# Data and signal line chokes

## Common-mode chokes, ring core
## 0.005 … 47 mH, 100 … 1200 mA, +60 °C

**Series/Type:** **B82793C0/S0**

Date: March 2016

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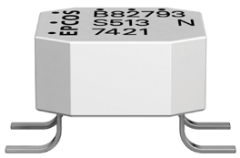
**Rated voltage 42 V AC/80 V DC**
**Rated inductance 0.005 ... 47 mH**
**Rated current 100 ... 1200 mA**



### Construction

- Current-compensated double choke
- Ferrite core
- LCP case (UL 94 V-0), silicone potting
- Bifilar winding (B82793C0)
- Sector winding (B82793S0)

### Features

- High rated currents, reduced components height
- Qualified to AEC-Q200 ($L \leq 4.7$ mH)
- Suitable for reflow soldering
- RoHS-compatible

### Function

- B82793C0:
  Suppression of asymmetrical interference coupled in on lines, whereas data signals up to some MHz can pass unaffectedly.
- B82793S0:
  Suppression of asymmetrical and symmetrical interference (by $L_{stray}$) coupled in on lines. The high-frequency portions of the symmetrical data signal are decreased so far that EMC problems can be significantly reduced.

### Applications

- Automotive applications, e.g. CAN bus
- Industrial applications
- Types with $L_R > 4.7$ mH only for telecom applications

### Terminals

- Base material CuSn6
- Layer composition Ni, Sn
- Hot-dipped

### Marking

- Marking on component: Manufacturer, process location (coded), winding method (coded), ordering code (short form), date of manufacture (YWWD)
- Minimum data on reel: Manufacturer, ordering code, L value and tolerance, quantity, date of packing

### Delivery mode and packing unit

- 16-mm blister tape, wound on 330-mm ∅ reel
- Packing unit: 1500 pcs./reel

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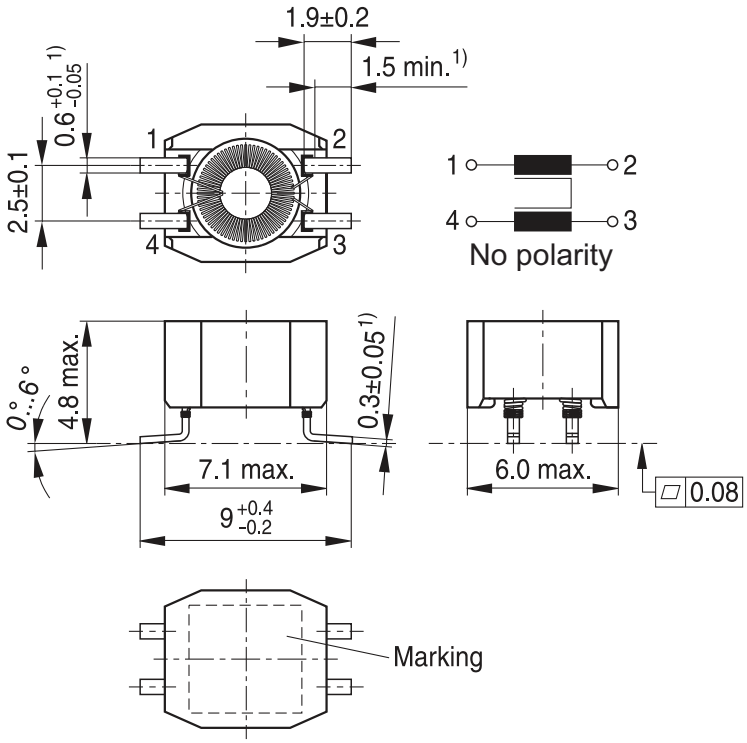
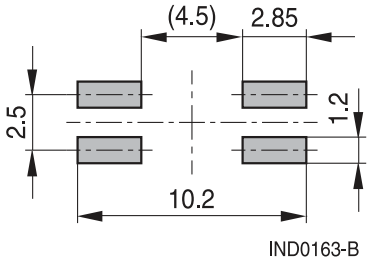
## Dimensional drawing and pin configuration




1) Soldering area

IND0010-9-E

## Layout recommendation

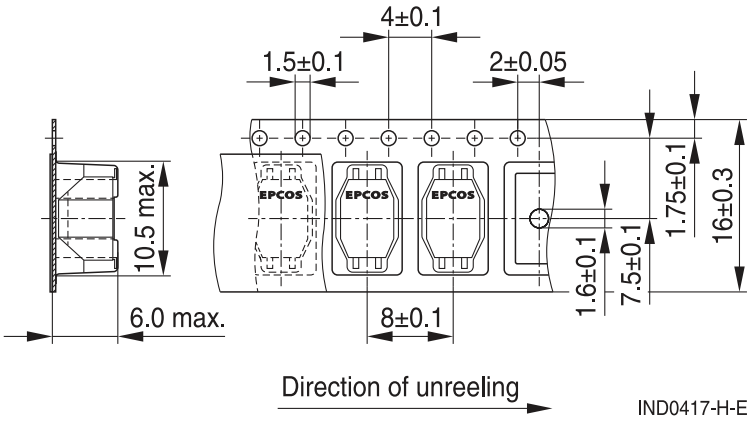



IND0163-B

Dimensions in mm

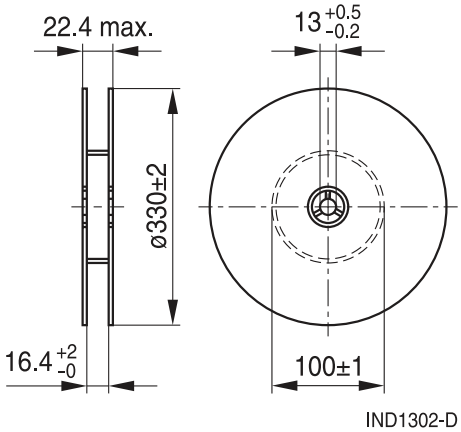
## Taping and packing

Blister tape




IND0417-H-E

Reel




IND1302-D

Dimensions in mm

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**Technical data and measuring conditions**

| | |
|---|---|
| Rated voltage $V_R$ | 42 V AC (50/60 Hz) / 80 V DC |
| Rated temperature $T_R$ | +60 °C |
| Rated current $I_R$ | Referred to 50 Hz and rated temperature |
| Rated inductance $L_R$ | Measured with Agilent 4284A, 0.1 mA, +20 °C<br>Measuring frequency: $L_R \leq 1$ mH = 100 kHz<br>$L_R > 1$ mH = 10 kHz<br>Inductance is specified per winding. |
| Inductance tolerance | ±30% ($L_R \leq 0.47$ mH), –30/+50% ($L_R \geq 1$ mH) at +20 °C |
| Inductance decrease $\Delta L/L$ | < 10% at DC magnetic bias with $I_R$, +20 °C |
| Stray inductance $L_{stray,typ}$ | Measured with Agilent 4284A, 5 mA, +20 °C, typical values<br>Measuring frequency: $L_R \leq 11$ µH = 1 MHz<br>$L_R > 11$ µH = 100 kHz |
| DC resistance $R_{typ}$ | Measured at +20 °C, typical values, specified per winding |
| Solderability | SnPb: +(215 ±3) °C, (3 ±0.3) s<br>Sn96.5Ag3.0Cu0.5: +(245 ±5) °C, (3 ±0.3) s<br>Wetting of soldering area ≥ 95%<br>(to IEC 60068-2-58) |
| Resistance to soldering heat | +(260 ±5) °C, (10 ±1) s (to IEC 60068-2-58) |
| Climatic category | 40/125/56 (to IEC 60068-1) |
| Storage conditions (packaged) | –25 °C … +40 °C, ≤ 75% RH |
| Weight | Approx. 0.25 g |

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## Characteristics and ordering codes

| $L_R$ mH | $L_{stray,typ}$ nH | $I_R$ mA | $R_{typ}$ mΩ | $V_{test}$ V DC, 2 s | Ordering code |
|---|---|---|---|---|---|
| 0.005 | 40 | 1200 | 60 | 250 | B82793C0502N201 |
| 0.011 | 50 | 800 | 80 | 250 | B82793C0113N201 |
| 0.025 | 60 | 800 | 110 | 250 | B82793C0253N201 |
| 0.025 | 1400 | 800 | 110 | 250 | B82793S0253N201 |
| 0.051 | 70 | 800 | 140 | 250 | B82793C0513N201 |
| 0.051 | 2300 | 800 | 140 | 250 | B82793S0513N201 |
| 0.10 | 100 | 500 | 180 | 250 | B82793C0104N201 |
| 0.47 | 100 | 700 | 170 | 750 | B82793C0474N215 |
| 1.0 | 70 | 700 | 140 | 750 | B82793C0105N265 |
| 2.2 | 120 | 500 | 400 | 750 | B82793C0225N265 |
| 4.7 | 250 | 400 | 550 | 750 | B82793C0475N265 |
| For telecommunications | | | | | |
| 20 | 300 | 100 | 1800 | 750 | B82793C0206N265 |
| 47 | 1200 | 100 | 3700 | 750 | B82793C0476N265 |

