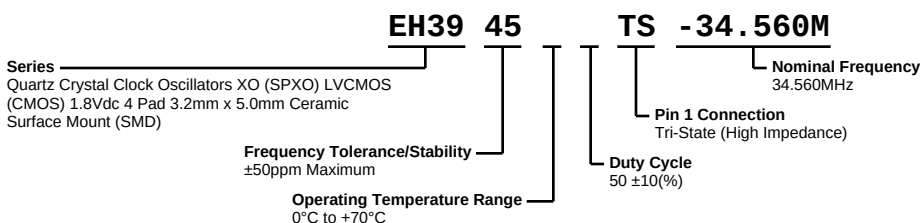


# EH3945TS-34.560M



## ELECTRICAL SPECIFICATIONS

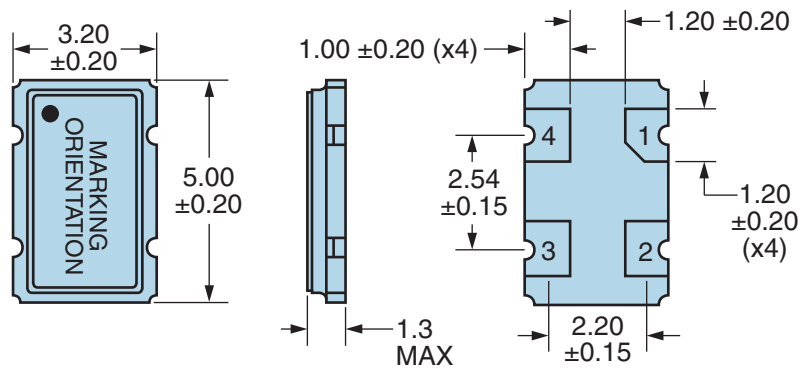
|                                       |                                                                                                                                                                                                                                                     |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Nominal Frequency                     | 34.560MHz                                                                                                                                                                                                                                           |
| Frequency Tolerance/Stability         | $\pm 50$ 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°, 260°C Reflow, Shock, and Vibration) |
| Aging at 25°C                         | $\pm 5$ ppm/Year Maximum                                                                                                                                                                                                                            |
| Operating Temperature Range           | 0°C to +70°C                                                                                                                                                                                                                                        |
| Supply Voltage                        | 1.8Vdc $\pm 5\%$                                                                                                                                                                                                                                    |
| Input Current                         | 4mA Maximum (No Load)                                                                                                                                                                                                                               |
| Output Voltage Logic High (Voh)       | 90% of Vdd Minimum (IOH = -8mA)                                                                                                                                                                                                                     |
| Output Voltage Logic Low (Vol)        | 10% of Vdd 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                 | 15pF Maximum                                                                                                                                                                                                                                        |
| Output Logic Type                     | CMOS                                                                                                                                                                                                                                                |
| Pin 1 Connection                      | Tri-State (High Impedance)                                                                                                                                                                                                                          |
| Tri-State Input Voltage (Vih and Vil) | 90% of Vdd Minimum or No Connect to Enable Output, 10% of Vdd Maximum to Disable Output (High Impedance)                                                                                                                                            |
| Standby Current                       | 10 $\mu$ A Maximum (Pin 1 = Ground)                                                                                                                                                                                                                 |
| RMS Phase Jitter                      | 20pSec Typical, 30pSec Maximum (Fj = 12kHz to 20MHz)                                                                                                                                                                                                |
| Period Jitter (RMS)                   | 15pSec Typical                                                                                                                                                                                                                                      |
| Period Jitter (pk-pk)                 | 100pSec Typical, 200pSec Maximum                                                                                                                                                                                                                    |
| 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         |
| Flammability                 | UL94-V0                                       |
| Gross Leak Test              | MIL-STD-883, Method 1014, Condition C         |
| Mechanical Shock             | MIL-STD-883, Method 2002, Condition B         |
| Moisture Resistance          | MIL-STD-883, Method 1004                      |
| Moisture Sensitivity         | J-STD-020, MSL 1                              |
| 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         |

