

# EMRA23X2H-49.152M TR

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Jun 19, 2020)


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## ITEM DESCRIPTION

MEMS Clock Oscillators LVCMOS (CMOS) 3.3Vdc 4 Pad 3.2mm x 5.0mm Plastic Surface Mount (SMD) 49.152MHz  $\pm 50$ ppm over -55°C to +125°C

## ELECTRICAL SPECIFICATIONS

|                                                  |                                                                                                                                                                                                                 |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                                | 49.152MHz                                                                                                                                                                                                       |
| Frequency Tolerance/Stability                    | $\pm 50$ ppm Maximum over -55°C to +125°C (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, and Output Load Change) |
| Aging at 25°C                                    | $\pm 1.5$ ppm Maximum First Year                                                                                                                                                                                |
| Supply Voltage                                   | 3.3Vdc $\pm 10\%$                                                                                                                                                                                               |
| Input Current                                    | 6mA Maximum (No Load)                                                                                                                                                                                           |
| Output Voltage Logic High (Voh)                  | 90% of Vdd Minimum (IOH = -4mA)                                                                                                                                                                                 |
| Output Voltage Logic Low (Vol)                   | 10% of Vdd Maximum (IOL = +4mA)                                                                                                                                                                                 |
| Rise/Fall Time                                   | 1.2nSec Typical, 3nSec Maximum (Measured from 20% to 80% of waveform)                                                                                                                                           |
| Duty Cycle                                       | 50 $\pm 5\%$ (Measured at 50% of waveform)                                                                                                                                                                      |
| Load Drive Capability                            | 15pF Maximum                                                                                                                                                                                                    |
| Output Logic Type                                | CMOS                                                                                                                                                                                                            |
| Output Control Function                          | Tri-State (Disabled Output: High Impedance)                                                                                                                                                                     |
| Output Control Input Voltage Logic High (Vih)    | 70% of Vdd Minimum or No Connect to Enable Output                                                                                                                                                               |
| Output Control Input Voltage Logic Low (Vil)     | 30% of Vdd Maximum to Disable Output                                                                                                                                                                            |
| Tri-State Output Enable Time                     | 150nSec Maximum                                                                                                                                                                                                 |
| Tri-State Output Disable Time                    | 150nSec Maximum                                                                                                                                                                                                 |
| Period Jitter (RMS)                              | 2pSec Typical, 4pSec Maximum                                                                                                                                                                                    |
| RMS Phase Jitter (Fj = 900kHz to 7.5MHz; Random) | 0.5pSec Typical, 1pSec Maximum                                                                                                                                                                                  |
| RMS Phase Jitter (Fj = 12kHz to 20MHz; Random)   | 1.5pSec Typical, 3pSec Maximum                                                                                                                                                                                  |
| Start Up Time                                    | 5mSec Maximum                                                                                                                                                                                                   |
| Storage Temperature Range                        | -65°C to +150°C                                                                                                                                                                                                 |

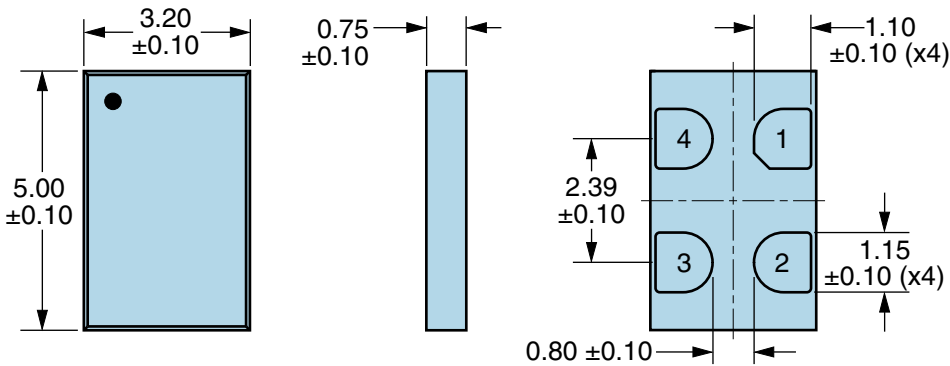
## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                      |                                                                    |
|----------------------|--------------------------------------------------------------------|
| ESD Susceptibility   | JESD22-A114, HBM, 2000V                                            |
| Flammability         | UL94-V0                                                            |
| Mechanical Shock     | MIL-STD-883, Method 2002, Condition E, 10,000G                     |
| Moisture Sensitivity | J-STD-020, MSL 1                                                   |
| Solderability        | MIL-STD-883, Method 2003 (Four I/O Pads on bottom of package only) |
| Temperature Cycling  | JESD22-A104, Condition B                                           |
| Vibration            | MIL-STD-883, Method 2007, Condition A, 20G                         |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)