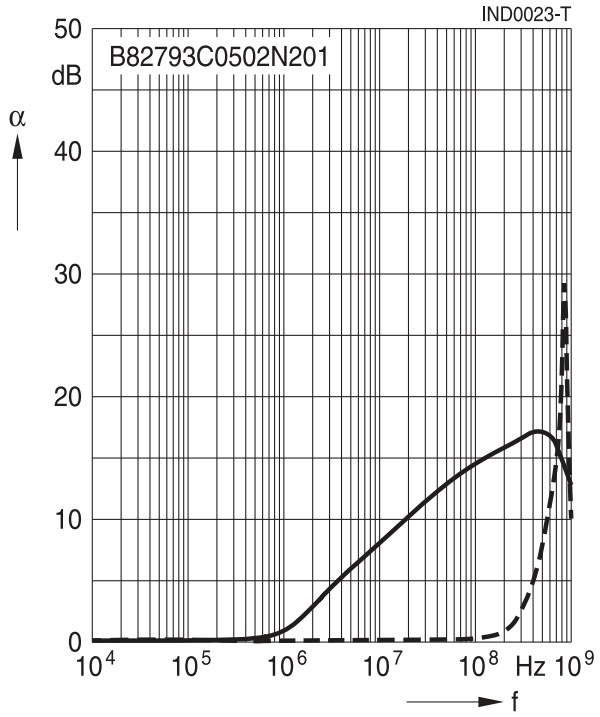
## SMD

**Insertion loss** $\alpha$ (typical values at |Z| = 50 Ω, +20 °C)

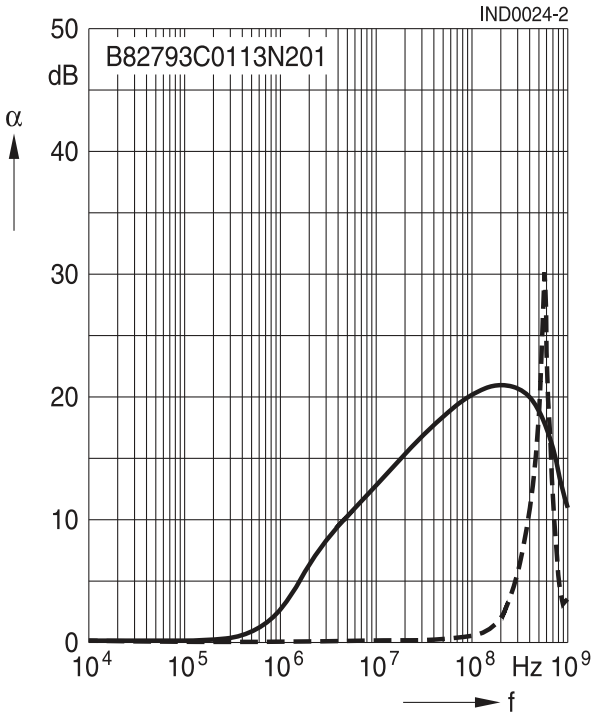
——— asymmetrical, all branches in parallel (common mode)

- - - - - - - symmetrical (differential mode)

