

EPH1100TSC-13.560M

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REGULATORY COMPLIANCE (Data Sheet downloaded on May 22, 2017)


[Click badges to download compliance docs](#)

Regulatory Compliance standards are subject to updates by governing bodies. Click the badges to download the latest compliance docs for this part number directly from Ecliptek.



ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) HCMOS/TTL (CMOS) 5.0Vdc 8 Pin DIP Metal Thru-Hole 13.560MHz \pm 100ppm -20°C to +70°C

ELECTRICAL SPECIFICATIONS

| | |
|-----------------------------------|--|
| Nominal Frequency | 13.560MHz |
| Frequency Tolerance/Stability | \pm 100ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration) |
| Aging at 25°C | \pm 5ppm/year Maximum |
| Operating Temperature Range | -20°C to +70°C |
| Supply Voltage | 5.0Vdc \pm 10% |
| Input Current | 45mA Maximum (Unloaded) |
| Output Voltage Logic High (Voh) | Vdd-0.4Vdc Minimum (IOH = -16mA) |
| Output Voltage Logic Low (Vol) | 0.4Vdc Maximum (IOL = +16mA) |
| Rise/Fall Time | 4nSec Maximum (Measured at 20% to 80% of waveform) |
| Duty Cycle | 50 \pm 10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load) |
| Load Drive Capability | 50pF HCMOS Load Maximum |
| Output Logic Type | CMOS |
| Pin 1 Connection | Tri-State (Disabled Output: High Impedance) |
| Pin 1 Input Voltage (Vih and Vil) | +2.0Vdc Minimum to enable output, +0.8Vdc Maximum to disable output, No Connect to enable output. |
| Disable Current | 30mA Maximum (Pin 1 = Ground) |
| Peak to Peak Jitter (tPK) | 100pSec Maximum, 50pSec Typical |
| RMS Period Jitter (tRMS) | 13pSec Maximum, 8pSec Typical |
| Start Up Time | 10mSec Maximum |
| Storage Temperature Range | -55°C to +125°C |

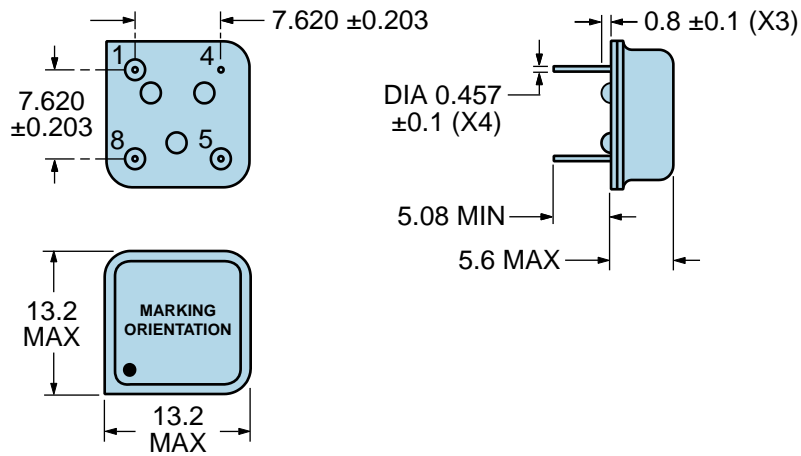
ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

| | |
|------------------------------|---------------------------------------|
| Fine Leak Test | MIL-STD-883, Method 1014, Condition A |
| Gross Leak Test | MIL-STD-883, Method 1014, Condition C |
| Lead Integrity | MIL-STD-883, Method 2004 |
| Mechanical Shock | MIL-STD-202, Method 213, Condition C |
| Resistance to Soldering Heat | MIL-STD-202, Method 210 |
| Resistance to Solvents | MIL-STD-202, Method 215 |
| Solderability | MIL-STD-883, Method 2003 |
| Temperature Cycling | MIL-STD-883, Method 1010 |
| Vibration | MIL-STD-883, Method 2007, Condition A |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)