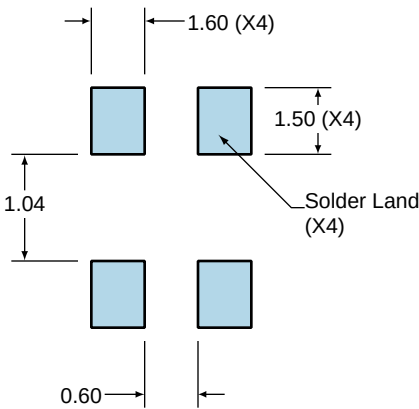


| PIN | CONNECTION                 |
|-----|----------------------------|
| 1   | Tri-State (High Impedance) |
| 2   | Ground                     |
| 3   | Output                     |
| 4   | Supply Voltage             |

| LINE | MARKING                           |
|------|-----------------------------------|
| 1    | Ecliptek Manufacturing Identifier |

Suggested Solder Pad Layout

All Dimensions in Millimeters

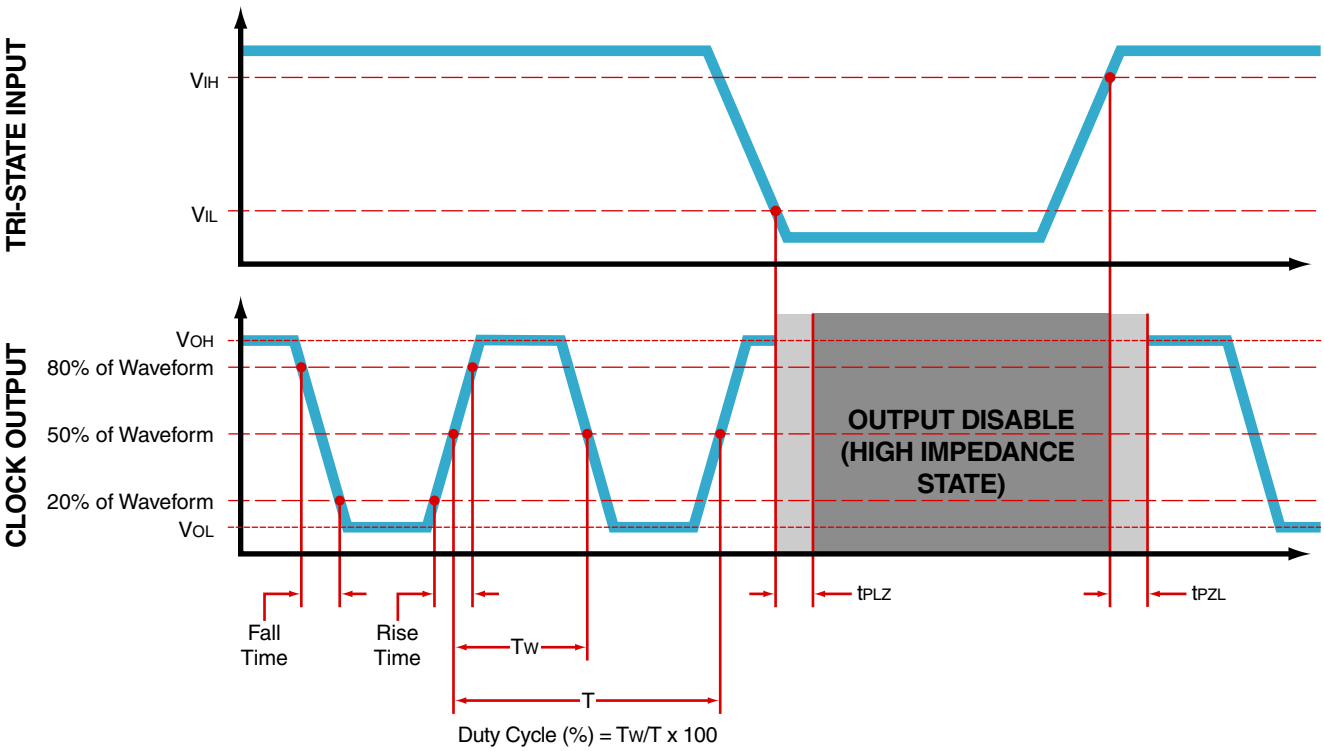


All Tolerances are ±0.1

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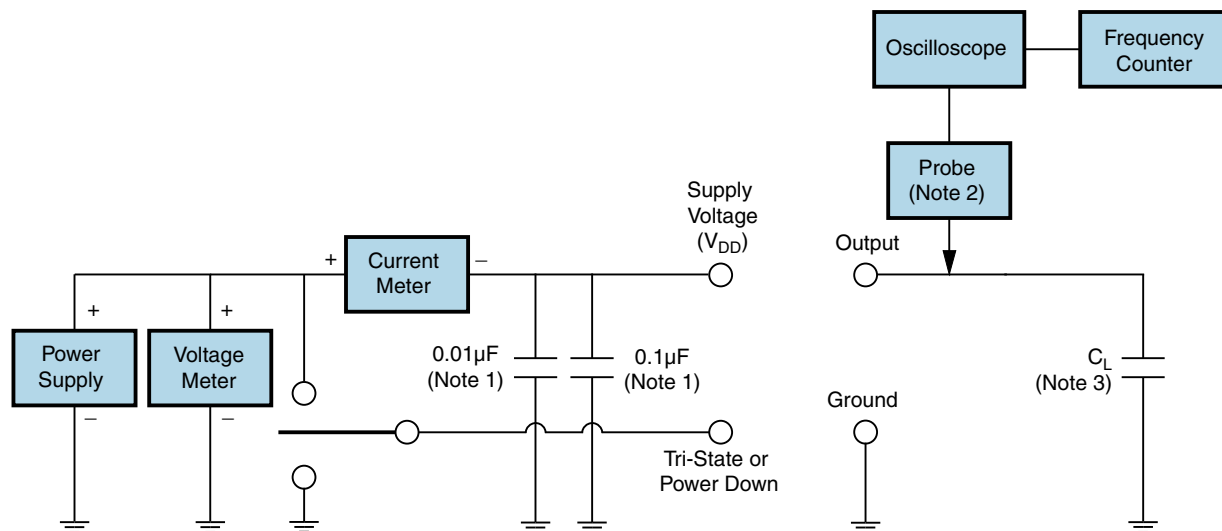
OUTPUT WAVEFORM & TIMING DIAGRAM



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## 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 input 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. See applicable specification sheet for 'Load Drive Capability'.