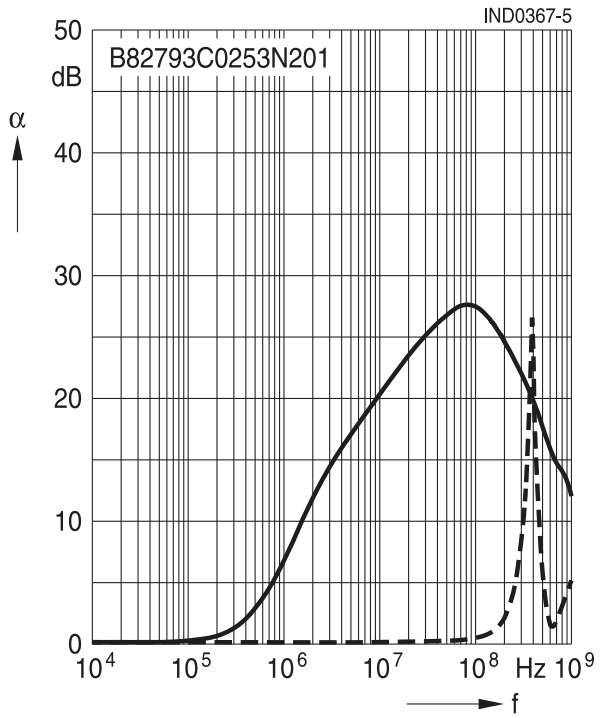
$L_R$ = 0.005 mH



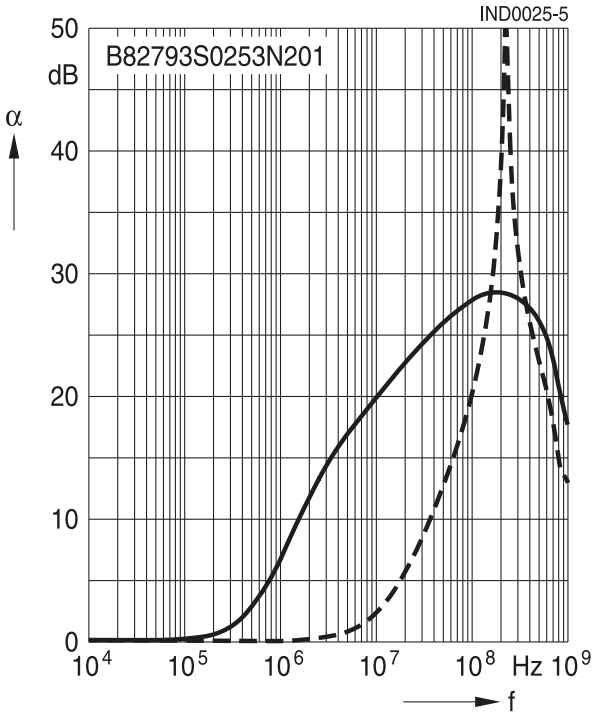

$L_R$ = 0.011 mH




$L_R$ = 0.025 mH (low $L_{stray}$)




$L_R$ = 0.025 mH (high $L_{stray}$)



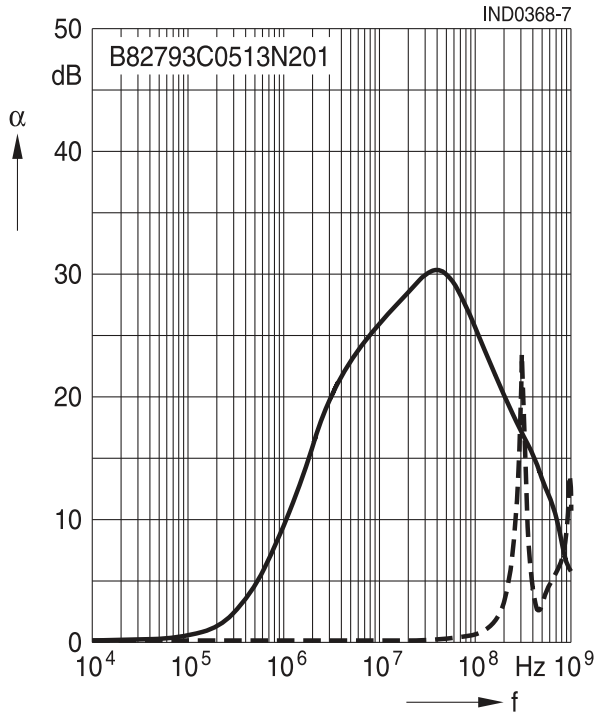
## SMD

**Insertion loss** $\alpha$ (typical values at |Z| = 50 Ω, +20 °C)

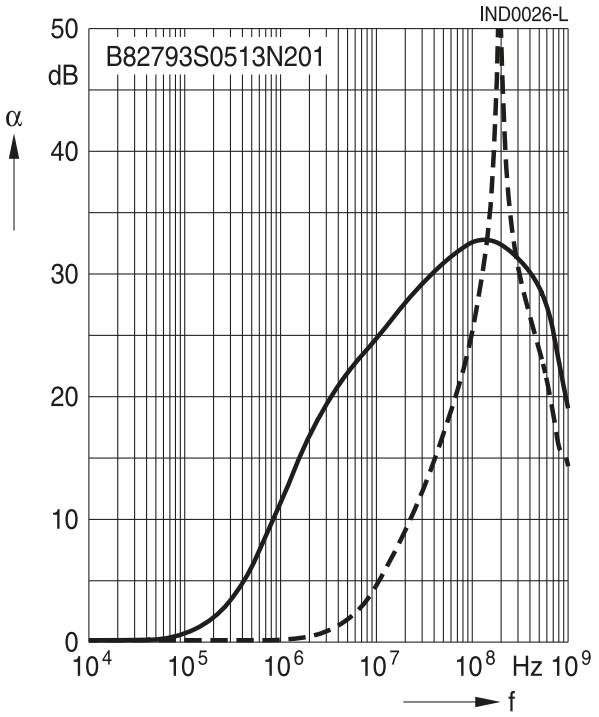
——— asymmetrical, all branches in parallel (common mode)

- - - - - - - symmetrical (differential mode)

