

# Type 0679L

## Square Ceramic Surface Mount Quick Acting Fuse

HF 0679L Series – 2410 Size

RoHS Compliant

### Features

- Quick Acting, 2410 SMD
- Compatible with 260°C, IR Pb-free solder process
- Wide range of current rating from 250mA to 20A
- 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)
- Full compliance with EU Directive 2011/65/EU and amending directive 2015/863
- Halogen Free, (MSL = 1)
- Meets Bel automotive qualification\*
- \* - Largely based on internal AEC-Q test plan

### Applications

- Notebook
- LCD monitor
- PC computer
- Office electronic equipment
- Industrial equipment
- Medical equipment
- POE, POE+
- LCD / LED monitor
- Power supply
- LCD / LED TV



**AEC-Q Compliant**

HALOGEN FREE = HF

### Electrical Characteristics

(UL/CSA/STD.248-14)

| Testing Current | Blow Time |         |
|-----------------|-----------|---------|
|                 | Minimum   | Maximum |
| 100%            | 4 Hrs.    | N/A     |
| 200%            | N/A       | 5 Sec   |

### Safety Agency Approvals

| Safety Agency                                           | Safety Agency Certificate | Ampere Rating /Voltage Rating | Ampere Range / Volt @ I.R. ability*                                       |
|---------------------------------------------------------|---------------------------|-------------------------------|---------------------------------------------------------------------------|
|                                                         | E20624                    | 250mA–20A/125V AC<br>125V DC  | 250mA –20A / 125V@ 50A AC<br>125V@300A DC<br>250mA –10A / 86V@ 10,000A DC |
| *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", "Q", "L"—laser marked on ceramic tube, "bel" stamped in end caps.                                                          |
|           | On Label :                                                                                                                                   |
|           | "bel", "0679L", "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)                                                  | High temperature storage     | MIL-STD-202 Method 108                                                    |
| Vibration Resistance       | MIL-STD-202G, Method 201A (10-55 Hz, 0.06 inch, total excursion).                                                                                 | Temperature cycling          | JESD22 Method JA-104, Test Condition B                                    |
| Salt Spray Resistance      | MIL-STD-202G, Method 101E, Test Condition B (48 hrs.).                                                                                            | Biased humidity              | MIL-STD-202 Method 103, 85C/85% RH with 10% operating power for 1000 hrs. |
| Insulation Resistance      | MIL-STD-202G, Method 302, Test Condition A (After Opening) 10,000 ohms minimum.                                                                   | Operational life             | MIL-STD-202 Method 108, Test Condition D                                  |
| Solderability              | MIL-STD-202G, Method 208H                                                                                                                         | Resistance to solvents       | MIL-STD-202 Method 215                                                    |
| Resistance to solder Heat  | MIL-STD-202G, Method 210F, Test Condition C, Top Side (260°C, 20 sec)<br>MIL-STD-202G, Method 210F, Test Condition D, Bottom Side (260°C, 10 sec) | Mechanical shock             | MIL-STD-202 Method 213, Test Condition C                                  |
| Thermal Shock              | MIL-STD-202G, Method 107G, Test Condition B (-65°C to +125°C).                                                                                    | Vibration                    | MIL-STD-202 Method 204                                                    |
| Operating Temperature      | -55°C to +125°C                                                                                                                                   | Resistance to soldering heat | MIL-STD-202 Method 210, Test condition B                                  |
| Moisture Sensitivity Level | 1 (According to IPC J-Std-020)                                                                                                                    | 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 (A) | Typical Cold Resistance (ohms) | Volt-drop @100% In (Volt) max. | Voltage and Interrupting Ratings                                                        | Melting I <sup>2</sup> t <10m Sec (A <sup>2</sup> Sec) | Melting I <sup>2</sup> t @10 In (A <sup>2</sup> Sec) | Maximum Power Dissipation (W) | Agency Approvals |
|--------------|-------------------|--------------------------------|--------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|-------------------------------|------------------|
| 0679L0250-XX | 250mA             | 0.55                           | 0.530                          | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.01                                                   | 0.02                                                 | 0.13                          | Y                |
| 0679L0375-XX | 375mA             | 0.32                           | 0.480                          |                                                                                         | 0.04                                                   | 0.04                                                 | 0.18                          | Y                |
| 0679L0500-XX | 500mA             | 0.22                           | 0.470                          |                                                                                         | 0.08                                                   | 0.08                                                 | 0.24                          | Y                |
| 0679L0630-XX | 630mA             | 0.17                           | 0.410                          |                                                                                         | 0.15                                                   | 0.15                                                 | 0.26                          | Y                |
| 0679L0750-XX | 750mA             | 0.14                           | 0.380                          |                                                                                         | 0.24                                                   | 0.26                                                 | 0.29                          | Y                |
| 0679L1000-XX | 1A                | 0.09                           | 0.280                          |                                                                                         | 0.51                                                   | 0.54                                                 | 0.28                          | Y                |
| 0679L1250-XX | 1.25A             | 0.068                          | 0.250                          |                                                                                         | 0.21                                                   | 0.22                                                 | 0.31                          | Y                |
| 0679L1500-XX | 1.5A              | 0.053                          | 0.250                          |                                                                                         | 0.32                                                   | 0.29                                                 | 0.38                          | Y                |
| 0679L2000-XX | 2A                | 0.035                          | 0.240                          |                                                                                         | 0.62                                                   | 0.68                                                 | 0.48                          | Y                |
| 0679L2500-XX | 2.5A              | 0.028                          | 0.240                          |                                                                                         | 0.96                                                   | 1.13                                                 | 0.60                          | Y                |
| 0679L3000-XX | 3A                | 0.022                          | 0.220                          |                                                                                         | 1.6                                                    | 1.8                                                  | 0.66                          | Y                |
| 0679L3500-XX | 3.5A              | 0.019                          | 0.220                          |                                                                                         | 2.0                                                    | 2.2                                                  | 0.77                          | Y                |
| 0679L4000-XX | 4A                | 0.018                          | 0.220                          |                                                                                         | 3.1                                                    | 3.5                                                  | 0.88                          | Y                |
| 0679L5000-XX | 5A                | 0.014                          | 0.200                          |                                                                                         | 5.3                                                    | 5.5                                                  | 1.00                          | Y                |
| 0679L6300-XX | 6.3A              | 0.011                          | 0.190                          |                                                                                         | 8.7                                                    | 8.3                                                  | 1.20                          | Y                |
| 0679L7000-XX | 7A                | 0.010                          | 0.175                          |                                                                                         | 11.1                                                   | 10.8                                                 | 1.23                          | Y                |
| 0679L8000-XX | 8A                | 0.0085                         | 0.170                          |                                                                                         | 14.8                                                   | 14.1                                                 | 1.36                          | Y                |
| 0679L9100-XX | 10A               | 0.0064                         | 0.150                          |                                                                                         | 25.7                                                   | 25.7                                                 | 1.50                          | Y                |
| 0679L9120-XX | 12A               | 0.0054                         | 0.140                          |                                                                                         | 41.0                                                   | 38.9                                                 | 1.68                          | Y                |
| 0679L9150-XX | 15A               | 0.0038                         | 0.130                          |                                                                                         | 76.7                                                   | 103.5                                                | 1.95                          | Y                |
| 0679L9200-XX | 20A               | 0.0032                         | 0.130                          |                                                                                         | 130.5                                                  | 128.0                                                | 2.60                          | 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 |
|-------------|-----------------------------|
| 250mA-5A    | 1 oz. copper, 5.0mm wide.   |
| 6A-20A      | 3 oz. copper, 10mm wide.    |