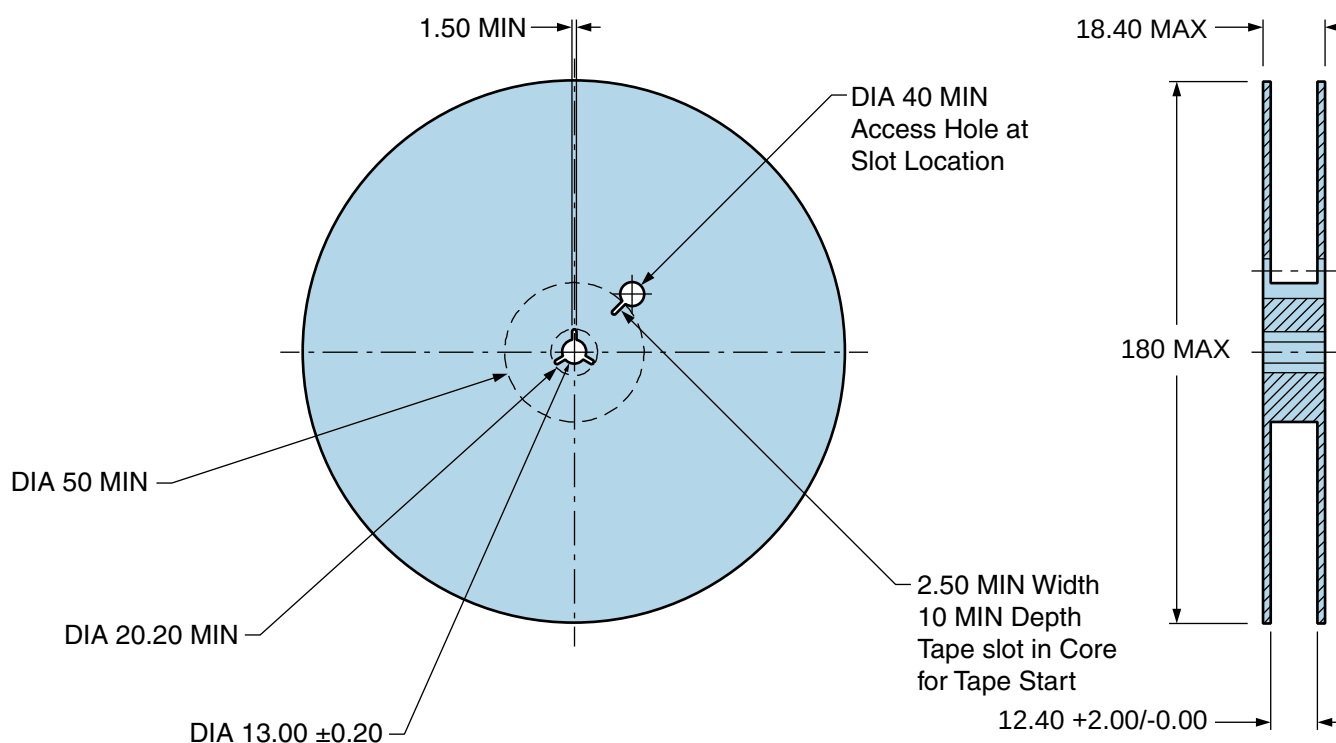
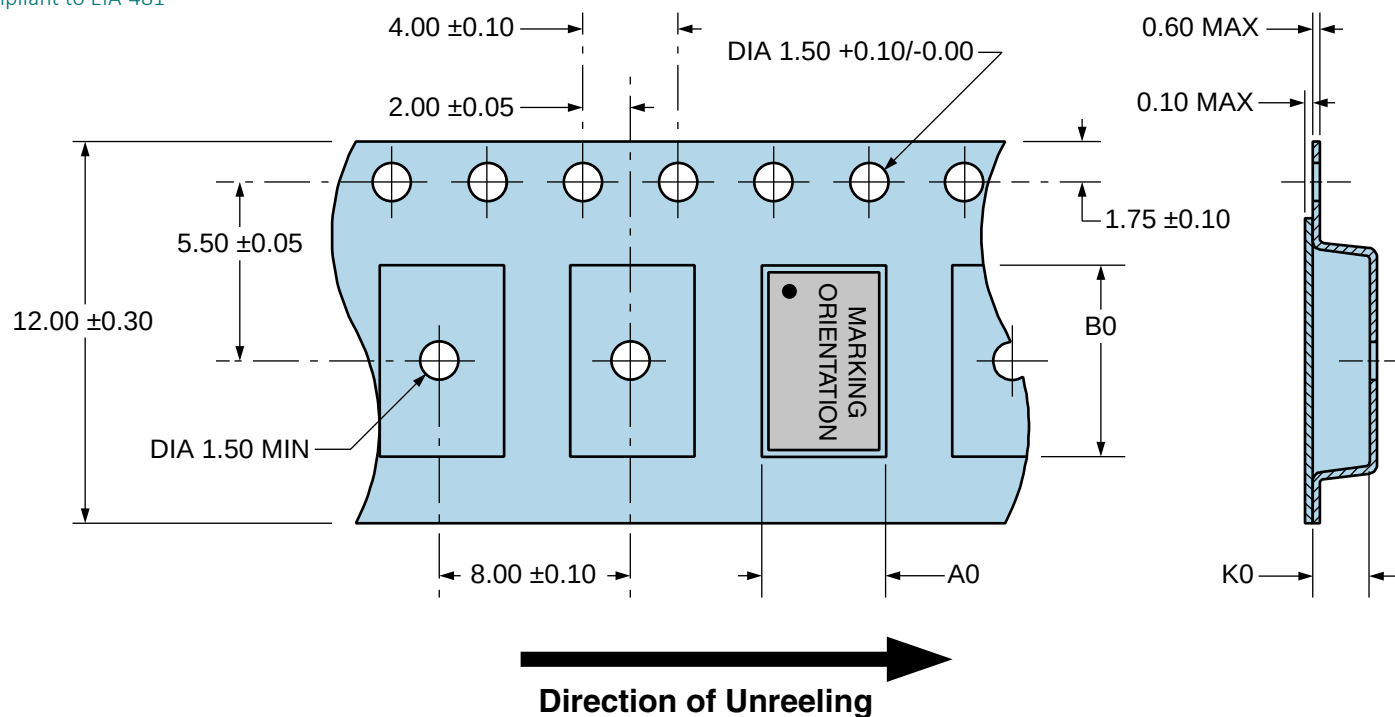
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## Tape & Reel Dimensions

