

# Type 0680L

## Square Ceramic Surface Mount Slow Blow Fuse

HF 0680L Series – 2410 Size

RoHS Compliant

### Features

- Slow Blow, 2410 SMD
- Compatible with 260°C, IR Pb-free solder process
- Wide range of current rating from 375mA to 12A
- Wide operating temperature range, -55°C to 125°C
- Tape & Reel for auto-insert SMD process
- AEC-Q Compliant
- RoHS compliant with exemption 7(a)
- Halogen Free, (MSL = 1)
- Meets Bel automotive qualification\*
- \* - Largely based on internal AEC-Q test plan



**AEC-Q Compliant**

### Applications

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

HALOGEN FREE = HF

### Electrical Characteristics

(UL/CSA/STD.248-14)



Testing Current	Blow Time	
	Minimum	Maximum
100%	4 Hrs.	N/A
200%	N/A	120 Sec
300%	0.15 Sec	3 Sec
800%	0.01 Sec	0.1 Sec

### Safety Agency Approvals

Safety Agency	Safety Agency Certificate	Voltage Rating (V)	Ampere Range / Volt @ I.R. ability*
UL US	E506667	375mA-7A/125V AC 125V DC >7A-12A/50V AC 75V DC	375mA-7A/125V AC @50A 125V DC @100A 75V DC @500A >7A-12A/50V AC @100A 75V DC @500A

\*I.R.= Interrupting Rating = Short Circuit Rating(Amps)

### Physical Specifications


Materials	Body : Ceramic
	Terminations : Silver Plated Caps /Gold Plated Caps/Palladium Plated Caps
Marking	On Fuse :
	"Current Rating", "T", "L"—laser marked on ceramic tube, "bel" stamped in end caps.
	On Label :
"bel", "0680L", "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, Test Condition C. Top Side (260°C, 20 sec) MIL-STD-202G, Method 210F, Test Condition D. Bottom Side (260°C, 10 sec)
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 (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

## Electrical Specifications

Part Number	Ampere Rating	Typical Cold Resistance (ohms)	Volt-drop @100% In (Volt) max.	Voltage and Interrupting Ratings	Melting I <sup>2</sup> T @10 In (A <sup>2</sup> Sec)	Melting I <sup>2</sup> T <10ms (A <sup>2</sup> Sec)	Maximum Power Dissipation (W)	Agency Approvals
								
0680L0375-XX	375mA	0.93	1.20	See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings	0.14	0.10	0.45	Y
0680L0500-XX	500mA	0.58	0.90		0.27	0.35	0.45	Y
0680L0630-XX	630mA	0.41	0.80		0.43	0.42	0.50	Y
0680L0750-XX	750mA	0.33	0.75		0.62	0.61	0.56	Y
0680L1000-XX	1A	0.175	0.60		1.5	1.3	0.60	Y
0680L1500-XX	1.5A	0.095	0.40		3.3	3.2	0.60	Y
0680L2000-XX	2A	0.068	0.35		6	5	0.70	Y
0680L2500-XX	2.5A	0.048	0.34		9	7	0.85	Y
0680L3000-XX	3A	0.037	0.27		13	12	0.81	Y
0680L3500-XX	3.5A	0.030	0.26		18	17	0.91	Y
0680L4000-XX	4A	0.026	0.25		24	22	1.00	Y
0680L5000-XX	5A	0.019	0.23		37	36	1.15	Y
0680L6300-XX	6.3A	0.015	0.22		43	50	1.39	Y
0680L7000-XX	7A	0.012	0.21		68	77	1.47	Y
0680L8000-XX	8A	0.0099	0.20		108	105	1.60	Y
0680L9100-XX	10A	0.0084	0.19		170	150	1.90	Y
0680L9120-XX	12A	0.0063	0.18		244	180	2.16	Y

Consult manufacturer for other ratings  
XX - Packaging code (see "ordering information")

**NOTES:**

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.

Fuse rating	Test Board Trace Dimensions
375mA-5A	1 oz. copper, 5.0mm wide.
6A-12A	3 oz. copper, 10mm wide.

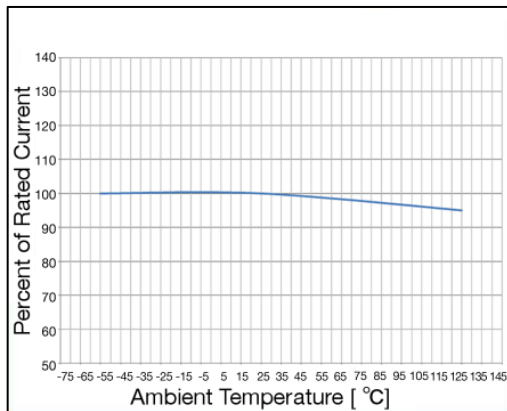


Specifications subject to change without notice

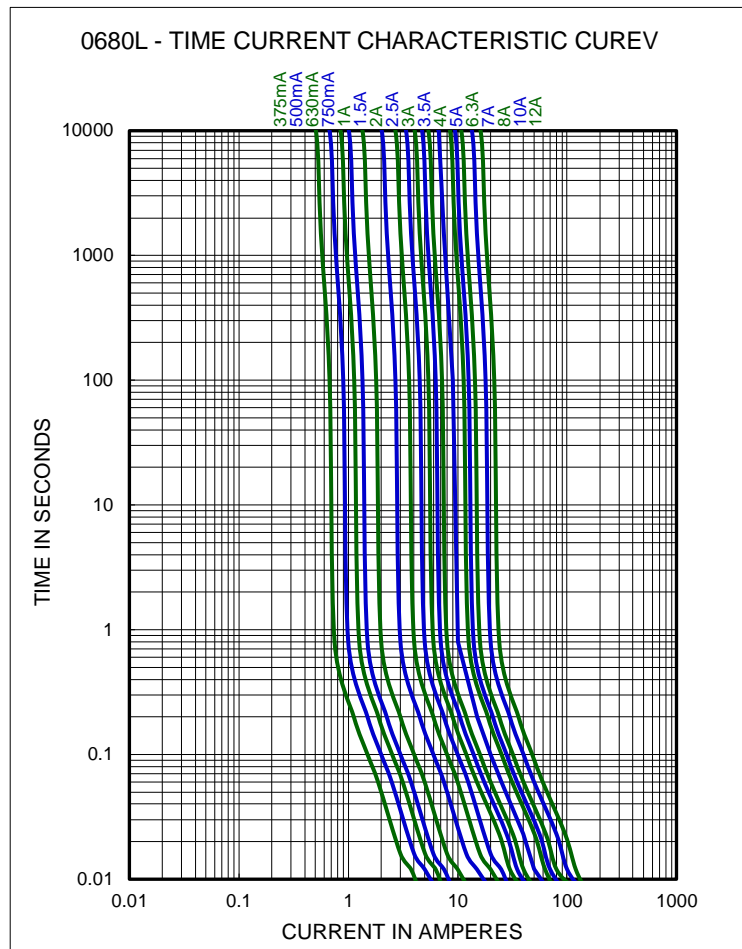
**Bel Fuse Inc.**  
206 Van Vorst Street  
Jersey City, NJ 07302 USA

+1 201.432.0463  
Bel.US.CS@belf.com  
[belfuse.com/circuit-protection](http://belfuse.com/circuit-protection)

## Temperature Derating Curve



## Average Time Current Curve



## Soldering Parameters

IR Reflow Profile (IPC/JEDEC J-STD-020D)	
<b>Preheat &amp; Soak</b>	
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 ( $T_p$ )	260°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.

