

Type 0678D

Square Ceramic Surface Mount Fast Blow Fuse

HF 0678D Series - 3912 Size

RoHS 2 Compliant

Features

- Fast blow
- Surface mount high breaking capacity (350V AC/125V DC)
- Current rating from 500mA to 5A
- Wide operating temperature range from -55 °C to 125 °C
- Tape & Reel for auto-insert SMD process
- Compatible with 260 °C, IR Pb-free solder process
- RoHS compliant with exemption 7a
- Halogen Free, (MSL = 1)

Applications

- Voltage regulator module
- PC server
- Office electronic equipment
- Industrial equipment
- Medical equipment
- POE, POE+
- Power supply
- DC-DC Converter
- Mass Storage Systems

HALOGEN FREE = **HF**



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

Safety Agency Approvals

| Testing Current | Blow Time | |
|-----------------|-----------|---------|
| | Minimum | Maximum |
| 100% | 4 Hrs. | N/A |
| 200% | N/A | 60 Sec |

| SAFETY AGENCY | SAFETY AGENCY CERTIFICATE | VOLTAGE RATING (V) | AMPERE RANGE / VOLT @ I.R. ABILITY* |
|---------------|---------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| | E20624 | 500mA - 1A / 350 VAC 250 VDC >1A - 5A / 350 VAC 125 VDC | 500mA - 1A / 350V @ 100A AC 250V @ 100A DC 125V @ 2000A DC >1A - 5A / 350V @ 100A AC 125V @ 2000A DC |

* I.R. = INTERRUPTING RATING = SHORT CIRCUIT RATING (AMPS)

Physical Specifications

| | |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Materials | Body : Ceramic |
| | Terminations : Silver Plated Caps |
| Marking | On Fuse : |
| | "Current Rating", "D" in green color. "bel" stamped in end caps. |
| | On Label : |
| | "bel", "0678D", "Current Rating", "Voltage Rating", "Interrupting Rating", " Appropriate Safety Logos" and , (China RoHS compliant). |

Specifications subject to change without notice



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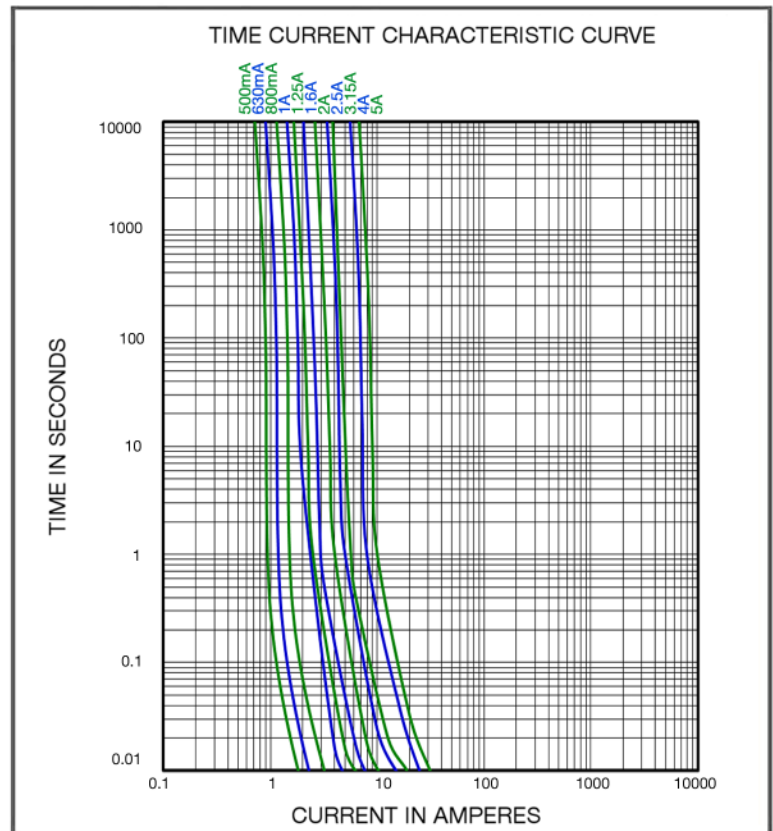
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Environmental Specifications

