ±10% | CL10A225KQ8NNNZ | |
| | | | 4.7uF | ±10% | CL10A475KQ8NNNZ | |
| | | 10Vdc | 2.2uF | ±10% | CL10A225KP8NNNZ | |
| | | | 4.7uF | ±10% | CL10A475KP8NNNZ | |
| | | | 10uF | ±10% | CL10A106KP8NNNZ | Derating Ref. |
| | | | 10uF | ±20% | CL10A106MP8NNNZ | Derating Ref. |
| | 1.00mm | 6.3Vdc | 22uF | ±20% | CL10A226MQ8NRNR | Derating |
| | 1.05mm | 10Vdc | 22uF | ±20% | CL10A226MP8NUNR | Derating |
| 2.0 × 1.25 (0805) | 1.35mm | 6.3Vdc | 47uF | ±20% | CL21A476MQMNRNR | Derating |
| | 1.40mm | 6.3Vdc | 22uF | ±20% | CL21A226MQQNNNR | |
| | | 25Vdc | 4.7uF | ±10% | CL21A475KAQNNNR | Derating |

* HMC : Horizontally Mounted Capacitor

## Product Line Up ( T – HMC* / X5R)

| Size L × W (mm / inch) | Thickness Max. (mm) | Rated Voltage (Vdc) | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|---|
| 1.0 × 0.5 (0402) | 0.80mm | 6.3Vdc | 2.2uF | ±10% | CL05A225KQ7NSB8 | Ref. |
| | | | 4.7uF | ±20% | CL05A475MQ7NRB8 | Derating Ref. |
| | | 10Vdc | 2.2uF | ±10% | CL05A225KP7NSB8 | Derating Ref. |
| | | | 4.7uF | ±20% | CL05A475MP7NRB8 | Derating Ref. |
| | 0.90mm | 6.3Vdc | 10uF | ±20% | CL05A106MQ8NUB8 | Derating Ref. |
| | | 10Vdc | 10uF | ±20% | CL05A106MP8NUB8 | Derating Ref. |
| 1.6 × 0.8 (0603) | 0.95mm | 6.3Vdc | 22uF | ±20% | CL10A226MQCNRBE | Derating |
| | | 10Vdc | 22uF | ±20% | CL10A226MPCNUBE | Derating |
| | 1.00mm | 10Vdc | 4.7uF | ±10% | CL10A475KP9NHBC | |
| | 1.05mm | 6.3Vdc | 10uF | ±20% | CL10A106MQNNHBC | Ref. |
| | | 10Vdc | 10uF | ±20% | CL10A106MPNNHBC | Derating Ref. |
| | 1.15mm | 6.3Vdc | 22uF | ±20% | CL10A226MQONUBE | Derating |
| | 1.20mm | 6.3Vdc | 47uF | ±20% | CL10A476MQENRBE | Derating |
| | 1.25mm | 10Vdc | 22uF | ±20% | CL10A226MPMNUBE | Derating |
| | | 6.3Vdc | 22uF | ±20% | CL10A226MQMNUBE | Derating |
| 2.0 × 1.25 (0805) | 1.20mm | 25Vdc | 10uF | ±10% | CL21A106KAENRBE | Derating |

* T– HMC : Thick & Horizontally Mounted Capacitor

※ □ mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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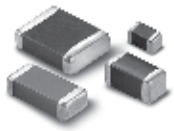
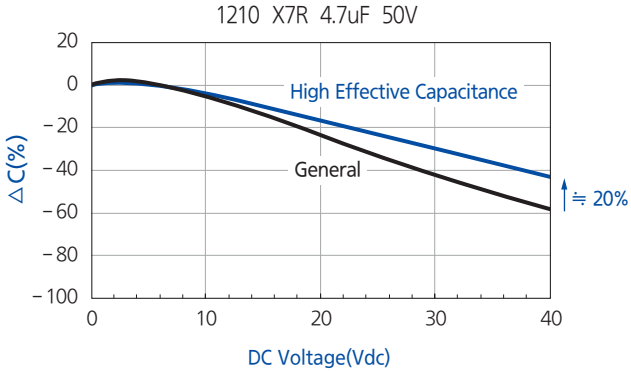
# High Effective Capacitance Capacitors

## Feature



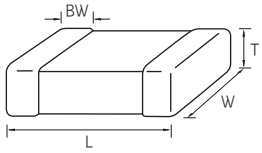
- Wide selection of size : from 0402(inch) to 1210(inch)
- When a DC bias is applied, a capacitance is higher than conventional products.
- Highly reliable performance
- Reduced capacitance degradation by bias and aging
- DC – bias performance (Graph) :

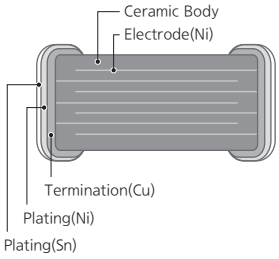



## Application

- HDD / SSD board
- Display
- Digital Camera
- Lighting
- Mobile Phone
- PC (Laptop, Desktop)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.20 | 1.25±0.20 | 0.85±0.10(*) | C | 0.50+0.2/-0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| | | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 | Q | |
| 31 | 1206 | 3.20±0.20 | 1.60±0.20 | 0.85±0.10(*) | C | 0.50±0.30 |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 1.80±0.20(*) | U | 0.60±0.30 |
| | | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | |

* Mark is only applicable to "L","Y","F", 12th code in part number.

## High Effective Capacitance Table (X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(nF) | | Capacitance(uF) | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 680 | 820 | 1.0 | 2.2 | 4.7 | 10 | 22 |
| 0402 (1005) | 6.3 | | | ■ | | | | |
| | 16 | | | ■ | | | | |
| 0603 (1608) | 6.3 | | | ■ | ■ | | ■ | |
| | 10 | ■ | ■ | ■ | ■ | | ■ | |
| | 16 | | | ■ | ■ | | ■ | |
| | 25 | | | ■ | | | | |
| 0805 (2012) | 4.0 | | | | | | ■ | |
| | 6.3 | | | ■ | ■ | ■ | ■ | |
| | 10 | | | ■ | ■ | ■ | ■ | |
| | 16 | | | ■ | ■ | ■ | ■ | |
| | 25 | | | ■ | ■ | ■ | ■ | |
| 1206 (3216) | 16 | | | | | | ■ | |
| | 25 | | | | | ■ | ■ | ■ |

## High Effective Capacitance Table (X6S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | |
|---|---|---|---|---|---|---|
| | | 1.0 | 2.2 | 4.7 | 10 | 22 |
| 0402(1005) | 10 | ■ | | | | |
| 0603 (1608) | 6.3 | | | ■ | | |
| | 10 | | | ■ | | |
| | 16 | | ■ | ■ | | |
| | 25 | | ■ | ■ | | |
| 1206 (3216) | 10 | | | | | ■ |
| | 16 | | | | ■ | ■ |
| | 25 | | | | ■ | ■ |

## High Effective Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | |
|---|---|---|---|---|---|---|
| | | 1.0 | 2.2 | 4.7 | 10 | 22 |
| 0805 (2012) | 10 | | | ■ | | |
| | 25 | ■ | ■ | | | |
| | 50 | ■ | | | | |
| 1206 (3216) | 10 | | | | ■ | |
| | 50 | | | ■ | | |
| 1210 (3225) | 25 | | | | ■ | |
| | 50 | | | ■ | ■ | |

# High Effective Capacitance Capacitors

## Product Line Up (X5R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 6.3Vdc | 1.0uF | ±10% | CL10A105KQ8N3N□ | |
| | 10Vdc | 680nF | ±10% | CL10A684KP8N3N□ | |
| | | 820nF | ±10% | CL10A824KP8N3N□ | |
| | 16Vdc | 1.0uF | ±10% | CL10A105KO8N3N□ | |
| | | 2.2uF | ±10% | CL10A225KO8N3N□ | |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 6.3Vdc | 10uF | ±10% | CL21A106KQCL3R□ | |
| | 10Vdc | 10uF | ±10% | CL21A106KPCL3R□ | Derating |
| | 16Vdc | 10uF | ±10% | CL21A106KOCL3R□ | Derating |
| 1.35mm | 6.3Vdc | 10uF | ±10% | CL21A106KQFN3N□ | |
| | 10Vdc | 10uF | ±10% | CL21A106KPFN3N□ | |
| | 16Vdc | 10uF | ±10% | CL21A106KOFN3N□ | Derating |
| | 25Vdc | 4.7uF | ±10% | CL21A475KAFN3N□ | Derating |
| | | 10uF | ±10% | CL21A106KAFN3N□ | Derating |
| 1.40mm | 4.0Vdc | 10uF | ±10% | CL21A106KRQN3N□ | |
| | 6.3Vdc | 4.7uF | ±10% | CL21A475KQQN3N□ | Ref. |
| | | 10uF | ±10% | CL21A106KQQN3N□ | Ref. |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 16Vdc | 10uF | ±10% | CL31A106KOCL3N□ | Derating |
| | 25Vdc | 4.7uF | ±10% | CL31A475KACL3N□ | |
| | | 10uF | ±10% | CL31A106KACL3N□ | Derating |
| 1.80mm | 25Vdc | 22uF | ±10% | CL31A226KAHN3N□ | Derating |

## Product Line Up (X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 10Vdc | 4.7uF | ±10% | CL21B475KPFN3N□ | Ref. |
| | 25Vdc | 1.0uF | ±10% | CL21B105KAFN3N□ | |
| | | 2.2uF | ±10% | CL21B225KAFN3N□ | |
| | 50Vdc | 1.0uF | ±10% | CL21B105KBFN3N□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 10Vdc | 10uF | ±10% | CL31B106KPHN3N□ | |
| | 50Vdc | 4.7uF | ±10% | CL31B475KBHN3N□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.00mm | 25Vdc | 10uF | ±10% | CL32B106KAUL3N□ | |
| 2.70mm | 50Vdc | 4.7uF | ±10% | CL32B475KBJN3N□ | |

## Product Line Up (X6S)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 25Vdc | 10uF | ±10% | CL31X106KACL3N□ | Derating |
| 1.80mm | 10Vdc | 22uF | ±10% | CL31X226KPHN3N□ | Derating |
| | 16Vdc | 22uF | ±10% | CL31X226KOHN3N□ | Derating |
| | 25Vdc | 22uF | ±10% | CL31X226KAHN3N□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Low ESL Capacitors _ LICC



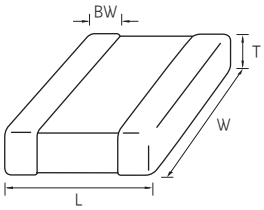
## Feature

- Low ESL, good for noise reduction for high frequency
- Highly reliable performance
- Tape & reel for surface mount assembly

## Application

- High Speed Microprocessor
- High Frequency Digital Equipment

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| L5 | 0204 | 0.52±0.05 | 1.00±0.05 | 0.30±0.05 | 3 | 0.18±0.06 |
| L6 | 0304 | 0.60±0.05 | 1.00±0.05 | 0.40±0.05 | 4 | 0.18±0.10 |
| 01 | 0306 | 0.80±0.05 | 1.60±0.20 | 0.50+0.05/-0.10 | 5 | 0.25±0.15 |

## Low ESL Capacitance Table

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0.01 | 0.1 | 0.22 | 0.47 | 1.0 | 2.2 | 4.3 |
| 0204 (0510) | 2.5 | | | | | X7S | | |
| | 4.0 | | | | X6S | | | |
| | 6.3 | | X7T | | | | | |
| 0304(0610) | 4.0 | | | | | | | X5R |
| 0306 (0816) | 4.0 | | X7S | | | | | |
| | 6.3 | | X7R | | | | | |
| | 10 | | X7R | | | | | |
| | 25 | X7R | | | | | | |

## Product Line Up

| EIA Code | Size L × W | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|---|---|---|
| 0204 | 0.50mm × 1.00mm | 0.35mm | 2.5Vdc | X7T | 1.0uF | ±20% | CLL5Z105MS3NLN□ | Derating |
| | | | 4.0Vdc | X6S | 470nF | ±20% | CLL5X474MR3NLN□ | Derating |
| | | | | X6S | 1.0uF | ±20% | CLL5X105MR3NLN□ | Derating |
| | | | 6.3Vdc | X7S | 100nF | ±20% | CLL5Y104MQ3NLN□ | |
| 0304 | 0.60mm × 1.00mm | 0.45mm | 4.0Vdc | X5R | 4.3uF | ±20% | CLL6A435MR4NLN□ | Derating |
| 0306 | 0.80mm × 1.60mm | 0.55mm | 4.0Vdc | X7S | 100nF | ±20% | CL01Y104MR5NLN□ | |
| | | | | X7S | 1.0uF | ±20% | CL01Y105MR5NLN□ | Derating |
| | | | 6.3Vdc | X7R | 100nF | ±10% | CL01B104KQ5NLN□ | |
| | | | 10Vdc | X7R | 100nF | ±10% | CL01B104KP5NLN□ | |
| | | | 25Vdc | X7R | 10nF | ±10% | CL01B103KA5NLN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Low ESL Capacitors _ SLIC



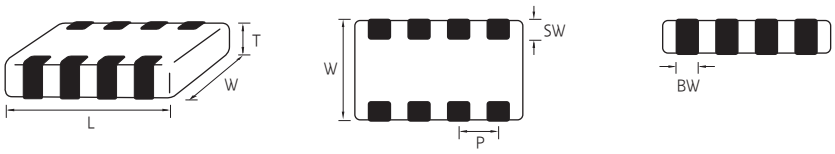
## Feature

- Low ESL, good for noise reduction for high frequency
- Highly reliable performance
- Tape & reel for surface mount assembly

## Application

- High Speed Microprocessor
- High Frequency Digital Equipment

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW | SW | P |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.50+0.05/-0.10 | 5 | 0.25±0.10 | 0.15±0.10 | 0.40±0.10 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.50+0.05/-0.10 | 5 | 0.25+0.15/-0.10 | 0.20+0.15/-0.10 | 0.50±0.10 |

## Low ESL Capacitance Table

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | 0.22 | 0.47 | 0.68 | 1.0 | 2.2 | 4.3 |
| 0603(1608) | 0.55 | 4.0 | | X7S | | | X7S | | |
| 0805(2012) | 0.55 | 4.0 | | | X7R | | | X7S | |

## Product Line Up

| EIA Code | Size L × W | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|---|---|---|
| 0603 | 1.60mm × 0.80mm | 0.55mm | 4.0Vdc | X7S | 100nF | ±20% | CL10Y104MR5NJN□ |
| | | | | X7S | 470nF | ±20% | CL10Y474MR5NJN□ |
| | | | | X7S | 1.0uF | ±20% | CL10Y105MR5NJN□ |
| | | | | X7S | 2.2uF | ±20% | CL10Y225MR5NJN□ |
| 0805 | 2.00mm × 1.25mm | 0.55mm | 4.0Vdc | X7S | 2.2uF | ±20% | CL21Y225MR5NJN□ |
| | | | 6.3Vdc | X7R | 470nF | ±20% | CL21B474MQ5NJN□ |
| | | | | X7R | 680nF | ±20% | CL21B684MQ5NJN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Low ESL Capacitors _ 3T



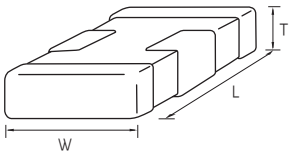
## Feature

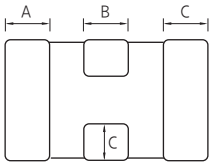
- Low ESL, good for noise reduction for high frequency
- Highly reliable performance
- Tape & reel for surface mount assembly

## Application

- High Speed Microprocessor
  - CPU / GPU for PC & Game console
  - AP for Smartphone
  - Network IC
- High Frequency Digital Equipment

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW | | |
| | | | | | | A | B | C |
| 05 | 0402 | 1.05±0.05 | 0.65±0.05 | 0.45±0.05 | 5 | 0.17±0.10 | 0.35±0.10 | 0.15±0.10 |
| 19 | 0503 | 1.20±0.05 | 0.90±0.05 | 0.75±0.05 | 7 | 0.15±0.10 | 0.50±0.10 | 0.20±0.10 |

## Low ESL Capacitance Table

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1.0 | 2.2 | 4.3 | 10 | 22 | 47 |
| 0402(1005) | 0.5 | 4.0 | | | X5R | | | |
| 0503(1209) | 0.8 | 4.0 | | | | | X5R | |

## Product Line Up

| EIA Code | Size L × W | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|---|---|---|
| 0402 | 1.00mm × 0.50mm | 0.50mm | 4.0Vdc | X5R | 4.3uF | ±20% | CL05A435MR5NWN□ |
| 0503 | 1.20mm × 0.90mm | 0.80mm | 4.0Vdc | X5R | 22uF | ±20% | CL19A226MR7NWN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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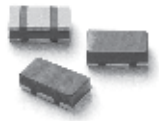
# Low ESL Capacitors _ VLC

## Feature

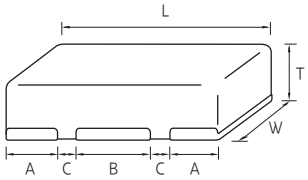


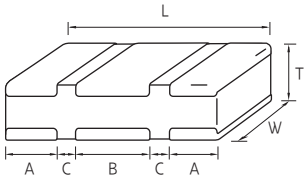
- Lowest ESL, good for noise reduction for high frequency
- Highly reliable performance
- Tape & reel for surface mount assembly

## Application

- High Speed Microprocessor
  - CPU / GPU for PC & Game console
  - AP for Smartphone
  - Network IC
- High Frequency Digital Equipment

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | Band Width | | Band Gap |
| | | | | | | A | B | C |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.70±0.10 | 7 | 0.42±0.10 | 0.74±0.10 | 0.21±0.05 |
| | | | | 0.90±0.10 | 9 | | | |

## Low ESL Capacitance Table

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1.0 | 2.2 | 3.3 | 4.7 | 10 | 22 | 47 |
| 0805(2012) | 0.8 | 4.0 | | | | | | | X5R |
| | 1.0 | 4.0 | | | | | | | X5R |

## Product Line Up

| EIA Code | Size L × W | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|---|---|---|
| 0805 | 2.00mm × 1.25mm | 0.80mm | 4.0Vdc | X5R | 47uF | ±20% | CL21A476MR7NVN□ |
| | | 1.00mm | | X5R | 47uF | ±20% | CL21A476MR9NVN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Low ESL Capacitors _ X2Y®

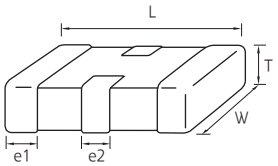
## Feature

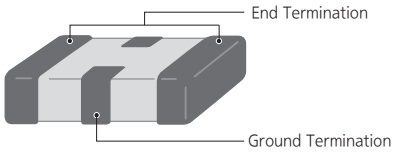
- One device for EMI suppression or decoupling
- Differential and common mode attenuation
- Matched capacitance line to ground, both lines

## Application

- Amplifier FIlter & Decoupling
- High Speed Data Filtering
- EMC I / O Filtering
- FPGA / ASIC / u – P Decoupling
- DDR Memory Decoupling

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | | |
|---|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | e1 | e2 |
| 10 | 0603 | 1.60±0.15 | 0.80±0.10 | 0.60±0.10 | 6 | 0.25±0.15 | 0.45±0.15 |

## Low ESL Capacitance Table

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | nF | | | uF | | | |
| | | | 1.0 | 2.2 | 4.7 | 0.1 | 0.22 | 0.47 | 1.0 |
| 0603 (1608) | 0.7 | 6.3 | | | | | X7R | | X5R |
| | | 10 | | | | | | X5R | |
| | | 16 | | | | X7R | | | |
| | | 25 | | | | | | | |
| | | 50 | X7R | | | | | | |
| | | 100 | | X7R | | | | | |

## Product Line Up

| EIA Code | Size L × W | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|---|---|---|
| 0603 | 1.60mm × 0.80mm | 0.70mm | 6.3Vdc | X7R | 220nF | ±20% | CL10B224MQ6NXN□ |
| | | | | X5R | 1.0uF | ±20% | CL10A105MQ6NXN□ |
| | | | 10Vdc | X5R | 470nF | ±20% | CL10A474MP6NXN□ |
| | | | | X5R | 1.0uF | ±20% | CL10A105MP6NXN□ |
| | | | 16Vdc | X7R | 100nF | ±20% | CL10B104MO6NXN□ |
| | | | | X7R | 220nF | ±20% | CL10B224MO6NXN□ |
| | | | 50Vdc | X7R | 1.0nF | ±20% | CL10B102MB6NXN□ |
| | | | 100Vdc | X7R | 2.2nF | ±20% | CL10B222MC6NXN□ |
| | | | | X7R | 4.7nF | ±20% | CL10B472MC6NXN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Array Type Capacitors

## Feature

- Reduction in required space (more than 50%)
- Reduction in cost and time for replacement of PCB
- Reduction in amount of solder joints
- Easier PCB design
- Reduced waste from tape and reel packaging process
- It protect EMI bypassing digital signal line nose

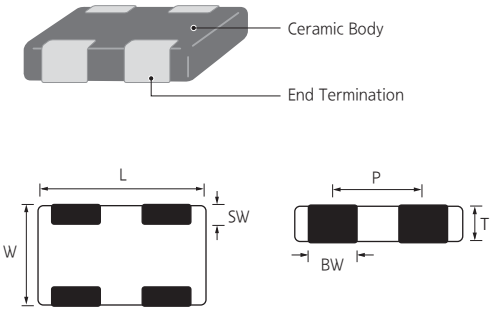
## Application

- A bypass for digital and analog signal line noise generated by telecommunication equipment and other common electronic circuits

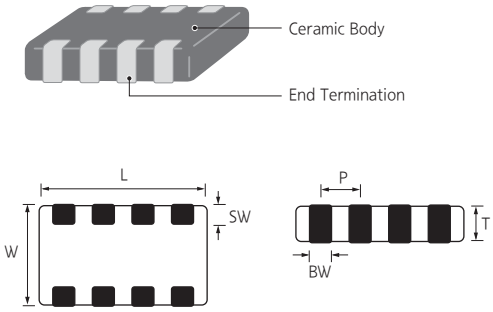
## Structure and Dimensions

| CL | 14 | A | 105 | M | A | 5 | N | A | N | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

■ A : ARRAY (2 – element)




■ B : ARRAY (4 – element)




| Code | Size (mm) | EIA Code | Dimension(mm) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | L | W | T | BW | SW | P |
| A | 0906 | 0302 | 0.90±0.05 | 0.60±0.05 | 0.45±0.05 | 0.25±0.05 | 0.15±0.10 | 0.45±0.05 |
| A | 1410 | 0504 | 1.37±0.15 | 1.00±0.15 | 0.35±0.05 | 0.36±0.10 | 0.20±0.10 | 0.64±0.10 |
| | | | | | 0.50±0.05 | | | |
| | | | | | 0.60±0.06 | | | |
| | | | | | 0.80±0.08 | | | |
| A | 2012 | 0805 | 2.00±0.15 | 1.25±0.15 | 0.85±0.10 | 0.50±0.20 | 0.25±0.15 | 1.00±0.10 |
| B | 2012 | 0805 | 2.00±0.15 | 1.25±0.15 | 0.85±0.10 | 0.25±0.10 | 0.25±0.15 | 0.50±0.10 |
| B | 3216 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | 0.40±0.20 | 0.30±0.15 | 0.80±0.20 |

## Array Type capacitance Table (C0G / X5R / X7R)

| TC | Size inch (mm) | Type | Rated Voltage (Vdc) | T max. (mm) | Capacitance(pF) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 10 | 22 | 27 | 47 | 100 | 470 |
| C0G | 0504(1410) | 2 – element | 25 | 0.88 | | | | | | |
| | 1206(3216) | 4 – element | 50 | 1.00 | | | | | | |

| TC | Size inch (mm) | Type | Rated Voltage (Vdc) | T max. (mm) | Capacitance(nF) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 | 220 | 470 | 1000 | 2200 |
| X5R | 0302(0906) | 2 – element | 4.0 | 0.50 | | | | | | | | | | | |
| | | | 6.3 | | | | | | | | | | | | |
| | | | 10 | | | | | | | | | | | | |
| | 0504(1410) | 2 – element | 6.3 | 0.88 | | | | | | | | | | | |
| | | | | 0.66 | | | | | | | | | | | |
| | | | | 0.55 | | | | | | | | | | | |
| | | | | 0.40 | | | | | | | | | | | |
| | | | 10 | 0.88 | | | | | | | | | | | |
| | | | | 0.66 | | | | | | | | | | | |
| | | | | 0.55 | | | | | | | | | | | |
| | | | | 0.40 | | | | | | | | | | | |
| | | | 16 | 0.88 | | | | | | | | | | | |
| | | | | 0.66 | | | | | | | | | | | |
| | | | | 0.55 | | | | | | | | | | | |
| | | | | 0.40 | | | | | | | | | | | |
| | | | 25 | 0.88 | | | | | | | | | | | |
| | | | | 0.66 | | | | | | | | | | | |
| | | | | 0.55 | | | | | | | | | | | |
| | 0805(2012) | 2 – element | 6.3 | 0.95 | | | | | | | | | | | |
| | | | 10 | | | | | | | | | | | | |
| | | | 16 | | | | | | | | | | | | |
| X7R | 0805(2012) | 4 – element | 10 | 0.95 | | | | | | | | | | | |
| | | | 16 | | | | | | | | | | | | |
| | 1206(3216) | 4 – element | 16 | 1.00 | | | | | | | | | | | |
| | | | 25 | | | | | | | | | | | | |
| | | | 50 | | | | | | | | | | | | |

# Array Type Capacitors

## Product Line Up (C0G / X5R )

■ Size : 0.90 X 0.60mm (inch : 0302)

| Element Type | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|---|---|
| 2 - Array | 0.50mm | 4.0Vdc | X5R | 1.0uF | ±20% | CL09A105MR4NAN□ | Derating |
| | | 6.3Vdc | X5R | 100nF | ±10% | CL09A104KQ4SAN□ | Derating |
| | | | X5R | 1.0uF | ±20% | CL09A105MQ4NAN□ | Derating |
| | | 10Vdc | X5R | 100nF | ±10% | CL09A104KP4SAN□ | |

■ Size : 1.40 X 1.00mm (inch : 0504)

| Element Type | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|---|---|
| 2 - Array | 0.66mm | 25Vdc | C0G | 27pF | ±10% | CL14C270KA6NAN□ | |
| | 0.40mm | 10Vdc | X5R | 1.0uF | ±20% | CL14A105MP3NAN□ | Derating |
| | | 16Vdc | X5R | 1.0uF | ±20% | CL14A105MO3NAN□ | Derating |
| | 0.55mm | 25Vdc | X5R | 1.0uF | ±20% | CL14A105MA5NAN□ | Derating |
| | 0.66mm | 10Vdc | X5R | 100nF | ±10% | CL14A104KP6NAN□ | |
| | | 25Vdc | X5R | 100nF | ±10% | CL14A104KA6NAN□ | |
| | 0.88mm | 10Vdc | X5R | 1.0uF | ±10% | CL14A105KP8NAN□ | Derating |
| | | | X5R | 2.2uF | ±10% | CL14A225KP8NAN□ | Derating |
| | | 16Vdc | X5R | 1.0uF | ±20% | CL14A105MO8NAN□ | Derating |

## Product Line Up (C0G / X5R / X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Element Type | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|---|---|
| 2 - Array | 0.95mm | 10Vdc | X5R | 1.0uF | ±20% | CL21A105MPCNAN□ | |
| | | 16Vdc | X5R | 1.0uF | ±10% | CL21A105KOCNAN□ | |
| 4 - Array | 0.95mm | 10Vdc | X7R | 100nF | ±20% | CL21B104MPCNBN□ | |
| | | 16Vdc | X7R | 100nF | ±10% | CL21B104KOCNBN□ | |
| | | 50Vdc | X7R | 470pF | ±10% | CL21B471KBCNBN□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Element Type | Thickness Max. | Rated Voltage | TC Code | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|---|---|
| 4 - Array | 1.00mm | 50Vdc | C0G | 10pF | ±5% | CL31C100JBCNBN□ | |
| | | | C0G | 15pF | ±5% | CL31C150JBCNBN□ | |
| | | | C0G | 22pF | ±5% | CL31C220JBCNBN□ | |
| | | | C0G | 27pF | ±5% | CL31C270JBCNBN□ | |
| | | | C0G | 33pF | ±10% | CL31C330KBCNBN□ | |
| | | | C0G | 39pF | ±10% | CL31C390KBCNBN□ | |
| | | | C0G | 68pF | ±5% | CL31C680JBCNBN□ | |
| | | | C0G | 82pF | ±5% | CL31C820JBCNBN□ | |
| | | | C0G | 100pF | ±5% | CL31C101JBCNBN□ | |
| | | | C0G | 150pF | ±10% | CL31C151KBCNBN□ | |
| | | | C0G | 180pF | ±5% | CL31C181JBCNBN□ | |
| | | | C0G | 330pF | ±5% | CL31C331JBCNBN□ | |
| | | | C0G | 470pF | ±5% | CL31C471JBCNBN□ | |
| | 1.00mm | 16Vdc | X7R | 100nF | ±10% | CL31B104KOCNBN□ | |
| | | 25Vdc | X7R | 47nF | ±10% | CL31B473KACNBN□ | |
| | | | X7R | 100nF | ±10% | CL31B104KACNBN□ | |
| | | 50Vdc | X7R | 1.0nF | ±20% | CL31B102MBCNBN□ | |
| | | | X7R | 10nF | ±20% | CL31B103MBCNBN□ | |
| | | | X7R | 15nF | ±10% | CL31B153KBCNBN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

In order to move to the page directly, please click the here. ↑

# Industrial Capacitors Part Numbering System

| CL | 32 | B | 106 | K | A | J | N | N | W | E |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

* SEMCO MLCC use 15 – digit Part Numbering system.

| | 8 9 10 Code | Meaning |
|---|---|---|
| Standard Termination | NNW | Industrial Capacitors (Networks, Power, etc) |
| | NFN | Industrial Capacitors for Power Application |
| | GQW / GNW | High Q Industrial Capacitors |
| | N3W | High Effective Capacitance Industrial Capacitors |
| Soft Termination | ZW6 / SW6 | Soft – Termination(3mm) Industrial Capacitors |
| | ZNW / SNW | Soft – termination Industrial Capacitors |
| | ZFN / SFN / YFN | Soft – termination Capacitors for Power Application |
| Reinforced Soft Termination | Z46 | Reinforced Soft – Termination(3mm) Industrial Capacitors |
| | Z4J | Reinforced Soft – Termination(5mm) Industrial Capacitors |

* For the meaning of 8 (N, G, S, Z, and Y), please refer to the Page 05 (Part Numbering System).

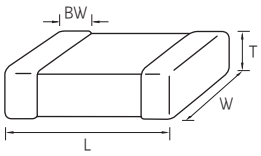
## Feature

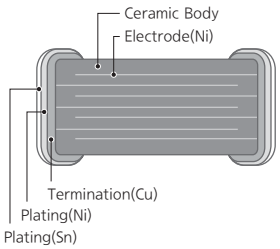
- Rated voltage 6.3V~250V
  temperature range −55℃ to +125℃ (X7R / C0G), −55℃ to +85℃ (X5R),
  case size 0201 to 2220
- Special outgoing inspection for industrial application (HALT, etc)

## Application

- Network, Power application and etc.
- Ideal for decoupling and filtering applications (Class II : X5R / X7R / X6S)
- Impedance matching, tuning, coupling in high frequency circuit (Class I : C0G)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 03 | 0201 | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 3 | 0.15±0.05 |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.65±0.10 | A | 0.50+0.20/−0.30 |
| | | | | 0.85±0.10 | C | |
| | | | | 1.15±0.10 | M | |
| | | | | 1.25±0.10 | F | |
| 31 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | 0.50±0.30 |
| | | | | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 1.25±0.20 | F | 0.60±0.30 |
| | | | | 1.60±0.20 | H | |
| | | | | 2.00±0.20 | I | |
| | | | | 2.50±0.20 | J | |
| 42 | 1808 | 4.50±0.40 | 2.00±0.20 | 1.25±0.20 | F | 0.80±0.30 |
| | | | | 1.60±0.20 | H | |
| | | | | 2.00±0.20 | I | |
| 43 | 1812 | 4.50±0.40 | 3.20±0.30 | 1.25±0.20 | F | 0.80±0.30 |
| | | | | 1.60±0.20 | H | |
| | | | | 2.00±0.20 | I | |
| | | | | 2.50±0.20 | J | |
| 55 | 2220 | 5.70±0.40 | 5.00±0.40 | 2.50±0.20 | J | 1.00±0.30 |

# Industrial Capacitors

## Industrial Capacitance Table (C0G)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(PF) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0.2 | 0.5 | 1.0 | 10 | 22 | 47 | 100 |
| 0201(0603) | 25 | | | | | ■ | ■ | ■ |

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pF | | | | | | | | | | | | | | | | | | | | | | | nF | | | | | | | | | | | | | |
| | | 1.0↓ | 1.0 | 10 | 12 | 15 | 18 | 22 | 33 | 47 | 56 | 91 | 100 | 120 | 180 | 220 | 240 | 270 | 330 | 390 | 470 | 560 | 680 | 910 | 1.0 | 1.2 | 1.8 | 2.2 | 2.7 | 4.7 | 5.6 | 8.2 | 10 | 27 | 33 | 47 | 68 | 100 |
| 0402 (1005) | 25 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | |
| | 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | |
| | 100 | | | | | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603 (1608) | 25 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | |
| | 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | |
| | 100 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | |
| 0805 (2012) | 25 | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | |
| | 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | |
| | 100 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1206 (3216) | 25 | | | | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| | 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| | 100 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | |
| | 500 | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | | | | | | | | | | | | | | |
| | 2k | | | | | | | ■ | ■ | ■ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1210 (3225) | 50 | | | | | | | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | |
| | 1k | | | | | | | | | | | | ■ | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1812(4532) | 50 | | | | | | | | | | | | | | | | | | | | | | | | | | | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |

## Industrial Capacitance Table (X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pF | | | | nF | | | | | | | | | | | | uF | | | |
| | | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 10 | 15 | 22 | 33 | 47 | 68 | 100 | 220 | 470 | 1.0 | 2.2 | 3.3 | 4.7 |
| 0201 (0603) | 4.0 | | | | | | | | | | | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | |

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | uF | | | | | | | |
| | | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 | 220 |
| 0402 (1005) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| 0603 (1608) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| 0805 (2012) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| 1206 (3216) | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| 1210 (3225) | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |

# Industrial Capacitors

## Industrial Capacitance Table (X6S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.1 | 0.22 | 0.47 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 | 220 |
| 0402 (1005) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| 0603 (1608) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| 0805 (2012) | 4.0 | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | |
| 1206(3216) | 4.0 | | | | | | | | | | | |
| 1210 (3225) | 6.3 | | | | | | | | | | | |
| | 10 | | | | | | | | | | | |
| | 16 | | | | | | | | | | | |

## Industrial Capacitance Table (X7R / X7S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pF | | | | | nF | | | | | | | |
| | | 100 | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 22 | 47 | 100 |
| 0201 (0603) | 10 | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | |

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | | | | | | uF | | | | | | | | | |
| | | 4.7 | 10 | 15 | 22 | 33 | 47 | 68 | 100 | 120 | 150 | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 22 | 47 | 100 |
| 0402 (1005) | 6.3 | | | | | | | | | | | | | | | X7S | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | |
| 0603 (1608) | 6.3 | | | | | | | | | | | | | | | | | | | | X7S | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | |

## Industrial Capacitance Table (X7R / X7S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | | | | | | uF | | | | | | | | | |
| | | 4.7 | 10 | 15 | 22 | 33 | 47 | 68 | 100 | 120 | 150 | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 22 | 47 | 100 |
| 0805 (2012) | 6.3 | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| 1206 (3216) | 6.3 | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | 6.8 | | | | | | | | | | | | | | | | | | | | | | |
| | 2k | 2.2 | | | | | | | | | | | | | | | | | | | | | | |
| 1210 (3225) | 6.3 | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | | | | | | | | | | | | |
| | 2k | 1 | | | | | | | | | | | | | | | | | | | | | | |
| 1812 (4532) | 100 | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | | | | | | | | | |
| | 630 | | | | | | | | | | | | | | | | | | | | | | | |
| | 1k | | | | | | | | | | | | | | | | | | | | | | | |
| 2220(5750) | 100 | | | | | | | | | | | | | | | | | | | | | | | |

## Product Line Up (C0G)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 4.7pF | ±0.25pF | CL03C4R7CA3GNW□ |
| | | 10pF | ±0.50pF | CL03C100DA3GNW□ |
| | | 12pF | ±5% | CL03C120JA3NNW□ |
| | | 15pF | ±5% | CL03C150JA3NNW□ |
| | | 27pF | ±5% | CL03C270JA3NNW□ |
| | | 33pF | ±5% | CL03C330JA3NNW□ |
| | | 47pF | ±5% | CL03C470JA3NNW□ |
| | | 56pF | ±5% | CL03C560JA3NNW□ |
| | | 68pF | ±5% | CL03C680JA3NNW□ |
| | | 82pF | ±5% | CL03C820JA3NNW□ |
| | | 100pF | ±5% | CL03C101JA3NNW□ |

