

## REGULATORY COMPLIANCE

 <b>Lead Free</b> COMPLIANT	 <b>EU RoHS</b> 2011/65 + 2015/863 COMPLIANT	 <b>China RoHS</b> COMPLIANT	 <b>REACH</b> <b>SVHC</b> COMPLIANT	 <b>DRC</b> <b>CONFLICT</b> <b>FREE</b>
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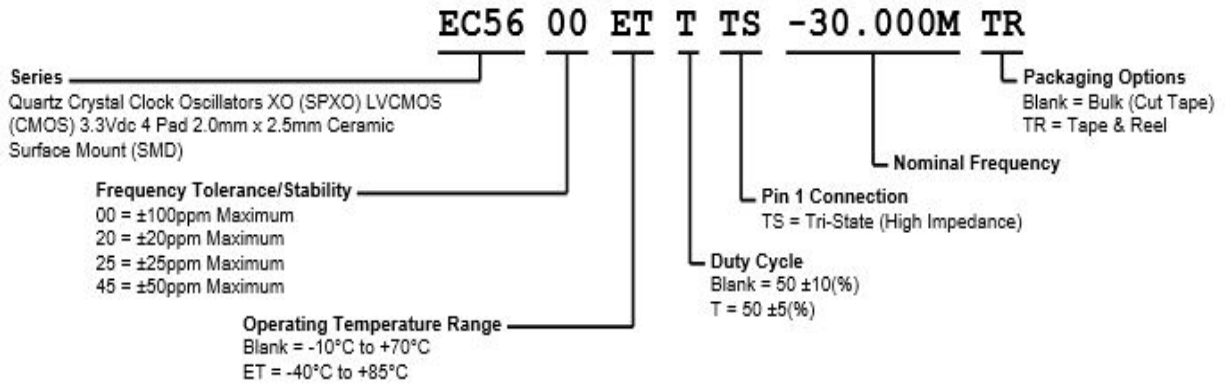
## ITEM DESCRIPTION

Quartz Crystal Clock Oscillators XO (SPXO) LVCMOS (CMOS) 3.3Vdc 4 Pad 2.0mm x 2.5mm Ceramic Surface Mount (SMD)