# EH3945TS-34.560M

## MECHANICAL DIMENSIONS (all dimensions in millimeters)

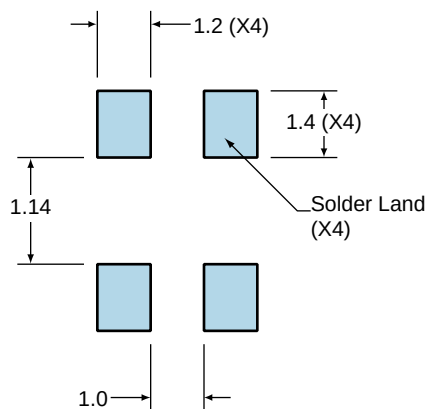


| PIN | CONNECTION     |
|-----|----------------|
| 1   | Tri-State      |
| 2   | Case Ground    |
| 3   | Output         |
| 4   | Supply Voltage |

| LINE | MARKING                                                              |
|------|----------------------------------------------------------------------|
| 1    | <b>E34.560</b><br><i>E=Ecliptek Designator</i>                       |
| 2    | <b>XXXXXX</b><br><i>XXXXXX=Ecliptek<br/>Manufacturing Identifier</i> |

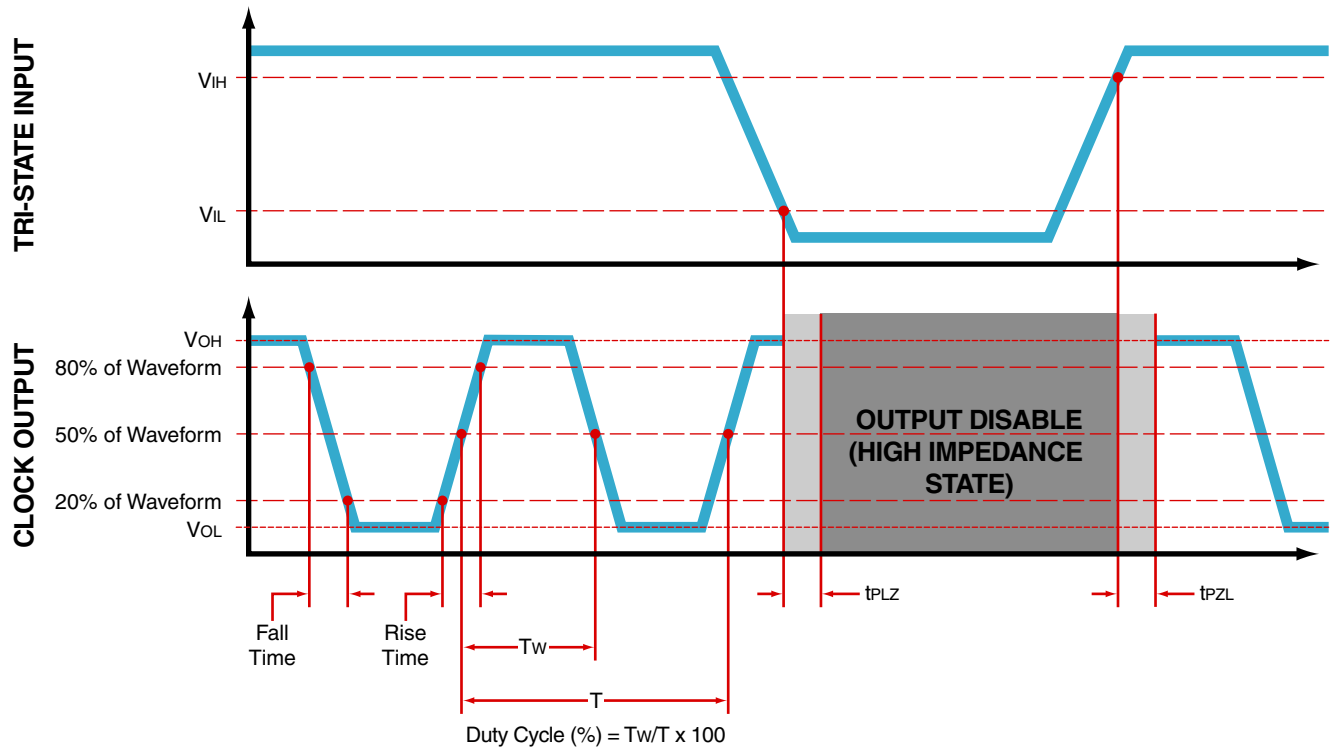
## Suggested Solder Pad Layout

All Dimensions in Millimeters



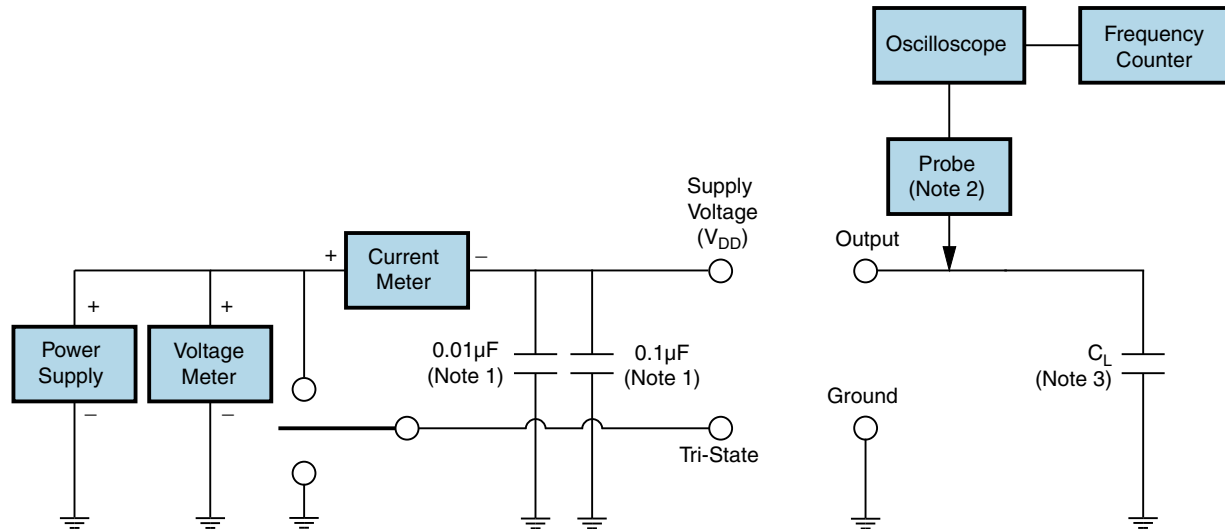
All Tolerances are  $\pm 0.1$

## OUTPUT WAVEFORM & TIMING DIAGRAM



# EH3945TS-34.560M

## Test Circuit for CMOS Output

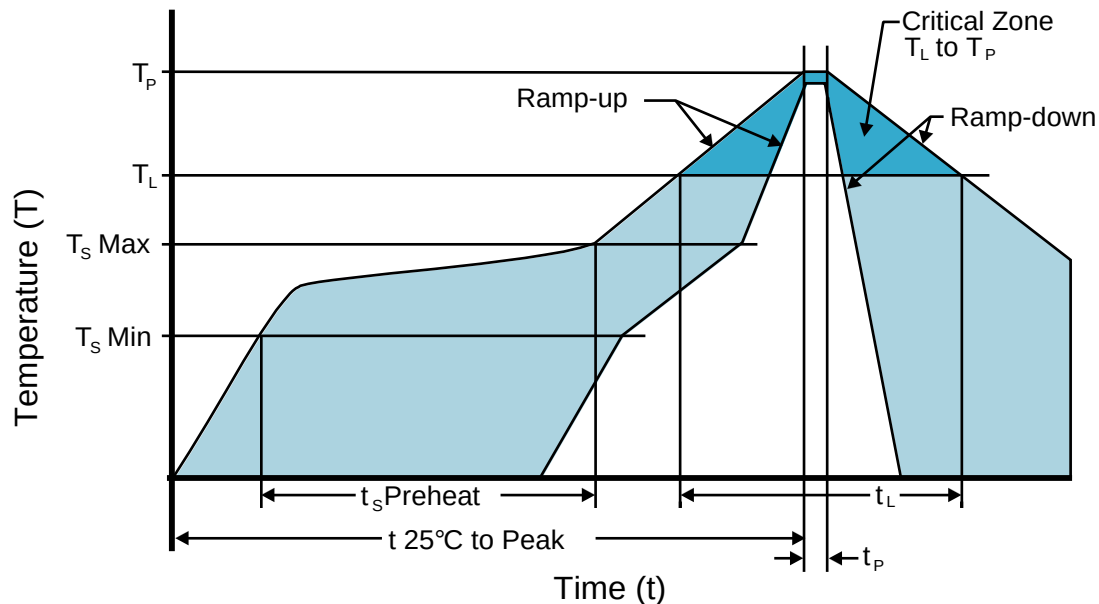


Note 1: An external 0.01µF ceramic bypass capacitor in parallel with a 0.1µF high frequency ceramic bypass capacitor close (less than 2mm) to the package ground and supply voltage pin is required.