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 25Vdc | 82pF | ±10% | CL05C820KA5NNW□ |
| | | 150pF | ±5% | CL05C151JA5NNW□ |
| | | 220pF | ±5% | CL05C221JA5NNW□ |
| | 50Vdc | 0.1pF | ±0.05pF | CL05C0R1AB5GNW□ |
| | | 0.1pF | ±0.1pF | CL05C0R1BB5GNW□ |
| | | 0.2pF | ±0.05pF | CL05C0R2AB5GNW□ |
| | | 0.2pF | ±0.1pF | CL05C0R2BB5GNW□ |
| | | 0.3pF | ±0.05pF | CL05C0R3AB5GNW□ |
| | | 0.3pF | ±0.1pF | CL05C0R3BB5GNW□ |
| | | 0.4pF | ±0.05pF | CL05C0R4AB5GNW□ |
| | | 0.4pF | ±0.1pF | CL05C0R4BB5GNW□ |
| | | 0.5pF | ±0.05pF | CL05C0R5AB5GNW□ |
| | | 0.5pF | ±0.1pF | CL05C0R5BB5GNW□ |
| | | 0.6pF | ±0.05pF | CL05C0R6AB5GNW□ |
| | | 0.6pF | ±0.1pF | CL05C0R6BB5GNW□ |
| | | 0.7pF | ±0.05pF | CL05C0R7AB5GNW□ |
| | | 0.7pF | ±0.1pF | CL05C0R7BB5GNW□ |
| | | 0.8pF | ±0.05pF | CL05C0R8AB5GNW□ |
| | | 0.8pF | ±0.1pF | CL05C0R8BB5GNW□ |
| | | 0.9pF | ±0.05pF | CL05C0R9AB5GNW□ |
| | | 0.9pF | ±0.1pF | CL05C0R9BB5GNW□ |
| | | 1.0pF | ±0.05pF | CL05C010AB5GNW□ |
| | | 1.0pF | ±0.1pF | CL05C010BB5GNW□ |
| | | 1.0pF | ±0.25pF | CL05C010CB5NNW□ |
| | | 1.0pF | ±0.25pF | CL05C010CB5GNW□ |
| | | 1.1pF | ±0.05pF | CL05C1R1AB5GNW□ |
| | | 1.1pF | ±0.1pF | CL05C1R1BB5GNW□ |
| | | 1.1pF | ±0.25pF | CL05C1R1CB5GNW□ |
| | | 1.2pF | ±0.05pF | CL05C1R2AB5GNW□ |
| | | 1.2pF | ±0.1pF | CL05C1R2BB5GNW□ |
| | | 1.2pF | ±0.25pF | CL05C1R2CB5GNW□ |
| | | 1.3pF | ±0.05pF | CL05C1R3AB5GNW□ |
| | | 1.3pF | ±0.1pF | CL05C1R3BB5GNW□ |
| | | 1.3pF | ±0.25pF | CL05C1R3CB5GNW□ |
| | | 1.5pF | ±0.05pF | CL05C1R5AB5GNW□ |
| | | 1.5pF | ±0.1pF | CL05C1R5BB5GNW□ |
| | | 1.5pF | ±0.25pF | CL05C1R5CB5GNW□ |
| | | 1.6pF | ±0.05pF | CL05C1R6AB5GNW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 1.6pF | ±0.1pF | CL05C1R6BB5GNW□ |
| | | 1.6pF | ±0.25pF | CL05C1R6CB5GNW□ |
| | | 1.8pF | ±0.05pF | CL05C1R8AB5GNW□ |
| | | 1.8pF | ±0.1pF | CL05C1R8BB5NNW□ |
| | | 1.8pF | ±0.1pF | CL05C1R8BB5GNW□ |
| | | 1.8pF | ±0.25pF | CL05C1R8CB5GNW□ |
| | | 2.0pF | ±0.05pF | CL05C020AB5GNW□ |
| | | 2.0pF | ±0.1pF | CL05C020BB5GNW□ |
| | | 2.0pF | ±0.25pF | CL05C020CB5GNW□ |
| | | 2.2pF | ±0.05pF | CL05C2R2AB5GNW□ |
| | | 2.2pF | ±0.1pF | CL05C2R2BB5GNW□ |
| | | 2.2pF | ±0.25pF | CL05C2R2CB5NNW□ |
| | | 2.2pF | ±0.25pF | CL05C2R2CB5GNW□ |
| | | 2.4pF | ±0.05pF | CL05C2R4AB5GNW□ |
| | | 2.4pF | ±0.1pF | CL05C2R4BB5NNW□ |
| | | 2.4pF | ±0.1pF | CL05C2R4BB5GNW□ |
| | | 2.4pF | ±0.25pF | CL05C2R4CB5GNW□ |
| | | 2.7pF | ±0.05pF | CL05C2R7AB5GNW□ |
| | | 2.7pF | ±0.1pF | CL05C2R7BB5NNW□ |
| | | 2.7pF | ±0.1pF | CL05C2R7BB5GNW□ |
| | | 2.7pF | ±0.25pF | CL05C2R7CB5NNW□ |
| | | 2.7pF | ±0.25pF | CL05C2R7CB5GNW□ |
| | | 3.0pF | ±0.05pF | CL05C030AB5GNW□ |
| | | 3.0pF | ±0.1pF | CL05C030BB5GNW□ |
| | | 3.0pF | ±0.25pF | CL05C030CB5GNW□ |
| | | 3.3pF | ±0.05pF | CL05C3R3AB5GNW□ |
| | | 3.3pF | ±0.1pF | CL05C3R3BB5NNW□ |
| | | 3.3pF | ±0.1pF | CL05C3R3BB5GNW□ |
| | | 3.3pF | ±0.25pF | CL05C3R3CB5NNW□ |
| | | 3.3pF | ±0.25pF | CL05C3R3CB5GNW□ |
| | | 3.6pF | ±0.05pF | CL05C3R6AB5GNW□ |
| | | 3.6pF | ±0.1pF | CL05C3R6BB5NNW□ |
| | | 3.6pF | ±0.1pF | CL05C3R6BB5GNW□ |
| | | 3.6pF | ±0.25pF | CL05C3R6CB5GNW□ |
| | | 3.9pF | ±0.05pF | CL05C3R9AB5GNW□ |
| | | 3.9pF | ±0.1pF | CL05C3R9BB5GNW□ |
| | | 3.9pF | ±0.25pF | CL05C3R9CB5GNW□ |
| | | 4.0pF | ±0.05pF | CL05C040AB5GNW□ |
| | | 4.0pF | ±0.1pF | CL05C040BB5GNW□ |
| | | 4.0pF | ±0.25pF | CL05C040CB5GNW□ |
| | | 4.3pF | ±0.05pF | CL05C4R3AB5GNW□ |
| | | 4.3pF | ±0.1pF | CL05C4R3BB5GNW□ |
| | | 4.3pF | ±0.25pF | CL05C4R3CB5GNW□ |
| | | 4.7pF | ±0.05pF | CL05C4R7AB5GNW□ |
| | | 4.7pF | ±0.1pF | CL05C4R7BB5GNW□ |
| | | 4.7pF | ±0.25pF | CL05C4R7CB5NNW□ |
| | | 4.7pF | ±0.25pF | CL05C4R7CB5GNW□ |
| | | 5.0pF | ±0.05pF | CL05C050AB5GNW□ |
| | | 5.0pF | ±0.1pF | CL05C050BB5GNW□ |
| | | 5.0pF | ±0.25pF | CL05C050CB5GNW□ |
| | | 5.1pF | ±0.05pF | CL05C5R1AB5GNW□ |
| | | 5.1pF | ±0.1pF | CL05C5R1BB5GNW□ |
| | | 5.1pF | ±0.25pF | CL05C5R1CB5GNW□ |
| | | 5.1pF | ±0.5pF | CL05C5R1DB5GNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 5.6pF | ±0.05pF | CL05C5R6AB5GNW□ |
| | | 5.6pF | ±0.1pF | CL05C5R6BB5GNW□ |
| | | 5.6pF | ±0.25pF | CL05C5R6CB5NNW□ |
| | | 5.6pF | ±0.25pF | CL05C5R6CB5GNW□ |
| | | 5.6pF | ±0.5pF | CL05C5R6DB5GNW□ |
| | | 6.0pF | ±0.05pF | CL05C060AB5GNW□ |
| | | 6.0pF | ±0.1pF | CL05C060BB5GNW□ |
| | | 6.0pF | ±0.25pF | CL05C060CB5GNW□ |
| | | 6.0pF | ±0.5pF | CL05C060DB5GNW□ |
| | | 6.2pF | ±0.05pF | CL05C6R2AB5GNW□ |
| | | 6.2pF | ±0.1pF | CL05C6R2BB5GNW□ |
| | | 6.2pF | ±0.25pF | CL05C6R2CB5GNW□ |
| | | 6.2pF | ±0.5pF | CL05C6R2DB5GNW□ |
| | | 6.8pF | ±0.05pF | CL05C6R8AB5GNW□ |
| | | 6.8pF | ±0.1pF | CL05C6R8BB5NNW□ |
| | | 6.8pF | ±0.1pF | CL05C6R8BB5GNW□ |
| | | 6.8pF | ±0.25pF | CL05C6R8CB5NNW□ |
| | | 6.8pF | ±0.25pF | CL05C6R8CB5GNW□ |
| | | 6.8pF | ±0.5pF | CL05C6R8DB5GNW□ |
| | | 7.0pF | ±0.05pF | CL05C070AB5GNW□ |
| | | 7.0pF | ±0.1pF | CL05C070BB5GNW□ |
| | | 7.0pF | ±0.25pF | CL05C070CB5GNW□ |
| | | 7.0pF | ±0.5pF | CL05C070DB5GNW□ |
| | | 7.5pF | ±0.05pF | CL05C7R5AB5GNW□ |
| | | 7.5pF | ±0.1pF | CL05C7R5BB5GNW□ |
| | | 7.5pF | ±0.25pF | CL05C7R5CB5GNW□ |
| | | 7.5pF | ±0.5pF | CL05C7R5DB5GNW□ |
| | | 8.0pF | ±0.05pF | CL05C080AB5GNW□ |
| | | 8.0pF | ±0.1pF | CL05C080BB5GNW□ |
| | | 8.0pF | ±0.25pF | CL05C080CB5GNW□ |
| | | 8.0pF | ±0.5pF | CL05C080DB5GNW□ |
| | | 8.2pF | ±0.05pF | CL05C8R2AB5GNW□ |
| | | 8.2pF | ±0.1pF | CL05C8R2BB5NNW□ |
| | | 8.2pF | ±0.1pF | CL05C8R2BB5GNW□ |
| | | 8.2pF | ±0.25pF | CL05C8R2CB5GNW□ |
| | | 8.2pF | ±0.5pF | CL05C8R2DB5GNW□ |
| | | 9.0pF | ±0.05pF | CL05C090AB5GNW□ |
| | | 9.0pF | ±0.1pF | CL05C090BB5GNW□ |
| | | 9.0pF | ±0.25pF | CL05C090CB5GNW□ |
| | | 9.0pF | ±0.5pF | CL05C090DB5GNW□ |
| | | 9.1pF | ±0.05pF | CL05C9R1AB5GNW□ |
| | | 9.1pF | ±0.1pF | CL05C9R1BB5GNW□ |
| | | 9.1pF | ±0.25pF | CL05C9R1CB5GNW□ |
| | | 9.1pF | ±0.5pF | CL05C9R1DB5GNW□ |
| | | 10pF | ±1% | CL05C100FB5GNW□ |
| | | 10pF | ±2% | CL05C100GB5GNW□ |
| | | 10pF | ±5% | CL05C100JB5NNW□ |
| | | 10pF | ±5% | CL05C100JB5GNW□ |
| | | 11pF | ±1% | CL05C110FB5GNW□ |
| | | 11pF | ±2% | CL05C110GB5GNW□ |
| | | 11pF | ±5% | CL05C110JB5GNW□ |
| | | 12pF | ±1% | CL05C120FB5GNW□ |
| | | 12pF | ±2% | CL05C120GB5NNW□ |
| | | 12pF | ±2% | CL05C120GB5GNW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 12pF | ±5% | CL05C120JB5NNW□ |
| | | 12pF | ±5% | CL05C120JB5GNW□ |
| | | 15pF | ±1% | CL05C150FB5GNW□ |
| | | 15pF | ±2% | CL05C150GB5GNW□ |
| | | 15pF | ±5% | CL05C150JB5GNW□ |
| | | 18pF | ±1% | CL05C180FB5GNW□ |
| | | 18pF | ±2% | CL05C180GB5GNW□ |
| | | 18pF | ±5% | CL05C180JB5NNW□ |
| | | 18pF | ±5% | CL05C180JB5GNW□ |
| | | 20pF | ±1% | CL05C200FB5GNW□ |
| | | 20pF | ±2% | CL05C200GB5GNW□ |
| | | 20pF | ±5% | CL05C200JB5GNW□ |
| | | 22pF | ±1% | CL05C220FB5GNW□ |
| | | 22pF | ±2% | CL05C220GB5GNW□ |
| | | 22pF | ±5% | CL05C220JB5NNW□ |
| | | 22pF | ±5% | CL05C220JB5GNW□ |
| | | 24pF | ±1% | CL05C240FB5GNW□ |
| | | 24pF | ±2% | CL05C240GB5GNW□ |
| | | 24pF | ±5% | CL05C240JB5NNW□ |
| | | 24pF | ±5% | CL05C240JB5GNW□ |
| | | 27pF | ±1% | CL05C270FB5GNW□ |
| | | 27pF | ±2% | CL05C270GB5GNW□ |
| | | 27pF | ±5% | CL05C270JB5NNW□ |
| | | 27pF | ±5% | CL05C270JB5GNW□ |
| | | 33pF | ±1% | CL05C330FB5GNW□ |
| | | 33pF | ±2% | CL05C330GB5GNW□ |
| | | 33pF | ±5% | CL05C330JB5NNW□ |
| | | 33pF | ±5% | CL05C330JB5GNW□ |
| | | 39pF | ±1% | CL05C390FB5GNW□ |
| | | 39pF | ±2% | CL05C390GB5GNW□ |
| | | 39pF | ±5% | CL05C390JB5NNW□ |
| | | 39pF | ±5% | CL05C390JB5GNW□ |
| | | 47pF | ±1% | CL05C470FB5GNW□ |
| | | 47pF | ±2% | CL05C470GB5GNW□ |
| | | 47pF | ±5% | CL05C470JB5NNW□ |
| | | 47pF | ±5% | CL05C470JB5GNW□ |
| | | 51pF | ±5% | CL05C510JB5NNW□ |
| | | 56pF | ±5% | CL05C560JB5NNW□ |
| | | 68pF | ±5% | CL05C680JB5NNW□ |
| | | 82pF | ±5% | CL05C820JB5NNW□ |
| | | 82pF | ±10% | CL05C820KB5NNW□ |
| | | 100pF | ±5% | CL05C101JB5NNW□ |
| | | 120pF | ±5% | CL05C121JB5NNW□ |
| | | 150pF | ±5% | CL05C151JB5NNW□ |
| | | 180pF | ±5% | CL05C181JB5NNW□ |
| | | 270pF | ±1% | CL05C271FB5NNW□ |
| | | 270pF | ±5% | CL05C271JB5NNW□ |
| | | 330pF | ±5% | CL05C331JB5NNW□ |
| | | 390pF | ±1% | CL05C391FB5NNW□ |
| | | 390pF | ±5% | CL05C391JB5NNW□ |
| | | 470pF | ±1% | CL05C471FB5NNW□ |
| | | 470pF | ±5% | CL05C471JB5NNW□ |
| | | 560pF | ±5% | CL05C561JB5NNW□ |
| | | 680pF | ±5% | CL05C681JB5NNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 820pF | ±5% | CL05C821JB5NNW□ |
| | | 1.0nF | ±5% | CL05C102JB5NNW□ |
| | 100Vdc | 47pF | ±5% | CL05C470JC5NNW□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 1.0pF | ±0.25pF | CL10C010CB8NNW□ |
| | | 1.2pF | ±0.25pF | CL10C1R2CB8NNW□ |
| | | 1.5pF | ±0.1pF | CL10C1R5BB8NNW□ |
| | | 1.5pF | ±0.25pF | CL10C1R5CB8NNW□ |
| | | 2.2pF | ±0.1pF | CL10C2R2BB8NNW□ |
| | | 2.2pF | ±0.25pF | CL10C2R2CB8NNW□ |
| | | 2.7pF | ±0.1pF | CL10C2R7BB8NNW□ |
| | | 2.7pF | ±0.25pF | CL10C2R7CB8NNW□ |
| | | 3.3pF | ±0.1pF | CL10C3R3BB8NNW□ |
| | | 3.3pF | ±0.25pF | CL10C3R3CB8NNW□ |
| | | 3.3pF | ±0.5pF | CL10C3R3DB8NNW□ |
| | | 3.6pF | ±0.25pF | CL10C3R6CB8NNW□ |
| | | 3.9pF | ±0.1pF | CL10C3R9BB8NNW□ |
| | | 3.9pF | ±0.25pF | CL10C3R9CB8NNW□ |
| | | 4.7pF | ±0.1pF | CL10C4R7BB8NNW□ |
| | | 4.7pF | ±0.25pF | CL10C4R7CB8NNW□ |
| | | 4.7pF | ±0.5pF | CL10C4R7DB8NNW□ |
| | | 5.0pF | ±0.1pF | CL10C050BB8NNW□ |
| | | 5.6pF | ±0.25pF | CL10C5R6CB8NNW□ |
| | | 6.2pF | ±0.25pF | CL10C6R2CB8NNW□ |
| | | 6.8pF | ±0.25pF | CL10C6R8CB8NNW□ |
| | | 6.8pF | ±0.5pF | CL10C6R8DB8NNW□ |
| | | 8.2pF | ±0.25pF | CL10C8R2CB8NNW□ |
| | | 9.0pF | ±5% | CL10C090JB8NNW□ |
| | | 10pF | ±0.25pF | CL10C100CB8NNW□ |
| | | 10pF | ±5% | CL10C100JB8NNW□ |
| | | 15pF | ±1% | CL10C150FB8NNW□ |
| | | 15pF | ±5% | CL10C150JB8NNW□ |
| | | 20pF | ±5% | CL10C200JB8NNW□ |
| | | 22pF | ±1% | CL10C220FB8NNW□ |
| | | 22pF | ±2% | CL10C220GB8NNW□ |
| | | 22pF | ±5% | CL10C220JB8NNW□ |
| | | 27pF | ±5% | CL10C270JB8NNW□ |
| | | 30pF | ±5% | CL10C300JB8NNW□ |
| | | 33pF | ±5% | CL10C330JB8NNW□ |
| | | 33pF | ±10% | CL10C330KB8NNW□ |
| | | 47pF | ±5% | CL10C470JB8NNW□ |
| | | 47pF | ±10% | CL10C470KB8NNW□ |
| | | 56pF | ±5% | CL10C560JB8NNW□ |
| | | 68pF | ±5% | CL10C680JB8NNW□ |
| | | 82pF | ±1% | CL10C820FB8NNW□ |
| | | 82pF | ±5% | CL10C820JB8NNW□ |
| | | 100pF | ±1% | CL10C101FB8NNW□ |
| | | 100pF | ±5% | CL10C101JB8NNW□ |
| | | 100pF | ±10% | CL10C101KB8NNW□ |
| | | 120pF | ±5% | CL10C121JB8NNW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 150pF | ±1% | CL10C151FB8NNW□ |
| | | 150pF | ±2% | CL10C151GB8NNW□ |
| | | 150pF | ±5% | CL10C151JB8NNW□ |
| | | 180pF | ±5% | CL10C181JB8NNW□ |
| | | 220pF | ±2% | CL10C221GB8NNW□ |
| | | 220pF | ±5% | CL10C221JB8NNW□ |
| | | 270pF | ±1% | CL10C271FB8NNW□ |
| | | 270pF | ±5% | CL10C271JB8NNW□ |
| | | 330pF | ±5% | CL10C331JB8NNW□ |
| | | 390pF | ±5% | CL10C391JB8NNW□ |
| | | 390pF | ±10% | CL10C391KB8NNW□ |
| | | 470pF | ±5% | CL10C471JB8NNW□ |
| | | 680pF | ±5% | CL10C681JB8NNW□ |
| | | 820pF | ±10% | CL10C821KB8NNW□ |
| | | 1.0nF | ±5% | CL10C102JB8NNW□ |
| | | 1.2nF | ±5% | CL10C122JB8NNW□ |
| | | 1.5nF | ±5% | CL10C152JB8NNW□ |
| | 100Vdc | 10pF | ±5% | CL10C100JC8NNW□ |
| | | 33pF | ±5% | CL10C330JC8NNW□ |
| | | 47pF | ±5% | CL10C470JC8NNW□ |
| | | 82pF | ±5% | CL10C820JC8NNW□ |
| | | 100pF | ±5% | CL10C101JC8NNW□ |
| | | 150pF | ±5% | CL10C151JC8NNW□ |
| | | 220pF | ±5% | CL10C221JC8NNW□ |
| | | 270pF | ±5% | CL10C271JC8NNW□ |
| | | 330pF | ±5% | CL10C331JC8NNW□ |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 50Vdc | 1.0pF | ±0.25pF | CL21C010CBANNW□ |
| | | 1.5pF | ±0.1pF | CL21C1R5BBANNW□ |
| | | 10pF | ±0.5pF | CL21C100DBANNW□ |
| | | 10pF | ±5% | CL21C100JBANNW□ |
| | | 15pF | ±5% | CL21C150JBANNW□ |
| | | 22pF | ±1% | CL21C220FBANNW□ |
| | | 22pF | ±5% | CL21C220JBANNW□ |
| | | 33pF | ±5% | CL21C330JBANNW□ |
| | | 47pF | ±5% | CL21C470JBANNW□ |
| | | 47pF | ±10% | CL21C470KBANNW□ |
| | | 100pF | ±2% | CL21C101GBANNW□ |
| | | 100pF | ±5% | CL21C101JBANNW□ |
| | | 120pF | ±5% | CL21C121JBANNW□ |
| | | 150pF | ±5% | CL21C151JBANNW□ |
| | | 220pF | ±5% | CL21C221JBANNW□ |
| | | 220pF | ±10% | CL21C221KBANNW□ |
| | | 330pF | ±1% | CL21C331FBANNW□ |
| | | 1.0nF | ±5% | CL21C102JBANNW□ |
| | 100Vdc | 15pF | ±5% | CL21C150JCANNW□ |
| | | 100pF | ±5% | CL21C101JCANNW□ |
| | | 150pF | ±5% | CL21C151JCANNW□ |
| 0.95mm | 50Vdc | 680pF | ±5% | CL21C681JBCNNW□ |
| | | 1.0nF | ±5% | CL21C102JBCNNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 100Vdc | 470pF | ±5% | CL21C471JCCNNW□ |
| | | 680pF | ±5% | CL21C681JCCNNW□ |
| | 200Vdc | 220pF | ±5% | CL21C221JDCNNW□ |
| | 250Vdc | 0.5pF | ±0.05pF | CL21C0R5AECGNW□ |
| | | 0.5pF | ±0.1pF | CL21C0R5BECGNW□ |
| | | 0.5pF | ±0.25pF | CL21C0R5CECGNW□ |
| | | 0.6pF | ±0.05pF | CL21C0R6AECGNW□ |
| | | 0.6pF | ±0.1pF | CL21C0R6BECGNW□ |
| | | 0.6pF | ±0.25pF | CL21C0R6CECGNW□ |
| | | 0.7pF | ±0.05pF | CL21C0R7AECGNW□ |
| | | 0.7pF | ±0.1pF | CL21C0R7BECGNW□ |
| | | 0.7pF | ±0.25pF | CL21C0R7CECGNW□ |
| | | 0.8pF | ±0.05pF | CL21C0R8AECGNW□ |
| | | 0.8pF | ±0.1pF | CL21C0R8BECGNW□ |
| | | 0.8pF | ±0.25pF | CL21C0R8CECGNW□ |
| | | 0.9pF | ±0.05pF | CL21C0R9AECGNW□ |
| | | 0.9pF | ±0.1pF | CL21C0R9BECGNW□ |
| | | 0.9pF | ±0.25pF | CL21C0R9CECGNW□ |
| | | 1.0pF | ±0.05pF | CL21C010AECGNW□ |
| | | 1.0pF | ±0.1pF | CL21C010BECGNW□ |
| | | 1.0pF | ±0.25pF | CL21C010CECGNW□ |
| | | 1.1pF | ±0.05pF | CL21C1R1AECGNW□ |
| | | 1.1pF | ±0.1pF | CL21C1R1BECGNW□ |
| | | 1.1pF | ±0.25pF | CL21C1R1CECGNW□ |
| | | 1.2pF | ±0.05pF | CL21C1R2AECGNW□ |
| | | 1.2pF | ±0.1pF | CL21C1R2BECGNW□ |
| | | 1.2pF | ±0.25pF | CL21C1R2CECGNW□ |
| | | 1.3pF | ±0.05pF | CL21C1R3AECGNW□ |
| | | 1.3pF | ±0.1pF | CL21C1R3BECGNW□ |
| | | 1.3pF | ±0.25pF | CL21C1R3CECGNW□ |
| | | 1.5pF | ±0.05pF | CL21C1R5AECGNW□ |
| | | 1.5pF | ±0.1pF | CL21C1R5BECGNW□ |
| | | 1.5pF | ±0.25pF | CL21C1R5CECGNW□ |
| | | 1.6pF | ±0.05pF | CL21C1R6AECGNW□ |
| | | 1.6pF | ±0.1pF | CL21C1R6BECGNW□ |
| | | 1.6pF | ±0.25pF | CL21C1R6CECGNW□ |
| | | 1.8pF | ±0.05pF | CL21C1R8AECGNW□ |
| | | 1.8pF | ±0.1pF | CL21C1R8BECGNW□ |
| | | 1.8pF | ±0.25pF | CL21C1R8CECGNW□ |
| | | 2.0pF | ±0.05pF | CL21C020AECGNW□ |
| | | 2.0pF | ±0.1pF | CL21C020BECGNW□ |
| | | 2.0pF | ±0.25pF | CL21C020CECGNW□ |
| | | 2.2pF | ±0.05pF | CL21C2R2AECGNW□ |
| | | 2.2pF | ±0.1pF | CL21C2R2BECGNW□ |
| | | 2.2pF | ±0.25pF | CL21C2R2CECGNW□ |
| | | 2.4pF | ±0.05pF | CL21C2R4AECGNW□ |
| | | 2.4pF | ±0.1pF | CL21C2R4BECGNW□ |
| | | 2.4pF | ±0.25pF | CL21C2R4CECGNW□ |
| | | 2.7pF | ±0.05pF | CL21C2R7AECGNW□ |
| | | 2.7pF | ±0.1pF | CL21C2R7BECGNW□ |
| | | 2.7pF | ±0.25pF | CL21C2R7CECGNW□ |
| | | 3.0pF | ±0.05pF | CL21C030AECGNW□ |
| | | 3.0pF | ±0.1pF | CL21C030BECGNW□ |
| | | 3.0pF | ±0.25pF | CL21C030CECGNW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 250Vdc | 3.3pF | ±0.05pF | CL21C3R3AECGNW□ |
| | | 3.3pF | ±0.1pF | CL21C3R3BECGNW□ |
| | | 3.3pF | ±0.25pF | CL21C3R3CECGNW□ |
| | | 3.6pF | ±0.05pF | CL21C3R6AECGNW□ |
| | | 3.6pF | ±0.1pF | CL21C3R6BECGNW□ |
| | | 3.6pF | ±0.25pF | CL21C3R6CECGNW□ |
| | | 3.9pF | ±0.05pF | CL21C3R9AECGNW□ |
| | | 3.9pF | ±0.1pF | CL21C3R9BECGNW□ |
| | | 3.9pF | ±0.25pF | CL21C3R9CECGNW□ |
| | | 4.0pF | ±0.05pF | CL21C040AECGNW□ |
| | | 4.0pF | ±0.1pF | CL21C040BECGNW□ |
| | | 4.0pF | ±0.25pF | CL21C040CECGNW□ |
| | | 4.3pF | ±0.05pF | CL21C4R3AECGNW□ |
| | | 4.3pF | ±0.1pF | CL21C4R3BECGNW□ |
| | | 4.3pF | ±0.25pF | CL21C4R3CECGNW□ |
| | | 4.7pF | ±0.05pF | CL21C4R7AECGNW□ |
| | | 4.7pF | ±0.1pF | CL21C4R7BECGNW□ |
| | | 4.7pF | ±0.25pF | CL21C4R7CECGNW□ |
| | | 5.0pF | ±0.05pF | CL21C050AECGNW□ |
| | | 5.0pF | ±0.1pF | CL21C050BECGNW□ |
| | | 5.0pF | ±0.25pF | CL21C050CECGNW□ |
| | | 5.1pF | ±0.05pF | CL21C5R1AECGNW□ |
| | | 5.1pF | ±0.1pF | CL21C5R1BECGNW□ |
| | | 5.1pF | ±0.25pF | CL21C5R1CECGNW□ |
| | | 5.1pF | ±0.5pF | CL21C5R1DECGNW□ |
| | | 5.6pF | ±0.05pF | CL21C5R6AECGNW□ |
| | | 5.6pF | ±0.1pF | CL21C5R6BECGNW□ |
| | | 5.6pF | ±0.25pF | CL21C5R6CECGNW□ |
| | | 5.6pF | ±0.5pF | CL21C5R6DECGNW□ |
| | | 6.0pF | ±0.05pF | CL21C060AECGNW□ |
| | | 6.0pF | ±0.1pF | CL21C060BECGNW□ |
| | | 6.0pF | ±0.25pF | CL21C060CECGNW□ |
| | | 6.0pF | ±0.5pF | CL21C060DECGNW□ |
| | | 6.2pF | ±0.05pF | CL21C6R2AECGNW□ |
| | | 6.2pF | ±0.1pF | CL21C6R2BECGNW□ |
| | | 6.2pF | ±0.25pF | CL21C6R2CECGNW□ |
| | | 6.2pF | ±0.5pF | CL21C6R2DECGNW□ |
| | | 6.8pF | ±0.05pF | CL21C6R8AECGNW□ |
| | | 6.8pF | ±0.1pF | CL21C6R8BECGNW□ |
| | | 6.8pF | ±0.25pF | CL21C6R8CECGNW□ |
| | | 6.8pF | ±0.5pF | CL21C6R8DECGNW□ |
| | | 7.0pF | ±0.05pF | CL21C070AECGNW□ |
| | | 7.0pF | ±0.1pF | CL21C070BECGNW□ |
| | | 7.0pF | ±0.25pF | CL21C070CECGNW□ |
| | | 7.0pF | ±0.5pF | CL21C070DECGNW□ |
| | | 7.5pF | ±0.05pF | CL21C7R5AECGNW□ |
| | | 7.5pF | ±0.1pF | CL21C7R5BECGNW□ |
| | | 7.5pF | ±0.25pF | CL21C7R5CECGNW□ |
| | | 7.5pF | ±0.5pF | CL21C7R5DECGNW□ |
| | | 8.0pF | ±0.05pF | CL21C080AECGNW□ |
| | | 8.0pF | ±0.1pF | CL21C080BECGNW□ |
| | | 8.0pF | ±0.25pF | CL21C080CECGNW□ |
| | | 8.0pF | ±0.5pF | CL21C080DECGNW□ |
| | | 8.2pF | ±0.05pF | CL21C8R2AECGNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 250Vdc | 8.2pF | ±0.1pF | CL21C8R2BECGNW□ |
| | | 8.2pF | ±0.25pF | CL21C8R2CECGNW□ |
| | | 8.2pF | ±0.5pF | CL21C8R2DECGNW□ |
| | | 9.0pF | ±0.05pF | CL21C090AECGNW□ |
| | | 9.0pF | ±0.1pF | CL21C090BECGNW□ |
| | | 9.0pF | ±0.25pF | CL21C090CECGNW□ |
| | | 9.0pF | ±0.5pF | CL21C090DECGNW□ |
| | | 9.1pF | ±0.05pF | CL21C9R1AECGNW□ |
| | | 9.1pF | ±0.1pF | CL21C9R1BECGNW□ |
| | | 9.1pF | ±0.25pF | CL21C9R1CECGNW□ |
| | | 9.1pF | ±0.5pF | CL21C9R1DECGNW□ |
| | | 10pF | ±1% | CL21C100FECGNW□ |
| | | 10pF | ±2% | CL21C100GECGNW□ |
| | | 10pF | ±5% | CL21C100JECGNW□ |
| | | 10pF | ±5% | CL21C100JECNNW□ |
| | | 11pF | ±1% | CL21C110FECGNW□ |
| | | 11pF | ±2% | CL21C110GECGNW□ |
| | | 11pF | ±5% | CL21C110JECGNW□ |
| | | 12pF | ±1% | CL21C120FECGNW□ |
| | | 12pF | ±2% | CL21C120GECGNW□ |
| | | 12pF | ±5% | CL21C120JECGNW□ |
| | | 15pF | ±1% | CL21C150FECGNW□ |
| | | 15pF | ±2% | CL21C150GECGNW□ |
| | | 15pF | ±5% | CL21C150JECGNW□ |
| | | 18pF | ±1% | CL21C180FECGNW□ |
| | | 18pF | ±2% | CL21C180GECGNW□ |
| | | 18pF | ±5% | CL21C180JECGNW□ |
| | | 20pF | ±1% | CL21C200FECGNW□ |
| | | 20pF | ±2% | CL21C200GECGNW□ |
| | | 20pF | ±5% | CL21C200JECGNW□ |
| | | 22pF | ±1% | CL21C220FECGNW□ |
| | | 22pF | ±2% | CL21C220GECGNW□ |
| | | 22pF | ±5% | CL21C220JECGNW□ |
| | | 24pF | ±1% | CL21C240FECGNW□ |
| | | 24pF | ±2% | CL21C240GECGNW□ |
| | | 24pF | ±5% | CL21C240JECGNW□ |
| | | 27pF | ±1% | CL21C270FECGNW□ |
| | | 27pF | ±2% | CL21C270GECGNW□ |
| | | 27pF | ±5% | CL21C270JECGNW□ |
| | | 33pF | ±1% | CL21C330FECGNW□ |
| | | 33pF | ±2% | CL21C330GECGNW□ |
| | | 33pF | ±5% | CL21C330JECGNW□ |
| | | 33pF | ±5% | CL21C330JECNNW□ |
| | | 39pF | ±1% | CL21C390FECGNW□ |
| | | 39pF | ±2% | CL21C390GECGNW□ |
| | | 39pF | ±5% | CL21C390JECGNW□ |
| | | 47pF | ±1% | CL21C470FECGNW□ |
| | | 47pF | ±2% | CL21C470GECGNW□ |
| | | 47pF | ±5% | CL21C470JECGNW□ |
| | | 62pF | ±1% | CL21C620FECGNW□ |
| | | 62pF | ±2% | CL21C620GECGNW□ |
| | | 62pF | ±5% | CL21C620JECGNW□ |
| | | 68pF | ±1% | CL21C680FECGNW□ |
| | | 68pF | ±2% | CL21C680GECGNW□ |
| 0.95mm | 250Vdc | 68pF | ±5% | CL21C680JECGNW□ |
| | | 82pF | ±1% | CL21C820FECGNW□ |
| | | 82pF | ±2% | CL21C820GECGNW□ |
| | | 82pF | ±5% | CL21C820JECGNW□ |
| | | 100pF | ±1% | CL21C101FECGNW□ |
| | | 100pF | ±2% | CL21C101GECGNW□ |
| | | 100pF | ±5% | CL21C101JECGNW□ |
| | | 100pF | ±5% | CL21C101JECNNW□ |
| 1.35mm | 25Vdc | 3.3nF | ±1% | CL21C332FAFNNW□ |
| | 50Vdc | 1.2nF | ±5% | CL21C122JBFNNW□ |
| | | 1.2nF | ±5% | CL21C122JBFNNW□ |
| | | 1.5nF | ±5% | CL21C152JBFNNW□ |
| | | 2.2nF | ±5% | CL21C222JBFNNW□ |
| | | 2.7nF | ±5% | CL21C272JBFNNW□ |
| | | 2.7nF | ±5% | CL21C272JBFNNW□ |
| | | 3.3nF | ±5% | CL21C332JBFNNW□ |
| | | 3.3nF | ±5% | CL21C332JBFNNW□ |
| | | 3.9nF | ±5% | CL21C392JBFNNW□ |
| | | 4.7nF | ±5% | CL21C472JBFNNW□ |
| | | 4.7nF | ±5% | CL21C472JBFNNW□ |
| | 100Vdc | 1.0nF | ±5% | CL21C102JCFNNW□ |
| | 200Vdc | 470pF | ±5% | CL21C471JDFNNW□ |
| | 630Vdc | 39pF | ±5% | CL21C390JHFNNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (C0G)

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 50Vdc | 1.0nF | ±5% | CL31C102JBCNNW□ |
| | | 1.5nF | ±2% | CL31C152GBCNNW□ |
| | 100Vdc | 100pF | ±5% | CL31C101JCCNNW□ |
| | | 220pF | ±5% | CL31C221JCCNNW□ |
| | | 560pF | ±5% | CL31C561JCCNNW□ |
| | | 680pF | ±5% | CL31C681JCCNNW□ |
| | | 2.2nF | ±5% | CL31C222JCCNNW□ |
| 1.40mm | 25Vdc | 10nF | ±1% | CL31C103FAFNNW□ |
| | | 10nF | ±2% | CL31C103GAFNNW□ |
| | 50Vdc | 3.3nF | ±5% | CL31C332JBFNNW□ |
| | 200Vdc | 1.0nF | ±5% | CL31C102JDFNNW□ |
| | 500Vdc | 10pF | ±5% | CL31C100JGFNNW□ |
| | | 39pF | ±5% | CL31C390JGFNNW□ |
| | | 220pF | ±5% | CL31C221JGFNNW□ |
| | | 330pF | ±5% | CL31C331JGFNNW□ |
| | | 470pF | ±5% | CL31C471JGFNNW□ |
| | 630Vdc | 220pF | ±5% | CL31C221JHFNNW□ |
| 1.80mm | 25Vdc | 47nF | ±5% | CL31C473JAHNNW□ |
| | | 100nF | ±5% | CL31C104JAHNNW□ |
| | 50Vdc | 5.6nF | ±5% | CL31C562JBHNNW□ |
| | | 6.8nF | ±5% | CL31C682JBHNNW□ |
| | | 12nF | ±5% | CL31C123JBHNNW□ |
| | | 22nF | ±5% | CL31C223JBHNNW□ |
| | | 27nF | ±5% | CL31C273JBHNNW□ |
| | | 33nF | ±5% | CL31C333JBHNNW□ |
| | 2kVdc | 22pF | ±10% | CL31C220KJHNNW□ |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.45mm | 1kVdc | 100pF | ±10% | CL32C101KIFNNW□ |
| 2.70mm | 100Vdc | 47nF | ±5% | CL32C473JCJNNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Industrial Capacitors

## Product Line Up (X5R)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 6.3Vdc | 10nF | ±10% | CL03A103KQ3NNW□ | |
| | | 100nF | ±10% | CL03A104KQ3NNW□ | Derating |
| | | 220nF | ±10% | CL03A224KQ3NNW□ | Derating Ref. |
| | | 220nF | ±20% | CL03A224MQ3NNW□ | Derating Ref. |
| | 10Vdc | 100nF | ±10% | CL03A104KP3NNW□ | Derating |
| | 25Vdc | 180pF | ±10% | CL03A181KA3NNW□ | Derating |
| | | 330pF | ±10% | CL03A331KA3NNW□ | Derating |
| | | 1.8nF | ±10% | CL03A182KA3NNW□ | Derating |

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 6.3Vdc | 220nF | ±10% | CL05A224KQ5NNW□ | |
| | | 330nF | ±10% | CL05A334KQ5NNW□ | |
| | | 470nF | ±10% | CL05A474KQ5NNW□ | |
| | | 1.0uF | ±10% | CL05A105KQ5NNW□ | Derating |
| | | 1.0uF | ±20% | CL05A105MQ5NNW□ | Derating |
| | | 2.2uF | ±20% | CL05A225MQ5NNW□ | Derating Ref. |
| | 10Vdc | 100nF | ±10% | CL05A104KP5NNW□ | |
| | | 220nF | ±10% | CL05A224KP5NNW□ | |
| | 16Vdc | 22nF | ±10% | CL05A223KO5NNW□ | |
| | | 100nF | ±10% | CL05A104KO5NNW□ | |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 6.3Vdc | 470nF | ±10% | CL10A474KQ8NNW□ | |
| | | 1.0uF | ±10% | CL10A105KQ8NNW□ | |
| | | 2.2uF | ±10% | CL10A225KQ8NNW□ | |
| | | 4.7uF | ±10% | CL10A475KQ8NNW□ | |
| | | 10uF | ±10% | CL10A106KQ8NNW□ | Ref. |
| | | 10uF | ±20% | CL10A106MQ8NNW□ | Ref. |
| | 10Vdc | 220nF | ±10% | CL10A224KP8NNW□ | |
| | | 470nF | ±10% | CL10A474KP8NNW□ | |
| | | 1.0uF | ±10% | CL10A105KP8NNW□ | |
| | | 2.2uF | ±10% | CL10A225KP8NNW□ | |
| | | 10uF | ±10% | CL10A106KP8NNW□ | Derating Ref. |
| | 16Vdc | 1.0uF | ±10% | CL10A105KO8NNW□ | |
| | | 2.2uF | ±10% | CL10A225KO8NNW□ | |
| | | 4.7uF | ±10% | CL10A475KO8NNW□ | Derating |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 16Vdc | 2.2uF | ±10% | CL21A225KOCLNW□ | |
| 1.35mm | 6.3Vdc | 10uF | ±10% | CL21A106KQFNNW□ | |
| | | 10uF | ±20% | CL21A106MQFNNW□ | |
| | | 4.7uF | ±10% | CL21A475KQFNNW□ | |
| | | 4.7uF | ±20% | CL21A475MQFNNW□ | |
| | 10Vdc | 10uF | ±10% | CL21A106KPFNNW□ | |
| | | 2.2uF | ±10% | CL21A225KPFNNW□ | |
| 1.35mm | 10Vdc | 4.7uF | ±10% | CL21A475KPFNNW□ | |
| | 25Vdc | 2.2uF | ±10% | CL21A225KAFNNW□ | |
| 1.40mm | 6.3Vdc | 22uF | ±20% | CL21A226MQQNNW□ | |
| | 16Vdc | 10uF | ±10% | CL21A106KOQNNW□ | Derating |
| | | 22uF | ±10% | CL21A226KOQNNW□ | Derating |
| | 25Vdc | 22uF | ±20% | CL21A226MAQNNW□ | Derating |
| 1.45mm | 6.3Vdc | 47uF | ±20% | CL21A476MQYNNW□ | Derating |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.25mm | 10Vdc | 10uF | ±10% | CL31A106KPPLNW□ | |
| 1.80mm | 6.3Vdc | 10uF | ±10% | CL31A106KQHNNW□ | |
| | | 10uF | ±20% | CL31A106MQHNNW□ | |
| | | 22uF | ±20% | CL31A226MQHNNW□ | |
| | | 47uF | ±20% | CL31A476MQHNNW□ | Derating |
| | | 100uF | ±20% | CL31A107MQHNNW□ | Derating |
| | 10Vdc | 4.7uF | ±10% | CL31A475KPHNNW□ | |
| | | 10uF | ±10% | CL31A106KPHNNW□ | |
| | 16Vdc | 3.3uF | ±10% | CL31A335KOHNNW□ | |
| | | 4.7uF | ±20% | CL31A475MOHNNW□ | |
| | | 10uF | ±10% | CL31A106KOHNNW□ | |
| | | 10uF | ±20% | CL31A106MOHNNW□ | |
| | | 22uF | ±20% | CL31A226MOHNNW□ | Derating |
| | 25Vdc | 10uF | ±10% | CL31A106KAHNNW□ | |
| | | 22uF | ±10% | CL31A226KAHNNW□ | Derating |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 16Vdc | 10uF | ±10% | CL32A106KOCLNW□ | |
| 1.70mm | 16Vdc | 10uF | ±10% | CL32A106KOTLNW□ | |
| 2.00mm | 25Vdc | 10uF | ±10% | CL32A106KAULNW□ | |
| 2.20mm | 10Vdc | 10uF | ±10% | CL32A106KPINNW□ | |
| | 25Vdc | 10uF | ±20% | CL32A106MAILNW□ | |
| 2.70mm | 6.3Vdc | 22uF | ±20% | CL32A226MQJNNW□ | |
| | | 47uF | ±20% | CL32A476MQJNNW□ | |
| | 10Vdc | 22uF | ±20% | CL32A226MPJNNW□ | |
| | | 47uF | ±20% | CL32A476MPJNNW□ | Derating |
| | 16Vdc | 10uF | ±20% | CL32A106MOJNNW□ | |
| | | 22uF | ±10% | CL32A226KOJNNW□ | |
| | | 22uF | ±20% | CL32A226MOJNNW□ | |
| | | 47uF | ±10% | CL32A476KOJNNW□ | |
| | | 47uF | ±20% | CL32A476MOJNNW□ | |
| | 25Vdc | 22uF | ±10% | CL32A226KAJNNW□ | |
| 2.80mm | 6.3Vdc | 100uF | ±20% | CL32A107MQVNNW□ | Derating |
| | 10Vdc | 100uF | ±20% | CL32A107MPVNNW□ | Derating |

