Not recommended for new applications. Please see 0678L

Type SMM

Square Ceramic Surface Mount Medium Blow Fuse

SMM Series – 3912 Size

RoHS 2 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 reflow process
- Halogen Free
- Leadfree

Applications

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

LEAD FREE =
HALOGEN FREE =

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*
	E20624	10A-30A/250VAC 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 : Matte Tin plated Brass Caps
Marking	On Fuse :
	"bel", "Current Rating" in black color.
	On Label :
	"bel", "SMM", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and " ", " "(China RoHS compliant).

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Specifications subject to change without notice

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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
Thermal Shock	MIL-STD-202G, Method 107G, Test Condition B (-65℃ to +125℃).
Operating Temperature	-55℃ to +125℃
Moisture Sensitivity Level	1 (Peak Temperature at 240℃ for 30 seconds max)

Electrical Specifications

Catalog Number	Ampere Rating	Nominal Cold Resistance (ohms)	Nominal Volt-drop @100% In (Volt) max.	Voltage and Interrupting Ratings	Melting I²T @10 In (A²Sec) Min.	Nominal Power Dissipation (W)	Agency Approvals
							cULus
SMM 10	10A	0.0056	0.18	See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings	50	1.8	Y
SMM 15	15A	0.0036	0.12		110	1.8	Y
SMM 20	20A	0.0025	0.09		270	1.8	Y
SMM 25	25A	0.0019	0.08		420	2.0	Y
SMM 30	30A	0.0013	0.07		1000	2.1	Y

Consult manufacturer for other ratings

Soldering Guidelines

Reflow Conditions Recommended 240℃, 30 sec. max.

When soldered to test boards using IR reflow in accordance with above 240℃, SMM samples exhibited DCR change of + 10% to -20% from initial values, the fuse may emit solder.

Subsequent tests showed all samples complied with the stated electrical characteristics on this data sheet.

NOTES:

Test Conditions

For all SMM 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 SMM 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 SMM 30 rating was 69℃(48℃ rise).

Caution:

- Minimum fusing point:

The SMM Series fuses are NOT intended to be operated at currents between 100% and 200% of ampere rating. Prolonged 0peration 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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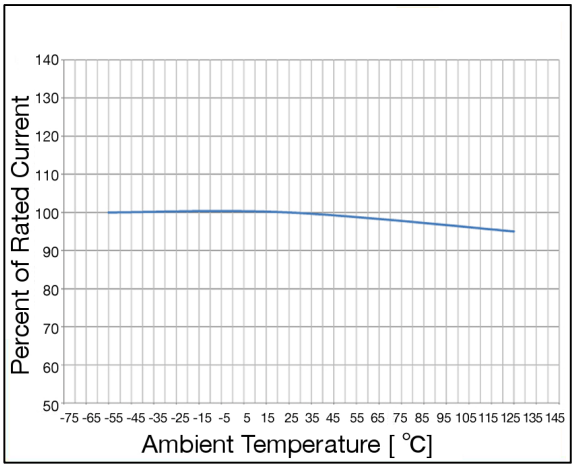
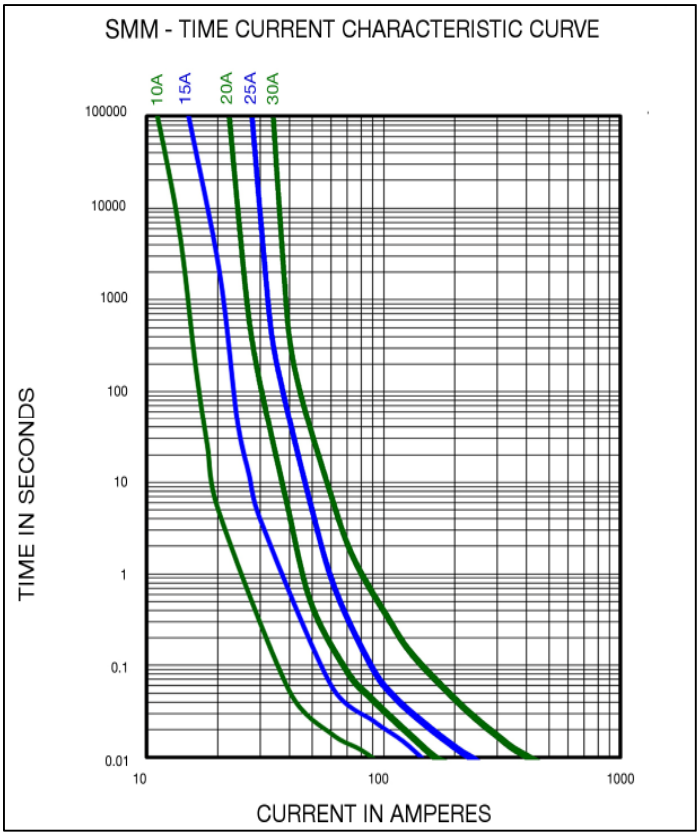
Temperature Derating Curve

