

# EH1300HSTS-33.333M-CL100

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## REGULATORY COMPLIANCE (Data Sheet downloaded on Oct 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) LVCMOS (CMOS) 3.3Vdc 8 Pin DIP Metal Thru-Hole 33.333MHz  $\pm 100$ ppm 0°C to +70°C

## ELECTRICAL SPECIFICATIONS

|                                       |                                                                                                                                                                                                                                        |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 33.333MHz                                                                                                                                                                                                                              |
| 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, 1st Year Aging at 25°C, Shock, and Vibration.) |
| Aging at 25°C                         | $\pm 5$ ppm/year Maximum                                                                                                                                                                                                               |
| Operating Temperature Range           | 0°C to +70°C                                                                                                                                                                                                                           |
| Supply Voltage                        | 3.3Vdc $\pm 10\%$                                                                                                                                                                                                                      |
| Input Current                         | 35mA Maximum (No Load)                                                                                                                                                                                                                 |
| Output Voltage Logic High (Voh)       | 2.7Vdc Minimum (IOH = -8mA)                                                                                                                                                                                                            |
| Output Voltage Logic Low (Vol)        | 0.5Vdc Maximum (IOL = +8mA)                                                                                                                                                                                                            |
| 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                 | 30pF Maximum                                                                                                                                                                                                                           |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                   |
| Pin 1 Connection                      | Tri-State (Disabled Output: High Impedance)                                                                                                                                                                                            |
| Tri-State Input Voltage (Vih and Vil) | 70% of Vdd Minimum to enable output, 20% of Vdd 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, $\pm 40$ pSec Typical                                                                                                                                                                                           |
| Start Up Time                         | 10mSec Maximum                                                                                                                                                                                                                         |
| Storage Temperature Range             | -55°C to +125°C                                                                                                                                                                                                                        |

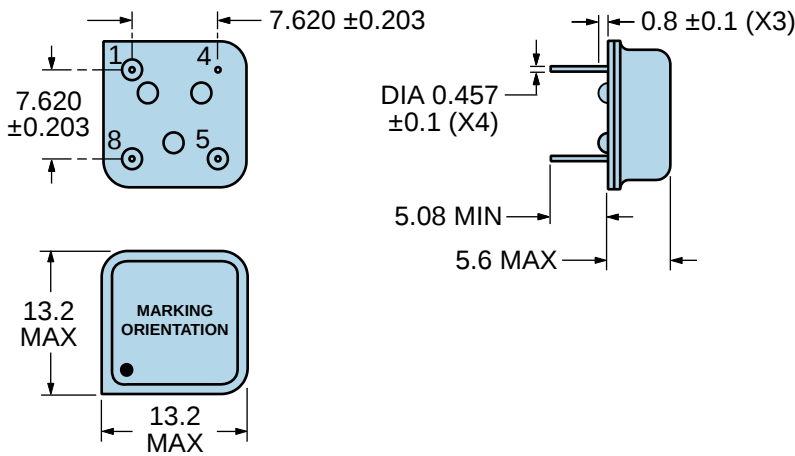
## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                              |                                       |
|------------------------------|---------------------------------------|
| 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   | Case/Ground                |
| 5   | Output                     |
| 8   | Supply Voltage             |

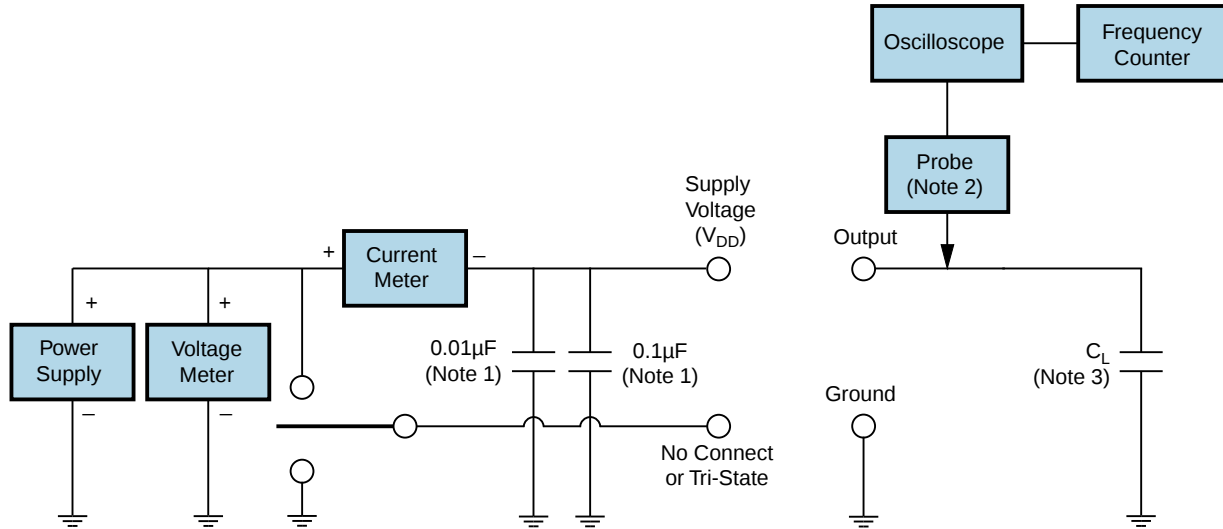
| LINE | MARKING                                                                                     |
|------|---------------------------------------------------------------------------------------------|
| 1    | ECLIPTEK                                                                                    |
| 2    | EH13TS<br>EH13=Product Series                                                               |
| 3    | 33.333M                                                                                     |
| 4    | XXYYZZ<br>XX=Ecliptek Manufacturing Code<br>Y=Last Digit of the Year<br>ZZ=Week of the Year |

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OUTPUT WAVEFORM & TIMING DIAGRAM

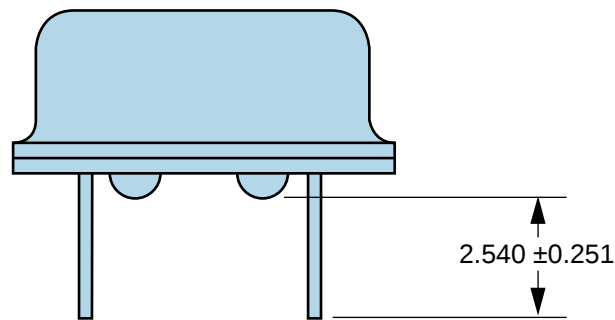


**Test Circuit for CMOS Output**

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.

**Value Added Option - Cut Leads**

All dimensions are in millimeters

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Recommended Solder Reflow Methods



High Temperature Solder Bath (Wave Solder)

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

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Recommended Solder Reflow Methods



Low Temperature Infrared/Convection 185°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)               | 185°C Maximum              |
| Target Peak Temperature (TP Target) | 185°C Maximum 2 Times      |
| Time within 5°C of actual peak (tp) | 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                    |

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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                                               |

Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum.

High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum.