

**EH2720TS-14.31818M**
[Click part number to visit Part Number Details page](#)
**REGULATORY COMPLIANCE** (Data Sheet downloaded on Apr 29, 2018)
[Click badges to download compliance docs](#)

Regulatory Compliance standards are subject to updates by governing bodies. Click the badges to download the latest compliance docs for this part number directly from Ecliptek.

**ITEM DESCRIPTION**

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 2.5Vdc 4 Pad 5.0mm x 7.0mm Ceramic Surface Mount (SMD) 14.31818MHz  $\pm 20$ ppm 0°C to +70°C

**ELECTRICAL SPECIFICATIONS**

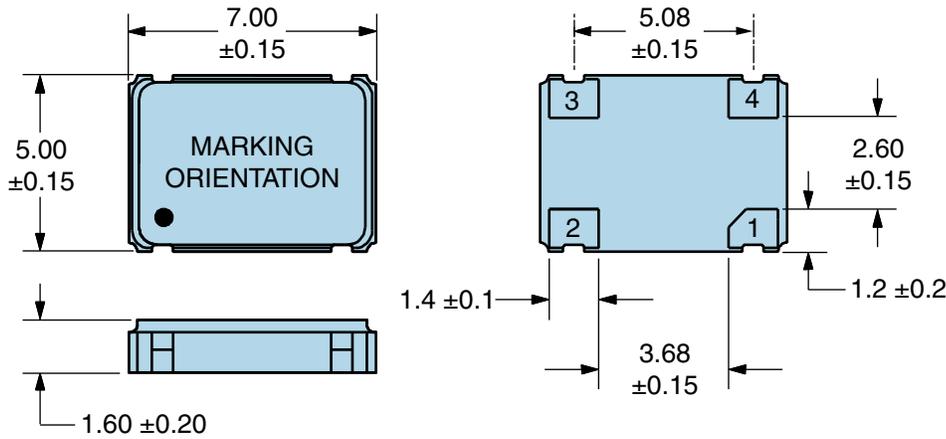
<b>Nominal Frequency</b>	14.31818MHz
<b>Frequency Tolerance/Stability</b>	$\pm 20$ ppm Maximum (Inclusive of all conditions: Calibration Tolerance at 25°C, Frequency Stability over the Operating Temperature Range, Supply Voltage Change, Output Load Change, First Year Aging at 25°, 260°C Reflow, Shock, and Vibration)
<b>Aging at 25°C</b>	$\pm 5$ ppm/Year Maximum
<b>Operating Temperature Range</b>	0°C to +70°C
<b>Supply Voltage</b>	2.5Vdc $\pm 5\%$
<b>Input Current</b>	6mA 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 $\pm 10$ (%) (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>	10 $\mu$ A Maximum (Pin 1 = Ground)
<b>RMS Phase Jitter</b>	20pSec Typical, 30pSec Maximum (Fj = 12kHz to 20MHz)
<b>Period Jitter (RMS)</b>	13pSec Typical
<b>Period Jitter (pk-pk)</b>	85pSec Typical, 100pSec 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: 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

## EH2720TS-14.31818M [Click part number to visit Part Number Details page](#)

### MECHANICAL DIMENSIONS (all dimensions in millimeters)

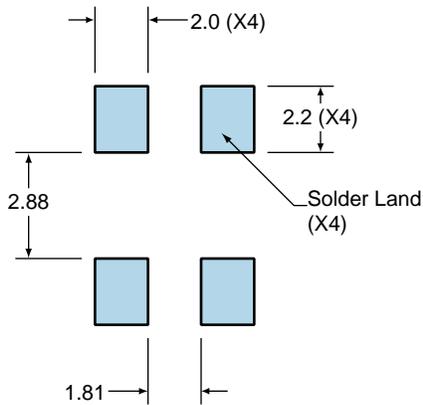


PIN	CONNECTION
1	Tri-State
2	Case Ground
3	Output
4	Supply Voltage

LINE	MARKING
1	ECLIPTEK
2	14.318M
3	XXXXX XXXXX=Ecliptek Manufacturing Identifier

