

# Type C2Q

## Surface Mount Very Fast-Acting Chip Fuse

HF  C2Q Series - 0603 Size

RoHS 6 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 reflow and wave soldering
- RoHS 6 compliant (MSL = 1)
- Halogen Free
- Leadfree

### 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 | VOLTAGE RATING (V)            | AMPERE RANGE / VOLT @ 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",<br>" Appropriate Safety Logos" and "  ", "  "(China RoHS compliant). |

Specifications subject to change without notice



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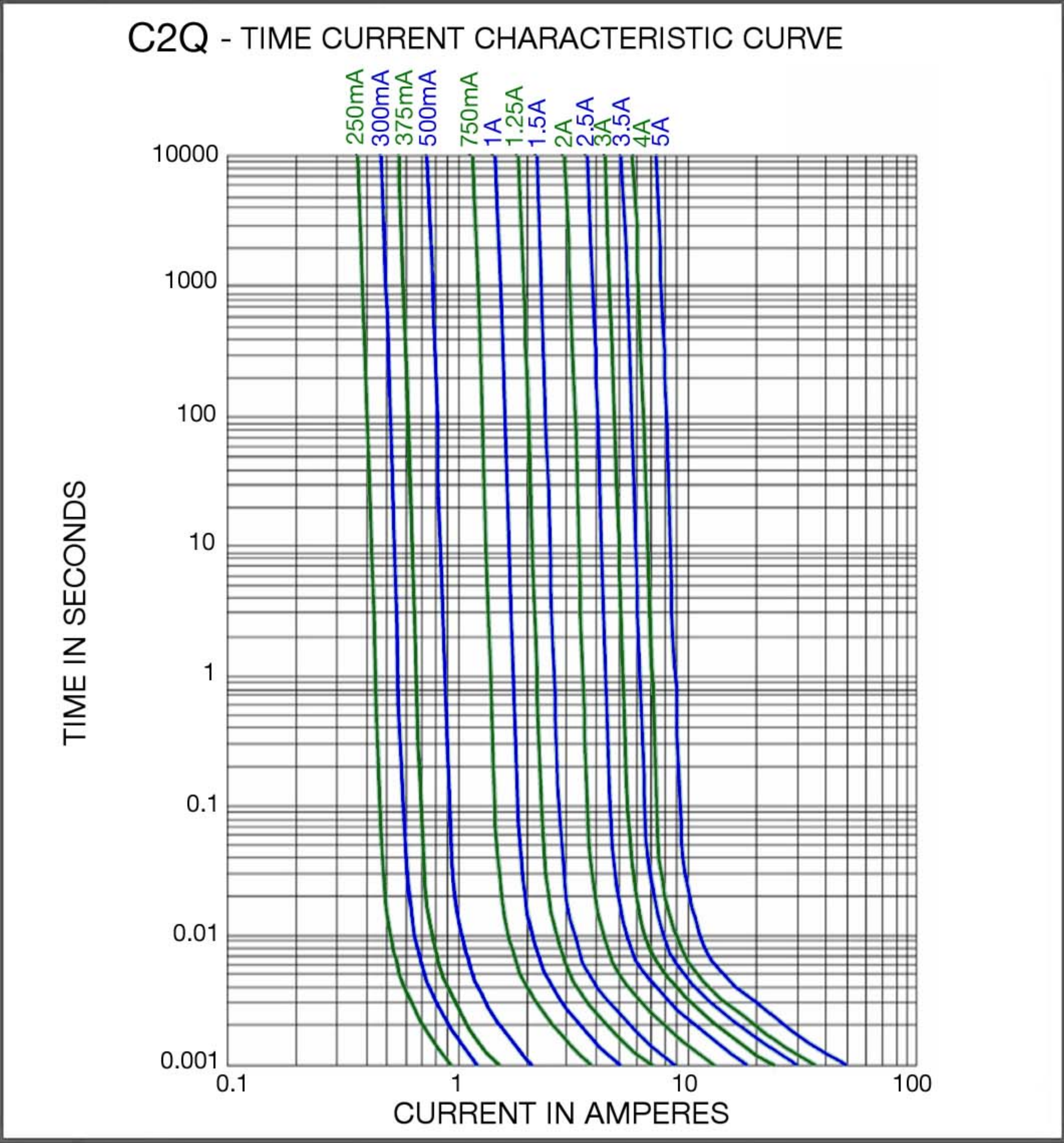
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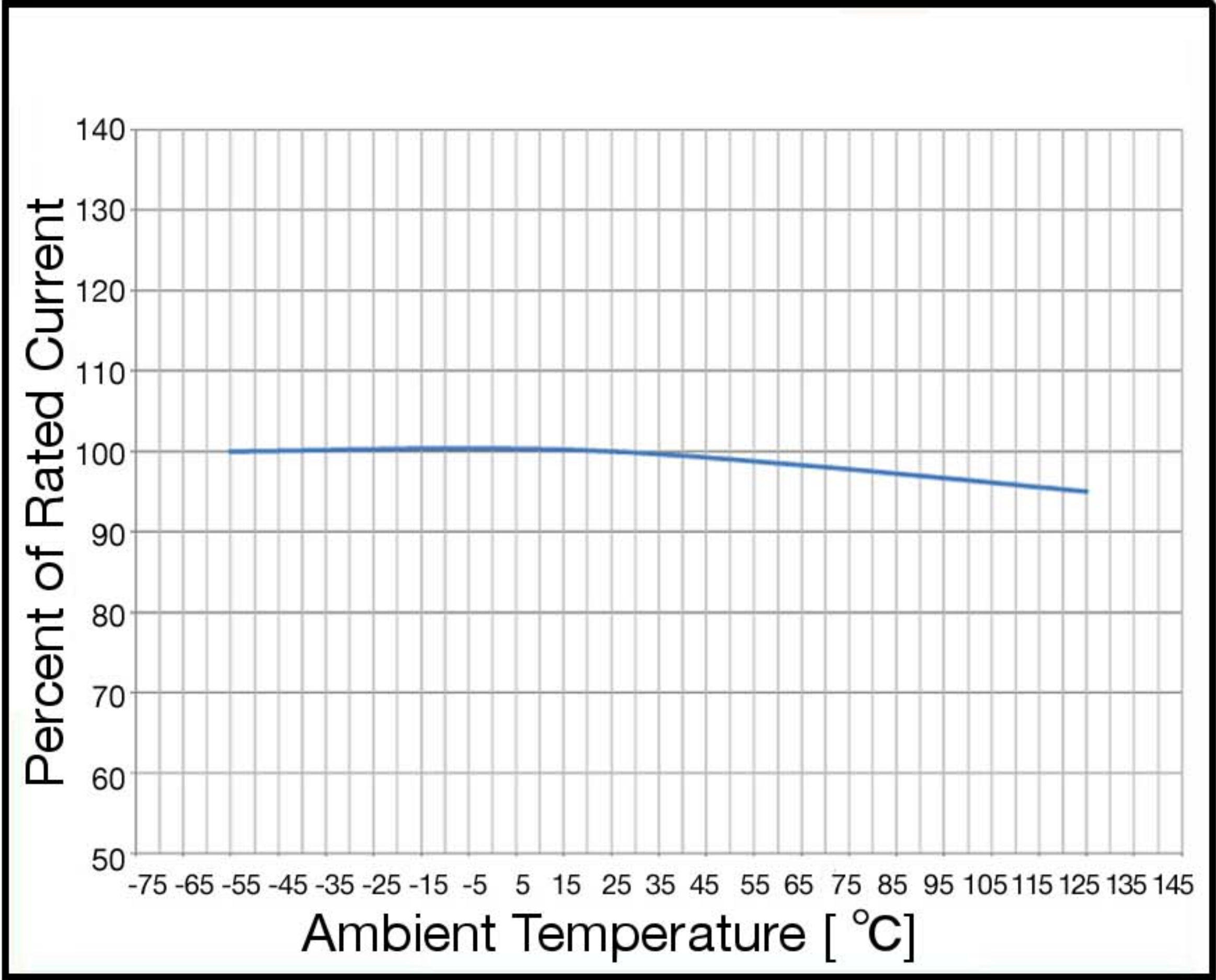
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Average Time Current Curve