Quantity Per Reel: 1,000 units

All Dimensions in Millimeters

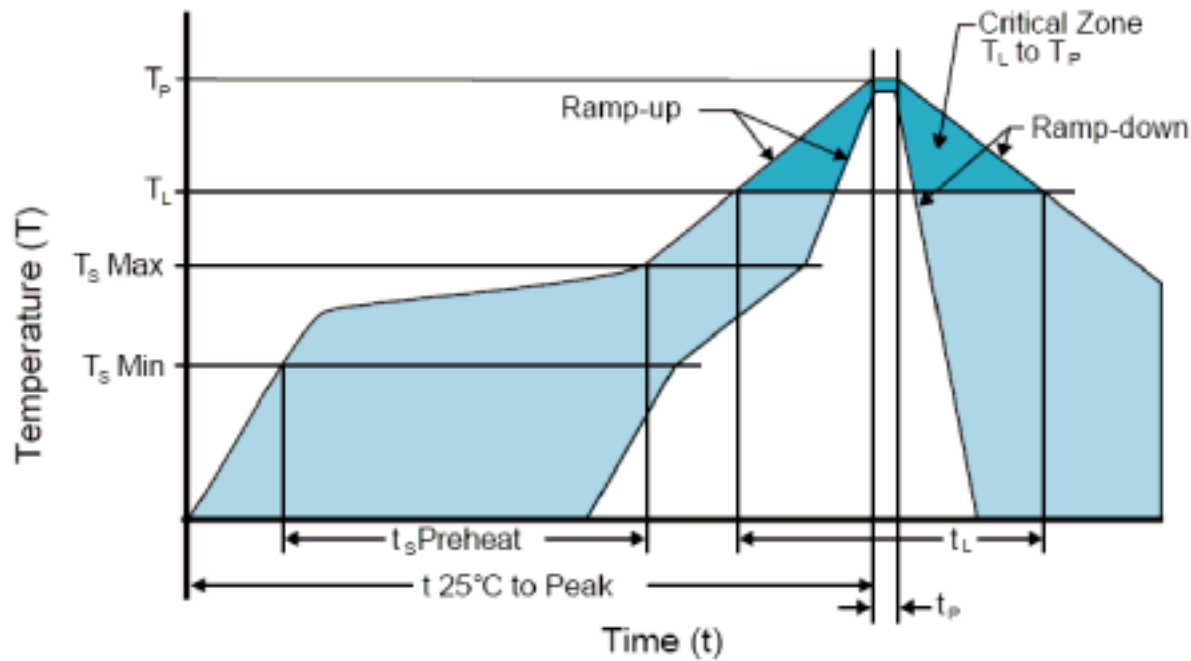
Compliant to EIA-481



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Recommended Solder Reflow Methods