### Suggested Solder Pad Layout

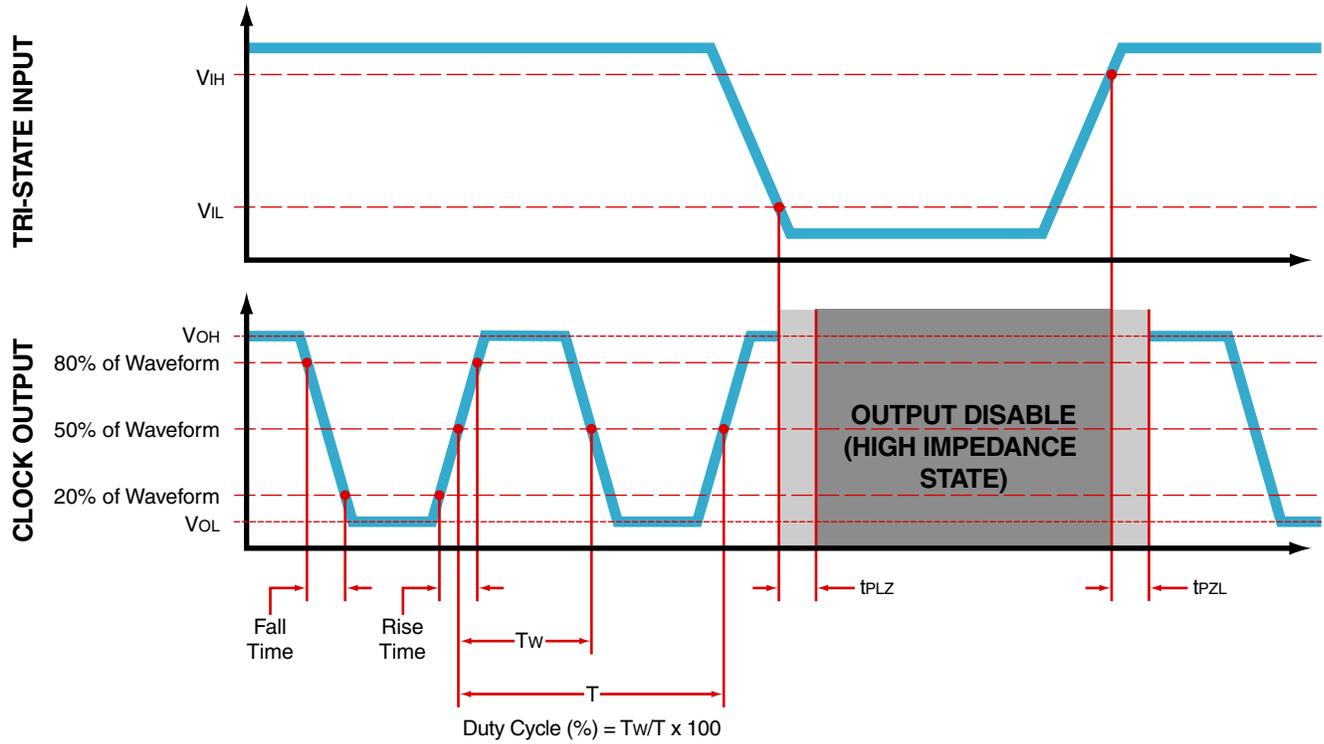
All Dimensions in Millimeters



All Tolerances are  $\pm 0.1$

# EH2720TS-14.31818M [Click part number to visit Part Number Details page](#)

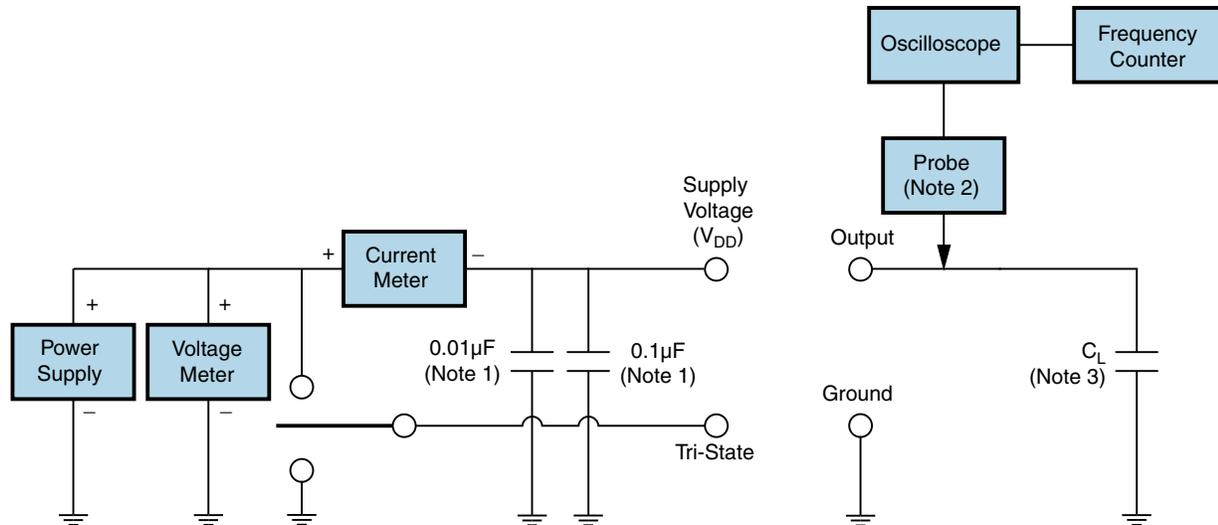
## OUTPUT WAVEFORM & TIMING DIAGRAM



# EH2720TS-14.31818M