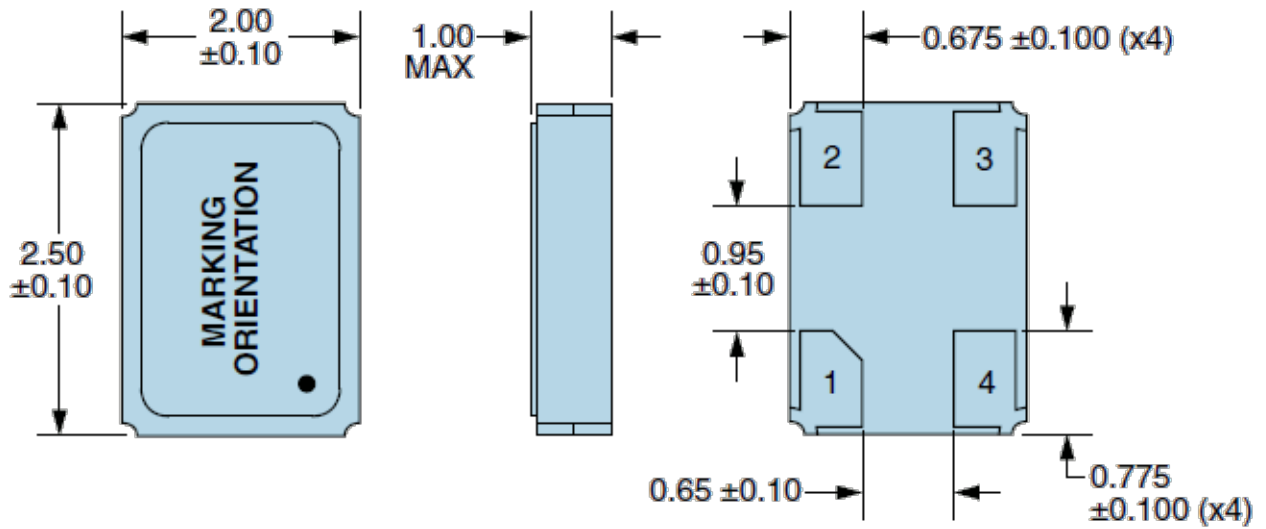
## ELECTRICAL SPECIFICATIONS

<b>Nominal Frequency</b>	1MHz to 50.625MHz
<b>Frequency Tolerance/Stability</b>	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 ±100ppm Maximum ±20ppm Maximum ±25ppm Maximum ±50ppm Maximum
<b>Operating Temperature Range</b>	-10°C to +70°C -40°C to +85°C
<b>Supply Voltage</b>	3.3Vdc ±10%
<b>Input Current</b>	6mA Maximum over Nominal Frequency of 1MHz to 19.999999MHz 7mA Maximum over Nominal Frequency of 20MHz to 39.999999MHz 8mA Maximum over Nominal Frequency of 40MHz to 50.625MHz
<b>Output Voltage Logic High (V<sub>OH</sub>)</b>	I <sub>OH</sub> = -4mA 90% of V <sub>DD</sub> Minimum
<b>Output Voltage Logic Low (V<sub>OL</sub>)</b>	I <sub>OL</sub> = +4mA 10% of V <sub>DD</sub> Maximum
<b>Rise/Fall Time</b>	Measured at 20% to 80% of waveform 10nSec Maximum
<b>Duty Cycle</b>	Measured at 50% of waveform 50 ±10(%) 50 ±5(%)
<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 (V<sub>IH</sub> and V<sub>IL</sub>)</b>	90% of V <sub>DD</sub> Minimum or No Connect to Enable Output, 10% of V <sub>DD</sub> Maximum to Disable Output (High Impedance)
<b>Standby Current</b>	Disabled Output: High Impedance 10µA Maximum
<b>RMS Phase Jitter</b>	12kHz to 20MHz offset frequency 1pSec Maximum
<b>Start Up Time</b>	10mSec Maximum
<b>Storage Temperature Range</b>	-55°C to +125°C

