

# ES52C5B25V-19.200M TR



## ITEM DESCRIPTION

Temperature Compensated Quartz Crystal Clock Oscillators TCXO TC(VC)XO Clipped Sinewave 3.0Vdc 4 Pad 3.2mm x 5.0mm Ceramic Surface Mount (SMD) 19.200MHz  $\pm 2.5$ ppm Maximum -10°C to +60°C

## ELECTRICAL SPECIFICATIONS

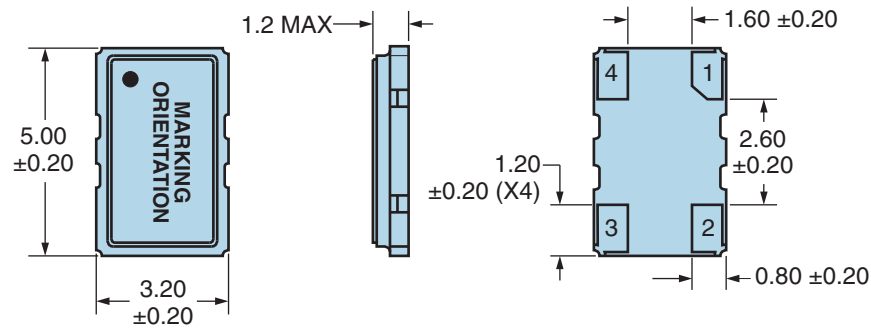
|                                        |                                                                                                                                          |
|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                      | 19.200MHz                                                                                                                                |
| Frequency Tolerance                    | $\pm 1.0$ ppm Maximum (at 25°C $\pm 2^\circ\text{C}$ , at Vdd=3.0Vdc, and Vc=1.5Vdc)                                                     |
| Frequency Stability                    | $\pm 2.5$ ppm Maximum (Inclusive of Operating Temperature Range, at Vdd=3.0Vdc)                                                          |
| Frequency Stability vs. Supply Voltage | $\pm 0.3$ ppm Maximum (Vdd $\pm 5\%$ )                                                                                                   |
| Frequency Stability vs. Load           | $\pm 0.2$ ppm Maximum ( $\pm 1\text{k}\Omega$ // $\pm 1\text{pF}$ )                                                                      |
| Frequency Stability vs. Aging          | $\pm 1$ ppm/year Maximum (at 25°C)                                                                                                       |
| Operating Temperature Range            | -10°C to +60°C                                                                                                                           |
| Supply Voltage                         | 3.0Vdc $\pm 5\%$                                                                                                                         |
| Input Current                          | 2.0mA Maximum                                                                                                                            |
| Output Voltage                         | 0.7Vp-p Clipped Sinewave Minimum (External DC-Cut capacitor required, 1000pF recommended)                                                |
| Load Drive Capability                  | 10kOhms//10pF                                                                                                                            |
| Output Logic Type                      | Clipped Sinewave                                                                                                                         |
| Control Voltage                        | 1.5Vdc $\pm 1.0$ Vdc                                                                                                                     |
| Control Voltage Range                  | 0.0Vdc to Vdd                                                                                                                            |
| Frequency Deviation                    | $\pm 8$ ppm Minimum                                                                                                                      |
| Linearity                              | 10% Maximum                                                                                                                              |
| Transfer Function                      | Positive Transfer Characteristic                                                                                                         |
| Modulation Bandwidth                   | 3kHz Minimum (Measured at -3dB with a Control Voltage of 1.5Vdc)                                                                         |
| Input Impedance                        | 100kOhms Minimum                                                                                                                         |
| Phase Noise                            | -80dBc/Hz at 10Hz Offset, -115dBc/Hz at 100Hz Offset, -135dBc/Hz at 1kHz Offset, and -148dBc/Hz at 10kHz Offset (All Values are Typical) |
| Start Up Time                          | 5mSec Maximum                                                                                                                            |
| Storage Temperature Range              | -40°C to +85°C                                                                                                                           |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                               |
|------------------------------|-----------------------------------------------|
| ESD Susceptibility           | MIL-STD-883, Method 3015, Class 1, HBM: 1500V |
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A         |
| Flammability                 | UL94-V0                                       |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C         |
| Mechanical Shock             | MIL-STD-883, Method 2002, Condition B         |
| Moisture Resistance          | MIL-STD-883, Method 1004                      |
| Moisture Sensitivity         | J-STD-020, MSL 1                              |
| Resistance to Soldering Heat | MIL-STD-202, Method 210, Condition K          |
| Resistance to Solvents       | MIL-STD-202, Method 215                       |
| Solderability                | MIL-STD-883, Method 2003                      |
| Temperature Cycling          | MIL-STD-883, Method 1010, Condition B         |
| Vibration                    | MIL-STD-883, Method 2007, Condition A         |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)

