

# Type C2Q

## Surface Mount Very Fast-Acting Chip Fuse

HF  C2Q Series – 0603 Size

RoHS Compliant

### Features

- Fast-acting
- Small size, 0603 SMD
- Current rating from 250mA to 5A
- Wide operating temperature range from -55°C to 125°C
- Tape and Reel for automatic SMD placement
- Compatible with 260°C IR Pb-free and wave soldering process
- Full compliance with EU Directive 2011/65/EU and amending directive 2015/863 (MSL = 1)
- Halogen Free and Lead Free



### Applications

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

LEAD FREE =   
HALOGEN FREE = 

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

| Testing Current | Blow Time |         |
|-----------------|-----------|---------|
|                 | Minimum   | Maximum |
| 100%            | 4 Hrs.    | N/A     |
| 200%            | N/A       | 5 Sec   |
| 300%            | N/A       | 0.2 Sec |

### Safety Agency Approvals

| Safety Agency                                                                       | Safety Agency Certificate | Ampere Rating/<br>Voltage Rating | Ampere Range / Volt<br>@ I.R. ability* |
|-------------------------------------------------------------------------------------|---------------------------|----------------------------------|----------------------------------------|
|  | E20624                    | 250mA-4A/32V AC<br>63V DC        | 250mA-4A/32V AC @ 35A<br>63V DC @ 50A  |
|                                                                                     |                           | 5A / 32V AC & DC                 | 5A / 32V AC & DC @ 50A                 |
| *I.R.= Interrupting Rating = Short Circuit Rating(Amps)                             |                           |                                  |                                        |

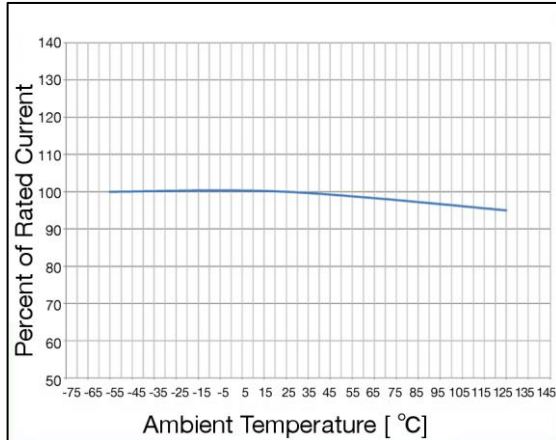
### Physical Specifications

|           |                                                                                                                                                                                                                        |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials | Body : Ceramic Substrate                                                                                                                                                                                               |
|           | Terminations : Ag / Ni / Sn (100% Lead-free)                                                                                                                                                                           |
|           | Element Cover Coating : Lead-free Glass                                                                                                                                                                                |
| Marking   | On Fuse :                                                                                                                                                                                                              |
|           | None                                                                                                                                                                                                                   |
|           | On Label :                                                                                                                                                                                                             |
|           | "bel", "C2Q", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and  " "(China RoHS compliant). |

