

# ANTREX Electronics

## Electronic Components Sourcing Information

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### Product Reference Information

|                      |                                             |
|----------------------|---------------------------------------------|
| <b>Part Number:</b>  | 0678H1600-02                                |
| <b>Manufacturer:</b> | Bel Fuse Inc.                               |
| <b>Package:</b>      | Tape & Reel (TR), Cut Tape (CT), Digi-Reel® |
| <b>Availability:</b> | Please confirm with sales                   |

#### Product Page:

<https://antrexco.com/product/details/bel-fuse-inc/0678h1600-02.html>

#### Request a Quote:

[Submit RFQ for this part](#)



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### Quality & Trust

New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

#### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

# Type 0678H

## Enhanced-breaking Capability Brick Fuse

**HF** 0678H Series-3912 Size

RoHS Compliant

### Features

- Enhanced – Breaking capacity
- Surface mount high current fuse
- Current rating from 500mA to 40A
- Wide operating temperature range from -55°C to 125°C
- Tape & Reel for auto-insert SMD process
- Compatible with 260°C, IR Pb-free solder process
- RoHS compliant with exemption 7(a)
- Full compliance with EU Directive 2011/65/EU and amending directive 2015/863
- Halogen Free, (MSL=1)
- AEC-Q Compliant
- Meets Bel automotive qualification\*
- \* - Largely based on internal AEC-Q test plan

### Applications

- Voltage regulator module
- PC server
- Office electronic equipment
- Industrial equipment
- Medical equipment
- POE, POE+
- Power supply
- DC-DC converter
- Mass storage systems

HALOGEN FREE = **HF**



UK  
CA  
TUV  
AEC-Q Compliant

### Physical Specifications

|           |                                                                                                                                                                                                                                                                                                                   |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials | Body : Ceramic                                                                                                                                                                                                                                                                                                    |
|           | Terminations : Silver Plated Caps /Palladium Plated Caps                                                                                                                                                                                                                                                          |
| Marking   | On Fuse :                                                                                                                                                                                                                                                                                                         |
|           | "Current Rating", "H"- laser marked on ceramic tube, "bel" stamped in end caps.                                                                                                                                                                                                                                   |
|           | On Label :                                                                                                                                                                                                                                                                                                        |
|           | "bel", "0678H", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and "  , "  " (China RoHS compliant). |

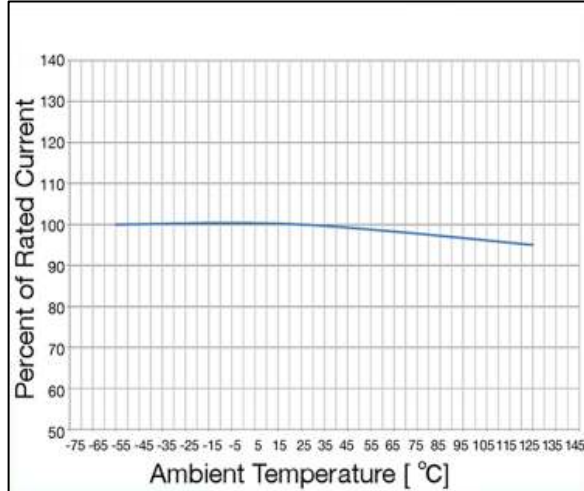
### Safety Agency Approvals

| Safety Agency                                                                       | Safety Agency Certificate                                                                                                                  | Ampere Rating/ Voltage Rating | Ampere Range / Volt @ I.R. ability*                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | E506667                                                                                                                                    | 500mA-40A/250V AC<br>125V DC  | 500mA-5A /125V@1000A AC<br>250V@300A AC<br>125V@2000A DC<br>>5A-20A /250V@100A AC<br>125V@500A AC<br>125V@1000A DC<br>100V@1500A DC<br>>20A-30A /250V@100A AC<br>125V@200A AC<br>125V@1000A DC<br>35A-40A /250V@100A AC<br>125V@500A AC<br>125V@1000A DC<br>40A / 100V@1500A DC |
|  | R 50544942<br>EN 60127-1:<br>2006+A1+A2<br>EN 60127-4:<br>2005+A1+A2<br><br>J 50545350<br>EN 60127-1:<br>2006+A1+A2<br>EN 60127-7:<br>2016 |                               |                                                                                                                                                                                                                                                                                 |
|  | E506667                                                                                                                                    |                               | 35A / 100V@1500A DC                                                                                                                                                                                                                                                             |
| *I.R.= Interrupting Rating = Short Circuit Rating(Amps)                             |                                                                                                                                            |                               |                                                                                                                                                                                                                                                                                 |

