

Type SMM

Square Ceramic Surface Mount Medium Blow Fuse

HF **Pb** SMM Series - 3912 Size

RoHS 6 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
- Leadfree

Applications

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

LEAD FREE = **Pb**
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 : 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).

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 °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 (ohm)	Nominal Volt-drop @100% In (Volt) max.	Voltage and Interrupting Ratings	Melting I ² T @10 In (A ² 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.

Pb-Free Process Compatibility:

When soldered to test boards using IR reflow in accordance with JEDEC J-STD-020 (260 °C, 40 sec. max.), SMM samples exhibited DCR change of + 10% to -20% from initial values.

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

NOT Recommended for Wave solder / Direct immersion / Hand Solder

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.

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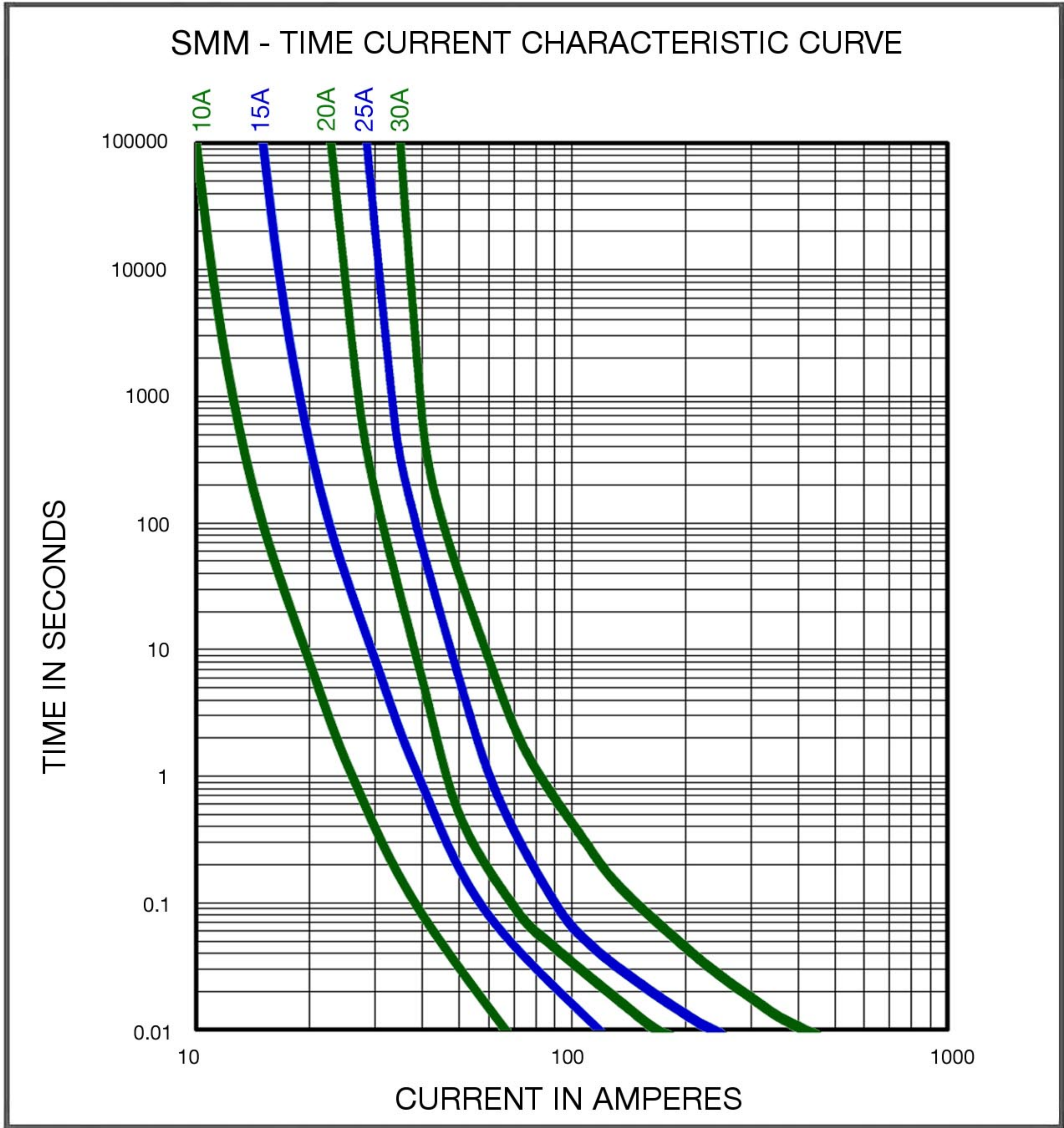
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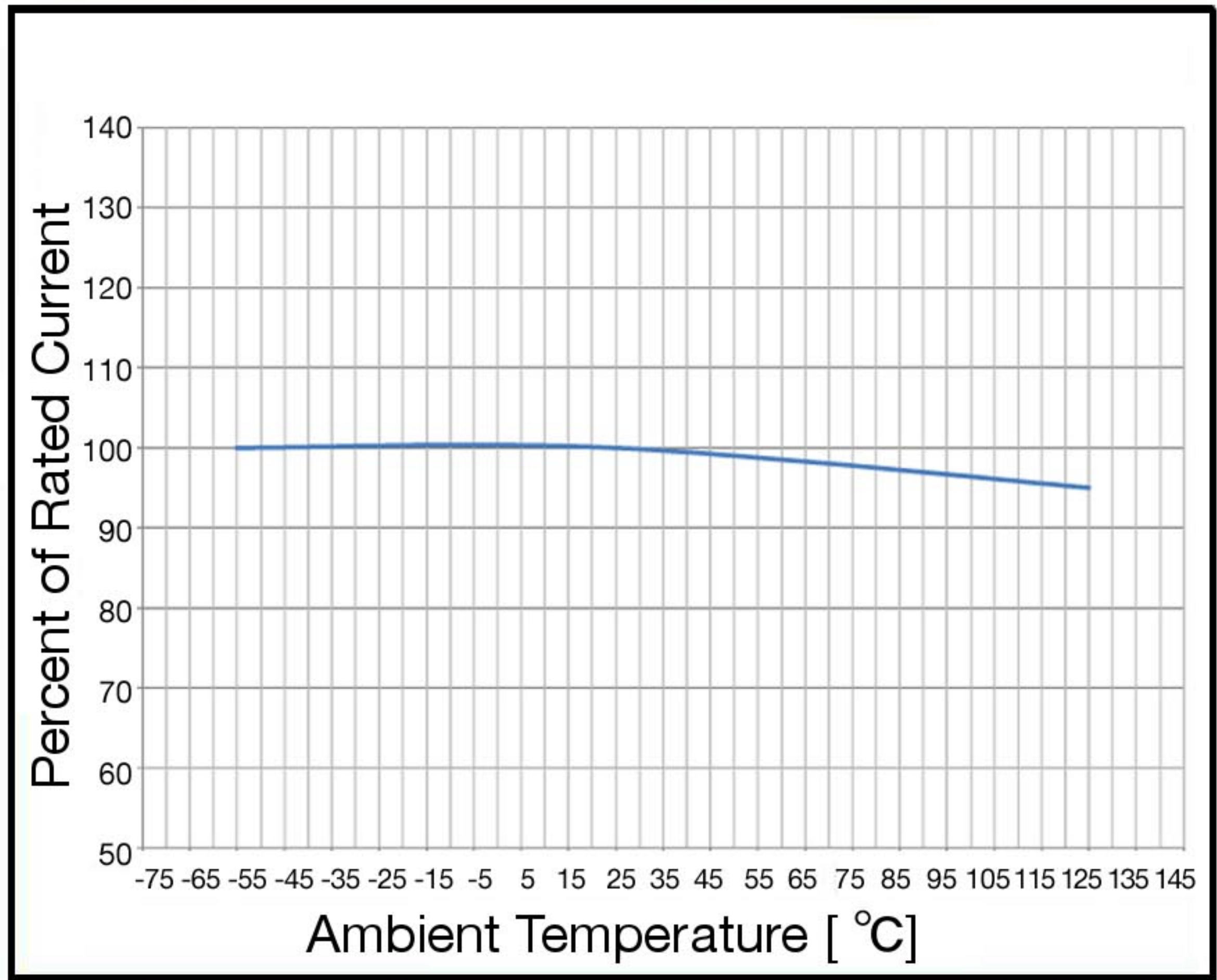
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Average Time Current Curve