Temperature Derating Curve



Electrical Specifications

| Part Number | Ampere Rating | Nominal Cold Resistance (ohm) | Volt-drop @100% In (Volt) Max | Voltage and Interrupting Ratings | Melting I ² T @10 In (A ² Sec) | Power Dissipation (W) Max | Agency Approvals |
|--------------|---------------|-------------------------------|-------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------|---------------------------|------------------|
| | | | | | | | |
| 0678D0500-02 | 500mA | 0.66 | 1.00 | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.03 | 0.5 | Y |
| 0678D0630-02 | 630mA | 0.54 | 1.30 | | 0.06 | 0.8 | Y |
| 0678D0800-02 | 800mA | 0.38 | 1.10 | | 0.08 | 0.9 | Y |
| 0678D1000-02 | 1A | 0.21 | 0.70 | | 0.3 | 0.7 | Y |
| 0678D1250-02 | 1.25A | 0.10 | 0.20 | | 0.4 | 0.3 | Y |
| 0678D1600-02 | 1.6A | 0.08 | 0.19 | | 0.5 | 0.3 | Y |
| 0678D2000-02 | 2A | 0.059 | 0.18 | | 0.9 | 0.4 | Y |
| 0678D2500-02 | 2.5A | 0.043 | 0.18 | | 1.6 | 0.5 | Y |
| 0678D3150-02 | 3.15A | 0.035 | 0.18 | | 2.6 | 0.6 | Y |
| 0678D4000-02 | 4A | 0.021 | 0.18 | | 7.5 | 0.7 | Y |
| 0678D5000-02 | 5A | 0.016 | 0.18 | | 9.0 | 0.9 | Y |

Consult manufacturer for other ratings

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| | |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| 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 C.Top Side(260 °C, 20 sec) MIL-STD-202G, Method 210F, Test Condition D.Bottom Side(260 °C,10 sec) |
| Thermal Shock | MIL-STD-202G, Method 107G, Test Condition B (-65 °C to +125 °C). |
| Operating Temperature | -55 °C to +125 °C |
| Moisture Sensitivity Level | 1 (According to IPC J-Std-020) |

Soldering Parameters

| IR Reflow Profile (IPC/JEDEC J-STD-020D) | |
|--------------------------------------------------------------------------------------------------|------------------|
| Preheat & Soak | |
| Temperature min (T _{min}) | 150 °C |
| Temperature max (T _{max}) | 200 °C |
| Time (T _{min} to T _{max}) (t _s) | 60 -120 seconds |
| Average ramp-up rate (T _{max} to T _p) | 3 °C/second max. |
| Liquidous temperature (T _L) | 217 °C |
| Time at liquidous (t _l) | 60 - 150 seconds |
| Peak temperature (T _p) | 260 °C max |
| Time (t _p) within 5 °C of the specified classification temperature (T _c) | 30 seconds |
| Average ramp-down rate (T _p to T _{max}) | 6 °C/second max. |
| Time 25 °C to peak temperature | 8 minutes max. |



| Lead-free Wave Soldering Profile | |
|------------------------------------------------------|------------------------------------------------|
| Wave Soldering Parameter | |
| Average ramp-up rate | 200 °C / second |
| Heating rate during preheat | typical 1 - 2 °C / second 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. |



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Fuse FGNO Explanation

0678D [XXXX] - 02

0678D=0678D Series; [XXXX]=Ampere Rating; XX=See Ordering Information as below

| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|
| 1/2 | .500 | 500 | 0500 |
| | .630 | 630 | 0630 |
| 8/10 | .800 | 800 | 0800 |

| 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 |
| | 3.15 | 3.15 | 3150 |
| | 4.0 | 4 | 4000 |
| | 5.0 | 5 | 5000 |

Mechanical Dimensions



Ordering Information



Packaging

| Packaging Tape & Reel | Packaging Specification | Quantity | Quantity & Packaging Code |
|----------------------------------------------|-------------------------|----------|---------------------------|
| 16 mm wide tape with 13 inches Diameter reel | EIA Standard 481-E | 2000 | 0678DXXXX-02 |

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