

# Type 5TT / 5TTP

## Slow Blow Fuse Series

**HF** **Pb** 5TT/5TTP Series, 5x20mm Glass/Ceramic Tube Slow Blow Fuse RoHS 2 Compliant

### Description

5x20mm Slow Blow, glass / ceramic tube body cartridge fuse designed, approved and complied with UL and CSA standard 248-14.

### Features

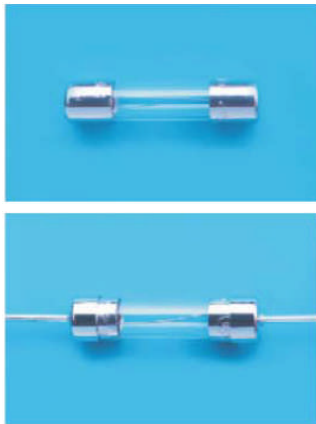
- Meet UL and CSA standard 248-14
- Wide operating temperature range
- Bulk and Tape & Reel packing available
- RoHS 2 compliant
- Halogen Free
- Lead Free

### Applications

Provide individual protection for components or internal circuits.

- Power supplies
- Battery charger
- Monitor
- Adapter

LEAD FREE = **Pb**  
HALOGEN FREE = **HF**



### Physical Specifications

|           |                                                                                                                                                       |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials | Body : Glass or Ceramic (see info below)                                                                                                              |
|           | Cap : Nickel Plated Brass Caps                                                                                                                        |
|           | Leads : Matte Tin Plated Copper                                                                                                                       |
| Marking   | On Fuse :                                                                                                                                             |
|           | "bel", "5TT", "Current Rating", "Voltage Rating",                                                                                                     |
|           | "Appropriate Safety Logos", "✓" ( RoHS 2 compliant )                                                                                                  |
|           | On Label :                                                                                                                                            |
|           | "bel", "5TT" or "5TTP", "Current Rating", "Voltage Rating", "Interrupting Rating",<br>"Appropriate Safety Logos" and "✓", "e" (China RoHS compliant). |

### Electrical Characteristics (UL/CSA STD,248-14)

| Testing Current | Blow Time |         | Amp Range |
|-----------------|-----------|---------|-----------|
|                 | Minimum   | Maximum |           |
| 100%            | 4 hrs.    | N/A     | 80mA-10A  |
| 135%            | N/A       | 1 Hr.   | 80mA-10A  |
| 200%            | 5 sec     | 30 sec  | 80mA-3A   |
|                 | 3 sec     | 30 sec  | 3.1A-10A  |

### Safety Agency Approvals

| Safety Agency | Safety Agency Certificate                                      | Voltage Rating (V)                   | Ampere Range / Volt @ I.R. ability*             |
|---------------|----------------------------------------------------------------|--------------------------------------|-------------------------------------------------|
| <b>UL</b>     | E20624                                                         | 80mA-3A/250V AC<br>3.15A-10A/125V AC | 80mA-3A/250V AC@100A<br>80mA-8A/125V AC@10,000A |
| <b>SP</b>     | LR39772                                                        |                                      |                                                 |
| <b>UL</b>     | E20624                                                         |                                      | 10A/125V AC@1,000A                              |
| <b>SP</b>     | LR39772                                                        |                                      | 1A-5A/125V AC@500A                              |
| <b>PS</b>     | JET1037-31003-1010<br>JET1037-31003-1011<br>JET1037-31003-1007 |                                      | >5A-15A/125V AC@300A                            |

\*I.R.= Interrupting Rating = Short Circuit Rating(Amps)

## Environmental Specifications

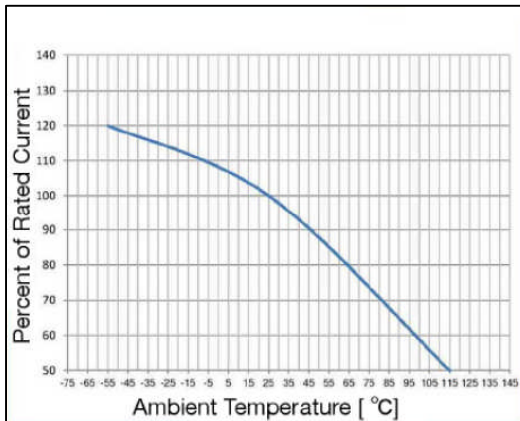
|                           |                                                                                                  |
|---------------------------|--------------------------------------------------------------------------------------------------|
| Shock Resistance          | MIL-STD-202G, Method 213B, Test Condition 1 (100 G's peak for 6 milliseconds; Sawtooth waveform) |
| Vibration Resistance      | MIL-STD-202G, Method 201A (10-55 Hz, 0.06 inch, total excursion).                                |
| Salt Spray Resistance     | MIL-STD-202G, Method 101E, Test Condition B (48 hrs).                                            |
| Insulation Resistance     | MIL-STD-202G, Method 302, Test Condition A (After Opening) 10,000 ohms minimum.                  |
| Solderability             | MIL-STD-202G, Method 208H                                                                        |
| Resistance to solder Heat | MIL-STD-202G, Method 210F, Test Condition B (260+/-5°C, 10+/-1 sec)                              |
| Thermal Shock             | MIL-STD-202G, Method 107G, Test Condition B (-65°C to +125°C).                                   |
| Operating Temperature     | -55°C to +125°C                                                                                  |
| Terminal Strength         | IEC-68-2-21                                                                                      |