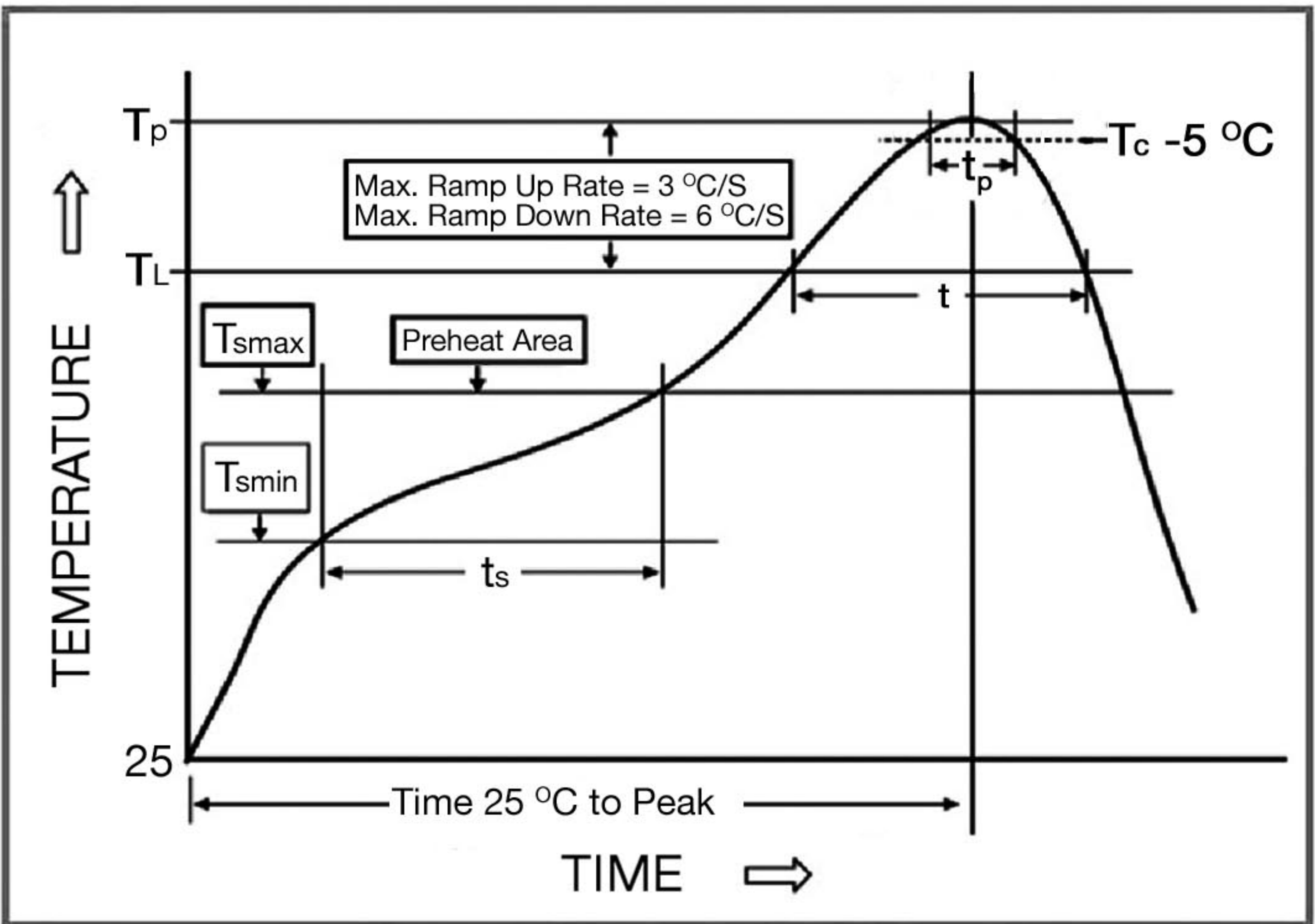


Temperature Derating Curve



Soldering Parameters

IR Reflow Profile	
Preheat & Soak	
Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200 °C
Time (T_{smin} to T_{smax}) (t_s)	60 - 120 seconds
Average ramp-up rate (T_{smax} 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)	240 °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_{smax})	6 °C/second max.
Time 25 °C to peak temperature	8 minutes max.

