

# EH1300HSTS-4.9152M-G2



## ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 3.3Vdc 8 Pin DIP Metal Thru-Hole 4.9152MHz  $\pm 100$ ppm 0°C to +70°C

## ELECTRICAL SPECIFICATIONS

|                                       |                                                                                                                                                                                                                                        |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 4.9152MHz                                                                                                                                                                                                                              |
| 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)

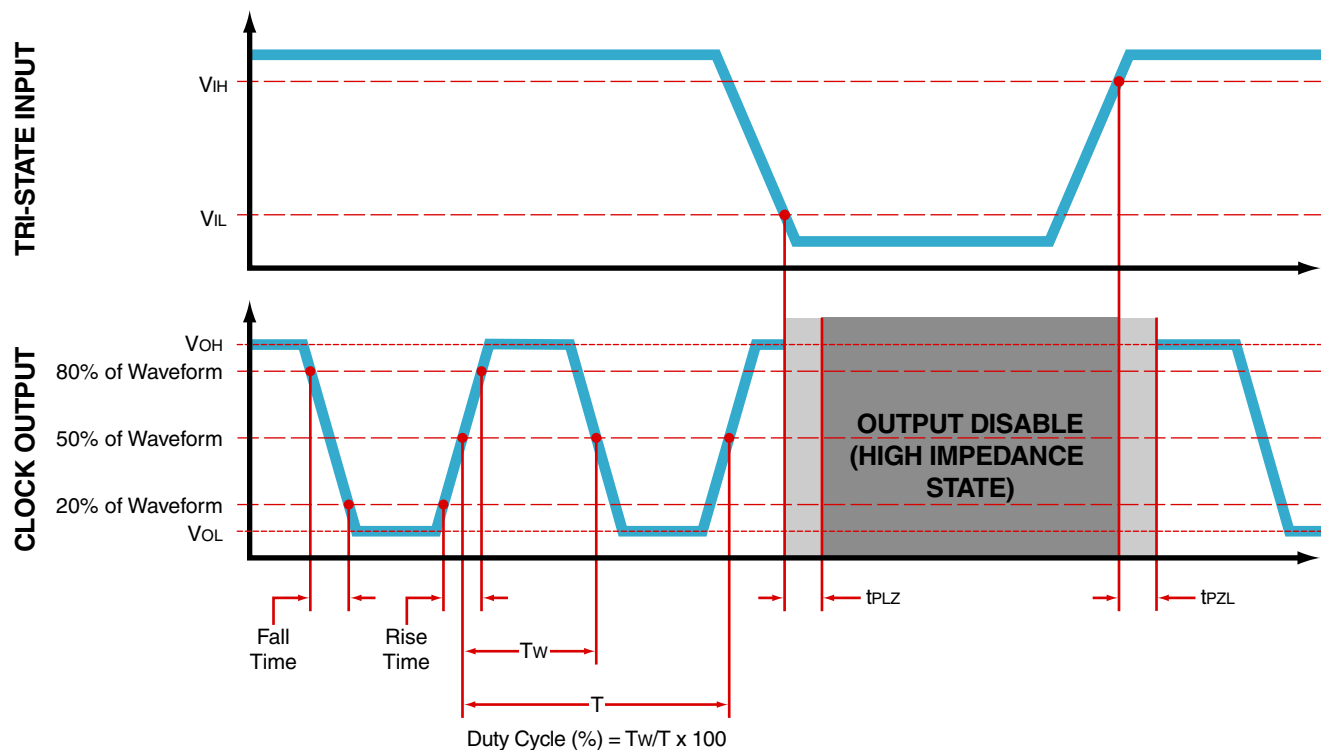


| PIN | CONNECTION                 |
|-----|----------------------------|
| 1   | Tri-State (High Impedance) |
| 4   | Case/Ground                |
| 5   | Output                     |
| 8   | Supply Voltage             |

| LINE | MARKING                                                                                     |
|------|---------------------------------------------------------------------------------------------|
| 1    | ECLIPTEK                                                                                    |
| 2    | EH13TS<br>EH13=Product Series                                                               |
| 3    | 4.9152M                                                                                     |
| 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



# EH1300HSTS-4.9152M-G2

## Test Circuit for CMOS Output



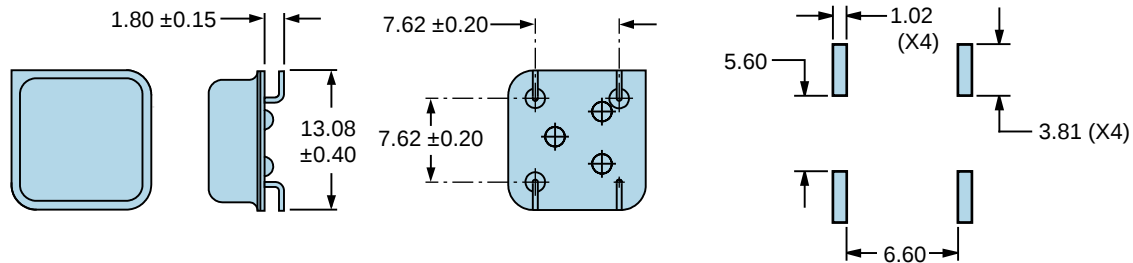
Note 1: An external 0.1 $\mu$ F low frequency tantalum bypass capacitor in parallel with a 0.01 $\mu$ F high frequency ceramic bypass capacitor close to the package ground and  $V_{DD}$  pin is required.