## Electrical Specifications

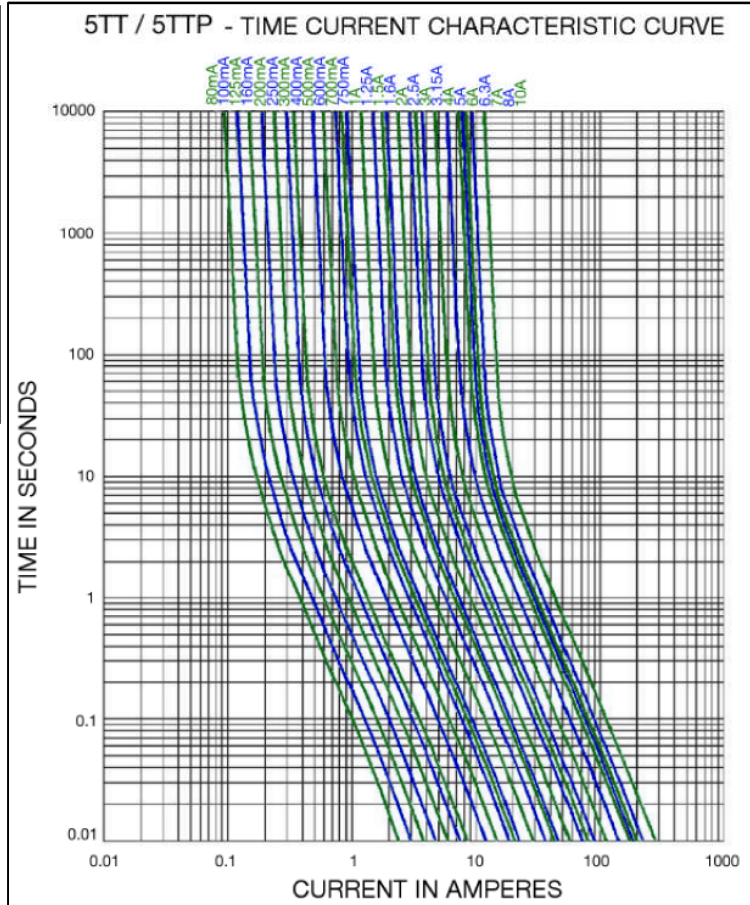
| Catalog Number | Ampere Rating | Typical Cold Resistance (ohms) | Volt-drop @100%In (Volt) max. | Voltage and Interrupting Ratings                                                        | Melting I <sup>2</sup> T <10 mSec (A <sup>2</sup> Sec) | Melting I <sup>2</sup> T @10 In (A <sup>2</sup> Sec) | Maximum Power Dissipation (W) | Agency Approvals                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|----------------|---------------|--------------------------------|-------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                |               |                                |                               |                                                                                         |                                                        |                                                      |                               |  |  |  |  |  |
| 5TT(P) 80-R    | 80mA          | 29                             | 3.10                          | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.091                                                  | 0.096                                                | 0.42                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 100-R   | 100mA         | 18.8                           | 2.52                          |                                                                                         | 0.137                                                  | 0.146                                                | 0.45                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 125-R   | 125mA         | 12.6                           | 2.22                          |                                                                                         | 0.208                                                  | 0.221                                                | 0.48                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 160-R   | 160mA         | 7.6                            | 1.88                          |                                                                                         | 0.314                                                  | 0.337                                                | 0.51                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 200-R   | 200mA         | 4.98                           | 1.45                          |                                                                                         | 0.476                                                  | 0.512                                                | 0.55                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 250-R   | 250mA         | 3.39                           | 1.25                          |                                                                                         | 0.719                                                  | 0.778                                                | 0.58                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 300-R   | 300mA         | 2.13                           | 0.97                          |                                                                                         | 0.885                                                  | 0.959                                                | 0.60                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 400-R   | 400mA         | 1.33                           | 0.83                          |                                                                                         | 1.65                                                   | 1.80                                                 | 0.66                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 500-R   | 500mA         | 0.865                          | 0.67                          |                                                                                         | 2.5                                                    | 2.7                                                  | 0.70                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 600-R   | 600mA         | 0.679                          | 0.64                          |                                                                                         | 3.8                                                    | 4.2                                                  | 0.75                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 700-R   | 700mA         | 0.465                          | 0.49                          |                                                                                         | 4.6                                                    | 5.1                                                  | 0.78                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 750-R   | 750mA         | 0.438                          | 0.48                          |                                                                                         | 5.3                                                    | 5.8                                                  | 0.79                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   |                                                                                     |
| 5TT(P) 1-R     | 1A            | 0.258                          | 0.40                          |                                                                                         | 8.6                                                    | 9.6                                                  | 0.85                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 1.25-R  | 1.25A         | 0.179                          | 0.34                          |                                                                                         | 13                                                     | 15                                                   | 0.91                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 1.5-R   | 1.5A          | 0.126                          | 0.30                          |                                                                                         | 18                                                     | 21                                                   | 0.96                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 1.6-R   | 1.6A          | 0.116                          | 0.30                          |                                                                                         | 20                                                     | 22                                                   | 0.97                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 2-R     | 2A            | 0.081                          | 0.27                          |                                                                                         | 30                                                     | 34                                                   | 1.03                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 2.5-R   | 2.5A          | 0.056                          | 0.23                          |                                                                                         | 45                                                     | 51                                                   | 1.10                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 3-R     | 3A            | 0.043                          | 0.21                          |                                                                                         | 56                                                     | 63                                                   | 1.13                          | Y                                                                                   |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 3.15-R  | 3.15A         | 0.040                          | 0.21                          |                                                                                         | 68                                                     | 78                                                   | 1.17                          |                                                                                     |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 4-R     | 4A            | 0.029                          | 0.19                          |                                                                                         | 103                                                    | 119                                                  | 1.25                          |                                                                                     |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 5-R     | 5A            | 0.020                          | 0.17                          |                                                                                         | 157                                                    | 180                                                  | 1.33                          |                                                                                     |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 6-R     | 6A            | 0.015                          | 0.15                          |                                                                                         | 218                                                    | 317                                                  | 1.23                          |                                                                                     |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 6.3-R   | 6.3A          | 0.014                          | 0.12                          |                                                                                         | 230                                                    | 345                                                  | 1.25                          |                                                                                     |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 7-R     | 7A            | 0.012                          | 0.13                          |                                                                                         | 295                                                    | 459                                                  | 1.37                          |                                                                                     |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 8-R     | 8A            | 0.011                          | 0.13                          |                                                                                         | 319                                                    | 472                                                  | 1.31                          |                                                                                     |                                                                                     |                                                                                     | Y                                                                                   | Y                                                                                   |
| 5TT(P) 10-R    | 10A           | 0.008                          | 0.13                          |                                                                                         | 467                                                    | 703                                                  | 1.40                          |                                                                                     | Y                                                                                   | Y                                                                                   |                                                                                     | Y                                                                                   |

