

62mA-400mA EOL – Last Buy Date is Jun 30, 2020  
 No replacements for these ratings

# Type GSA / GSAP

## Slow Blow Fuse Series

**HF** **Pb** GSA/GSAP Series, 6x32mm Ceramic Tube Slow Blow Fuse

RoHS 2 Compliant

### Description

6x32mm Slow Blow, 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 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 : Ceramic   |
|           | Cap : Nickel Plated Brass Caps   |
|           | Leads : Matte Tin Plated Copper  |
| Marking   | On Fuse :  |
|           | "bel", "GSA", "Current Rating", "Voltage Rating",<br>"Appropriate Safety Logos", "✓" ( RoHS 2 compliant )  |
|           | On Label :   |
|           | "bel", "GSA" or "GSAP", "Current Rating", "Voltage Rating", "Interrupting Rating",<br>"Appropriate Safety Logos" and "  ", "  "(China RoHS compliant). |

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

| Testing Current | Blow Time |         |
|-----------------|-----------|---------|
|                 | Minimum   | Maximum |
| 100%            | 4 hrs.    | N/A     |
| 135%            | N/A       | 1 Hr.   |
| 200%            | 5 sec     | 30 sec  |

### Safety Agency Approvals

| Safety Agency | Safety Agency Certificate                | Voltage Rating (V)   | Ampere Range / Volt @ I.R. ability*  |
|---------------|--|----------------------|--|
|               | E20624<br>LR39772                        | 63mA-15A/<br>250V AC | 63mA-8A/125V AC @10,000A<br>63mA-1A/250V AC @35A<br>>1A-3.5A/250V AC @100A<br>>3.5A-8A/250V AC @200A |
|               |  |                      | 10A-15A/125V AC @10,000A<br>10A-15A/250V AC @750A  |
|               | JET1037-31003-1010<br>JET1037-31003-1011 |                      | 1A-5A/125V AC @500A  |
|               | JET1037-31003-1007                       |                      | >5A-15A/125V AC @300A  |

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

# Type GSA / GSAP

## 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 |    |       |    |    |   |
|----------------|---------------|--------------------------------|-------------------------------|---|--|--|-------------------------------|------------------|----|-------|----|----|---|
|                |               |                                |                               |   |  |  |                               | UL US            | SP | UL US | SP | CS |   |
| GSA(P) 63-R    | 63mA          | 75.5                           | 7.33                          | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.087  | 0.098  | 0.71                          | Y                | Y  |       |    |    |   |
| GSA(P) 80-R    | 80mA          | 48.4                           | 6.27                          |   | 0.135  | 0.152  | 0.74                          | Y                | Y  |       |    |    |   |
| GSA(P) 100-R   | 100mA         | 29.4                           | 4.41                          |   | 0.209  | 0.238  | 0.55                          | Y                | Y  |       |    |    |   |
| GSA(P) 125-R   | 125mA         | 17.5                           | 3.45                          |   | 0.323  | 0.372  | 0.58                          | Y                | Y  |       |    |    |   |
| GSA(P) 160-R   | 160mA         | 12.3                           | 3.13                          |   | 0.499  | 0.581  | 0.60                          | Y                | Y  |       |    |    |   |
| GSA(P) 200-R   | 200mA         | 7.1                            | 2.13                          |   | 0.773  | 0.908  | 0.63                          | Y                | Y  |       |    |    |   |
| GSA(P) 250-R   | 250mA         | 5.0                            | 1.97                          |   | 1.2  | 1.4  | 0.66                          | Y                | Y  |       |    |    |   |
| GSA(P) 300-R   | 300mA         | 3.17                           | 1.52                          |   | 1.9  | 2.2  | 0.70                          | Y                | Y  |       |    |    |   |
| GSA(P) 375-R   | 375mA         | 2.14                           | 1.26                          |   | 2.6  | 3.2  | 0.73                          | Y                | Y  |       |    |    |   |
| GSA(P) 500-R   | 500mA         | 1.38                           | 1.07                          | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 4.4  | 5.4  | 0.78                          | Y                | Y  |       |    |    |   |
| GSA(P) 600-R   | 600mA         | 1.05                           | 0.98                          |   | 6.9  | 8.5  | 0.82                          | Y                | Y  |       |    |    |   |
| GSA(P) 700-R   | 700mA         | 0.648                          | 0.69                          |   | 8.5  | 11   | 0.84                          | Y                | Y  |       |    |    |   |
| GSA(P) 750-R   | 750mA         | 0.642                          | 0.68                          |   | 10   | 12   | 0.85                          | Y                | Y  |       |    |    |   |
| GSA(P) 1-R     | 1A            | 0.374                          | 0.59                          |   | 16   | 21   | 0.91                          | Y                | Y  |       |    |    | Y |
| GSA(P) 1.25-R  | 1.25A         | 0.248                          | 0.43                          |   | 25   | 32   | 0.96                          | Y                | Y  |       |    |    | Y |
| GSA(P) 1.6-R   | 1.6A          | 0.155                          | 0.38                          |   | 39   | 50   | 1.01                          | Y                | Y  |       |    |    | Y |
| GSA(P) 2-R     | 2A            | 0.115                          | 0.36                          |   | 61   | 79   | 1.06                          | Y                | Y  |       |    |    | Y |
| GSA(P) 2.5-R   | 2.5A          | 0.079                          | 0.29                          |   | 94   | 123  | 1.12                          | Y                | Y  |       |    |    | Y |
| GSA(P) 3-R     | 3A            | 0.058                          | 0.27                          |   | 146  | 192  | 1.18                          | Y                | Y  |       |    |    | Y |
| GSA(P) 4-R     | 4A            | 0.039                          | 0.23                          |   | 226  | 300  | 1.24                          | Y                | Y  |       |    |    | Y |
| GSA(P) 5-R     | 5A            | 0.029                          | 0.22                          |   | 349  | 469  | 1.31                          | Y                | Y  |       |    |    | Y |
| GSA(P) 6-R     | 6A            | 0.018                          | 0.19                          |   | 286  | 455  | 1.61                          | Y                | Y  |       |    |    | Y |
| GSA(P) 7-R     | 7A            | 0.016                          | 0.18                          |   | 372  | 592  | 1.81                          | Y                | Y  |       |    |    | Y |
| GSA(P) 8-R     | 8A            | 0.013                          | 0.17                          |   | 483  | 769  | 1.95                          | Y                | Y  |       |    |    | Y |
| GSA(P) 10-R    | 10A           | 0.010                          | 0.17                          | 817   | 1300   | 2.26   |                               |                  | Y  | Y     |    | Y  |   |
| GSA(P) 12-R    | 12A           | 0.008                          | 0.15                          | 1277  | 2031   | 2.56   |                               |                  | Y  | Y     |    | Y  |   |
| GSA(P) 15-R    | 15A           | 0.006                          | 0.15                          | 2123  | 3377   | 2.96   |                               |                  | Y  | Y     |    | Y  |   |

