

# EV34C6B3A1-2.048M TR

|  |  |  |   |
|--|--|--|---|
|  <p><b>Lead Free</b><br/>COMPLIANT</p> |  <p><b>EU RoHS</b><br/>2011/65 +<br/>2015/863<br/>COMPLIANT</p> |  <p><b>China RoHS</b><br/>COMPLIANT</p> |  <p><b>REACH</b><br/>SVHC 163<br/>Jun 15, 2015<br/>COMPLIANT</p> |
|--|--|--|---|



## ITEM DESCRIPTION


Voltage Controlled Quartz Crystal Clock Oscillators VCXO LVCMOS (CMOS) 2.5Vdc 6 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD) 2.048MHz  $\pm 50$ ppm Maximum -40°C to +85°C  $\pm 50$ ppm Minimum 10% Typical, 20% Maximum

## ELECTRICAL SPECIFICATIONS

|  |  |
|--|--|
| <b>Nominal Frequency</b>                     | 2.048MHz   |
| <b>Frequency Tolerance/Stability</b>         | $\pm 50$ ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, Shock, and Vibration.)                                      |
| <b>Aging at 25°C</b>                         | $\pm 2$ ppm/First Year Typical, $\pm 10$ ppm/10 Years Maximum  |
| <b>Operating Temperature Range</b>           | -40°C to +85°C   |
| <b>Supply Voltage</b>                        | 2.5Vdc $\pm 5\%$   |
| <b>Input Current</b>                         | 15mA Maximum   |
| <b>Output Voltage Logic High (Voh)</b>       | 90% of Vdd Minimum (IOH = -4mA)  |
| <b>Output Voltage Logic Low (Vol)</b>        | 10% of Vdd Maximum (IOL = +4mA)  |
| <b>Rise/Fall Time</b>                        | 5nSec Maximum (Measured at 20% to 80% of Waveform)   |
| <b>Duty Cycle</b>                            | 50 $\pm 10$ (%) (Measured at 50% of Waveform)  |
| <b>Load Drive Capability</b>                 | 15pF Maximum   |
| <b>Output Logic Type</b>                     | CMOS   |
| <b>Absolute Pull Range</b>                   | $\pm 50$ ppm Minimum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, Shock, Vibration, and Aging over the Control Voltage (Vc).) |
| <b>Control Voltage</b>                       | 0.2Vdc to 2.3Vdc (Test Condition for APR)  |
| <b>Control Voltage Range</b>                 | 0.0Vdc to Vdd  |
| <b>Linearity</b>                             | 10% Typical, 20% Maximum   |
| <b>Transfer Function</b>                     | Positive Transfer Characteristic   |
| <b>Modulation Bandwidth</b>                  | 10kHz Minimum (Measured at -3dB, Vc = 1.25Vdc)   |
| <b>Input Impedance</b>                       | 50kOhms Minimum  |
| <b>Input Leakage Current</b>                 | 10 $\mu$ A Maximum   |
| <b>Phase Noise</b>                           | All Values are Typical<br>-65dBc/Hz at offset of 10Hz<br>-95dBc/Hz at offset of 100Hz<br>-120dBc/Hz at offset of 1kHz<br>-142dBc/Hz at offset of 10kHz<br>-152dBc/Hz at offset of 100kHz<br>-154dBc/Hz at offset of 1MHz                           |
| <b>Tri-State Input Voltage (Vih and Vil)</b> | 90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High Impedance)   |
| <b>RMS Phase Jitter</b>                      | 1pSec Maximum (Fj = 12kHz to 20MHz; Random)  |
| <b>Start Up Time</b>                         | 10mSec Maximum   |
| <b>Storage Temperature Range</b>             | -55°C to +125°C  |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

