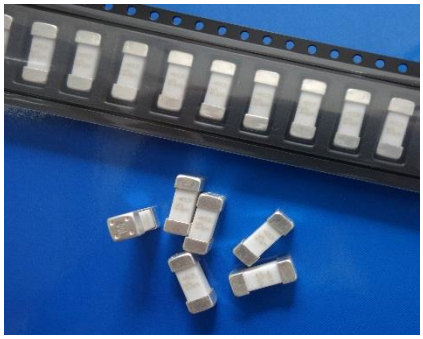
Type 0683G

Square Ceramic Surface Mount Slow Blow Fuse

HF 0683G Series - 4818 Size RoHS Compliant



AEC-Q Compliant

Features

- Slow Blow, 4818 SMD
- Compatible with 260℃, IR Pb-free solder process
-1.6A-30A 350VAC, 1.6A-30A 125VDC, Voltage Rating
- Wide range of current rating from 1.6A to 30A
- Wide operating temperature range -55℃ to 125℃
- Tape & Reel for auto-insert SMD process
- RoHS compliant with exemption 7(a)
  Fully compliance with EU Directive 2011/65/EU and amending directive 2015/863
- Halogen Free
- Meets Bel automotive qualification*
  * - Largely based on internal AEC-Q test plan

Applications

- Lighting system
- Power supply- Notebook
- Power supply
- PC computer
- Office electronic equipment
- Industrial equipment
- POE, POE+
- LCD / LED monitor
- LCD / LED TV
- -Storage system
- -Telecom system
- -Wireless basestation
- -White goods
- -Game console
- -Battery charging circuit protection

HALOGEN FREE = HF

Physical Specifications

Materials	Body : Ceramic
	Terminations : Silver Plated Caps /Gold Plated Caps/Palladium Plated Caps
Marking	On Fuse :
	"Current Rating", "S", "G" – laser marked on ceramic tube "bel" stamped in end caps.
	On Label :
	"bel", "0683G", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and " ", " " "(China RoHS compliant).

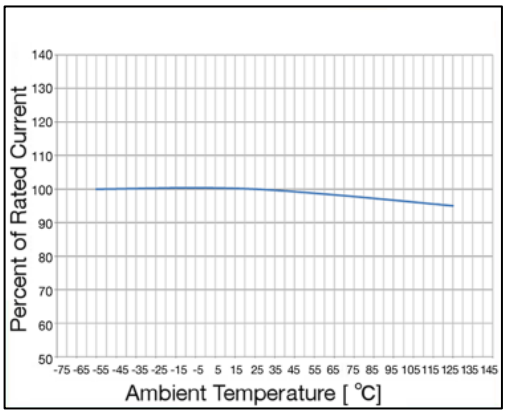
Electrical Characteristics (Per IEC 60127-7)

Testing Current	Blow Time	
	Minimum	Maximum
100%	4 hr.	N/A
210%	N/A	120 sec.
1000%	0.01 sec	0.1 sec