Temperature Derating Curve



### Electrical Specifications

| Catalog Number | Ampere Rating (A) | Nominal Cold Resistance (ohm) | Nominal Volt-drop @100% In (Volt) max. | Voltage and Interrupting Ratings                                                        | Nominal Melting I <sup>2</sup> T <10 m Sec (A <sup>2</sup> Sec) | Nominal Melting I <sup>2</sup> T @10 In (A <sup>2</sup> Sec) | Nominal Power Dissipation @100% In (W) | Agency Approvals                                                                         |
|----------------|-------------------|-------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------|------------------------------------------------------------------------------------------|
|                |                   |                               |                                        |                                                                                         |                                                                 |                                                              |                                        |  US |
| C2Q 250        | 250mA             | 0.77                          | 0.243                                  | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.002                                                           | 0.0001                                                       | 0.06                                   | Y                                                                                        |
| C2Q 300        | 300mA             | 0.54                          | 0.217                                  |                                                                                         | 0.003                                                           | 0.0001                                                       | 0.07                                   | Y                                                                                        |
| C2Q 375        | 375mA             | 0.42                          | 0.196                                  |                                                                                         | 0.005                                                           | 0.0002                                                       | 0.07                                   | Y                                                                                        |
| C2Q 500        | 500mA             | 0.28                          | 0.171                                  |                                                                                         | 0.009                                                           | 0.0004                                                       | 0.09                                   | Y                                                                                        |
| C2Q 750        | 750mA             | 0.17                          | 0.159                                  |                                                                                         | 0.020                                                           | 0.0011                                                       | 0.12                                   | Y                                                                                        |
| C2Q 1          | 1A                | 0.122                         | 0.154                                  |                                                                                         | 0.036                                                           | 0.002                                                        | 0.15                                   | Y                                                                                        |
| C2Q 1.25       | 1.25A             | 0.092                         | 0.144                                  |                                                                                         | 0.058                                                           | 0.004                                                        | 0.18                                   | Y                                                                                        |
| C2Q 1.5        | 1.5A              | 0.073                         | 0.138                                  |                                                                                         | 0.084                                                           | 0.006                                                        | 0.21                                   | Y                                                                                        |
| C2Q 2          | 2A                | 0.053                         | 0.133                                  |                                                                                         | 0.15                                                            | 0.011                                                        | 0.27                                   | Y                                                                                        |
| C2Q 2.5        | 2.5A              | 0.042                         | 0.130                                  |                                                                                         | 0.24                                                            | 0.019                                                        | 0.33                                   | Y                                                                                        |
| C2Q 3          | 3A                | 0.034                         | 0.130                                  |                                                                                         | 0.36                                                            | 0.030                                                        | 0.39                                   | Y                                                                                        |
| C2Q 3.5        | 3.5A              | 0.028                         | 0.131                                  |                                                                                         | 0.50                                                            | 0.044                                                        | 0.46                                   | Y                                                                                        |
| C2Q 4          | 4A                | 0.023                         | 0.131                                  |                                                                                         | 0.63                                                            | 0.059                                                        | 0.52                                   | Y                                                                                        |
| C2Q 5          | 5A                | 0.019                         | 0.131                                  |                                                                                         | 1.05                                                            | 0.103                                                        | 0.66                                   | Y                                                                                        |