■ Size : 4.50 X 3.20mm (inch : 1812)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 3.50mm | 6.3Vdc | 100uF | ±20% | CL43A107MQLNNW□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X6S)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 10Vdc | 1.0uF | ±10% | CL05X105KP5NNW□ | Derating |

■ Size : 1.60 X 0.80 (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 6.3Vdc | 10uF | ±20% | CL10X106MQ8NNW□ | Derating |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.40mm | 4.0Vdc | 22uF | ±20% | CL21X226MRQNNW□ | Derating |
| | 6.3Vdc | 22uF | ±20% | CL21X226MQQNNW□ | Derating |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 4.0Vdc | 47uF | ±20% | CL31X476MRHNNW□ | Derating |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.80mm | 6.3Vdc | 100uF | ±20% | CL32X107MQVNNW□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X7R)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 10Vdc | 10nF | ±10% | CL03B103KP3NNW□ | |
| | 25Vdc | 330pF | ±10% | CL03B331KA3NNW□ | |
| | | 470pF | ±10% | CL03B471KA3NNW□ | |
| | | 1.00nF | ±10% | CL03B102KA3NNW□ | |
| | | 2.20nF | ±10% | CL03B222KA3NNW□ | |

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 6.3Vdc | 220nF | ±10% | CL05B224KQ5NNW□ | |
| | | 470nF | ±10% | CL05B474KQ5NNW□ | Ref. |
| | 10Vdc | 33nF | ±10% | CL05B333KP5NNW□ | |
| | | 100nF | ±10% | CL05B104KP5NNW□ | |
| | 16Vdc | 1.0nF | ±10% | CL05B102KO5NNW□ | |
| | | 5.6nF | ±10% | CL05B562KO5NNW□ | |
| | | 6.8nF | ±10% | CL05B682KO5NNW□ | |
| | | 10nF | ±5% | CL05B103JO5NNW□ | |
| | | 10nF | ±10% | CL05B103KO5NNW□ | |
| | | 10nF | ±20% | CL05B103MO5NNW□ | |
| | | 15nF | ±10% | CL05B153KO5NNW□ | |
| | | 22nF | ±10% | CL05B223KO5NNW□ | |
| | | 33nF | ±10% | CL05B333KO5NNW□ | |
| | | 33nF | ±20% | CL05B333MO5NNW□ | |
| | | 47nF | ±10% | CL05B473KO5NNW□ | |
| | | 47nF | ±20% | CL05B473MO5NNW□ | |
| | | 100nF | ±10% | CL05B104KO5NNW□ | |
| | 25Vdc | 560pF | ±10% | CL05B561KA5NNW□ | |
| | | 1.0nF | ±10% | CL05B102KA5NNW□ | |
| | | 4.7nF | ±10% | CL05B472KA5NNW□ | |
| | | 8.2nF | ±10% | CL05B822KA5NNW□ | |
| | | 10nF | ±10% | CL05B103KA5NNW□ | |
| | | 15nF | ±10% | CL05B153KA5NNW□ | |
| | | 18nF | ±10% | CL05B183KA5NNW□ | |
| | | 33nF | ±10% | CL05B333KA5NNW□ | |
| | 50Vdc | 100pF | ±10% | CL05B101KB5NNW□ | |
| | | 330pF | ±10% | CL05B331KB5NNW□ | |
| | | 470pF | ±10% | CL05B471KB5NNW□ | |
| | | 560pF | ±10% | CL05B561KB5NNW□ | |
| | | 680pF | ±10% | CL05B681KB5NNW□ | |
| | | 820pF | ±10% | CL05B821KB5NNW□ | |
| | | 1.0nF | ±10% | CL05B102KB5NNW□ | |
| | | 1.5nF | ±10% | CL05B152KB5NNW□ | |
| | | 1.8nF | ±10% | CL05B182KB5NNW□ | |
| | | 2.2nF | ±5% | CL05B222JB5NNW□ | |
| | | 2.2nF | ±10% | CL05B222KB5NNW□ | |
| | | 2.7nF | ±10% | CL05B272KB5NNW□ | |
| | | 3.3nF | ±10% | CL05B332KB5NNW□ | |
| | | 3.9nF | ±10% | CL05B392KB5NNW□ | |
| | | 5.6nF | ±10% | CL05B562KB5NNW□ | |
| | | 6.8nF | ±10% | CL05B682KB5NNW□ | |
| | | 8.2nF | ±10% | CL05B822KB5NNW□ | |
| | | 10nF | ±10% | CL05B103KB5NNW□ | |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 10Vdc | 220nF | ±10% | CL10B224KP8NNW□ | |
| | | 330nF | ±10% | CL10B334KP8NNW□ | |
| | | 2.2uF | ±10% | CL10B225KP8NNW□ | Ref. |
| | 16Vdc | 18nF | ±10% | CL10B183KO8NNW□ | |
| | | 22nF | ±10% | CL10B223KO8NNW□ | |
| | | 27nF | ±10% | CL10B273KO8NNW□ | |
| | | 33nF | ±10% | CL10B333KO8NNW□ | |
| | | 47nF | ±10% | CL10B473KO8NNW□ | |
| | | 100nF | ±10% | CL10B104KO8NNW□ | |
| | | 100nF | ±20% | CL10B104MO8NNW□ | |
| | | 120nF | ±10% | CL10B124KO8NNW□ | |
| | | 150nF | ±10% | CL10B154KO8NNW□ | |
| | | 220nF | ±10% | CL10B224KO8NNW□ | |
| | | 330nF | ±10% | CL10B334KO8NNW□ | |
| | | 470nF | ±10% | CL10B474KO8NNW□ | |
| | | 1.0uF | ±20% | CL10B105MO8NNW□ | |
| | 25Vdc | 18nF | ±10% | CL10B183KA8NNW□ | |
| | | 22nF | ±10% | CL10B223KA8NNW□ | |
| | | 27nF | ±10% | CL10B273KA8NNW□ | |
| | | 47nF | ±10% | CL10B473KA8NNW□ | |
| | | 100nF | ±5% | CL10B104JA8NNW□ | |
| | | 100nF | ±10% | CL10B104KA8NNW□ | |
| | | 100nF | ±20% | CL10B104MA8NNW□ | |
| | | 470nF | ±10% | CL10B474KA8NNW□ | |
| | | 1.0uF | ±10% | CL10B105KA8NNW□ | |
| | 50Vdc | 100pF | ±10% | CL10B101KB8NNW□ | |
| | | 150pF | ±10% | CL10B151KB8NNW□ | |
| | | 220pF | ±10% | CL10B221KB8NNW□ | |
| | | 270pF | ±10% | CL10B271KB8NNW□ | |
| | | 330pF | ±10% | CL10B331KB8NNW□ | |
| | | 470pF | ±10% | CL10B471KB8NNW□ | |
| | | 560pF | ±10% | CL10B561KB8NNW□ | |
| | | 680pF | ±10% | CL10B681KB8NNW□ | |
| | | 1.0nF | ±5% | CL10B102JB8NNW□ | |
| | | 1.0nF | ±10% | CL10B102KB8NNW□ | |
| | | 1.2nF | ±10% | CL10B122KB8NNW□ | |
| | | 1.5nF | ±10% | CL10B152KB8NNW□ | |
| | | 1.8nF | ±10% | CL10B182KB8NNW□ | |
| | | 2.2nF | ±10% | CL10B222KB8NNW□ | |
| | | 2.7nF | ±10% | CL10B272KB8NNW□ | |
| | | 3.3nF | ±10% | CL10B332KB8NNW□ | |
| | | 4.7nF | ±10% | CL10B472KB8NNW□ | |
| | | 5.6nF | ±10% | CL10B562KB8NNW□ | |
| | | 5.6nF | ±20% | CL10B562MB8NNW□ | |
| | | 6.8nF | ±10% | CL10B682KB8NNW□ | |
| | | 10nF | ±10% | CL10B103KB8NNW□ | |
| | | 12nF | ±10% | CL10B123KB8NNW□ | |
| | | 15nF | ±10% | CL10B153KB8NNW□ | |
| | | 22nF | ±10% | CL10B223KB8NNW□ | |
| | | 33nF | ±10% | CL10B333KB8NNW□ | |
| | | 47nF | ±10% | CL10B473KB8NNW□ | |
| | | 100nF | ±10% | CL10B104KB8NNW□ | |
| | 100Vdc | 100nF | ±10% | CL10B104KC8NNW□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.75mm | 16Vdc | 150nF | ±10% | CL21B154KOANNW□ | |
| | 25Vdc | 10nF | ±10% | CL21B103KAANNW□ | |
| | 50Vdc | 390pF | ±10% | CL21B391KBANNW□ | |
| | | 1.0nF | ±10% | CL21B102KBANNW□ | |
| | | 2.2nF | ±10% | CL21B222KBANNW□ | |
| | | 3.3nF | ±5% | CL21B332JBANNW□ | |
| | | 3.3nF | ±10% | CL21B332KBANNW□ | |
| | | 4.7nF | ±10% | CL21B472KBANNW□ | |
| | | 6.8nF | ±10% | CL21B682KBANNW□ | |
| | | 10nF | ±10% | CL21B103KBANNW□ | |
| | | 10nF | ±20% | CL21B103MBANNW□ | |
| | | 15nF | ±10% | CL21B153KBANNW□ | |
| | | 22nF | ±10% | CL21B223KBANNW□ | |
| | | 33nF | ±10% | CL21B333KBANNW□ | |
| | 100Vdc | 330pF | ±10% | CL21B331KCANNW□ | |
| | | 1.0nF | ±10% | CL21B102KCANNW□ | |
| | | 2.2nF | ±10% | CL21B222KCANNW□ | |
| 0.95mm | 16Vdc | 100nF | ±5% | CL21B104JOCNNW□ | |
| | | 220nF | ±10% | CL21B224KOCNNW□ | |
| | | 330nF | ±10% | CL21B334KOCNNW□ | |
| | 25Vdc | 100nF | ±10% | CL21B104KACNNW□ | |
| | 50Vdc | 47nF | ±10% | CL21B473KBCNNW□ | |
| | | 100nF | ±10% | CL21B104KBCNNW□ | |
| | | 100nF | ±20% | CL21B104MBCNNW□ | |
| | 200Vdc | 1.0nF | ±10% | CL21B102KDCNNW□ | |
| | | 2.2nF | ±10% | CL21B222KDCNNW□ | |
| | | 4.7nF | ±10% | CL21B472KDCNNW□ | |
| | | 10nF | ±10% | CL21B103KDCNNW□ | |
| 1.35mm | 10Vdc | 1.0uF | ±10% | CL21B105KPFNNW□ | |
| | | 1.0uF | ±20% | CL21B105MPFNNW□ | |
| | | 2.2uF | ±10% | CL21B225KPFNNW□ | |
| | 16Vdc | 470nF | ±10% | CL21B474KOFNNW□ | |
| | | 680nF | ±10% | CL21B684KOFNNW□ | |
| | | 1.0uF | ±10% | CL21B105KOFNNW□ | |
| | | 2.2uF | ±10% | CL21B225KOFNNW□ | |
| | | 4.7uF | ±10% | CL21B475KOFNNW□ | Ref. |
| | 25Vdc | 150nF | ±10% | CL21B154KAFNNW□ | |
| | | 220nF | ±10% | CL21B224KAFNNW□ | |
| | | 470nF | ±10% | CL21B474KAFNNW□ | |
| | | 1.0uF | ±10% | CL21B105KAFNNW□ | |
| | | 2.2uF | ±10% | CL21B225KAFNNW□ | |
| | 50Vdc | 220nF | ±10% | CL21B224KBFNNW□ | |
| | | 330nF | ±10% | CL21B334KBFNNW□ | |
| | | 470nF | ±10% | CL21B474KBFNNW□ | |
| | | 680nF | ±10% | CL21B684KBFNNW□ | |
| | 100Vdc | 18nF | ±10% | CL21B183KCFNNW□ | |
| | | 22nF | ±10% | CL21B223KCFNNW□ | |
| | | 47nF | ±10% | CL21B473KCFNNW□ | |
| | | 100nF | ±10% | CL21B104KCFNNW□ | |
| 1.40mm | 6.3Vdc | 10uF | ±10% | CL21B106KQQNNW□ | |
| | 10Vdc | 10uF | ±10% | CL21B106KPQNNW□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 16Vdc | 470nF | ±10% | CL31B474KOCNNW□ | |
| | | 47nF | ±10% | CL31B473KOCNNW□ | |
| | 50Vdc | 100nF | ±5% | CL31B104JBCNNW□ | |
| | | 100nF | ±10% | CL31B104KBCNNW□ | |
| | | 10nF | ±10% | CL31B103KBCNNW□ | |
| | | 120nF | ±10% | CL31B124KBCNNW□ | |
| | | 150nF | ±10% | CL31B154KBCNNW□ | |
| | | 1.0nF | ±10% | CL31B102KBCNNW□ | |
| | | 3.3nF | ±5% | CL31B332JBCNNW□ | |
| | | 47nF | ±10% | CL31B473KBCNNW□ | |
| | 100Vdc | 10nF | ±5% | CL31B103JCCNNW□ | |
| | | 10nF | ±20% | CL31B103MCCNNW□ | |
| | | 15nF | ±10% | CL31B153KCCNNW□ | |
| | | 1.0nF | ±10% | CL31B102KCCNNW□ | |
| | | 22nF | ±10% | CL31B223KCCNNW□ | |
| | | 33nF | ±10% | CL31B333KCCNNW□ | |
| | | 47nF | ±10% | CL31B473KCCNNW□ | |
| | | 47nF | ±20% | CL31B473MCCNNW□ | |
| 1.25mm | 25Vdc | 1.0uF | ±10% | CL31B105KAPLNW□ | Derating |
| 1.40mm | 10Vdc | 2.2uF | ±10% | CL31B225KPFNNW□ | |
| | 16Vdc | 1.0uF | ±10% | CL31B105KOFNNW□ | |
| | | 1.0uF | ±20% | CL31B105MOFNNW□ | |
| | 50Vdc | 220nF | ±10% | CL31B224KBFNNW□ | |
| | | 220nF | ±20% | CL31B224MBFNNW□ | |
| | | 330nF | ±10% | CL31B334KBFNNW□ | |
| | 100Vdc | 100nF | ±10% | CL31B104KCFNNW□ | |
| | 200Vdc | 33nF | ±10% | CL31B333KDFNNW□ | |
| | | 47nF | ±10% | CL31B473KDFNNW□ | |
| | 500Vdc | 4.7nF | ±10% | CL31B472KGFNNW□ | |
| | | 6.8nF | ±10% | CL31B682KGFNNW□ | |
| 1.80mm | 6.3Vdc | 22uF | ±10% | CL31B226KQHNNW□ | |
| | 10Vdc | 10uF | ±10% | CL31B106KPHNNW□ | |
| | | 22uF | ±10% | CL31B226KPHNNW□ | |
| | | 4.7uF | ±10% | CL31B475KPHNNW□ | |
| | 16Vdc | 10uF | ±10% | CL31B106KOHNNW□ | |
| | | 2.2uF | ±10% | CL31B225KOHNNW□ | |
| | | 4.7uF | ±10% | CL31B475KOHNNW□ | |
| | 25Vdc | 10uF | ±10% | CL31B106KAHNNW□ | |
| | | 1.0uF | ±5% | CL31B105JAHNNW□ | |
| | | 1.0uF | ±10% | CL31B105KAHNNW□ | |
| | | 1.0uF | ±20% | CL31B105MAHNNW□ | |
| | | 2.2uF | ±10% | CL31B225KAHNNW□ | |
| | | 4.7uF | ±10% | CL31B475KAHNNW□ | |
| | 50Vdc | 1.0uF | ±10% | CL31B105KBHNNW□ | |
| | | 2.2uF | ±10% | CL31B225KBHNNW□ | |
| | | 470nF | ±10% | CL31B474KBHNNW□ | |
| | 100Vdc | 1.0uF | ±10% | CL31B105KCHNNW□ | |
| | 200Vdc | 68nF | ±10% | CL31B683KDHNNW□ | |
| | 250Vdc | 47nF | ±10% | CL31B473KEHNNW□ | |
| | 2kVdc | 2.2nF | ±10% | CL31B222KJHNNW□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Industrial Capacitors

## Product Line Up (X7R)

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 25Vdc | 470nF | ±10% | CL32B474KAFNNW□ | |
| | | 470nF | ±20% | CL32B474MAFNNW□ | |
| | | 1.0uF | ±10% | CL32B105KAFNNW□ | |
| | 50Vdc | 100nF | ±20% | CL32B104MBFNNW□ | |
| | | 220nF | ±10% | CL32B224KBFNNW□ | |
| | | 330nF | ±10% | CL32B334KBFNNW□ | |
| | | 470nF | ±10% | CL32B474KBFNNW□ | |
| | 100Vdc | 100nF | ±10% | CL32B104KCFNNW□ | |
| | | 150nF | ±10% | CL32B154KCFNNW□ | |
| | 500Vdc | 22nF | ±10% | CL32B223KGFNNW□ | |
| | 2kVdc | 1.0nF | ±10% | CL32B102KJFNNW□ | |
| 1.80mm | 100Vdc | 220nF | ±10% | CL32B224KCHNNW□ | |
| | | 330nF | ±10% | CL32B334KCHNNW□ | |
| | 200Vdc | 47nF | ±10% | CL32B473KDHNNW□ | |
| | 250Vdc | 47nF | ±10% | CL32B473KEHNNW□ | |
| 2.00mm | 50Vdc | 4.7uF | ±10% | CL32B475KBUYNW□ | |
| 2.20mm | 16Vdc | 4.7uF | ±10% | CL32B475KOINNW□ | |
| | 25Vdc | 2.2uF | ±10% | CL32B225KAINNW□ | |
| | 630Vdc | 47nF | ±10% | CL32B473KHINNW□ | |
| 2.70mm | 10Vdc | 47uF | ±10% | CL32B476KPJNNW□ | Ref. |
| | 16Vdc | 22uF | ±10% | CL32B226KOJNNW□ | |
| | | 22uF | ±20% | CL32B226MOJNNW□ | |
| | 25Vdc | 10uF | ±10% | CL32B106KAJNNW□ | |
| | | 22uF | ±10% | CL32B226KAJNNW□ | |
| | | 22uF | ±20% | CL32B226MAJNNW□ | |
| | 50Vdc | 3.3uF | ±10% | CL32B335KBJNNW□ | |
| | | 10uF | ±10% | CL32B106KBJNNW□ | |
| | 100Vdc | 680nF | ±10% | CL32B684KCJNNW□ | |
| | | 1.0uF | ±10% | CL32B105KCJNNW□ | |
| | 200Vdc | 100nF | ±10% | CL32B104KDJNNW□ | |

■ Size : 4.50 X 3.20mm (inch : 1812)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.45mm | 200Vdc | 100nF | ±10% | CL43B104KDFNNW□ | |
| | 1kVdc | 10nF | ±10% | CL43B103KIFNNW□ | Derating |
| 1.80mm | 100Vdc | 470nF | ±10% | CL43B474KCHNNW□ | |
| 2.70mm | 250Vdc | 220nF | ±10% | CL43B224KEJNNW□ | |
| | 1kVdc | 22nF | ±10% | CL43B223KIJNNW□ | Derating |

■ Size : 5.70 X 5.00mm (inch : 2220)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 100Vdc | 1.0uF | ±10% | CL55B105KCHNNW□ | |

## Product Line Up (X7S)

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 50Vdc | 10uF | ±10% | CL32Y106KBJNNW□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Soft-Termination Industrial Capacitors



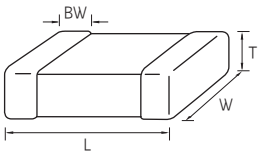
## Feature

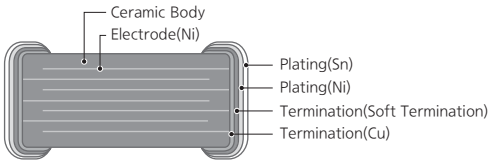
- Soft – Termination relaxes the applied thermal / mechanical stresses by ductile properties of metal – polymer composites.
- Can be applied to power (SMPS, DC – DC Converter) and industrial equipment
- ZNW, SNW series : Metal Epoxy
- Speical outgoing inspection for industrial application (HALT, etc)

## Application

- Power(SMPS, DC – DC converter)
- Ideal for decoupling and filtering applications(Class II : X7R / X6S)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.65±0.10 | A | 0.50+0.20/-0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 1.15±0.10 | M | |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| 31 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | 0.50±0.30 |
| | | 3.20±0.15 | 1.60±0.15 | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 1.25±0.20 | F | 0.60±0.30 |
| | | 3.20±0.30 | 2.50±0.20 | 1.60±0.20 | H | |
| | | 3.20±0.30 | 2.50±0.20 | 2.00±0.20 | I | |
| | | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | |

# Soft-Termination Industrial Capacitors

## Industrial Capacitance Table (X6S / X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | uF | | | | | |
| | | 68 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 |
| 0805(2012) | 100 | | | | | | | | | | |
| 1206(3216) | 100 | | | | | | | | | | |
| 1210 (3225) | 16 | | | | | | | | | | X6S |
| | 100 | | | | | | | | | | |

## Product Line Up (X6S)

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.80mm | 10Vdc | 47uF | ±10% | CL32X476KOVZNW□ | Derating |

## Product Line Up ( X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 100Vdc | 100nF | ±10% | CL21B104KCFSNW□ | |
| | | 220nF | ±10% | CL21B224KCFSNW□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 100Vdc | 1.0uF | ±10% | CL31B105KCHSNW□ | |
| | | 2.2uF | ±10% | CL31B225KCHSNW□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 100Vdc | 1.0uF | ±10% | CL32B105KCJSNW□ | |
| | | 2.2uF | ±10% | CL32B225KCJSNW□ | |
| 2.80mm | 100Vdc | 4.7uF | ±10% | CL32B475KCVZNW□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Industrial Capacitors for Power Application



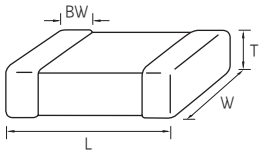
## Feature

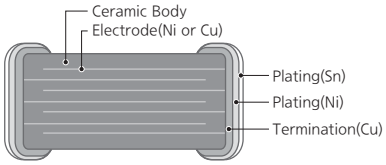
- Rated voltage 6.3V~100V,
  Temperature range –55℃ to +125℃ (C0G / X7R), –55℃ to +105℃ (X6S), –55℃ to +85℃ (X5R),
  Case size 0201 to 1210.
- Special outgoing inspection for Power application
  (Bending Test : Sampling Test upto 2mm : X7R, 3mm : C0G)

## Application

- Power supply (SMPS, DC – DC converter)
- Ideal for decoupling and filtering applications (Class II : X7R / X6S / X5R)
- Impedance matching, tuning, coupling in high frequency circuit (Class I : C0G)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 03 | 0201 | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 3 | 0.15±0.05 |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.65±0.10 | A | 0.50+0.20/–0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 1.15±0.10 | M | |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| 31 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | 0.50±0.30 |
| | | 3.20±0.15 | 1.60±0.15 | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 1.25±0.20 | F | 0.60±0.30 |
| | | 3.20±0.30 | 2.50±0.20 | 1.60±0.20 | H | |
| | | 3.20±0.30 | 2.50±0.20 | 2.00±0.20 | I | |
| | | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | |

# Industrial Capacitors for Power Application

## Industrial Capacitance Table (C0G)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | |
|---|---|---|---|
| | | pF | nF |
| | | 1.0↓ 1.0 10 12 18 22 27 33 56 100 180 220 270 330 470 560 680 910 | 1.0 1.2 1.8 2.2 2.7 3.3 3.9 4.7 5.6 6.8 8.2 10 15 18 22 27 33 39 47 56 |
| 0402 (1005) | 25 | | |
| | 50 | | |
| 0603 (1608) | 25 | | |
| | 50 | | |
| | 100 | | |
| | 250 | | |
| 0805 (2012) | 25 | | |
| | 50 | | |
| | 100 | | |
| | 200 | | |
| 1206 (3216) | 50 | | |
| | 100 | | |
| | 200 | | |
| | 500 | | |
| | 1k | | |
| 1210(3225) | 100 | | |

## Industrial Capacitance Table (X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | uF | | | | | | | | |
| | | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 | 150 | 220 |
| 0201 (0603) | 4.0 | | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| 0402 (1005) | 4.0 | | | | | | | | | | | | |
| | 6.3 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | |
| 0603 (1608) | 6.3 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | |
| 0805 (2012) | 6.3 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |
| 1206 (3216) | 6.3 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | |
| | 25 | | | | | | 3.3 | | | | | | |
| | 50 | | | | | | | | | | | | |
| 1210 (3225) | 6.3 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | |

## Industrial Capacitance Table (X6S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance(uF) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.1 | 0.22 | 0.47 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 | 220 |
| 0402(1005) | 6.3 | | | | | | | | | | | |
| 0805 (2012) | 4.0 | | | | | | | | | | | |
| | 25 | | | | | | | | | | | |
| 1206(3216) | 6.3 | | | | | | | | | | | |

# Industrial Capacitors for Power Application

## Industrial Capacitance Table (X7R / X7S)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | pF | | | | | nF | | | | | | | |
| | | 100 | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 22 | 47 | 100 |
| 0201(0603) | 10 | | | | | | | | | | | | | | |

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | | | | | | | | | | uF | | | | | | | | | |
| | | 1.0 | 2.2 | 3.3 | 4.7 | 10 | 15 | 22 | 33 | 47 | 68 | 100 | 120 | 150 | 220 | 330 | 470 | 680 | 1.0 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 22 | 47 | 100 |
| 0402 (1005) | 10 | | | | | | | | | | | | | | | | X7S | | | | | | | | | | |
| | 16 | | | | | 8.2 | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | X7S | | | | | | | | | | | | | | | |
| | 50 | 0.27 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0603 (1608) | 6.3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | 1.50 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | X7S | | | | | | | | |
| | 50 | 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0805 (2012) | 6.3 | | | | | | | | | | | | | | | | | | | | | X7S | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | X7S | | X7T | | | |
| | 50 | 0.10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | 0.22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1206 (3216) | 6.3 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 35 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | | | | X7S | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 200 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 250 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 500 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 630 | 0.33 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1k | 0.22 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2k | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1210 (3225) | 6.3 | | | | | | | | | | | | | | | | | | | | | | | | | | X7T |
| | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | | | X7S | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | |

## Product Line Up (C0G)

### ■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 25Vdc | 1.0nF | ±5% | CL05C102JA5NFN□ |
| | 50Vdc | 0.5pF | ±0.1pF | CL05C0R5BB5NFN□ |
| | | 0.5pF | ±0.25pF | CL05C0R5CB5NFN□ |
| | | 1.0pF | ±0.25pF | CL05C010CB5NFN□ |
| | | 2.0pF | ±0.25pF | CL05C020CB5NFN□ |
| | | 10pF | ±0.25pF | CL05C100CB5NFN□ |
| | | 10pF | ±5% | CL05C100JB5NFN□ |
| | | 15pF | ±5% | CL05C150JB5NFN□ |
| | | 18pF | ±5% | CL05C180JB5NFN□ |
| | | 20pF | ±5% | CL05C200JB5NFN□ |
| | | 22pF | ±5% | CL05C220JB5NFN□ |
| | | 27pF | ±5% | CL05C270JB5NFN□ |
| | | 33pF | ±5% | CL05C330JB5NFN□ |
| | | 47pF | ±5% | CL05C470JB5NFN□ |
| | | 56pF | ±5% | CL05C560JB5NFN□ |
| | | 68pF | ±5% | CL05C680JB5NFN□ |
| | | 100pF | ±5% | CL05C101JB5NFN□ |
| | | 120pF | ±5% | CL05C121JB5NFN□ |
| | | 150pF | ±5% | CL05C151JB5NFN□ |
| | | 180pF | ±5% | CL05C181JB5NFN□ |
| | | 220pF | ±5% | CL05C221JB5NFN□ |
| | | 270pF | ±5% | CL05C271JB5NFN□ |
| | | 330pF | ±5% | CL05C331JB5NFN□ |
| | | 680pF | ±5% | CL05C681JB5NFN□ |

### ■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 25Vdc | 1.0nF | ±5% | CL10C102JA8NFN□ |
| | 50Vdc | 0.5pF | ±0.25pF | CL10C0R5CB8NFN□ |
| | | 1.0pF | ±0.25pF | CL10C010CB8NFN□ |
| | | 3.9pF | ±0.25pF | CL10C3R9CB8NFN□ |
| | | 4.7pF | ±0.25pF | CL10C4R7CB8NFN□ |
| | | 5.0pF | ±0.1pF | CL10C050BB8NFN□ |
| | | 5.0pF | ±0.25pF | CL10C050CB8NFN□ |
| | | 10pF | ±5% | CL10C100JB8NFN□ |
| | | 12pF | ±1% | CL10C120FB8NFN□ |
| | | 12pF | ±5% | CL10C120JB8NFN□ |
| | | 15pF | ±5% | CL10C150JB8NFN□ |
| | | 18pF | ±5% | CL10C180JB8NFN□ |
| | | 20pF | ±5% | CL10C200JB8NFN□ |
| | | 22pF | ±5% | CL10C220JB8NFN□ |
| | | 27pF | ±5% | CL10C270JB8NFN□ |
| | | 33pF | ±5% | CL10C330JB8NFN□ |
| | | 39pF | ±5% | CL10C390JB8NFN□ |
| | | 47pF | ±5% | CL10C470JB8NFN□ |
| | | 56pF | ±5% | CL10C560JB8NFN□ |
| | | 62pF | ±5% | CL10C620JB8NFN□ |
| | | 68pF | ±5% | CL10C680JB8NFN□ |
| | | 82pF | ±5% | CL10C820JB8NFN□ |
| | | 100pF | ±5% | CL10C101JB8NFN□ |
| | | 120pF | ±5% | CL10C121JB8NFN□ |
| | | 150pF | ±5% | CL10C151JB8NFN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 180pF | ±5% | CL10C181JB8NFN□ |
| | | 200pF | ±5% | CL10C201JB8NFN□ |
| | | 220pF | ±5% | CL10C221JB8NFN□ |
| | | 270pF | ±5% | CL10C271JB8NFN□ |
| | | 330pF | ±5% | CL10C331JB8NFN□ |
| | | 390pF | ±5% | CL10C391JB8NFN□ |
| | | 430pF | ±5% | CL10C431JB8NFN□ |
| | | 470pF | ±5% | CL10C471JB8NFN□ |
| | | 560pF | ±5% | CL10C561JB8NFN□ |
| | | 680pF | ±5% | CL10C681JB8NFN□ |
| | | 820pF | ±5% | CL10C821JB8NFN□ |
| | | 1.0nF | ±5% | CL10C102JB8NFN□ |
| | | 1.2nF | ±5% | CL10C122JB8NFN□ |
| | | 1.5nF | ±5% | CL10C152JB8NFN□ |
| | | 1.8nF | ±5% | CL10C182JB8NFN□ |
| | | 2.2nF | ±5% | CL10C222JB8NFN□ |
| | | 2.7nF | ±5% | CL10C272JB8NFN□ |
| | | 3.3nF | ±5% | CL10C332JB8NFN□ |
| | 100Vdc | 47pF | ±5% | CL10C470JC8NFN□ |
| | | 220pF | ±5% | CL10C221JC8NFN□ |
| | | 470pF | ±5% | CL10C471JC8NFN□ |
| | 250Vdc | 470pF | ±5% | CL10C471JE8NFN□ |

### ■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 50Vdc | 0.5pF | ±0.25pF | CL21C0R5CBANFN□ |
| | | 1.0pF | ±0.25pF | CL21C010CBANFN□ |
| | | 1.8pF | ±0.25pF | CL21C1R8CBANFN□ |
| | | 2.0pF | ±0.25pF | CL21C020CBANFN□ |
| | | 3.0pF | ±0.25pF | CL21C030CBANFN□ |
| | | 3.9pF | ±0.25pF | CL21C3R9CBANFN□ |
| | | 4.0pF | ±0.25pF | CL21C040CBANFN□ |
| | | 4.7pF | ±0.25pF | CL21C4R7CBANFN□ |
| | | 6.0pF | ±0.5pF | CL21C060DBANFN□ |
| | | 7.0pF | ±0.5pF | CL21C070DBANFN□ |
| | | 7.5pF | ±0.5pF | CL21C7R5DBANFN□ |
| | | 8.0pF | ±0.5pF | CL21C080DBANFN□ |
| | | 8.2pF | ±0.5pF | CL21C8R2DBANFN□ |
| | | 10pF | ±5% | CL21C100JBANFN□ |
| | | 12pF | ±5% | CL21C120JBANFN□ |
| | | 15pF | ±5% | CL21C150JBANFN□ |
| | | 18pF | ±5% | CL21C180JBANFN□ |
| | | 20pF | ±5% | CL21C200JBANFN□ |
| | | 22pF | ±5% | CL21C220JBANFN□ |
| | | 25pF | ±5% | CL21C250JBANFN□ |
| | | 27pF | ±5% | CL21C270JBANFN□ |
| | | 30pF | ±5% | CL21C300JBANFN□ |
| | | 33pF | ±5% | CL21C330JBANFN□ |
| | | 39pF | ±5% | CL21C390JBANFN□ |
| | | 47pF | ±5% | CL21C470JBANFN□ |
| | | 51pF | ±5% | CL21C510JBANFN□ |
| | | 56pF | ±5% | CL21C560JBANFN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Industrial Capacitors for Power Application

## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.75mm | 50Vdc | 68pF | ±5% | CL21C680JBANFN□ |
| | | 82pF | ±5% | CL21C820JBANFN□ |
| | | 100pF | ±5% | CL21C101JBANFN□ |
| | | 120pF | ±5% | CL21C121JBANFN□ |
| | | 150pF | ±5% | CL21C151JBANFN□ |
| | | 180pF | ±5% | CL21C181JBANFN□ |
| | | 200pF | ±5% | CL21C201JBANFN□ |
| | | 220pF | ±5% | CL21C221JBANFN□ |
| | | 240pF | ±5% | CL21C241JBANFN□ |
| | | 270pF | ±5% | CL21C271JBANFN□ |
| | | 300pF | ±5% | CL21C301JBANFN□ |
| | | 330pF | ±5% | CL21C331JBANFN□ |
| | | 390pF | ±5% | CL21C391JBANFN□ |
| | | 470pF | ±5% | CL21C471JBANFN□ |
| | | 560pF | ±5% | CL21C561JBANFN□ |
| | 100Vdc | 22pF | ±5% | CL21C220JCANFN□ |
| | | 33pF | ±5% | CL21C330JCANFN□ |
| | | 100pF | ±5% | CL21C101JCANFN□ |
| 0.95mm | 50Vdc | 680pF | ±5% | CL21C681JBCNFN□ |
| | | 820pF | ±5% | CL21C821JBCNFN□ |
| | | 1.0nF | ±5% | CL21C102JBCNFN□ |
| | 100Vdc | 470pF | ±5% | CL21C471JCCNFN□ |
| | 200Vdc | 47pF | ±5% | CL21C470JDCNFN□ |
| | | 100pF | ±5% | CL21C101JDCNFN□ |
| | | 220pF | ±5% | CL21C221JDCNFN□ |
| 1.35mm | 50Vdc | 4.7nF | ±5% | CL21C472JAFNFN□ |
| | 50Vdc | 1.5nF | ±5% | CL21C152JBFNFN□ |
| | | 1.8nF | ±5% | CL21C182JBFNFN□ |
| | | 2.2nF | ±5% | CL21C222JBFNFN□ |
| | | 3.9nF | ±5% | CL21C392JBFNFN□ |
| | | 4.7nF | ±5% | CL21C472JBFNFN□ |
| | | 10nF | ±5% | CL21C103JBFNFN□ |
| | 200Vdc | 1.0nF | ±5% | CL21C102JDFNFN□ |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 50Vdc | 12pF | ±5% | CL31C120JBCNFN□ |
| | | 15pF | ±5% | CL31C150JBCNFN□ |
| | | 18pF | ±5% | CL31C180JBCNFN□ |
| | | 22pF | ±5% | CL31C220JBCNFN□ |
| | | 33pF | ±5% | CL31C330JBCNFN□ |
| | | 47pF | ±5% | CL31C470JBCNFN□ |
| | | 56pF | ±5% | CL31C560JBCNFN□ |
| | | 100pF | ±5% | CL31C101JBCNFN□ |
| | | 100pF | ±10% | CL31C101KBCNFN□ |
| | | 120pF | ±5% | CL31C121JBCNFN□ |
| | | 220pF | ±5% | CL31C221JBCNFN□ |
| | | 270pF | ±5% | CL31C271JBCNFN□ |
| | | 330pF | ±5% | CL31C331JBCNFN□ |
| | | 470pF | ±5% | CL31C471JBCNFN□ |
| | | 560pF | ±5% | CL31C561JBCNFN□ |
| 1.00mm | 50Vdc | 1.0nF | ±5% | CL31C102JBCNFN□ |
| | | 1.5nF | ±5% | CL31C152JBCNFN□ |
| | 100Vdc | 100pF | ±5% | CL31C101JCCNFN□ |
| | | 330pF | ±5% | CL31C331JCCNFN□ |
| | | 470pF | ±5% | CL31C471JCCNFN□ |
| | 200Vdc | 100pF | ±5% | CL31C101JDCNFN□ |
| | | 220pF | ±5% | CL31C221JDCNFN□ |
| 1.40mm | 50Vdc | 4.7nF | ±5% | CL31C472JBFNFN□ |
| | 500Vdc | 33pF | ±5% | CL31C330JGFNFN□ |
| | | 47pF | ±5% | CL31C470JGFNFN□ |
| | | 100pF | ±5% | CL31C101JGFNFN□ |
| | | 180pF | ±5% | CL31C181JGFNFN□ |
| | | 220pF | ±5% | CL31C221JGFNFN□ |
| | | 330pF | ±5% | CL31C331JGFNFN□ |
| | | 390pF | ±5% | CL31C391JGFNFN□ |
| | | 470pF | ±5% | CL31C471JGFNFN□ |
| | | 560pF | ±5% | CL31C561JGFNFN□ |
| | 630Vdc | 10pF | ±5% | CL31C100JHFNFN□ |
| | | 15pF | ±5% | CL31C150JHFNFN□ |
| | | 33pF | ±5% | CL31C330JHFNFN□ |
| | | 47pF | ±5% | CL31C470JHFNFN□ |
| | | 100pF | ±5% | CL31C101JHFNFN□ |
| | | 150pF | ±5% | CL31C151JHFNFN□ |
| | | 220pF | ±5% | CL31C221JHFNFN□ |
| | | 220pF | ±10% | CL31C221KHFNFN□ |
| | | 330pF | ±5% | CL31C331JHFNFN□ |
| | | 470pF | ±5% | CL31C471JHFNFN□ |
| | 1kVdc | 10pF | ±5% | CL31C100JIFNFN□ |
| | | 18pF | ±5% | CL31C180JIFNFN□ |
| | | 22pF | ±5% | CL31C220JIFNFN□ |
| | | 33pF | ±5% | CL31C330JIFNFN□ |
| | | 47pF | ±5% | CL31C470JIFNFN□ |
| | | 56pF | ±5% | CL31C560JIFNFN□ |
| | | 68pF | ±5% | CL31C680JIFNFN□ |
| | | 100pF | ±5% | CL31C101JIFNFN□ |
| 1.80mm | 500Vdc | 680pF | ±5% | CL31C681JGHNFN□ |
| | | 1.0nF | ±5% | CL31C102JGHNFN□ |
| | | 2.2nF | ±5% | CL31C222JGHNFN□ |
| | 630Vdc | 680pF | ±5% | CL31C681JHHNFN□ |
| | | 1.0nF | ±5% | CL31C102JHHNFN□ |
| | | 1.2nF | ±5% | CL31C122JHHNFN□ |
| | | 1.5nF | ±5% | CL31C152JHHNFN□ |
| | | 2.2nF | ±5% | CL31C222JHHNFN□ |
| | | 3.3nF | ±5% | CL31C332JHHNFN□ |
| | 1kVdc | 220pF | ±5% | CL31C221JIHNFN□ |

■ Size : 4.50 X 3.20mm (inch : 1812)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 2.70mm | 630Vdc | 22nF | ±5% | CL43C223JHJNFNF□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X5R)

### ■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 4.0Vdc | 2.2uF | ±20% | CL05A225MR5NFN□ | Derating |
| | 6.3Vdc | 470nF | ±10% | CL05A474KQ5NFN□ | |
| | | 1.0uF | ±10% | CL05A105KQ5NFN□ | Derating |
| | | 2.2uF | ±10% | CL05A225KQ5NFN□ | Derating Ref. |
| | 10Vdc | 100nF | ±10% | CL05A104KP5NFN□ | |
| | | 220nF | ±10% | CL05A224KP5NFN□ | |
| | | 470nF | ±10% | CL05A474KP5NFN□ | |
| | 16Vdc | 1.0uF | ±10% | CL05A105KO5NFN□ | Derating |

### ■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 6.3Vdc | 1.0uF | ±10% | CL10A105KQ8NFN□ | |
| | | 2.2uF | ±10% | CL10A225KQ8NFN□ | |
| | 10Vdc | 1.0uF | ±10% | CL10A105KP8NFN□ | |
| | | 2.2uF | ±10% | CL10A225KP8NFN□ | |
| | | 4.7uF | ±10% | CL10A475KP8NFN□ | |
| | | 10uF | ±10% | CL10A106KP8NFN□ | Derating Ref. |
| | | 10uF | ±20% | CL10A106MP8NFN□ | Derating Ref. |
| | 16Vdc | 1.0uF | ±10% | CL10A105KO8NFN□ | |
| | | 2.2uF | ±10% | CL10A225KO8NFN□ | |
| | | 4.7uF | ±10% | CL10A475KO8NFN□ | Derating |
| | 25Vdc | 470nF | ±10% | CL10A474KA8NFN□ | |
| | | 1.0uF | ±10% | CL10A105KA8NFN□ | |
| | 50Vdc | 1.0uF | ±10% | CL10A105KB8NFN□ | |

### ■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 6.3Vdc | 4.7uF | ±10% | CL21A475KQFNFN□ | |
| | | 10uF | ±10% | CL21A106KQFNFN□ | |
| | 10Vdc | 2.2uF | ±10% | CL21A225KPFNFN□ | |
| | | 4.7uF | ±10% | CL21A475KPFNFN□ | |
| | | 10uF | ±10% | CL21A106KPFNFN□ | |
| | 16Vdc | 2.2uF | ±10% | CL21A225KOFNFN□ | |
| 1.40mm | 6.3Vdc | 22uF | ±10% | CL21A226KQQNFN□ | |
| | 16Vdc | 10uF | ±10% | CL21A106KOQNFN□ | Derating |
| | 25Vdc | 4.7uF | ±10% | CL21A475KAQNFN□ | |
| | | 22uF | ±20% | CL21A226MAQNFN□ | Derating |
| 1.45mm | 25Vdc | 10uF | ±10% | CL21A106KAYNFN□ | Derating |

### ■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 16Vdc | 22uF | ±10% | CL31A226KOCLFN□ | Derating |
| | | 22uF | ±20% | CL31A226MOCLFN□ | Derating |
| 1.80mm | 6.3Vdc | 10uF | ±10% | CL31A106KQHNFN□ | |
| | | 22uF | ±10% | CL31A226KQHNFN□ | |
| | | 22uF | ±20% | CL31A226MQHNFN□ | |
| | 10Vdc | 4.7uF | ±10% | CL31A475KPHNFN□ | |
| | | 10uF | ±10% | CL31A106KPHNFN□ | |
| | 16Vdc | 4.7uF | ±10% | CL31A475KOHNFN□ | |
| | | 4.7uF | ±20% | CL31A475MOHNFN□ | |
| | | 10uF | ±10% | CL31A106KOHNFN□ | |
| | | 22uF | ±10% | CL31A226KOHNFN□ | |
| | 25Vdc | 3.3uF | ±10% | CL31A335KAHNFN□ | |
| | | 4.7uF | ±10% | CL31A475KAHNFN□ | |
| | | 10uF | ±10% | CL31A106KAHNFN□ | |
| | | 22uF | ±10% | CL31A226KAHNFN□ | Derating |
| | 50Vdc | 10uF | ±10% | CL31A106KBHNFN□ | |

### ■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 6.3Vdc | 22uF | ±10% | CL32A226KQJNFN□ | |
| | | 22uF | ±20% | CL32A226MQJNFN□ | |
| | 10Vdc | 22uF | ±10% | CL32A226KPJNFN□ | |
| | 16Vdc | 10uF | ±10% | CL32A106KOJNFN□ | |
| | | 22uF | ±10% | CL32A226KOJNFN□ | |
| | 25Vdc | 10uF | ±10% | CL32A106KAJNFN□ | |
| | | 22uF | ±10% | CL32A226KAJNFN□ | |
| 2.80mm | 6.3Vdc | 100uF | ±20% | CL32A107MQVNFN□ | Derating |
| | | 150uF | ±20% | CL32A157MQVNFN□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Industrial Capacitors for Power Application

## Product Line Up (X6S)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 6.3Vdc | 1.0uF | ±10% | CL05X105KQ5NFN□ | Derating |
| 0.57mm | 2.5Vdc | 2.2uF | ±20% | CL05X225MS5NFN□ | Derating |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.40mm | 4.0Vdc | 22uF | ±20% | CL21X226MRQNFN□ | Derating |
| 1.45mm | 25Vdc | 10uF | ±10% | CL21X106KAYNFN□ | Derating |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 6.3Vdc | 47uF | ±20% | CL31X476MQHNFN□ | Derating |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (X7R)

■ Size : 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.33mm | 10Vdc | 4.7nF | ±10% | CL03B472KP3NFN□ | |
| | | 6.8nF | ±10% | CL03B682KP3NFN□ | |
| | | 10nF | ±10% | CL03B103KP3NFN□ | |

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 10Vdc | 100nF | ±10% | CL05B104KP5NFN□ | |
| | 16Vdc | 330pF | ±10% | CL05B331KO5NFN□ | |
| | | 8.2nF | ±10% | CL05B822KO5NFN□ | |
| | | 10nF | ±10% | CL05B103KO5NFN□ | |
| | | 15nF | ±10% | CL05B153KO5NFN□ | |
| | | 22nF | ±10% | CL05B223KO5NFN□ | |
| | | 27nF | ±10% | CL05B273KO5NFN□ | |
| | | 33nF | ±10% | CL05B333KO5NFN□ | |
| | | 68nF | ±10% | CL05B683KO5NFN□ | |
| | | 100nF | ±10% | CL05B104KO5NFN□ | |
| | 25Vdc | 4.7nF | ±10% | CL05B472KA5NFN□ | |
| | | 5.6nF | ±10% | CL05B562KA5NFN□ | |
| | | 10nF | ±10% | CL05B103KA5NFN□ | |
| | | 22nF | ±10% | CL05B223KA5NFN□ | |
| | 50Vdc | 270pF | ±10% | CL05B271KB5NFN□ | |
| | | 330pF | ±10% | CL05B331KB5NFN□ | |
| | | 390pF | ±10% | CL05B391KB5NFN□ | |
| | | 470pF | ±10% | CL05B471KB5NFN□ | |
| | | 560pF | ±10% | CL05B561KB5NFN□ | |
| | | 680pF | ±10% | CL05B681KB5NFN□ | |
| | | 820pF | ±10% | CL05B821KB5NFN□ | |
| | | 1.0nF | ±5% | CL05B102JB5NFN□ | |
| | | 1.0nF | ±10% | CL05B102KB5NFN□ | |
| | | 1.5nF | ±10% | CL05B152KB5NFN□ | |
| | | 2.2nF | ±10% | CL05B222KB5NFN□ | |
| | | 3.3nF | ±10% | CL05B332KB5NFN□ | |
| | | 4.7nF | ±10% | CL05B472KB5NFN□ | |
| | | 5.6nF | ±10% | CL05B562KB5NFN□ | |
| | | 10nF | ±10% | CL05B103KB5NFN□ | |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 6.3Vdc | 1.0uF | ±10% | CL10B105KQ8NFN□ | |
| | 10Vdc | 220nF | ±10% | CL10B224KP8NFN□ | |
| | | 330nF | ±10% | CL10B334KP8NFN□ | |
| | | 470nF | ±10% | CL10B474KP8NFN□ | |
| | | 1.0uF | ±10% | CL10B105KP8NFN□ | |
| | | 2.2uF | ±10% | CL10B225KP8NFN□ | Ref. |
| | 16Vdc | 1.5nF | ±10% | CL10B152KO8NFN□ | |
| | | 3.3nF | ±10% | CL10B332KO8NFN□ | |
| | | 10nF | ±10% | CL10B103KO8NFN□ | |
| | | 15nF | ±10% | CL10B153KO8NFN□ | |
| | | 33nF | ±10% | CL10B333KO8NFN□ | |
| 0.90mm | 16Vdc | 47nF | ±10% | CL10B473KO8NFN□ | |
| | | 68nF | ±10% | CL10B683KO8NFN□ | |
| | | 100nF | ±10% | CL10B104KO8NFN□ | |
| | | 150nF | ±10% | CL10B154KO8NFN□ | |
| | | 220nF | ±10% | CL10B224KO8NFN□ | |
| | | 330nF | ±10% | CL10B334KO8NFN□ | |
| | | 470nF | ±10% | CL10B474KO8NFN□ | |
| | | 680nF | ±10% | CL10B684KO8NFN□ | |
| | | 1.0uF | ±10% | CL10B105KO8NFN□ | |
| | 25Vdc | 1.0nF | ±10% | CL10B102KA8NFN□ | |
| | | 10nF | ±10% | CL10B103KA8NFN□ | |
| | | 12nF | ±10% | CL10B123KA8NFN□ | |
| | | 15nF | ±10% | CL10B153KA8NFN□ | |
| | | 18nF | ±10% | CL10B183KA8NFN□ | |
| | | 22nF | ±10% | CL10B223KA8NFN□ | |
| | | 27nF | ±10% | CL10B273KA8NFN□ | |
| | | 33nF | ±10% | CL10B333KA8NFN□ | |
| | | 47nF | ±10% | CL10B473KA8NFN□ | |
| | | 68nF | ±10% | CL10B683KA8NFN□ | |
| | | 100nF | ±10% | CL10B104KA8NFN□ | |
| | | 150nF | ±10% | CL10B154KA8NFN□ | |
| | | 220nF | ±10% | CL10B224KA8NFN□ | |
| | | 470nF | ±10% | CL10B474KA8NFN□ | |
| | | 1.0uF | ±10% | CL10B105KA8NFN□ | |
| | 50Vdc | 100pF | ±10% | CL10B101KB8NFN□ | |
| | | 150pF | ±10% | CL10B151KB8NFN□ | |
| | | 180pF | ±10% | CL10B181KB8NFN□ | |
| | | 220pF | ±10% | CL10B221KB8NFN□ | |
| | | 270pF | ±10% | CL10B271KB8NFN□ | |
| | | 330pF | ±10% | CL10B331KB8NFN□ | |
| | | 390pF | ±10% | CL10B391KB8NFN□ | |
| | | 470pF | ±10% | CL10B471KB8NFN□ | |
| | | 560pF | ±10% | CL10B561KB8NFN□ | |
| | | 820pF | ±10% | CL10B821KB8NFN□ | |
| | | 1.0nF | ±5% | CL10B102JB8NFN□ | |
| | | 1.0nF | ±10% | CL10B102KB8NFN□ | |
| | | 1.2nF | ±10% | CL10B122KB8NFN□ | |
| | | 1.5nF | ±10% | CL10B152KB8NFN□ | |
| | | 1.8nF | ±10% | CL10B182KB8NFN□ | |
| | | 2.2nF | ±10% | CL10B222KB8NFN□ | |
| | | 2.7nF | ±10% | CL10B272KB8NFN□ | |
| | | 3.3nF | ±10% | CL10B332KB8NFN□ | |
| | | 3.9nF | ±10% | CL10B392KB8NFN□ | |
| | | 4.7nF | ±10% | CL10B472KB8NFN□ | |
| | | 5.6nF | ±10% | CL10B562KB8NFN□ | |
| | | 6.8nF | ±10% | CL10B682KB8NFN□ | |
| | | 8.2nF | ±10% | CL10B822KB8NFN□ | |
| | | 10nF | ±5% | CL10B103JB8NFN□ | |
| | | 10nF | ±10% | CL10B103KB8NFN□ | |
| | | 12nF | ±10% | CL10B123KB8NFN□ | |
| | | 15nF | ±10% | CL10B153KB8NFN□ | |
| | | 18nF | ±10% | CL10B183KB8NFN□ | |
| | | 22nF | ±10% | CL10B223KB8NFN□ | |
| | | 27nF | ±10% | CL10B273KB8NFN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Industrial Capacitors for Power Application

## Product Line Up (X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 50Vdc | 33nF | ±10% | CL10B333KB8NFN□ | |
| | | 39nF | ±10% | CL10B393KB8NFN□ | |
| | | 47nF | ±10% | CL10B473KB8NFN□ | |
| | | 56nF | ±10% | CL10B563KB8NFN□ | |
| | | 68nF | ±10% | CL10B683KB8NFN□ | |
| | | 82nF | ±10% | CL10B823KB8NFN□ | |
| | | 100nF | ±10% | CL10B104KB8NFN□ | |
| | | 100nF | ±20% | CL10B104MB8NFN□ | |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.75mm | 25Vdc | 1.0nF | ±10% | CL21B102KAANFN□ | |
| | | 10nF | ±10% | CL21B103KAANFN□ | |
| | 50Vdc | 100pF | ±10% | CL21B101KBANFN□ | |
| | | 180pF | ±10% | CL21B181KBANFN□ | |
| | | 220pF | ±10% | CL21B221KBANFN□ | |
| | | 270pF | ±10% | CL21B271KBANFN□ | |
| | | 330pF | ±10% | CL21B331KBANFN□ | |
| | | 390pF | ±10% | CL21B391KBANFN□ | |
| | | 470pF | ±10% | CL21B471KBANFN□ | |
| | | 560pF | ±10% | CL21B561KBANFN□ | |
| | | 680pF | ±10% | CL21B681KBANFN□ | |
| | | 820pF | ±10% | CL21B821KBANFN□ | |
| | | 1.0nF | ±5% | CL21B102JBANFN□ | |
| | | 1.0nF | ±10% | CL21B102KBANFN□ | |
| | | 1.2nF | ±10% | CL21B122KBANFN□ | |
| | | 1.5nF | ±10% | CL21B152KBANFN□ | |
| | | 1.8nF | ±10% | CL21B182KBANFN□ | |
| | | 2.2nF | ±10% | CL21B222KBANFN□ | |
| | | 3.3nF | ±10% | CL21B332KBANFN□ | |
| | | 3.9nF | ±10% | CL21B392KBANFN□ | |
| | | 4.7nF | ±10% | CL21B472KBANFN□ | |
| | | 5.6nF | ±10% | CL21B562KBANFN□ | |
| | | 6.8nF | ±10% | CL21B682KBANFN□ | |
| | | 8.2nF | ±10% | CL21B822KBANFN□ | |
| | | 10nF | ±10% | CL21B103KBANFN□ | |
| | | 12nF | ±10% | CL21B123KBANFN□ | |
| | | 15nF | ±10% | CL21B153KBANFN□ | |
| | | 18nF | ±10% | CL21B183KBANFN□ | |
| | | 22nF | ±10% | CL21B223KBANFN□ | |
| | | 27nF | ±10% | CL21B273KBANFN□ | |
| | | 33nF | ±10% | CL21B333KBANFN□ | |
| | 100Vdc | 1.0nF | ±10% | CL21B102KCANFN□ | |
| | | 2.2nF | ±10% | CL21B222KCANFN□ | |
| | | 4.7nF | ±10% | CL21B472KCANFN□ | |
| | | 6.8nF | ±10% | CL21B682KCANFN□ | |
| | | 10nF | ±10% | CL21B103KCANFN□ | |
| 0.95mm | 16Vdc | 220nF | ±10% | CL21B224KOCNFN□ | |
| | | 330nF | ±10% | CL21B334KOCNFN□ | |
| | 25Vdc | 100nF | ±10% | CL21B104KACNFN□ | |
| | 50Vdc | 150pF | ±10% | CL21B151KBCNFN□ | |
| | | 180pF | ±10% | CL21B181KBCNFN□ | |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 50Vdc | 220pF | ±10% | CL21B221KBCNFN□ | |
| | | 270pF | ±10% | CL21B271KBCNFN□ | |
| | | 330pF | ±10% | CL21B331KBCNFN□ | |
| | | 390pF | ±10% | CL21B391KBCNFN□ | |
| | | 470pF | ±10% | CL21B471KBCNFN□ | |
| | | 560pF | ±10% | CL21B561KBCNFN□ | |
| | | 820pF | ±10% | CL21B821KBCNFN□ | |
| | | 1.0nF | ±10% | CL21B102KBCNFN□ | |
| | | 1.5nF | ±10% | CL21B152KBCNFN□ | |
| | | 2.2nF | ±10% | CL21B222KBCNFN□ | |
| | | 2.7nF | ±10% | CL21B272KBCNFN□ | |
| | | 3.3nF | ±10% | CL21B332KBCNFN□ | |
| | | 4.7nF | ±10% | CL21B472KBCNFN□ | |
| | | 6.8nF | ±10% | CL21B682KBCNFN□ | |
| | | 8.2nF | ±10% | CL21B822KBCNFN□ | |
| | | 10nF | ±10% | CL21B103KBCNFN□ | |
| | | 12nF | ±10% | CL21B123KBCNFN□ | |
| | | 15nF | ±10% | CL21B153KBCNFN□ | |
| | | 18nF | ±10% | CL21B183KBCNFN□ | |
| | | 20nF | ±10% | CL21B203KBCNFN□ | |
| | | 22nF | ±10% | CL21B223KBCNFN□ | |
| | | 27nF | ±10% | CL21B273KBCNFN□ | |
| | | 33nF | ±10% | CL21B333KBCNFN□ | |
| | | 47nF | ±5% | CL21B473JBCNFN□ | |
| | | 47nF | ±10% | CL21B473KBCNFN□ | |
| | | 56nF | ±10% | CL21B563KBCNFN□ | |
| | | 68nF | ±10% | CL21B683KBCNFN□ | |
| | | 82nF | ±10% | CL21B823KBCNFN□ | |
| | | 100nF | ±10% | CL21B104KBCNFN□ | |
| | 200Vdc | 220pF | ±10% | CL21B221KDCNFN□ | |
| | | 470pF | ±10% | CL21B471KDCNFN□ | |
| | | 1.0nF | ±10% | CL21B102KDCNFN□ | |
| | | 2.2nF | ±10% | CL21B222KDCNFN□ | |
| | | 4.7nF | ±10% | CL21B472KDCNFN□ | |
| 1.35mm | 10Vdc | 2.2uF | ±10% | CL21B225KPFNFN□ | |
| | | 4.7uF | ±10% | CL21B475KPFNFN□ | Ref. |
| | 16Vdc | 470nF | ±10% | CL21B474KOFNFN□ | |
| | | 680nF | ±10% | CL21B684KOFNFN□ | |
| | | 1.0uF | ±10% | CL21B105KOFNFN□ | |
| | | 2.2uF | ±10% | CL21B225KOFNFN□ | |
| | | 4.7uF | ±10% | CL21B475KOFNFN□ | Ref. |
| | 25Vdc | 150nF | ±10% | CL21B154KAFNFN□ | |
| | | 220nF | ±10% | CL21B224KAFNFN□ | |
| | | 470nF | ±10% | CL21B474KAFNFN□ | |
| | | 1.0uF | ±10% | CL21B105KAFNFN□ | |
| | | 1.5uF | ±10% | CL21B155KAFNFN□ | |
| | | 2.2uF | ±10% | CL21B225KAFNFN□ | |
| | | 4.7uF | ±10% | CL21B475KAFNFN□ | Ref. |
| | 50Vdc | 120nF | ±10% | CL21B124KBFNFN□ | |
| | | 150nF | ±10% | CL21B154KBFNFN□ | |
| | | 220nF | ±10% | CL21B224KBFNFN□ | |
| | | 330nF | ±10% | CL21B334KBFNFN□ | |
| | | 470nF | ±10% | CL21B474KBFNFN□ | |
| | | 1.0uF | ±10% | CL21B105KBFNFN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (X7R)

### ■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 100Vdc | 220nF | ±10% | CL21B224KCFNFN□ | |
| 1.40mm | 6.3Vdc | 4.7uF | ±10% | CL21B475KQQNFN□ | Ref. |
| | | 10uF | ±10% | CL21B106KQQNFN□ | |
| | 10Vdc | 10uF | ±10% | CL21B106KPQNFN□ | |
| | 16Vdc | 10uF | ±10% | CL21B106KOQNFN□ | |

### ■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 10Vdc | 1.2uF | ±10% | CL31B125KPCNFN□ | |
| | 16Vdc | 330nF | ±10% | CL31B334KOCNFN□ | |
| | 25Vdc | 220nF | ±10% | CL31B224KACNFN□ | |
| | 50Vdc | 220pF | ±10% | CL31B221KBCNFN□ | |
| | | 330pF | ±10% | CL31B331KBCNFN□ | |
| | | 470pF | ±10% | CL31B471KBCNFN□ | |
| | | 560pF | ±10% | CL31B561KBCNFN□ | |
| | | 680pF | ±10% | CL31B681KBCNFN□ | |
| | | 1.5nF | ±10% | CL31B152KBCNFN□ | |
| | | 2.2nF | ±10% | CL31B222KBCNFN□ | |
| | | 2.7nF | ±10% | CL31B272KBCNFN□ | |
| | | 3.3nF | ±10% | CL31B332KBCNFN□ | |
| | | 4.7nF | ±10% | CL31B472KBCNFN□ | |
| | | 8.2nF | ±10% | CL31B822KBCNFN□ | |
| | | 10nF | ±10% | CL31B103KBCNFN□ | |
| | | 15nF | ±10% | CL31B153KBCNFN□ | |
| | | 33nF | ±10% | CL31B333KBCNFN□ | |
| | | 47nF | ±10% | CL31B473KBCNFN□ | |
| | | 68nF | ±10% | CL31B683KBCNFN□ | |
| | | 100nF | ±10% | CL31B104KBCNFN□ | |
| | 100Vdc | 1.0nF | ±10% | CL31B102KCCNFN□ | |
| | | 2.2nF | ±10% | CL31B222KCCNFN□ | |
| | | 3.3nF | ±10% | CL31B332KCCNFN□ | |
| | | 10nF | ±10% | CL31B103KCCNFN□ | |
| | | 22nF | ±10% | CL31B223KCCNFN□ | |
| | 200Vdc | 470pF | ±10% | CL31B471KDCNFN□ | |
| | | 1.0nF | ±10% | CL31B102KDCNFN□ | |
| 1.40mm | 16Vdc | 1.0uF | ±10% | CL31B105KOFNFN□ | |
| | 50Vdc | 220nF | ±10% | CL31B224KBFNFN□ | |
| | | 330nF | ±10% | CL31B334KBFNFN□ | |
| | 100Vdc | 100nF | ±10% | CL31B104KCFNFN□ | |
| | 500Vdc | 220pF | ±10% | CL31B221KGFNFN□ | |
| | | 470pF | ±10% | CL31B471KGFNFN□ | |
| | | 1.0nF | ±10% | CL31B102KGFNFN□ | |
| | | 2.2nF | ±10% | CL31B222KGFNFN□ | |
| | | 3.3nF | ±10% | CL31B332KGFNFN□ | |
| | | 4.7nF | ±10% | CL31B472KGFNFN□ | |
| | | 6.8nF | ±10% | CL31B682KGFNFN□ | |
| | | 10nF | ±10% | CL31B103KGFNFN□ | |
| | 630Vdc | 330pF | ±10% | CL31B331KHFNFN□ | |
| | | 470pF | ±10% | CL31B471KHFNFN□ | |
| | | 680pF | ±10% | CL31B681KHFNFN□ | |
| | | 1.0nF | ±10% | CL31B102KHFNFN□ | |
| | | 1.5nF | ±10% | CL31B152KHFNFN□ | |
| 1.40mm | 630Vdc | 2.2nF | ±10% | CL31B222KHFNFN□ | |
| | | 3.3nF | ±10% | CL31B332KHFNFN□ | |
| | | 4.7nF | ±10% | CL31B472KHFNFN□ | |
| | | 6.8nF | ±10% | CL31B682KHFNFN□ | |
| | | 10nF | ±10% | CL31B103KHFNFN□ | |
| | 1kVdc | 220pF | ±10% | CL31B221KIFNFN□ | Derating |
| | | 1.0nF | ±10% | CL31B102KIFNFN□ | Derating |
| | | 1.5nF | ±10% | CL31B152KIFNFN□ | Derating |
| 1.80mm | 6.3Vdc | 6.8uF | ±10% | CL31B685KQHNFN□ | |
| | | 10uF | ±10% | CL31B106KQHNFN□ | |
| | 10Vdc | 4.7uF | ±10% | CL31B475KPHNFN□ | |
| | | 22uF | ±10% | CL31B226KPHNFN□ | |
| | 16Vdc | 2.2uF | ±10% | CL31B225KOHNFN□ | |
| | | 3.3uF | ±10% | CL31B335KOHNFN□ | |
| | | 4.7uF | ±10% | CL31B475KOHNFN□ | |
| | | 10uF | ±10% | CL31B106KOHNFN□ | |
| | 25Vdc | 680nF | ±10% | CL31B684KAHNFN□ | |
| | | 1.0uF | ±10% | CL31B105KAHNFN□ | |
| | | 2.2uF | ±10% | CL31B225KAHNFN□ | |
| | | 4.7uF | ±10% | CL31B475KAHNFN□ | |
| | | 10uF | ±10% | CL31B106KAHNFN□ | |
| | 35Vdc | 10uF | ±10% | CL31B106KLHNFN□ | Ref. |
| | 50Vdc | 470nF | ±10% | CL31B474KBHNFN□ | |
| | | 680nF | ±10% | CL31B684KBHNFN□ | |
| | | 1.0uF | ±10% | CL31B105KBHNFN□ | |
| | | 2.2uF | ±10% | CL31B225KBHNFN□ | |
| | | 4.7uF | ±10% | CL31B475KBHNFN□ | |
| | 100Vdc | 220nF | ±10% | CL31B224KCHNFN□ | |
| | | 1.0uF | ±10% | CL31B105KCHNFN□ | |
| | 200Vdc | 100nF | ±10% | CL31B104KDHNFN□ | |
| | 250Vdc | 100nF | ±10% | CL31B104KEHNFN□ | |
| | 500Vdc | 33nF | ±10% | CL31B333KGHNFN□ | |
| | 630Vdc | 22nF | ±10% | CL31B223KHHNFN□ | |
| | | 33nF | ±10% | CL31B333KHHNFN□ | |
| | 2kVdc | 2.2nF | ±10% | CL31B222KJHNFN□ | Ref. |

### ■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.20mm | 10Vdc | 10uF | ±10% | CL32B106KPINFN□ | |
| 2.70mm | 6.3Vdc | 22uF | ±20% | CL32B226MQJNFN□ | |
| | 10Vdc | 470nF | ±10% | CL32B474KPJNFN□ | |
| | | 22uF | ±10% | CL32B226KPJNFN□ | |
| | | 22uF | ±20% | CL32B226MPJNFN□ | |
| | 16Vdc | 10uF | ±10% | CL32B106KOJNFN□ | |
| | | 22uF | ±10% | CL32B226KOJNFN□ | |
| | 25Vdc | 10uF | ±10% | CL32B106KAJNFN□ | |
| | | 22uF | ±10% | CL32B226KAJNFN□ | |
| | 50Vdc | 2.2uF | ±10% | CL32B225KBJNFN□ | |
| | | 4.7uF | ±10% | CL32B475KBJNFN□ | |
| | | 10uF | ±10% | CL32B106KBJNFN□ | |
| | 100Vdc | 1.0uF | ±10% | CL32B105KCJNFN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Soft – Termination Capacitors for Power Application

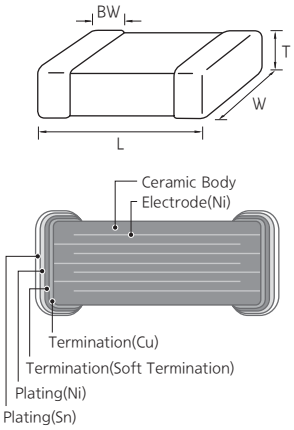
## Feature

- Soft – Termination relaxes the applied thermal / mechanical stresses by ductile properties of metal–polymer composites.
- Special outgoing inspection for Power application (Bending Test : Sampling Test upto 2mm : X7R)
- Can be applied to power(SMPS, DC – DC Converter) and industrial equipment
- ZFN, SFN, YFN series : Metal Epoxy

## Application

- Power(SMPS, DC – DC converter)
- Ideal for decoupling and filtering applications (Class II : X7R)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.65±0.10 | A | 0.50+0.20/–0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 1.15±0.10 | M | |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| 31 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | 0.50±0.30 |
| | | 3.20±0.15 | 1.60±0.15 | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |

## Industrial Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | | | | | | uF | | | | |
| | | 1.0 | 1.5 | 2.2 | 3.3 | 4.7 | 10 | 22 | 33 | 47 | 68 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 |
| 0402(1005) | 50 | | | | | | | | | | | | | | | | | | |
| 0603 (1608) | 10 | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | |
| | 50 | 0.47 | | | | | | | | | | | | | | | | | |
| 0805 (2012) | 10 | | | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | |
| 1206 (3216) | 16 | | | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | | | |

## Product Line Up (ZFN – X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 10Vdc | 2.2uF | ±10% | CL10B225KP8ZFN□ | Ref. |
| | 16Vdc | 1.0uF | ±10% | CL10B105KO8ZFN□ | |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 16Vdc | 4.7uF | ±10% | CL21B475KOFZFN□ | Ref. |
| | 25Vdc | 4.7uF | ±10% | CL21B475KAFZFN□ | Ref. |
| | 50Vdc | 1.0uF | ±10% | CL21B105KBFZFN□ | |
| 1.40mm | 10Vdc | 10uF | ±10% | CL21B106KPQZFN□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 16Vdc | 10uF | ±10% | CL31B106KOHZFN□ | |
| | 50Vdc | 4.7uF | ±10% | CL31B475KBHZFN□ | |

## Product Line Up (SFN – X7R)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 50Vdc | 22nF | ±10% | CL05B223KB5SFN□ | |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 16Vdc | 68nF | ±10% | CL10B683KO8SFN□ | |
| | | 100nF | ±10% | CL10B104KO8SFN□ | |
| | | 220nF | ±10% | CL10B224KO8SFN□ | |
| | | 1.0uF | ±10% | CL10B105KO8SFN□ | |
| | 25Vdc | 10nF | ±10% | CL10B103KA8SFN□ | |
| | | 150nF | ±10% | CL10B154KA8SFN□ | |
| | | 220nF | ±10% | CL10B224KA8SFN□ | |
| | | 1.0uF | ±10% | CL10B105KA8SFN□ | |
| | 50Vdc | 470pF | ±10% | CL10B471KB8SFN□ | |
| | | 1.0nF | ±10% | CL10B102KB8SFN□ | |
| | | 1.5nF | ±10% | CL10B152KB8SFN□ | |
| | | 2.2nF | ±10% | CL10B222KB8SFN□ | |
| | | 2.7nF | ±10% | CL10B272KB8SFN□ | |
| | | 3.3nF | ±10% | CL10B332KB8SFN□ | |
| | | 3.9nF | ±10% | CL10B392KB8SFN□ | |
| | | 4.7nF | ±10% | CL10B472KB8SFN□ | |
| | | 5.6nF | ±10% | CL10B562KB8SFN□ | |
| | | 6.8nF | ±10% | CL10B682KB8SFN□ | |
| | | 8.2nF | ±10% | CL10B822KB8SFN□ | |
| | | 10nF | ±10% | CL10B103KB8SFN□ | |
| | | 12nF | ±10% | CL10B123KB8SFN□ | |
| | | 15nF | ±10% | CL10B153KB8SFN□ | |
| | | 22nF | ±10% | CL10B223KB8SFN□ | |
| | | 27nF | ±10% | CL10B273KB8SFN□ | |
| | | 33nF | ±10% | CL10B333KB8SFN□ | |
| | | 39nF | ±10% | CL10B393KB8SFN□ | |
| | | 47nF | ±10% | CL10B473KB8SFN□ | |
| | | 56nF | ±10% | CL10B563KB8SFN□ | |
| | | 100nF | ±10% | CL10B104KB8SFN□ | |
| | | 220nF | ±10% | CL10B224KB8SFN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Soft – Termination Capacitors for Power Application

## Product Line Up (SFN – X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.70mm | 50Vdc | 330pF | ±10% | CL21B331KB6SFN□ | |
| | | 470pF | ±5% | CL21B471JB6SFN□ | |
| | | 560pF | ±10% | CL21B561KB6SFN□ | |
| | | 680pF | ±10% | CL21B681KB6SFN□ | |
| | | 2.2nF | ±10% | CL21B222KB6SFN□ | |
| | | 3.3nF | ±10% | CL21B332KB6SFN□ | |
| | | 4.7nF | ±10% | CL21B472KB6SFN□ | |
| | | 6.8nF | ±10% | CL21B682KB6SFN□ | |
| | | 8.2nF | ±10% | CL21B822KB6SFN□ | |
| | | 10nF | ±10% | CL21B103KB6SFN□ | |
| | | 15nF | ±10% | CL21B153KB6SFN□ | |
| | | 22nF | ±10% | CL21B223KB6SFN□ | |
| 0.95mm | 50Vdc | 4.7nF | ±10% | CL21B472KBCSFN□ | |
| | | 10nF | ±10% | CL21B103KBCSFN□ | |
| | | 22nF | ±10% | CL21B223KBCSFN□ | |
| | | 39nF | ±10% | CL21B393KBCSFN□ | |
| | | 47nF | ±10% | CL21B473KBCSFN□ | |
| | | 100nF | ±10% | CL21B104KBCSFN□ | |
| | 250Vdc | 1.0nF | ±10% | CL21B102KECSFN□ | |
| | | 2.2nF | ±10% | CL21B222KECSFN□ | |
| 1.35mm | 16Vdc | 1.0uF | ±10% | CL21B105KOFSFN□ | |
| | 25Vdc | 220nF | ±10% | CL21B224KAFSFN□ | |
| | | 470nF | ±10% | CL21B474KAFSFN□ | |
| | | 1.0uF | ±10% | CL21B105KAFSFN□ | |
| | | 2.2uF | ±10% | CL21B225KAFSFN□ | |
| | 50Vdc | 220nF | ±10% | CL21B224KBFSFN□ | |
| | | 470nF | ±10% | CL21B474KBFSFN□ | |
| | | 1.0uF | ±10% | CL21B105KBFSFN□ | |
| | 100Vdc | 100nF | ±10% | CL21B104KCFSFN□ | |
| | | 220nF | ±10% | CL21B224KCFSFN□ | |
| 1.40mm | 16Vdc | 4.7uF | ±10% | CL21B475KOQSFN□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.00mm | 50Vdc | 100nF | ±10% | CL31B104KBCSFN□ | |
| 1.25mm | 16Vdc | 470nF | ±10% | CL31B474KOPSFN□ | |
| | 50Vdc | 1.0uF | ±10% | CL31B105KBPSFN□ | |
| 1.40mm | 630Vdc | 220pF | ±10% | CL31B221KHFSFN□ | |
| | | 1.0nF | ±10% | CL31B102KHFSFN□ | |
| | | 1.5nF | ±10% | CL31B152KHFSFN□ | |
| | | 2.2nF | ±10% | CL31B222KHFSFN□ | |
| | | 2.7nF | ±10% | CL31B272KHFSFN□ | |
| | | 3.3nF | ±10% | CL31B332KHFSFN□ | |
| | | 4.7nF | ±10% | CL31B472KHFSFN□ | |
| | | 6.8nF | ±10% | CL31B682KHFSFN□ | |
| | | 10nF | ±10% | CL31B103KHFSFN□ | |
| | | 15nF | ±10% | CL31B153KHFSFN□ | |
| | 1kVdc | 1.0nF | ±10% | CL31B102KIFSFN□ | Derating |
| 1.80mm | 25Vdc | 10uF | ±10% | CL31B106KAHSFN□ | |
| | 35Vdc | 10uF | ±10% | CL31B106KLHSFN□ | Ref. |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 100Vdc | 220nF | ±10% | CL31B224KCHSFN□ | |
| | | 470nF | ±10% | CL31B474KCHSFN□ | |
| | | 1.0uF | ±10% | CL31B105KCHSFN□ | |
| | | 2.2uF | ±10% | CL31B225KCHSFN□ | |
| | 250Vdc | 47nF | ±10% | CL31B473KEHSFN□ | |
| | | 100nF | ±10% | CL31B104KEHSFN□ | |
| | 630Vdc | 22nF | ±10% | CL31B223KHHSFN□ | |
| | | 33nF | ±10% | CL31B333KHHSFN□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 50Vdc | 2.2uF | ±10% | CL32B225KBJSFN□ | |
| | 100Vdc | 1.0uF | ±10% | CL32B105KCJSFN□ | |
| | | 2.2uF | ±10% | CL32B225KCJSFN□ | |

## Product Line Up (YFN – X7R)

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.00mm | 25Vdc | 4.7uF | ±10% | CL32B475KAUYFN□ | |
| | 50Vdc | 4.7uF | ±10% | CL32B475KBUYFN□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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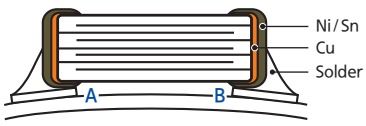
# Soft – Termination(3mm) Industrial Capacitors

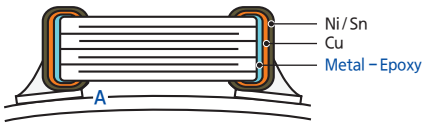


## Feature

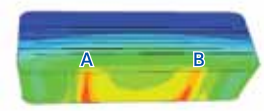
- Excellent bending strength(≥3mm) & 40℃ 95%RH 500hr with rated voltage
- Soft – Termination is applicable to all class II MLCC series
- W6 = Industrial(3mm bending) code for Network, Power, etc
- Speical outgoing inspection for industrial application (HALT, etc)
- Bending strength simulation

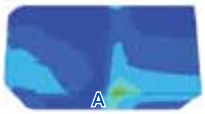



Cross-section of MLCC with Cu – Termination



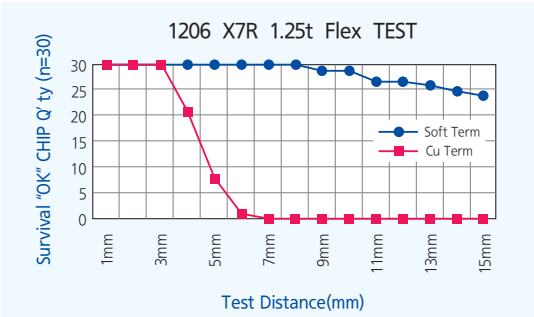

Cross-section of MLCC with Soft – Termination




Soft – Termination relaxes the applied thermal – mechanical stresses by ductile properties of metal – polymer composites.

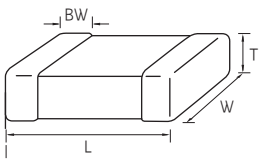
- Comparison of bending strength

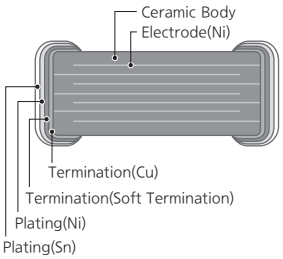



## Application

- Network, Power application and etc.
- Ideal for decoupling and filtering applications (Class II : X7R)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | 0.50+0.20/-0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| | | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 | Q | |
| 31 | 1206 | 3.20±0.20 | 1.60±0.20 | 1.15±0.10 | P | 0.50±0.30 |
| | | 3.20±0.15 | 1.60±0.15 | 1.25±0.15 | F | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | 0.60±0.30 |
| | | 3.20±0.40 | 2.50±0.30 | 2.50±0.30 | V | |

# Soft – Termination(3mm) Industrial Capacitors

## Industrial Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | | uF | | | | | | |
| | | 1.5 | 2.2 | 4.7 | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 |
| 0402 (1005) | 16 | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | |
| 0603 (1608) | 16 | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | |
| 0805 (2012) | 10 | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | |
| 1206 (3216) | 10 | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | |
| 1210 (3225) | 10 | | | | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | |

## Product Line Up (X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 16Vdc | 1.0uF | ±10% | CL10B105KO8ZW6□ | |
| | 25Vdc | 1.0uF | ±10% | CL10B105KA8ZW6□ | |
| | 50Vdc | 100nF | ±10% | CL10B104KB8ZW6□ | |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.95mm | 100Vdc | 47nF | ±10% | CL21B473KCCZW6□ | |
| | | 100nF | ±10% | CL21B104KCCZW6□ | |
| 1.35mm | 25Vdc | 1.0uF | ±10% | CL21B105KAFZW6□ | |
| | | 2.2uF | ±10% | CL21B225KAFZW6□ | |
| | | 4.7uF | ±10% | CL21B475KAFZW6□ | Ref. |
| | 50Vdc | 1.0uF | ±10% | CL21B105KBFZW6□ | |
| 1.40mm | 16Vdc | 4.7uF | ±10% | CL21B475KOQZW6□ | Ref. |

■ Size: 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.25mm | 100Vdc | 100nF | ±10% | CL31B104KCPZW6□ | |
| 1.40mm | 100Vdc | 100nF | ±10% | CL31B104KCFZW6□ | |
| 1.80mm | 16Vdc | 10uF | ±10% | CL31B106KOHZW6□ | |
| | 25Vdc | 4.7uF | ±10% | CL31B475KAHZW6□ | |
| | | 10uF | ±10% | CL31B106KAHZW6□ | |
| | 50Vdc | 4.7uF | ±10% | CL31B475KBHZW6□ | |

■ Size: 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 50Vdc | 10uF | ±10% | CL32B106KBJZW6□ | |
| | 100Vdc | 2.2uF | ±10% | CL32B225KCJZW6□ | |
| 2.80mm | 100Vdc | 4.7uF | ±10% | CL32B475KCVZW6□ | Derating |

## Product Line Up (X7S)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.90mm | 50Vdc | 100uF | ±10% | CL10Y104KB8ZW6□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# Reinforced Soft – Termination(3mm) Industrial Capacitors

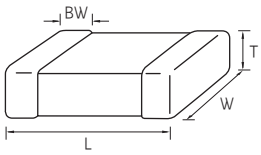
## Feature

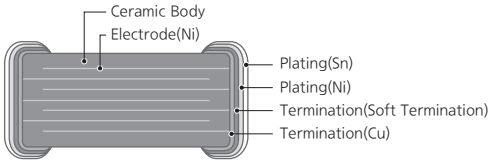
- Excellent bending strength(≥3mm) & 85℃ 85%RH 1000hr with rated voltage
- Soft-Termination is applicable to all class II MLCC series
- Durability against thermal shock / cycles

## Application

- Network, Power application and etc.
- Ideal for decoupling and filtering applications (Class II : X7R)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.60±0.10 | 6 | 0.50+0.20/-0.30 |
| | | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | |
| | | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | |
| | | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 | Q | |
| 31 | 1206 | 3.20±0.20 | 1.60±0.20 | 1.15±0.10 | P | 0.50±0.30 |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | 0.60±0.30 |

## Industrial Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | uF | | | | | | |
| | | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 | 47 | 100 |
| 0402 (1005) | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| 0603 (1608) | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | |
| 0805 (2012) | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | |
| 1206 (3216) | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 25 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | |
| 1210 (3225) | 10 | | | | | | | | | | | | | |
| | 16 | | | | | | | | | | | | | |
| | 50 | | | | | | | | | | | | | |

# Reinforced Soft – Termination(3mm) Industrial Capacitors

## Product Line Up (X7R)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 16Vdc | 15nF | ±10% | CL05B153KO5Z46□ |
| | | 22nF | ±10% | CL05B223KO5Z46□ |
| | | 33nF | ±10% | CL05B333KO5Z46□ |
| | | 47nF | ±10% | CL05B473KO5Z46□ |
| | | 100nF | ±10% | CL05B104KO5Z46□ |
| | 25Vdc | 1.0nF | ±10% | CL05B102KA5Z46□ |
| | | 4.7nF | ±10% | CL05B472KA5Z46□ |
| | | 10nF | ±10% | CL05B103KA5Z46□ |
| | | 22nF | ±10% | CL05B223KA5Z46□ |
| | 50Vdc | 330pF | ±10% | CL05B331KB5Z46□ |
| | | 470pF | ±10% | CL05B471KB5Z46□ |
| | | 1.0nF | ±10% | CL05B102KB5Z46□ |
| | | 1.5nF | ±10% | CL05B152KB5Z46□ |
| | | 2.2nF | ±10% | CL05B222KB5Z46□ |
| | | 4.7nF | ±10% | CL05B472KB5Z46□ |
| | | 10nF | ±10% | CL05B103KB5Z46□ |
| | | 15nF | ±10% | CL05B153KB5Z46□ |
| | | 22nF | ±10% | CL05B223KB5Z46□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 10Vdc | 1.0uF | ±10% | CL10B105KP8Z46□ |
| | 16Vdc | 47nF | ±10% | CL10B473KO8Z46□ |
| | | 68nF | ±10% | CL10B683KO8Z46□ |
| | | 100nF | ±10% | CL10B104KO8Z46□ |
| | | 220nF | ±10% | CL10B224KO8Z46□ |
| | | 470nF | ±10% | CL10B474KO8Z46□ |
| | | 680nF | ±10% | CL10B684KO8Z46□ |
| | | 1.0uF | ±10% | CL10B105KO8Z46□ |
| | 25Vdc | 10nF | ±10% | CL10B103KA8Z46□ |
| | | 68nF | ±10% | CL10B683KA8Z46□ |
| | | 100nF | ±10% | CL10B104KA8Z46□ |
| | | 150nF | ±10% | CL10B154KA8Z46□ |
| | | 220nF | ±10% | CL10B224KA8Z46□ |
| | | 470nF | ±10% | CL10B474KA8Z46□ |
| | | 1.0uF | ±10% | CL10B105KA8Z46□ |
| | 50Vdc | 220pF | ±10% | CL10B221KB8Z46□ |
| | | 470pF | ±10% | CL10B471KB8Z46□ |
| | | 1.0nF | ±10% | CL10B102KB8Z46□ |
| | | 1.2nF | ±10% | CL10B122KB8Z46□ |
| | | 1.5nF | ±10% | CL10B152KB8Z46□ |
| | | 2.2nF | ±10% | CL10B222KB8Z46□ |
| | | 3.3nF | ±10% | CL10B332KB8Z46□ |
| | | 4.7nF | ±10% | CL10B472KB8Z46□ |
| | | 6.8nF | ±10% | CL10B682KB8Z46□ |
| | | 10nF | ±10% | CL10B103KB8Z46□ |
| | | 15nF | ±10% | CL10B153KB8Z46□ |
| | | 22nF | ±10% | CL10B223KB8Z46□ |
| | | 33nF | ±10% | CL10B333KB8Z46□ |
| | | 47nF | ±10% | CL10B473KB8Z46□ |
| | | 68nF | ±10% | CL10B683KB8Z46□ |
| | | 100nF | ±10% | CL10B104KB8Z46□ |
| | | 150nF | ±10% | CL10B154KB8Z46□ |
| | | 220nF | ±10% | CL10B224KB8Z46□ |
| | 100Vdc | 270pF | ±10% | CL10B271KC8Z46□ |
| | | 470pF | ±10% | CL10B471KC8Z46□ |
| | | 1.0nF | ±10% | CL10B102KC8Z46□ |
| | | 2.2nF | ±10% | CL10B222KC8Z46□ |
| | | 2.7nF | ±10% | CL10B272KC8Z46□ |
| | | 4.7nF | ±10% | CL10B472KC8Z46□ |
| | | 10nF | ±10% | CL10B103KC8Z46□ |
| | | 68nF | ±10% | CL10B683KC8Z46□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up (X7R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.70mm | 50Vdc | 1.0nF | ±10% | CL21B102KB6Z46□ | |
| | | 1.5nF | ±10% | CL21B152KB6Z46□ | |
| | | 2.2nF | ±10% | CL21B222KB6Z46□ | |
| | | 4.7nF | ±10% | CL21B472KB6Z46□ | |
| | | 10nF | ±10% | CL21B103KB6Z46□ | |
| | | 22nF | ±10% | CL21B223KB6Z46□ | |
| | 100Vdc | 1.0nF | ±10% | CL21B102KC6Z46□ | |
| | | 3.3nF | ±10% | CL21B332KC6Z46□ | |
| | | 4.7nF | ±10% | CL21B472KC6Z46□ | |
| | | 10nF | ±10% | CL21B103KC6Z46□ | |
| | | 15nF | ±10% | CL21B153KC6Z46□ | |
| | | 22nF | ±10% | CL21B223KC6Z46□ | |
| 0.95mm | 25Vdc | 100nF | ±10% | CL21B104KACZ46□ | |
| | 50Vdc | 47nF | ±10% | CL21B473KBCZ46□ | |
| | | 68nF | ±10% | CL21B683KBCZ46□ | |
| | | 100nF | ±10% | CL21B104KBCZ46□ | |
| | 100Vdc | 47nF | ±10% | CL21B473KCCZ46□ | |
| | | 68nF | ±10% | CL21B683KCCZ46□ | |
| | | 100nF | ±10% | CL21B104KCCZ46□ | |
| 1.35mm | 16Vdc | 470nF | ±10% | CL21B474KOFZ46□ | |
| | | 1.0uF | ±10% | CL21B105KOFZ46□ | |
| | | 2.2uF | ±10% | CL21B225KOFZ46□ | |
| | 25Vdc | 220nF | ±10% | CL21B224KAFZ46□ | |
| | | 1.0uF | ±10% | CL21B105KAFZ46□ | |
| | | 2.2uF | ±10% | CL21B225KAFZ46□ | |
| | 35Vdc | 1.0uF | ±10% | CL21B105KLFZ46□ | |
| | 50Vdc | 100nF | ±10% | CL21B104KBFZ46□ | |
| | | 180nF | ±10% | CL21B184KBFZ46□ | |
| | | 220nF | ±10% | CL21B224KBFZ46□ | |
| | | 330nF | ±10% | CL21B334KBFZ46□ | |
| | | 470nF | ±10% | CL21B474KBFZ46□ | |
| | | 1.0uF | ±10% | CL21B105KBFZ46□ | |
| | 100Vdc | 100nF | ±10% | CL21B104KCFZ46□ | |
| 1.40mm | 10Vdc | 4.7uF | ±10% | CL21B475KPQZ46□ | Ref. |
| | 16Vdc | 4.7uF | ±10% | CL21B475KOQZ46□ | Ref. |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.25mm | 25Vdc | 1.0uF | ±10% | CL31B105KAPZ46□ | |
| | 50Vdc | 100nF | ±10% | CL31B104KBPZ46□ | |
| | 100Vdc | 100nF | ±10% | CL31B104KCPZ46□ | |
| | | 220nF | ±10% | CL31B224KCPZ46□ | |
| 1.80mm | 16Vdc | 2.2uF | ±10% | CL31B225KOHZ46□ | |
| | | 10uF | ±10% | CL31B106KOHZ46□ | |
| | 25Vdc | 1.5uF | ±10% | CL31B155KAHZ46□ | |
| | | 2.2uF | ±10% | CL31B225KAHZ46□ | |
| | | 3.3uF | ±10% | CL31B335KAHZ46□ | |
| | | 4.7uF | ±10% | CL31B475KAHZ46□ | |
| | | 10uF | ±10% | CL31B106KAHZ46□ | |
| | 50Vdc | 470nF | ±10% | CL31B474KBHZ46□ | |
| | | 680nF | ±10% | CL31B684KBHZ46□ | |
| | | 1.0uF | ±10% | CL31B105KBHZ46□ | |
| | | 1.5uF | ±10% | CL31B155KBHZ46□ | |
| | | 2.2uF | ±10% | CL31B225KBHZ46□ | |
| | | 4.7uF | ±10% | CL31B475KBHZ46□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 16Vdc | 22uF | ±10% | CL32B226KOJZ46□ | |
| | | 22uF | ±20% | CL32B226MOJZ46□ | |
| | 50Vdc | 4.7uF | ±10% | CL32B475KBJZ46□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# Reinforced Soft – Termination(5mm) Industrial Capacitors

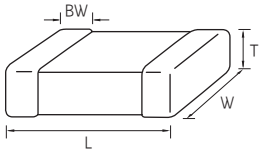
## Feature

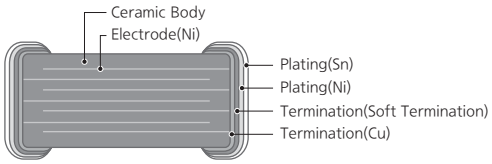
- Excellent bending strength(≥5mm) & 85℃ 85%RH 1000hr with rated voltage
- Soft – Termination is applicable to all class II MLCC series
- Durability against thermal shock / cycles

## Application

- Network, Power application and etc.
- Ideal for decoupling and filtering applications (Class II : X7R)
  (Directly connected to battery)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | 0.50+0.20/−0.30 |

## Industrial Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | | | uF | | |
| | | 1.5 | 4.7 | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 |
| 0603 (1608) | 25 | | | | | | | ■ | ■ | ■ | | |
| | 50 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | |
| 0805 (2012) | 25 | | | | | | | | | | ■ | |
| | 50 | | | | | | | | | ■ | | |

## Product Line Up (X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 25Vdc | 220nF | ±10% | CL10B224KA8Z4J□ |
| | | 1.0uF | ±10% | CL10B105KA8Z4J□ |
| | 50Vdc | 1.5nF | ±10% | CL10B152KB8Z4J□ |
| | | 4.7nF | ±10% | CL10B472KB8Z4J□ |
| | | 22nF | ±10% | CL10B223KB8Z4J□ |
| | | 47nF | ±10% | CL10B473KB8Z4J□ |
| | | 100nF | ±10% | CL10B104KB8Z4J□ |
| | | 220nF | ±10% | CL10B224KB8Z4J□ |
| | | 470nF | ±10% | CL10B474KB8Z4J□ |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.35mm | 25Vdc | 2.2uF | ±10% | CL21B225KAFZ4J□ |
| | 50Vdc | 1.0uF | ±10% | CL21B105KBFZ4J□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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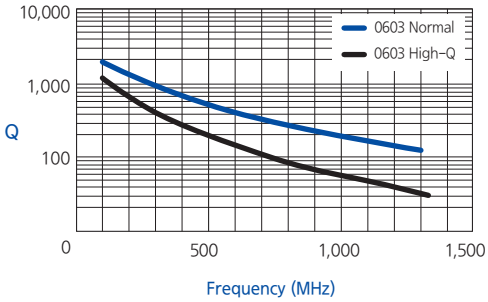
# High Q Industrial Capacitors

GNW / GQW – C0G

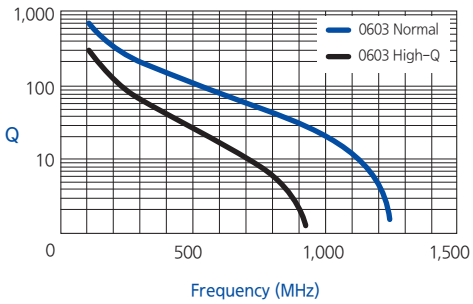
## Feature

- High Q and low ESR in high frequency range
- Tight tolerance available
- Expanding High – Q (Cu inner-electrode) line – up of 0402, 0603, 0805 case size (0201, 01005 products are already under mass production)
- High efficiency and low power consumption in RF circuit
- Speical outgoing inspection for industrial application (HALT, etc)
- Comparison of Q value in high frequency (Normal vs High – Q)

Q vs Frequency(0603 10pF 250V)



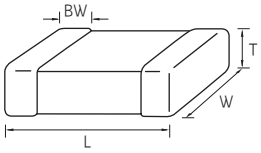

Q vs Frequency(0603 47pF 250V)

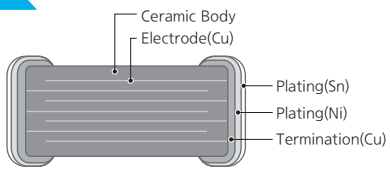



## Application

- Power amplifier module for base – station and GHz range communications
- Smart Factory & Smart Home (IoT)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 03 | 0201 | 0.60±0.03 | 0.30±0.03 | 0.30±0.03 | 3 | 0.15±0.05 |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.15 | 0.80±0.15 | 0.65±0.15 | A | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.85±0.10 | C | 0.50+0.20/-0.30 |

# High Q Industrial Capacitors

## Industrial Capacitance Table (C0G)

| Size inch (mm) | T max. (mm) | Rated Voltage (Vdc) | Capacitance(pF) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 0.1 | 0.5 | 1.0 | 1.5 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 15 | 22 | 33 | 47 | 6.8 | 100 | 150 | 220 |
| 01005 (0402) | 0.22 | 16 | | | | | | | | | | | 27 | | | | | | |
| | | 25 | | | | | | | | | | | 27 | | | | | | |
| 0201 (0603) | 0.33 | 25 | | | | | | | | | | | | | | | | | |
| | | 50 | | | | | | | | | | | | | | | | | |
| 0402(1005) | 0.55 | 50 | | | | | | | | | | | | | | | | | |
| 0603 (1608) | 0.90 | 50 | | | | | | | | | | | | | | | | | |
| | | 100 | | | | | | | | | | | | | | | | | |
| | 0.80 | 250 | | | | | | | | | | | | | | | | | |
| 0805(2012) | 1.00 | 250 | | | | | | | | | | | | | | | | | |

## Product Line Up (C0G)

■ Size: 0.60 X 0.30mm (inch : 0201)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.33mm | 25Vdc | 4.7pF | ±0.25pF | CL03C4R7CA3GNW□ |
| | | 10pF | ±0.5pF | CL03C100DA3GNW□ |

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 0.1pF | ±0.05pF | CL05C0R1AB5GNW□ |
| | | 0.1pF | ±0.1pF | CL05C0R1BB5GNW□ |
| | | 0.2pF | ±0.05pF | CL05C0R2AB5GNW□ |
| | | 0.2pF | ±0.1pF | CL05C0R2BB5GNW□ |
| | | 0.3pF | ±0.05pF | CL05C0R3AB5GNW□ |
| | | 0.3pF | ±0.1pF | CL05C0R3BB5GNW□ |
| | | 0.4pF | ±0.05pF | CL05C0R4AB5GNW□ |
| | | 0.4pF | ±0.1pF | CL05C0R4BB5GNW□ |
| | | 0.5pF | ±0.05pF | CL05C0R5AB5GNW□ |
| | | 0.5pF | ±0.1pF | CL05C0R5BB5GNW□ |
| | | 0.6pF | ±0.05pF | CL05C0R6AB5GNW□ |
| | | 0.6pF | ±0.1pF | CL05C0R6BB5GNW□ |
| | | 0.7pF | ±0.05pF | CL05C0R7AB5GNW□ |
| | | 0.7pF | ±0.1pF | CL05C0R7BB5GNW□ |
| | | 0.8pF | ±0.05pF | CL05C0R8AB5GNW□ |
| | | 0.8pF | ±0.1pF | CL05C0R8BB5GNW□ |
| | | 0.9pF | ±0.05pF | CL05C0R9AB5GNW□ |
| | | 0.9pF | ±0.1pF | CL05C0R9BB5GNW□ |
| | | 1.0pF | ±0.05pF | CL05C010AB5GNW□ |
| | | 1.0pF | ±0.1pF | CL05C010BB5GNW□ |
| | | 1.0pF | ±0.25pF | CL05C010CB5GNW□ |
| | | 1.1pF | ±0.05pF | CL05C1R1AB5GNW□ |
| | | 1.1pF | ±0.1pF | CL05C1R1BB5GNW□ |
| | | 1.1pF | ±0.25pF | CL05C1R1CB5GNW□ |
| | | 1.2pF | ±0.05pF | CL05C1R2AB5GNW□ |
| | | 1.2pF | ±0.1pF | CL05C1R2BB5GNW□ |
| | | 1.2pF | ±0.25pF | CL05C1R2CB5GNW□ |
| | | 1.3pF | ±0.05pF | CL05C1R3AB5GNW□ |
| | | 1.3pF | ±0.1pF | CL05C1R3BB5GNW□ |
| | | 1.3pF | ±0.25pF | CL05C1R3CB5GNW□ |
| | | 1.5pF | ±0.05pF | CL05C1R5AB5GNW□ |
| | | 1.5pF | ±0.1pF | CL05C1R5BB5GNW□ |
| | | 1.5pF | ±0.25pF | CL05C1R5CB5GNW□ |
| | | 1.6pF | ±0.05pF | CL05C1R6AB5GNW□ |
| | | 1.6pF | ±0.1pF | CL05C1R6BB5GNW□ |
| | | 1.6pF | ±0.25pF | CL05C1R6CB5GNW□ |
| | | 1.8pF | ±0.05pF | CL05C1R8AB5GNW□ |
| | | 1.8pF | ±0.1pF | CL05C1R8BB5GNW□ |
| | | 1.8pF | ±0.25pF | CL05C1R8CB5GNW□ |
| | | 2.0pF | ±0.05pF | CL05C020AB5GNW□ |
| | | 2.0pF | ±0.1pF | CL05C020BB5GNW□ |
| | | 2.0pF | ±0.25pF | CL05C020CB5GNW□ |
| | | 2.2pF | ±0.05pF | CL05C2R2AB5GNW□ |
| | | 2.2pF | ±0.1pF | CL05C2R2BB5GNW□ |
| | | 2.2pF | ±0.25pF | CL05C2R2CB5GNW□ |
| | | 2.4pF | ±0.05pF | CL05C2R4AB5GNW□ |
| | | 2.4pF | ±0.1pF | CL05C2R4BB5GNW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 2.4pF | ±0.25pF | CL05C2R4CB5GNW□ |
| | | 2.7pF | ±0.05pF | CL05C2R7AB5GNW□ |
| | | 2.7pF | ±0.1pF | CL05C2R7BB5GNW□ |
| | | 2.7pF | ±0.25pF | CL05C2R7CB5GNW□ |
| | | 3.0pF | ±0.05pF | CL05C030AB5GNW□ |
| | | 3.0pF | ±0.1pF | CL05C030BB5GNW□ |
| | | 3.0pF | ±0.25pF | CL05C030CB5GNW□ |
| | | 3.3pF | ±0.05pF | CL05C3R3AB5GNW□ |
| | | 3.3pF | ±0.1pF | CL05C3R3BB5GNW□ |
| | | 3.3pF | ±0.25pF | CL05C3R3CB5GNW□ |
| | | 3.6pF | ±0.05pF | CL05C3R6AB5GNW□ |
| | | 3.6pF | ±0.1pF | CL05C3R6BB5GNW□ |
| | | 3.6pF | ±0.25pF | CL05C3R6CB5GNW□ |
| | | 3.9pF | ±0.05pF | CL05C3R9AB5GNW□ |
| | | 3.9pF | ±0.1pF | CL05C3R9BB5GNW□ |
| | | 3.9pF | ±0.25pF | CL05C3R9CB5GNW□ |
| | | 4.0pF | ±0.05pF | CL05C040AB5GNW□ |
| | | 4.0pF | ±0.1pF | CL05C040BB5GNW□ |
| | | 4.0pF | ±0.25pF | CL05C040CB5GNW□ |
| | | 4.3pF | ±0.05pF | CL05C4R3AB5GNW□ |
| | | 4.3pF | ±0.1pF | CL05C4R3BB5GNW□ |
| | | 4.3pF | ±0.25pF | CL05C4R3CB5GNW□ |
| | | 4.7pF | ±0.05pF | CL05C4R7AB5GNW□ |
| | | 4.7pF | ±0.1pF | CL05C4R7BB5GNW□ |
| | | 4.7pF | ±0.25pF | CL05C4R7CB5GNW□ |
| | | 5.0pF | ±0.05pF | CL05C050AB5GNW□ |
| | | 5.0pF | ±0.1pF | CL05C050BB5GNW□ |
| | | 5.0pF | ±0.25pF | CL05C050CB5GNW□ |
| | | 5.1pF | ±0.05pF | CL05C5R1AB5GNW□ |
| | | 5.1pF | ±0.1pF | CL05C5R1BB5GNW□ |
| | | 5.1pF | ±0.25pF | CL05C5R1CB5GNW□ |
| | | 5.1pF | ±0.5pF | CL05C5R1DB5GNW□ |
| | | 5.6pF | ±0.05pF | CL05C5R6AB5GNW□ |
| | | 5.6pF | ±0.1pF | CL05C5R6BB5GNW□ |
| | | 5.6pF | ±0.25pF | CL05C5R6CB5GNW□ |
| | | 5.6pF | ±0.5pF | CL05C5R6DB5GNW□ |
| | | 6.0pF | ±0.05pF | CL05C060AB5GNW□ |
| | | 6.0pF | ±0.1pF | CL05C060BB5GNW□ |
| | | 6.0pF | ±0.25pF | CL05C060CB5GNW□ |
| | | 6.0pF | ±0.5pF | CL05C060DB5GNW□ |
| | | 6.2pF | ±0.05pF | CL05C6R2AB5GNW□ |
| | | 6.2pF | ±0.1pF | CL05C6R2BB5GNW□ |
| | | 6.2pF | ±0.25pF | CL05C6R2CB5GNW□ |
| | | 6.2pF | ±0.5pF | CL05C6R2DB5GNW□ |
| | | 6.8pF | ±0.05pF | CL05C6R8AB5GNW□ |
| | | 6.8pF | ±0.1pF | CL05C6R8BB5GNW□ |
| | | 6.8pF | ±0.25pF | CL05C6R8CB5GNW□ |
| | | 6.8pF | ±0.5pF | CL05C6R8DB5GNW□ |
| | | 7.0pF | ±0.05pF | CL05C070AB5GNW□ |
| | | 7.0pF | ±0.1pF | CL05C070BB5GNW□ |
| | | 7.0pF | ±0.25pF | CL05C070CB5GNW□ |
| | | 7.0pF | ±0.5pF | CL05C070DB5GNW□ |
| | | 7.5pF | ±0.05pF | CL05C7R5AB5GNW□ |
| | | 7.5pF | ±0.1pF | CL05C7R5BB5GNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

In order to move to the page directly, please click the here. ↑

# High Q Industrial Capacitors

## Product Line Up (C0G)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 7.5pF | ±0.25pF | CL05C7R5CB5GNW□ |
| | | 7.5pF | ±0.5pF | CL05C7R5DB5GNW□ |
| | | 8.0pF | ±0.05pF | CL05C080AB5GNW□ |
| | | 8.0pF | ±0.1pF | CL05C080BB5GNW□ |
| | | 8.0pF | ±0.25pF | CL05C080CB5GNW□ |
| | | 8.0pF | ±0.5pF | CL05C080DB5GNW□ |
| | | 8.2pF | ±0.05pF | CL05C8R2AB5GNW□ |
| | | 8.2pF | ±0.1pF | CL05C8R2BB5GNW□ |
| | | 8.2pF | ±0.25pF | CL05C8R2CB5GNW□ |
| | | 8.2pF | ±0.5pF | CL05C8R2DB5GNW□ |
| | | 9.0pF | ±0.05pF | CL05C090AB5GNW□ |
| | | 9.0pF | ±0.1pF | CL05C090BB5GNW□ |
| | | 9.0pF | ±0.25pF | CL05C090CB5GNW□ |
| | | 9.0pF | ±0.5pF | CL05C090DB5GNW□ |
| | | 9.1pF | ±0.05pF | CL05C9R1AB5GNW□ |
| | | 9.1pF | ±0.1pF | CL05C9R1BB5GNW□ |
| | | 9.1pF | ±0.25pF | CL05C9R1CB5GNW□ |
| | | 9.1pF | ±0.5pF | CL05C9R1DB5GNW□ |
| | | 10pF | ±1% | CL05C100FB5GNW□ |
| | | 10pF | ±2% | CL05C100GB5GNW□ |
| | | 10pF | ±5% | CL05C100JB5GNW□ |
| | | 11pF | ±1% | CL05C110FB5GNW□ |
| | | 11pF | ±2% | CL05C110GB5GNW□ |
| | | 11pF | ±5% | CL05C110JB5GNW□ |
| | | 12pF | ±1% | CL05C120FB5GNW□ |
| | | 12pF | ±2% | CL05C120GB5GNW□ |
| | | 12pF | ±5% | CL05C120JB5GNW□ |
| | | 15pF | ±1% | CL05C150FB5GNW□ |
| | | 15pF | ±2% | CL05C150GB5GNW□ |
| | | 15pF | ±5% | CL05C150JB5GNW□ |
| | | 18pF | ±1% | CL05C180FB5GNW□ |
| | | 18pF | ±2% | CL05C180GB5GNW□ |
| | | 18pF | ±5% | CL05C180JB5GNW□ |
| | | 20pF | ±1% | CL05C200FB5GNW□ |
| | | 20pF | ±2% | CL05C200GB5GNW□ |
| | | 20pF | ±5% | CL05C200JB5GNW□ |
| | | 22pF | ±1% | CL05C220FB5GNW□ |
| | | 22pF | ±2% | CL05C220GB5GNW□ |
| | | 22pF | ±5% | CL05C220JB5GNW□ |
| | | 24pF | ±1% | CL05C240FB5GNW□ |
| | | 24pF | ±2% | CL05C240GB5GNW□ |
| | | 24pF | ±5% | CL05C240JB5GNW□ |
| | | 27pF | ±1% | CL05C270FB5GNW□ |
| | | 27pF | ±2% | CL05C270GB5GNW□ |
| | | 27pF | ±5% | CL05C270JB5GNW□ |
| | | 33pF | ±1% | CL05C330FB5GNW□ |
| | | 33pF | ±2% | CL05C330GB5GNW□ |
| | | 33pF | ±5% | CL05C330JB5GNW□ |
| | | 39pF | ±1% | CL05C390FB5GNW□ |
| | | 39pF | ±2% | CL05C390GB5GNW□ |
| | | 39pF | ±5% | CL05C390JB5GNW□ |
| | | 47pF | ±1% | CL05C470FB5GNW□ |
| | | 47pF | ±2% | CL05C470GB5GNW□ |
| | | 47pF | ±5% | CL05C470JB5GNW□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.80mm | 100Vdc | 0.5pF | ±0.1pF | CL10C0R5BCAGQW□ |
| | 250Vdc | 0.1pF | ±0.05pF | CL10C0R1AEAGQW□ |
| | | 0.1pF | ±0.1pF | CL10C0R1BEAGQW□ |
| | | 0.2pF | ±0.05pF | CL10C0R2AEAGQW□ |
| | | 0.2pF | ±0.1pF | CL10C0R2BEAGQW□ |
| | | 0.3pF | ±0.05pF | CL10C0R3AEAGQW□ |
| | | 0.3pF | ±0.1pF | CL10C0R3BEAGQW□ |
| | | 0.3pF | ±0.25pF | CL10C0R3CEAGQW□ |
| | | 0.4pF | ±0.05pF | CL10C0R4AEAGQW□ |
| | | 0.4pF | ±0.1pF | CL10C0R4BEAGQW□ |
| | | 0.4pF | ±0.25pF | CL10C0R4CEAGQW□ |
| | | 0.5pF | ±0.05pF | CL10C0R5AEAGQW□ |
| | | 0.5pF | ±0.1pF | CL10C0R5BEAGQW□ |
| | | 0.5pF | ±0.25pF | CL10C0R5CEAGQW□ |
| | | 0.6pF | ±0.05pF | CL10C0R6AEAGQW□ |
| | | 0.6pF | ±0.1pF | CL10C0R6BEAGQW□ |
| | | 0.6pF | ±0.25pF | CL10C0R6CEAGQW□ |
| | | 0.7pF | ±0.05pF | CL10C0R7AEAGQW□ |
| | | 0.7pF | ±0.1pF | CL10C0R7BEAGQW□ |
| | | 0.7pF | ±0.25pF | CL10C0R7CEAGQW□ |
| | | 0.8pF | ±0.05pF | CL10C0R8AEAGQW□ |
| | | 0.8pF | ±0.1pF | CL10C0R8BEAGQW□ |
| | | 0.8pF | ±0.25pF | CL10C0R8CEAGQW□ |
| | | 0.9pF | ±0.05pF | CL10C0R9AEAGQW□ |
| | | 0.9pF | ±0.1pF | CL10C0R9BEAGQW□ |
| | | 0.9pF | ±0.25pF | CL10C0R9CEAGQW□ |
| | | 1.0pF | ±0.05pF | CL10C010AEAGQW□ |
| | | 1.0pF | ±0.1pF | CL10C010BEAGQW□ |
| | | 1.0pF | ±0.25pF | CL10C010CEAGQW□ |
| | | 1.1pF | ±0.05pF | CL10C1R1AEAGQW□ |
| | | 1.1pF | ±0.1pF | CL10C1R1BEAGQW□ |
| | | 1.1pF | ±0.25pF | CL10C1R1CEAGQW□ |
| | | 1.2pF | ±0.05pF | CL10C1R2AEAGQW□ |
| | | 1.2pF | ±0.1pF | CL10C1R2BEAGQW□ |
| | | 1.2pF | ±0.25pF | CL10C1R2CEAGQW□ |
| | | 1.3pF | ±0.05pF | CL10C1R3AEAGQW□ |
| | | 1.3pF | ±0.1pF | CL10C1R3BEAGQW□ |
| | | 1.3pF | ±0.25pF | CL10C1R3CEAGQW□ |
| | | 1.5pF | ±0.05pF | CL10C1R5AEAGQW□ |
| | | 1.5pF | ±0.1pF | CL10C1R5BEAGQW□ |
| | | 1.5pF | ±0.25pF | CL10C1R5CEAGQW□ |
| | | 1.6pF | ±0.05pF | CL10C1R6AEAGQW□ |
| | | 1.6pF | ±0.1pF | CL10C1R6BEAGQW□ |
| | | 1.6pF | ±0.25pF | CL10C1R6CEAGQW□ |
| | | 1.8pF | ±0.05pF | CL10C1R8AEAGQW□ |
| | | 1.8pF | ±0.1pF | CL10C1R8BEAGQW□ |
| | | 1.8pF | ±0.25pF | CL10C1R8CEAGQW□ |
| | | 2.0pF | ±0.05pF | CL10C020AEAGQW□ |
| | | 2.0pF | ±0.1pF | CL10C020BEAGQW□ |
| | | 2.0pF | ±0.25pF | CL10C020CEAGQW□ |
| | | 2.2pF | ±0.05pF | CL10C2R2AEAGQW□ |
| | | 2.2pF | ±0.1pF | CL10C2R2BEAGQW□ |
| | | 2.2pF | ±0.25pF | CL10C2R2CEAGQW□ |
| | | 2.4pF | ±0.05pF | CL10C2R4AEAGQW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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## Product Line Up ( C0G)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.80mm | 250Vdc | 2.4pF | ±0.1pF | CL10C2R4BEAGQW□ |
| | | 2.4pF | ±0.25pF | CL10C2R4CEAGQW□ |
| | | 2.7pF | ±0.05pF | CL10C2R7AEAGQW□ |
| | | 2.7pF | ±0.1pF | CL10C2R7BEAGQW□ |
| | | 2.7pF | ±0.25pF | CL10C2R7CEAGQW□ |
| | | 3.0pF | ±0.05pF | CL10C030AEAGQW□ |
| | | 3.0pF | ±0.1pF | CL10C030BEAGQW□ |
| | | 3.0pF | ±0.25pF | CL10C030CEAGQW□ |
| | | 3.3pF | ±0.05pF | CL10C3R3AEAGQW□ |
| | | 3.3pF | ±0.1pF | CL10C3R3BEAGQW□ |
| | | 3.3pF | ±0.25pF | CL10C3R3CEAGQW□ |
| | | 3.6pF | ±0.05pF | CL10C3R6AEAGQW□ |
| | | 3.6pF | ±0.1pF | CL10C3R6BEAGQW□ |
| | | 3.6pF | ±0.25pF | CL10C3R6CEAGQW□ |
| | | 3.9pF | ±0.05pF | CL10C3R9AEAGQW□ |
| | | 3.9pF | ±0.1pF | CL10C3R9BEAGQW□ |
| | | 3.9pF | ±0.25pF | CL10C3R9CEAGQW□ |
| | | 4.0pF | ±0.05pF | CL10C040AEAGQW□ |
| | | 4.0pF | ±0.1pF | CL10C040BEAGQW□ |
| | | 4.0pF | ±0.25pF | CL10C040CEAGQW□ |
| | | 4.3pF | ±0.05pF | CL10C4R3AEAGQW□ |
| | | 4.3pF | ±0.1pF | CL10C4R3BEAGQW□ |
| | | 4.3pF | ±0.25pF | CL10C4R3CEAGQW□ |
| | | 4.7pF | ±0.05pF | CL10C4R7AEAGQW□ |
| | | 4.7pF | ±0.1pF | CL10C4R7BEAGQW□ |
| | | 4.7pF | ±0.25pF | CL10C4R7CEAGQW□ |
| | | 5.0pF | ±0.05pF | CL10C050AEAGQW□ |
| | | 5.0pF | ±0.1pF | CL10C050BEAGQW□ |
| | | 5.0pF | ±0.25pF | CL10C050CEAGQW□ |
| | | 5.1pF | ±0.05pF | CL10C5R1AEAGQW□ |
| | | 5.1pF | ±0.1pF | CL10C5R1BEAGQW□ |
| | | 5.1pF | ±0.25pF | CL10C5R1CEAGQW□ |
| | | 5.1pF | ±0.5pF | CL10C5R1DEAGQW□ |
| | | 5.6pF | ±0.05pF | CL10C5R6AEAGQW□ |
| | | 5.6pF | ±0.1pF | CL10C5R6BEAGQW□ |
| | | 5.6pF | ±0.25pF | CL10C5R6CEAGQW□ |
| | | 5.6pF | ±0.5pF | CL10C5R6DEAGQW□ |
| | | 6.0pF | ±0.05pF | CL10C060AEAGQW□ |
| | | 6.0pF | ±0.1pF | CL10C060BEAGQW□ |
| | | 6.0pF | ±0.25pF | CL10C060CEAGQW□ |
| | | 6.0pF | ±0.5pF | CL10C060DEAGQW□ |
| | | 6.2pF | ±0.05pF | CL10C6R2AEAGQW□ |
| | | 6.2pF | ±0.1pF | CL10C6R2BEAGQW□ |
| | | 6.2pF | ±0.25pF | CL10C6R2CEAGQW□ |
| | | 6.2pF | ±0.5pF | CL10C6R2DEAGQW□ |
| | | 6.8pF | ±0.05pF | CL10C6R8AEAGQW□ |
| | | 6.8pF | ±0.1pF | CL10C6R8BEAGQW□ |
| | | 6.8pF | ±0.25pF | CL10C6R8CEAGQW□ |
| | | 6.8pF | ±0.5pF | CL10C6R8DEAGQW□ |
| | | 7.0pF | ±0.05pF | CL10C070AEAGQW□ |
| | | 7.0pF | ±0.1pF | CL10C070BEAGQW□ |
| | | 7.0pF | ±0.25pF | CL10C070CEAGQW□ |
| | | 7.0pF | ±0.5pF | CL10C070DEAGQW□ |
| | | 7.5pF | ±0.05pF | CL10C7R5AEAGQW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.80mm | 250Vdc | 7.5pF | ±0.1pF | CL10C7R5BEAGQW□ |
| | | 7.5pF | ±0.25pF | CL10C7R5CEAGQW□ |
| | | 7.5pF | ±0.5pF | CL10C7R5DEAGQW□ |
| | | 8.0pF | ±0.05pF | CL10C080AEAGQW□ |
| | | 8.0pF | ±0.1pF | CL10C080BEAGQW□ |
| | | 8.0pF | ±0.25pF | CL10C080CEAGQW□ |
| | | 8.0pF | ±0.5pF | CL10C080DEAGQW□ |
| | | 8.2pF | ±0.05pF | CL10C8R2AEAGQW□ |
| | | 8.2pF | ±0.1pF | CL10C8R2BEAGQW□ |
| | | 8.2pF | ±0.25pF | CL10C8R2CEAGQW□ |
| | | 8.2pF | ±0.5pF | CL10C8R2DEAGQW□ |
| | | 9.0pF | ±0.05pF | CL10C090AEAGQW□ |
| | | 9.0pF | ±0.1pF | CL10C090BEAGQW□ |
| | | 9.0pF | ±0.25pF | CL10C090CEAGQW□ |
| | | 9.0pF | ±0.5pF | CL10C090DEAGQW□ |
| | | 9.1pF | ±0.05pF | CL10C9R1AEAGQW□ |
| | | 9.1pF | ±0.1pF | CL10C9R1BEAGQW□ |
| | | 9.1pF | ±0.25pF | CL10C9R1CEAGQW□ |
| | | 9.1pF | ±0.5pF | CL10C9R1DEAGQW□ |
| | | 10pF | ±1% | CL10C100FEAGQW□ |
| | | 10pF | ±2% | CL10C100GEAGQW□ |
| | | 10pF | ±5% | CL10C100JEAGQW□ |
| | | 11pF | ±1% | CL10C110FEAGQW□ |
| | | 11pF | ±2% | CL10C110GEAGQW□ |
| | | 11pF | ±5% | CL10C110JEAGQW□ |
| | | 12pF | ±1% | CL10C120FEAGQW□ |
| | | 12pF | ±2% | CL10C120GEAGQW□ |
| | | 12pF | ±5% | CL10C120JEAGQW□ |
| | | 15pF | ±1% | CL10C150FEAGQW□ |
| | | 15pF | ±2% | CL10C150GEAGQW□ |
| | | 15pF | ±5% | CL10C150JEAGQW□ |
| | | 18pF | ±1% | CL10C180FEAGQW□ |
| | | 18pF | ±2% | CL10C180GEAGQW□ |
| | | 18pF | ±5% | CL10C180JEAGQW□ |
| | | 20pF | ±1% | CL10C200FEAGQW□ |
| | | 20pF | ±2% | CL10C200GEAGQW□ |
| | | 20pF | ±5% | CL10C200JEAGQW□ |
| | | 22pF | ±1% | CL10C220FEAGQW□ |
| | | 22pF | ±2% | CL10C220GEAGQW□ |
| | | 22pF | ±5% | CL10C220JEAGQW□ |
| | | 24pF | ±2% | CL10C240GEAGQW□ |
| | | 24pF | ±5% | CL10C240JEAGQW□ |
| | | 27pF | ±1% | CL10C270FEAGQW□ |
| | | 27pF | ±2% | CL10C270GEAGQW□ |
| | | 27pF | ±5% | CL10C270JEAGQW□ |
| | | 33pF | ±1% | CL10C330FEAGQW□ |
| | | 33pF | ±2% | CL10C330GEAGQW□ |
| | | 33pF | ±5% | CL10C330JEAGQW□ |
| | | 39pF | ±1% | CL10C390FEAGQW□ |
| | | 39pF | ±2% | CL10C390GEAGQW□ |
| | | 39pF | ±5% | CL10C390JEAGQW□ |
| | | 47pF | ±1% | CL10C470FEAGQW□ |
| | | 47pF | ±2% | CL10C470GEAGQW□ |
| | | 47pF | ±5% | CL10C470JEAGQW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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# High Q Industrial Capacitors

## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 250Vdc | 0.5pF | ±0.05pF | CL21C0R5AECGNW□ |
| | | 0.5pF | ±0.1pF | CL21C0R5BECGNW□ |
| | | 0.5pF | ±0.25pF | CL21C0R5CECGNW□ |
| | | 0.6pF | ±0.05pF | CL21C0R6AECGNW□ |
| | | 0.6pF | ±0.1pF | CL21C0R6BECGNW□ |
| | | 0.6pF | ±0.25pF | CL21C0R6CECGNW□ |
| | | 0.7pF | ±0.05pF | CL21C0R7AECGNW□ |
| | | 0.7pF | ±0.1pF | CL21C0R7BECGNW□ |
| | | 0.7pF | ±0.25pF | CL21C0R7CECGNW□ |
| | | 0.8pF | ±0.05pF | CL21C0R8AECGNW□ |
| | | 0.8pF | ±0.1pF | CL21C0R8BECGNW□ |
| | | 0.8pF | ±0.25pF | CL21C0R8CECGNW□ |
| | | 0.9pF | ±0.05pF | CL21C0R9AECGNW□ |
| | | 0.9pF | ±0.1pF | CL21C0R9BECGNW□ |
| | | 0.9pF | ±0.25pF | CL21C0R9CECGNW□ |
| | | 1.0pF | ±0.05pF | CL21C010AECGNW□ |
| | | 1.0pF | ±0.1pF | CL21C010BECGNW□ |
| | | 1.0pF | ±0.25pF | CL21C010CECGNW□ |
| | | 1.1pF | ±0.05pF | CL21C1R1AECGNW□ |
| | | 1.1pF | ±0.1pF | CL21C1R1BECGNW□ |
| | | 1.1pF | ±0.25pF | CL21C1R1CECGNW□ |
| | | 1.2pF | ±0.05pF | CL21C1R2AECGNW□ |
| | | 1.2pF | ±0.1pF | CL21C1R2BECGNW□ |
| | | 1.2pF | ±0.25pF | CL21C1R2CECGNW□ |
| | | 1.3pF | ±0.05pF | CL21C1R3AECGNW□ |
| | | 1.3pF | ±0.1pF | CL21C1R3BECGNW□ |
| | | 1.3pF | ±0.25pF | CL21C1R3CECGNW□ |
| | | 1.5pF | ±0.05pF | CL21C1R5AECGNW□ |
| | | 1.5pF | ±0.1pF | CL21C1R5BECGNW□ |
| | | 1.5pF | ±0.25pF | CL21C1R5CECGNW□ |
| | | 1.6pF | ±0.05pF | CL21C1R6AECGNW□ |
| | | 1.6pF | ±0.1pF | CL21C1R6BECGNW□ |
| | | 1.6pF | ±0.25pF | CL21C1R6CECGNW□ |
| | | 1.8pF | ±0.05pF | CL21C1R8AECGNW□ |
| | | 1.8pF | ±0.1pF | CL21C1R8BECGNW□ |
| | | 1.8pF | ±0.25pF | CL21C1R8CECGNW□ |
| | | 2.0pF | ±0.05pF | CL21C020AECGNW□ |
| | | 2.0pF | ±0.1pF | CL21C020BECGNW□ |
| | | 2.0pF | ±0.25pF | CL21C020CECGNW□ |
| | | 2.2pF | ±0.05pF | CL21C2R2AECGNW□ |
| | | 2.2pF | ±0.1pF | CL21C2R2BECGNW□ |
| | | 2.2pF | ±0.25pF | CL21C2R2CECGNW□ |
| | | 2.4pF | ±0.05pF | CL21C2R4AECGNW□ |
| | | 2.4pF | ±0.1pF | CL21C2R4BECGNW□ |
| | | 2.4pF | ±0.25pF | CL21C2R4CECGNW□ |
| | | 2.7pF | ±0.05pF | CL21C2R7AECGNW□ |
| | | 2.7pF | ±0.1pF | CL21C2R7BECGNW□ |
| | | 2.7pF | ±0.25pF | CL21C2R7CECGNW□ |
| | | 3.0pF | ±0.05pF | CL21C030AECGNW□ |
| | | 3.0pF | ±0.1pF | CL21C030BECGNW□ |
| | | 3.0pF | ±0.25pF | CL21C030CECGNW□ |
| | | 3.3pF | ±0.05pF | CL21C3R3AECGNW□ |
| | | 3.3pF | ±0.1pF | CL21C3R3BECGNW□ |
| | | 3.3pF | ±0.25pF | CL21C3R3CECGNW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 250Vdc | 3.6pF | ±0.05pF | CL21C3R6AECGNW□ |
| | | 3.6pF | ±0.1pF | CL21C3R6BECGNW□ |
| | | 3.6pF | ±0.25pF | CL21C3R6CECGNW□ |
| | | 3.9pF | ±0.05pF | CL21C3R9AECGNW□ |
| | | 3.9pF | ±0.1pF | CL21C3R9BECGNW□ |
| | | 3.9pF | ±0.25pF | CL21C3R9CECGNW□ |
| | | 4.0pF | ±0.05pF | CL21C040AECGNW□ |
| | | 4.0pF | ±0.1pF | CL21C040BECGNW□ |
| | | 4.0pF | ±0.25pF | CL21C040CECGNW□ |
| | | 4.3pF | ±0.05pF | CL21C4R3AECGNW□ |
| | | 4.3pF | ±0.1pF | CL21C4R3BECGNW□ |
| | | 4.3pF | ±0.25pF | CL21C4R3CECGNW□ |
| | | 4.7pF | ±0.05pF | CL21C4R7AECGNW□ |
| | | 4.7pF | ±0.1pF | CL21C4R7BECGNW□ |
| | | 4.7pF | ±0.25pF | CL21C4R7CECGNW□ |
| | | 5.0pF | ±0.05pF | CL21C050AECGNW□ |
| | | 5.0pF | ±0.1pF | CL21C050BECGNW□ |
| | | 5.0pF | ±0.25pF | CL21C050CECGNW□ |
| | | 5.1pF | ±0.05pF | CL21C5R1AECGNW□ |
| | | 5.1pF | ±0.1pF | CL21C5R1BECGNW□ |
| | | 5.1pF | ±0.25pF | CL21C5R1CECGNW□ |
| | | 5.1pF | ±0.5pF | CL21C5R1DECGNW□ |
| | | 5.6pF | ±0.05pF | CL21C5R6AECGNW□ |
| | | 5.6pF | ±0.1pF | CL21C5R6BECGNW□ |
| | | 5.6pF | ±0.25pF | CL21C5R6CECGNW□ |
| | | 5.6pF | ±0.5pF | CL21C5R6DECGNW□ |
| | | 6.0pF | ±0.05pF | CL21C060AECGNW□ |
| | | 6.0pF | ±0.1pF | CL21C060BECGNW□ |
| | | 6.0pF | ±0.25pF | CL21C060CECGNW□ |
| | | 6.0pF | ±0.5pF | CL21C060DECGNW□ |
| | | 6.2pF | ±0.05pF | CL21C6R2AECGNW□ |
| | | 6.2pF | ±0.1pF | CL21C6R2BECGNW□ |
| | | 6.2pF | ±0.25pF | CL21C6R2CECGNW□ |
| | | 6.2pF | ±0.5pF | CL21C6R2DECGNW□ |
| | | 6.8pF | ±0.05pF | CL21C6R8AECGNW□ |
| | | 6.8pF | ±0.1pF | CL21C6R8BECGNW□ |
| | | 6.8pF | ±0.25pF | CL21C6R8CECGNW□ |
| | | 6.8pF | ±0.5pF | CL21C6R8DECGNW□ |
| | | 7.0pF | ±0.05pF | CL21C070AECGNW□ |
| | | 7.0pF | ±0.1pF | CL21C070BECGNW□ |
| | | 7.0pF | ±0.25pF | CL21C070CECGNW□ |
| | | 7.0pF | ±0.5pF | CL21C070DECGNW□ |
| | | 7.5pF | ±0.05pF | CL21C7R5AECGNW□ |
| | | 7.5pF | ±0.1pF | CL21C7R5BECGNW□ |
| | | 7.5pF | ±0.25pF | CL21C7R5CECGNW□ |
| | | 7.5pF | ±0.5pF | CL21C7R5DECGNW□ |
| | | 8.0pF | ±0.05pF | CL21C080AECGNW□ |
| | | 8.0pF | ±0.1pF | CL21C080BECGNW□ |
| | | 8.0pF | ±0.25pF | CL21C080CECGNW□ |
| | | 8.0pF | ±0.5pF | CL21C080DECGNW□ |
| | | 8.2pF | ±0.05pF | CL21C8R2AECGNW□ |
| | | 8.2pF | ±0.1pF | CL21C8R2BECGNW□ |
| | | 8.2pF | ±0.25pF | CL21C8R2CECGNW□ |
| | | 8.2pF | ±0.5pF | CL21C8R2DECGNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

In order to move to the page directly, please click the here. ↑

## Product Line Up (C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 250Vdc | 9.0pF | ±0.05pF | CL21C090AECGNW□ |
| | | 9.0pF | ±0.1pF | CL21C090BECGNW□ |
| | | 9.0pF | ±0.25pF | CL21C090CECGNW□ |
| | | 9.0pF | ±0.5pF | CL21C090DECGNW□ |
| | | 9.1pF | ±0.05pF | CL21C9R1AECGNW□ |
| | | 9.1pF | ±0.1pF | CL21C9R1BECGNW□ |
| | | 9.1pF | ±0.25pF | CL21C9R1CECGNW□ |
| | | 9.1pF | ±0.5pF | CL21C9R1DECGNW□ |
| | | 10pF | ±1% | CL21C100FECGNW□ |
| | | 10pF | ±2% | CL21C100GECGNW□ |
| | | 10pF | ±5% | CL21C100JECGNW□ |
| | | 11pF | ±1% | CL21C110FECGNW□ |
| | | 11pF | ±2% | CL21C110GECGNW□ |
| | | 11pF | ±5% | CL21C110JECGNW□ |
| | | 12pF | ±1% | CL21C120FECGNW□ |
| | | 12pF | ±2% | CL21C120GECGNW□ |
| | | 12pF | ±5% | CL21C120JECGNW□ |
| | | 15pF | ±1% | CL21C150FECGNW□ |
| | | 15pF | ±2% | CL21C150GECGNW□ |
| | | 15pF | ±5% | CL21C150JECGNW□ |
| | | 18pF | ±1% | CL21C180FECGNW□ |
| | | 18pF | ±2% | CL21C180GECGNW□ |
| | | 18pF | ±5% | CL21C180JECGNW□ |
| | | 20pF | ±1% | CL21C200FECGNW□ |
| | | 20pF | ±2% | CL21C200GECGNW□ |
| | | 20pF | ±5% | CL21C200JECGNW□ |
| | | 22pF | ±1% | CL21C220FECGNW□ |
| | | 22pF | ±2% | CL21C220GECGNW□ |
| | | 22pF | ±5% | CL21C220JECGNW□ |
| | | 24pF | ±1% | CL21C240FECGNW□ |
| | | 24pF | ±2% | CL21C240GECGNW□ |
| | | 24pF | ±5% | CL21C240JECGNW□ |
| | | 27pF | ±1% | CL21C270FECGNW□ |
| | | 27pF | ±2% | CL21C270GECGNW□ |
| | | 27pF | ±5% | CL21C270JECGNW□ |
| | | 33pF | ±1% | CL21C330FECGNW□ |
| | | 33pF | ±2% | CL21C330GECGNW□ |
| | | 33pF | ±5% | CL21C330JECGNW□ |
| | | 39pF | ±1% | CL21C390FECGNW□ |
| | | 39pF | ±2% | CL21C390GECGNW□ |
| | | 39pF | ±5% | CL21C390JECGNW□ |
| | | 47pF | ±1% | CL21C470FECGNW□ |
| | | 47pF | ±2% | CL21C470GECGNW□ |
| | | 47pF | ±5% | CL21C470JECGNW□ |
| | | 62pF | ±1% | CL21C620FECGNW□ |
| | | 62pF | ±2% | CL21C620GECGNW□ |
| | | 62pF | ±5% | CL21C620JECGNW□ |
| | | 68pF | ±1% | CL21C680FECGNW□ |
| | | 68pF | ±2% | CL21C680GECGNW□ |
| | | 68pF | ±5% | CL21C680JECGNW□ |
| | | 82pF | ±1% | CL21C820FECGNW□ |
| | | 82pF | ±2% | CL21C820GECGNW□ |
| | | 82pF | ±5% | CL21C820JECGNW□ |
| | | 100pF | ±1% | CL21C101FECGNW□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 250Vdc | 100pF | ±2% | CL21C101GECGNW□ |
| | | 100pF | ±5% | CL21C101JECGNW□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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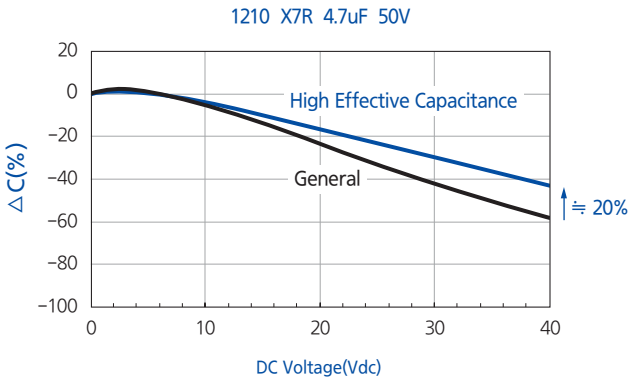
# High Effective Capacitance Industrial Capacitors

## Feature

- Excellent DC – bias characteristics with fine powder
- Enhance high temperature reliability
- Speical outgoing inspection for industrial application (HALT, etc)
- Advantage of fine powder technology

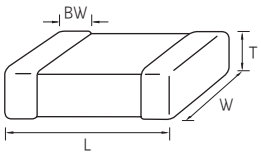


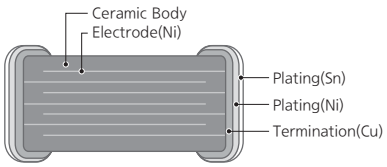

By using finer powder : Reduced capacitance degradation by bias and aging

## Application

- 24 / 48V input line filter for power supply
- Network, Power application and etc.
- Ideal for decoupling and filtering applications (Class II : X7R)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 1.25±0.10 | F | 0.50+0.20/−0.30 |
| 31 | 1206 | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | 0.50±0.30 |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 2.50±0.20 | J | 0.60±0.30 |
| | | 3.20±0.40 | 2.50±0.30 | 2.50±0.30 | V | |

## Industrial Capacitance Table (X5R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | uF | | | | |
| | | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 6.8 | 10 |
| 0805(2012) | 6.3 | | | | | | | | | | | |

## Industrial Capacitance Table (X7R)

| Size inch (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | nF | | | | | | uF | | | | |
| | | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 6.8 | 10 |
| 0402(1005) | 16 | | | | | | | | | | | |
| 1206 (3216) | 50 | | | | | | | | | | | |
| | 100 | | | | | | | | | | | |
| 1210 (3225) | 50 | | | | | | | | | | | |
| | 100 | | | | | | | | | | | |

## Product Line Up (X5R)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.35mm | 6.3Vdc | 10uF | ±10% | CL21A106KQFN3W□ | |

## Product Line Up (X7R)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 0.55mm | 16Vdc | 100nF | ±10% | CL05B104KO5N3W□ | |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 1.80mm | 50Vdc | 4.7uF | ±10% | CL31B475KBHN3W□ | |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number | Remark |
|---|---|---|---|---|---|
| 2.70mm | 50Vdc | 10uF | ±10% | CL32B106KBJN3W□ | |
| | | 4.7uF | ±10% | CL32B475KBJN3W□ | |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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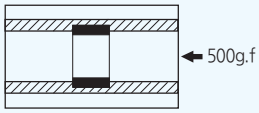
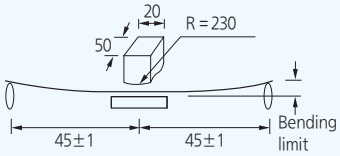
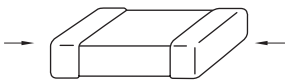
# Reliability Test Condition

| No. | Item | | Performance | Test condition |
|---|---|---|---|---|
| 1 | Appearance | | No abnormal exterior appearance | Visual Inspection through Microscope (X10) |
| 2 | Insulation resistance | | 10,000MΩ min. or 500MΩ ·μF min.(or*100MΩ ·μF) product whichever is smaller.<br>(Rated voltage ≤16V:10,000MΩ min. or 100MΩ ·μF min. product whichever is smaller) | Apply the rated voltage for 60 ~ 120sec.<br>Rated voltage > 500V : Insulation resistance shall be measured with 500±50Vdc |
| 3 | Withstanding voltage | | No dielectric breakdown or mechanical breakdown | Apply the specified voltage*for 1 ~ 5 sec.<br>Charge / Discharge current limit : 50mA max<br>*CLASS I (Rated Voltage < 100V) : 300% of the rated Voltage<br>CLASS II (Rated Voltage < 100V) : 250% of the rated Voltage<br>In the case of rated Voltage ≥ 100V products, following condition should be applied.<br>100V ≤ Rated Voltage < 500V : 200% of the rated Voltage<br>500V ≤ Rated Voltage < 1000V : 150% of the rated Voltage<br>Rated Voltage ≥ 1000V : 120% of the rated Voltage |
| 4 | Capacitance | Class I | Within the specified tolerance | ■ Class I<br>Capacitance: ≤1,000pF — Frequency: 1MHz±10% — Voltage: 0.5 ~ 5Vrms<br>Capacitance: >1,000pF — Frequency: 1kHz±10% — Voltage: 0.5 ~ 5Vrms |
| | | Class II | Within the specified tolerance | ■ Class II<br>Capacitance: ≤10μF — Frequency: 1kHz±10% — Voltage: 1.0±0.2Vrms<br>Capacitance: >10μF — Frequency: 120Hz±20% — Voltage: 0.5±0.1Vrms<br>Capacitance: Exception* — Frequency: 1kHz±10% — Voltage: 0.5±0.1Vrms<br>Capacitance shall be measured after the heat treatment of 150+0 / −10℃ for 1hr and leaving for 24±2hr at room temperature. (Class II ) |
| 5 | Q | Class I | Capacitance ≥ 30pF : Q ≥ 1,000<br>< 30pF : Q ≥ 400+20×C<br>(C : Capacitance) | |
| | Tanδ | Class II | 1.Characteristic : A(X5R)<br>Rated Voltage: 50V /35V — Spec: 0.025 max / 0.05 max*<br>Rated Voltage: 25V — Spec: 0.025 max / 0.05 max*/ 0.10 max*<br>Rated Voltage: 16V — Spec: 0.035 max / 0.05 max*/ 0.10 max*<br>Rated Voltage: ≤10V — Spec: 0.05 max / 0.10 max*<br>2.Characteristic : B(X7R), X(X6S), Y(X7S)<br>Rated Voltage: 50V≥/ 35V / 25V — Spec: 0.025 max / 0.05 max* / 0.10 max*<br>Rated Voltage: 16V — Spec: 0.035 max / 0.10 max*<br>Rated Voltage: ≤10V — Spec: 0.05 max/0.10 max*<br>3.Characteristic : F(Y5V)<br>Rated Voltage: 50V / 35V / 25V — Spec: 0.05 max / 0.07 max* / 0.09 max*<br>Rated Voltage: 16V — Spec: 0.07 max / 0.09 max* / 0.125 max*<br>Rated Voltage: 10V — Spec: 0.125 max/0.16 max*<br>Rated Voltage: ≤ 6.3V — Spec: 0.16 max | * The conditions of measurement may be altered upon request. You can check the specification at the web site or contact sales people for each product with mark* |
| 6 | Temperature characteristics of capacitance | Class I | Characteristic: C(C0G) — Temp. coefficient (PPM/℃): 0±30 | Capacitance shall be measured by the steps shown in the following table.<br>Step 1 — Temperature(℃): 25±2<br>Step 2 — Temperature(℃): Min. operating temp.±2<br>Step 3 — Temperature(℃): 25±2<br>Step 4 — Temperature(℃): Max. operating temp.±2<br>Step 5 — Temperature(℃): 25±2<br>■ Class I<br>Temperature Coefficient shall be calculated from the formula as below<br>Temp. Coefficient = $\frac{C2-C1}{C1\times\Delta T}\times10^6$[ppm/℃]<br>C1 : Capacitance at step 3<br>C2 : Capacitance at 125℃<br>ΔT : 125℃ − 25℃ = 100℃ |
| | | Class II | Characteristic: A(X5R) / B(X7R) — Capacitance change(%) with No bias: ±15%<br>Characteristic: X(X6S) / Y(X7S) — Capacitance change(%) with No bias: ±22%<br>Characteristic: Z(X7T) — Capacitance change(%) with No bias: +22% ~ −33%<br>Characteristic: F(Y5V) — Capacitance change(%) with No bias: +22% ~ −82% | ■ Class II<br>Capacitance change shall be calculated from the formula as below<br>$\Delta C = \frac{C2-C1}{C1}\times100(\%)$<br>C1 : Capacitance at step 3<br>C2 : Capacitance at step 2 or step 4 |

| No. | Item | | Performance | Test condition |
|---|---|---|---|---|
| 7 | Adhesive strength of termination | | No indication of peeling shall occur on the terminal electrode. | Apply 500g.f pressure for 10±1 sec.<br>※ 200g.f for size 0201 / 100g.f for size 01005<br>  <br> |
| 8 | Bending strength | Appearance | No mechanical damage shall occur. | • Bending Limit : 1mm • Test Speed : 1.0mm / sec.<br>Keep the test board at the limit point in 5sec. then Measure Capacitance.<br>※ Industial Capacitor<br>- SW6 / ZW6 / Z46 Code, Bending Limit : 3mm<br>- Z4J Code, Bending Limit : 5mm<br>  <br> |
| | | Capacitance | Characteristic: Class I — Capacitance change: Within±5% or ±0.5pF whichever is larger<br>Characteristic: Class II, A(X5R), B(X7R), X(X6S), Y(X7S) Z(X7T) — Capacitance change: Within±12.5%<br>Characteristic: Class II, F(Y5V) — Capacitance change: Within±30% | |
| 9 | Solderability | | More than 75% of the terminal surface is to be soldered newly, so metal part does not come out or dissolve<br>※ Industial Capacitor : Z46 / Z4J Code, More than 95%<br>  | Solder: Sn_Ag3_0.5Cu<br>Solder temp.: 245±5℃<br>Flux: RMA Type<br>Dip time: 3±0.3sec.<br>Pre-heating: at 80~120℃ for 10~30sec. |
| 10 | Resistance to soldering heat | Appearance | No mechanical damage shall occur. | Solder temperature: 270±5℃ DIP TIME : 10±1 sec.<br>Each termination shall be fully immersed and preheated as below :<br>Step 1: Temp.(℃) 80~100, Time(sec.) 60<br>Step 2: Temp.(℃) 150~180, Time(sec.) 60<br><br>Perform the initial measurement according to Note1.<br>Please refer to p.131<br><br>Final measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance | Characteristic: Class I — Capacitance change: ±2.5% or ±0.25pF whichever is larger<br>Characteristic: Class II, A(X5R), B(X7R), X(X6S), Y(X7S) Z(X7T) — Capacitance change: Within±7.5%<br>Characteristic: Class II, F(Y5V) — Capacitance change: Within±20% | |
| | | Q (Class I ) | Within the specified initial value | |
| | | Tanδ (Class II ) | Within the specified initial value | |
| | | Insulation resistance | Within the specified initial value | |
| | | Withstanding voltage | No breakdown of dielectric | |
| 11 | Vibration test | Appearance | No mechanical damage shall occur. | The capacitor shall be subjected to a harmonic motion having a total amplitude of 1.5mm changing frequency from 10Hz to 55Hz and back to 10Hz in about 1 min.<br><br>Repeat this for 2hours each in 3mutually perpendicular directions<br><br>※ Industial Capacitor : Z46 / Z4J Code<br>With frequency from 10~2000Hz during 20min.<br>3 directions X 12 times (total 36 times, 12hr)<br><br>Perform the initial measurement according to Note1.<br>Please refer to p.131<br><br>Final measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance | Characteristic: Class I — Capacitance change: ±2.5% or ±0.25pF whichever is larger<br>Characteristic: Class II, A(X5R), B(X7R) — Capacitance change: Within±5%<br>Characteristic: Class II, X(X6S), Y(X7S) Z(X7T) — Capacitance change: Within±5%<br>Characteristic: Class II, F(Y5V) — Capacitance change: Within±10% | |
| | | Q (Class I ) | Within the specified initial value | |
| | | Tanδ (Class II ) | Within the specified initial value | |
| | | Insulation resistance | Within the specified initial value | |

# Reliability Test Condition

<table>
<tr><th>No.</th><th colspan="2">Item</th><th>Performance</th><th>Test condition</th></tr>
<tr><td rowspan="5">12</td><td rowspan="5">Moisture resistance</td><td>Appearance</td><td>No mechanical damage shall occur.</td><td rowspan="5">Applied voltage : Rated Voltage<br><br>Temperature : 40±2℃<br>Humidity : 90~95%RH<br>Duration time : 500+12/-0hr.<br>Charge/Discharge current : 50mA max.<br><br>※ Industial Capacitor : Z46/Z4J Code<br>85±2℃, 80~85%RH, 1000+48/-0hr.<br><br>Perform the initial measurement according to Note1.<br>Perform the final measurement according to Note2.<br>Please refer to p.131<br><br>This test is only applied to Rated Voltage ≤ 500V products.<br>You can check the specification at the web site or contact sales people for each product with mark*</td></tr>
<tr><td>Capacitance</td><td>
<table>
<tr><th>Characteristic</th><th colspan="2">Capacitance change</th></tr>
<tr><td colspan="2">Class I</td><td>±7.5% or ±0.75pF whichever is larger</td></tr>
<tr><td rowspan="2">Class II</td><td>A(X5R), B(X7R), X(X6S), Y(X7S) Z(X7T)</td><td>Within±12.5%</td></tr>
<tr><td>F(Y5V)</td><td>±30%</td></tr>
</table>
</td></tr>
<tr><td>Q<br>(Class I)</td><td>Capacitance≥30pF : Q≥200<br><30pF : Q≥100+10/3×C(C : Capacitance)</td></tr>
<tr><td>Tanδ<br>(Class II)</td><td>1. Capacitance : A(X5R)<br>0.05 max / 0.075 max* (35V / 50V)<br>0.05 max / 0.075 max* / 0.125 max*(16V / 25V)<br>0.075 max / 0.125 max* (≤10V)<br>2. Capacitance : B(X7R), X(X6S)<br>0.05 max / 0.125 max* (16V / 25V / 35V / 50V≥)<br>0.075 max / 0.125 max* (≤10V)<br>3. Capacitance : F(Y5V)<br>0.09 max (50V)<br>0.09 max / 0.125 max* (25V / 35V)<br>0.09 max / 0.125 max* / 0.16 max* (16V)<br>0.16 max / 0.195 max* (10V)<br>0.195 max (4V / 6.3V)<br>4. Industial Capacitor : Z46/Z4J Code<br>0.035 max* (≥25V)<br>0.050 max* (16V)<br>0.075 max* (10V)</td></tr>
<tr><td>Insulation resistance</td><td>500MΩ min. or 25MΩ ·μF min.<br>product whichever is smaller / 12.5MΩ ·μF or over*</td></tr>
<tr><td rowspan="5">13</td><td rowspan="5">High temperature resistance</td><td>Appearance</td><td>No mechanical damage shall occur.</td><td rowspan="5">Temperature : Max. operating temperature<br><br>Duration Time: 1000+48/-0hr.<br>Charge/Discharge Current : 50mAmax.<br><br>Apply Voltage : 100% of Rated Voltage*<br>It depends on each item (120%/150%/200% Rated Voltage)<br><br>Perform the initial measurement according to Note1.<br>Perform the final measurement according to Note2.<br>Please refer to p.131<br><br>You can check the specification at the web site or contact sales people for each product with mark*</td></tr>
<tr><td>Capacitance</td><td>
<table>
<tr><th>Characteristic</th><th colspan="2">Capacitance change</th></tr>
<tr><td colspan="2">Class I</td><td>±3% or ±0.30pF whichever is larger</td></tr>
<tr><td rowspan="2">Class II</td><td>A(X5R), B(X7R), X(X6S), Y(X7S) Z(X7T)</td><td>Within±12.5%</td></tr>
<tr><td>F(Y5V)</td><td>30%</td></tr>
</table>
</td></tr>
<tr><td>Q<br>(Class I)</td><td>Capacitance≥30pF : Q≥350<br>10pF≤Capacitance<30pF : Q≥275+2.5×C<br>Capacitance<10pF : Q≥200+10×C (C : Capacitance)</td></tr>
<tr><td>Tanδ<br>(Class II)</td><td>1. Capacitance : A(X5R)<br>0.05 max / 0.075 max* (35V / 50V)<br>0.05 max / 0.075 max* / 0.125 max*(16V / 25V)<br>0.075 max / 0.125 max* (≤10V)<br>2. Capacitance : B(X7R), X(X6S)<br>0.05 max / 0.125 max* (16V / 25V / 35V / 50V≥)<br>0.075 max / 0.125 max* (≤10V)<br>3. Capacitance : F(Y5V)<br>0.09 max (50V)<br>0.09 max / 0.125 max* (25V / 35V)<br>0.09 max / 0.125 max* / 0.16 max* (16V)<br>0.16 max / 0.195 max* (10V)<br>0.195 max (4V / 6.3V)<br>4. Industial Capacitor : Z46/Z4J Code<br>0.035 max* (≥25V)<br>0.050 max* (16V)<br>0.075 max* (10V)</td></tr>
<tr><td>Insulation resistance</td><td>1,000MΩ min. or 50MΩ ·μF min.<br>product whichever is smaller / 25MΩ ·μF or over*</td></tr>
</table>

| No. | Item | | Performance | Test condition |
|---|---|---|---|---|
| 14 | Temperature cycle | Appearance | No mechanical damage shall occur. | Capacitor shall be subjected to 5 cycles.<br>※ Industial Capacitor : Z46 / Z4J Code, 1000 cycles.<br>Condition for 1 cycle :<br>Perform the initial measurement according to Note1.<br>Please refer to p.131<br><br>Final measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance | Class I: ±2.5% or ±0.25pF whichever is larger<br>Class II: A(X5R) Within ±7.5% / ±10% / ±15%*; B(X7R) Within±7.5%; X(X6S), Y(X7S) Z(X7T) Within±15%; F(Y5V) Within±20% | |
| | | Q (Class I ) | Within the specified initial value | |
| | | Tanδ (Class II ) | Within the specified initial value | |
| | | Insulation resistance | Within the specified initial value | |
| 15 | Mechanical Shock (Only for Z46 / Z4J Code) | Appearance | No abnormal exterior appearance. | Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks)<br>Perform the initial measurement according to Note1.<br>Perform the final measurement according to Note2.<br>Please refer to p.131 |
| | | Capacitance | Class II: Within±10% | |
| | | Tanδ (Class II ) | 1. Capacitance : B(X7R)<br>0.025 max* (25V)<br>0.035 max* (16V)<br>0.050 max* (6.3V/10V) | |
| | | IR | 1,000MΩ min. or 50MΩ · μF min. product whichever is smaller / 12.5MΩ · μF or over* | |

Step / Temp.(℃) / Time(min.)

| Step | Temp.(℃) | Time(min.) |
|---|---|---|
| 1 | Min. operating temperature +0 / −3 | 30 |
| 2 | 25 | 2 ~ 3 |
| 3 | Max. operating temperature +3 / −0 | 30 |
| 4 | 25 | 2 ~ 3 |

Peak value / Duration / Wave / Velocity

| Peak value | Duration | Wave | Velocity |
|---|---|---|---|
| 1,500G | 0.5ms | Half sine | 4.7m / sec |

**Recommended Soldering Method**

| Size inch(mm) | Temperature Characteristic | Capacitance | Condition: Flow | Condition: Reflow |
|---|---|---|---|---|
| 01005(0402) | – | – | – | ○ |
| 0201(0603) | | | | |
| 0402(1005) | | | | |
| 0603(1608) | Class I | – | ○ | ○ |
| | Class II | C < 1uF | ○ | ○ |
| | | C ≥ 1uF | – | ○ |
| 0805(2012) | Class I | – | ○ | ○ |
| | Class II | C < 4.7uF | ○ | ○ |
| | | C ≥ 4.7uF | – | ○ |
| | Array | – | – | ○ |
| 1206(3216) | Class I | – | ○ | ○ |
| | Class II | C < 10uF | ○ | ○ |
| | | C ≥ 10uF | – | ○ |
| | Array | – | – | ○ |
| 1210(3225) | – | – | – | ○ |
| 1808(4520) | | | | ○ |
| 1812(4532) | | | | ○ |
| 2220(5750) | | | | ○ |

**Note 1. Initial Measurement For Class II**

Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.

**Note 2. Latter Measurement**

1. CLASS I
   Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.
2. CLASS II
   Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.

**Note 3. All Size in Reliability Test Condition Section is "inch"**

# Premium Capacitors for Automotive Applications

| CL | 10 | B | 104 | K | B | 8 | W | P | N | C |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |

## 1 SERIES CODE

CL = Multilayer Ceramic Capacitors

## 2 SIZE CODE

| Code | inch(mm) | Code | inch(mm) | Code | inch(mm) |
|---|---|---|---|---|---|
| 05 | 0402(1005) | 21 | 0805(2012) | 32 | 1210(3225) |
| 10 | 0603(1608) | 31 | 1206(3216) | | |

## 3 DIELECTRIC CODE

Class I

| Symbol | EIA Code | Operation Temperature Range(℃) | Temperature Coeffcient(ppm / ℃) |
|---|---|---|---|
| C | C0G | -55 ~ +125 | 0±30 |

Class II

| Symbol | EIA Code | Operation Temperature Range(℃) | Capacitance Change(%) |
|---|---|---|---|
| B | X7R | -55 ~ +125 | ±15 |
| Y | X7S | -55 ~ +125 | ±22 |

## 4 CAPACITANCE CODE

Capacitance expressed in pF. 2 significant digits plus number of zeros.

example) 106=10×$10^6$=10,000,000pF

For Values <10pF, Letter R denotes decimal point

example) 1R5 =1.5pF

## 5 TOLERANCE CODE

Capacitance Tolerance

| Code | Capacitance Tolerance | TC | Capacitance series | Remark |
|---|---|---|---|---|
| C | ±0.25pF | C0G | E-12 series* | under 5pF |
| D | ±0.5pF | C0G | E-12 series* | 5pF < Cp < 10pF |
| J | ±5% | C0G | E-12 series | ≥ 10pF |
| K | ±10% | X7R/X7S | E-6 series | |
| M | ±20% | X7R/X7S | E-6 series | |

* E-24 series is also available

※This code has only typical specifications. Please refer to individual specifications.

| Series | Capacitance Step | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| E-3 | 1.0 | | | | 2.2 | | | | 4.7 | | | |
| E-6 | 1.0 | | 1.5 | | 2.2 | | 3.3 | | 4.7 | | 6.8 | |
| E-12 | 1.0 | 1.2 | 1.5 | 1.8 | 2.2 | 2.7 | 3.3 | 3.9 | 4.7 | 5.6 | 6.8 | 8.2 |
| E-24 | 1.0 | 1.1 | 1.2 | 1.3 | 2.2 | 2.4 | 2.7 | 3.0 | 4.7 | 5.1 | 5.6 | 6.2 |
| | 1.5 | 1.6 | 1.8 | 2.0 | 3.3 | 3.6 | 3.9 | 4.3 | 6.8 | 7.5 | 8.2 | 9.1 |

## 6 RATED VOLTAGE CODE

Q = 6.3V P = 10V O = 16V A = 25V B = 50V C = 100V

## 7 THICKNESS CODE

(Unit:mm)

| Size mm(inch) | Code | Thickness* | Tolerance |
|---|---|---|---|
| 1005(0402) | 5 | 0.50 | ±0.05 |
| 1608(0603) | 8 | 0.80 | ±0.10 |
| 2012(0805) | 6 | 0.60 | ±0.10 |
| | C | 0.85 | ±0.10 |
| | F | 1.25 | ±0.10 |
| | Q | 1.25 | ±0.15 |
| 3216(1206) | C | 0.85 | ±0.15 |
| | P | 1.15 | ±0.10 |
| | H | 1.60 | ±0.20 |
| 3225(1210) | I | 2.00 | ±0.20 |
| | J | 2.50 | ±0.20 |

* In case of Higher Bending Strength , ESD protection capacitors, Please refer to individual specifications.
※ This code has only typical specifications. Please refer to individual specifications.

## 8 DESIGN CODE

| Code | Inner electrode | Termination | Plating material | Design |
|---|---|---|---|---|
| 1 | Ni | Cu | Ni_Sn 100% | Standard |
| V | Ni | Cu/Metal Epoxy | Ni_Sn 100% | Standard |
| W | Ni | Cu/Metal Epoxy | Ni_Sn 100% | Open Mode |
| X | Ni | Cu/Metal Epoxy | Ni_Sn 100% | Float Mode |

※ This code has only typical specifications. Please refer to individual specifications.

## 9 PRODUCT CODE OR SIZE CONTROL CODE

P = Automotive product meet AEC-Q200.

## 10 CONTROL CODE

N = Standard J = Higher Bending Strength E = ESD Protection

## 11 PACKAGING CODE

| Code | Type | Code | Type |
|---|---|---|---|
| C | Cardbord Tape, 7"reel | E | Embossed Tape, 7"reel |
| D/L | Cardbord Tape, 13"reel (Quantity option) | F | Embossed Tape, 13"reel |

※ If you want to learn to the code or quantity in detail, please see page 148.
In order to move to the page directly, please click the here. ↑

# General Automotive Capacitors

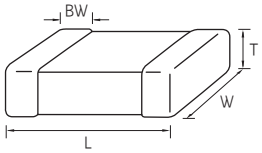
## Feature

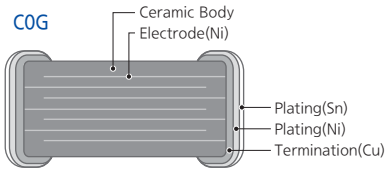
- Automotive products are manufactured in state of the art facilities recommend for registration to ISO / TS 16949 : 2002.
- Automotive products meet AEC – Q200 requirements.
- Automotive products are RoHS compliant.
- Automotive products meet JEDEC – 020 – D requirements.
- X7R dielectric components have BME and metal – epoxy terminations with a Ni / Sn plated overcoat.
- C0G dielectric components contain BME and copper terminations with a Ni / Sn plated overcoat.
- Size 0603 / 0805 / 1206 is suitable for flow and reflow soldering.
  Size 0402 and smaller (≤0402) and 1210 and bigger (≥1210) is suitable for reflow soldering.