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.

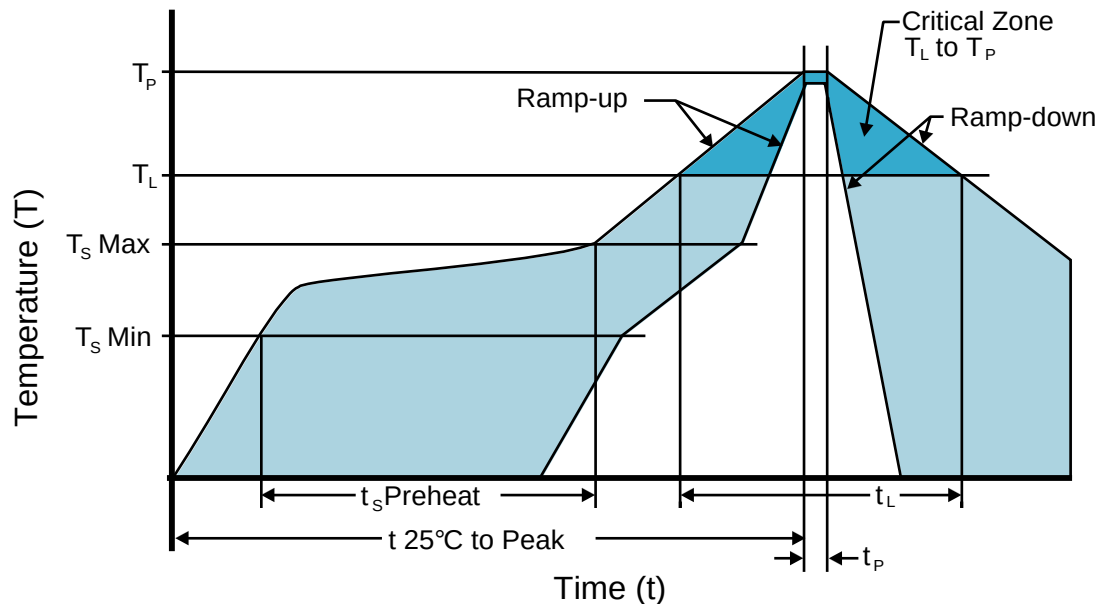
## Recommended Solder Reflow Methods



### High Temperature Infrared/Convection

|                                                                  |                                      |
|------------------------------------------------------------------|--------------------------------------|
| <b><math>T_s \text{ MAX to } T_L</math> (Ramp-up Rate)</b>       | 3°C/second Maximum                   |
| <b>Preheat</b>                                                   |                                      |
| - Temperature Minimum ( $T_s \text{ MIN}$ )                      | 150°C                                |
| - Temperature Typical ( $T_s \text{ TYP}$ )                      | 175°C                                |
| - Temperature Maximum ( $T_s \text{ MAX}$ )                      | 200°C                                |
| - Time ( $t_s \text{ MIN}$ )                                     | 60 - 180 Seconds                     |
| <b>Ramp-up Rate (<math>T_L</math> to <math>T_p</math>)</b>       | 3°C/second Maximum                   |
| <b>Time Maintained Above:</b>                                    |                                      |
| - Temperature ( $T_L$ )                                          | 217°C                                |
| - Time ( $t_L$ )                                                 | 60 - 150 Seconds                     |
| <b>Peak Temperature (<math>T_p</math>)</b>                       | 260°C Maximum for 10 Seconds Maximum |
| <b>Target Peak Temperature (<math>T_p \text{ Target}</math>)</b> | 250°C +0/-5°C                        |
| <b>Time within 5°C of actual peak (<math>t_p</math>)</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

**$T_S$  MAX to  $T_L$  (Ramp-up Rate)** 5°C/second Maximum

#### Preheat

- 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

**Ramp-up Rate ( $T_L$  to  $T_P$ )** 5°C/second Maximum

#### Time Maintained Above:

- Temperature ( $T_L$ ) 150°C
- Time ( $t_L$ ) 200 Seconds Maximum

**Peak Temperature ( $T_P$ )** 240°C Maximum

**Target Peak Temperature ( $T_P$  Target)** 240°C Maximum 2 Times / 230°C Maximum 1 Time

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