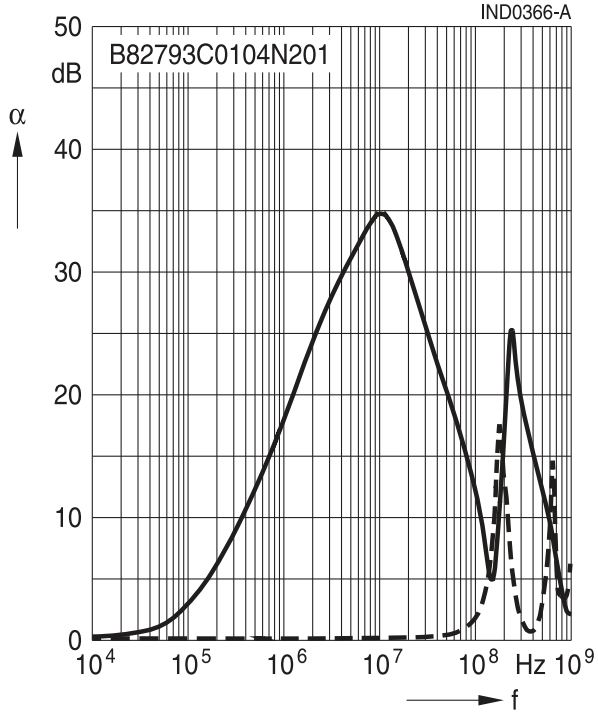
$L_R$ = 0.051 mH (low $L_{stray}$)



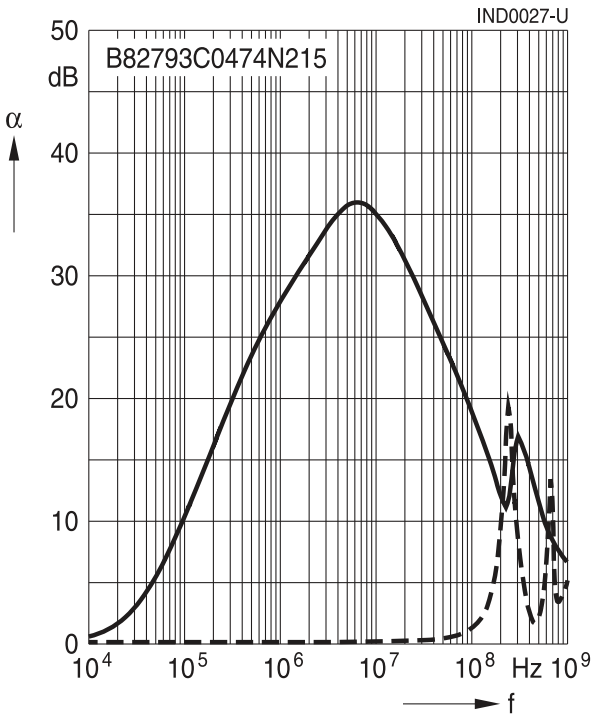

$L_R$ = 0.051 mH (high $L_{stray}$)