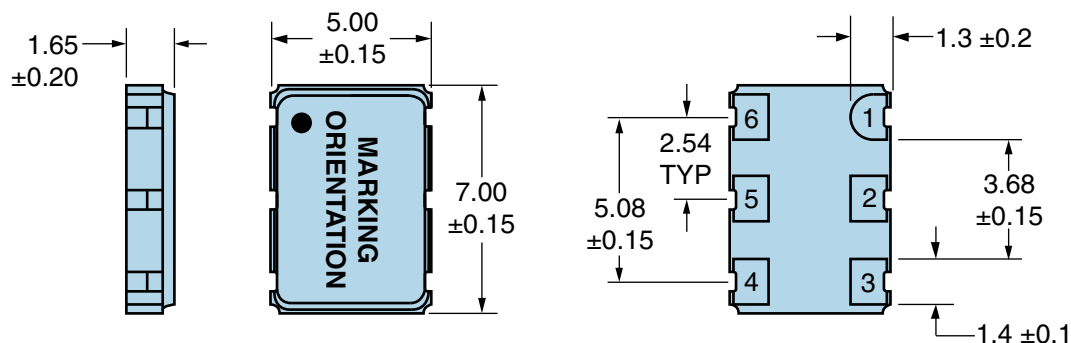
|                            |   |
|----------------------------|---|
| <b>ESD Susceptibility</b>  | MIL-STD-883, Method 3015, Class 1, HBM: 1500V |
| <b>Fine Leak Test</b>      | MIL-STD-883, Method 1014, Condition A         |
| <b>Flammability</b>        | UL94-V0                                       |
| <b>Gross Leak Test</b>     | MIL-STD-883, Method 1014, Condition C         |
| <b>Mechanical Shock</b>    | MIL-STD-883, Method 2002, Condition B         |
| <b>Moisture Resistance</b> | MIL-STD-883, Method 1004                      |

**EV34C6B3A1-2.048M TR** **ENVIRONMENTAL & MECHANICAL SPECIFICATIONS CONTINUED**

|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>Moisture Sensitivity</b>         | J-STD-020, MSL 1                      |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210, Condition K  |
| <b>Resistance to Solvents</b>       | MIL-STD-202, Method 215               |
| <b>Solderability</b>                | MIL-STD-883, Method 2003              |
| <b>Temperature Cycling</b>          | MIL-STD-883, Method 1010, Condition B |
| <b>Vibration</b>                    | MIL-STD-883, Method 2007, Condition A |

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## MECHANICAL DIMENSIONS (all dimensions in millimeters)

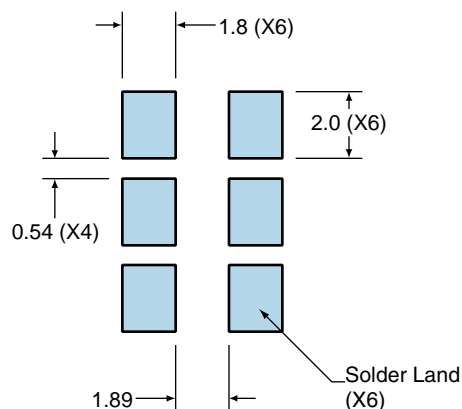


| PIN | CONNECTION      |
|-----|-----------------|
| 1   | Control Voltage |
| 2   | Tri-State       |
| 3   | Case/Ground     |
| 4   | Output          |
| 5   | No Connect      |
| 6   | Supply Voltage  |

| LINE | MARKING   |
|------|---|
| 1    | ECLIPTEK  |
| 2    | 2.0480M   |
| 3    | XXXXX<br>XXXXX=Ecliptek<br>Manufacturing Identifier |