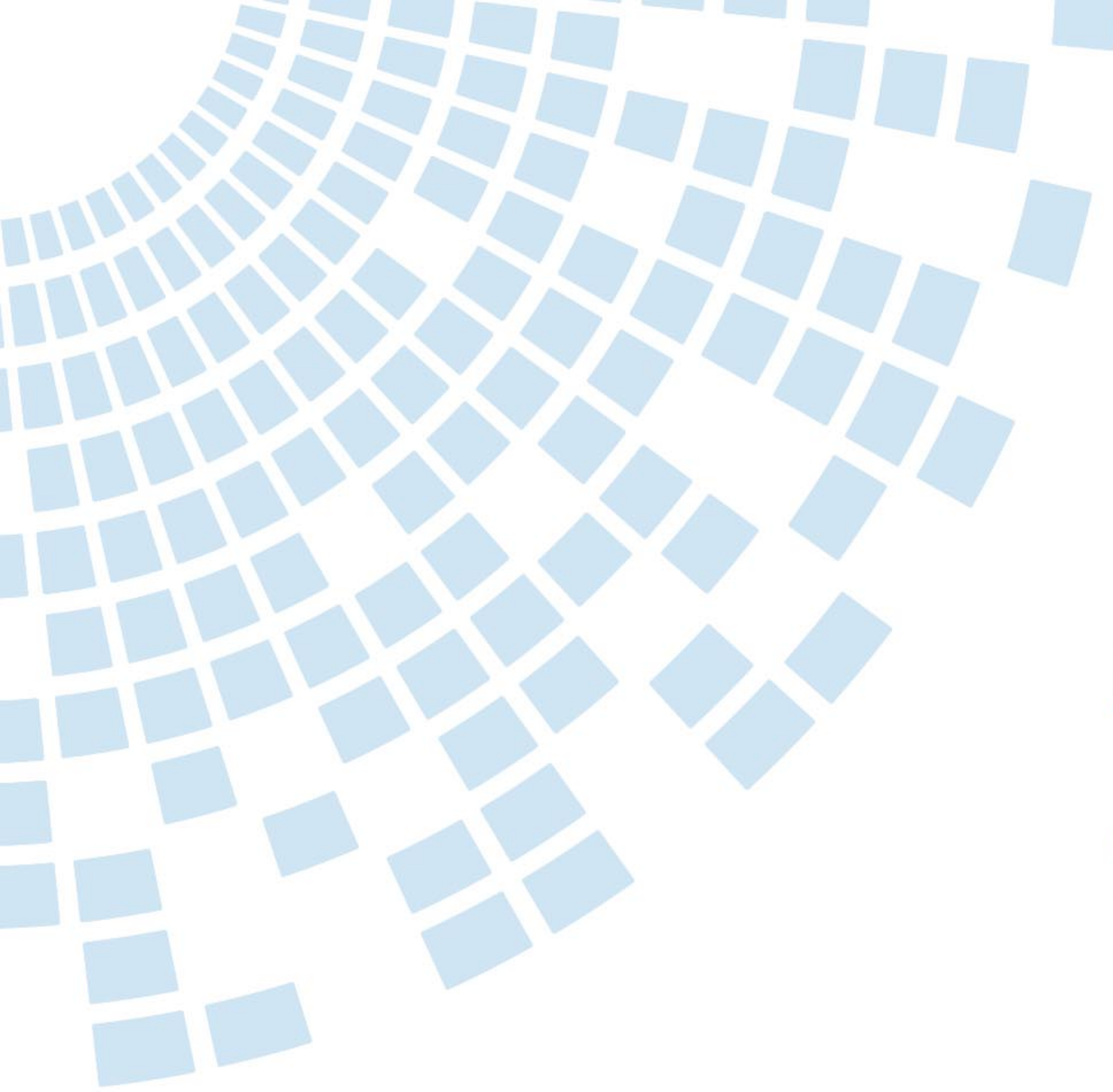


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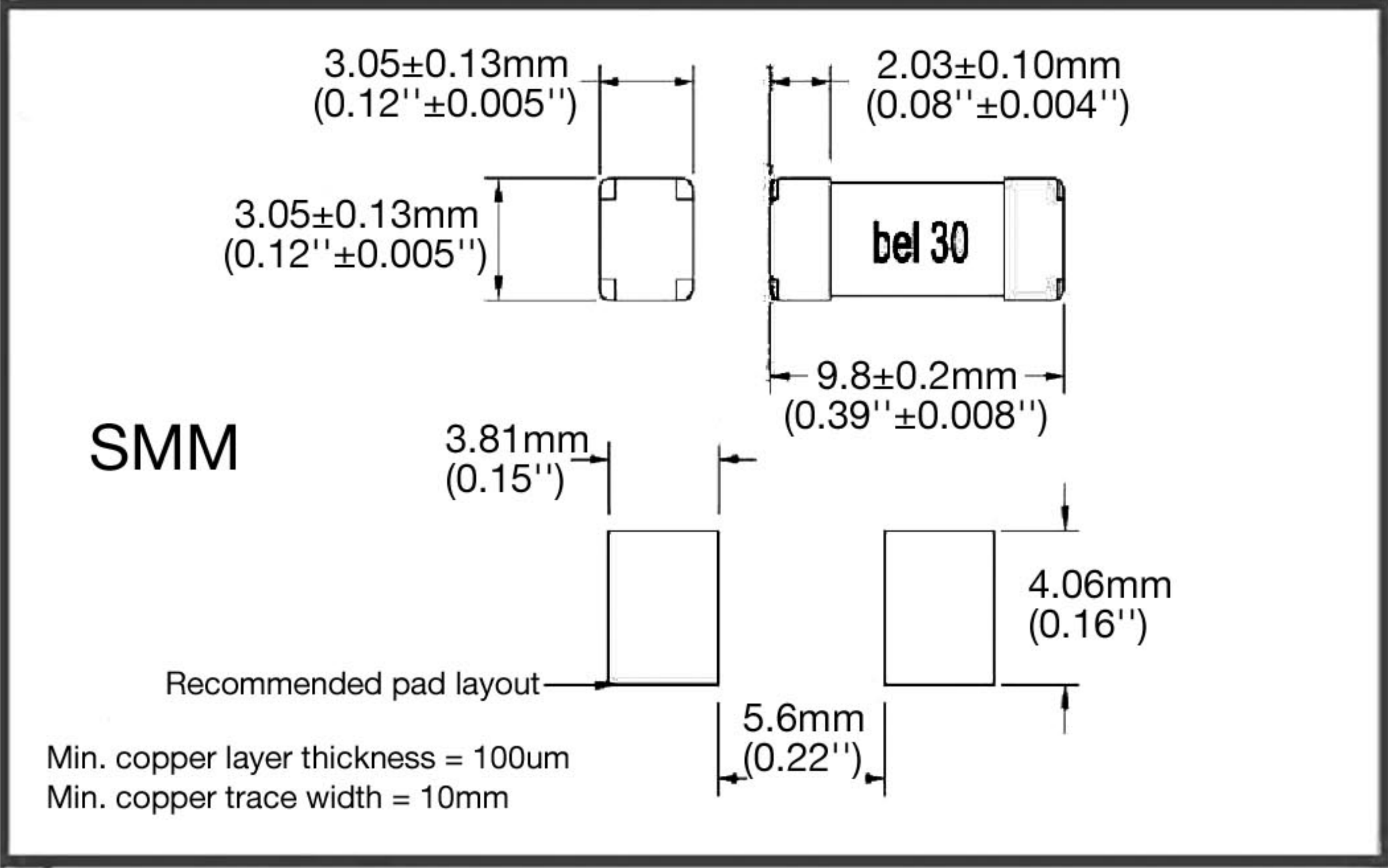
