

**EH1520SJETTS-45.000M TR**
[Click part number to visit Part Number Details page](#)
**REGULATORY COMPLIANCE** (Data Sheet downloaded on May 1, 2018)
[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 J-Lead 9.8mm x 14.0mm Plastic Surface Mount (SMD) 45.000MHz  $\pm 20$ ppm -40°C to +85°C

**ELECTRICAL SPECIFICATIONS**

|                                       |                                                                                                                                                                                                                                        |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 45.000MHz                                                                                                                                                                                                                              |
| Frequency Tolerance/Stability         | $\pm 20$ 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                        | 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 (High Impedance)                                                                                                                                                                                                             |
| Tri-State Input Voltage (Vih and Vil) | 70% of Vdd Minimum to enable output, 20% of Vdd Maximum to disable output, 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                                                                                                                                                                                                                        |

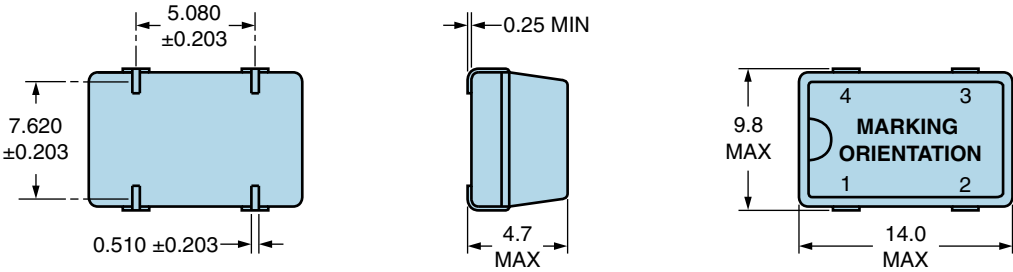
**ENVIRONMENTAL & MECHANICAL SPECIFICATIONS**

|                              |                                                               |
|------------------------------|---------------------------------------------------------------|
| ESD Susceptibility           | MIL-STD-883, Method 3015, Class 1, HBM: 1500V                 |
| Fine Leak Test               | MIL-STD-883, Method 1014, Condition A (Internal Crystal Only) |
| Flammability                 | UL94-V0                                                       |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C (Internal Crystal Only) |
| Mechanical Shock             | MIL-STD-202, Method 213, Condition C                          |
| Moisture Resistance          | MIL-STD-883, Method 1004                                      |
| 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)

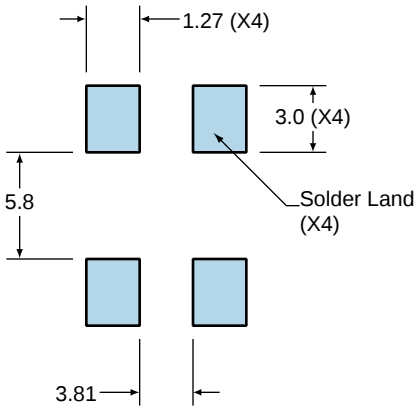


| PIN | CONNECTION                 |
|-----|----------------------------|
| 1   | Tri-State (High Impedance) |
| 2   | Ground                     |
| 3   | Output                     |
| 4   | Supply Voltage             |

| LINE | MARKING                                               |
|------|-------------------------------------------------------|
| 1    | ECLIPTEK                                              |
| 2    | 45.000M                                               |
| 3    | XXXXXX<br>XXXXXX=Ecliptek<br>Manufacturing Identifier |

