

# 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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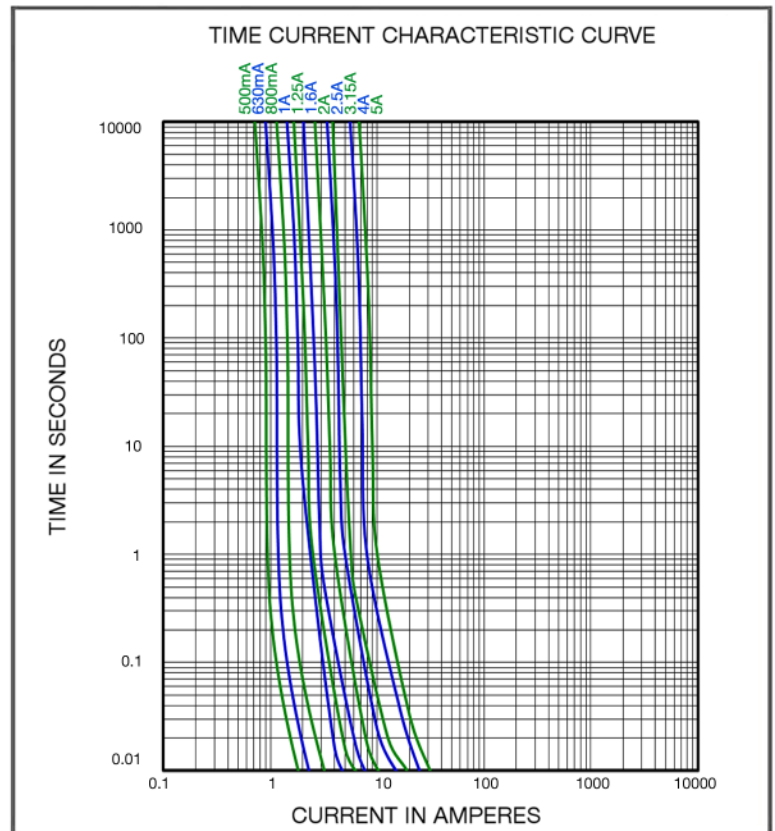
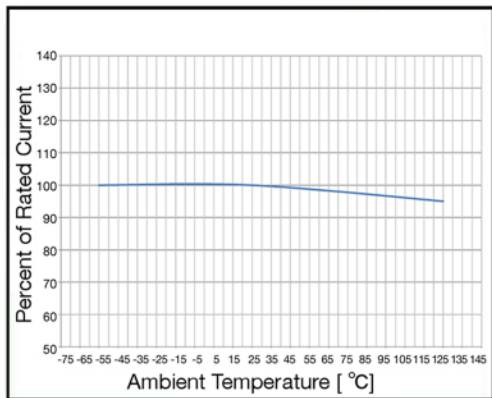
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### Environmental Specifications

### 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 <sup>2</sup> T @10 In (A <sup>2</sup> 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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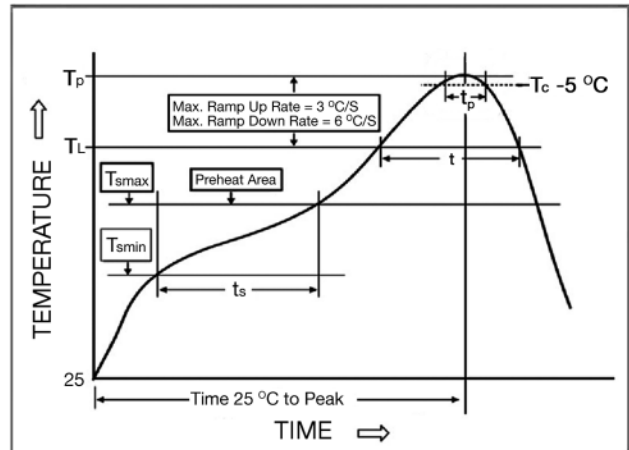
RoHS 2 Compliant