[Click part number to visit Part Number Details page](#)

## 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.

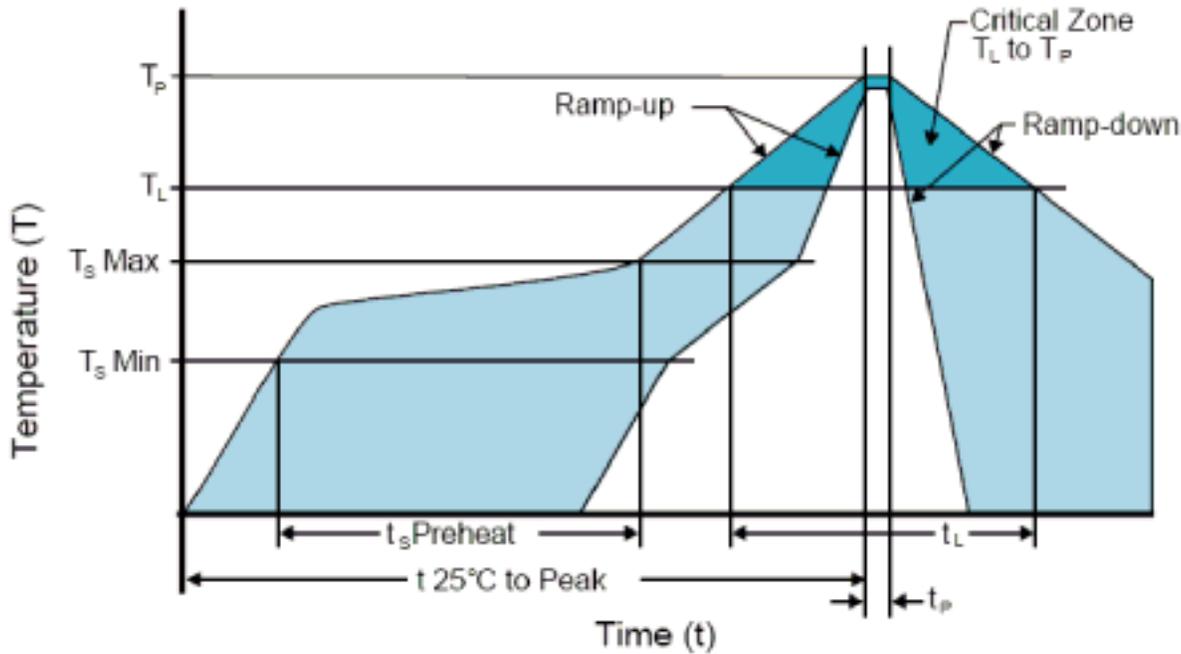
Note 2: A low capacitance (<12pF), 10X attenuation factor, high impedance (>10Mohms), and high bandwidth (>300MHz) passive probe is recommended.