Suggested Solder Pad Layout

All Dimensions in Millimeters



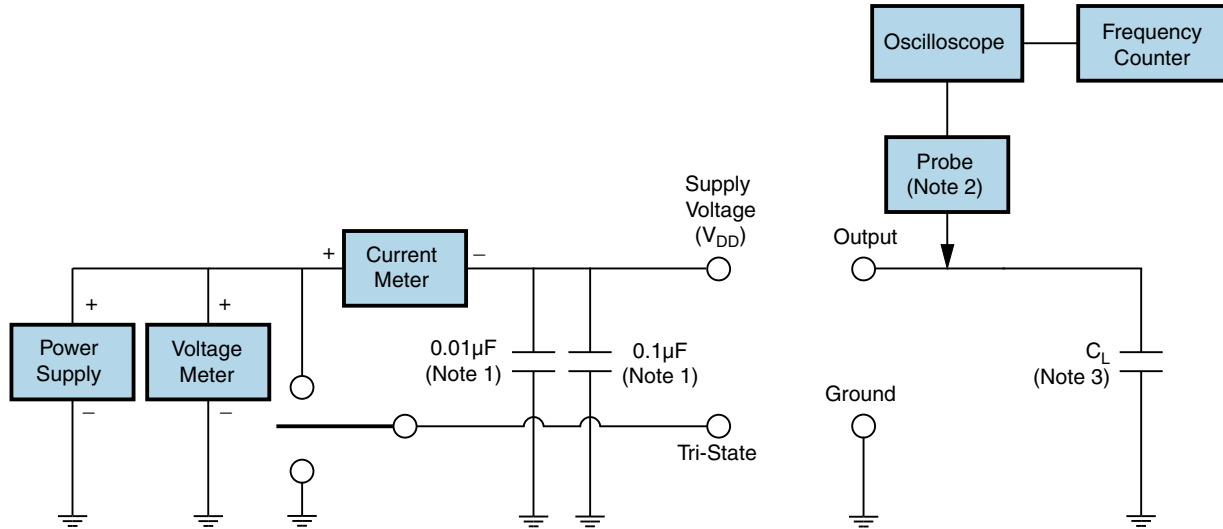
All Tolerances are ±0.1

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OUTPUT WAVEFORM & TIMING DIAGRAM



**Test Circuit for CMOS Output**

Note 1: An external  $0.01\mu F$  ceramic bypass capacitor in parallel with a  $0.1\mu F$  high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage 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.