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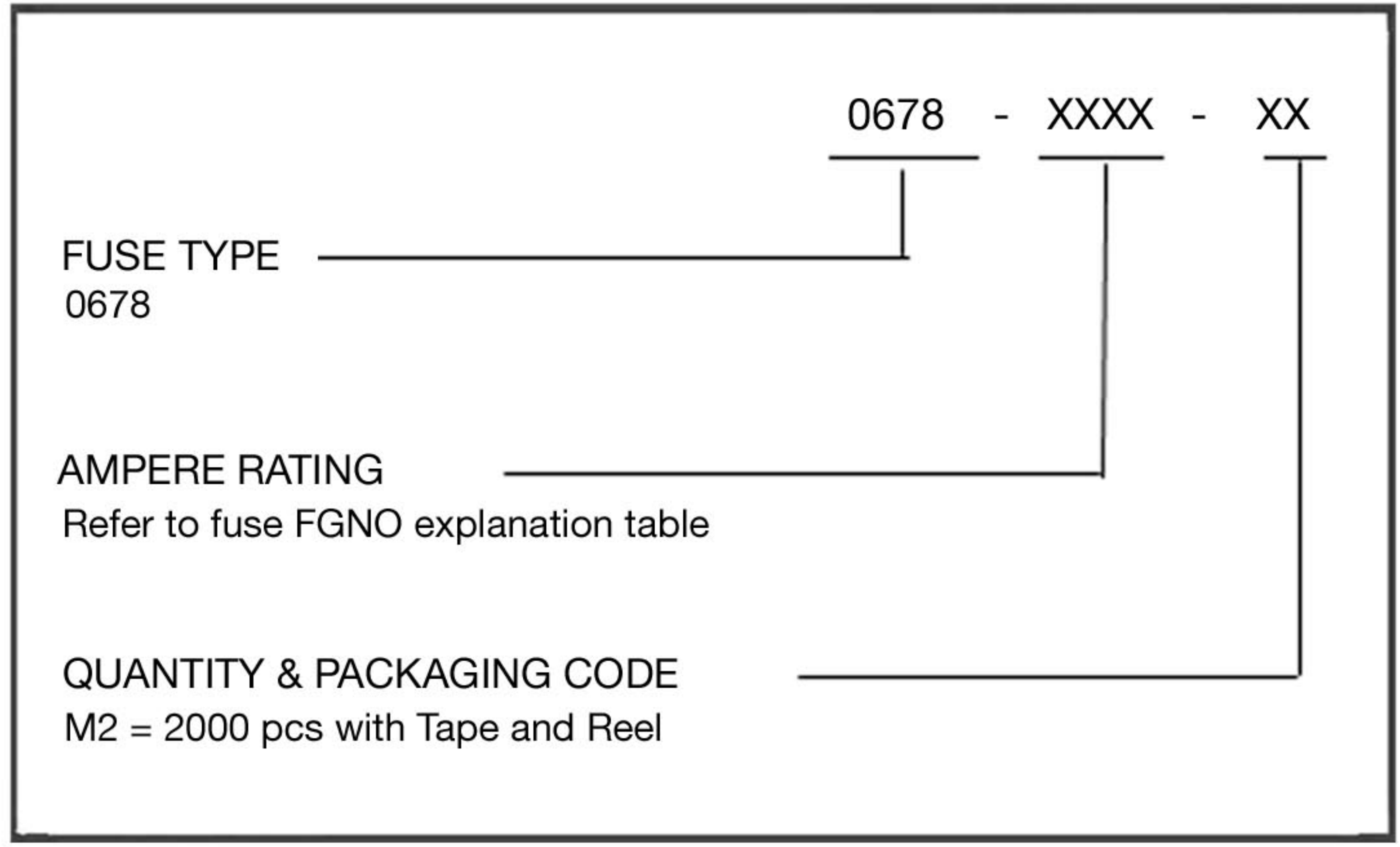
Fuse FGNO Explanation 06XX X [XXXX] X XX, [XXXX]=Ampere Rating