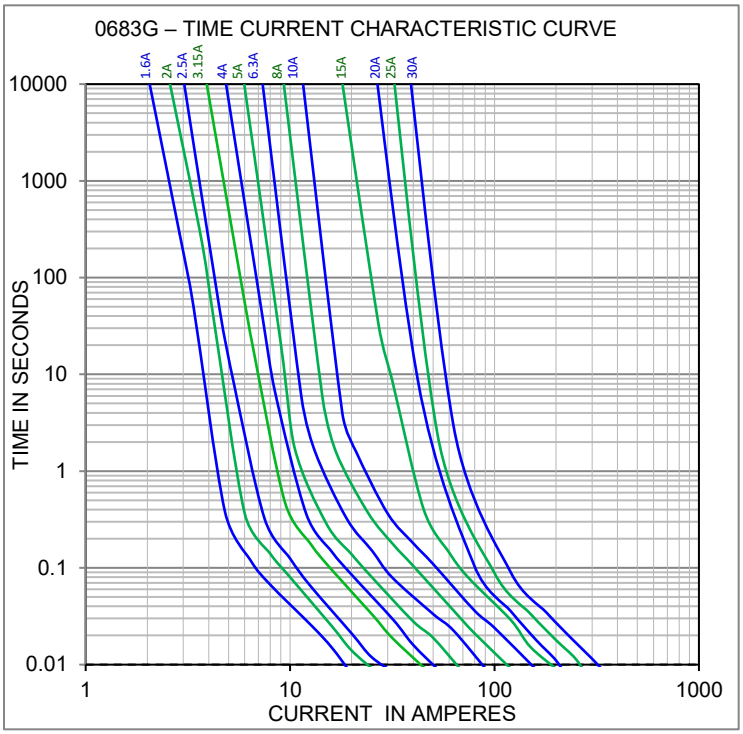
Safety Agency Approvals

Safety Agency	Safety Agency Certificate	Ampere Rating/ Voltage Rating	Ampere Range / Volt @ I.R. ability*
cULus	E506667	1.6A-30A/350VAC	1.6A-30A/125V @2000A DC 1.6A-5A/250V @1500A AC >5A-30A/250V @500A AC 1.6A-30A/350V @100A AC
TÜV	R 50529162 Tested according to EN 60127-1: 2006+A1+A2 EN 60127-4: 2005+A1+A2	1.6A/350VAC	1.6A/250V @1500A AC 1.6A/350V @100A AC 1.6A/125V @2000A DC
*I.R.= Interrupting Rating = Short Circuit Rating(Amps)			

Temperature Derating Curve



Average Time Current Curve



Electrical Specifications

Part Number	Ampere Rating	Typical Cold Resistance (ohms)	Volt-drop @100%In (Volt) max.	Voltage and Interrupting Ratings	Nominal Melting I²T @10 In (A² Sec)	Maximum Power Dissipation (W)	Agency Approvals	
							c UL us	TÜV
0683G1600-01	1.6A	0.065	0.18	See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings	3.6	0.29	Y	Y
0683G1600-11							Y	
0683G1600-21							Y	
0683G2000-X1	2A	0.049	0.17		5.6	0.34	Y	
0683G2500-X1	2.5A	0.038	0.17		7.5	0.43	Y	
0683G3150-X1	3.15A	0.028	0.16		16.9	0.50	Y	
0683G4000-X1	4A	0.023	0.16		25	0.64	Y	
0683G5000-X1	5A	0.017	0.16		47	0.80	Y	
0683G6300-X1	6.3A	0.013	0.16		67	1.0	Y	
0683G8000-X1	8A	0.010	0.16		122	1.3	Y	
0683G9100-X1	10A	0.0079	0.15		210	1.5	Y	
0683G9150-X1	15A	0.0035	0.10		270	1.5	Y	
0683G9200-X1	20A	0.0028	0.10		410	2.0	Y	
0683G9250-X1	25A	0.0023	0.10		700	2.5	Y	
0683G9300-X1	30A	0.0019	0.10		1000	3.0	Y	

Consult manufacturer for other ratings

NOTES 1:

All tests were conducted with the fuses soldered to a printed circuit boards with a nominal thickness of 1.6 mm. The copper test circuit trace was a printed circuit with an overall length of 100 mm, copper thickness/width as described below. The printed circuit boards were mounted by screws to a test fixture having brass blocks for connection of the test leads. All samples were soldered to the test boards by the manufacturer. Recommended solder paste thickness is 0.15mm.

NOTES 2:

Conventional (Ambient Pressure) Reflow Process is recommended for this device. The sale and use of product is subject to bel terms and condition of sale, unless otherwise agreed .User should independently evaluate the suitability of and test each product selected for their own application. Product are not designed for, and may not be used in, all applications.

Fuse rating	Test Board Trace Dimensions
1.6A-5A	1 oz. copper, 5.0mm wide.
>5A-10A	2 oz. copper, 7.5mm wide.
>10A-30A	3 oz. copper, 15mm wide.

Caution

- Minimum fusing point:

The 0683G Series fuse are NOT intended to be operated at currents between 100% and 210% 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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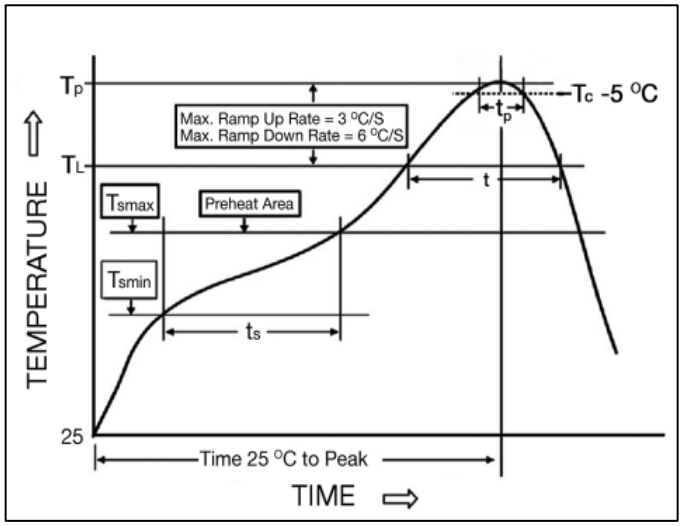
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Environmental Specifications

