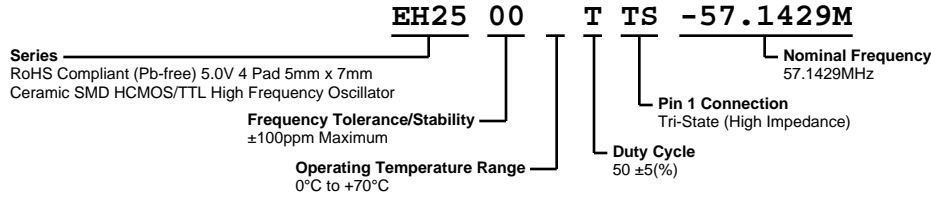


# EH2500TTS-57.1429M



**ECLIPTEK**  
CORPORATION



## ELECTRICAL SPECIFICATIONS

|  |   |
|--|---|
| <b>Nominal Frequency</b>                     | 57.1429MHz  |
| <b>Frequency Tolerance/Stability</b>         | ±100ppm 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) |
| <b>Aging at 25°C</b>                         | ±5ppm/year Maximum  |
| <b>Operating Temperature Range</b>           | 0°C to +70°C  |
| <b>Supply Voltage</b>                        | 5.0Vdc ±10%   |
| <b>Input Current</b>                         | 50mA Maximum (No Load)  |
| <b>Output Voltage Logic High (Voh)</b>       | 2.4Vdc Minimum with TTL Load, Vdd-0.4Vdc Minimum with HCMOS Load (IOH= -16mA)   |
| <b>Output Voltage Logic Low (Vol)</b>        | 0.4Vdc Maximum with TTL Load, 0.5Vdc Maximum with HCMOS Load (IOH= +16mA)   |
| <b>Rise/Fall Time</b>                        | 6nSec Maximum (Measured at 0.8Vdc to 2.0Vdc with TTL Load; Measured at 20% to 80% of waveform with HCMOS Load)  |
| <b>Duty Cycle</b>                            | 50 ±5(%) (Measured at 50% of waveform with TTL Load or with HCMOS Load)   |
| <b>Load Drive Capability</b>                 | 10TTL Load or 50pF HCMOS Load 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> | +2.2Vdc Minimum to enable output, +0.8Vdc Maximum to disable output (High Impedance), No Connect to enable output.  |
| <b>Absolute Clock Jitter</b>                 | ±250pSec Maximum, ±100pSec Typical  |
| <b>One Sigma Clock Period Jitter</b>         | ±50pSec Maximum, ±30pSec Typical  |
| <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: 1500V |
| <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         |

# EH2500TTS-57.1429M

## MECHANICAL DIMENSIONS (all dimensions in millimeters)

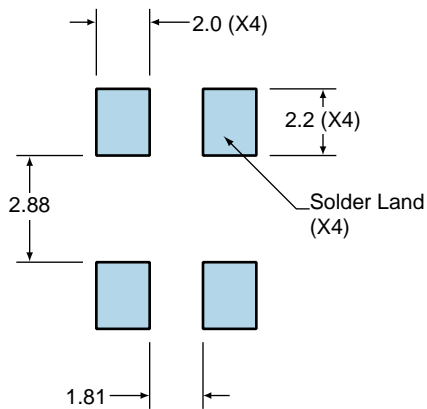


| PIN | CONNECTION     |
|-----|----------------|
| 1   | Tri-State      |
| 2   | Ground         |
| 3   | Output         |
| 4   | Supply Voltage |

| LINE | MARKING  |
|------|--|
| 1    | <b>ECLIPTEK</b>  |
| 2    | <b>57.142M</b>   |
| 3    | <b>XXXXXX</b><br>XXXXXX=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 TTL Output

| Output Load Drive Capability | $R_L$ Value (Ohms) | $C_L$ Value (pF) |
|------------------------------|--------------------|------------------|
| 10TTL                        | 390                | 15               |
| 5TTL                         | 780                | 15               |
| 2TTL                         | 1100               | 6                |
| 10LSTTL                      | 2000               | 15               |
| 1TTL                         | 2200               | 3                |

Table 1:  $R_L$  Resistance Value and  $C_L$  Capacitance Value Vs. Output Load Drive Capability



- 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.
- Note 4: Resistance value  $R_L$  is shown in Table 1. See applicable specification sheet for 'Load Drive Capability'.
- Note 5: All diodes are MMBD7000, MMBD914, or equivalent.

# EH2500TTS-57.1429M

## 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.

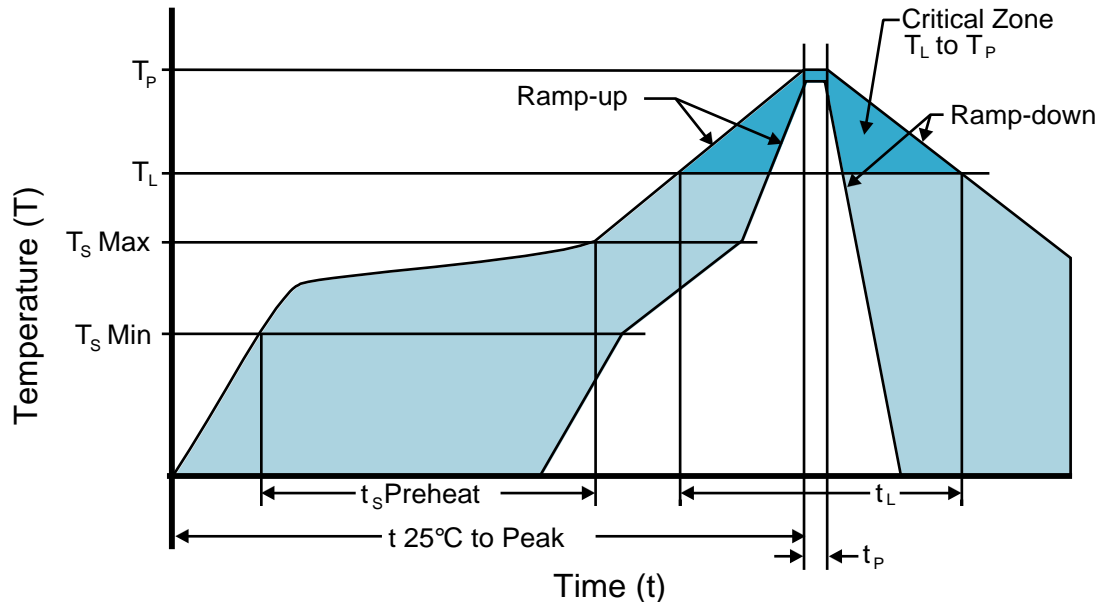
## Recommended Solder Reflow Methods



### 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   |
| <b>Additional Notes</b>                                  | Temperatures shown are applied to body of device. |

## 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  |
| <b>Additional Notes</b>                                  | Temperatures shown are applied to body of device.      |

### Low Temperature Manual Soldering

185°C Maximum for 10 seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)

### High Temperature Manual Soldering

260°C Maximum for 5 seconds Maximum, 2 times Maximum. (Temperatures shown are applied to body of device.)