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

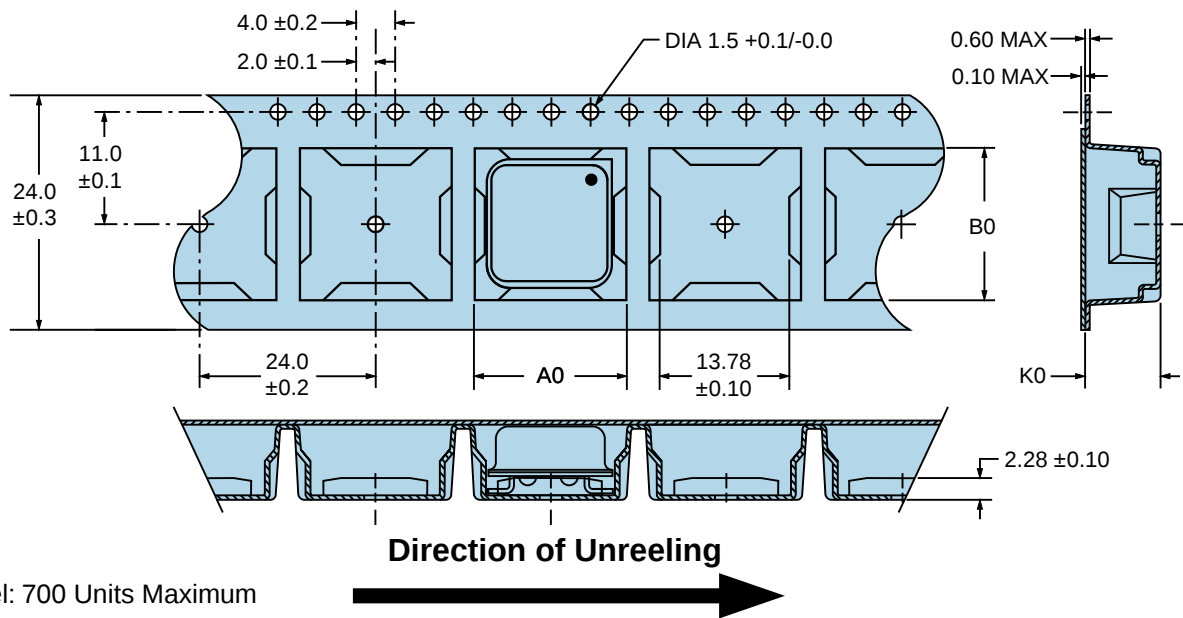
Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

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## Gull Wing Option G Dimensions & Recommended Solder Pad Layout