Consult manufacturer for other ratings

## Temperature Derating Curve

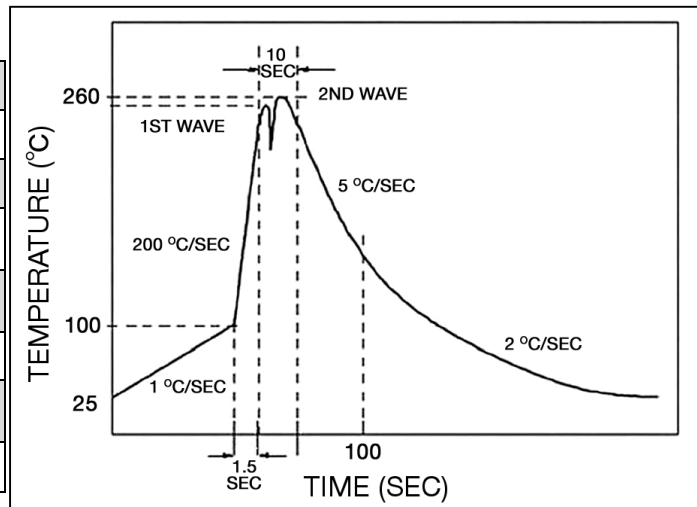


## Average Time Current Curve



## Soldering Parameters

| Lead-free Wave Soldering Profile                   |                                              |
|----------------------------------------------------|----------------------------------------------|
| Wave Soldering Parameter                           |                                              |
| Average ramp-up rate                               | 200°C / second                               |
| Heating rate during preheat                        | typical 1 - 2°C / second<br>Max 4°C / second |
| Final preheat temperature                          | within 125°C of soldering temperature        |
| Peak temperature $T_p$                             | 260°C                                        |
| Time within +0°C / -5°C of actual peak temperature | 10 seconds                                   |
| Ramp-down rate                                     | 5°C / second max.                            |



