


# EPH1100TSC-13.560M

 <b>Lead Free</b>  <b>COMPLIANT</b>	 <b>EU RoHS</b> 2011/65 + 2015/863 <b>COMPLIANT</b>	 <b>China RoHS</b>  <b>COMPLIANT</b>	 <b>REACH</b> <b>SVHC 163</b> Jun 15, 2015 <b>COMPLIANT</b>
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## ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) HCMOS/TTL (CMOS) 5.0Vdc 8 Pin DIP Metal Thru-Hole 13.560MHz  $\pm$ 100ppm - 20°C to +70°C

## ELECTRICAL SPECIFICATIONS

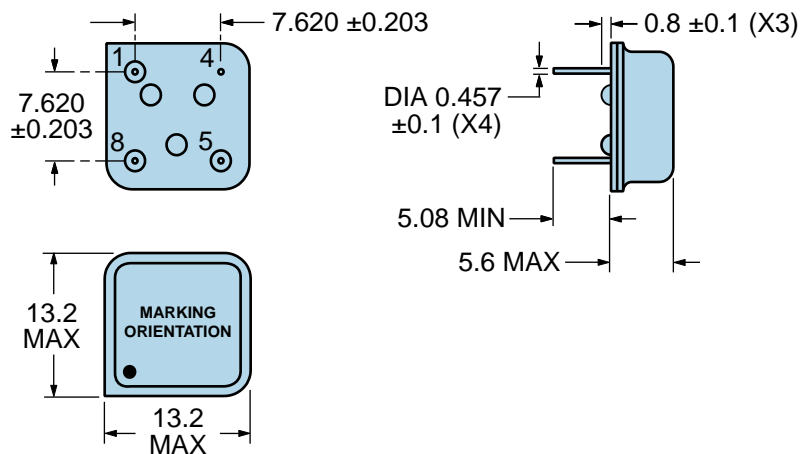
<b>Nominal Frequency</b>	13.560MHz
<b>Frequency Tolerance/Stability</b>	$\pm$ 100ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°C, Shock, and Vibration)
<b>Aging at 25°C</b>	$\pm$ 5ppm/year Maximum
<b>Operating Temperature Range</b>	-20°C to +70°C
<b>Supply Voltage</b>	5.0Vdc $\pm$ 10%
<b>Input Current</b>	45mA Maximum (Unloaded)
<b>Output Voltage Logic High (Voh)</b>	Vdd-0.4Vdc Minimum (IOH = -16mA)
<b>Output Voltage Logic Low (Vol)</b>	0.4Vdc Maximum (IOL = +16mA)
<b>Rise/Fall Time</b>	4nSec Maximum (Measured at 20% to 80% of waveform)
<b>Duty Cycle</b>	50 $\pm$ 10(%) (Measured at 1.4Vdc with TTL Load; Measured at 50% of waveform with HCMOS Load)
<b>Load Drive Capability</b>	50pF HCMOS Load Maximum
<b>Output Logic Type</b>	CMOS
<b>Pin 1 Connection</b>	Tri-State (Disabled Output: High Impedance)
<b>Pin 1 Input Voltage (Vih and Vil)</b>	+2.0Vdc Minimum to enable output, +0.8Vdc Maximum to disable output, No Connect to enable output.
<b>Disable Current</b>	30mA Maximum (Pin 1 = Ground)
<b>Peak to Peak Jitter (tPK)</b>	100pSec Maximum, 50pSec Typical
<b>RMS Period Jitter (tRMS)</b>	13pSec Maximum, 8pSec Typical
<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>Lead Integrity</b>	MIL-STD-883, Method 2004
<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