Consult manufacturer for other ratings

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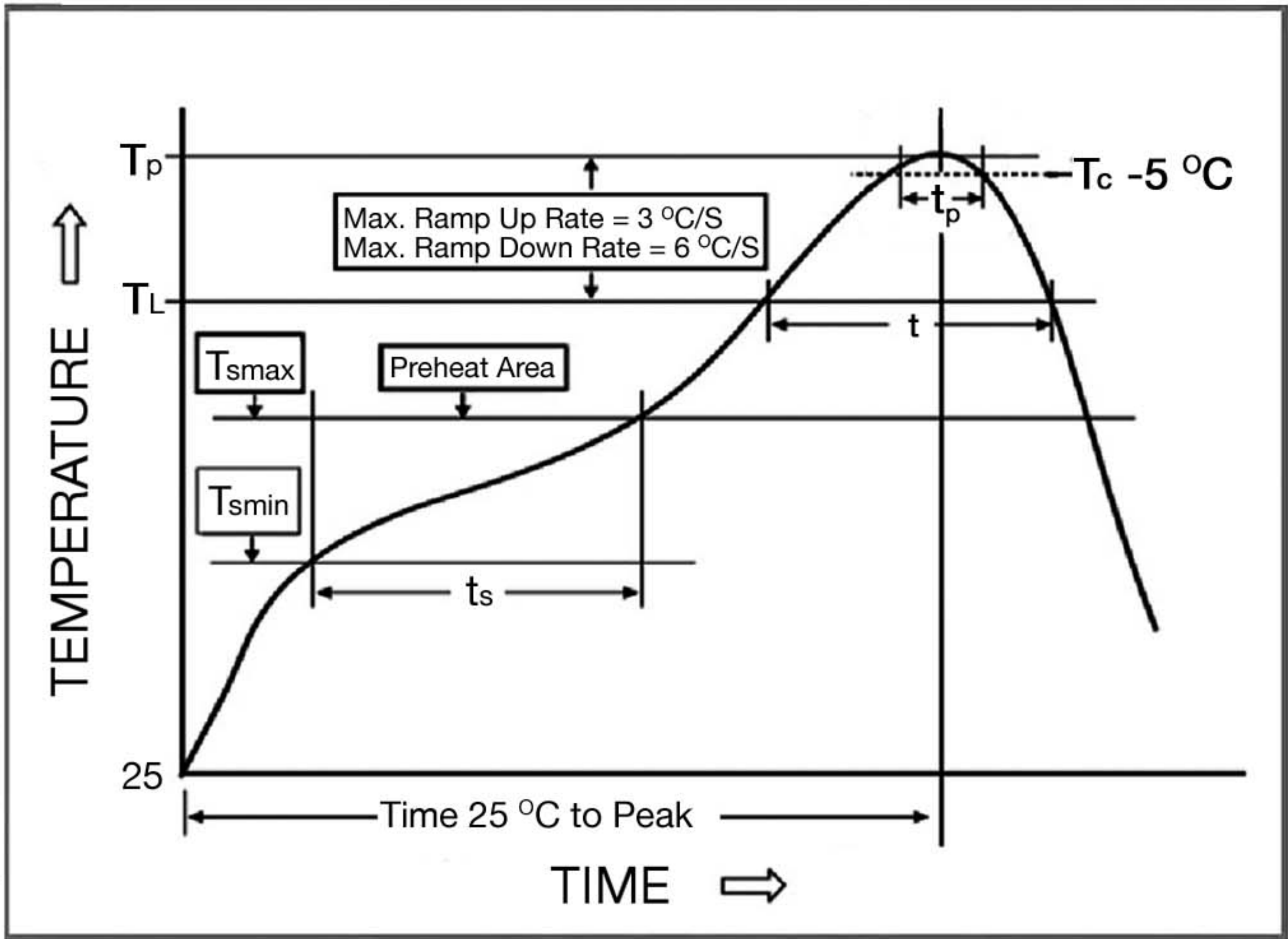
RoHS 6 Compliant

