Type 0678D

Square Ceramic Surface Mount Fast Blow Fuse

HF 0678D Series-3912 Size RoHS 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℃ to 125℃
- Tape & Reel for auto-insert SMD process
- Compatible with 260℃, IR Pb-free solder process
- RoHS compliant with exemption 7(a)
  Full compliance with EU Directive 2011/65/EU and amending directive 2015/863
- Halogen Free, (MSL=1)
- AEC-Q Compliant
- Meets Bel automotive qualification*
  * - Largely based on internal AEC-Q test plan

AEC-Q Compliant

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

Physical Specifications

Materials	Body : Ceramic
	Terminations : Silver Plated Caps /Palladium Plated Caps
Marking	On Fuse :
	"Current Rating", "D" – laser marked on ceramic tube, "bel" stamped in end caps.
	On Label :
	"bel", "0678D", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and " ", " " "(China RoHS compliant).

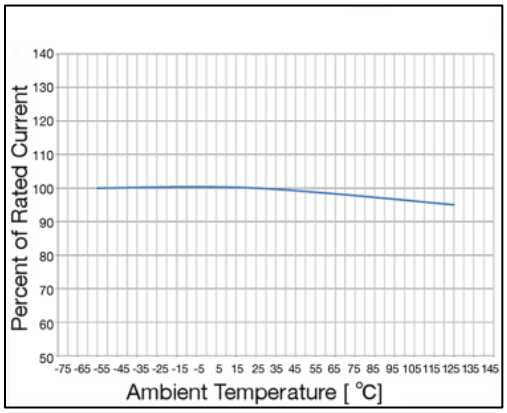
Electrical Characteristics (UL/CSA STD.248-14)

Testing Current	Blow Time	
	Minimum	Maximum
100%	4 hrs.	N/A
200%	N/A	60 sec

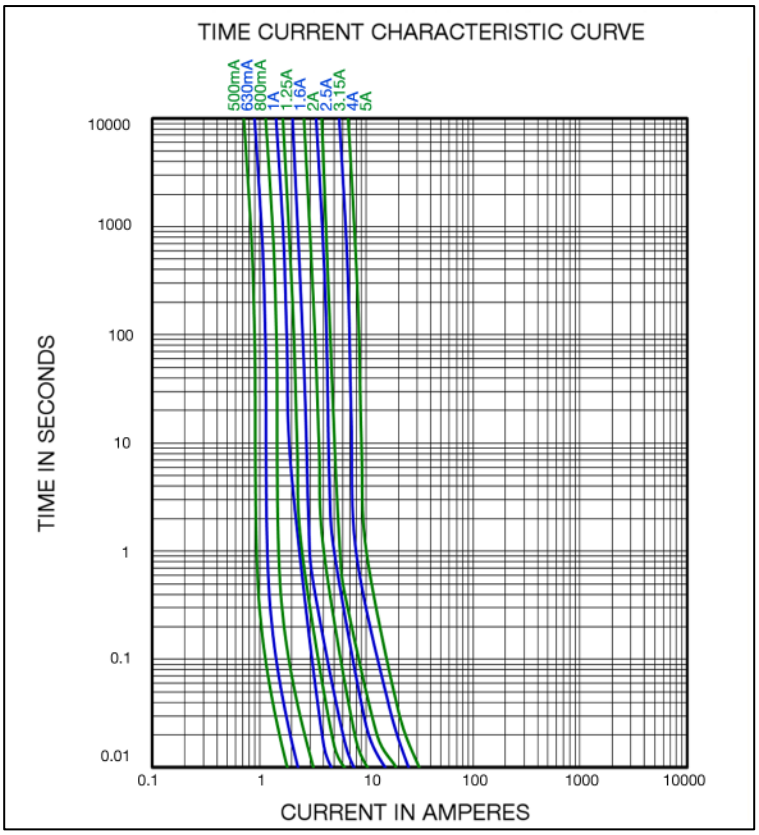
Safety Agency Approvals

Safety Agency	Safety Agency Certificate	Ampere Rating/ Voltage Rating	Ampere Range / Volt @ I.R. ability*
	E506667	500mA-1A/350V AC 250V DC > 1A-5A/350V AC 125V DC	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)			