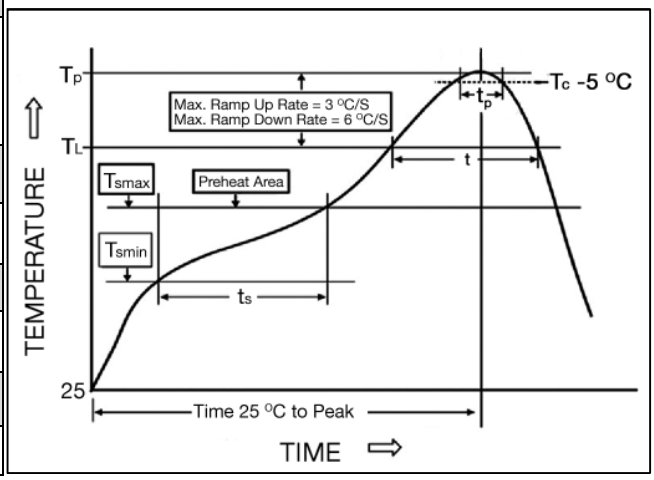


Average Time Current Curve



Soldering Parameters

IR Reflow Profile	
Preheat & Soak Temperature min (Tsmin) Temperature max (Tsmax) Time (Tsmin to Tsmax) (ts)	 150℃ 200℃ 60-120 seconds
Average ramp-up rate (Tsmax to Tp)	3℃/second max.
Liquidous temperature (TL) Time at liquidous (tL)	217℃ 60-150 seconds
Peak temperature (Tp)	240℃ max
Time (tp) within 5℃ of the specified classification temperture (Tc)	30 seconds
Average ramp-down rate (Tp to Tsmax)	6℃/second max.
Time 25℃ to peak temperature	8 minutes max.



Soldering Guidelines
Reflow Conditions Recommended 240℃, 30 sec. max.
NOT Recommended for Wave solder / Direct immersion / Hand Solder

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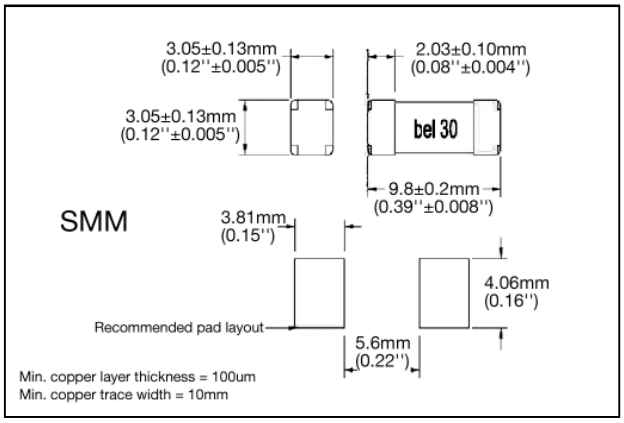
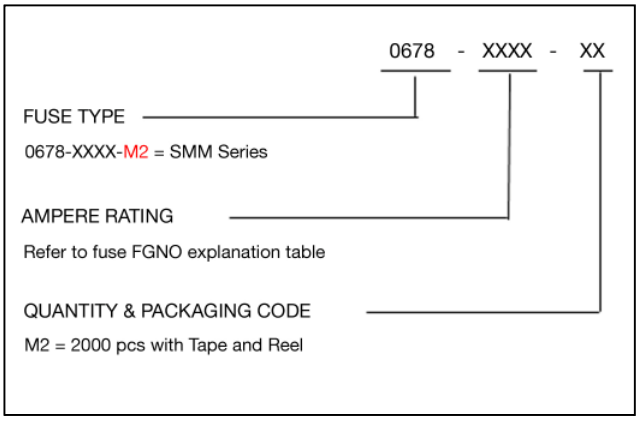
Fuse FGNO Explanation
0678 - [XXXX] X XX
[XXXX]=Ampere Rating; XX=See Ordering Information as below

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	0678-XXXX-M2

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