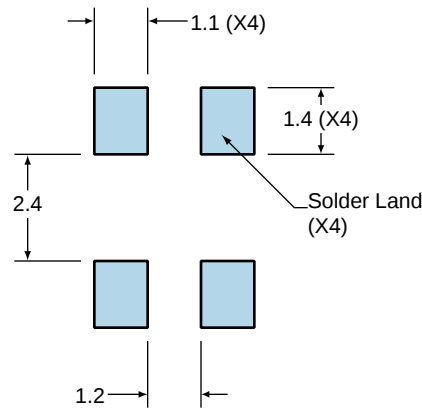


| PIN | CONNECTION      |
|-----|-----------------|
| 1   | Control Voltage |
| 2   | Ground          |
| 3   | Output          |
| 4   | Supply Voltage  |

| LINE | MARKING                                                      |
|------|--------------------------------------------------------------|
| 1    | <b>E19.200</b><br>E=Ecliptek Designator                      |
| 2    | <b>XXXXXX</b><br>XXXXXX=Ecliptek<br>Manufacturing Identifier |

Suggested Solder Pad Layout

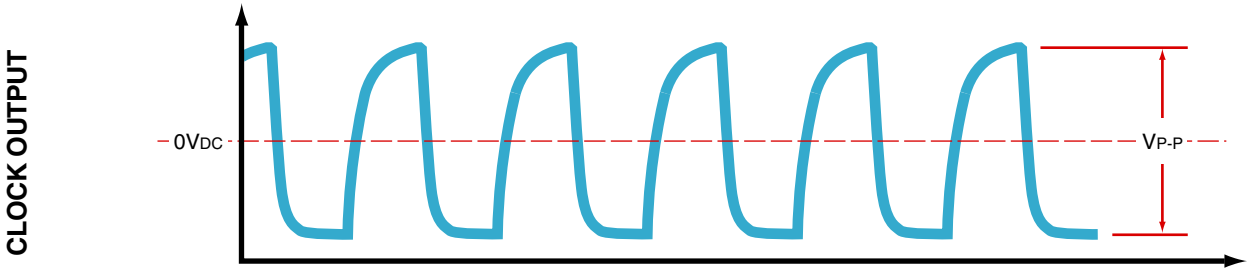
All Dimensions in Millimeters



All Tolerances are ±0.1

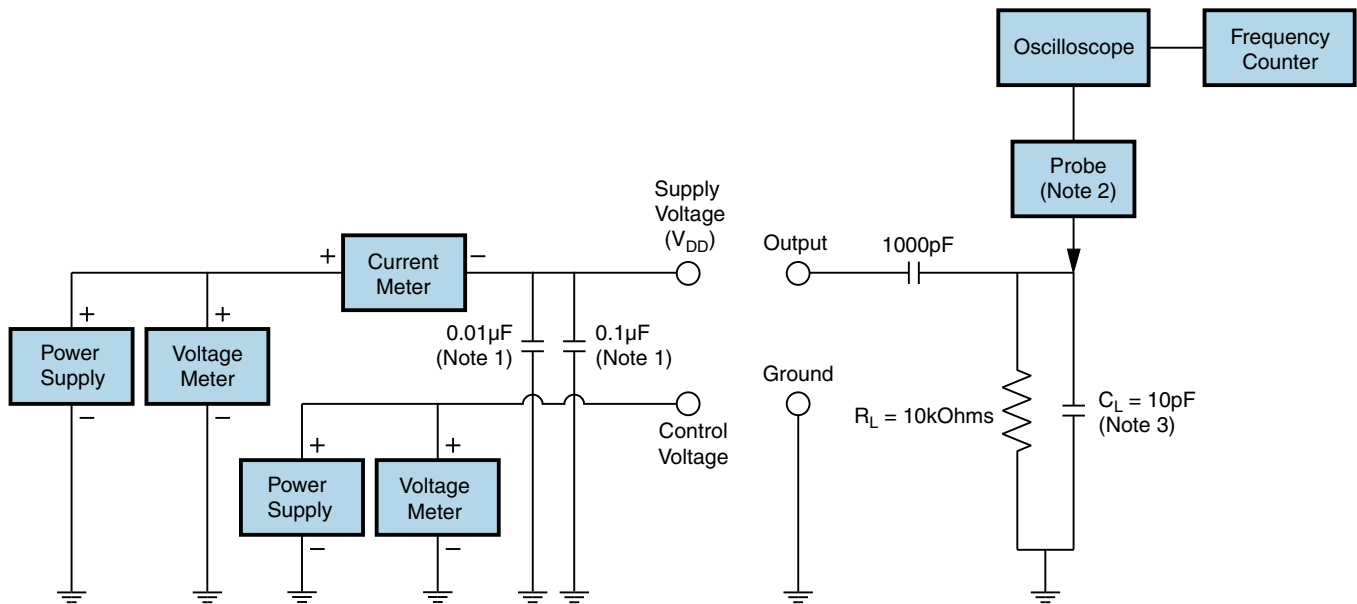
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OUTPUT WAVEFORM



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## Test Circuit for Control Voltage Option