# Type 5TT / 5TTP

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## Fuse FGNO Explanation

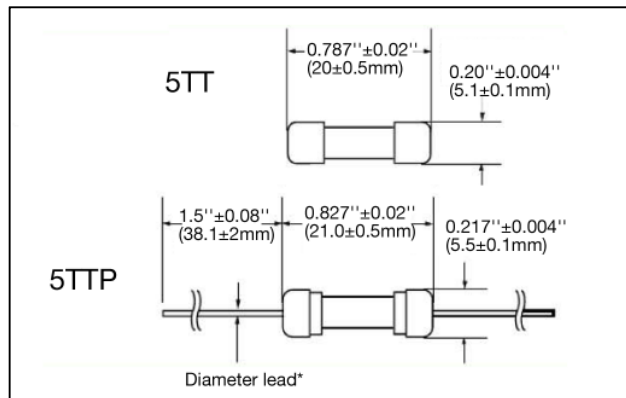
0654 R [XXXX] -XX

[XXXX]=Ampere Rating; XX=See Ordering Information as below

| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|
| 8/100    | 0.080   | 80        | 0080           |
| 1/10     | .100    | 100       | 0100           |
| 1/8      | .125    | 125       | 0125           |
|          | .160    | 160       | 0160           |
| 2/10     | .200    | 200       | 0200           |
| 1/4      | .250    | 250       | 0250           |
| 3/10     | .300    | 300       | 0300           |
| 4/10     | .400    | 400       | 0400           |
| 1/2      | .500    | 500       | 0500           |
| 6/10     | .600    | 600       | 0600           |
| 7/10     | .700    | 700       | 0700           |
| 3/4      | .750    | 750       | 0750           |
|          |         |           |                |
|          |         |           |                |
|          |         |           |                |

| Fraction | Decimal | Amps | Bel FGNO[XXXX] |
|----------|---------|------|----------------|
|          | 1.0     | 1    | 1000           |
| 1-1/4    | 1.25    | 1.25 | 1250           |
| 1-1/2    | 1.50    | 1.5  | 1500           |
|          | 1.60    | 1.6  | 1600           |
|          | 2.0     | 2    | 2000           |
| 2-1/2    | 2.5     | 2.5  | 2500           |
|          | 3.0     | 3    | 3000           |
|          | 3.15    | 3.15 | 3150           |
|          | 4.0     | 4    | 4000           |
|          | 5.0     | 5    | 5000           |
|          | 6.0     | 6    | 6000           |
|          | 6.3     | 6.3  | 6300           |
|          | 7.0     | 7    | 7000           |
|          | 8.0     | 8    | 8000           |
|          |         | 10   | 9100           |

## Mechanical Dimensions



\*Ratings 5A and less have 0.032" diameter lead;

\*Ratings 6A and above have 0.040" diameter lead.

## Ordering Information

0654 R XXXX - X X

FUSE TYPE  
0654RXXXX-XX = 5TT/5TTP Series [X>1]

R = RoHS Compliant

AMPERE RATING  
Refer to fuse FGNO explanation table

VOLTAGE / MECHANICAL / SAFETY AGENCY  
2 = 125V for > 3A - 10A  
3 = 250V for 80mA - 3A  
5 = Ceramic tube for 6A and above

PACKAGING CODE  
1 = Cartridge version, 1K / box  
3 = Pigtail version, 1K bulk pack  
6 = Pigtail version, Tape and Reel, 1500 / reel

## Packaging

| Packaging Option        | Packaging Specification | Quantity | Packaging Code | Inside Tape Spacing |
|-------------------------|-------------------------|----------|----------------|---------------------|
| Bulk                    | N/A                     | 1000     | 33 / 21 / 51   | N/A                 |
| Bulk (Pigtail Type)     | N/A                     | 1000     | 33 / 23 / 53   | N/A                 |
| Tape & Reel, 10mm Pitch | EIA-296-F               | 1500     | 36 / 26 / 56   | 63                  |



Specifications subject to change without notice

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Rev. 5TT Jan2019