Note 3: Capacitance value  $C_L$  includes sum of all probe and fixture capacitance.

# EH2720TS-14.31818M

[Click part number to visit Part Number Details page](#)

## Recommended Solder Reflow Methods



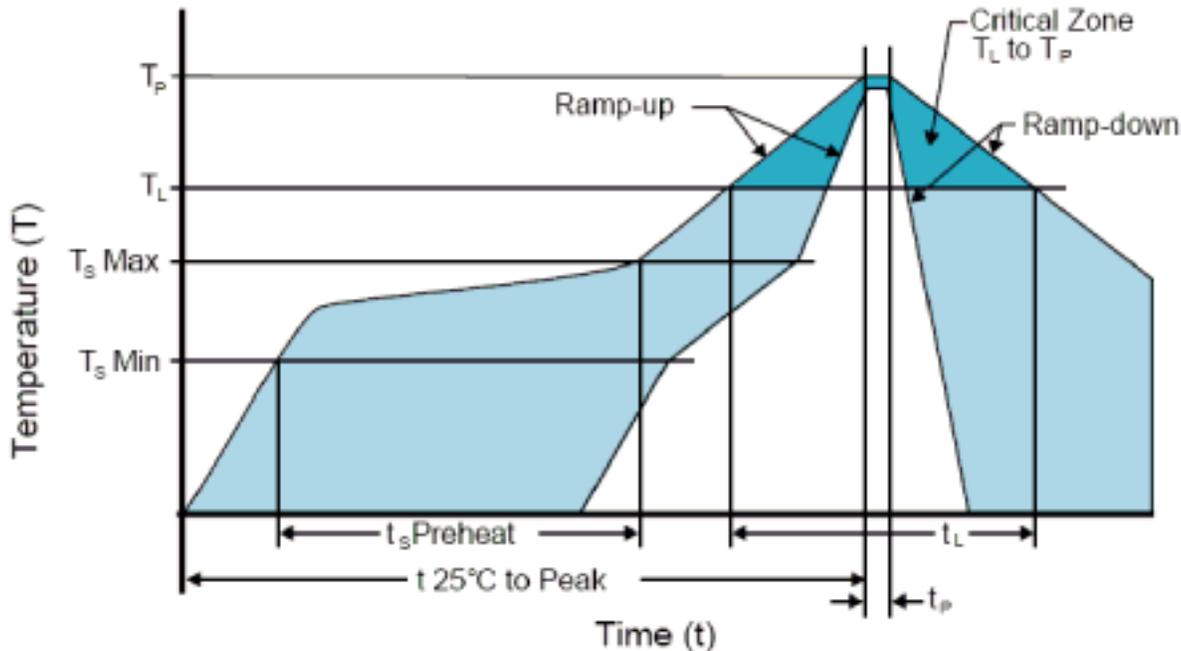
### High Temperature Infrared/Convection

<b><math>T_s \text{ MAX}</math> to <math>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
<b>Additional Notes</b>	Temperatures shown are applied to body of device.

# EH2720TS-14.31818M

[Click part number to visit Part Number Details page](#)

## Recommended Solder Reflow Methods



### Low Temperature Infrared/Convection 240°C

Ts MAX to Tl (Ramp-up Rate)	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)	60 - 120 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>	240°C Maximum
<b>Target Peak Temperature (Tp Target)</b>	240°C Maximum 2 Times / 230°C Maximum 1 Time
<b>Time within 5°C of actual peak (tp)</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.)