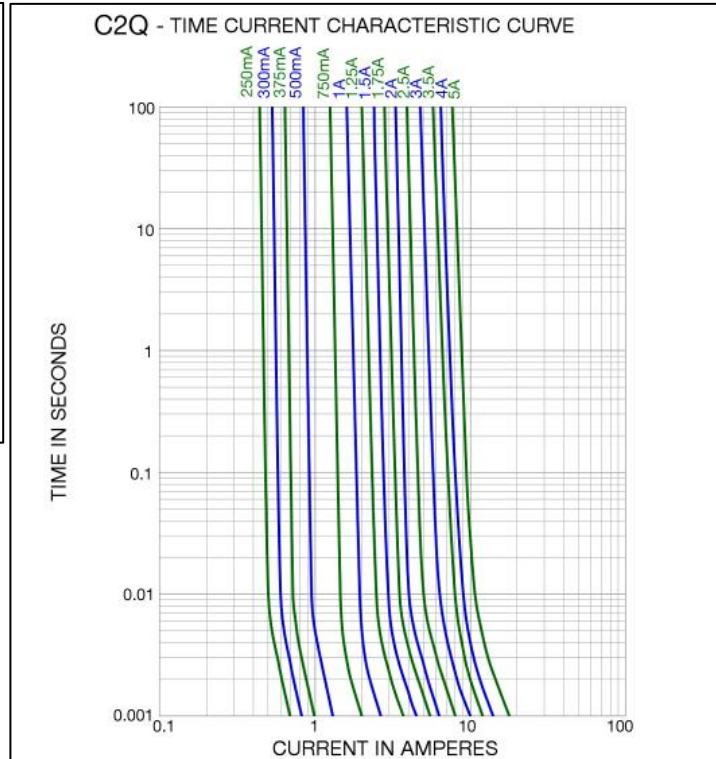
# Type C2Q

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Temperature Derating Curve



Average Time Current Curve



Electrical Specifications

| Catalog Number | Ampere Rating (A) | Nominal Cold Resistance (ohms) | Nominal Volt-drop @100% In (Volt) | Voltage and Interrupting Ratings                                                        | Nominal Melting I <sup>2</sup> T @10 In (A <sup>2</sup> Sec) | Nominal Power Dissipation @100% In (W) | Agency Approvals                                                                      |
|----------------|-------------------|--------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------|---------------------------------------------------------------------------------------|
|                |                   |                                |                                   |                                                                                         |                                                              |                                        |  |
| C2Q 250        | 250mA             | 0.77                           | 0.243                             | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.00001                                                      | 0.06                                   | Y                                                                                     |
| C2Q 300        | 300mA             | 0.54                           | 0.217                             |                                                                                         | 0.00003                                                      | 0.07                                   | Y                                                                                     |
| C2Q 375        | 375mA             | 0.42                           | 0.196                             |                                                                                         | 0.00004                                                      | 0.07                                   | Y                                                                                     |
| C2Q 500        | 500mA             | 0.28                           | 0.171                             |                                                                                         | 0.00015                                                      | 0.09                                   | Y                                                                                     |
| C2Q 750        | 750mA             | 0.17                           | 0.159                             |                                                                                         | 0.0005                                                       | 0.12                                   | Y                                                                                     |
| C2Q 1          | 1A                | 0.122                          | 0.154                             |                                                                                         | 0.0010                                                       | 0.15                                   | Y                                                                                     |
| C2Q 1.25       | 1.25A             | 0.092                          | 0.152                             |                                                                                         | 0.0018                                                       | 0.19                                   | Y                                                                                     |
| C2Q 1.5        | 1.5A              | 0.073                          | 0.146                             |                                                                                         | 0.0025                                                       | 0.22                                   | Y                                                                                     |
| C2Q 1.75       | 1.75A             | 0.063                          | 0.144                             |                                                                                         | 0.0044                                                       | 0.25                                   | Y                                                                                     |
| C2Q 2          | 2A                | 0.053                          | 0.133                             |                                                                                         | 0.0063                                                       | 0.27                                   | Y                                                                                     |
| C2Q 2.5        | 2.5A              | 0.042                          | 0.130                             |                                                                                         | 0.0074                                                       | 0.33                                   | Y                                                                                     |
| C2Q 3          | 3A                | 0.034                          | 0.130                             |                                                                                         | 0.018                                                        | 0.39                                   | Y                                                                                     |
| C2Q 3.5        | 3.5A              | 0.028                          | 0.131                             |                                                                                         | 0.021                                                        | 0.46                                   | Y                                                                                     |
| C2Q 4          | 4A                | 0.023                          | 0.131                             |                                                                                         | 0.042                                                        | 0.52                                   | Y                                                                                     |
| C2Q 5          | 5A                | 0.019                          | 0.131                             |                                                                                         | 0.055                                                        | 0.66                                   | Y                                                                                     |