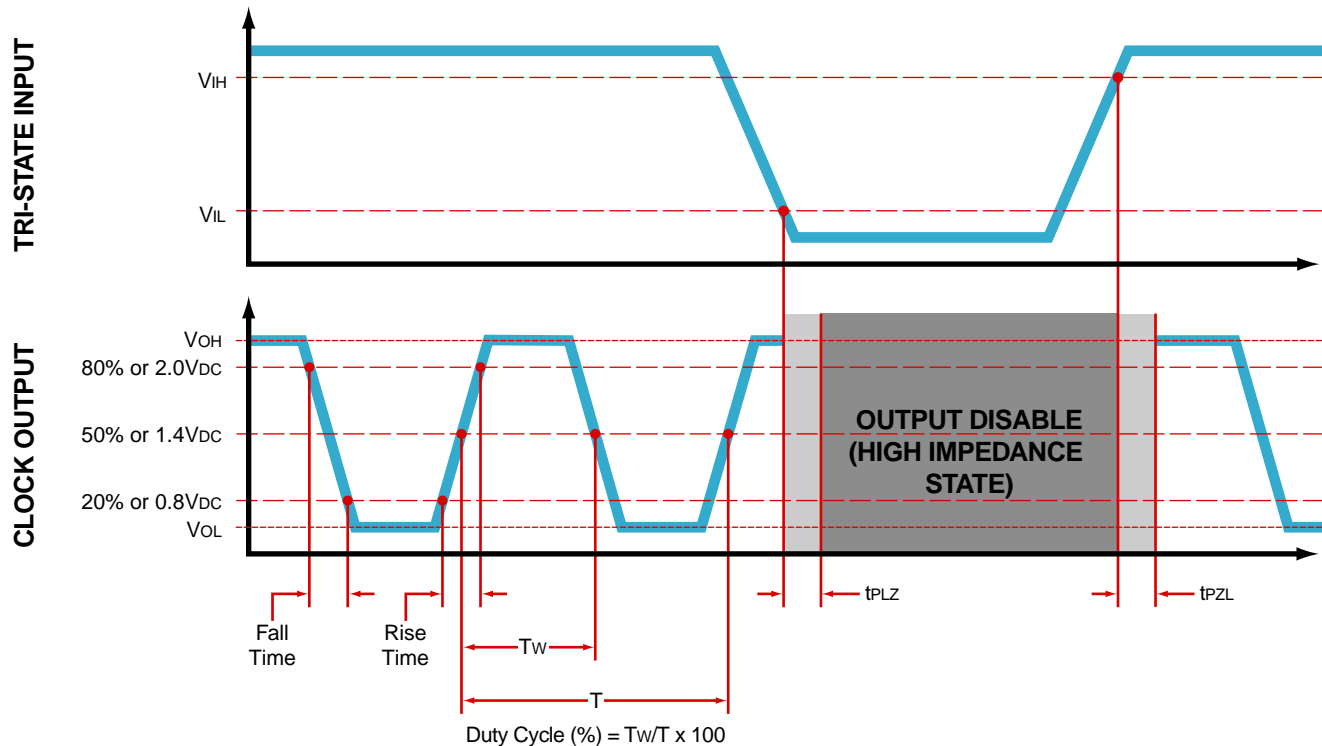
| PIN | CONNECTION |
|-----|----------------------------|
| 1 | Tri-State (High Impedance) |
| 4 | Ground/Case Ground |
| 5 | Output |
| 8 | Supply Voltage |

| LINE | MARKING |
|------|--|
| 1 | ECLIPTEK |
| 2 | 13.560M |
| 3 | XXXXX XXXXX=Ecliptek Manufacturing Identifier |

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OUTPUT WAVEFORM & TIMING DIAGRAM



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.

