

**EOL-Last Buy Date is June 30, 2019**  
**Not recommended for new applications. Please see 0678L**

# Type SMM

## Square Ceramic Surface Mount Medium Blow Fuse

HF  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°C to 125°C
- Tape & Reel for auto-insert SMD process
- Compatible with reflow process
- Halogen Free
- Lead Free

### 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) 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	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).	

## 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°C to +125°C).
Operating Temperature	-55°C to +125°C
Moisture Sensitivity Level	1 ( Peak Temperature at 240°C 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 I <sup>2</sup> T @ 10 In (A <sup>2</sup> Sec) Min.	Nominal Power Dissipation (W)	Agency Approvals
							
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°C, 30 sec. max.

When soldered to test boards using IR reflow in accordance with above 240°C, 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°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 SMM 30 rating was 69°C (48°C rise).

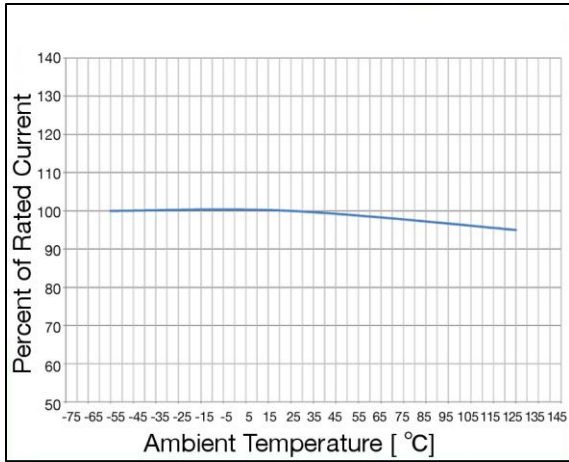
## Caution:

- Minimum fusing point:

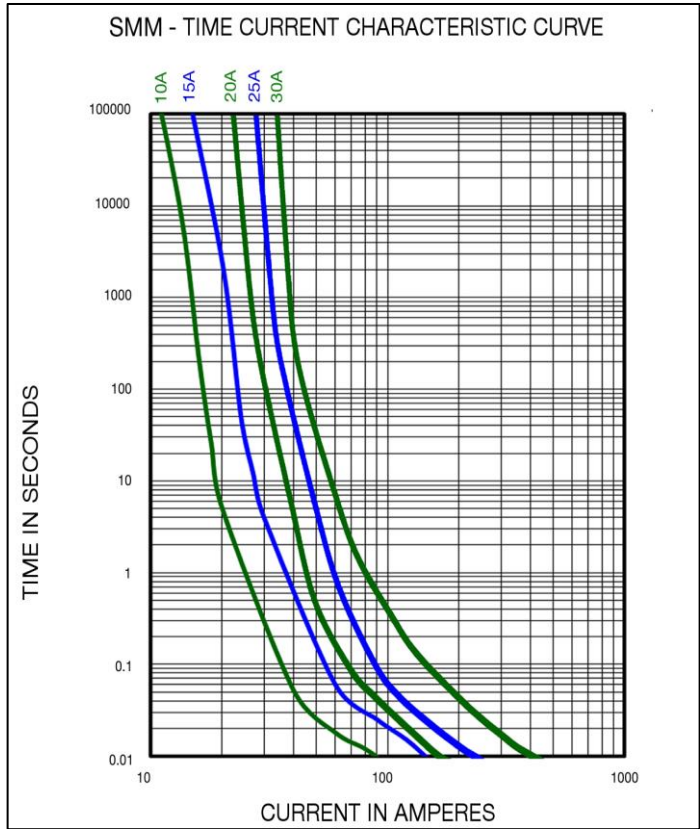
The SMM Series fuses are NOT intended to be operated at currents between 100% and 200% of ampere rating. Prolonged operation at currents in this range may result in overheating of the fuse and/or desoldering of the fuse caps from the PCB pad.

# Type SMM

## Temperature Derating Curve

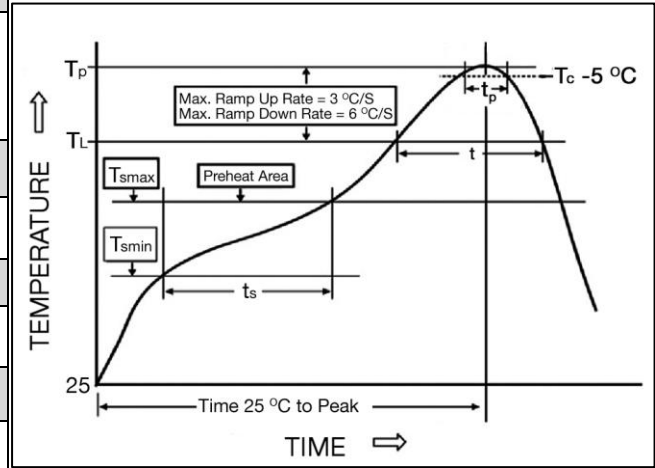


## Average Time Current Curve



## Soldering Parameters

IR Reflow Profile	
<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> )	240°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.



### Soldering Guidelines

Reflow Conditions Recommended 240°C, 30 sec. max.

NOT Recommended for Wave solder / Direct immersion / Hand Solder



Specifications subject to change without notice

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[belfuse.com/circuit-protection](http://belfuse.com/circuit-protection)

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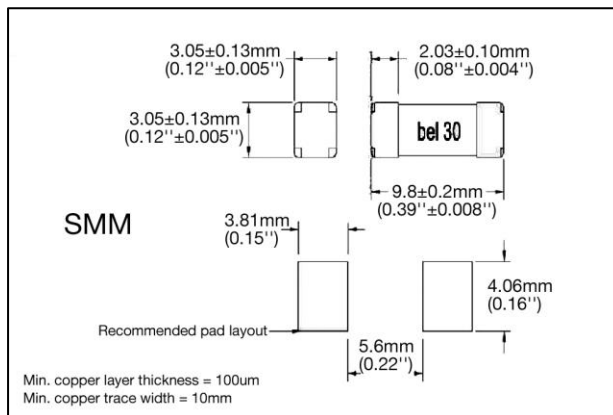
## Fuse FGNO Explanation

0678 - [XXXX] X XX

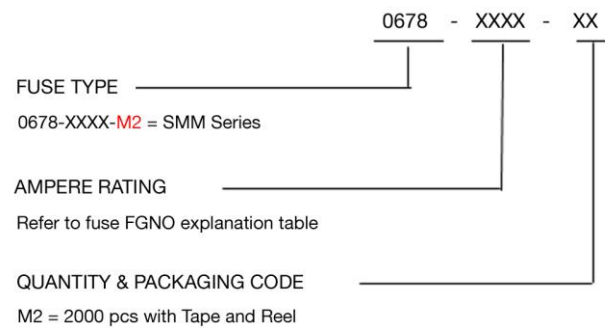
[XXXX]=Ampere Rating; XX=See Ordering Information as below

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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