

Type 0678L

Square Ceramic Surface Mount Medium Blow Fuse

HF 0678L Series - 3912 Size

RoHS Compliant

Features

- Medium Blow
- Surface mount high current fuse
- Current rating from 10A to 30A
- 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

HALOGEN FREE = **HF**



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	VOLTAGE RATING (V)	AMPERE RANGE / VOLT @ I.R. ABILITY*
UL	E20624	10A - 30A / 250 VAC 72 VDC	10A - 30A / 250V @ 100A AC 125V @ 150A AC 72V @ 130A DC 65V @ 300A DC

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

Physical Specifications

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

Specifications subject to change without notice



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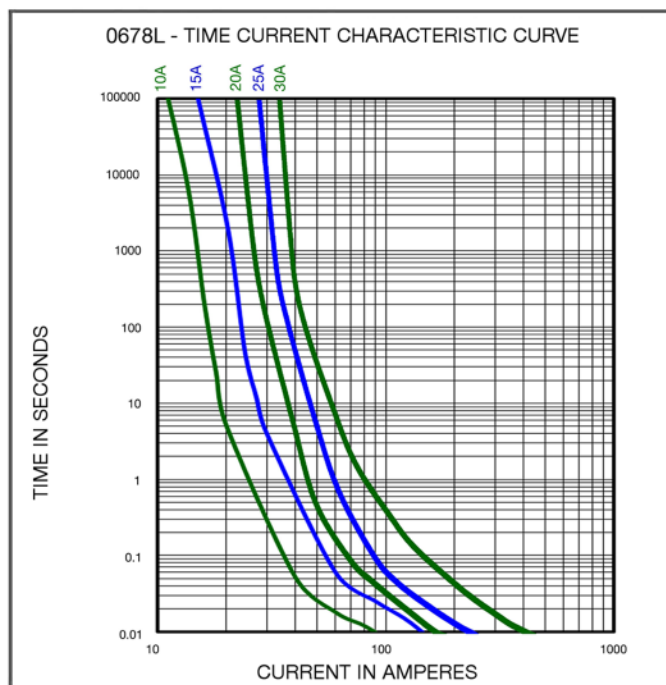
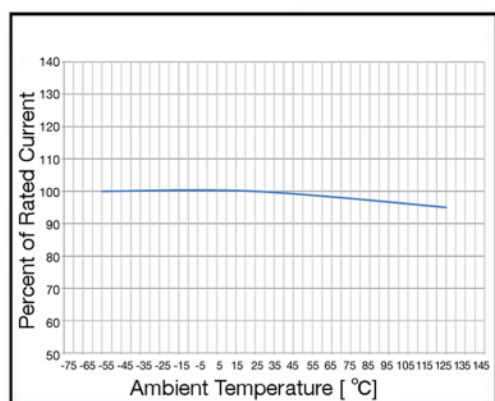
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Environmental Specifications

Temperature Derating Curve



Electrical Specifications

Part Number	Ampere Rating	Nominal Cold Resistance (ohm)	Nominal Volt-drop @100% In (Volt) max.	Voltage and Interrupting Ratings	Melting I²T @10 In (A² Sec) Min.	Nominal Power Dissipation (W)	Agency Approvals
							 US
0678L9100-02	10A	0.0056	0.18	See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings	50	1.8	Y
0678L9150-02	15A	0.0036	0.12		110	1.8	Y
0678L9200-02	20A	0.0025	0.09		270	1.8	Y
0678L9250-02	25A	0.0019	0.08		420	2.0	Y
0678L9300-02	30A	0.0013	0.07		1000	2.1	Y

Consult manufacturer for other ratings

XX - Packaging code (see "ordering information")

NOTES:

Test Conditions

For all 0678L data, as well as UL Component investigation, all tests were conducted with fuse samples soldered on a PCB (1.6mm thick) test board with copper traces measuring 0.1mm nominal thickness (3 oz. clad), 10mm wide and 100mm overall length.

- UL Condition of Acceptability

- the following information is contained in the UL Component Recognition for 0678L Fuse Series:

The maximum temperature recorded in open air was 100 °C in a 21 °C ambient (79 °C rise). Consideration should be given to checking operating temperatures in end-use application with regard to thermal index of surrounding materials and components. (Maximum temperature recorded at 80% of rating (24A) for the 0678L 30 rating was 69 °C(48 °C rise).

Caution:

- Minimum fusing point:

The 0678L Series fuses are NOT intended to be operated at currents between 100% and 200% of ampere rating. Prolonged operation at currents in this range may result in overheating of the fuse and/or desoldering of the fuse caps from the PCB pad.