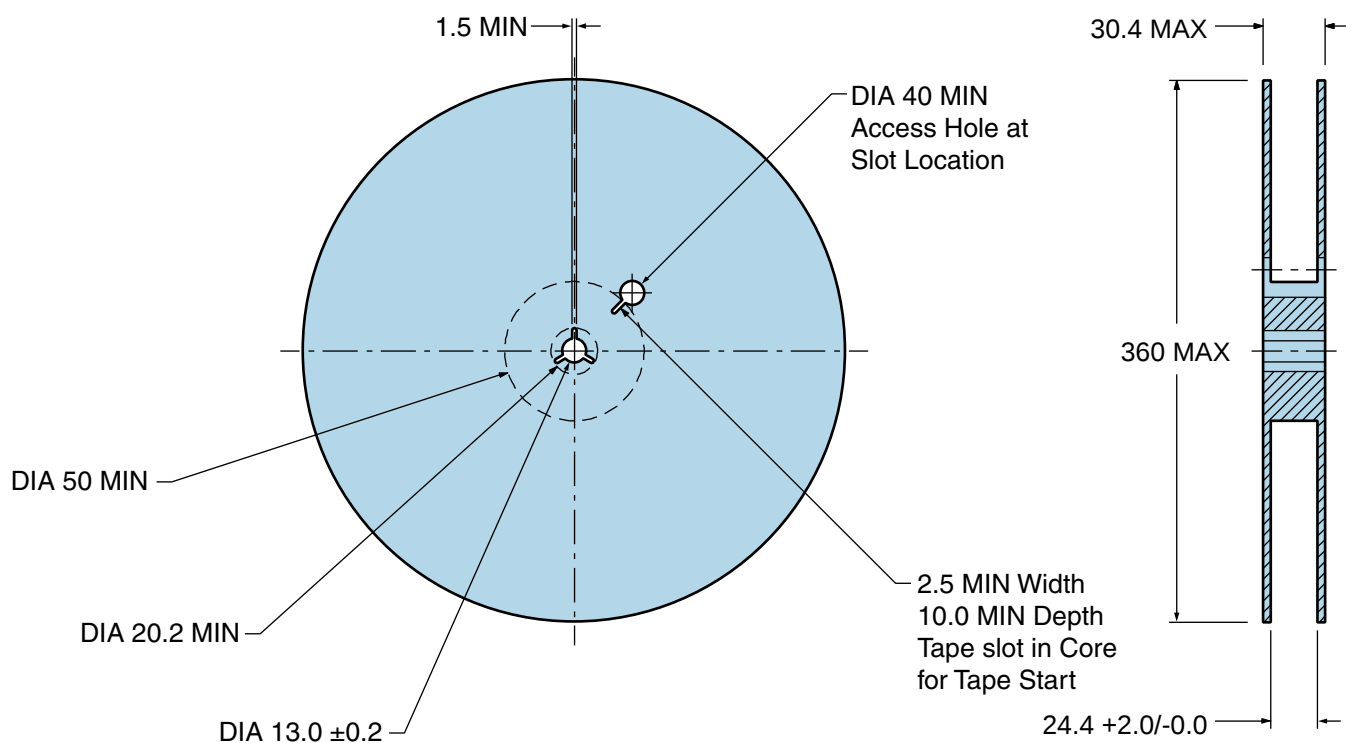
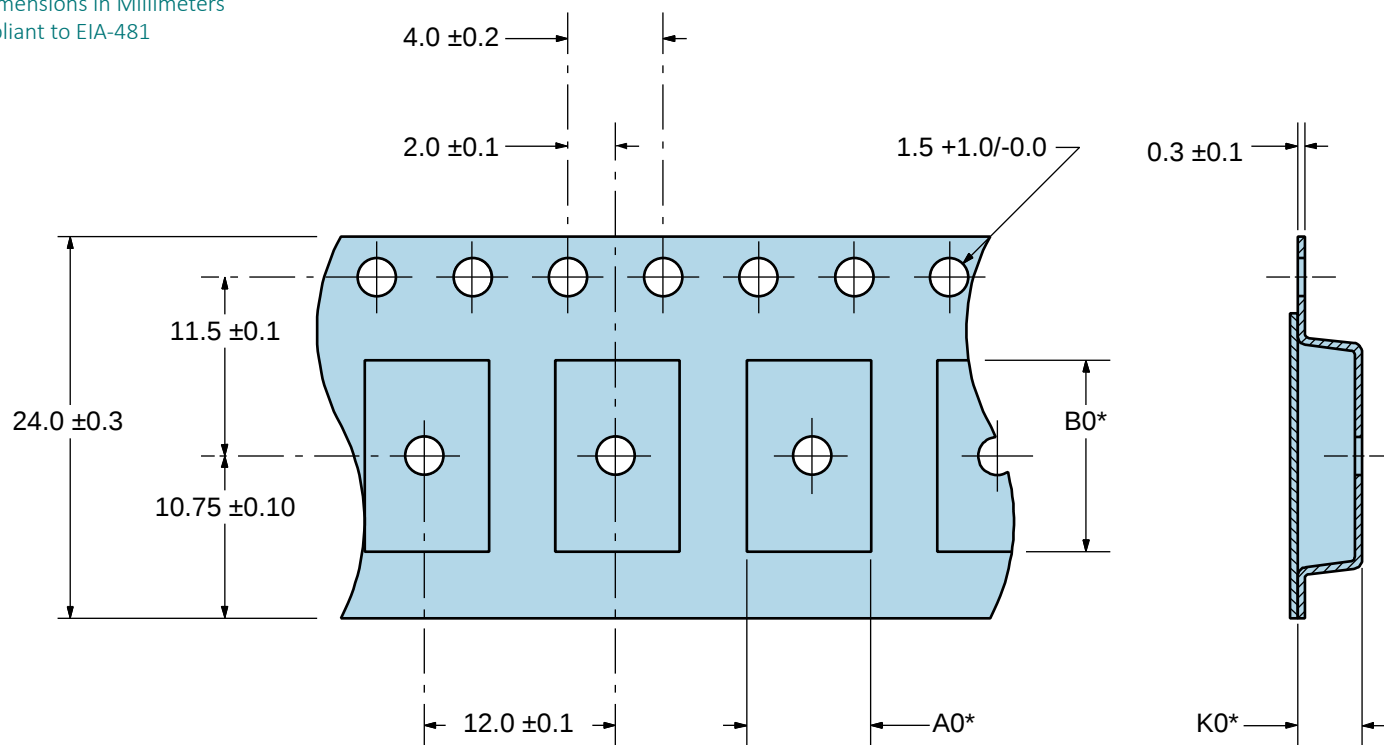
# EH1520SJETS-45.000M TR

## 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



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                                                |

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.