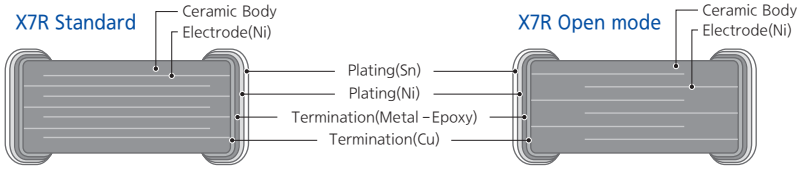
## Application

- Automotive Electronic Equipment
  (Powertrain, Safety, Body & Chassis, Convenience, Infortainment)

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.05 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.10 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.10 | 1.25±0.10 | 0.60±0.10 | 6 | 0.50+0.20/–0.30 |
| | | | | 0.85±0.10 | C | |
| | | | | 1.25±0.10 | F | |
| | | 2.00±0.15 | 1.25±0.15 | 1.25±0.15 | Q | |
| 31 | 1206 | 3.20±0.15 | 1.60±0.15 | 0.85±0.15 | C | 0.50±0.30 |
| | | | | 1.15±0.10 | P | |
| | | 3.20±0.20 | 1.60±0.20 | 1.60±0.20 | H | |
| 32 | 1210 | 3.20±0.30 | 2.50±0.20 | 2.00±0.20 | I | 0.60±0.30 |
| | | | | 2.50±0.20 | J | |

## Automotive Capacitance Table (C0G)

| Size inch (mm) | Thickness (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | pF | | | | | | nF | | | | |
| | | | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 |
| 0402 (1005) | 0.50 | 50 | | | | | | | | | | | |
| | | 100 | | | | | | | | | | | |
| 0603 (1608) | 0.80 | 50 | | | | | | | | | | | |
| | | 100 | | | | | 270 | | | | | | |
| 0805 (2012) | 0.60 0.85 1.25 | 50 | | | | | | | | | | | |
| | | 100 | | | | | | | | | | | |

## Automotive Capacitance Table (X7R)

| Size inch (mm) | Thickness (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | nF | | | | | | uF | | | | |
| | | | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 |
| 0402 (1005) | 0.50 | 10 | ■ | ■ | ■ | ■ | | | | | | | |
| | | 16 | ■ | ■ | ■ | ■ | | | | | | | |
| | | 25 | ■ | ■ | ■ | | | | | | | | |
| | | 50 | ■ | ■ | ■ | | | | | | | | |
| 0603 (1608) | 0.80 | 10 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| | | 16 | ■ | ■ | ■ | ■ | ■ | ■ | ■ | | | | |
| | | 25 | ■ | ■ | ■ | ■ | ■ | ■ | | | | | |
| | | 50 | ■ | ■ | ■ | ■ | ■ | | | | | | |
| | | 100 | ■ | ■ | ■ | | | | | | | | |
| 0805 (2012) | 1.25 | 10 | | | | | ■ | ■ | ■ | ■ | ■ | | |
| | 0.85 | 16 | | | ■ | ■ | | | | | | | |
| | 1.25 | | | | | | ■ | ■ | ■ | ■ | ■ | | |
| | 0.60 | 25 | ■ | ■ | | | | | | | | | |
| | 0.85 | | | | ■ | ■ | | | | | | | |
| | 1.25 | | | | | ■ | ■ | ■ | ■ | ■ | | | |
| | 0.60 | 50 | ■ | ■ | | | | | | | | | |
| | 0.85 | | | | ■ | ■ | | | | | | | |
| | 1.25 | | | | | ■ | ■ | ■ | ■ | | | | |
| | 0.60 | 100 | ■ | ■ | | | | | | | | | |
| | 0.85 | | | | ■ | ■ | | | | | | | |
| | 1.25 | | | | | ■ | | | | | | | |
| 1206 (3216) | 1.60 | 10 | | | | | | | | ■ | ■ | ■ | |
| | 1.15 | 16 | | | | | | | ■ | | | | |
| | 1.60 | | | | | | | | | ■ | ■ | ■ | |
| | 0.85 | 25 | | | | ■ | ■ | ■ | | | | | |
| | 1.15 | | | | | | | | ■ | | | | |
| | 1.60 | | | | | | | | | ■ | ■ | ■ | |
| | 0.85 | 50 | | | | ■ | | | | | | | |
| | 1.15 | | | | | | ■ | | | | | | |
| | 1.60 | | | | | | | ■ | ■ | ■ | | | |
| | 0.85 | 100 | | | | ■ | | | | | | | |
| | 1.15 | | | | | ■ | ■ | | | | | | |
| 1210 (3225) | 2.50 | 10 | | | | | | | | | | | ■ |
| | 2.50 | 16 | | | | | | | | | | | ■ |
| | 2.50 | 25 | | | | | | | | | ■ | | |
| | 2.50 | 50 | | | | | | | | | ■ | | |

# General Automotive Capacitors

## Product Line Up (Automotive Capacitors – C0G)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 50Vdc | 4.7pF | ±0.25pF | CL05C4R7CB51PN□ |
| | | 6.8pF | ±0.5pF | CL05C6R8DB51PN□ |
| | | 10pF | ±5% | CL05C100JB51PN□ |
| | | 12pF | ±5% | CL05C120JB51PN□ |
| | | 15pF | ±5% | CL05C150JB51PN□ |
| | | 18pF | ±5% | CL05C180JB51PN□ |
| | | 22pF | ±5% | CL05C220JB51PN□ |
| | | 33pF | ±5% | CL05C330JB51PN□ |
| | | 39pF | ±5% | CL05C390JB51PN□ |
| | | 47pF | ±5% | CL05C470JB51PN□ |
| | | 56pF | ±5% | CL05C560JB51PN□ |
| | | 68pF | ±5% | CL05C680JB51PN□ |
| | | 82pF | ±5% | CL05C820JB51PN□ |
| | | 100pF | ±5% | CL05C101JB51PN□ |
| | | 120pF | ±5% | CL05C121JB51PN□ |
| | | 150pF | ±5% | CL05C151JB51PN□ |
| | | 180pF | ±5% | CL05C181JB51PN□ |
| | | 220pF | ±5% | CL05C221JB51PN□ |
| | 100Vdc | 4.7pF | ±0.25pF | CL05C4R7CC51PN□ |
| | | 6.8pF | ±0.5pF | CL05C6R8DC51PN□ |
| | | 10pF | ±5% | CL05C100JC51PN□ |
| | | 12pF | ±5% | CL05C120JC51PN□ |
| | | 15pF | ±5% | CL05C150JC51PN□ |
| | | 18pF | ±5% | CL05C180JC51PN□ |
| | | 22pF | ±5% | CL05C220JC51PN□ |
| | | 27pF | ±5% | CL05C270JC51PN□ |
| | | 33pF | ±5% | CL05C330JC51PN□ |
| | | 39pF | ±5% | CL05C390JC51PN□ |
| | | 47pF | ±5% | CL05C470JC51PN□ |
| | | 56pF | ±5% | CL05C560JC51PN□ |
| | | 68pF | ±5% | CL05C680JC51PN□ |
| | | 82pF | ±5% | CL05C820JC51PN□ |
| | | 100pF | ±5% | CL05C101JC51PN□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 4.7pF | ±0.25pF | CL10C4R7CB81PN□ |
| | | 6.8pF | ±0.5pF | CL10C6R8DB81PN□ |
| | | 10pF | ±5% | CL10C100JB81PN□ |
| | | 12pF | ±5% | CL10C120JB81PN□ |
| | | 15pF | ±5% | CL10C150JB81PN□ |
| | | 18pF | ±5% | CL10C180JB81PN□ |
| | | 22pF | ±5% | CL10C220JB81PN□ |
| | | 27pF | ±5% | CL10C270JB81PN□ |
| | | 33pF | ±5% | CL10C330JB81PN□ |
| | | 39pF | ±5% | CL10C390JB81PN□ |
| | | 47pF | ±5% | CL10C470JB81PN□ |
| | | 56pF | ±5% | CL10C560JB81PN□ |
| | | 68pF | ±5% | CL10C680JB81PN□ |
| | | 82pF | ±5% | CL10C820JB81PN□ |
| | | 100pF | ±5% | CL10C101JB81PN□ |
| | | 120pF | ±5% | CL10C121JB81PN□ |
| | | 150pF | ±5% | CL10C151JB81PN□ |
| | | 180pF | ±5% | CL10C181JB81PN□ |
| | | 220pF | ±5% | CL10C221JB81PN□ |
| | | 270pF | ±5% | CL10C271JB81PN□ |
| | | 330pF | ±5% | CL10C331JB81PN□ |
| | | 390pF | ±5% | CL10C391JB81PN□ |
| | | 470pF | ±5% | CL10C471JB81PN□ |
| | | 560pF | ±5% | CL10C561JB81PN□ |
| | | 680pF | ±5% | CL10C681JB81PN□ |
| | | 820pF | ±5% | CL10C821JB81PN□ |
| | | 1.0nF | ±5% | CL10C102JB81PN□ |
| | 100Vdc | 4.7pF | ±0.25pF | CL10C4R7CC81PN□ |
| | | 6.8pF | ±0.5pF | CL10C6R8DC81PN□ |
| | | 10pF | ±5% | CL10C100JC81PN□ |
| | | 12pF | ±5% | CL10C120JC81PN□ |
| | | 15pF | ±5% | CL10C150JC81PN□ |
| | | 18pF | ±5% | CL10C180JC81PN□ |
| | | 22pF | ±5% | CL10C220JC81PN□ |
| | | 27pF | ±5% | CL10C270JC81PN□ |
| | | 33pF | ±5% | CL10C330JC81PN□ |
| | | 39pF | ±5% | CL10C390JC81PN□ |
| | | 47pF | ±5% | CL10C470JC81PN□ |
| | | 56pF | ±5% | CL10C560JC81PN□ |
| | | 68pF | ±5% | CL10C680JC81PN□ |
| | | 82pF | ±5% | CL10C820JC81PN□ |
| | | 100pF | ±5% | CL10C101JC81PN□ |
| | | 120pF | ±5% | CL10C121JC81PN□ |
| | | 150pF | ±5% | CL10C151JC81PN□ |
| | | 180pF | ±5% | CL10C181JC81PN□ |
| | | 220pF | ±5% | CL10C221JC81PN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (Automotive Capacitors – C0G)

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.70mm | 50Vdc | 10pF | ±5% | CL21C100JB61PN□ |
| | | 12pF | ±5% | CL21C120JB61PN□ |
| | | 15pF | ±5% | CL21C150JB61PN□ |
| | | 18pF | ±5% | CL21C180JB61PN□ |
| | | 22pF | ±5% | CL21C220JB61PN□ |
| | | 27pF | ±5% | CL21C270JB61PN□ |
| | | 33pF | ±5% | CL21C330JB61PN□ |
| | | 39pF | ±5% | CL21C390JB61PN□ |
| | | 47pF | ±5% | CL21C470JB61PN□ |
| | | 56pF | ±5% | CL21C560JB61PN□ |
| | | 68pF | ±5% | CL21C680JB61PN□ |
| | | 82pF | ±5% | CL21C820JB61PN□ |
| | | 100pF | ±5% | CL21C101JB61PN□ |
| | | 120pF | ±5% | CL21C121JB61PN□ |
| | | 150pF | ±5% | CL21C151JB61PN□ |
| | | 180pF | ±5% | CL21C181JB61PN□ |
| | | 220pF | ±5% | CL21C221JB61PN□ |
| | | 270pF | ±5% | CL21C271JB61PN□ |
| | | 330pF | ±5% | CL21C331JB61PN□ |
| | | 390pF | ±5% | CL21C391JB61PN□ |
| | 100Vdc | 10pF | ±5% | CL21C100JC61PN□ |
| | | 12pF | ±5% | CL21C120JC61PN□ |
| | | 15pF | ±5% | CL21C150JC61PN□ |
| | | 18pF | ±5% | CL21C180JC61PN□ |
| | | 22pF | ±5% | CL21C220JC61PN□ |
| | | 27pF | ±5% | CL21C270JC61PN□ |
| | | 33pF | ±5% | CL21C330JC61PN□ |
| | | 39pF | ±5% | CL21C390JC61PN□ |
| | | 47pF | ±5% | CL21C470JC61PN□ |
| | | 56pF | ±5% | CL21C560JC61PN□ |
| | | 68pF | ±5% | CL21C680JC61PN□ |
| | | 82pF | ±5% | CL21C820JC61PN□ |
| | | 100pF | ±5% | CL21C101JC61PN□ |
| | | 120pF | ±5% | CL21C121JC61PN□ |
| | | 150pF | ±5% | CL21C151JC61PN□ |
| | | 180pF | ±5% | CL21C181JC61PN□ |
| | | 220pF | ±5% | CL21C221JC61PN□ |
| | | 270pF | ±5% | CL21C271JC61PN□ |
| | | 330pF | ±5% | CL21C331JC61PN□ |
| | | 390pF | ±5% | CL21C391JC61PN□ |
| 0.95mm | 50Vdc | 470pF | ±5% | CL21C471JBC1PN□ |
| | | 560pF | ±5% | CL21C561JBC1PN□ |
| | | 680pF | ±5% | CL21C681JBC1PN□ |
| | | 820pF | ±5% | CL21C821JBC1PN□ |
| | | 1.0nF | ±5% | CL21C102JBC1PN□ |
| | | 1.2nF | ±5% | CL21C122JBC1PN□ |
| | | 1.5nF | ±5% | CL21C152JBC1PN□ |
| | | 1.8nF | ±5% | CL21C182JBC1PN□ |
| | | 2.2nF | ±5% | CL21C222JBC1PN□ |
| | | 2.7nF | ±5% | CL21C272JBC1PN□ |
| | | 3.3nF | ±5% | CL21C332JBC1PN□ |
| | | 3.9nF | ±5% | CL21C392JBC1PN□ |
| | | 4.7nF | ±5% | CL21C472JBC1PN□ |
| | | 5.6nF | ±5% | CL21C562JBC1PN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.95mm | 100Vdc | 470pF | ±5% | CL21C471JCC1PN□ |
| | | 560pF | ±5% | CL21C561JCC1PN□ |
| | | 680pF | ±5% | CL21C681JCC1PN□ |
| | | 820pF | ±5% | CL21C821JCC1PN□ |
| | | 1.0nF | ±5% | CL21C102JCC1PN□ |
| 1.35mm | 50Vdc | 1.0nF | ±5% | CL21C102JBF1PN□ |
| | | 1.2nF | ±5% | CL21C122JBF1PN□ |
| | | 1.5nF | ±5% | CL21C152JBF1PN□ |
| | | 1.8nF | ±5% | CL21C182JBF1PN□ |
| | | 2.2nF | ±5% | CL21C222JBF1PN□ |
| | | 2.7nF | ±5% | CL21C272JBF1PN□ |
| | | 3.3nF | ±5% | CL21C332JBF1PN□ |
| | | 3.9nF | ±5% | CL21C392JBF1PN□ |
| | | 4.7nF | ±5% | CL21C472JBF1PN□ |
| | | 5.6nF | ±5% | CL21C562JBF1PN□ |
| | | 6.8nF | ±5% | CL21C682JBF1PN□ |
| | | 8.2nF | ±5% | CL21C822JBF1PN□ |
| | | 10nF | ±5% | CL21C103JBF1PN□ |
| | 100Vdc | 1.0nF | ±5% | CL21C102JCF1PN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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# General Automotive Capacitors

## Product Line Up (Automotive Capacitors – X7R)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 10Vdc | 100nF | ±10% | CL05B104KP5VPN□ |
| | 16Vdc | 1.0nF | ±10% | CL05B102KO5VPN□ |
| | | 1.5nF | ±10% | CL05B152KO5VPN□ |
| | | 2.2nF | ±10% | CL05B222KO5VPN□ |
| | | 3.3nF | ±10% | CL05B332KO5VPN□ |
| | | 4.7nF | ±10% | CL05B472KO5VPN□ |
| | | 6.8nF | ±10% | CL05B682KO5VPN□ |
| | | 10nF | ±10% | CL05B103KO5VPN□ |
| | | 15nF | ±10% | CL05B153KO5VPN□ |
| | | 22nF | ±10% | CL05B223KO5VPN□ |
| | | 33nF | ±10% | CL05B333KO5VPN□ |
| | | 47nF | ±10% | CL05B473KO5VPN□ |
| | | 68nF | ±10% | CL05B683KO5VPN□ |
| | | 100nF | ±10% | CL05B104KO5VPN□ |
| | 25Vdc | 1.0nF | ±10% | CL05B102KA5VPN□ |
| | | 1.5nF | ±10% | CL05B152KA5VPN□ |
| | | 2.2nF | ±10% | CL05B222KA5VPN□ |
| | | 3.3nF | ±10% | CL05B332KA5VPN□ |
| | | 4.7nF | ±10% | CL05B472KA5VPN□ |
| | | 6.8nF | ±10% | CL05B682KA5VPN□ |
| | | 10nF | ±10% | CL05B103KA5VPN□ |
| | | 15nF | ±10% | CL05B153KA5VPN□ |
| | | 22nF | ±10% | CL05B223KA5VPN□ |
| | | 33nF | ±10% | CL05B333KA5VPN□ |
| | | 47nF | ±10% | CL05B473KA5VPN□ |
| | 50Vdc | 330pF | ±10% | CL05B331KB5VPN□ |
| | | 470pF | ±10% | CL05B471KB5VPN□ |
| | | 560pF | ±10% | CL05B561KB5VPN□ |
| | | 680pF | ±10% | CL05B681KB5VPN□ |
| | | 1.0nF | ±10% | CL05B102KB5VPN□ |
| | | 1.5nF | ±10% | CL05B152KB5VPN□ |
| | | 2.2nF | ±10% | CL05B222KB5VPN□ |
| | | 3.3nF | ±10% | CL05B332KB5VPN□ |
| | | 4.7nF | ±10% | CL05B472KB5VPN□ |
| | | 6.8nF | ±10% | CL05B682KB5VPN□ |
| | | 10nF | ±10% | CL05B103KB5VPN□ |
| | | 15nF | ±10% | CL05B153KB5VPN□ |
| | | 22nF | ±10% | CL05B223KB5VPN□ |
| | | 33nF | ±10% | CL05B333KB5VPN□ |
| | | 47nF | ±10% | CL05B473KB5VPN□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 10Vdc | 1.0uF | ±10% | CL10B105KP8VPN□ |
| | 16Vdc | 47nF | ±10% | CL10B473KO8WPN□ |
| | | 68nF | ±10% | CL10B683KO8WPN□ |
| | | 100nF | ±10% | CL10B104KO8WPN□ |
| | | 150nF | ±10% | CL10B154KO8VPN□ |
| | | 220nF | ±10% | CL10B224KO8VPN□ |
| | | 330nF | ±10% | CL10B334KO8VPN□ |
| | | 470nF | ±10% | CL10B474KO8VPN□ |
| | | 680nF | ±10% | CL10B684KO8VPN□ |
| | | 1.0uF | ±10% | CL10B105KO8VPN□ |
| | 25Vdc | 1.0nF | ±10% | CL10B102KA8WPN□ |
| | | 1.5nF | ±10% | CL10B152KA8WPN□ |
| | | 2.2nF | ±10% | CL10B222KA8WPN□ |
| | | 3.3nF | ±10% | CL10B332KA8WPN□ |
| | | 4.7nF | ±10% | CL10B472KA8WPN□ |
| | | 6.8nF | ±10% | CL10B682KA8WPN□ |
| | | 10nF | ±10% | CL10B103KA8WPN□ |
| | | 15nF | ±10% | CL10B153KA8WPN□ |
| | | 22nF | ±10% | CL10B223KA8WPN□ |
| | | 33nF | ±10% | CL10B333KA8WPN□ |
| | | 47nF | ±10% | CL10B473KA8WPN□ |
| | | 68nF | ±10% | CL10B683KA8WPN□ |
| | | 100nF | ±10% | CL10B104KA8WPN□ |
| | | 150nF | ±10% | CL10B154KA8VPN□ |
| | | 220nF | ±10% | CL10B224KA8VPN□ |
| | | 330nF | ±10% | CL10B334KA8VPN□ |
| | | 470nF | ±10% | CL10B474KA8VPN□ |
| | 50Vdc | 470pF | ±10% | CL10B471KB8WPN□ |
| | | 1.0nF | ±10% | CL10B102KB8WPN□ |
| | | 1.5nF | ±10% | CL10B152KB8WPN□ |
| | | 2.2nF | ±10% | CL10B222KB8WPN□ |
| | | 3.3nF | ±10% | CL10B332KB8WPN□ |
| | | 4.7nF | ±10% | CL10B472KB8WPN□ |
| | | 6.8nF | ±10% | CL10B682KB8WPN□ |
| | | 10nF | ±10% | CL10B103KB8WPN□ |
| | | 15nF | ±10% | CL10B153KB8WPN□ |
| | | 22nF | ±10% | CL10B223KB8WPN□ |
| | | 33nF | ±10% | CL10B333KB8WPN□ |
| | | 47nF | ±10% | CL10B473KB8WPN□ |
| | | 68nF | ±10% | CL10B683KB8WPN□ |
| | | 100nF | ±10% | CL10B104KB8WPN□ |
| | | 150nF | ±10% | CL10B154KB8VPN□ |
| | | 220nF | ±10% | CL10B224KB8VPN□ |
| | 100Vdc | 220pF | ±10% | CL10B221KC8WPN□ |
| | | 330pF | ±10% | CL10B331KC8WPN□ |
| | | 470pF | ±10% | CL10B471KC8WPN□ |
| | | 680pF | ±10% | CL10B681KC8WPN□ |
| | | 1.0nF | ±10% | CL10B102KC8WPN□ |
| | | 1.5nF | ±10% | CL10B152KC8WPN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
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## Product Line Up (Automotive Capacitors – X7R)

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 100Vdc | 2.2nF | ±10% | CL10B222KC8WPN□ |
| | | 3.3nF | ±10% | CL10B332KC8WPN□ |
| | | 4.7nF | ±10% | CL10B472KC8WPN□ |
| | | 6.8nF | ±10% | CL10B682KC8WPN□ |
| | | 10nF | ±10% | CL10B103KC8WPN□ |
| | | 15nF | ±10% | CL10B153KC8WPN□ |
| | | 22nF | ±10% | CL10B223KC8WPN□ |
| | | 33nF | ±10% | CL10B333KC8WPN□ |
| | | 47nF | ±10% | CL10B473KC8WPN□ |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.70mm | 50Vdc | 1.0nF | ±10% | CL21B102KB6WPN□ |
| | | 2.2nF | ±10% | CL21B222KB6WPN□ |
| | | 4.7nF | ±10% | CL21B472KB6WPN□ |
| | | 10nF | ±10% | CL21B103KB6WPN□ |
| | | 15nF | ±10% | CL21B153KB6WPN□ |
| | | 22nF | ±10% | CL21B223KB6WPN□ |
| | 100Vdc | 1.0nF | ±10% | CL21B102KC6WPN□ |
| | | 2.2nF | ±10% | CL21B222KC6WPN□ |
| | | 4.7nF | ±10% | CL21B472KC6WPN□ |
| | | 10nF | ±10% | CL21B103KC6WPN□ |
| | | 15nF | ±10% | CL21B153KC6WPN□ |
| | | 22nF | ±10% | CL21B223KC6WPN□ |
| 0.95mm | 16Vdc | 100nF | ±10% | CL21B104KOCWPN□ |
| | 25Vdc | 47nF | ±10% | CL21B473KACWPN□ |
| | | 68nF | ±10% | CL21B683KACWPN□ |
| | | 100nF | ±10% | CL21B104KACWPN□ |
| | 50Vdc | 33nF | ±10% | CL21B333KBCWPN□ |
| | | 47nF | ±10% | CL21B473KBCWPN□ |
| | | 68nF | ±10% | CL21B683KBCWPN□ |
| | | 100nF | ±10% | CL21B104KBCWPN□ |
| | 100Vdc | 33nF | ±10% | CL21B333KCCWPN□ |
| | | 47nF | ±10% | CL21B473KCCWPN□ |
| | | 68nF | ±10% | CL21B683KCCWPN□ |
| | | 100nF | ±10% | CL21B104KCCWPN□ |
| 1.35mm | 10Vdc | 1.0uF | ±10% | CL21B105KPFVPN□ |
| | | 2.2uF | ±10% | CL21B225KPFVPN□ |
| | 16Vdc | 150nF | ±10% | CL21B154KOFVPN□ |
| | | 220nF | ±10% | CL21B224KOFVPN□ |
| | | 330nF | ±10% | CL21B334KOFVPN□ |
| | | 470nF | ±10% | CL21B474KOFVPN□ |
| | | 680nF | ±10% | CL21B684KOFVPN□ |
| | | 1.0uF | ±10% | CL21B105KOFVPN□ |
| | | 2.2uF | ±10% | CL21B225KOFVPN□ |
| | 25Vdc | 150nF | ±10% | CL21B154KAFVPN□ |
| | | 220nF | ±10% | CL21B224KAFVPN□ |
| | | 330nF | ±10% | CL21B334KAFVPN□ |
| | | 470nF | ±10% | CL21B474KAFVPN□ |
| | | 680nF | ±10% | CL21B684KAFVPN□ |
| | | 1.0uF | ±10% | CL21B105KAFVPN□ |
| | | 2.2uF | ±10% | CL21B225KAFVPN□ |

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 50Vdc | 100nF | ±10% | CL21B104KBFWPN□ |
| | | 150nF | ±10% | CL21B154KBFVPN□ |
| | | 220nF | ±10% | CL21B224KBFVPN□ |
| | | 330nF | ±10% | CL21B334KBFVPN□ |
| | | 470nF | ±10% | CL21B474KBFVPN□ |
| | | 680nF | ±10% | CL21B684KBFVPN□ |
| | | 1.0uF | ±10% | CL21B105KBFVPN□ |
| | 100Vdc | 100nF | ±10% | CL21B104KCFWPN□ |
| 1.40mm | 10Vdc | 4.7uF | ±10% | CL21B475KPQVPN□ |
| | 16Vdc | 4.7uF | ±10% | CL21B475KOQVPN□ |

■ Size : 3.20 X 1.60mm (inch : 1206)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 25Vdc | 220nF | ±10% | CL31B224KACWPN□ |
| | | 330nF | ±10% | CL31B334KACWPN□ |
| | | 470nF | ±10% | CL31B474KACWPN□ |
| | 50Vdc | 100nF | ±10% | CL31B104KBCWPN□ |
| | 100Vdc | 100nF | ±10% | CL31B104KCCWPN□ |
| 1.25mm | 16Vdc | 1.0uF | ±10% | CL31B105KOPWPN□ |
| | 25Vdc | 680nF | ±10% | CL31B684KAPWPN□ |
| | | 1.0uF | ±10% | CL31B105KAPWPN□ |
| | 50Vdc | 100nF | ±10% | CL31B104KBPWPN□ |
| | | 150nF | ±10% | CL31B154KBPWPN□ |
| | | 220nF | ±10% | CL31B224KBPWPN□ |
| | 100Vdc | 100nF | ±10% | CL31B104KCPWPN□ |
| | | 150nF | ±10% | CL31B154KCPWPN□ |
| | | 220nF | ±10% | CL31B224KCPWPN□ |
| 1.80mm | 10Vdc | 4.7uF | ±10% | CL31B475KPHVPN□ |
| | | 10uF | ±10% | CL31B106KPHVPN□ |
| | 16Vdc | 2.2uF | ±10% | CL31B225KOHVPN□ |
| | | 4.7uF | ±10% | CL31B475KOHVPN□ |
| | | 10uF | ±10% | CL31B106KOHVPN□ |
| | 25Vdc | 2.2uF | ±10% | CL31B225KAHVPN□ |
| | | 4.7uF | ±10% | CL31B475KAHVPN□ |
| | | 10uF | ±10% | CL31B106KAHVPN□ |
| | 50Vdc | 330nF | ±10% | CL31B334KBHWPN□ |
| | | 470nF | ±10% | CL31B474KBHWPN□ |
| | | 680nF | ±10% | CL31B684KBHWPN□ |
| | | 1.0uF | ±10% | CL31B105KBHWPN□ |
| | | 2.2uF | ±10% | CL31B225KBHVPN□ |
| | | 4.7uF | ±10% | CL31B475KBHVPN□ |

■ Size : 3.20 X 2.50mm (inch : 1210)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 2.70mm | 10Vdc | 22uF | ±10% | CL32B226KPJVPN□ |
| | 16Vdc | 22uF | ±10% | CL32B226KOJVPN□ |
| | 25Vdc | 4.7uF | ±10% | CL32B475KAJVPN□ |
| | 50Vdc | 4.7uF | ±10% | CL32B475KBJVPN□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

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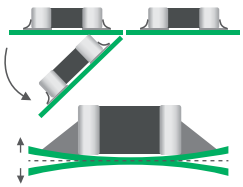
# Special Automotive Capacitors

Higher Bending Strength

## Feature

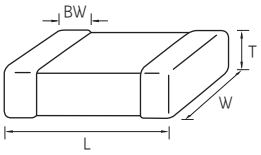
- AEC – Q200 qualified, 5mm bending strength guarantee.
- Strong thermal – mechanical properties.



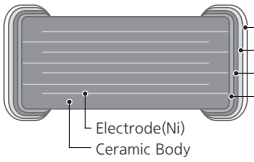
## Application

- Critical circuits and Battery line circuits.
  (Prevent a module / sub – system failure in the event of a cracked / shorted capacitor)

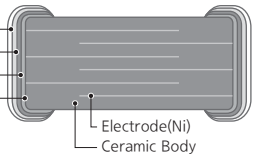
## Structure and Dimensions




Standard Design **VPJ**




Open mode Design **WPJ**




| Size Code | EIA Code | Dimension(mm) | | | | |
|---|---|---|---|---|---|---|
| | | L | W | T | Thickness Code | BW |
| 05 | 0402 | 1.00±0.10 | 0.50±0.05 | 0.50±0.05 | 5 | 0.25±0.10 |
| 10 | 0603 | 1.60±0.20 | 0.80±0.10 | 0.80±0.10 | 8 | 0.30±0.20 |
| 21 | 0805 | 2.00±0.30 | 1.25±0.20 | 0.85±0.10 | C | 0.50+0.20/−0.30 |
| | | | | 1.25±0.20 | F | |
| 31 | 1206 | 3.20±0.30 | 1.60±0.30 | 1.60±0.30 | H | 0.50±0.30 |
| 32 | 1210 | 3.20±0.40 | 2.50±0.30 | 2.50±0.30 | J | 0.60±0.30 |

## Higher Bending Strength Capacitance Table (X7R)

| Size inch (mm) | Thickness (mm) | Rated Voltage (Vdc) | Capacitance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | nF | | | | | | uF | | | | |
| | | | 10 | 22 | 47 | 100 | 220 | 470 | 1.0 | 2.2 | 4.7 | 10 | 22 |
| 0402 (1005) | 0.50 | 16 | | | | | | | | | | | |
| | | 50 | | | | | | | | | | | |
| 0603(1608) | 0.80 | 25 | | | | | | | | | | | |
| 0805(2012) | 1.25 | 25 | | | | | | | | | | | |
| 1206(3216) | 1.60 | 16 | | | | | | | | | | | |

## Product Line Up (Higher Bending Strength Capacitors – X7R)

■ Size : 1.00 X 0.50mm (inch : 0402)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.55mm | 16Vdc | 10nF | ±10% | CL05B103KO5VPJ□ |
| | | 22nF | ±10% | CL05B223KO5VPJ□ |
| | | 47nF | ±10% | CL05B473KO5VPJ□ |
| | | 100nF | ±10% | CL05B104KO5VPJ□ |
| | 25Vdc | 10nF | ±10% | CL05B103KA5VPJ□ |
| | | 22nF | ±10% | CL05B223KA5VPJ□ |
| | 50Vdc | 10nF | ±10% | CL05B103KB5VPJ□ |
| | | 22nF | ±10% | CL05B223KB5VPJ□ |

■ Size : 1.60 X 0.80mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 0.90mm | 10Vdc | 1.0uF | ±10% | CL10B105KP8VPJ□ |
| | 16Vdc | 1.0uF | ±10% | CL10B105KO8VPJ□ |
| | 25Vdc | 1.0uF | ±10% | CL10B105KA8VPJ□ |

■ Size : 2.00 X 1.25mm (inch : 0805)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.45mm | 10Vdc | 1.0uF | ±10% | CL21B105KPFVPJ□ |
| | 16Vdc | 1.0uF | ±10% | CL21B105KOFVPJ□ |
| | 25Vdc | 1.0uF | ±10% | CL21B105KAFVPJ□ |

■ Size : 3.20 X 1.60mm (inch : 1206)

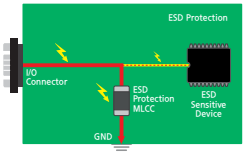
| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.90mm | 10Vdc | 4.7uF | ±10% | CL31B475KPHVPJ□ |
| | 16Vdc | 4.7uF | ±10% | CL31B475KOHVPJ□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148
In order to move to the page directly, please click the here. ↑

# Special Automotive Capacitors

## Feature

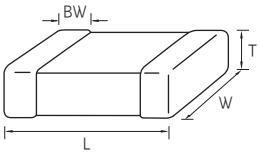
- Compliance with the IEC 61000 – 4 – 2 standard for ESD immunity.
- Enhanced DC – Bias & Breakdown voltage.

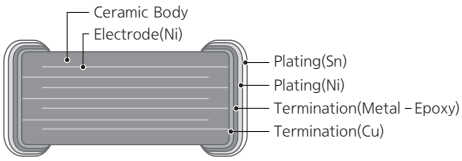



## Application

- Input and output sections in a wide range of automotive electronics.

## Structure and Dimensions




| Size Code | EIA Code | Dimension(mm) | | | |
|---|---|---|---|---|---|
| | | L | W | T | BW |
| 10 | 0603 | 1.70±0.10 | 0.90±0.10 | 0.90±0.10 | 0.30±0.20 |

## ESD Protection Capacitance Table (X7R)

| Size inch (mm) | Thickness (mm) | Rated Voltage (Vdc) | Capacitance(nF) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1.0 | 1.5 | 2.2 | 3.3 | 4.7 | 6.8 | 10 | 15 | 22 | 33 | 47 |
| 0603(1608) | 0.80 | 100 | | | | | | | | | | | |

## Product Lineup (ESD Protection Capacitors – X7R)

■ Size : 1.70 X 0.90mm (inch : 0603)

| Thickness Max. | Rated Voltage | Capacitance | Capacitance Tolerance | Part Number |
|---|---|---|---|---|
| 1.00mm | 100Vdc | 1.0nF | ±10% | CL10B102KC84PE□ |
| | | 1.5nF | ±10% | CL10B152KC84PE□ |
| | | 2.2nF | ±10% | CL10B222KC84PE□ |
| | | 3.3nF | ±10% | CL10B332KC84PE□ |
| | | 4.7nF | ±10% | CL10B472KC84PE□ |
| | | 6.8nF | ±10% | CL10B682KC84PE□ |
| | | 10nF | ±10% | CL10B103KC84PE□ |

※ □mark means packaging code. If you want to learn the code or quantity in detail, please see p.148

In order to move to the page directly, please click the here. ↑

# Reliability Test Conditions

| No. | Item | | | Performance | Test condition |
|---|---|---|---|---|---|
| 1 | Pre-and Post-Stress Electrical Test | | | - | |
| 2 | High Tempera-ture Exposure | Appearance | | No abnormal exterior appearance | Unpowered, 1000hrs@T = 125℃<br><br>Initial Measurement<br>Perform the heat treatment at 150℃ +0/-10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class I | Within±2.5% or ±0.25pF,<br>(Whichever is larger) | |
| | | | Class II | Within±10% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 1,000<br>< 30pF : Q≥ 400 + 20 X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.030 max<br>≥ 16V : 0.050 max<br>≥ 10V : 0.075 max *1) | |
| | | IR | | More than 10,000MΩ or 500MΩ X μF<br>(Whichever is smaller) *1) | |
| 3 | Tempera-ture Cycling | Appearance | | No abnormal exterior appearance | 1000Cycles<br>Initial Measurement<br>Perform the heat treatment at 150℃ +0/-10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Step / Temperature(℃) / Time(min.)<br>1 / Min. operating Temp.+0/-3 / 30±3<br>2 / 25±2 / 1<br>3 / Max. operating Temp.+3/-0 / 30±3<br>4 / 25±2 / 1 |
| | | Capacitance Change | Class I | Within±2.5% or ±0.25pF,<br>(Whichever is larger) | |
| | | | Class II | Within±10% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 1,000<br>< 30pF : Q≥ 400 + 20 X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.030 max<br>≥ 16V : 0.050 max<br>≥ 10V : 0.075 max *1) | |
| | | IR | | More than 10,000MΩ or 500MΩ X μF<br>(Whichever is smaller) *1) | |
| 4 | Destructive Physical Analysis | | | No defects or abnormalities | Per EIA 469 |
| 5 | Biased Humidity | Appearance | | No abnormal exterior appearance | 1000hrs 85℃/85%RH, Rated voltage and 1.3~1.5V, (add 100kohm resistor)<br><br>Initial Measurement<br>Perform the heat treatment at 150℃ +0/-10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Perform the heat treatment at 150℃ +0 / -10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class I | Within±2.5% or ±0.25pF,<br>(Whichever is larger) | |
| | | | Class II | Within±12.5% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 200<br>< 30pF : Q≥ 100 + (10/3) X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.035 max<br>≥ 16V : 0.050 max<br>≥ 10V : 0.075 max *1) | |
| | | IR | | More than 500MΩ or 25MΩ X μF<br>(Whichever is smaller) *1) | |
| 6 | High Tempera-ture Operating Life | Appearance | | No abnormal exterior appearance | 1000hrs @ TA=125℃, 200% Rated Voltage, *2)<br><br>Initial Measurement<br>Perform the heat treatment at 150℃ +0/-10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Perform the heat treatment at 150℃ +0 / -10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class I | Within±3.0% or ±0.3pF,<br>(Whichever is larger) | |
| | | | Class II | Within±12.5% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 350<br>≥ 10pF : Q≥ 275 + (5/2) X C<br>< 10pF : Q≥ 200 + 10 X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.035 max<br>≥ 16V : 0.050 max<br>≥ 10V : 0.075 max *1) | |
| | | IR | | More than 1,000MΩ or 50MΩ X μF<br>(Whichever is smaller) *1) | |

※ *1) : Indicates typical specification. Please refer to individual specifications.
*2) : Some of the parts are applicable in rated voltage ×150% or ×120%, Please refer to individual specifications.

# Reliability Test Conditions

| No. | Item | | | Performance | Test condition |
|---|---|---|---|---|---|
| 7 | External Visual | | | No abnormal exterior appearance | Microscope (x10) |
| 8 | Physical Dimensions | | | Within the specified dimensions | Using the calipers |
| 9 | Mechanical Shock | Appearance | | No abnormal exterior appearance | Three shocks in each direction should be applied along 3 mutually perpendicular axes of the test specimen (18 shocks)<br>Peak value: 1,500G; Duration: 0.5ms; Wave: Half sine; Velocity: 4.7m / sec<br><br>Initial Measurement<br>Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class I | Within±2.5% or ±0.25pF, (Whichever is larger) | |
| | | | Class II | Within±10% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 1,000<br>< 30pF : Q≥ 400 + 20 X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.025 max<br>≥ 16V : 0.035 max<br>≥ 10V : 0.050 max *1) | |
| | | IR | | More than 10,000MΩ or 500MΩ X μF (Whichever is smaller) *1) | |
| 10 | Vibration | Appearance | | No abnormal exterior appearance | 5g's for 20min., 12cycles each of 3 orientations, Use 8" × 5" PCB 0.031" Thick 7 secure points on one long side and 2 secure points at corners of opposite sides. Parts mounted within 2" from any secure point. Test from 10~2000Hz.<br><br>Initial Measurement<br>Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class I | Within±2.5% or ±0.25pF, (Whichever is larger) | |
| | | | Class II | Within±10% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 1,000<br>< 30pF : Q≥ 400 + 20 X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.025 max<br>≥ 16V : 0.035 max<br>≥ 10V : 0.050 max *1) | |
| | | IR | | More than 10,000MΩ or 500MΩ X μF (Whichever is smaller) *1) | |
| 11 | Resistance to Solder Heat | Appearance | | No abnormal exterior appearance | Solder pot : 260±5℃, 10±1sec.<br>Initial Measurement<br>Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class I | Within±2.5% or ±0.25pF, (Whichever is larger) | |
| | | | Class II | Within±10% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 1,000<br>< 30pF : Q≥ 400 + 20 X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.025 max<br>≥ 16V : 0.035 max<br>≥ 10V : 0.050 max *1) | |
| | | IR | | More than 10,000MΩ or 500MΩ X μF (Whichever is smaller) *1) | |
| 12 | ESD | Appearance | | No abnormal exterior appearance | AEC − Q200 − 002<br>Initial Measurement<br>Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br><br>Final Measurement<br>Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class I | Within±2.5% or ±0.25pF, (Whichever is larger) | |
| | | | Class II | Within±10% | |
| | | Q | Class I | Capacitance ≥ 30pF : Q≥ 1,000<br>< 30pF : Q≥ 400 + 20 X C<br>(C : Capacitance) | |
| | | Tanδ | Class II | Rated Voltage ≥ 25V : 0.025 max<br>≥ 16V : 0.035 max<br>≥ 10V : 0.050 max *1) | |
| | | IR | | More than 10,000MΩ or 500MΩ X μF (Whichever is smaller) *1) | |
| 13 | Solderability | | | 95% of the terminations is to be soldered evenly and continuously | a) Preheat at 155℃ for 4 hrs, Immerse in solder for 5s at 235±5℃<br>b) Steam aging for 8 hrs, Immerse in solder for 5s at 235±5℃<br>c) Steam aging for 8 hrs, Immerse in solder for 120s at 260±5℃<br>solder : a solution ethanol and rosin |

※ *1) : Indicates typical specification. Please refer to individual specifications.

