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℃ 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

Applications

- Voltage regulator module
- PC server
- Office electronic equipment
- Industrial equipment
- Medical equipment
- POE, POE+
- Power supply
- DC-DC converter

HALOGEN FREE = HF

AEC-Q Compliant

Physical Specifications

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

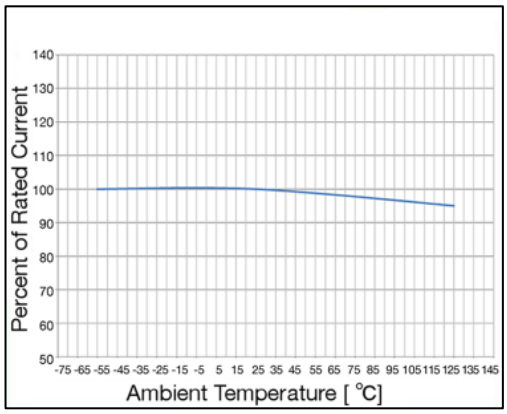
Electrical Characteristics (UL/CSA STD.248-14)

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

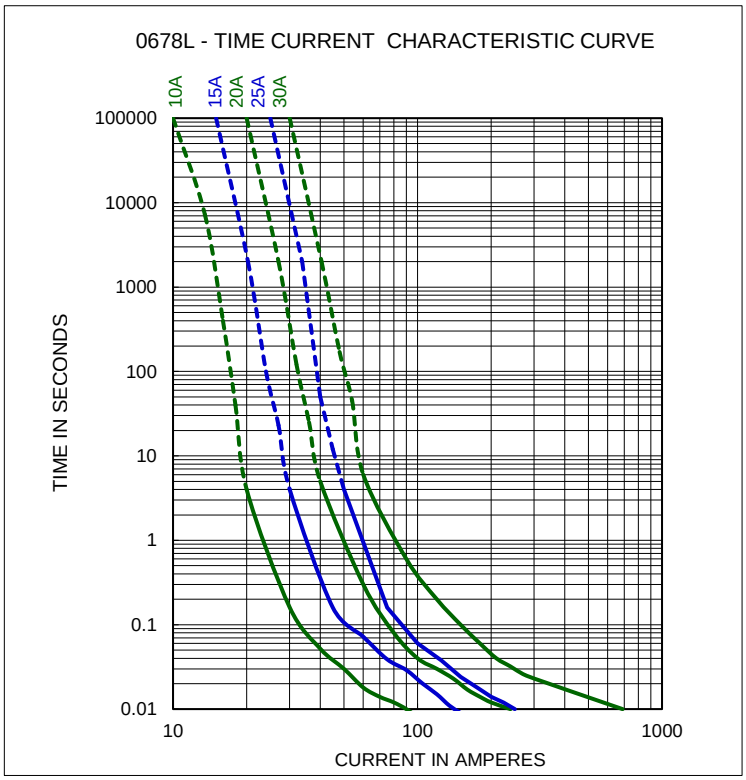
Safety Agency Approvals

Safety Agency	Safety Agency Certificate	Ampere Rating/ Voltage Rating	Ampere Range / Volt @ I.R. ability*
c UL us	E506667	10A-30A / 250V AC 72V DC	10A-30A /250V @ 100A AC 125V @ 150A AC 72V @ 130A DC 65V @ 300A 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)	Nominal Volt-drop @100%In (Volt) max.	Voltage and Interrupting Ratings	Melting I²T @10 In (A² Sec) Min.	Nominal Power Dissipation (W)	Agency Approvals
							cRUus
0678L9100-XX	10A	0.0056	0.18	See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings	50	1.8	Y
0678L9150-XX	15A	0.0036	0.12		110	1.8	Y
0678L9200-XX	20A	0.0025	0.09		270	1.8	Y
0678L9250-XX	25A	0.0019	0.08		420	2.0	Y
0678L9300-XX	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℃ in a 21℃ ambient (79℃ 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℃ (48℃ rise).