# EPH1100TSC-13.560M [↗](#)

## MECHANICAL DIMENSIONS (all dimensions in millimeters)

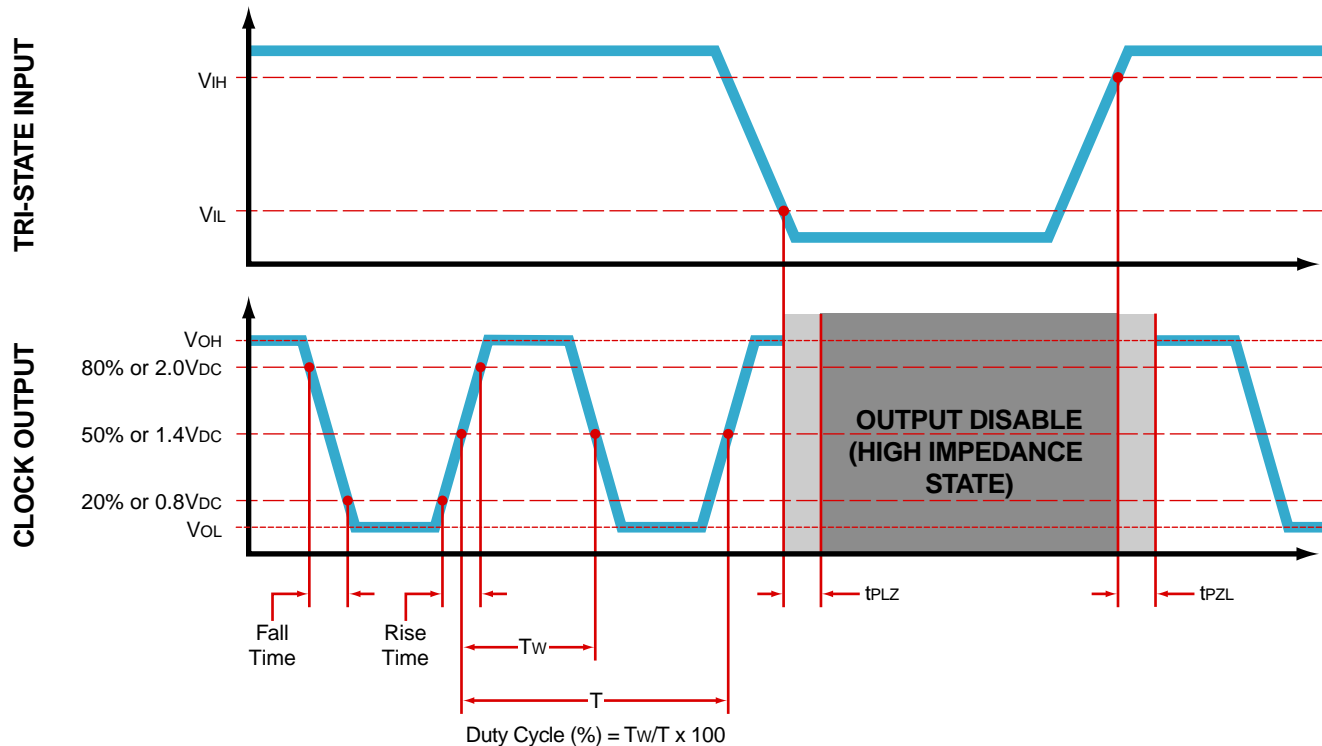


PIN	CONNECTION
1	Tri-State (High Impedance)
4	Ground/Case Ground
5	Output
8	Supply Voltage

LINE	MARKING
1	<b>ECLIPTEK</b>
2	<b>13.560M</b>
3	<b>XXXXX</b> XXXXX=Ecliptek Manufacturing Identifier