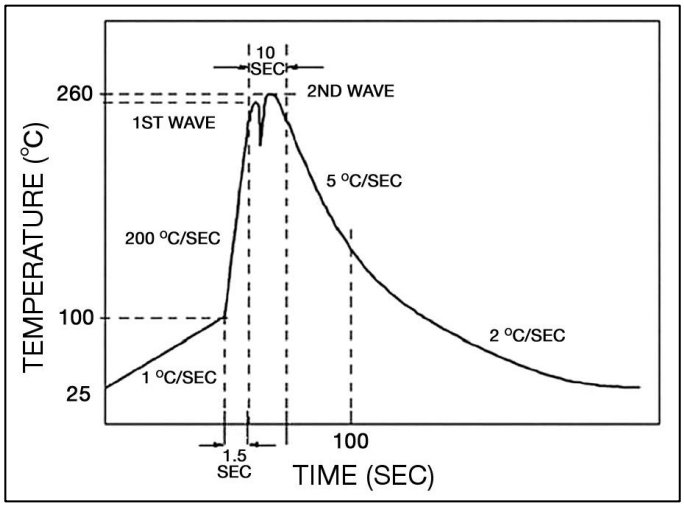
Shock Resistance	MIL-STD-202G, Method 213B, Test Condition 1 (100 G's peak for 6 milliseconds; Sawtooth waveform)
Vibration Resistance	MIL-STD-202G, Method 201A (10-55 Hz, 0.06 inch, total excursion).
Salt Spray Resistance	MIL-STD-202G, Method 101E, Test Condition B (48 hrs.).
Insulation Resistance	MIL-STD-202G, Method 302, Test Condition B (After Opening) 10,000 ohms minimum.
Solderability	J-STD-002 Test B
Resistance to solder Heat	MIL-STD-202G, Method 210, Test Condition B
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)

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.



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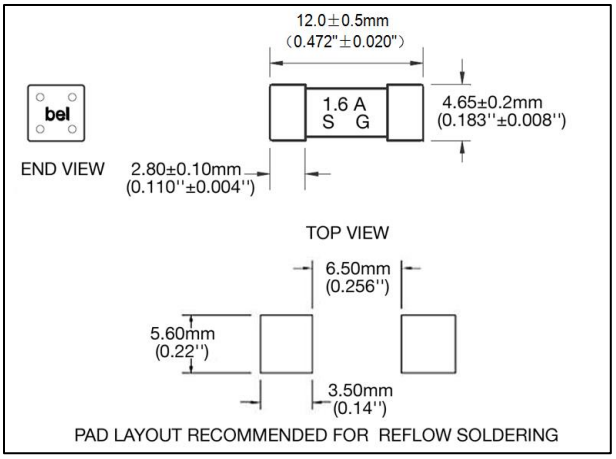
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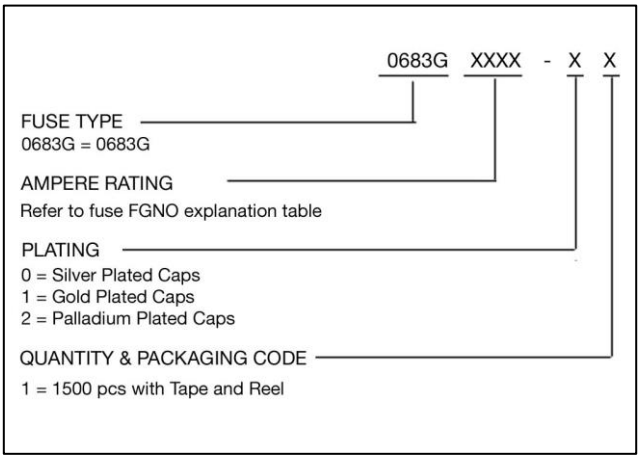
Fuse FGNO Explanation
0683G [XXXX] -X1
0683G=0683G Series; [XXXX]=Ampere Rating; XX=See Ordering Information as below

Fraction	Decimal	Amps	Bel FGNO[XXXX]
	1.60	1.6	1600
	2.0	2	2000
2-1/2	2.5	2.5	2500
	3.15	3.15	3150
	4.0	4	4000
	5.0	5	5000
	6.3	6.3	6300
	8.0	8	8000
	10	10	9100
	15	15	9150
	20	20	9200
	25	25	9250
	30	30	9300

Mechanical Dimensions



Ordering Information



Packaging

Packaging Tape & Reel	Packaging Specification	Quantity	Quantity & Packaging Code
24mm wide tape with 13 inches Diameter reel	EIA Standard 481-E	1500	1

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