$L_R$ = 0.10 mH




$L_R$ = 0.47 mH



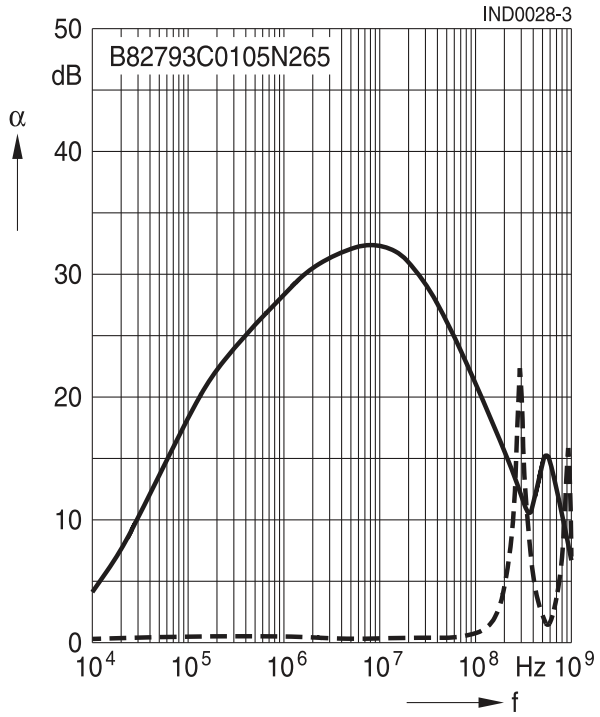
## SMD

**Insertion loss** $\alpha$ (typical values at |Z| = 50 Ω, +20 °C)

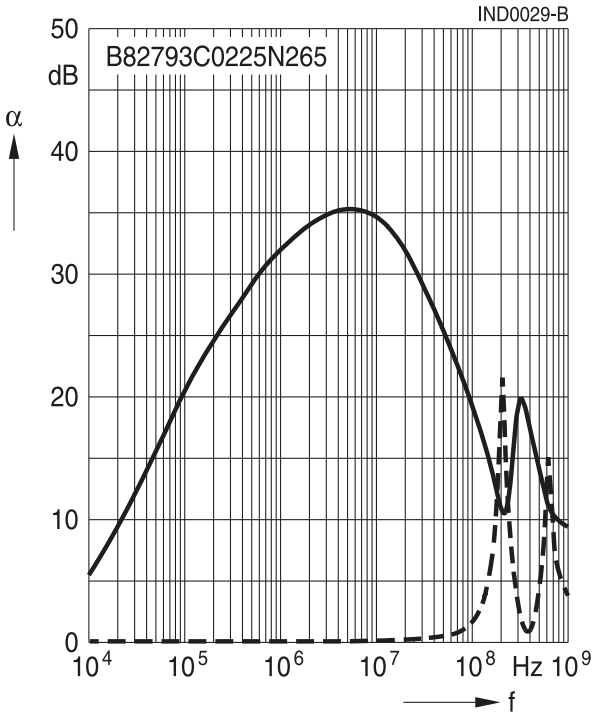
——— asymmetrical, all branches in parallel (common mode)

- - - - - - - symmetrical (differential mode)