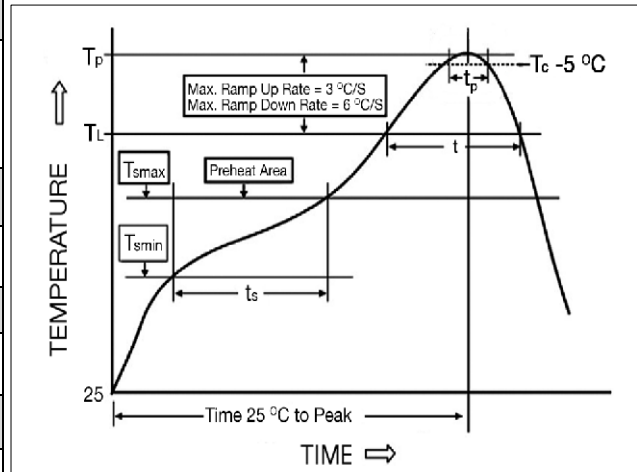
Consult manufacturer for other ratings

## Environmental Specifications

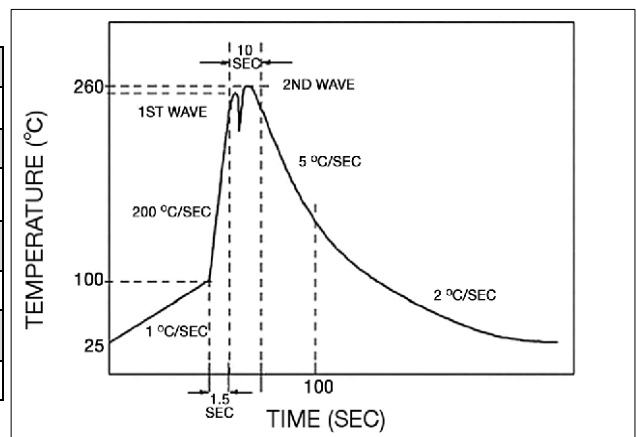
|                            |                                                                                                                                                   |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Shock Resistance           | MIL-STD-202G, Method 213B, Test Condition 1<br>(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<br>(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)                                                                                                                    |

## 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.                            |



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## Fuse FGNO Explanation

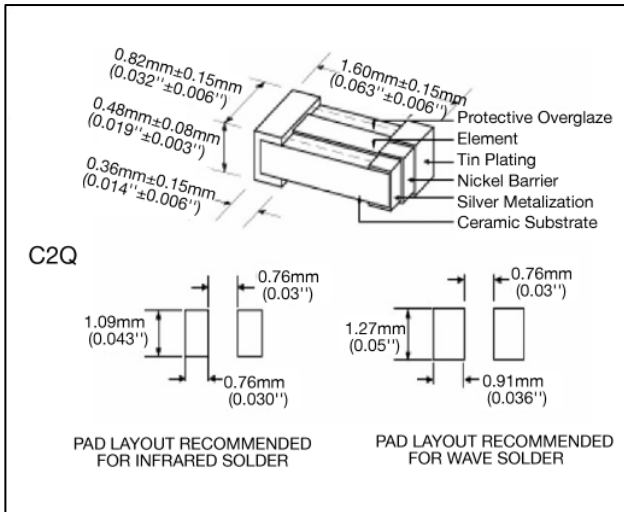
0686 - [XXXX] -XX

0686=C2Q; [XXXX]=Ampere Rating; XX=See Ordering Information as below

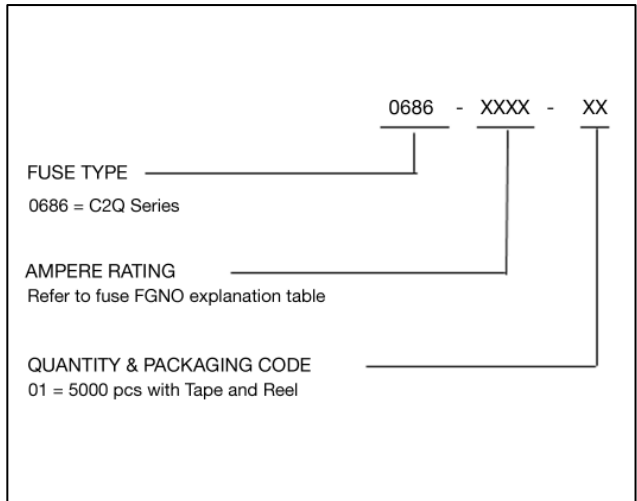
| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|
| 1/4      | 0.250   | 250       | 0250           |
| 3/10     | .300    | 300       | 0300           |
| 3/8      | .375    | 375       | 0375           |
| 1/2      | .500    | 500       | 0500           |
| 3/4      | .750    | 750       | 0750           |
|          |         |           |                |
|          |         |           |                |
|          |         |           |                |
|          |         |           |                |
|          |         |           |                |

| Fraction | Decimal | Amps | Bel FGNO[XXXX] |
|----------|---------|------|----------------|
|          | 1.0     | 1    | 1000           |
| 1-1/4    | 1.25    | 1.25 | 1250           |
| 1-1/2    | 1.50    | 1.5  | 1500           |
|          | 1.75    | 1.75 | 1750           |
|          | 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           |

## Mechanical Dimensions



## Ordering Information



## Packaging

| Packaging Tape & Reel                      | Packaging Specification | Quantity | Quantity & Packaging Code |
|--------------------------------------------|-------------------------|----------|---------------------------|
| 8 mm wide tape with 7 inches Diameter reel | EIA Standard 481-E      | 5000     | 0686-XXXX-01              |