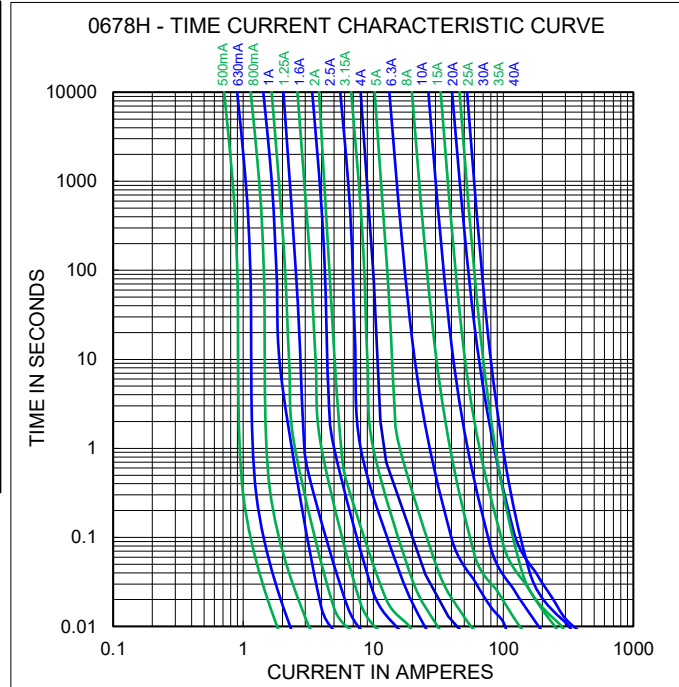
### Electrical Characteristics (UL/CSA STD.248-14)

| Testing Current | Blow Time |         |
|-----------------|-----------|---------|
|                 | Minimum   | Maximum |
| 100%            | 4 hrs.    | N/A     |
| 200%            | N/A       | 60 sec  |