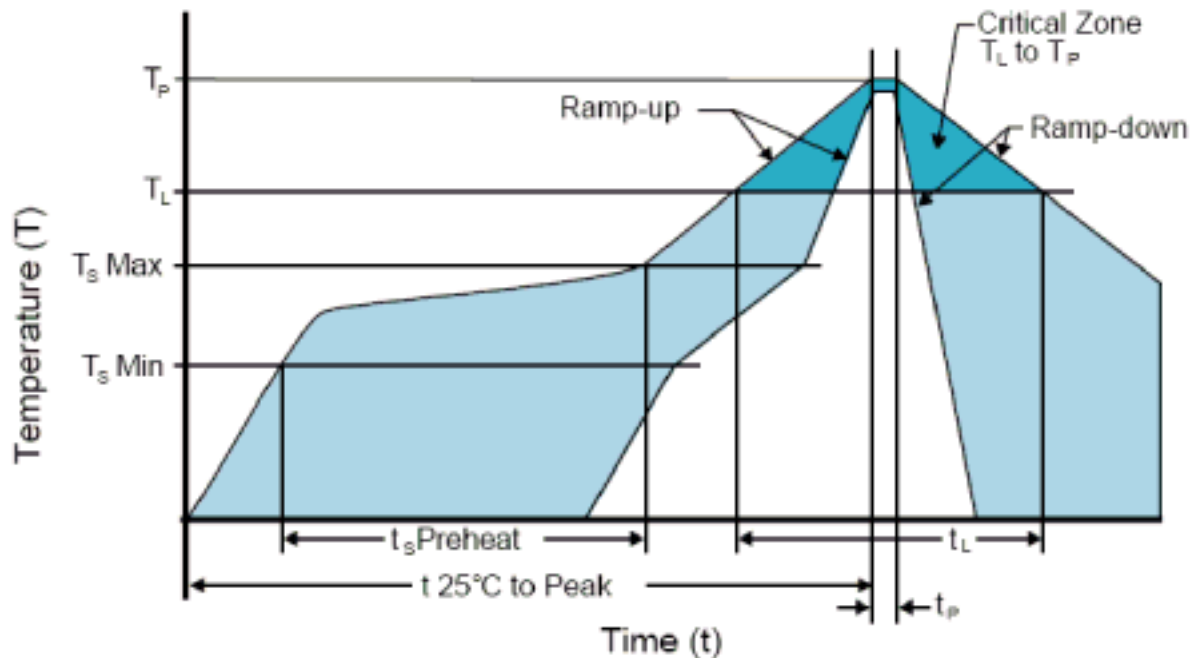
Note 2: A low input capacitance ($<12\text{pF}$), 10X Attenuation Factor, High Impedance ($>10\text{Mohms}$), and High bandwidth ($>300\text{MHz}$) passive probe is recommended.

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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Recommended Solder Reflow Methods



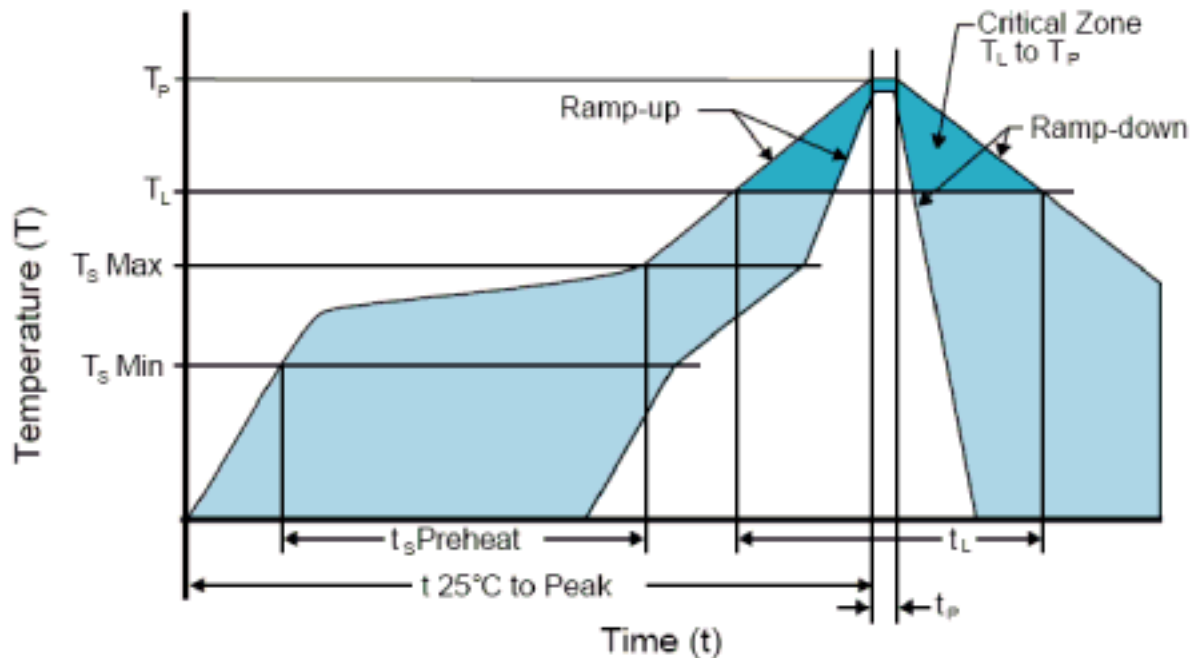
High Temperature Solder Bath (Wave Solder)

