

**EC3900ETTS-12.000M**
[Click part number to visit Part Number Details page](#)
**REGULATORY COMPLIANCE** (Data Sheet downloaded on Feb 1, 2017)
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**ITEM DESCRIPTION**

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 1.8Vdc 4 Pad 3.2mm x 5.0mm Ceramic Surface Mount (SMD) 12.000MHz  $\pm 100$ ppm -40°C to +85°C

**ELECTRICAL SPECIFICATIONS**

|                                       |                                                                                                                                                                                                                                         |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 12.000MHz                                                                                                                                                                                                                               |
| 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) |
| Operating Temperature Range           | -40°C to +85°C                                                                                                                                                                                                                          |
| Supply Voltage                        | 1.8Vdc $\pm 5\%$                                                                                                                                                                                                                        |
| Input Current                         | 4mA Maximum                                                                                                                                                                                                                             |
| Output Voltage Logic High (Voh)       | 90% of Vdd Minimum (IOH = -4mA)                                                                                                                                                                                                         |
| Output Voltage Logic Low (Vol)        | 10% of Vdd Maximum (IOH = +4mA)                                                                                                                                                                                                         |
| Rise/Fall Time                        | 6nSec Maximum (Measured at 20% to 80% of waveform)                                                                                                                                                                                      |
| Duty Cycle                            | 50 $\pm 10\%$ (Measured at 50% of waveform)                                                                                                                                                                                             |
| Load Drive Capability                 | 15pF Maximum                                                                                                                                                                                                                            |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                    |
| Pin 1 Connection                      | Tri-State (High Impedance)                                                                                                                                                                                                              |
| Tri-State Input Voltage (Vih and Vil) | 90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High Impedance)                                                                                                                                |
| Standby Current                       | 10 $\mu$ A Maximum (Disabled Output: High Impedance)                                                                                                                                                                                    |
| RMS Phase Jitter                      | 1pSec Maximum (12kHz to 20MHz offset frequency)                                                                                                                                                                                         |
| 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         |

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MECHANICAL DIMENSIONS (all dimensions in millimeters)



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

| LINE | MARKING                                                        |
|------|----------------------------------------------------------------|
| 1    | <b>E12.000</b><br><i>E=Ecliptek Designator</i>                 |
| 2    | <b>XXXXX</b><br><i>XXXXX=Ecliptek Manufacturing Identifier</i> |

Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are ±0.1

OUTPUT WAVEFORM & TIMING DIAGRAM



**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 ( $<12\text{pF}$ ), 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.