### Environmental Specifications

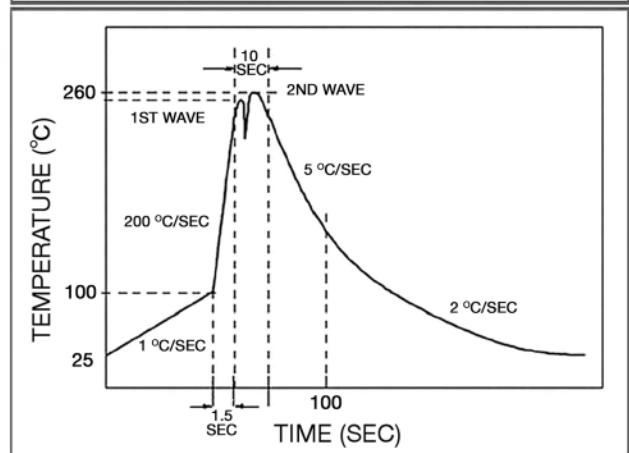
Shock Resistance	MIL-STD-202G, Method 213B, Test Condition 1 (100 G's peak for 6 milliseconds; Sawtooth waveform)
Vibration Resistance	MIL-STD-202G, Method 201A(10-55 Hz,0.06 inch, total excursion).
Salt Spray Resistance	MIL-STD-202G, Method 101E, Test Condition B(48 hrs).
Insulation Resistance	MIL-STD-202G, 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 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)	
<b>Preheat &amp; Soak</b>	
Temperature min (T <sub>min</sub> )	150 °C
Temperature max (T <sub>max</sub> )	200 °C
Time (T <sub>min</sub> to T <sub>max</sub> ) (t <sub>s</sub> )	60 -120 seconds
Average ramp-up rate (T <sub>max</sub> to T <sub>p</sub> )	3 °C/second max.
Liquidous temperature (T <sub>L</sub> )	217 °C
Time at liquidous (t <sub>l</sub> )	60 - 150 seconds
Peak temperature (T <sub>p</sub> )	260 °C max
Time (t <sub>p</sub> ) within 5 °C of the specified classification temperature (T <sub>c</sub> )	30 seconds
Average ramp-down rate (T <sub>p</sub> to T <sub>max</sub> )	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 <sub>p</sub>	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

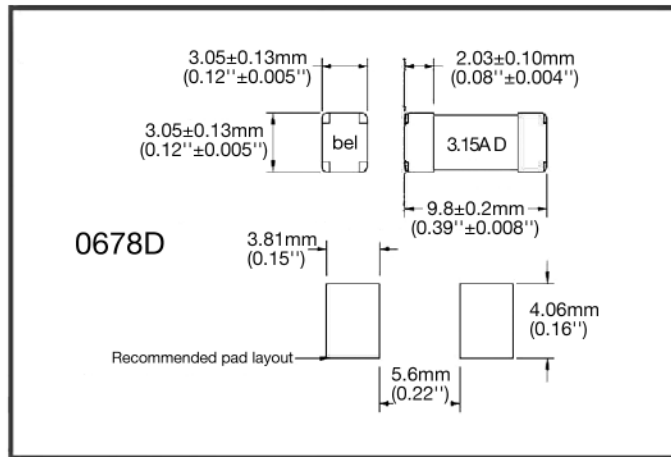
0678D [XXXX] - 02

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

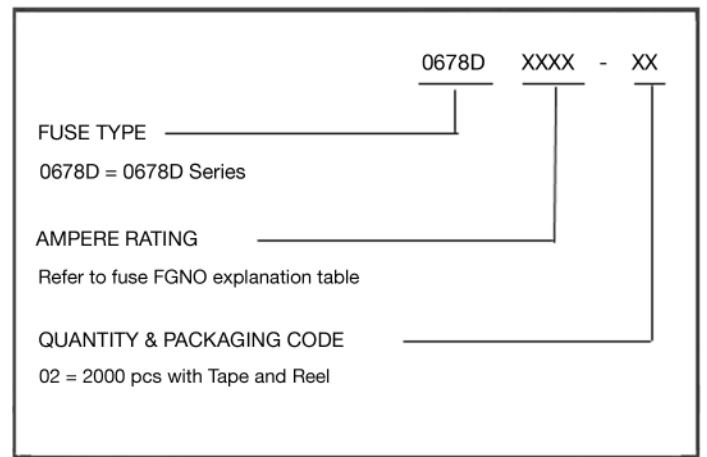
Fraction	Decimal	Milliamps	Bel FGNO[XXXX]
1/2	.500	500	0500
	.630	630	0630
8/10	.800	800	0800

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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