

**EH2500ETTS-125.000M**
[Click part number to visit Part Number Details page](#)
**REGULATORY COMPLIANCE** (Data Sheet downloaded on Apr 26, 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 4 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD) 125.000MHz  $\pm 100$ ppm -40°C to +85°C

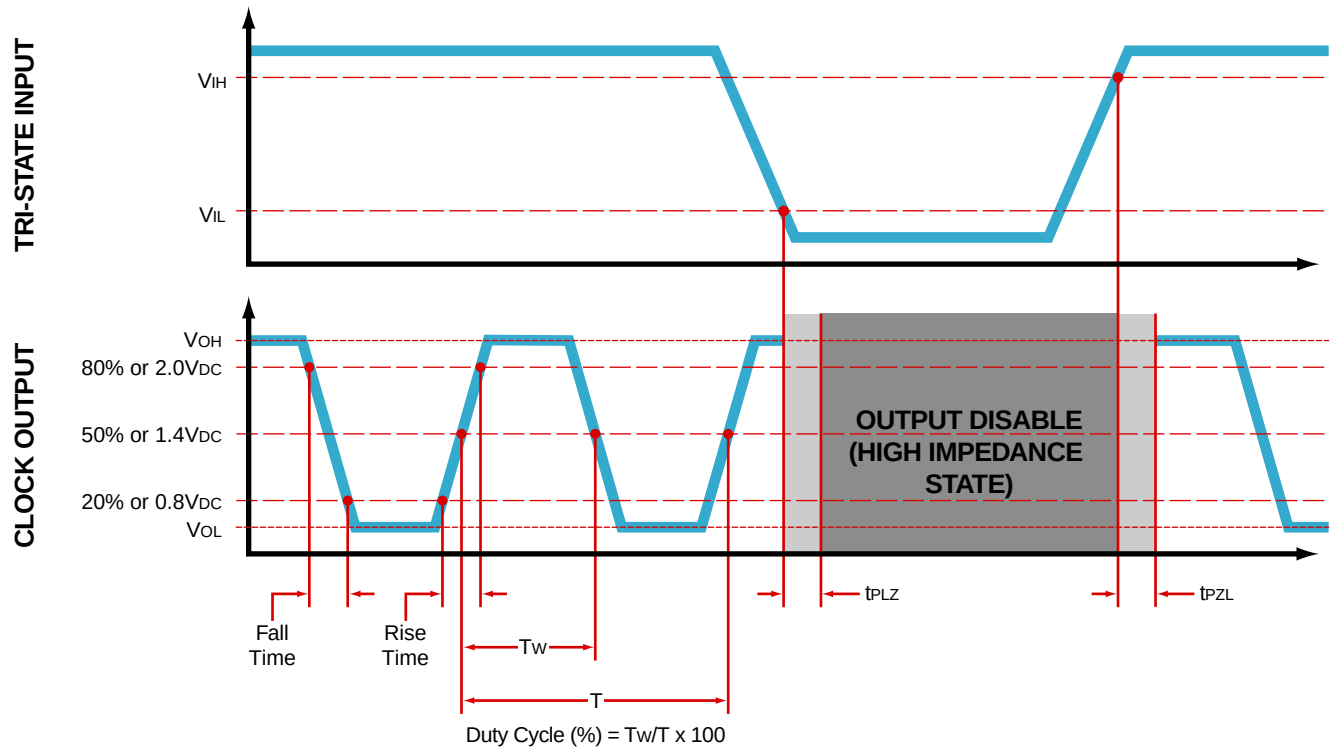
**ELECTRICAL SPECIFICATIONS**

|                                       |                                                                                                                                                                                                                                         |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 125.000MHz                                                                                                                                                                                                                              |
| Frequency Tolerance/Stability         | $\pm 100$ ppm 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                         | $\pm 5$ ppm/year Maximum                                                                                                                                                                                                                |
| Operating Temperature Range           | -40°C to +85°C                                                                                                                                                                                                                          |
| Supply Voltage                        | 5.0Vdc $\pm 10\%$                                                                                                                                                                                                                       |
| Input Current                         | 50mA Maximum (No Load)                                                                                                                                                                                                                  |
| Output Voltage Logic High (Voh)       | 2.4Vdc Minimum with TTL Load, Vdd-0.4Vdc Minimum with HCMOS Load (IOH= -16mA)                                                                                                                                                           |
| Output Voltage Logic Low (Vol)        | 0.4Vdc Maximum with TTL Load, 0.5Vdc Maximum with HCMOS Load (IOL= +16mA)                                                                                                                                                               |
| Rise/Fall Time                        | 4nSec Maximum (Measured at 0.8Vdc to 2.0Vdc with TTL Load; Measured at 20% to 80% of waveform with HCMOS Load)                                                                                                                          |
| Duty Cycle                            | 50 $\pm 5$ (%) (Measured at 50% of waveform with TTL Load or with HCMOS Load)                                                                                                                                                           |
| Load Drive Capability                 | 5TTL Load or 15pF HCMOS Load Maximum                                                                                                                                                                                                    |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                    |
| Pin 1 Connection                      | Tri-State (High Impedance)                                                                                                                                                                                                              |
| Tri-State Input Voltage (Vih and Vil) | +2.2Vdc Minimum to enable output, +0.8Vdc Maximum to disable output (High Impedance), No Connect to enable output.                                                                                                                      |
| Absolute Clock Jitter                 | $\pm 250$ pSec Maximum, $\pm 100$ pSec Typical                                                                                                                                                                                          |
| One Sigma Clock Period Jitter         | $\pm 50$ pSec Maximum, $\pm 30$ pSec Typical                                                                                                                                                                                            |
| Start Up Time                         | 10mSec Maximum                                                                                                                                                                                                                          |
| Storage Temperature Range             | -55°C to +125°C                                                                                                                                                                                                                         |