### Environmental Specifications

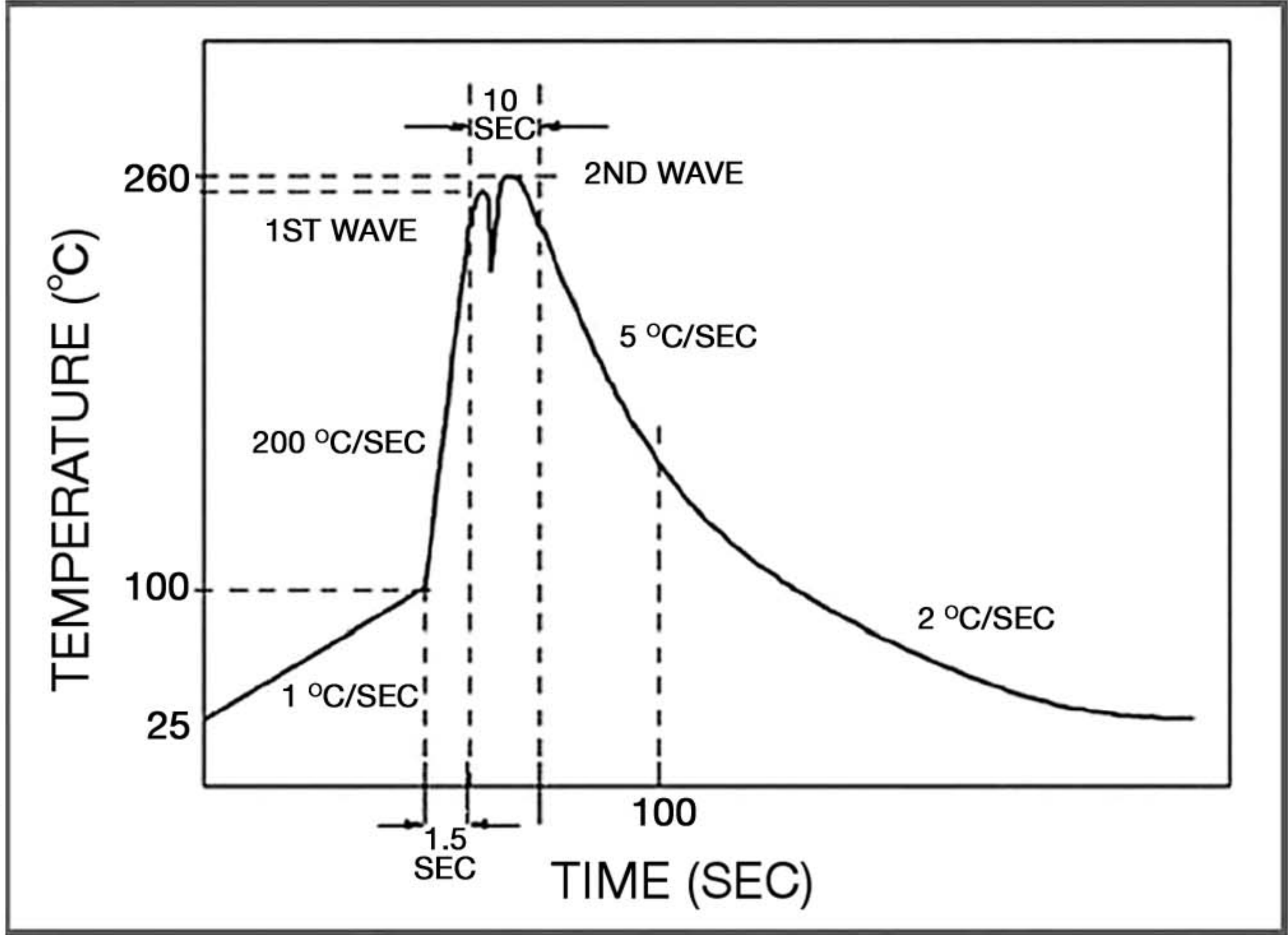
|                            |                                                                                                                                                 |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| 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)<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