Temperature Derating Curve



Average Time Current Curve



Electrical Specifications

Part Number	Ampere Rating	Nominal Cold Resistance (ohms)	Volt-drop @100%In (Volt) Max.	Voltage and Interrupting Ratings	Melting I²T @10 In (A² Sec)	Power Dissipation (W) Max	Agency Approvals
							cULus
0678D0500-XX	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-XX	630mA	0.54	1.30		0.06	0.8	Y
0678D0800-XX	800mA	0.38	1.10		0.08	0.9	Y
0678D1000-XX	1A	0.21	0.70		0.3	0.7	Y
0678D1250-XX	1.25A	0.10	0.20		0.4	0.3	Y
0678D1600-XX	1.6A	0.08	0.19		0.5	0.3	Y
0678D2000-XX	2A	0.059	0.18		0.9	0.4	Y
0678D2500-XX	2.5A	0.043	0.18		1.6	0.5	Y
0678D3150-XX	3.15A	0.035	0.18		2.6	0.6	Y
0678D4000-XX	4A	0.021	0.18		7.5	0.7	Y
0678D5000-XX	5A	0.016	0.18		9.0	0.9	Y

Consult manufacturer for other ratings
XX - Packaging code (see “ordering information”)

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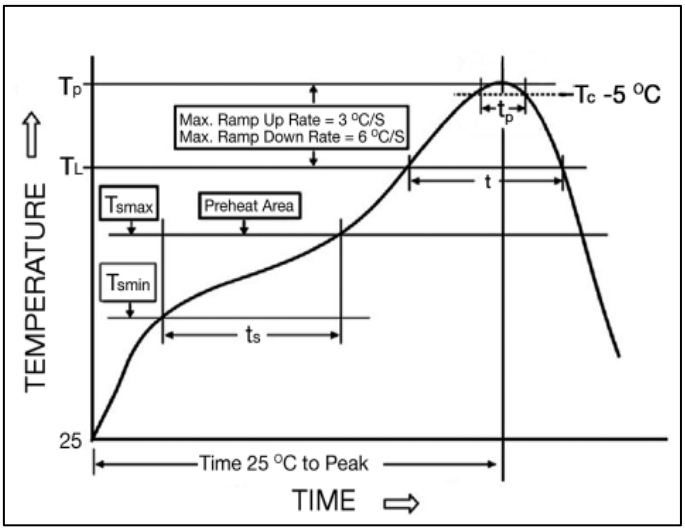
Environmental Specifications

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

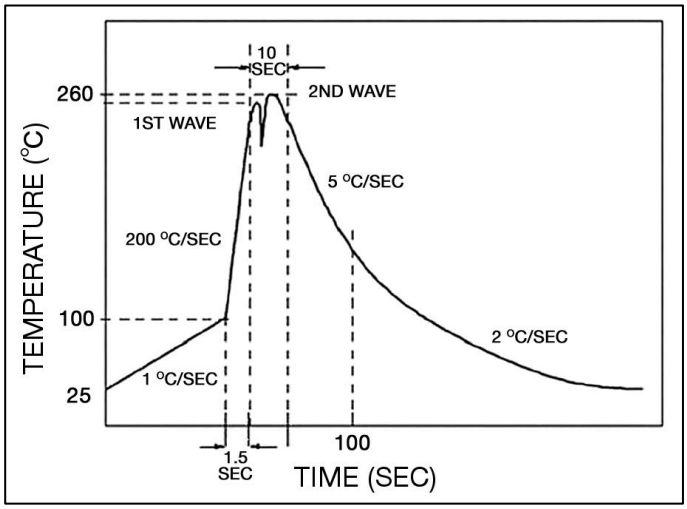
High temperature storage	MIL-STD-202 Method 108
Temperature cycling	JESD22 Method JA-104,Test Condition B
Biased humidity	MIL-STD-202 Method 103, 85C/85% RH with 10% operating power for 1000 hrs.
Operational life	MIL-STD-202 Method 108, Test Condition D
Resistance to solvents	MIL-STD-202 Method 215
Mechanical shock	MIL-STD-202 Method 213,Test Condition C
Vibration	MIL-STD-202 Method 204
Resistance to soldering heat	MIL-STD-202 Method 210,Test condition B
Thermal shock	MIL-STD-202 Method 107
Solderability	J-STD-002
Board flex(SMD)	AEC-Q200-005
Terminal strength	AEC-Q200-006
Electrical characterization	3 temperature electrical