## Suggested Solder Pad Layout

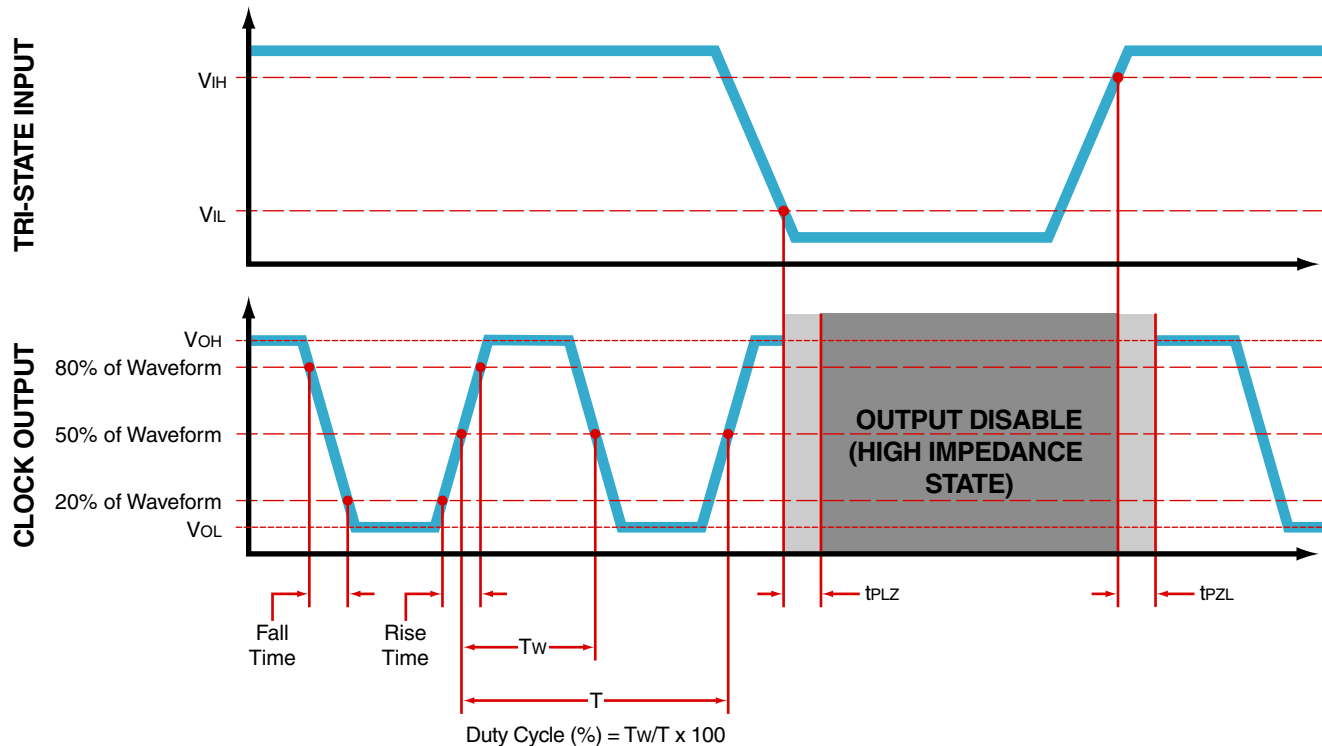
All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