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

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

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

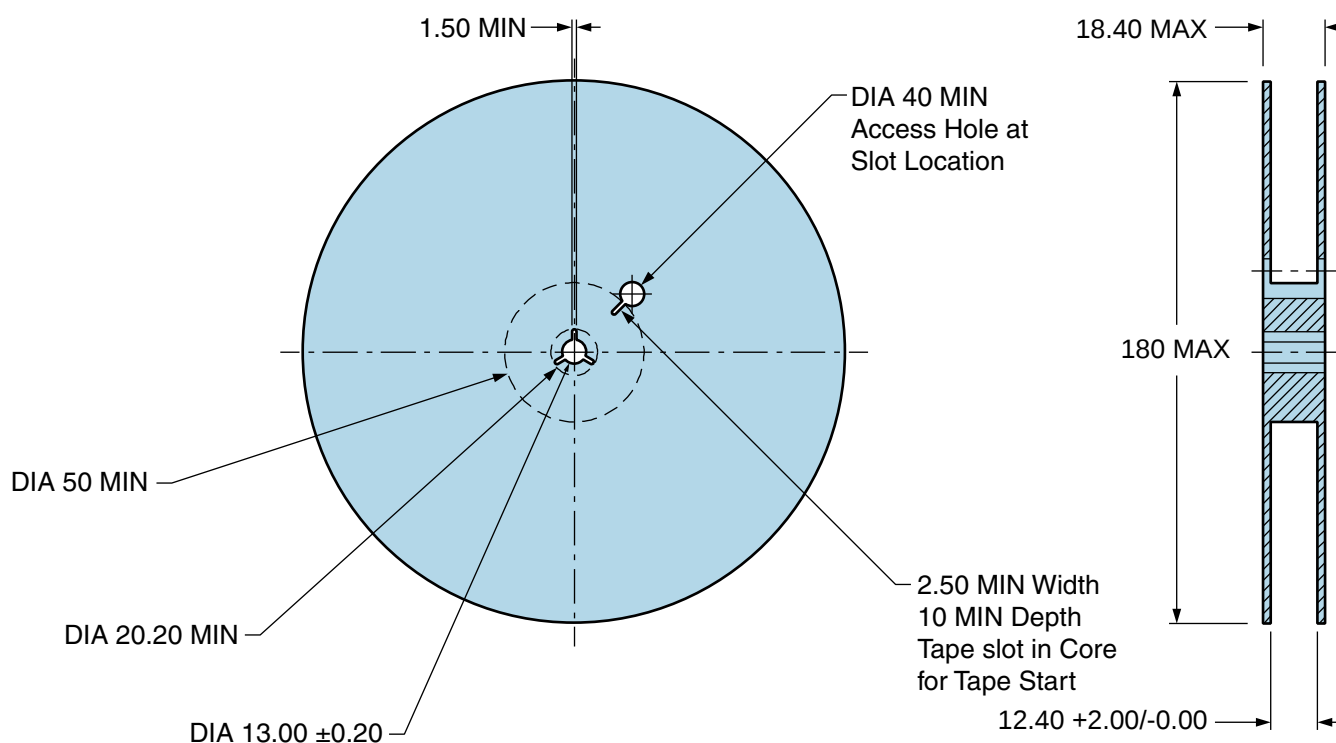
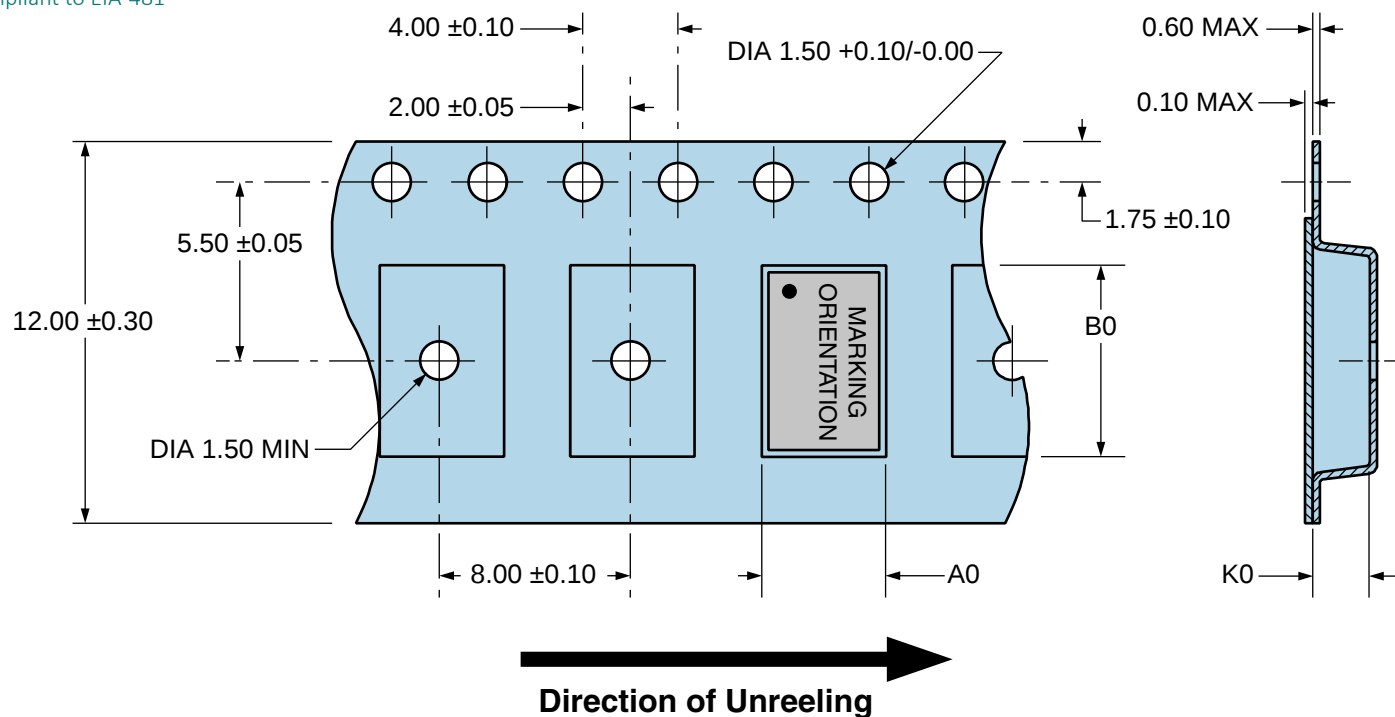
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## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