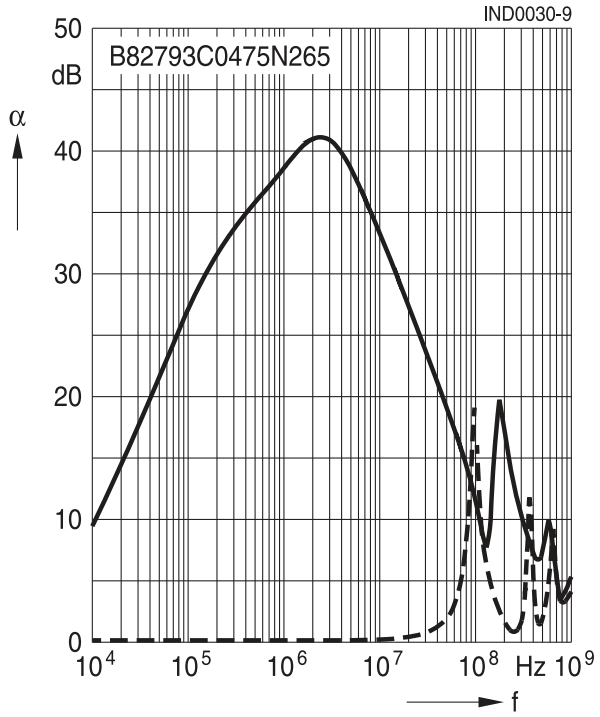
$L_R$ =1.0 mH



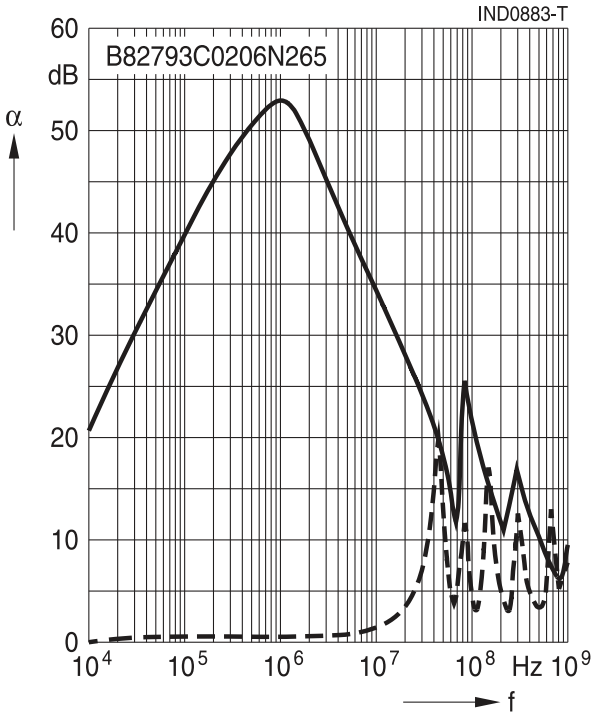

$L_R$ = 2.2 mH




$L_R$ = 4.7 mH




$L_R$ = 20 mH



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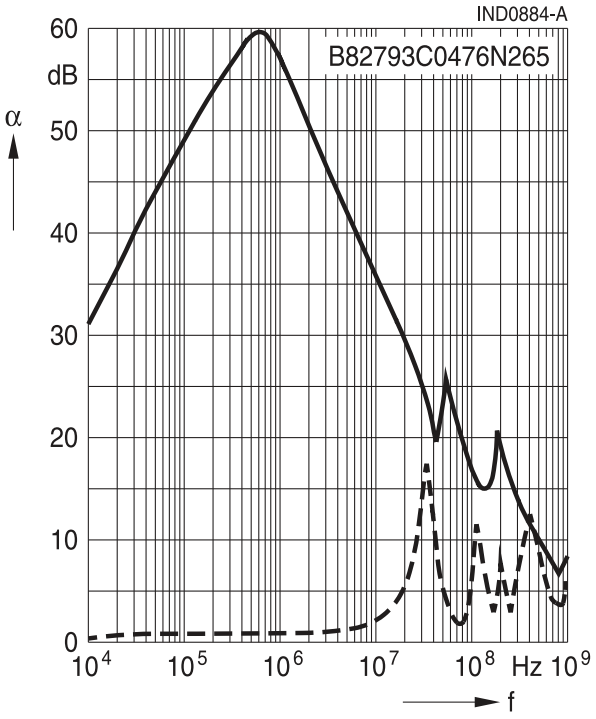
**Insertion loss** $\alpha$ (typical values at |Z| = 50 Ω, +20 °C)

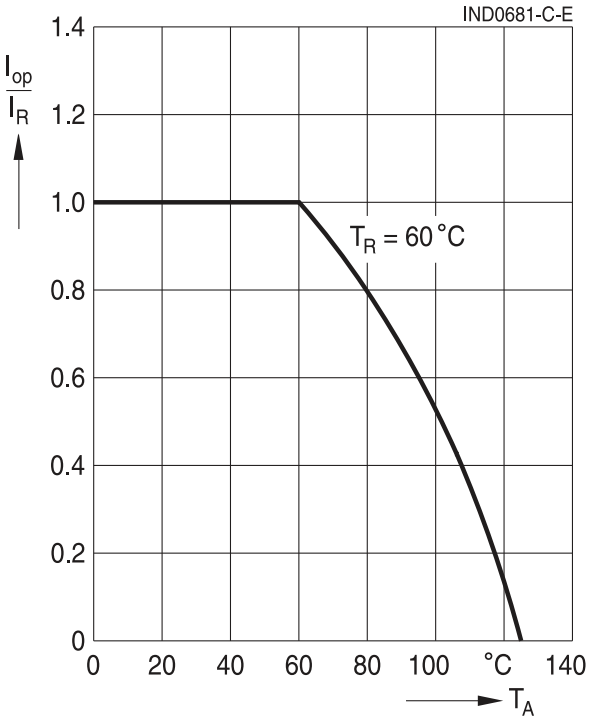
——— asymmetrical, all branches in parallel (common mode)

- - - - - - - symmetrical (differential mode)