## Temperature Derating Curve



## Average Time Current Curve



## Electrical Specifications

| Part Number  | Ampere Rating | Nominal Cold Resistance (ohms) | Nominal Volt-drop @100%In (Volt) | Voltage and Interrupting Ratings                                                        | Nominal Melting I²T @10 In (A² Sec) | Nominal Power Dissipation (W) | Agency Approvals |   |
|--------------|---------------|--------------------------------|----------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------|-------------------------------|------------------|---|
|              |               |                                |                                  |                                                                                         |                                     |                               |                  |   |
| 0678H0500-XX | 500mA         | 0.66                           | 1.00                             | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.03                                | 0.5                           | Y                | Y |
| 0678H0630-XX | 630mA         | 0.54                           | 1.30                             |                                                                                         | 0.06                                | 0.8                           | Y                | Y |
| 0678H0800-XX | 800mA         | 0.38                           | 1.10                             |                                                                                         | 0.08                                | 0.9                           | Y                | Y |
| 0678H1000-XX | 1A            | 0.21                           | 0.70                             |                                                                                         | 0.3                                 | 0.7                           | Y                | Y |
| 0678H1250-XX | 1.25A         | 0.10                           | 0.20                             |                                                                                         | 0.4                                 | 0.3                           | Y                | Y |
| 0678H1600-XX | 1.6A          | 0.08                           | 0.19                             |                                                                                         | 0.5                                 | 0.3                           | Y                | Y |
| 0678H2000-XX | 2A            | 0.059                          | 0.18                             |                                                                                         | 1.0                                 | 0.4                           | Y                | Y |
| 0678H2500-XX | 2.5A          | 0.043                          | 0.18                             |                                                                                         | 1.8                                 | 0.5                           | Y                | Y |
| 0678H3150-XX | 3.15A         | 0.035                          | 0.18                             |                                                                                         | 2.8                                 | 0.6                           | Y                | Y |
| 0678H4000-XX | 4A            | 0.021                          | 0.18                             |                                                                                         | 7.8                                 | 0.7                           | Y                | Y |
| 0678H5000-XX | 5A            | 0.016                          | 0.18                             |                                                                                         | 10                                  | 0.9                           | Y                | Y |
| 0678H6300-XX | 6.3A          | 0.013                          | 0.17                             |                                                                                         | 20                                  | 1.1                           | Y                | Y |
| 0678H8000-XX | 8A            | 0.010                          | 0.15                             |                                                                                         | 34                                  | 1.2                           | Y                | Y |
| 0678H9100-XX | 10A           | 0.0060                         | 0.13                             |                                                                                         | 90                                  | 1.3                           | Y                | Y |
| 0678H9150-XX | 15A           | 0.0045                         | 0.12                             |                                                                                         | 178                                 | 1.8                           | Y                | Y |
| 0678H9200-XX | 20A           | 0.0030                         | 0.09                             |                                                                                         | 345                                 | 1.8                           | Y                | Y |
| 0678H9250-XX | 25A           | 0.0025                         | 0.09                             |                                                                                         | 600                                 | 2.25                          | Y                | Y |
| 0678H9300-XX | 30A           | 0.0016                         | 0.09                             |                                                                                         | 990                                 | 2.7                           | Y                | Y |
| 0678H9350-XX | 35A           | 0.0016                         | 0.11                             |                                                                                         | 735                                 | 3.9                           | Y                | Y |
| 0678H9400-XX | 40A           | 0.0015                         | 0.11                             |                                                                                         | 1000                                | 4.4                           | Y                | 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.

### Caution

- Minimum fusing point:

The 0678H Series fuse 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.

| Fuse rating | Test Board Trace Dimensions |
|-------------|-----------------------------|
| 500mA-5A    | 1 oz. copper, 5.0mm wide.   |
| >5A-30A     | 3 oz. copper, 10mm wide.    |
| >30A-40A    | 3 oz. copper, 15mm wide.    |

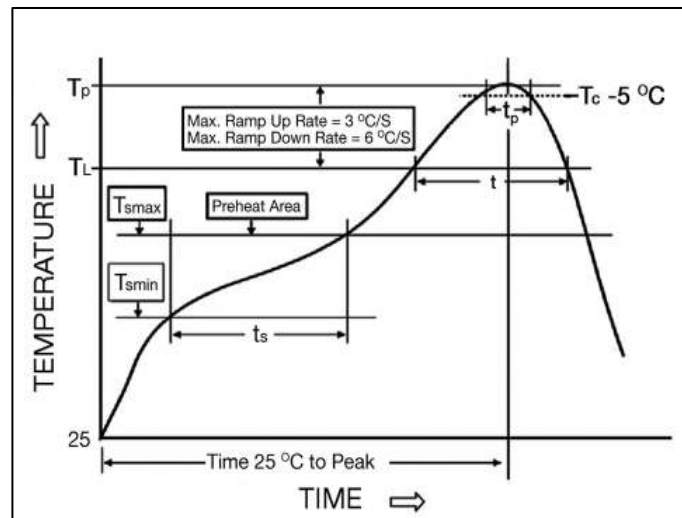
## Environmental Specifications

|                            |                                                                                                                                                   |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 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)<br>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)                                                                                                                    |