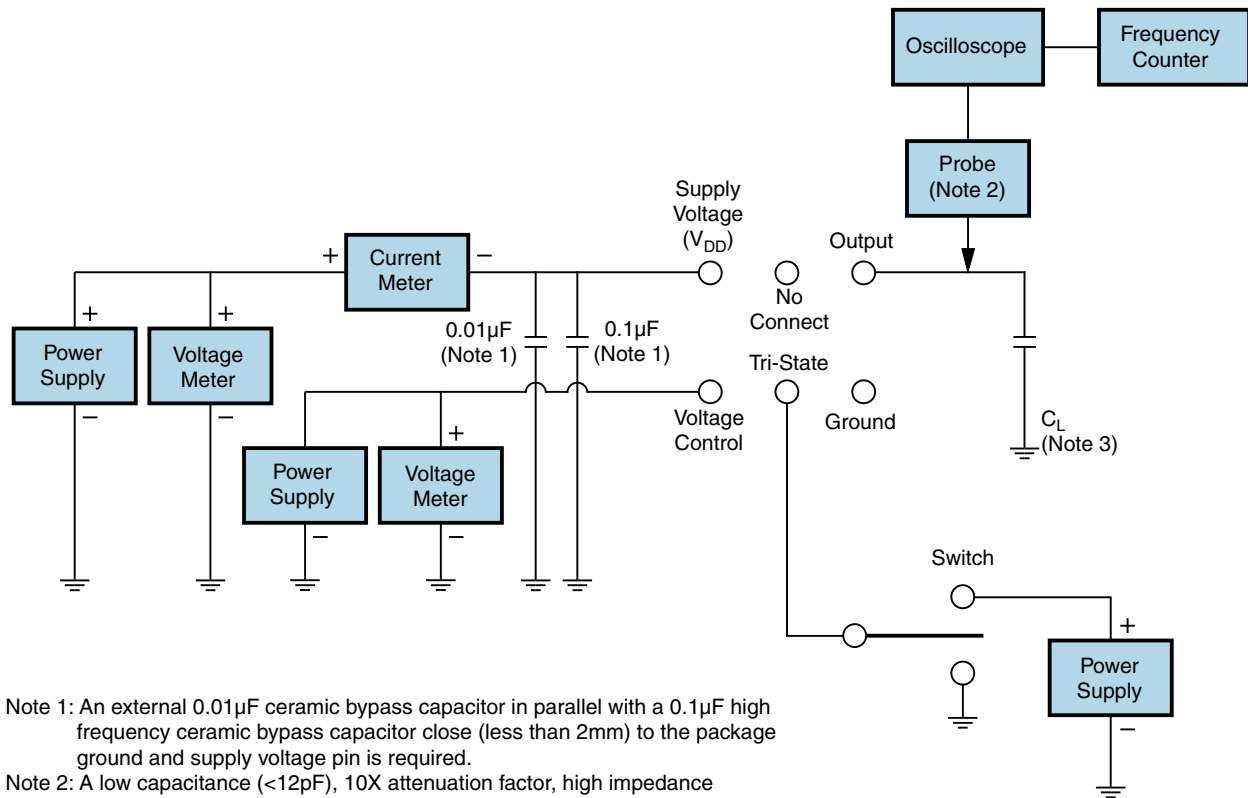
# EV34C6B3A1-2.048M TR

## OUTPUT WAVEFORM & TIMING DIAGRAM



# EV34C6B3A1-2.048M TR

## Test Circuit for CMOS Output



Note 1: An external  $0.01\mu\text{F}$  ceramic bypass capacitor in parallel with a  $0.1\mu\text{F}$  high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

Note 2: A low capacitance ( $<12\text{pF}$ ), 10X attenuation factor, high impedance ( $>10\text{Mohms}$ ), and high bandwidth ( $>300\text{MHz}$ ) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