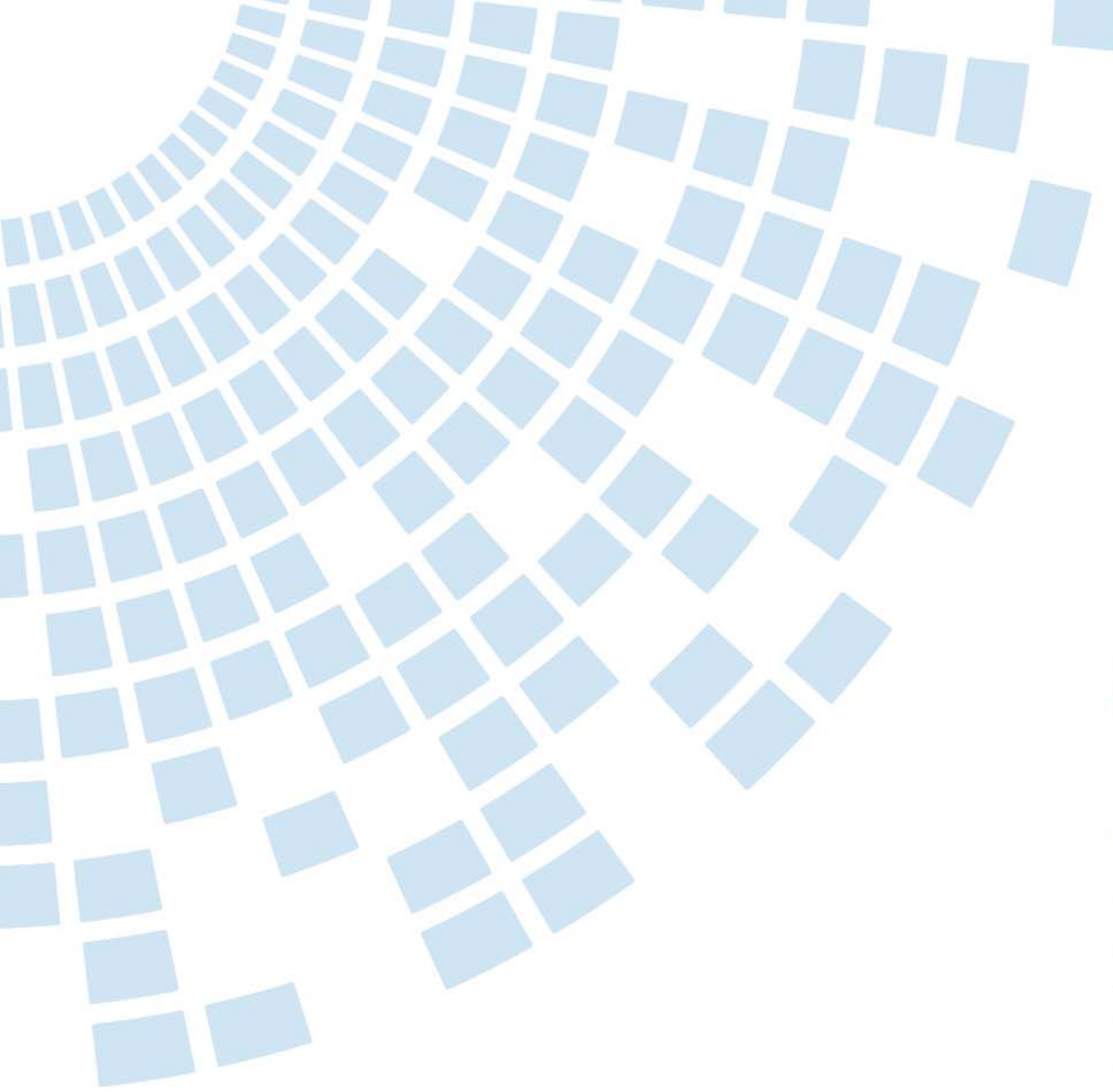
| IR Reflow Profile (IPC/JEDEC J-STD-020D)                                                         |                  |
|--------------------------------------------------------------------------------------------------|------------------|
| <b>Preheat &amp; Soak</b>                                                                        |                  |
| Temperature min (T <sub>min</sub> )                                                              | 150 °C           |
| Temperature max (T <sub>max</sub> )                                                              | 200 °C           |