Specifications subject to change without notice

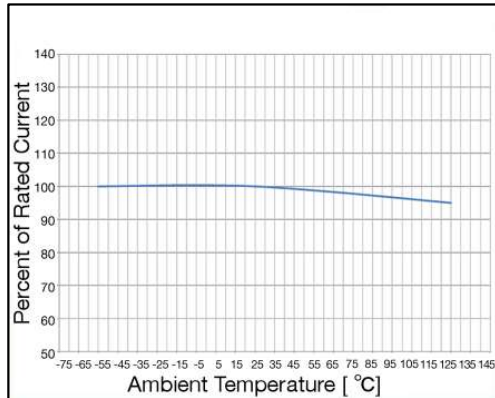
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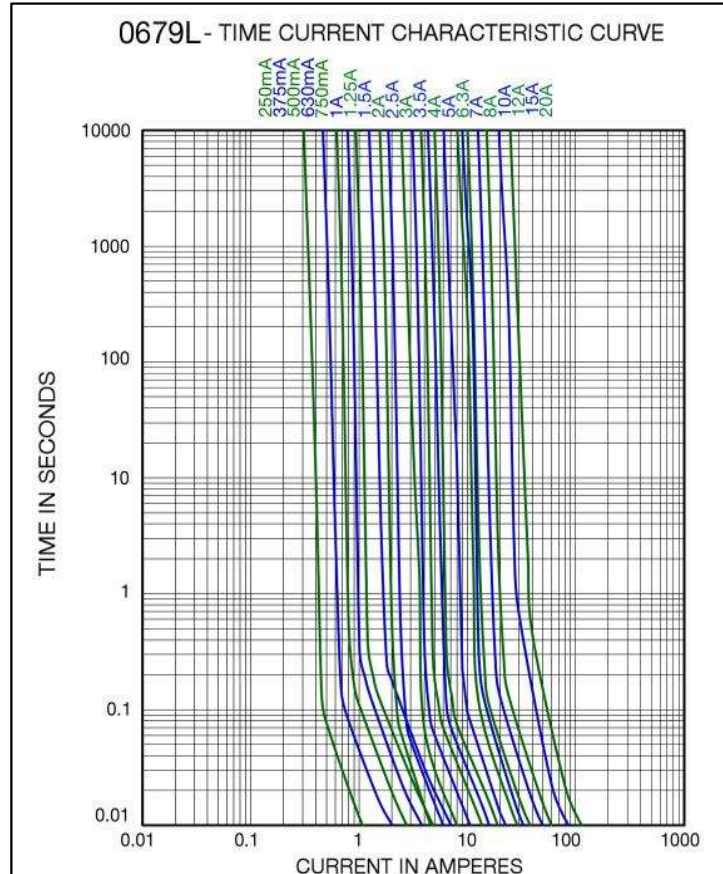
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## Temperature Derating Curve