$L_R$ = 47 mH




**Current derating $I_{op}/I_R$ versus ambient temperature**



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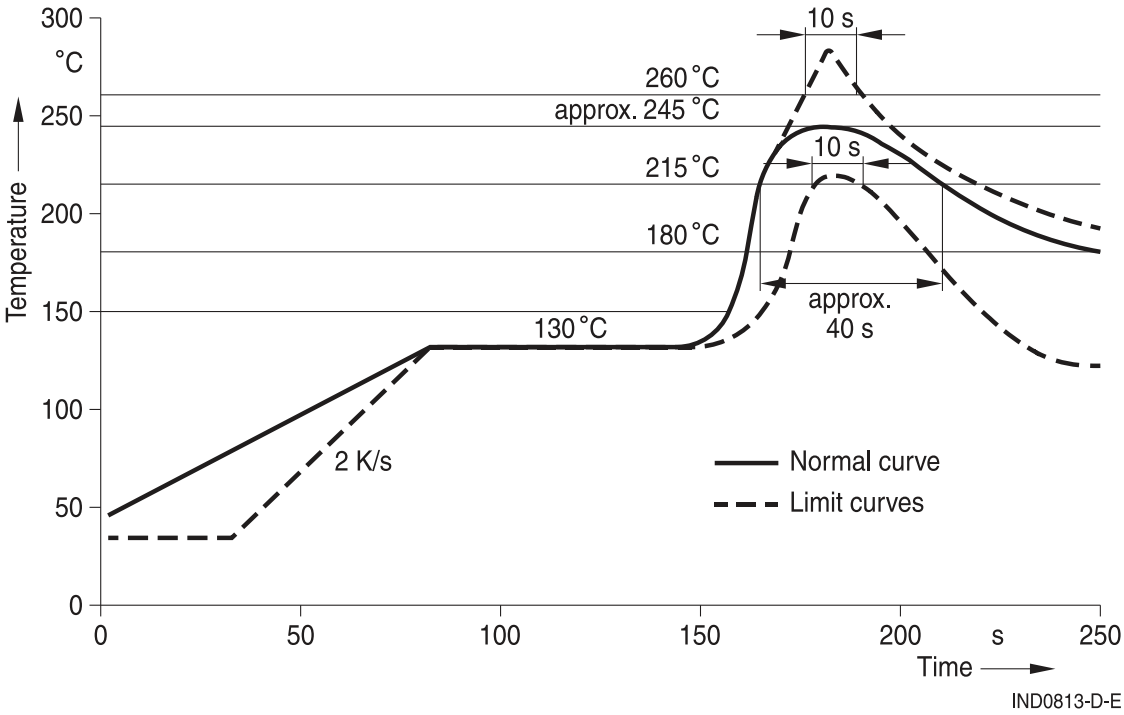
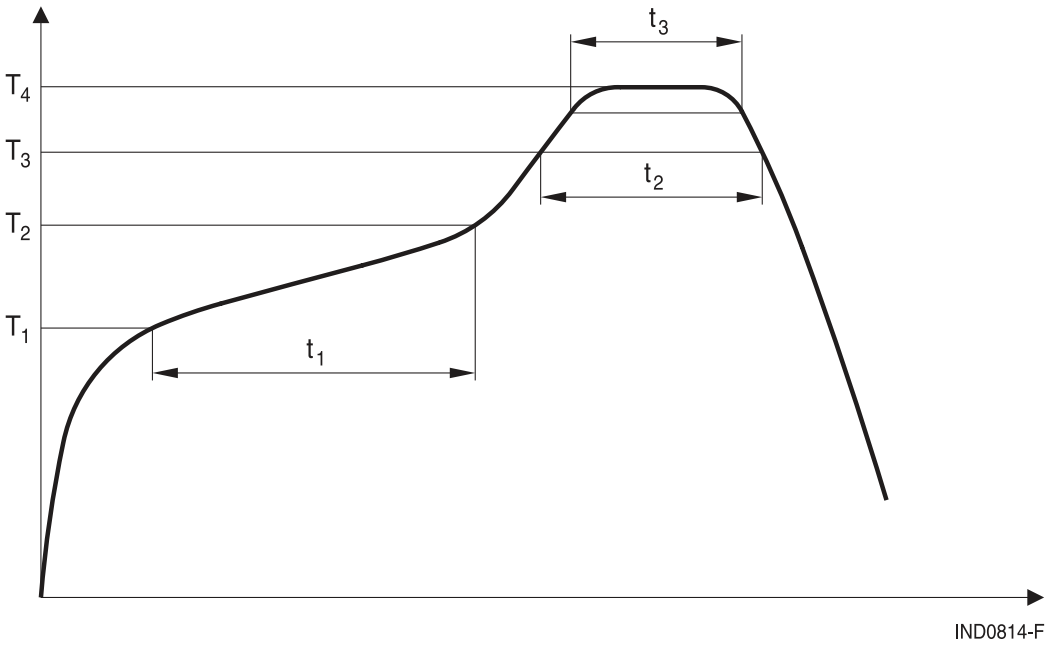
**Recommended reflow soldering curve**

Pb containing solder material (based on CECC 00802 edition 2)




Pb-free solder material (based on JEDEC J-STD 020D)




| $T_1$ °C | $T_2$ °C | $T_3$ °C | $T_4$ °C | $t_1$ s | $t_2$ s | $t_3$ s |
|---|---|---|---|---|---|---|
| 150 | 200 | 217 | 250 | < 110 | < 90 | < 40 @ $T_4$ –5 °C |

Time from +25 °C to $T_4$: max 300 s
Maximal numbers of reflow cycles: 3

## Cautions and warnings

### SMD

- Please note the recommendations in our Inductors data book (latest edition) and in the data sheets.
  - Particular attention should be paid to the derating curves given there.
  - The soldering conditions should also be observed. Temperatures quoted in relation to wave soldering refer to the pin, not the housing.
- If the components are to be washed varnished it is necessary to check whether the washing varnish agent that is used has a negative effect on the wire insulation, any plastics that are used, or on glued joints. In particular, it is possible for washing varnish agent residues to have a negative effect in the long-term on wire insulation.
  Washing processes may damage the product due to the possible static or cyclic mechanical loads (e.g. ultrasonic cleaning). They may cause cracks to develop on the product and its parts, which might lead to reduced reliability or lifetime.
- The following points must be observed if the components are potted in customer applications:
  - Many potting materials shrink as they harden. They therefore exert a pressure on the plastic housing or core. This pressure can have a deleterious effect on electrical properties, and in extreme cases can damage the core or plastic housing mechanically.
  - It is necessary to check whether the potting material used attacks or destroys the wire insulation, plastics or glue.
  - The effect of the potting material can change the high-frequency behaviour of the components.
- Ferrites are sensitive to direct impact. This can cause the core material to flake, or lead to breakage of the core.
- Even for customer-specific products, conclusive validation of the component in the circuit can only be carried out by the customer.

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