| Time (T <sub>min</sub> to T <sub>max</sub> ) (t <sub>s</sub> )                                   | 60 -120 seconds  |
| Average ramp-up rate (T <sub>max</sub> to T <sub>p</sub> )                                       | 3 °C/second max. |
| Liquidous temperature (T <sub>L</sub> )                                                          | 217 °C           |
| Time at liquidous (t <sub>L</sub> )                                                              | 60 - 150 seconds |
| Peak temperature (T <sub>p</sub> )                                                               | 260 °C max       |
| Time (t <sub>p</sub> ) within 5 °C of the specified classification temperature (T <sub>c</sub> ) | 30 seconds       |
| Average ramp-down rate (T <sub>p</sub> to T <sub>max</sub> )                                     | 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 Tp                                  | 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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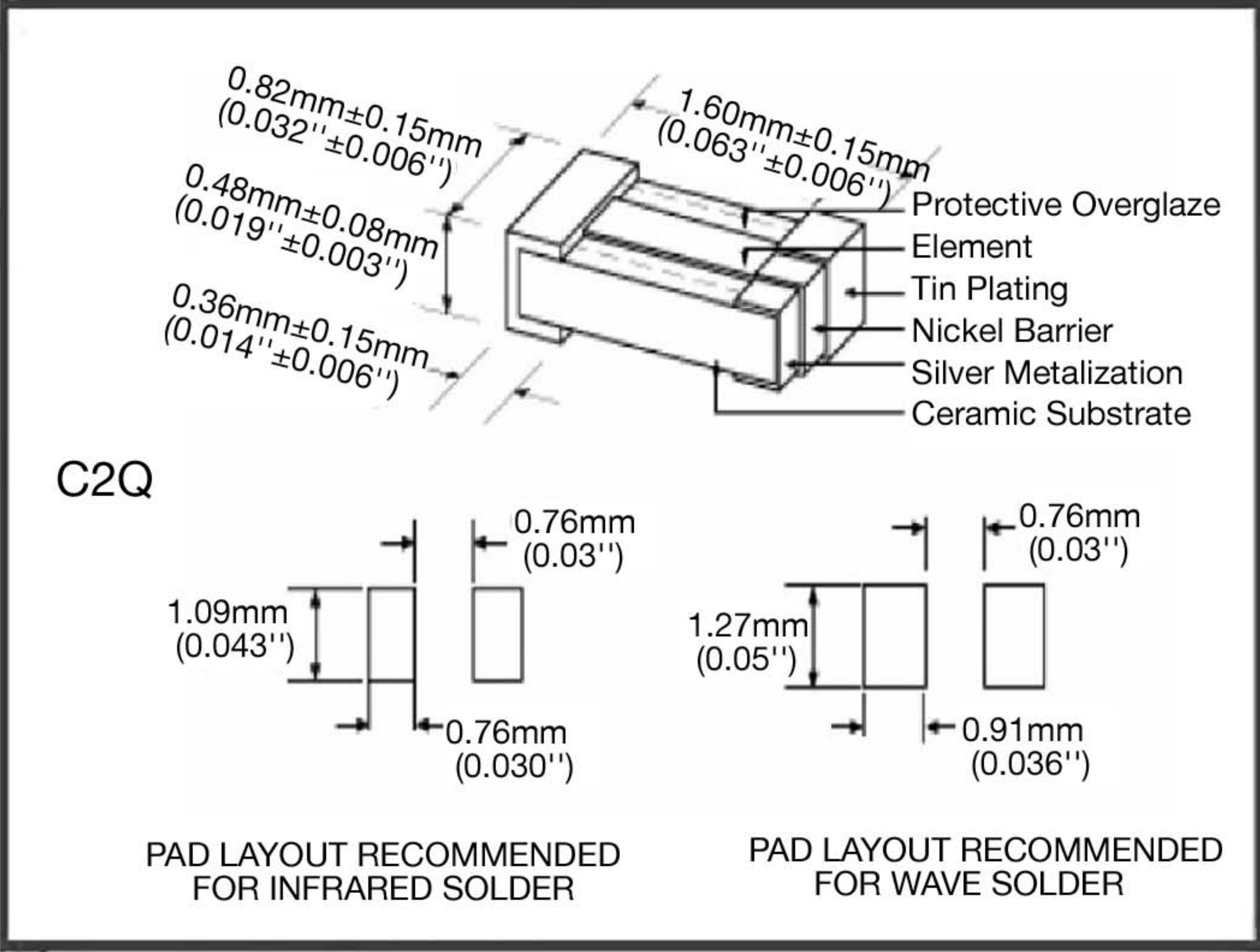
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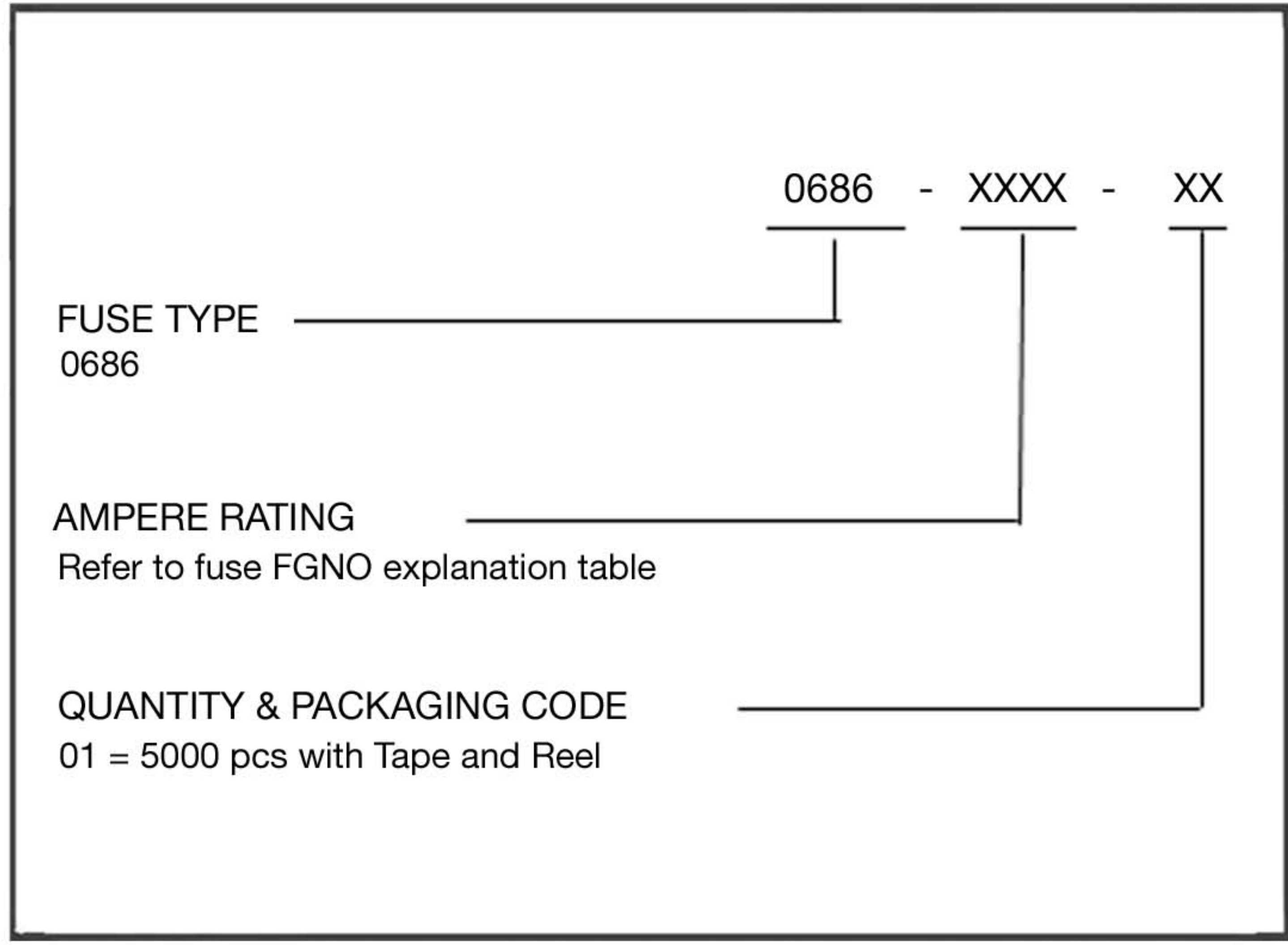
### Fuse FGNO Explanation 06XX X [XXXX] X XX, [XXXX]=Ampere Rating

| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] | Fraction | Decimal | Amps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|----------|---------|------|----------------|
| 1/32     | 0.032   | 32        | 0032           |          | 1.0     | 1    | 1000           |
| 1/25     | .040    | 40        | 0040           | 1-1/4    | 1.25    | 1.25 | 1250           |
| 1/20     | .050    | 50        | 0050           | 1-1/2    | 1.50    | 1.5  | 1500           |
| 1/16     | .063    | 63        | 0063           |          | 1.60    | 1.6  | 1600           |
| 8/100    | .080    | 80        | 0080           |          | 2.0     | 2    | 2000           |
| 1/10     | .100    | 100       | 0100           | 2-1/4    | 2.25    | 2.25 | 2250           |
| 1/8      | .125    | 125       | 0125           | 2-1/2    | 2.5     | 2.5  | 2500           |
| 15/100   | .150    | 150       | 0150           |          | 3.0     | 3    | 3000           |
|          | .160    | 160       | 0160           |          | 3.15    | 3.15 | 3150           |
| 2/10     | .200    | 200       | 0200           | 3-1/2    | 3.5     | 3.5  | 3500           |
| 1/4      | .250    | 250       | 0250           |          | 4.0     | 4    | 4000           |
| 3/10     | .300    | 300       | 0300           |          | 5.0     | 5    | 5000           |
|          | .315    | 315       | 0315           |          | 6.0     | 6    | 6000           |
| 3/8      | .375    | 375       | 0375           |          | 6.3     | 6.3  | 6300           |
| 4/10     | .400    | 400       | 0400           |          | 7.0     | 7    | 7000           |
| 1/2      | .500    | 500       | 0500           | 7-1/2    | 7.5     | 7.5  | 7500           |
| 6/10     | .600    | 600       | 0600           |          | 8.0     | 8    | 8000           |
|          | .630    | 630       | 0630           |          |         | 10   | 9100           |
| 7/10     | .700    | 700       | 0700           |          |         | 12   | 9120           |
| 3/4      | .750    | 750       | 0750           |          |         | 15   | 9150           |
| 8/10     | .800    | 800       | 0800           |          |         | 20   | 9200           |
|          |         |           |                |          |         | 25   | 9250           |
|          |         |           |                |          |         | 30   | 9300           |

### 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              |

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