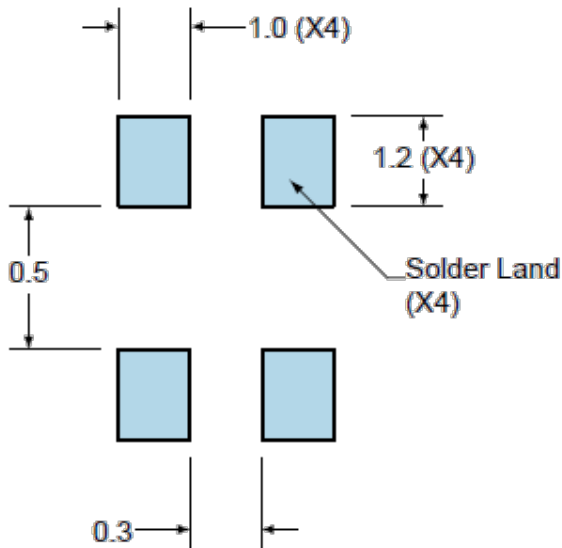
**PART NUMBERING GUIDE**



**MECHANICAL DIMENSIONS**



**SUGGESTED SOLDER PAD LAYOUT**

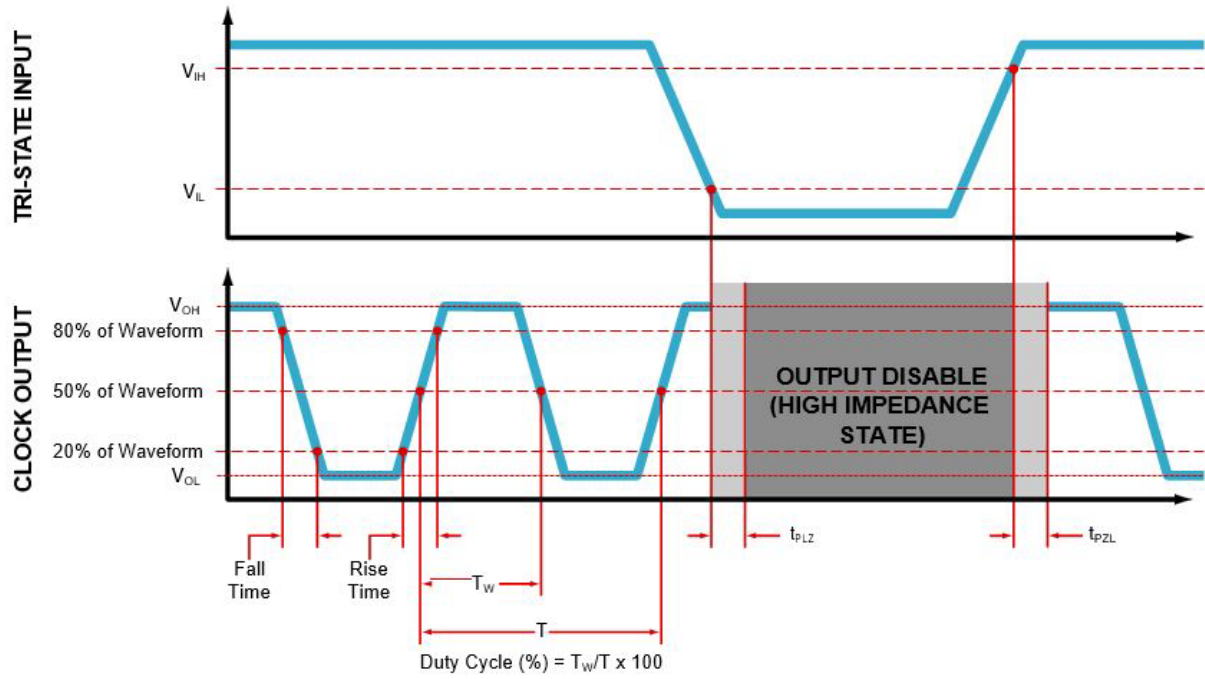


PIN	CONNECTION
1	Tri-State
2	Case/Ground
3	Output
4	Supply Voltage

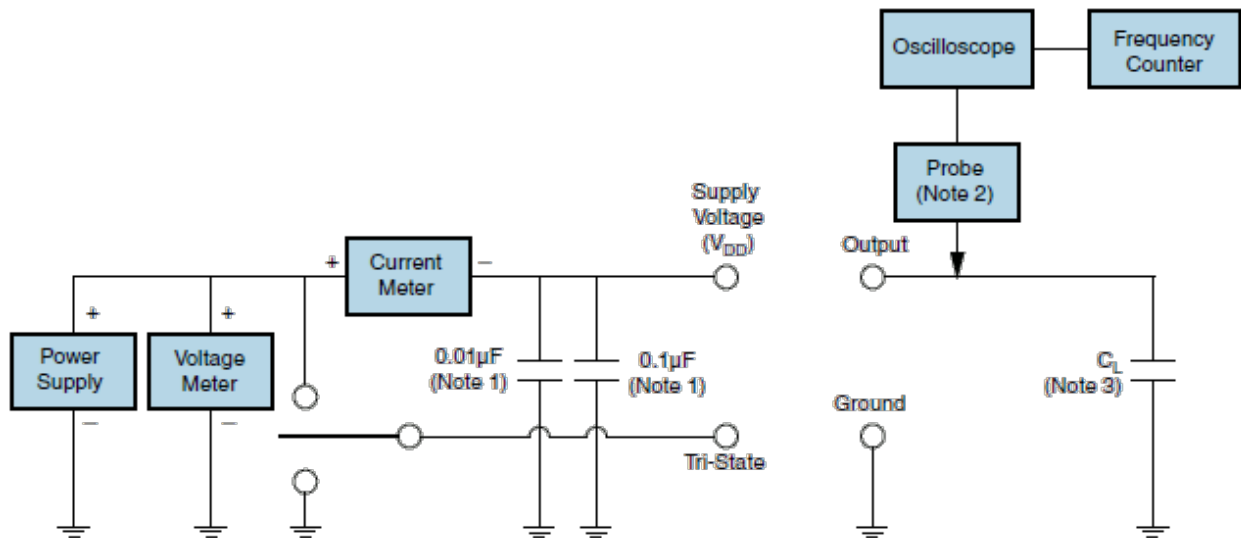
All Tolerances are  $\pm 0.1$