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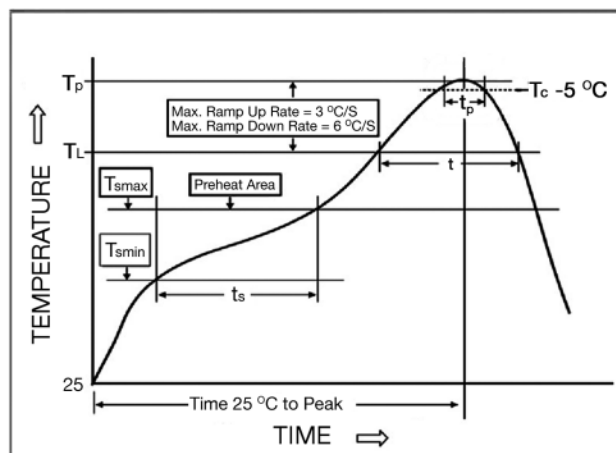
RoHS Compliant

Environmental Specifications

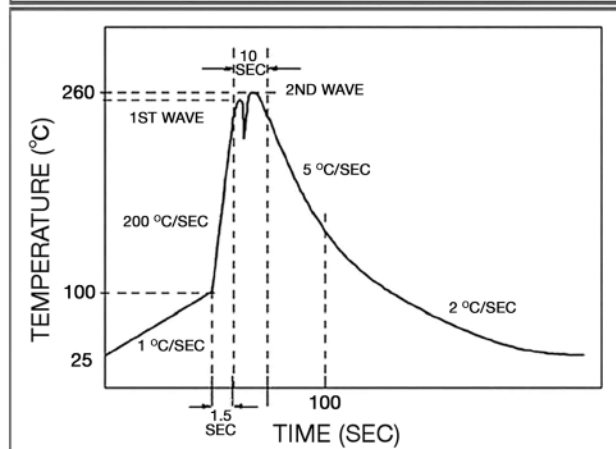
Shock Resistance	MIL-STD-202G, Method 213B, Test Condition 1 (100 G's peak for 6 milliseconds; Sawtooth waveform)
Vibration Resistance	MIL-STD-202G, Method 201A(10-55 Hz,0.06 inch, total excursion).
Salt Spray Resistance	MIL-STD-202G, Method 101E, Test Condition B(48 hrs).
Insulation Resistance	MIL-STD-202G, 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)	
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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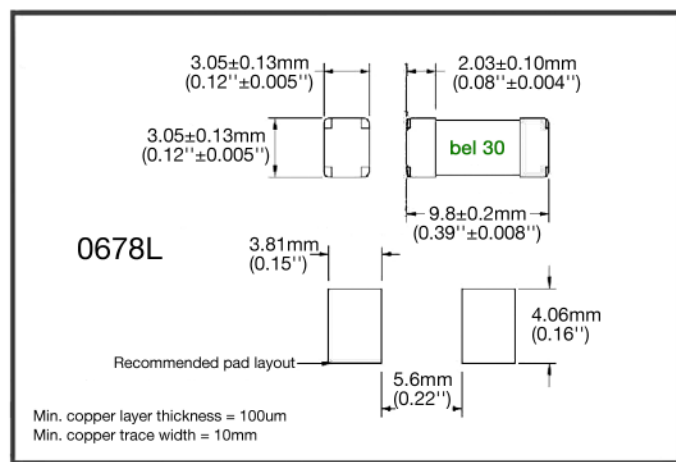
Fuse FGNO Explanation

0678L [XXXX] - 02

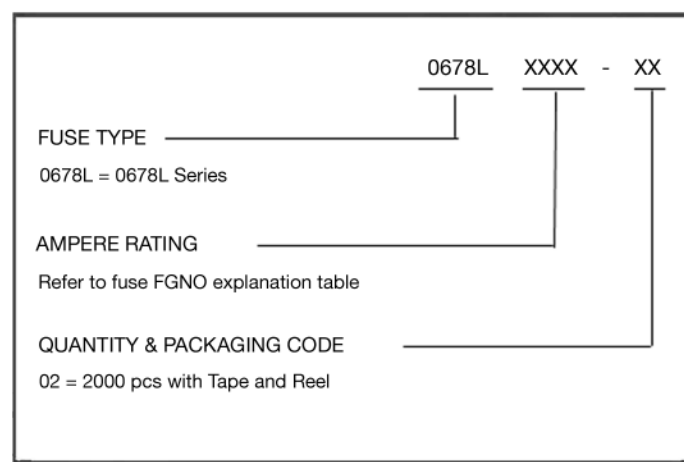
0678L=0678L Series; [XXXX]=Ampere Rating; XX=See Ordering Information as below

Amps	Bel FGNO[XXXX]
10	9100
12	9120
15	9150
20	9200
25	9250
30	9300

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	0678LXXXX-02

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