Soldering Parameters

IR Reflow Profile (IPC/JEDEC J-STD-020D)	
Preheat & Soak Temperature min (T_{smin}) Temperature max (T_{smax}) Time (T_{smin} to T_{smax}) (t_s)	 150℃ 200℃ 60-120 seconds
Average ramp-up rate(T_{smax} to T_p)	3℃ / second max.
Liquidous temperature(T_L) Time at liquidous (t_L)	217℃ 60 – 150 seconds
Peak temperature (T_p)	260℃ max
Time (tp) within 5℃ of the specified classification temperature (T_c)	30 seconds
Average ramp-down rate(T_p to T_{smax})	6℃ / second max.
Time 25℃ to peak temperature	8 minutes max.



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



Specifications subject to change without notice

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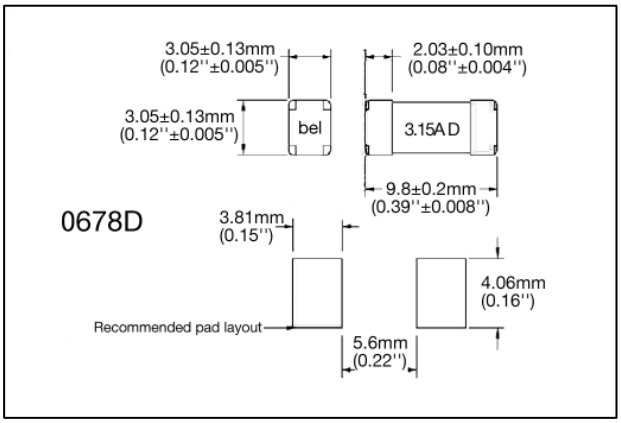
Fuse FGNO Explanation
0678D [XXXX] -XX
0678D=0678D Series; [XXXX]=Ampere Rating; XX=See Ordering Information as below

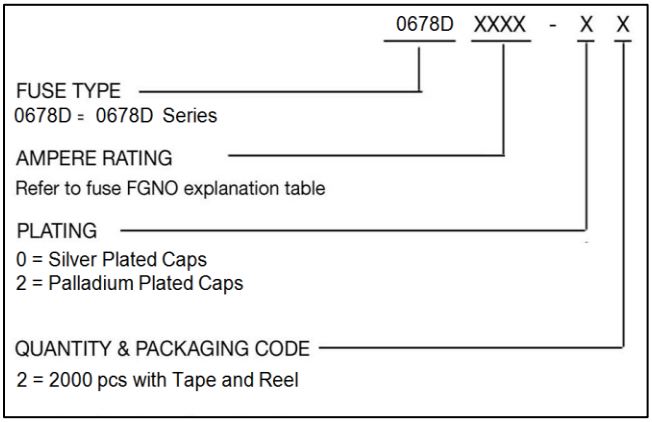
Fraction	Decimal	Milliamps	Bel FGNO[XXXX]
1/2	0.500	500	0500
	.630	630	0630
8/10	.800	800	0800

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 & Peel	Packaging Specification	Quantity	Quantity & Packaging Code
16mm wide tape with 13 inches Diameter reel	EIA Standard 481-E	2000	2

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