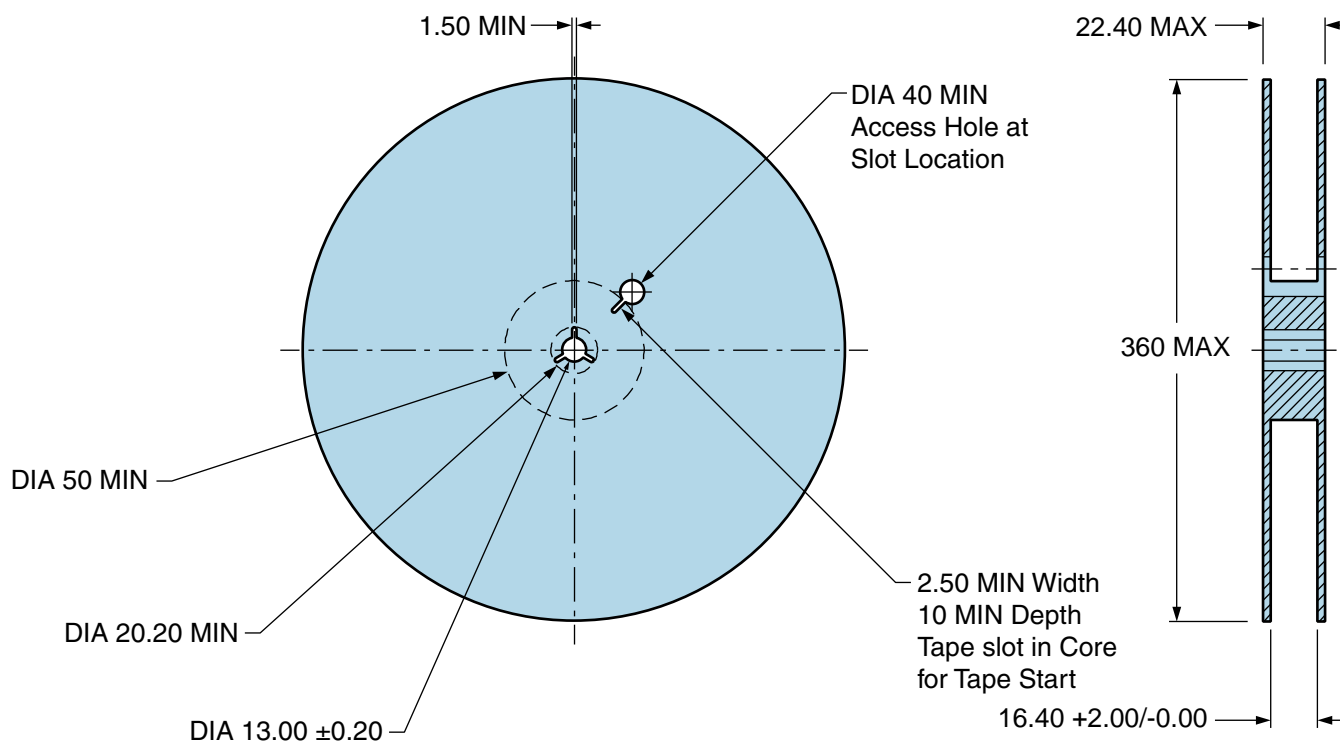
# EV34C6B3A1-2.048M TR

## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

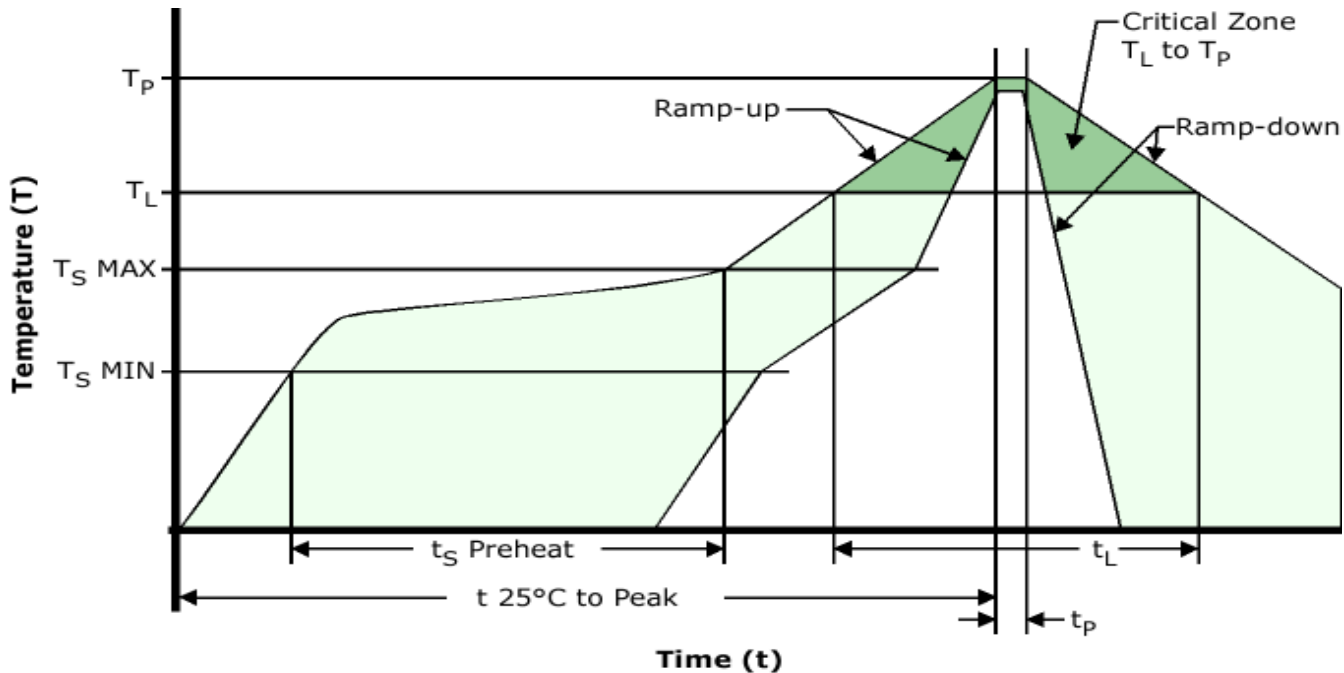
All Dimensions in Millimeters

Compliant to EIA-481



# EV34C6B3A1-2.048M TR

## Recommended Solder Reflow Methods



## High Temperature Infrared/Convection

$T_S$  MAX to  $T_L$  (Ramp-up Rate) 3°C/Second Maximum

### Preheat

- Temperature Minimum ( $T_S$  MIN) 150°C
- Temperature Typical ( $T_S$  TYP) 175°C
- Temperature Maximum ( $T_S$  MAX) 200°C
- Time ( $t_s$  MIN) 60 - 180 Seconds