Fraction	Decimal	Milliamps	Bel FGNO[XXXX]	Fraction	Decimal	Amps	Bel FGNO[XXXX]
1/32	0.032	32	0032		1.0	1	1000
1/25	.040	40	0040	1-1/4	1.25	1.25	1250
1/20	.050	50	0050	1-1/2	1.50	1.5	1500
1/16	.063	63	0063		1.60	1.6	1600
8/100	.080	80	0080		2.0	2	2000
1/10	.100	100	0100	2-1/4	2.25	2.25	2250
1/8	.125	125	0125	2-1/2	2.5	2.5	2500
15/100	.150	150	0150		3.0	3	3000
	.160	160	0160		3.15	3.15	3150
2/10	.200	200	0200	3-1/2	3.5	3.5	3500
1/4	.250	250	0250		4.0	4	4000
3/10	.300	300	0300		5.0	5	5000
	.315	315	0315		6.0	6	6000
3/8	.375	375	0375		6.3	6.3	6300
4/10	.400	400	0400		7.0	7	7000
1/2	.500	500	0500	7-1/2	7.5	7.5	7500
6/10	.600	600	0600		8.0	8	8000
	.630	630	0630			10	9100
7/10	.700	700	0700			12	9120
3/4	.750	750	0750			15	9150
8/10	.800	800	0800			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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