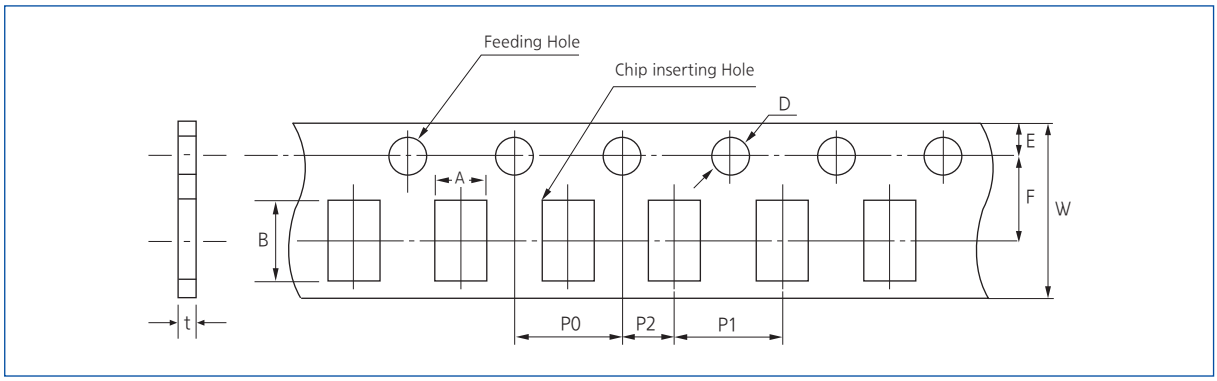
| No. | Item | | | Performance | Test condition |
|---|---|---|---|---|---|
| 14 | Electrical Characteri-zation | Capacitance | | Within specified tolerance | The Capacitance / D.F. should be measured at 25℃,<br>* Capacitance shall be measured after the heat treatment of 150+0 / −10℃ for 1hr and leaving for 24±2hr at room temperature. (Class Ⅱ)<br>Class \| Capacitance \| Frequency \| Voltage<br>Ⅰ: 1000pF ↓ \| 1㎒±10% \| 0.5 ~ 5.0Vrms<br>Ⅰ: 1000pF ↑ \| 1㎑±10% \| 0.5 ~ 5.0Vrms<br>Ⅱ: 10㎌ ↓ \| 1㎑±10% \| 1.0±0.2Vrms<br>Ⅱ: 10㎌ ↑ \| 120㎐±20% \| 0.5±0.1Vrms<br>I.R. should be measured with a DC voltage not exceeding Rated Voltage @25℃, @125℃ for 60 ~ 120 sec.<br>Dielectric Strength : 250% of the rated voltage for 1 ~ 5 seconds<br>The charge / discharge current is less than 50mA. |
| | | Q | Class Ⅰ | Capacitance ≥ 30pF : Q≥ 1,000<br>< 30pF : Q≥ 400 + 20 X C<br>(C : Capacitance) | |
| | | Tanδ | Class Ⅱ | Rated Voltage ≥ 25V : 0.025 max<br>≥ 16V : 0.035 max<br>≥ 10V : 0.050 max *1) | |
| | | IR@25℃ | Class Ⅰ | More than 100,000㏁ or 1,000㏁ X ㎌<br>(Whichever is smaller) | |
| | | | Class Ⅱ | More than 10,000㏁ or 500㏁ X ㎌<br>(Whichever is smaller) | |
| | | IR@125℃ | Class Ⅰ | More than 10,000㏁ or 100㏁ X ㎌<br>(Whichever is smaller) | |
| | | | Class Ⅱ | More than 1,000㏁ or 10㏁ X ㎌<br>(Whichever is smaller) | |
| | | Dielectric Strength | | No dielectric breakdown or mechanical breakdown | |
| 15 | Board Flex | Appearance | | No abnormal exterior appearance | Bending to the limit for 60 seconds.<br>Limit : Class Ⅰ – 3mm<br>Class Ⅱ – 2mm *1)<br>Initial Measurement<br>Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br>Final Measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class Ⅰ | Within±5.0% or ±0.5pF,<br>(Whichever is larger) | |
| | | | Class Ⅱ | Within±10% | |
| 16 | Terminal Strength (SMD) | Appearance | | No abnormal exterior appearance | 18N, for 60±1 sec.<br>* 0603(1608) −10N, 0402(1005) −2N<br>Initial Measurement<br>Perform the heat treatment at 150℃ +0 / −10℃ for 1 hour and leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement.<br>Final Measurement<br>Leave the capacitor in ambient condition for 24±2 hours before measurement. Then perform the measurement. |
| | | Capacitance Change | Class Ⅰ | Within±2.5% or ±0.25pF,<br>(Whichever is larger) | |
| | | | Class Ⅱ | Within±10% | |
| 17 | Beam Load | | | Destruction value should be exceed<br>Chip Length ≤ 2.5mm<br>a) Chip Thickness > 0.5mm : 20N<br>b) Chip Thickness ≤ 0.5mm : 8N<br>Chip Length ≥ 3.2mm<br>a) Chip Thickness ≥ 1.25mm : 54.5N<br>b) Chip Thickness < 1.25mm : 15N | Beam speed<br>Chip Length ≤ 2.5mm, 0.50±0.05mm / sec.<br>Chip Length ≥ 3.5mm, 2.50±0.25mm / sec. |
| 18 | Capaci-tance Tempera-ture Character-istics | Capacitance Change | Class Ⅰ | 0±30ppm / ℃ | Capacitance shall be measured by the steps shown in the following table.<br>Step \| Temperature(℃)<br>1 \| 25±2<br>2 \| Min. operating temp.±2<br>3 \| 25±2<br>4 \| Max. operating temp.±2<br>5 \| 25±2<br>■ Class Ⅰ<br>Temperature Coefficient shall be calculated from the formula as below<br>Temp. Coefficient = $\frac{C2-C1}{C1 \times \Delta T} \times 10^6$[ppm / ℃]<br>C1 : Capacitance at step 3 C2 : Capacitance at 125℃<br>ΔT : 125℃ – 25℃ = 100℃<br>■ Class Ⅱ<br>Capacitance change shall be calculated from the formula as below<br>$\Delta C = \frac{C2-C1}{C1} \times 100(\%)$<br>C1 : Capacitance at step 3 C2 : Capacitance at step 2 or step 4 |
| | | | Class Ⅱ | Within±15% | |

※ *1) : Indicates typical specification. Please refer to individual specifications.
If you want more detaiedl imformation, Please Visit Samsung Electro – mechanics website ( www.semlcr.com )

# Packaging Specifications

■ Taping Packaging design : Packaging design follows IEC 60286 – 3 standard
(IEC 60286 – 3 Packaging of components for automatic handling – parts 3)

## Cardboard(Paper) tape : 4mm pitch

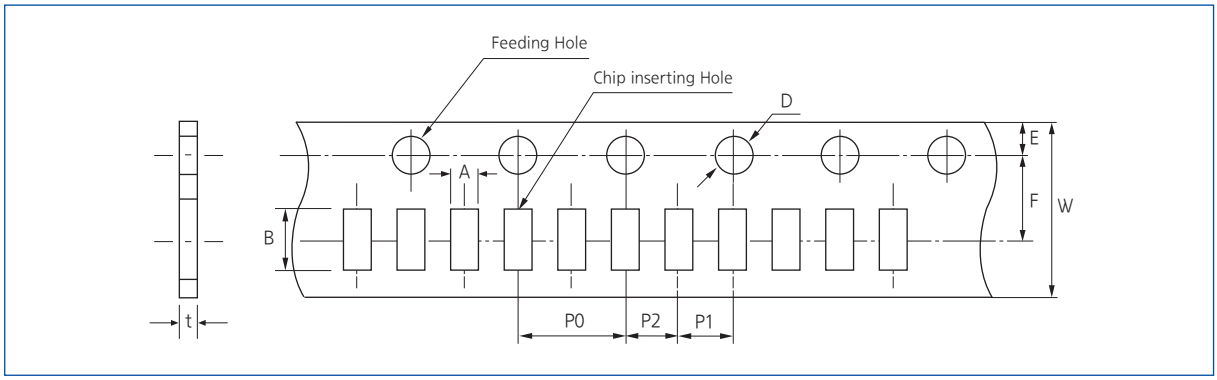



Unit : mm

| Symbol | | A | B | W | F | E | P1 | P2 | P0 | D | t |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Size inch(mm) | 0504 (1410) | 1.30 ±0.20 | 1.70 ±0.20 | 8.00 ±0.30 | 3.50 ±0.05 | 1.75 ±0.10 | 4.00 ±0.10 | 2.00 ±0.05 | 4.00 ±0.10 | Ø1.50 +0.10/−0 | 1.10 Below |
| | 0603 0306 (1608) (0816) | 1.10 ±0.20 | 1.90 ±0.20 | | | | | | | | |
| | 0805 0508 (2012) (1220) | 1.60 ±0.20 | 2.40 ±0.20 | | | | | | | | |
| | 1206 0612 (3216) (1632) | 2.00 ±0.20 | 3.60 ±0.20 | | | | | | | | |

※ According to normal size, we fill out A, B in the table above. The data may be changed as special size tolerance.

## Cardboard(Paper) tape : 2mm pitch

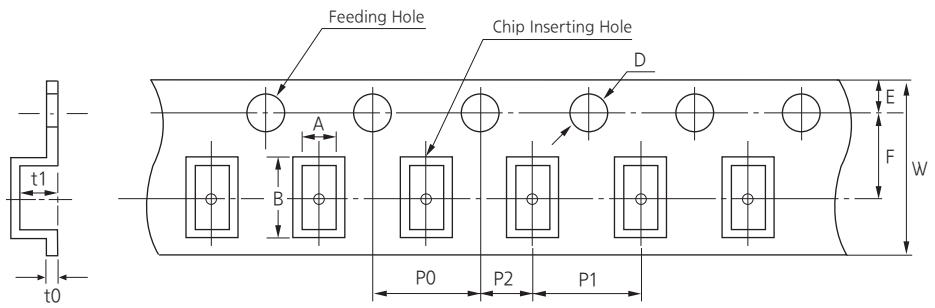



Unit : mm

| Symbol | | A | B | W | F | E | P1 | P2 | P0 | D | t |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Size inch(mm) | 01005 (0402) | 0.25 ±0.02 | 0.45 ±0.02 | 8.00 ±0.30 | 3.50 ±0.05 | 1.75 ±0.10 | 2.00 ±0.10 | 2.00 ±0.05 | 4.00 ±0.10 | Ø1.50 +0.10 /−0.03 | 0.25 ±0.02 |
| | 0201 (0603) | 0.38 ±0.03 | 0.68 ±0.03 | | | | | | | | 0.37 ±0.03 |
| | 0402 (1005) | 0.62 ±0.05 | 1.12 ±0.05 | | | | | | | | 0.37 ±0.05 |
| | | | | | | | | | | | 0.60 ±0.05 |
| | 0204 (0510) | 0.62+0.05 /−0.10 | 1.12+0.05 /−0.10 | | | | | | | | 0.37 ±0.03 |

※ According to normal size, we fill out A, B in the table above. The data may be changed as special size tolerance.

## Embossed(Plastic) tape



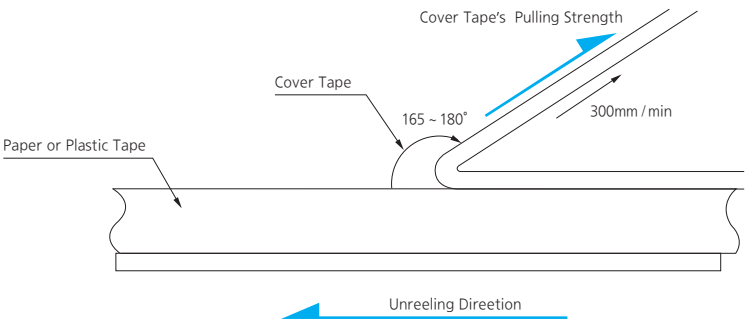

Unit : mm

| Symbol / Type | | A | B | W | F | E | P1 | P2 | P0 | D | t1 | t0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size inch(mm) | 01005 (0402) | 0.25 ±0.02 | 0.45 ±0.02 | 4.00 ±0.05 | 1.80 ±0.02 | 0.90 ±0.05 | 1.00 ±0.02 | 1.00 ±0.02 | 2.00 ±0.04 | Ø0.80 ±0.04 | 0.25 ±0.02 | 0.50 Max |
| | 0603 (1608) | 1.05 ±0.15 | 1.90 ±0.15 | 8.00 ±0.30 | 3.50 ±0.05 | 1.75 ±0.10 | 4.00 ±0.10 | 2.00 ±0.05 | 4.00 ±0.10 | Ø1.50 +0.10 /−0.03 | 2.90 Max | 0.60 Below |
| | 0805 (2012) | 1.45 ±0.20 | 2.30 ±0.20 | | | | | | | | | |
| | 1206 (3216) | 1.90 ±0.20 | 3.50 ±0.20 | | | | | | | | | |
| | 1210 (3225) | 2.80 ±0.20 | 3.60 ±0.20 | | | | | | | | | |
| | 1808 (4520) | 2.30 ±0.20 | 4.90 ±0.20 | 12.00 ±0.30 | 5.60 ±0.05 | | 8.00 ±0.10 | | | | 3.80 Max | |
| | 1812 (4532) | 3.60 ±0.20 | 4.90 ±0.20 | | | | | | | | | |
| | 2220 (5750) | 5.50 ±0.20 | 6.20 ±0.20 | | | | | | | | | |
| | 0204 (5010) | 0.62 +0.05 /−0.10 | 1.12 +0.05 /−0.10 | 0.80 ±0.30 | 3.50 ±0.05 | | 4.00 ±0.10 | | | | 2.50 Max | |
| | 0306 (0816) | 1.10 ±0.20 | 1.90 ±0.20 | | | | | | | | | |
| | 0508 (1220) | 1.45 ±0.20 | 2.30 ±0.20 | | | | | | | | | |
| | 0612 (1632) | 2.00 ±0.20 | 3.60 ±0.20 | | | | | | | | | |

※ According to normal size, we fill out A, B in the table above. The data may be changed as special size tolerance.

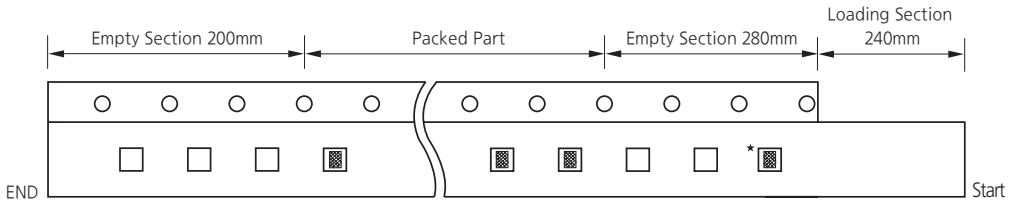
## Peeling off of Tape

■ 10g.f ≤ Peel off force ≤ 70g.f



# Packaging Specifications

## Taping figure




★The chip is only use for identifying the label and packaged products. Please don't use the chip.

## Packaging Code & Quantity

Unit : kpcs

| Size inch(mm) | Thickness code | Cardboard(Paper) Type | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 7" Reel | | | | | 10" Reel | 13" Reel | | | | |
| | | C | 8 | H | Z* | Y* | O | D | L | 2* | 7* | 3 |
| 01005(0402) | 2 | 20 | – | – | – | – | – | 100 | – | – | – | – |
| 0201(0603) | 3 | 10 | – | 15 | 10 | 10 | 30 | 50 | – | 150 | 50 | – |
| 0402(1005) | 3 | 10 | – | 15 | – | – | 30 | 50 | – | – | – | – |
| | 5 | 10 | 8 | – | 10 | 10 | 30 | 50 | 40 | 100 | 50 | – |
| | 7,8(THMC) | – | 8 | – | – | – | – | – | – | – | – | 30 |
| 0504(1410) | 8 | 4 | – | – | – | – | 10 | 10 | 15 | – | – | – |
| 0603(1608) | 5 | 4 | – | – | – | – | 30 | 50 | – | – | – | – |
| | 8 | 4 | – | – | 4 | 4 | 10 | 10 | 15 | – | – | – |
| | 9,N | 4 | – | – | – | – | – | – | – | – | – | – |
| 0805(2012) | A,C | 4 | – | – | – | – | 10 | 10 | 15 | – | – | – |
| 1206(3216) | C | 4 | – | – | – | – | 10 | 10 | 15 | – | – | – |

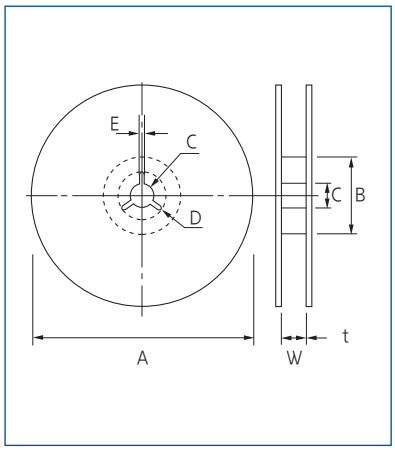
* 2 = 1mm Pitch / Z = Chip aligned for horizontal / Y, 7 = Chip aligned for vertical

Unit : kpcs

| Size inch(mm) | Thickness code | Embossed(Plastic) Type | | | | | | Bulk case Type | Bulk Type |
|---|---|---|---|---|---|---|---|---|---|
| | | 7" Reel | | | | 10" Reel | 13" Reel | | |
| | | E | G | W* | R* | S | F | P | B |
| 01005(0402) | 2 | 50 | – | – | – | – | – | – | – |
| 0201(0603) | 1 | 10 | – | – | – | – | – | – | – |
| 0402(1005) | 1,2,L | 15 | – | – | – | – | – | – | – |
| | 3,5 | – | – | – | – | – | – | 50 | – |
| 0603(1608) | 8 | 3 | – | – | 3 | – | 10 | 15 | – |
| | E,M | 3 | – | – | – | – | – | – | – |
| 0604(1610) | D | 3 | – | 3 | – | 6 | 10 | – | – |
| 0805(2012) | A,C | – | – | – | – | – | – | 10 | – |
| | E | 2 | 3 | 2 | – | 6 | 10 | 5 | – |
| | F | 2 | 3 | 2 | – | 6 | 10 | 5 | – |
| | Q | 2 | 3 | 2 | – | 6 | 10 | 5 | – |
| 1206(3216) | E,P,F | 2 | 3 | – | – | 6 | 10 | – | – |
| | H | 2 | – | 2 | – | 4 | 8 | – | – |
| 1210(3225) | 9,D,C,O | 2 | – | – | – | – | 10 | – | – |
| | E,F,M | 2 | – | – | – | – | 10 | – | – |
| | H,T | 2 | – | – | – | 4 | 8 | – | – |
| | I,U | 2 | – | – | – | – | 4 | – | – |
| | J,V | 1 | – | 1 | – | – | 4 | – | – |
| | S | 2 | – | – | – | – | 8 | – | – |
| 1808(4520) | F | 2 | – | – | – | – | – | – | – |
| 1812(4532) | F | 1 | – | – | – | – | 4 | – | – |
| | H,I | 1 | – | – | – | – | 4 | – | – |
| | J,L | – | – | – | – | – | 2 | – | – |
| 2220(5750) | H,I,J | – | – | – | – | – | 2 | – | – |

* R = Chip aligned for horizontal / W = Chip aligned for vertical

## Reel Dimensions



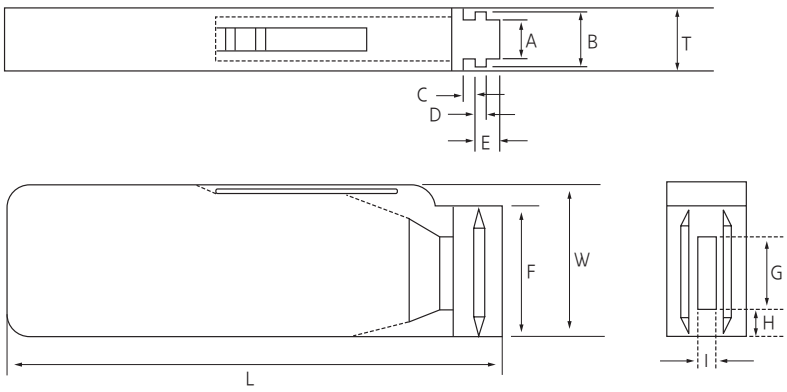

Unit : mm

| Symbol | Tape Width | A | B | C | D |
|---|---|---|---|---|---|
| 7" Reel | 4mm | Ø178±2.0 | MINØ50 | Ø13±0.5 | 21±0.8 |
| | 8mm | Ø178 ± 2.0 | MINØ50 | Ø13±0.5 | 21±0.8 |
| | 12mm | Ø178 ±2.0 | MINØ50 | Ø13±0.5 | 21±0.8 |
| 10" Reel | 8mm | Ø258 ± 2.0 | MINØ70 | Ø13±0.5 | 21±0.8 |
| 13" Reel | 8mm | Ø330±2.0 | MINØ70 | Ø13±0.5 | 21±0.8 |
| | 12mm | Ø330±2.0 | MINØ70 | Ø13±0.5 | 21±0.8 |

| Symbol | Tape Width | E | W | t |
|---|---|---|---|---|
| 7" Reel | 4mm | 2.0±0.5 | 5.0±0.5 | 1.2±0.2 |
| | 8mm | 2.0±0.5 | 10±1.5 | 0.9±0.2 |
| | 12mm | 2.0±0.5 | 13±0.5 | 1.2±0.2 |
| 10" Reel | 8mm | 2.0±0.5 | 10±1.5 | 1.8±0.2 |
| 13" Reel | 8mm | 2.0±0.5 | 10±1.5 | 1.8±0.2 |
| | 12mm | 2.0±0.5 | 13±0.5 | 2.2±0.2 |

## Bulk Case Packaging

- Bulk case packaging can reduce the stock space and transportation costs.
- The bulk feeding system can increase the productivity.
- It can eliminate the components loss.




Unit : mm

| Symbol | A | B | T | C | D | E |
|---|---|---|---|---|---|---|
| Dimension | 6.80±0.10 | 8.80±0.10 | 12±0.10 | 1.50±0.10 / -0 | 2.00 +0 / -0.10 | 3.00 +0.20 / -0 |

| Symbol | F | W | G | H | L | I |
|---|---|---|---|---|---|---|
| Dimension | 31.5 +0.20 / -0 | 36 +0 / -0.20 | 19±0.35 | 7.00±0.35 | 110±0.70 | 5.00±0.35 |

■ QUANTITY

Unit : pcs

| Size Inch(mm) | 0402(1005) | 0603(1608) | 0805(2012) | |
|---|---|---|---|---|
| | | | T ≤ 0.85mm | T ≥ 1.0mm |
| Quantity | 50,000 | 10,000 or 15,000 | 10,000 | 5,000 |

# Application Manual for Surface Mounting

## 1. Storage of products

### 1-1. Storage Environment

Tape packing materials are designed to withstand long-term storage, but they will degrade more rapidly in the presence of high temperature or high humidity, Therefore, the products must be stored in an ambient 0~40℃ with a relative humidity of 0~70%. Allowable storage period is within 6 months from the outgoing date of delivery.

### 1-2. Corrosive Gases

Since sulfur and chlorine may degrade the solderability of the end termination, it is important to store the capacitors in an environment free of these gases

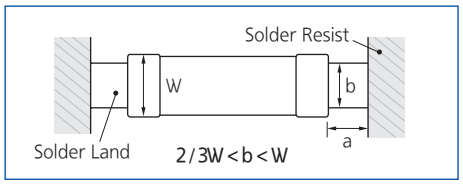
### 1-3. Temperature Fluctuations

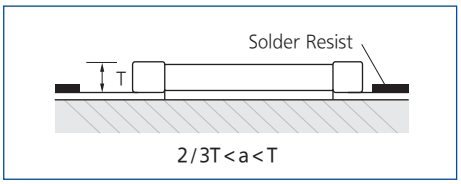
Since dew condensation may occur by the differences in temperature when the products are taken out of storage, it is important to maintain a temperature-controlled environment.

## 2. Design of Solder Land Pattern

When designing printed circuit boards, the shape and size of the solder lands must allow for the proper amount of solder on the capacitor. The amount of solder at the end terminations has a direct effect on the probability that the chip will crack.
The greater amount of solder, the larger amount of stress on the chip, and the more likely that it will break.
Use the following illustrations as guidelines for proper Solder land design.

Recommendation of solder Land Shape and Size



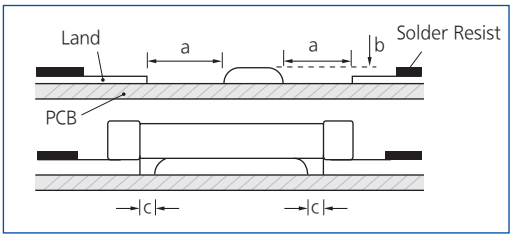




## 3. Adhesives

MLCCs generally require the use of an adhesive to position the chips to the circuit board prior to soldering.

### 3-1. Requirements for Adhesives

They must have enough adhesion so that the chips will not fall off or move during the handling of the circuit board.
They must maintain their adhesive strength when exposed to soldering temperatures.
They should not spread or run when applied to the circuit board.
They should have a long pot life.
They should harden quickly.
They should not corrode the circuit board or chip material.
They should be a good insulator.
They should be non-toxic, and not produce harmful gases, nor be harmful when touched.




| Type | 21 | 31 |
|---|---|---|
| a | Min. 0.2 | Min. 0.2 |
| b | 70 ~100㎛ | 70 ~100㎛ |
| c | > 0 | > 0 |

### 3-2. Application Method

It is important to use the proper amount of adhesive. Too little will cause poor adhesion to the circuit board, and too much may strain theconductor pattern, thereby causing defective soldering. The following illustrations show the proper quantity of adhesive.

### 3-3. Adhesive hardening Characteristics

To prevent oxidation of the terminations, the adhesive must harden at 160℃ or less, within 2 minutes or less

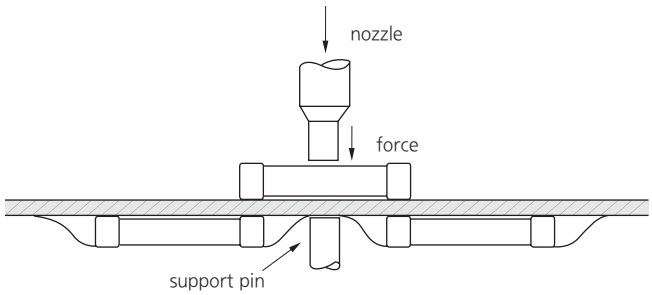
## 4. Mounting

### 4-1. Mounting Head Pressure

Excessive pressure will cause chip capacitors to crack.
The pressure between nozzle and chip capacitor will be 300g maximum during mounting.

### 4-2. Bending Stress

Bending of printed circuit board by mounting head when double-sided circuit boards are used,
chip capacitors first are mounted and soldered onto one side of the board.
When the capacitors are mounted onto the other side, it is important to support the board as shown in the illustration.
If the circuit board is not supported, it may bend, causing the already-installed capacitors to crack.




## 5. Flux

Although highly-activated flux gives better solderability, substances which increase activity may also degrade the insulation of the chip capactiors, To avoid such degradation, it is recommended that a mildly activated rosin flux ( less than 0.2% chlo.rine ) be used

## 6. Soldering

Since a multilayer ceramic chip capacitor comes into direct contact with melted solder during soldering, it is exposed to potentially mechanical stress caused by the sudden temperature change. The capacitor may also be subject to silver migration, and to contamination by the flux. Because of these factors, soldering technique is critical.

### 6-1. Soldering Methods

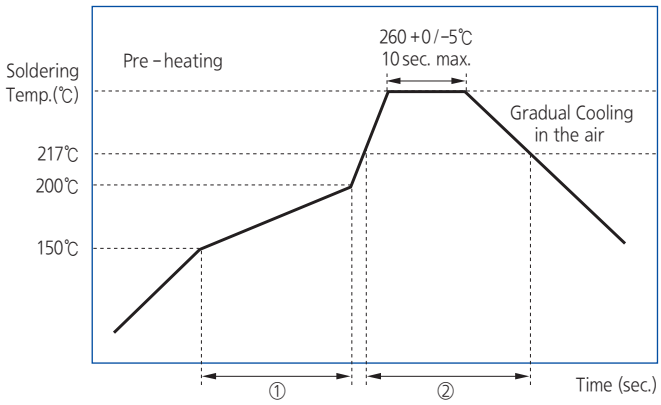
| Method | Classification | |
|---|---|---|
| Reflow slodering | -Overall heating | -Infrared rays<br>-Hot plate<br>-VPS (Vapor phase) |
| | -Local heating | -Air heater<br>-Laser<br>-Light beam |
| Flow slodering | -Single wave<br>-Double wave | |

### 6-2. Soldering Profile

To avoid the crack problem by sudden temperature change, follow the temperature profile in the adjacent graph.

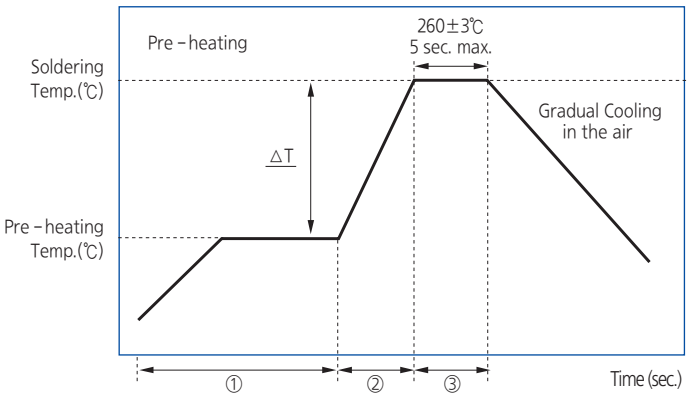
## 6-3. Pb-Free (Sn 100%) Plating

• REFLOW SOLDERING




| Soldering Temp.(℃) | Pre-heating Time (①, sec.) | Soldering Time(②, sec.) |
|---|---|---|
| 260+0 / -5 | 60 ~ 120 | 60 ~ 150 |

• FLOW SOLDERING




| △T (℃) | Soldering Temp. (℃) | Pre-heating Time (① + ②, sec.) | Soldering Time (③, sec.) |
|---|---|---|---|
| ≤150 (1206 and below size) | 260±3 | ≥120 | ≤5 |

• SOLDER IRON(Hand Soldering)

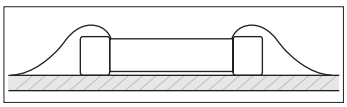
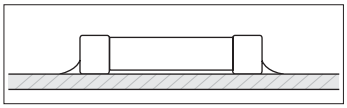
| Variation of Temp.(℃) | Soldering Temp.(℃) | Pre-heating Time(sec.) | Soldering Time(sec.) | Cooling Time(sec.) | Condition of Iron Facilities | | |
|---|---|---|---|---|---|---|---|
| | | | | | Wattage | Tip Diameter | Soldering Time |
| △T≤130 | 300±10℃ max. | ≥60 sec. | ≤ 4 sec. | - | 20W max. | 3mm max. | 4 sec max. |

※ Caution - Iron tip should not contact with ceramic body directly

### 6-4. Manual Soldering

Manual soldering can pose a great risk of creating thermal cracks in chip capacitors. The hot soldering iron tip comes into direct contact with the end terminations, and operator's carelessness may cause the tip of the soldering iron to come into direct contact with the ceramic body of the capacitor. Therefore the soldering iron must be handled carefully, and close attention must be paid to the selection of the soldering iron tip and to temperature control of the tip.

### 6-5. Amount of Solder

| | | |
|---|---|---|
| Too much Solder |  | Cracks tend to occur due to large stress. |
| Not enough solder |  | Weak holding force may cause bad connections or detaching of the capacitor |

### 6-6. Cooling

Natural cooling using air is recommended. If the chips are dipped into solvent for cleaning, the temperature difference(△T) must be less than 100℃

### 6-7. Cleaning

If rosin flux is used, cleaning usually is unnecessary. When strongly activated flux is used, chlorine in the flux may dissolve into some types of cleaning fluids, thereby affecting the chip capacitors. This means that the cleaning fluid must be carefully selected, and should always be new.

## 7. Notes for Separating Multiple, Shared PC Boards

A multi-PC board is separated into many individual circuit boards after soldering has been completed.
If the board is bent or distorted at the time of separation, cracks may occur in the chip capacitors.
Carefully choose a separation method that minimizes the bending of the circuit board.

# Certifications

ISO / TS 16949

ISO 14001

OHSAS18001

Sony Green Partner

QC 080000 IECQ HSPM

## Quality System Certification status for each factory site

| Certification | Suwon (Korea) | Busan (Korea) | Calamba (Philippines) | Tianjin (China) | Binhai (China) |
|---|---|---|---|---|---|
| ISO / TS 16949 | BSI TS 91430-000 | BSI TS 91430-001 | BSI TS 91430-005 | BSI TS 91430-007 | BSI TS 91430-007 |
| Date Validity | 2013-10-25 ~ 2016-10-24 | 2016-07-31 ~ 2018-09-14 | 2015-07-20 ~ 2018-07-19 | 2014-11-18 ~ 2017-11-17 | 2014-11-18 ~ 2017-11-17 |
| ISO 14001 | 20BK00223-UK | 20BK00223-UK | EMS_77354 | CNBJ320761-UK | CNBJ320761-UK |
| Date Validity | 2016-06-25 ~ 2018-09-14 | 2016-06-25 ~ 2018-09-14 | 2015-07-13 ~ 2018-07-12 | 2015-04-15 ~ 2018-04-14 | 2015-04-15 ~ 2018-04-14 |
| OHSAS 18001 | BK50217 | BK50217 | OHS_568723 | CN100043A | CN100043A |
| Date Validity | 2013-06-25 ~ 2019-06-24 | 2013-06-25 ~ 2019-06-24 | 2010-12-21 ~ 2016-10-13 | 2015-04-15 ~ 2018-04-14 | 2015-04-15 ~ 2018-04-14 |
| QC 080000 | KR-HSPM-1011 | KR-HSPM-1012 | PI-HSPM-1001 | PRC-HSPM-1767 | PRC-HSPM-1767-2 |
| Date Validity | 2016-07-02 ~ 2019-07-01 | 2016-07-14 ~ 2019-07-19 | 2016-07-11 ~ 2019-07-04 | 2016-07-11 ~ 2019-07-26 | 2016-07-11 ~ 2019-07-26 |
| Sony Green Partner Date Validity | 2016-02-22 ~ 2018-05-31 | 2016-02-22 ~ 2018-05-31 | 2016-02-22 ~ 2018-05-31 | 2016-02-22 ~ 2018-05-31 | 2016-02-22 ~ 2018-05-31 |

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## http://www.Samsungsem.com

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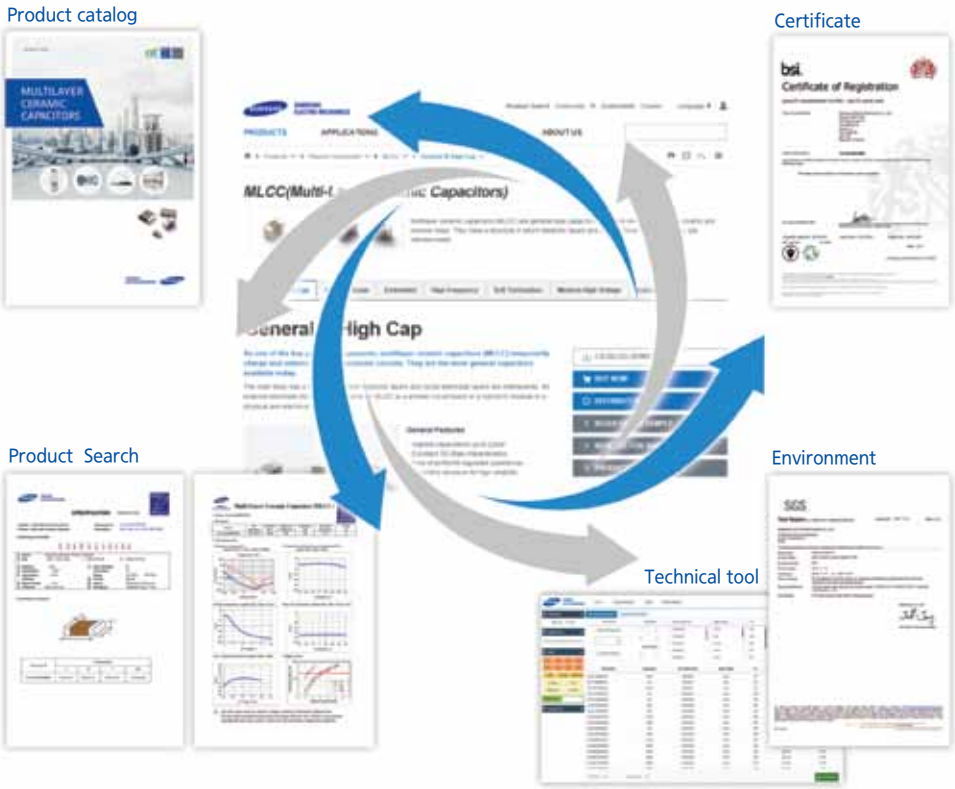
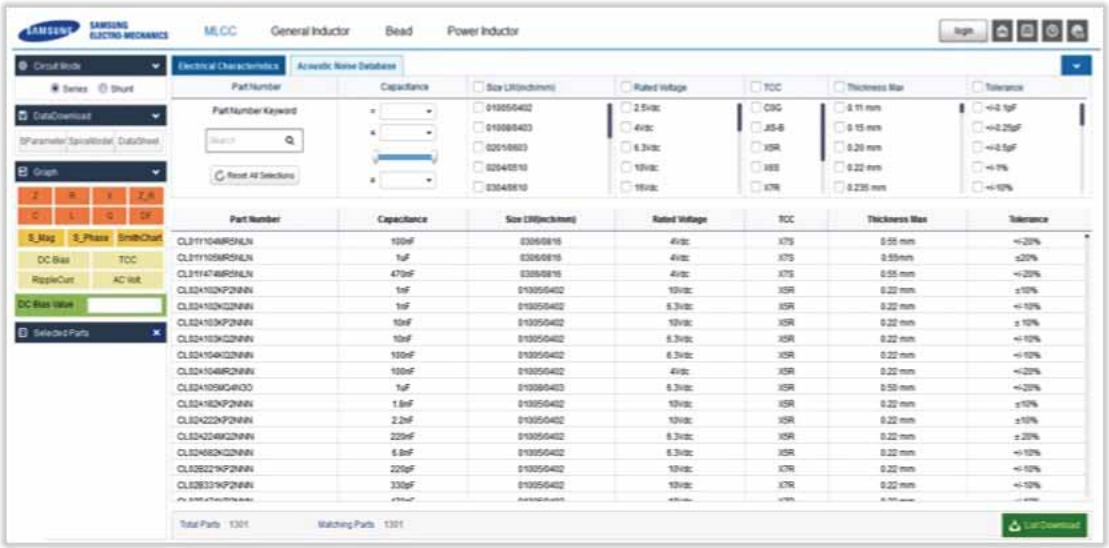
SEMCO web-site supports all technical data & information for our partner.




### LCR Web Library

The software of "LCR Web Library" provides the characteristics of SEMCO's products on the website.
(http://weblib.samsungsem.com/)

- S-parameter and Spice Model of MLCC, Inductor and Bead.
- The acoustic noise data of MLCC
- Capacitance of MLCC according to Temperature and DC bias



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All information indicated in this catalog is as of September. 2016
* The specifications and designs contained herein may be subject to change without notice.