**All Dimensions in Millimeters**

OUTPUT WAVEFORM & TIMING DIAGRAM



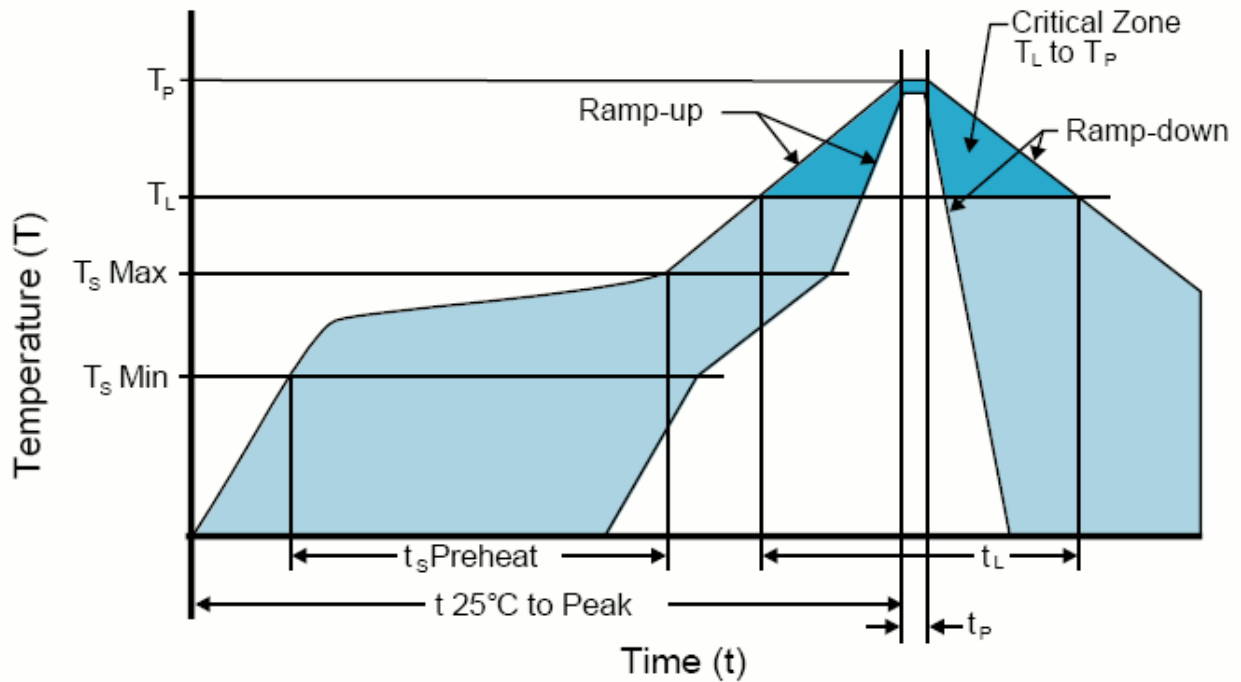
TEST CIRCUIT FOR CMOS OUTPUT



- Note 1:** An external  $0.01\mu\text{F}$  ceramic bypass capacitor in parallel with a  $0.1\mu\text{F}$  high frequency 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.