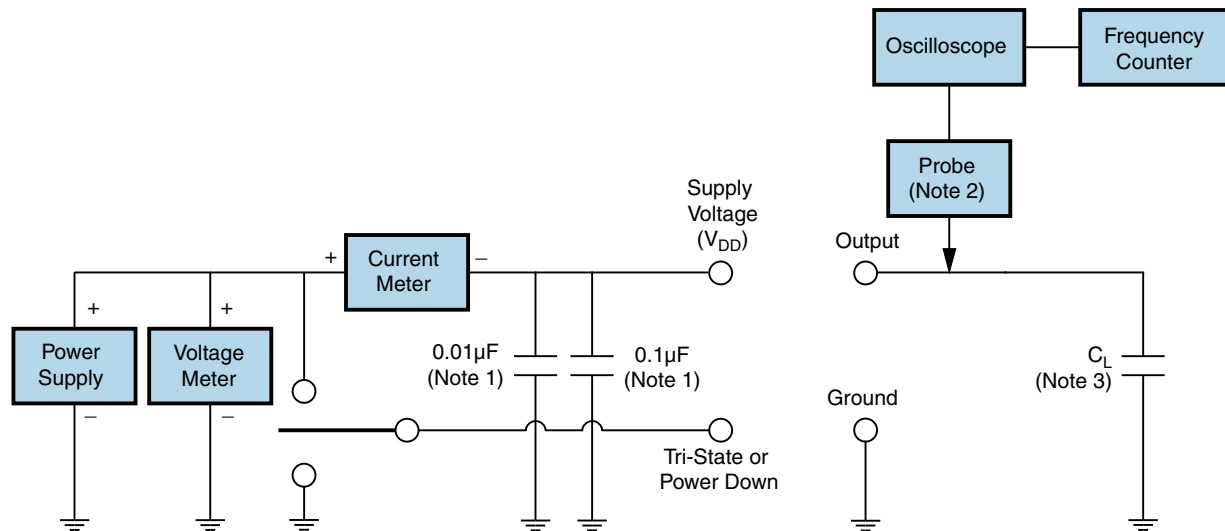
# EPH1100TSC-13.560M [↗](#)

## OUTPUT WAVEFORM & TIMING DIAGRAM



# EPH1100TSC-13.560M

## Test Circuit for CMOS Output



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

Note 2: A low input 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. See applicable specification sheet for 'Load Drive Capability'.

# EPH1100TSC-13.560M [↗](#)

## Recommended Solder Reflow Methods



### High Temperature Solder Bath (Wave Solder)

Ts MAX to TL (Ramp-up Rate)	3°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum (Ts MIN)	150°C
- Temperature Typical (Ts TYP)	175°C
- Temperature Maximum (Ts MAX)	200°C
- Time (ts MIN)	60 - 180 Seconds
<b>Ramp-up Rate (TL to TP)</b>	3°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (TL)	217°C
- Time (tL)	60 - 150 Seconds
<b>Peak Temperature (TP)</b>	260°C Maximum for 10 Seconds Maximum
<b>Target Peak Temperature (TP Target)</b>	250°C +0/-5°C
<b>Time within 5°C of actual peak (tp)</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 back of PCB board and device leads only. Do not use this method for product with the Gull Wing option.