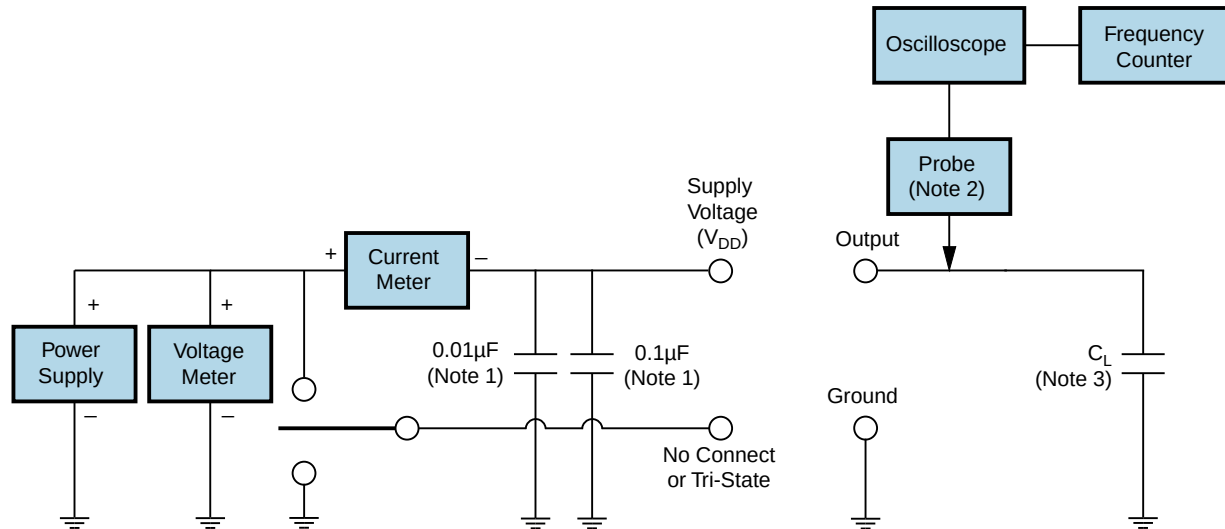
**ENVIRONMENTAL & MECHANICAL SPECIFICATIONS**

|                              |                                               |
|------------------------------|-----------------------------------------------|
| 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         |

1-800-ECLIPTEK or 714.433.1200





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**Test Circuit for CMOS Output**

Note 1: An external 0.1  $\mu\text{F}$  low frequency tantalum bypass capacitor in parallel with a 0.01  $\mu\text{F}$  high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

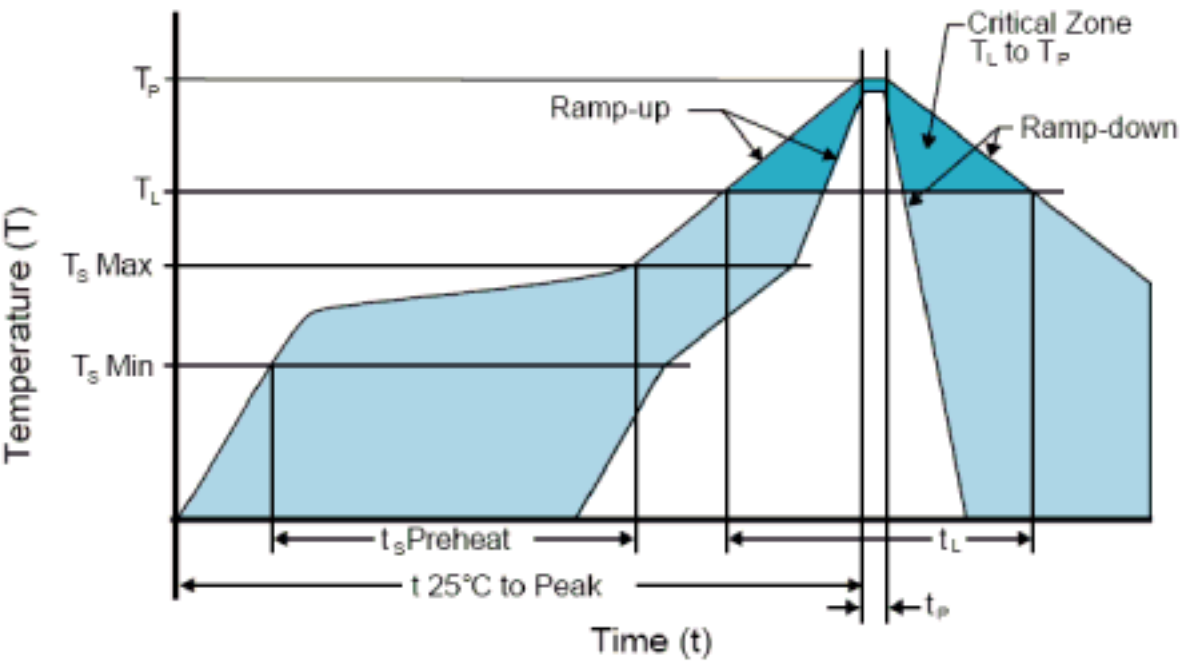
Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