RECOMMENDED SOLDER REFLOW METHOD



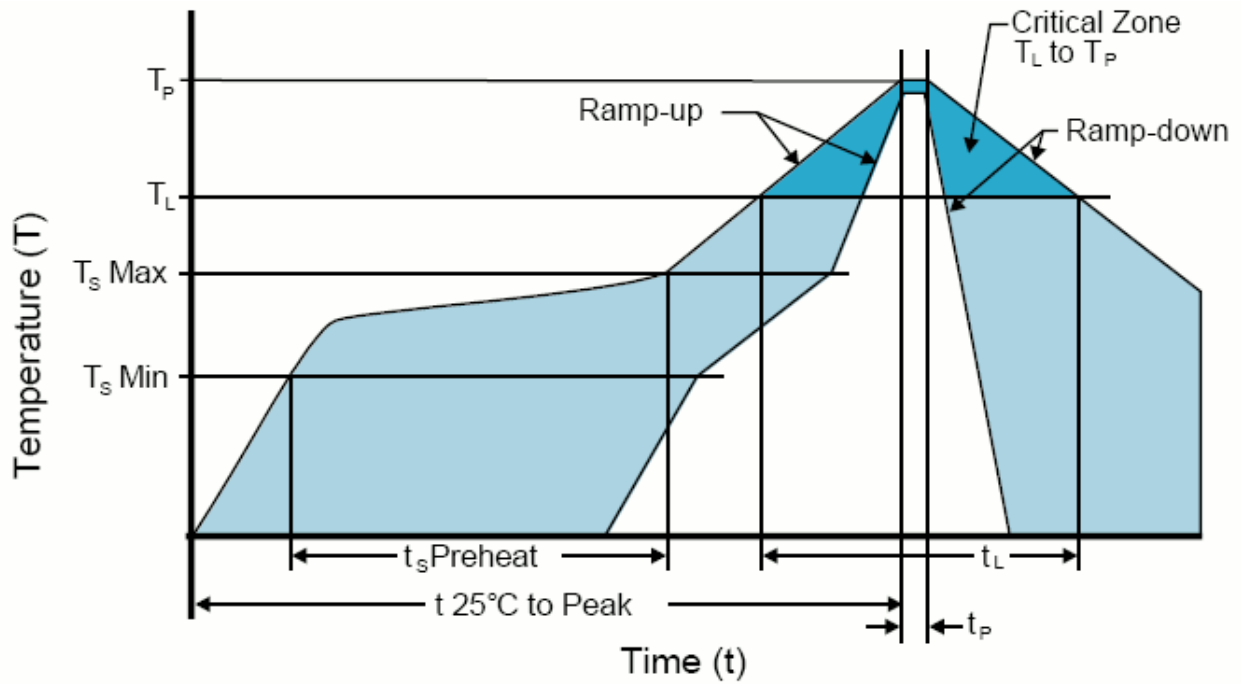
**HIGH TEMPERATURE INFRARED/CONVECTION**

T <sub>s</sub> MAX to T <sub>L</sub> (Ramp-up Rate)	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> )	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.

**High Temperature Manual Soldering**

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

RECOMMENDED SOLDER REFLOW METHOD



**LOW TEMPERATURE INFRARED/CONVECTION**

T <sub>s</sub> MAX to T <sub>L</sub> (Ramp-up Rate)	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> )	60 - 120 Seconds
Ramp-up Rate (T <sub>L</sub> to T <sub>P</sub> )	5°C/Second Maximum
<b>Time Maintained Above:</b>	
- Temperature (T <sub>L</sub> )	150°C
- Time (t <sub>L</sub> )	200 Seconds Maximum
Peak Temperature (T <sub>P</sub> )	240°C Maximum
Target Peak Temperature (T <sub>P</sub> Target)	240°C Maximum 2 Times / 230°C Maximum 1 Time
Time within 5°C of actual peak (t <sub>p</sub> )	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
Additional Notes	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.)



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