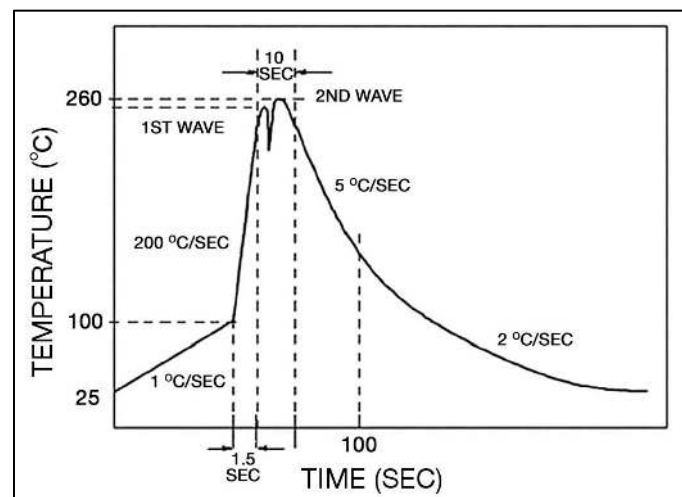
|                              |                                                                            |
|------------------------------|----------------------------------------------------------------------------|
| High temperature storage     | MIL-STD-202 Method 108                                                     |
| Temperature cycling          | JESD22 Method JA-104, Test Condition B                                     |
| Biased humidity              | MIL-STD-202 Method 103, 85°C/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                                                   |

## 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.    |



| Lead-free Wave Soldering Profile                   |                                              |
|----------------------------------------------------|----------------------------------------------|
| Wave Soldering Parameter                           |                                              |
| Average ramp-up rate                               | 200°C / second                               |
| Heating rate during preheat                        | typical 1 - 2°C / second<br>Max 4°C / second |
| Final preheat temperature                          | within 125°C of soldering temperature        |
| Peak temperature $T_p$                             | 260°C                                        |
| Time within +0°C / -5°C of actual peak temperature | 10 seconds                                   |
| Ramp-down rate                                     | 5°C / second max.                            |



Specifications subject to change without notice

# Type 0678H

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## Fuse FGNO Explanation

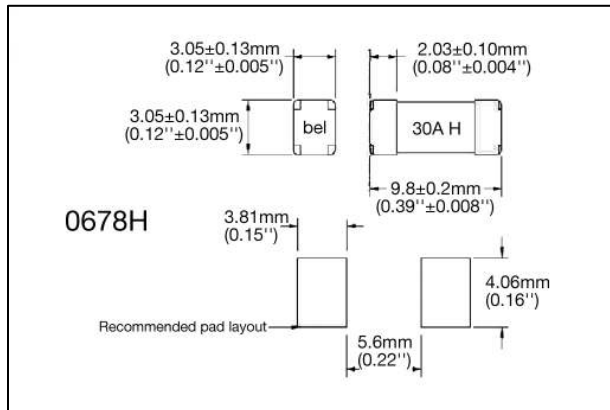
0678H [XXXX] -XX

0678H=0678H Series; [XXXX]=Ampere Rating; XX=See Ordering Information as below

| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|
| 1/2      | 0.500   | 500       | 0500           |
|          | .630    | 630       | 0630           |
| 8/10     | .800    | 800       | 0800           |

| Fraction | Decimal | Amps | Bel FGNO[XXXX] |
|----------|---------|------|----------------|
|          | 1.0     | 1    | 1000           |
| 1-1/4    | 1.25    | 1.25 | 1250           |
|          | 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   | 9100           |
|          |         | 15   | 9150           |
|          |         | 20   | 9200           |
|          |         | 25   | 9250           |
|          |         | 30   | 9300           |
|          |         | 35   | 9350           |
|          |         | 40   | 9400           |

## Mechanical Dimensions



## Ordering Information

|                                      |      |   |   |   |
|--------------------------------------|------|---|---|---|
| 0678H                                | XXXX | - | X | X |
| FUSE TYPE                            |      |   |   |   |
| 0678H = 0678H Series                 |      |   |   |   |
| AMPERE RATING                        |      |   |   |   |
| Refer to fuse FGNO explanation table |      |   |   |   |
| PLATING                              |      |   |   |   |
| 0 = Silver Plated Caps               |      |   |   |   |
| 2 = Palladium Plated Caps            |      |   |   |   |
| QUANTITY & PACKAGING CODE            |      |   |   |   |
| 2 = 2000 pcs with Tape and Reel      |      |   |   |   |

## Packaging

| Packaging Tape & Reel                       | Packaging Specification | Quantity | Quantity & Packaging Code |
|---------------------------------------------|-------------------------|----------|---------------------------|
| 16mm wide tape with 13 inches Diameter reel | EIA Standard 481-E      | 2000     | 2                         |



Specifications subject to change without notice

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