# EPH1100TSC-13.560M [↗](#)

## Recommended Solder Reflow Methods

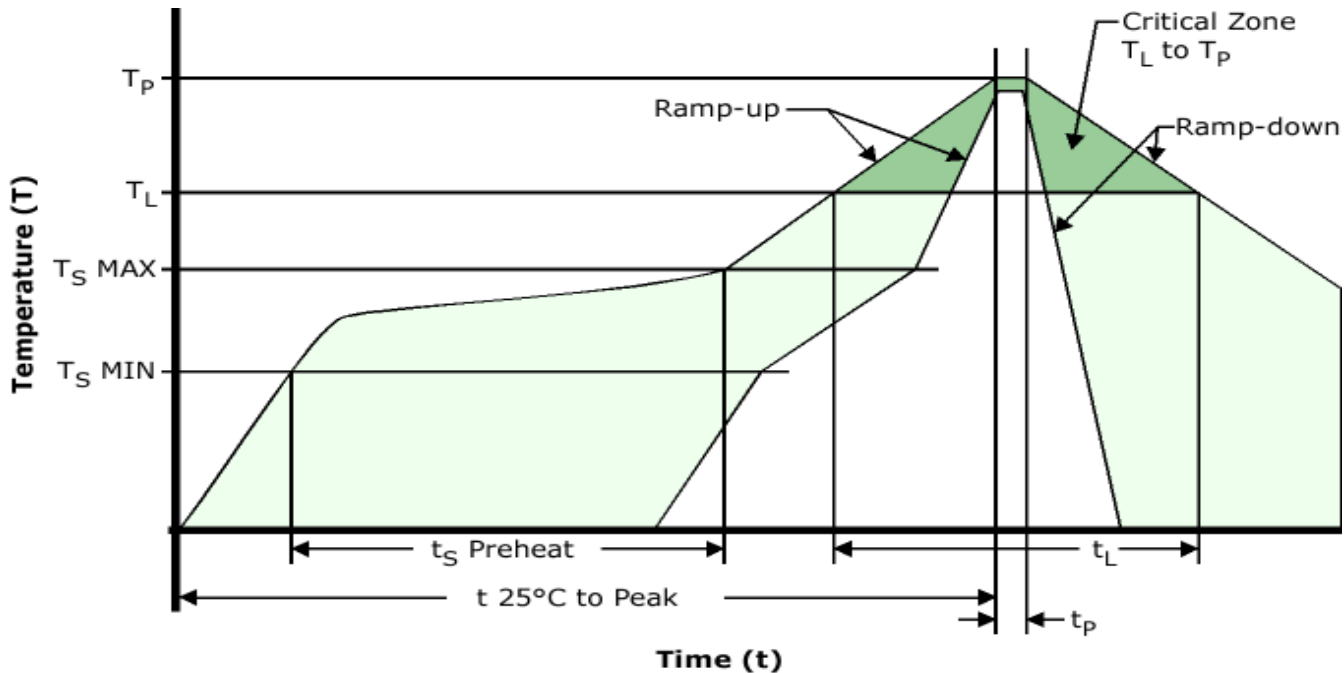


### Low Temperature Infrared/Convection $185^\circ\text{C}$

$T_S \text{ MAX}$ to $T_L$ (Ramp-up Rate)	$5^\circ\text{C/Second}$ Maximum
<b>Preheat</b>	
- Temperature Minimum ( $T_S \text{ MIN}$ )	N/A
- Temperature Typical ( $T_S \text{ TYP}$ )	$150^\circ\text{C}$
- Temperature Maximum ( $T_S \text{ MAX}$ )	N/A
- Time ( $t_s \text{ MIN}$ )	60 - 120 Seconds
Ramp-up Rate ( $T_L$ to $T_P$ )	$5^\circ\text{C/Second}$ Maximum
<b>Time Maintained Above:</b>	
- Temperature ( $T_L$ )	$150^\circ\text{C}$
- Time ( $t_L$ )	200 Seconds Maximum
Peak Temperature ( $T_P$ )	$185^\circ\text{C}$ Maximum
Target Peak Temperature ( $T_P \text{ Target}$ )	$185^\circ\text{C}$ Maximum 2 Times
Time within $5^\circ\text{C}$ of actual peak ( $t_p$ )	10 Seconds Maximum 2 Times
Ramp-down Rate	$5^\circ\text{C/Second}$ Maximum
Time $25^\circ\text{C}$ to Peak Temperature (t)	N/A
Moisture Sensitivity Level	Level 1
Additional Notes	Temperatures shown are applied to body of device. Use this method only for product with the Gull Wing option.

# EPH1100TSC-13.560M [↗](#)

## Recommended Solder Reflow Methods



### Low Temperature Solder Bath (Wave Solder)

<b>Ts MAX to TL (Ramp-up Rate)</b>	5°C/Second Maximum
<b>Preheat</b>	
- Temperature Minimum (Ts MIN)	N/A
- Temperature Typical (Ts TYP)	150°C
- Temperature Maximum (Ts MAX)	N/A
- Time (ts MIN)	30 - 60 Seconds
<b>Ramp-up Rate (TL to TP)</b>	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (TL)	150°C
- Time (tL)	200 Seconds Maximum
<b>Peak Temperature (TP)</b>	245°C Maximum
<b>Target Peak Temperature (TP Target)</b>	245°C Maximum 1 Time / 235°C Maximum 2 Times
<b>Time within 5°C of actual peak (tp)</b>	5 Seconds Maximum 1 Time / 15 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
<b>Additional Notes</b>	Temperatures shown are applied to back of PCB board and device leads only. Do not use this method for product with the Gull Wing option.

### Low Temperature Manual Soldering

185°C Maximum for 10 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)

### High Temperature Manual Soldering

260°C Maximum for 5 Seconds Maximum, 2 times Maximum. (Temperatures listed are applied to device leads only. This method can be utilized with both Gull Wing and Non-Gull Wing devices.)

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#### Как с нами связаться

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