Consult manufacturer for other ratings

**EOL—**  
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Specifications subject to change without notice

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# Type GSA / GSAP

## 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 Tp                                | 260°C  |
| Time within +0°C / -5°C of actual peak temperature | 10 seconds                                   |
| Ramp-down rate                                     | 5°C / second max.                            |



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## Fuse FGNO Explanation

06X6 R [XXXX] -XX

0606R=GSA/0616R=GSAP; [XXXX]=Ampere Rating; XX=See Ordering Information as below

| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|
| 1/16     | 0.063   | 63        | 0063           |
| 8/100    | .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           |
| 3/8      | .375    | 375       | 0375           |
| 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           |
|          | 1.60    | 1.6  | 1600           |
|          | 2.0     | 2    | 2000           |
| 2-1/2    | 2.5     | 2.5  | 2500           |
|          | 3.0     | 3    | 3000           |
|          | 4.0     | 4    | 4000           |
|          | 5.0     | 5    | 5000           |
|          | 6.0     | 6    | 6000           |
|          | 7.0     | 7    | 7000           |
|          | 8.0     | 8    | 8000           |
|          |         | 10   | 9100           |
|          |         | 12   | 9120           |
|          |         | 15   | 9150           |

## Mechanical Dimensions



\*Diameter lead 0.032" ± 0.002" for 5A and less  
 \*Diameter lead 0.039" ± 0.002" for 6A and above

## Ordering Information

**06X6 R XXXX - X X**

**FUSE TYPE** \_\_\_\_\_

0606R = GSA Series  
 0616R = GSAP Series

**R** = RoHS Compliant \_\_\_\_\_

**AMPERE RATING** \_\_\_\_\_  
 Refer to fuse FGNO explanation table

**PACKAGING CODE** \_\_\_\_\_

3 = GSA Cartridge, 1K/box  
 3 = GSAP Pigtail, Bulk, 1K/box

**VOLTAGE CODE** \_\_\_\_\_

3 = 250V for 100mA -20A

## Packaging

| Packaging Option    | Packaging Specification | Quantity | Packaging Code | Inside Tape Spacing |
|---------------------|-------------------------|----------|----------------|---------------------|
| Bulk                | N/A                     | 1000     | 33             | N/A                 |
| Bulk (Pigtail Type) | N/A                     | 1000     | 33             | N/A                 |



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