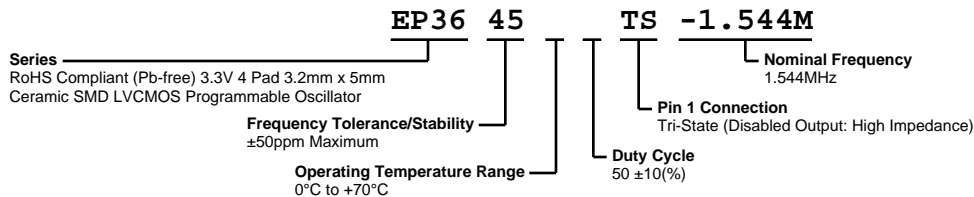


# EP3645TS-1.544M



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



## ELECTRICAL SPECIFICATIONS

|  |  |
|--|--|
| <b>Nominal Frequency</b>                     | 1.544MHz   |
| <b>Frequency Tolerance/Stability</b>         | ±50ppm 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>                        | 3.3Vdc ±0.3Vdc   |
| <b>Input Current</b>                         | 28mA Maximum (Unloaded)  |
| <b>Output Voltage Logic High (Voh)</b>       | Vdd-0.4Vdc Minimum (IOH = -8mA)  |
| <b>Output Voltage Logic Low (Vol)</b>        | 0.4Vdc Maximum (IOL = +8mA)  |
| <b>Rise/Fall Time</b>                        | 4nSec Maximum (Measured at 20% to 80% of waveform)   |
| <b>Duty Cycle</b>                            | 50 ±10(%) (Measured at 50% of waveform)  |
| <b>Load Drive Capability</b>                 | 30pF Maximum   |
| <b>Output Logic Type</b>                     | CMOS   |
| <b>Pin 1 Connection</b>                      | Tri-State (Disabled Output: High Impedance)  |
| <b>Tri-State Input Voltage (Vih and Vil)</b> | 70% of Vdd Minimum to enable output, 20% of Vdd Maximum to disable output, No Connect to enable output.  |
| <b>Standby Current</b>                       | 20µA Maximum (Pin 1 = Ground)  |
| <b>Disable Current</b>                       | 16mA Maximum (Pin 1 = Ground)  |
| <b>Absolute Clock Jitter</b>                 | ±250pSec Maximum, ±100pSec Typical   |
| <b>One Sigma Clock Period Jitter</b>         | ±50pSec Maximum  |
| <b>Start Up Time</b>                         | 10mSec Maximum   |
| <b>Storage Temperature Range</b>             | -55°C to +125°C  |

## ENVIRONMENTAL & MECHANICAL SPECIFICATIONS

|                                     |                                       |
|-------------------------------------|---------------------------------------|
| <b>Fine Leak Test</b>               | MIL-STD-883, Method 1014, Condition A |
| <b>Gross Leak Test</b>              | MIL-STD-883, Method 1014, Condition C |
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213, Condition C  |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210               |
| <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              |
| <b>Vibration</b>                    | MIL-STD-883, Method 2007, Condition A |

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## MECHANICAL DIMENSIONS (all dimensions in millimeters)



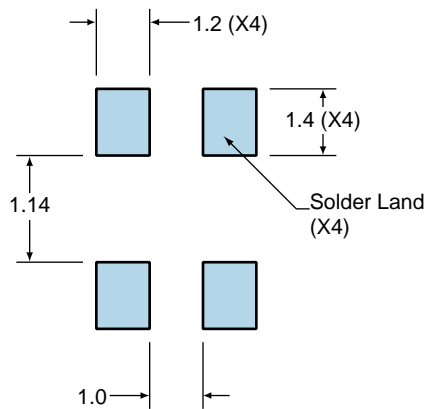
| PIN | CONNECTION                 |
|-----|----------------------------|
| 1   | Tri-State (High Impedance) |
| 2   | Ground/Case Ground         |
| 3   | Output                     |
| 4   | Supply Voltage             |

| LINE | MARKING                                |
|------|--|
| 1    | <b>E1.544</b><br>E=Ecliptek Designator |

## 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 0.1µF low frequency tantalum bypass capacitor in parallel with a 0.01µF 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.

## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

**$T_s$  MAX to  $T_L$  (Ramp-up Rate)** 3°C/second Maximum

#### Preheat

- Temperature Minimum ( $T_s$  MIN) 150°C
- Temperature Typical ( $T_s$  TYP) 175°C
- Temperature Maximum ( $T_s$  MAX) 200°C
- Time ( $t_s$  MIN) 60 - 180 Seconds

**Ramp-up Rate ( $T_L$  to  $T_p$ )** 3°C/second Maximum

#### Time Maintained Above:

- Temperature ( $T_L$ ) 217°C
- Time ( $t_L$ ) 60 - 150 Seconds

**Peak Temperature ( $T_p$ )** 260°C Maximum for 10 Seconds Maximum

**Target Peak Temperature ( $T_p$  Target)** 250°C +0/-5°C

**Time within 5°C of actual peak ( $t_p$ )** 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

## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

|  |  |
|--|--|
| <b><math>T_s</math> MAX to <math>T_L</math> (Ramp-up Rate)</b> | 5°C/second Maximum                                     |
| <b>Preheat</b>   |  |
| - Temperature Minimum ( $T_s$ MIN)                             | N/A  |
| - Temperature Typical ( $T_s$ TYP)                             | 150°C  |
| - Temperature Maximum ( $T_s$ MAX)                             | N/A  |
| - Time ( $t_s$ MIN)  | 60 - 120 Seconds                                       |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_p</math>)</b>     | 5°C/second Maximum                                     |
| <b>Time Maintained Above:</b>                                  |  |
| - Temperature ( $T_L$ )  | 150°C  |
| - Time ( $t_L$ )   | 200 Seconds Maximum                                    |
| <b>Peak Temperature (<math>T_p</math>)</b>                     | 240°C Maximum  |
| <b>Target Peak Temperature (<math>T_p</math> Target)</b>       | 240°C Maximum 1 Time / 230°C Maximum 2 Times           |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</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.