Ramp-up Rate ( $T_L$  to  $T_P$ ) 3°C/Second Maximum

### Time Maintained Above:

- Temperature ( $T_L$ ) 217°C
- Time ( $t_L$ ) 60 - 150 Seconds

Peak Temperature ( $T_P$ ) 260°C Maximum for 10 Seconds Maximum

Target Peak Temperature ( $T_P$  Target) 250°C +0/-5°C

Time within 5°C of actual peak ( $t_p$ ) 20 - 40 Seconds

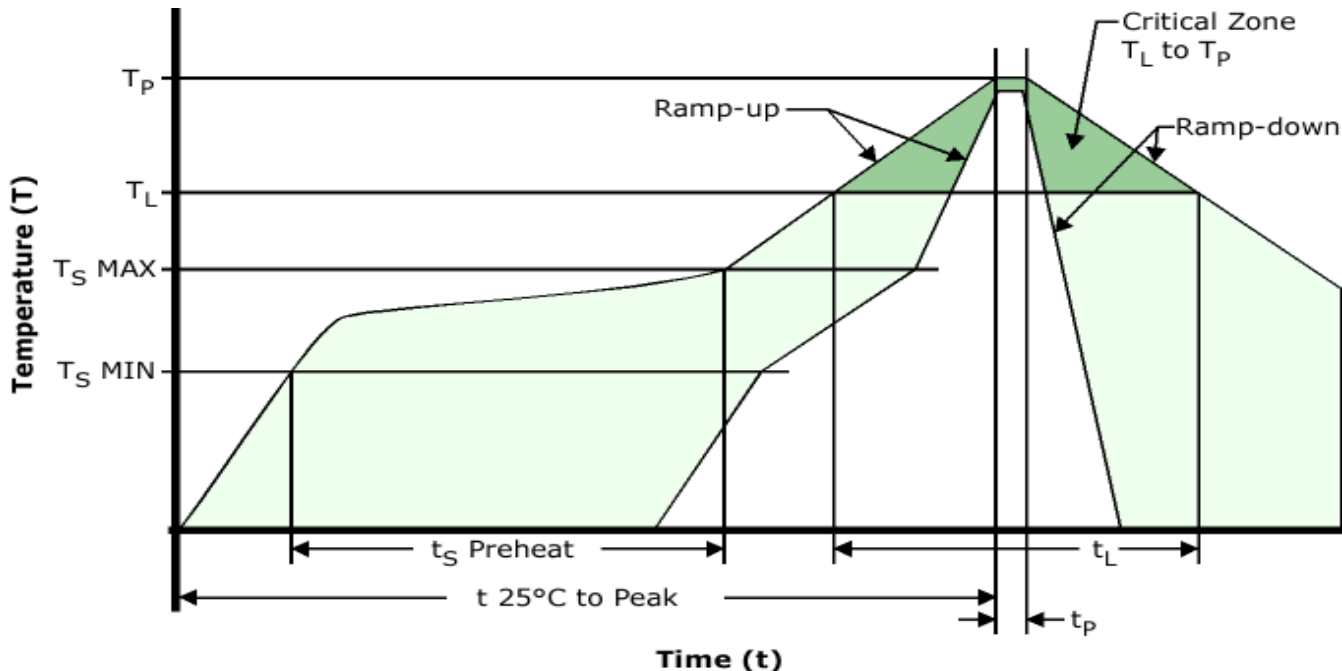
Ramp-down Rate 6°C/Second Maximum

Time 25°C to Peak Temperature (t) 8 Minutes Maximum

Moisture Sensitivity Level Level 1

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## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

$T_S$  MAX to  $T_L$  (Ramp-up Rate) 5°C/Second Maximum

#### Preheat

- Temperature Minimum ( $T_S$  MIN) N/A
- Temperature Typical ( $T_S$  TYP) 150°C
- Temperature Maximum ( $T_S$  MAX) N/A
- Time ( $t_s$  MIN) 60 - 120 Seconds

Ramp-up Rate ( $T_L$  to  $T_P$ ) 5°C/Second Maximum

#### Time Maintained Above:

- Temperature ( $T_L$ ) 150°C
- Time ( $t_L$ ) 200 Seconds Maximum

Peak Temperature ( $T_P$ ) 240°C Maximum

Target Peak Temperature ( $T_P$  Target) 240°C Maximum 2 Times / 230°C Maximum 1 Time

Time within 5°C of actual peak ( $t_p$ ) 10 Seconds Maximum 2 Times / 80 Seconds Maximum 1 Time

Ramp-down Rate 5°C/Second Maximum

Time 25°C to Peak Temperature (t) N/A

Moisture Sensitivity Level Level 1

### Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

### High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.