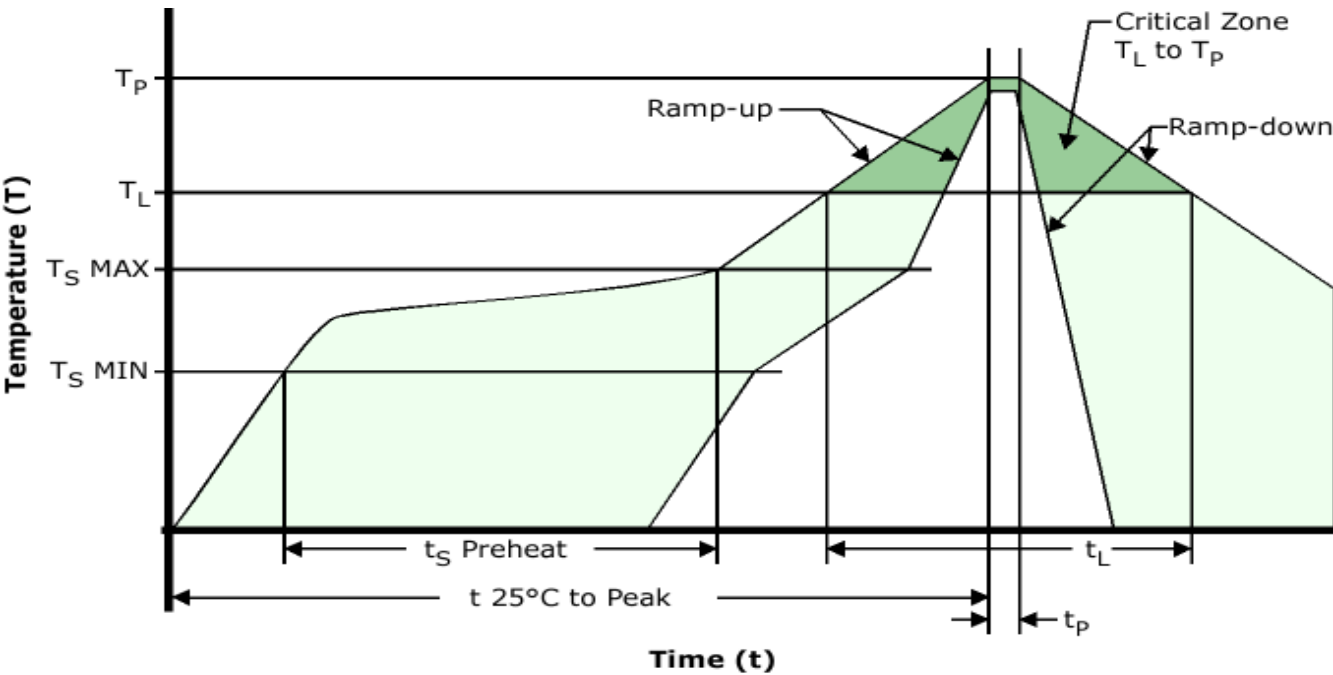
All Dimensions in Millimeters

Compliant to EIA-481



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Recommended Solder Reflow Methods