| | |
|--|--|
| $T_S \text{ MAX}$ to T_L (Ramp-up Rate) | 3°C/Second Maximum |
| Preheat | |
| - Temperature Minimum ($T_S \text{ MIN}$) | 150°C |
| - Temperature Typical ($T_S \text{ TYP}$) | 175°C |
| - Temperature Maximum ($T_S \text{ MAX}$) | 200°C |
| - Time ($t_s \text{ MIN}$) | 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 ($T_P \text{ Target}$) | 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 |
| Additional Notes | Temperatures shown are applied to back of PCB board and device leads only. Do not use this method for product with the Gull Wing option. |

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Recommended Solder Reflow Methods



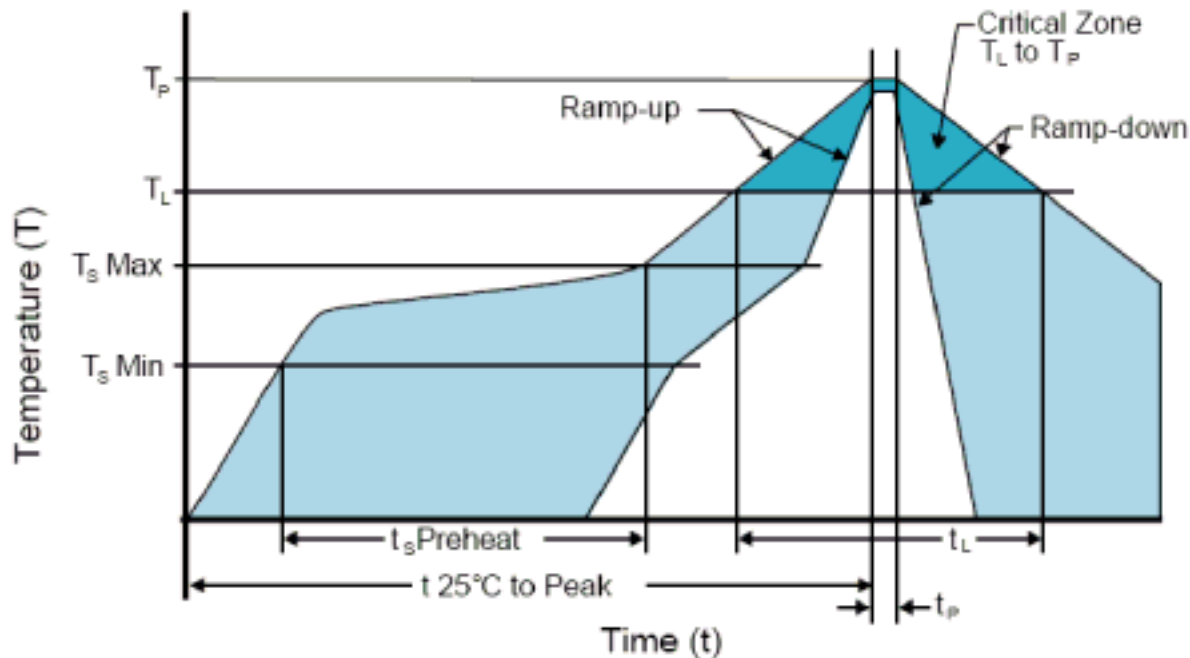
Low Temperature Infrared/Convection 185°C

| | |
|--|---|
| 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) | 185°C Maximum |
| Target Peak Temperature (T_P Target) | 185°C Maximum 2 Times |
| Time within 5°C of actual peak (t_p) | 10 Seconds Maximum 2 Times |
| 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. Use this method only for product with the Gull Wing option. |

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Recommended Solder Reflow Methods



Low Temperature Solder Bath (Wave Solder)

| | |
|--|--|
| 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) | 30 - 60 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) | 245°C Maximum |
| Target Peak Temperature (TP Target) | 245°C Maximum 1 Time / 235°C Maximum 2 Times |
| Time within 5°C of actual peak (tp) | 5 Seconds Maximum 1 Time / 15 Seconds Maximum 2 Times |
| 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 back of PCB board and device leads only. Do not use this method for product with the Gull Wing option. |

Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)