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

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Recommended Solder Reflow Methods



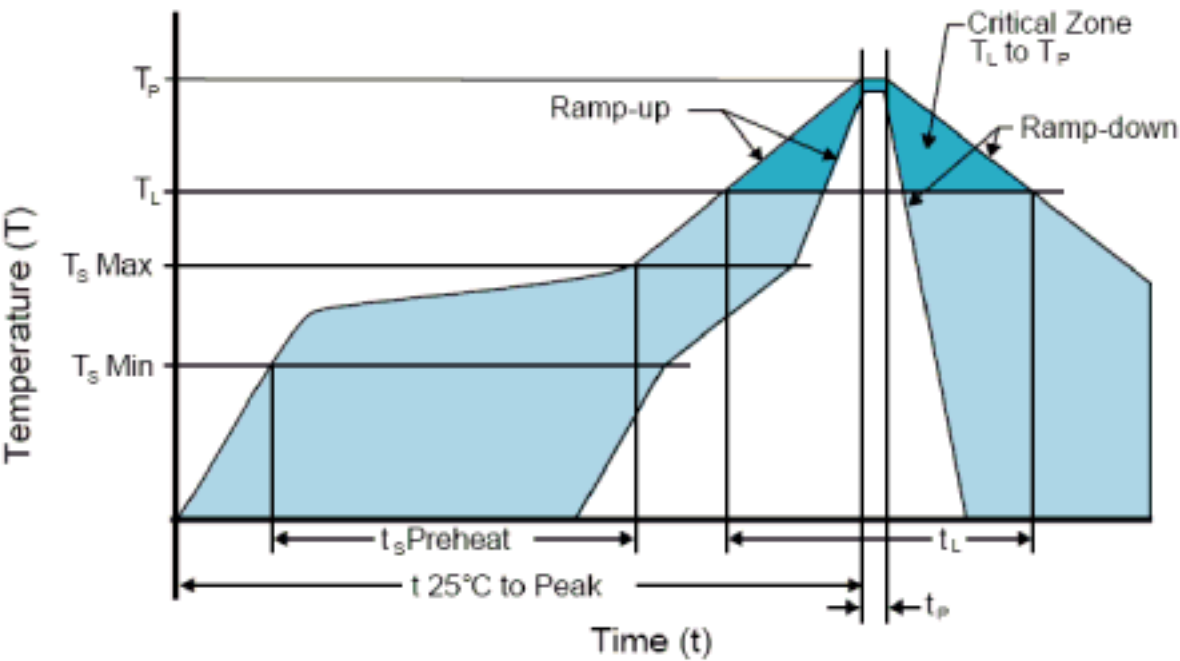
High Temperature Infrared/Convection

|                                     |                                                   |
|-------------------------------------|---------------------------------------------------|
| 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                    | Temperatures shown are applied to body of device. |

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Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 240°C

|                                                     |                                                        |
|-----------------------------------------------------|--------------------------------------------------------|
| T <sub>S</sub> MAX to T <sub>L</sub> (Ramp-up Rate) | 5°C/Second Maximum                                     |
| Preheat                                             |                                                        |
| - Temperature Minimum (T <sub>S</sub> MIN)          | N/A                                                    |
| - Temperature Typical (T <sub>S</sub> TYP)          | 150°C                                                  |
| - Temperature Maximum (T <sub>S</sub> MAX)          | N/A                                                    |
| - Time (t <sub>s</sub> MIN)                         | 60 - 120 Seconds                                       |
| Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> )    | 5°C/Second Maximum                                     |
| Time Maintained Above:                              |                                                        |
| - Temperature (T <sub>L</sub> )                     | 150°C                                                  |
| - Time (t <sub>L</sub> )                            | 200 Seconds Maximum                                    |
| Peak Temperature (T <sub>P</sub> )                  | 240°C Maximum                                          |
| Target Peak Temperature (T <sub>P</sub> Target)     | 240°C Maximum 2 Times / 230°C Maximum 1 Time           |
| Time within 5°C of actual peak (t <sub>P</sub> )    | 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.)