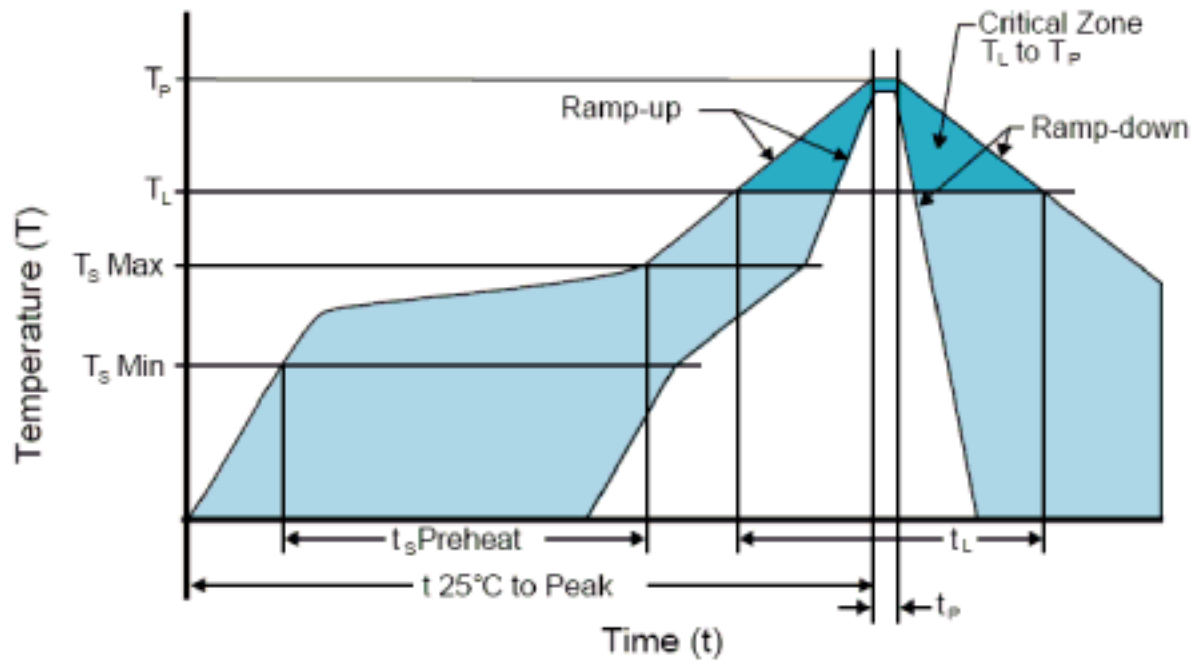
High Temperature Infrared/Convection

|                                     |                                                  |
|-------------------------------------|--------------------------------------------------|
| Ts MAX to TL (Ramp-up Rate)         | 3°C/Second Maximum                               |
| Preheat                             |                                                  |
| - Temperature Minimum (Ts MIN)      | 150°C                                            |
| - Temperature Typical (Ts TYP)      | 175°C                                            |
| - Temperature Maximum (Ts MAX)      | 200°C                                            |
| - Time (ts MIN)                     | 60 - 180 Seconds                                 |
| Ramp-up Rate (TL to TP)             | 3°C/Second Maximum                               |
| Time Maintained Above:              |                                                  |
| - Temperature (TL)                  | 217°C                                            |
| - Time (tL)                         | 60 - 150 Seconds                                 |
| Peak Temperature (TP)               | 260°C Maximum for 10 Seconds Maximum             |
| Target Peak Temperature (TP Target) | 250°C +0/-5°C                                    |
| Time within 5°C of actual peak (tp) | 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                    | Temperature 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                    | Temperature shown are applied to body of device.       |

Low Temperature Manual Soldering

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

High Temperature Manual Soldering

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

# Mouser Electronics

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#### Как с нами связаться

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