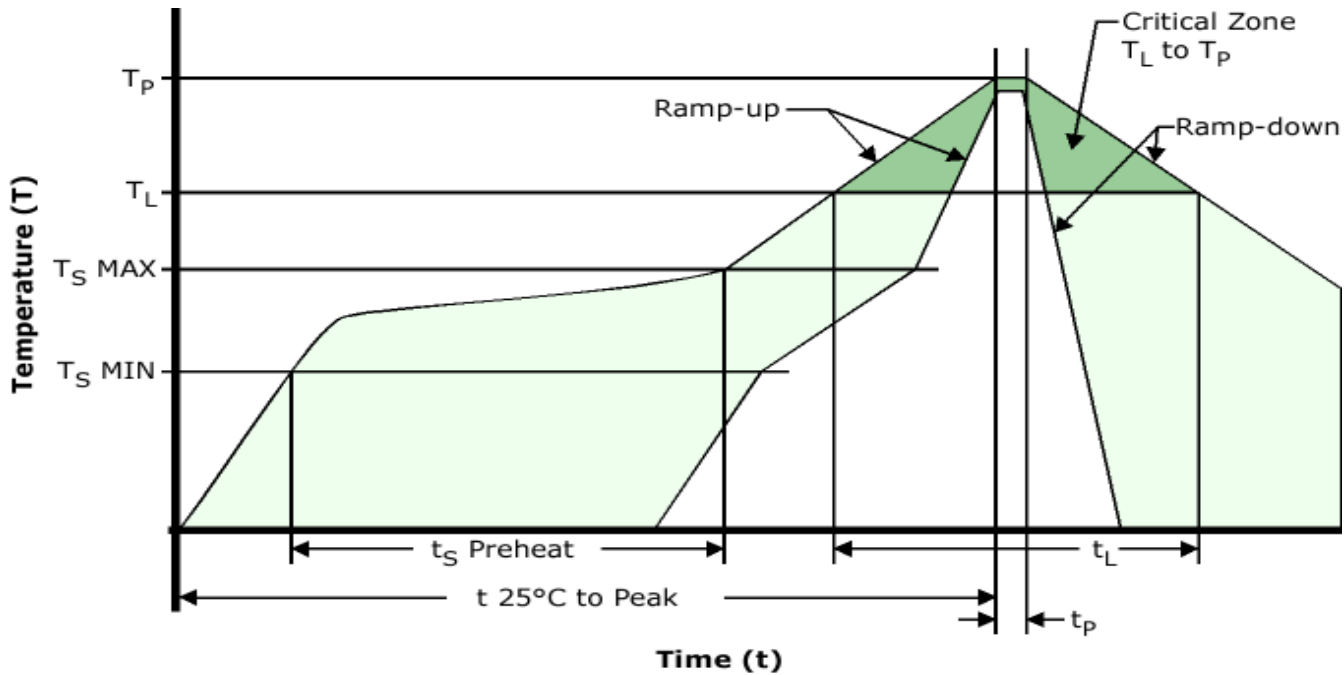


High Temperature Infrared/Convection

|                                                     |                                                   |
|-----------------------------------------------------|---------------------------------------------------|
| T <sub>S</sub> MAX to T <sub>L</sub> (Ramp-up Rate) | 3°C/Second Maximum                                |
| Preheat                                             |                                                   |
| - Temperature Minimum (T <sub>S</sub> MIN)          | 150°C                                             |
| - Temperature Typical (T <sub>S</sub> TYP)          | 175°C                                             |
| - Temperature Maximum (T <sub>S</sub> MAX)          | 200°C                                             |
| - Time (t <sub>s</sub> MIN)                         | 60 - 180 Seconds                                  |
| Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> )    | 3°C/Second Maximum                                |
| Time Maintained Above:                              |                                                   |
| - Temperature (T <sub>L</sub> )                     | 217°C                                             |
| - Time (t <sub>L</sub> )                            | 60 - 150 Seconds                                  |
| Peak Temperature (T <sub>P</sub> )                  | 260°C Maximum for 10 Seconds Maximum              |
| Target Peak Temperature (T <sub>P</sub> Target)     | 250°C +0/-5°C                                     |
| Time within 5°C of actual peak (t <sub>P</sub> )    | 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                                           |
| Additional Notes                                    | Temperatures shown are applied to body of device. |

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## Recommended Solder Reflow Methods



## Low Temperature Infrared/Convection 240°C

**TS MAX to TL (Ramp-up Rate)** 5°C/Second Maximum

### Preheat

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

**Ramp-up Rate (TL to TP)** 5°C/Second Maximum

### Time Maintained Above:

- Temperature (TL) 150°C
- Time (tL) 200 Seconds Maximum

**Peak Temperature (TP)** 240°C Maximum

**Target Peak Temperature (TP Target)** 240°C Maximum 2 Times / 230°C Maximum 1 Time

**Time within 5°C of actual peak (tp)** 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

**Additional Notes** Temperatures shown are applied to body of device.

## Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)

## High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)