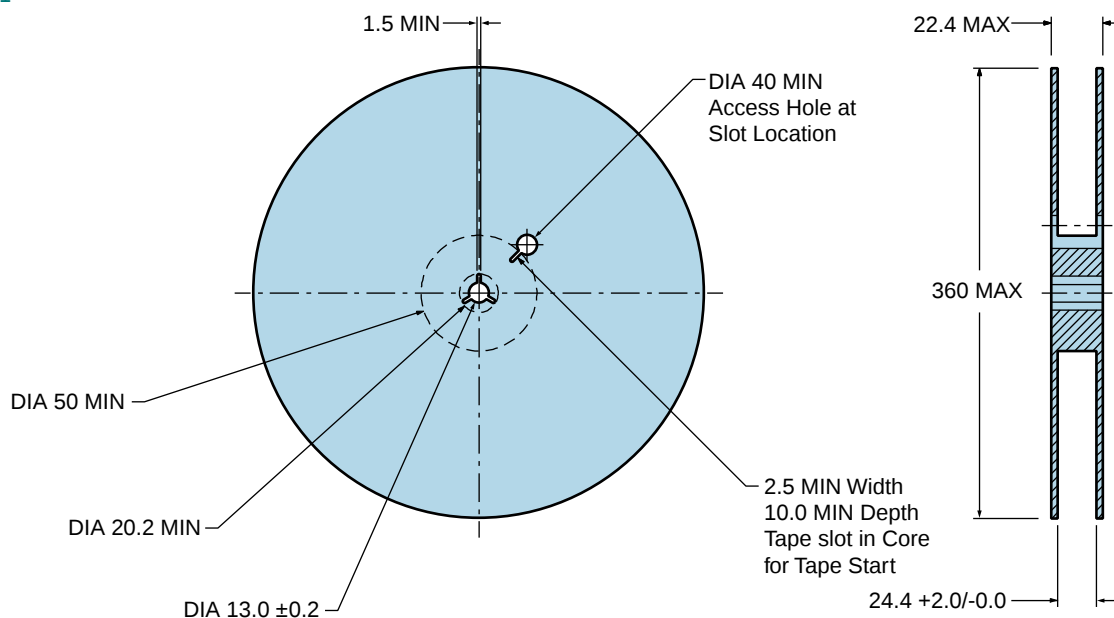


## Tape & Reel Dimensions



Quantity Per Reel: 700 Units Maximum

All Dimensions in Millimeters  
Compliant to EIA-481



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## Recommended Solder Reflow Methods



### High Temperature Solder Bath (Wave Solder) Time (t)

**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**

|                                    |                    |
|------------------------------------|--------------------|
| <b>Ts MAX to Tl (Ramp-up Rate)</b> | 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 |

|                                |                    |
|--------------------------------|--------------------|
| <b>Ramp-up Rate (Tl to Tp)</b> | 5°C/Second Maximum |
|--------------------------------|--------------------|

**Time Maintained Above:**

|                    |                     |
|--------------------|---------------------|
| - Temperature (Tl) | 150°C               |
| - Time (tL)        | 200 Seconds Maximum |

|                              |               |
|------------------------------|---------------|
| <b>Peak Temperature (Tp)</b> | 185°C Maximum |
|------------------------------|---------------|

|                                            |                       |
|--------------------------------------------|-----------------------|
| <b>Target Peak Temperature (Tp Target)</b> | 185°C Maximum 2 Times |
|--------------------------------------------|-----------------------|

|                                            |                            |
|--------------------------------------------|----------------------------|
| <b>Time within 5°C of actual peak (tp)</b> | 10 Seconds Maximum 2 Times |
|--------------------------------------------|----------------------------|

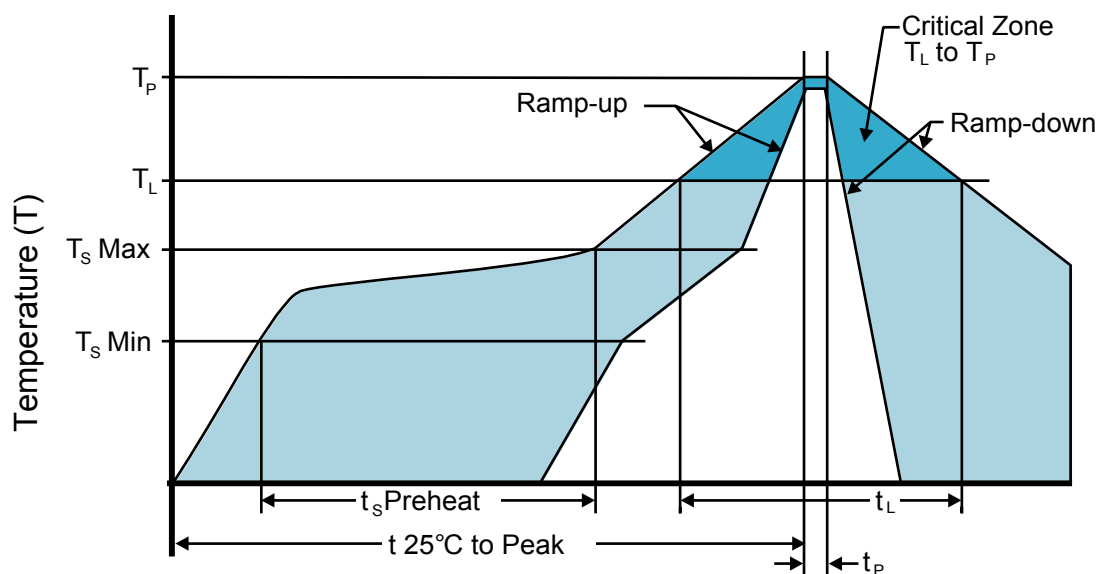
|                       |                    |
|-----------------------|--------------------|
| <b>Ramp-down Rate</b> | 5°C/Second Maximum |
|-----------------------|--------------------|

|                                          |     |
|------------------------------------------|-----|
| <b>Time 25°C to Peak Temperature (t)</b> | N/A |
|------------------------------------------|-----|

|                                   |         |
|-----------------------------------|---------|
| <b>Moisture Sensitivity Level</b> | Level 1 |
|-----------------------------------|---------|

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## Recommended Solder Reflow Methods



### Low Temperature Solder Bath (Wave Solder) Time (t)

**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.