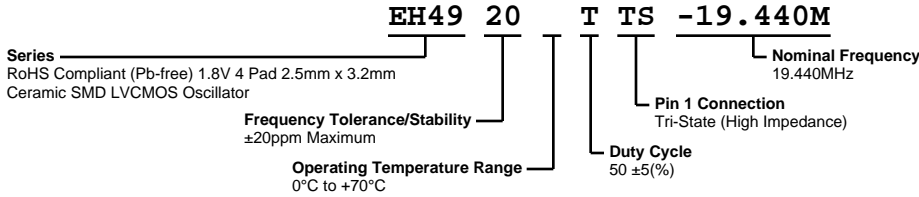


# EH4920TTS-19.440M



**ECLIPTEK**<sup>®</sup>  
CORPORATION



## ELECTRICAL SPECIFICATIONS

|  |   |
|--|---|
| <b>Nominal Frequency</b>                     | 19.440MHz   |
| <b>Frequency Tolerance/Stability</b>         | ±20ppm 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°, 260°C Reflow, Shock, and Vibration) |
| <b>Aging at 25°C</b>                         | ±5ppm/Year Maximum  |
| <b>Operating Temperature Range</b>           | 0°C to +70°C  |
| <b>Supply Voltage</b>                        | 1.8Vdc ±5%  |
| <b>Input Current</b>                         | 3.5mA Maximum (No Load)   |
| <b>Output Voltage Logic High (Voh)</b>       | 90% of Vdd Minimum (IOH = -8mA)   |
| <b>Output Voltage Logic Low (Vol)</b>        | 10% of Vdd Maximum (IOL = +8mA)   |
| <b>Rise/Fall Time</b>                        | 6nSec Maximum (Measured at 20% to 80% of waveform)  |
| <b>Duty Cycle</b>                            | 50 ±5% (Measured at 50% of waveform)  |
| <b>Load Drive Capability</b>                 | 15pF Maximum  |
| <b>Output Logic Type</b>                     | CMOS  |
| <b>Pin 1 Connection</b>                      | Tri-State (High Impedance)  |
| <b>Tri-State Input Voltage (Vih and Vil)</b> | 90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High Impedance)  |
| <b>Standby Current</b>                       | 10µA Maximum (Pin 1 = Ground)   |
| <b>Absolute Clock Jitter</b>                 | ±125pSec Maximum  |
| <b>Start Up Time</b>                         | 10mSec Maximum  |
| <b>Storage Temperature Range</b>             | -55°C to +125°C   |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                                     |   |
|-------------------------------------|---|
| <b>ESD Susceptibility</b>           | MIL-STD-883, Method 3015, Class 1, HBM: 1500Vdc |
| <b>Fine Leak Test</b>               | MIL-STD-883, Method 1014, Condition A           |
| <b>Flammability</b>                 | UL94-V0   |
| <b>Gross Leak Test</b>              | MIL-STD-883, Method 1014, Condition C           |
| <b>Mechanical Shock</b>             | MIL-STD-883, Method 2002, Condition B           |
| <b>Moisture Resistance</b>          | MIL-STD-883, Method 1004                        |
| <b>Moisture Sensitivity</b>         | J-STD-020, MSL 1                                |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210, Condition K            |
| <b>Resistance to Solvents</b>       | MIL-STD-202, Method 215                         |
| <b>Solderability</b>                | MIL-STD-883, Method 2003                        |
| <b>Temperature Cycling</b>          | MIL-STD-883, Method 1010, Condition B           |
| <b>Vibration</b>                    | MIL-STD-883, Method 2007, Condition A           |

# EH4920TTS-19.440M

## MECHANICAL DIMENSIONS (all dimensions in millimeters)



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

| LINE | MARKING   |
|------|---|
| 1    | EPO   |
| 2    | XXXXX<br>XXXXX=Ecliptek<br>Manufacturing Identifier |

## Suggested Solder Pad Layout

All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

## OUTPUT WAVEFORM & TIMING DIAGRAM



## Test Circuit for CMOS Output



Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF 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.

## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|  |                                      |
|--|--------------------------------------|
| <b>T<sub>s</sub> MAX to T<sub>L</sub> (Ramp-up Rate)</b> | 3°C/second Maximum                   |
| <b>Preheat</b>   |                                      |
| - Temperature Minimum (T <sub>s</sub> MIN)               | 150°C                                |
| - Temperature Typical (T <sub>s</sub> TYP)               | 175°C                                |
| - Temperature Maximum (T <sub>s</sub> MAX)               | 200°C                                |
| - Time (t <sub>s</sub> MIN)                              | 60 - 180 Seconds                     |
| <b>Ramp-up Rate (T<sub>L</sub> to T<sub>p</sub>)</b>     | 3°C/second Maximum                   |
| <b>Time Maintained Above:</b>                            |                                      |
| - Temperature (T <sub>L</sub> )                          | 217°C                                |
| - Time (t <sub>L</sub> )                                 | 60 - 150 Seconds                     |
| <b>Peak Temperature (T<sub>p</sub>)</b>                  | 260°C Maximum for 10 Seconds Maximum |
| <b>Target Peak Temperature (T<sub>p</sub> Target)</b>    | 250°C +0/-5°C                        |
| <b>Time within 5°C of actual peak (t<sub>p</sub>)</b>    | 20 - 40 seconds                      |
| <b>Ramp-down Rate</b>                                    | 6°C/second Maximum                   |
| <b>Time 25°C to Peak Temperature (t)</b>                 | 8 minutes Maximum                    |
| <b>Moisture Sensitivity Level</b>                        | Level 1                              |

## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

|  |  |
|--|--|
| <b>T<sub>s</sub> MAX to T<sub>L</sub> (Ramp-up Rate)</b> | 5°C/second Maximum                                     |
| <b>Preheat</b>   |  |
| - 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                                       |
| <b>Ramp-up Rate (T<sub>L</sub> to T<sub>P</sub>)</b>     | 5°C/second Maximum                                     |
| <b>Time Maintained Above:</b>                            |  |
| - Temperature (T <sub>L</sub> )                          | 150°C  |
| - Time (t <sub>L</sub> )                                 | 200 Seconds Maximum                                    |
| <b>Peak Temperature (T<sub>P</sub>)</b>                  | 240°C Maximum  |
| <b>Target Peak Temperature (T<sub>P</sub> Target)</b>    | 240°C Maximum 1 Time / 230°C Maximum 2 Times           |
| <b>Time within 5°C of actual peak (t<sub>p</sub>)</b>    | 10 seconds Maximum 2 Times / 80 seconds Maximum 1 Time |
| <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  |

### 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.