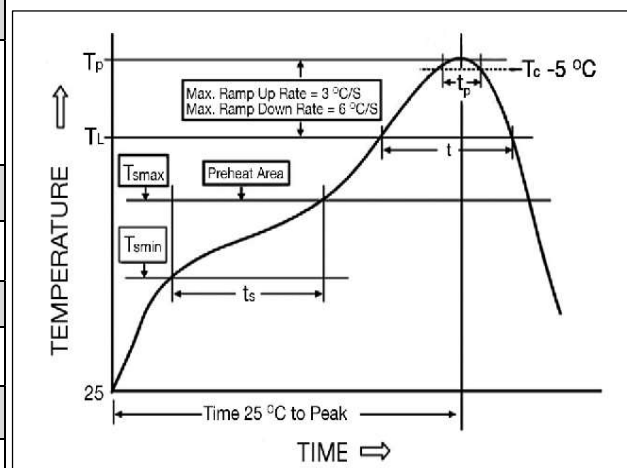


## Average Time Current Curve



## 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.  |



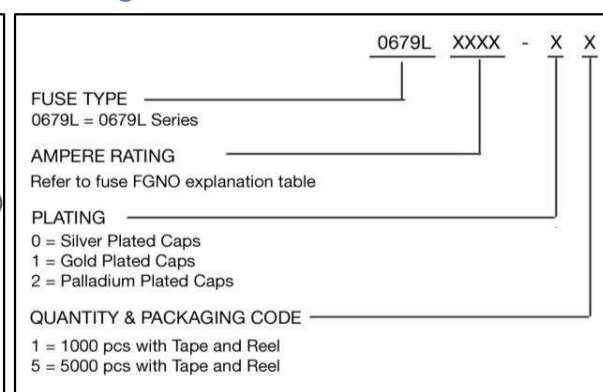
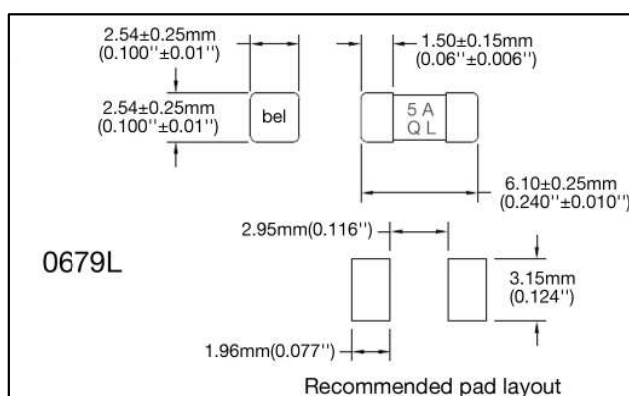
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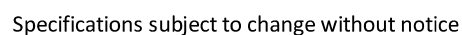
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| Fraction | Decimal | Amps | Bel FGN0[XXXX] |
|----------|---------|------|----------------|
|          | 1.0     | 1    | 1000           |
| 1-1/4    | 1.25    | 1.25 | 1250           |
| 1-1/2    | 1.50    | 1.5  | 1500           |
|          | 2.0     | 2    | 2000           |
| 2-1/2    | 2.5     | 2.5  | 2500           |
|          | 3.0     | 3    | 3000           |
| 3-1/2    | 3.5     | 3.5  | 3500           |
|          | 4.0     | 4    | 4000           |
|          | 5.0     | 5    | 5000           |
|          | 6.3     | 6.3  | 6300           |
|          | 7.0     | 7    | 7000           |
|          | 8.0     | 8    | 8000           |
|          |         | 10   | 9100           |
|          |         | 12   | 9120           |
|          |         | 15   | 9150           |
|          |         | 20   | 9200           |

## Ordering Information



| Packaging Tape & Reel                        | Packaging Specification | Quantity | Quantity & Packaging Code |
|----------------------------------------------|-------------------------|----------|---------------------------|
| 12 mm wide tape with 13 inches Diameter reel | EIA Standard 481-E      | 5000     | 5                         |
| 12 mm wide tape with 7 inches Diameter reel  | EIA Standard 481-E      | 1000     | 1                         |



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