Caution:

- Minimum fusing point:

The 0678L Series fuse 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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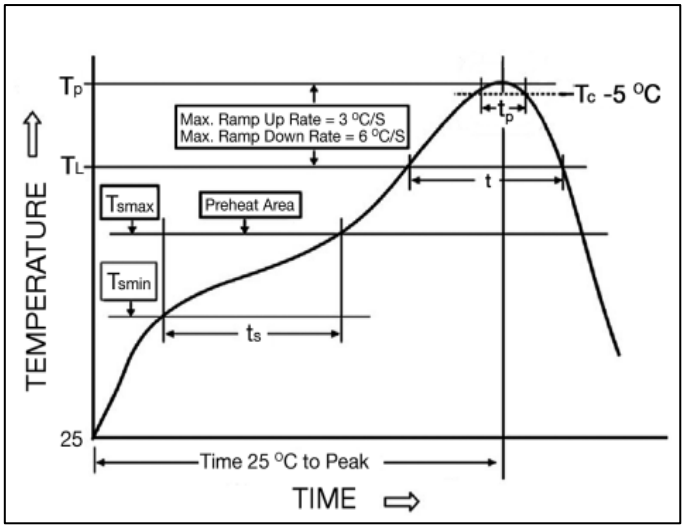
Environmental Specifications

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)

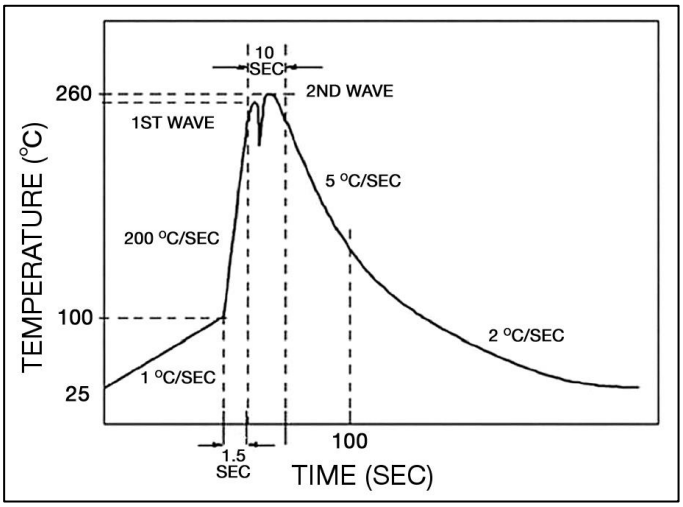
High temperature storage	MIL-STD-202 Method 108
Temperature cycling	JESD22 Method JA-104,Test Condition B
Biased humidity	MIL-STD-202 Method 103, 85C/85% RH with 10% operating power for 1000 hrs.
Operational life	MIL-STD-202 Method 108, Test Condition D
Resistance to solvents	MIL-STD-202 Method 215
Mechanical 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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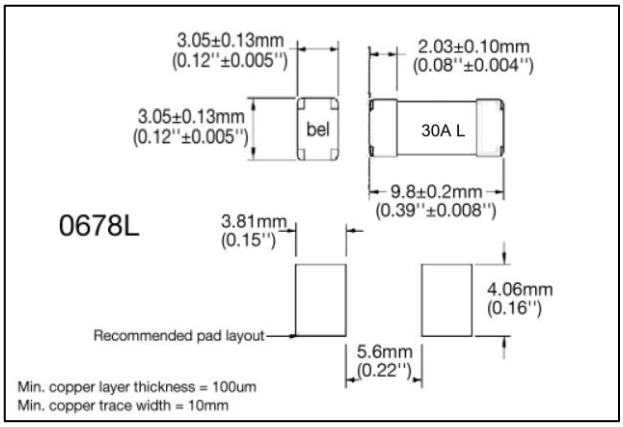
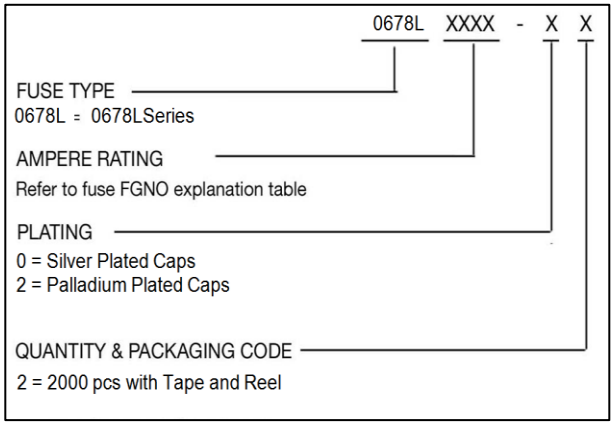
Fuse FGNO Explanation
0678L [XXXX] -XX
0678L=0678L Series; [XXXX]=Ampere Rating; XX=See Ordering Information as below

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

Mechanical Dimensions



Ordering Information



Packaging

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

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