

**AE-XA4XXX-X Series  
PECL/LVPECL UHF TCXO**

Rev. K

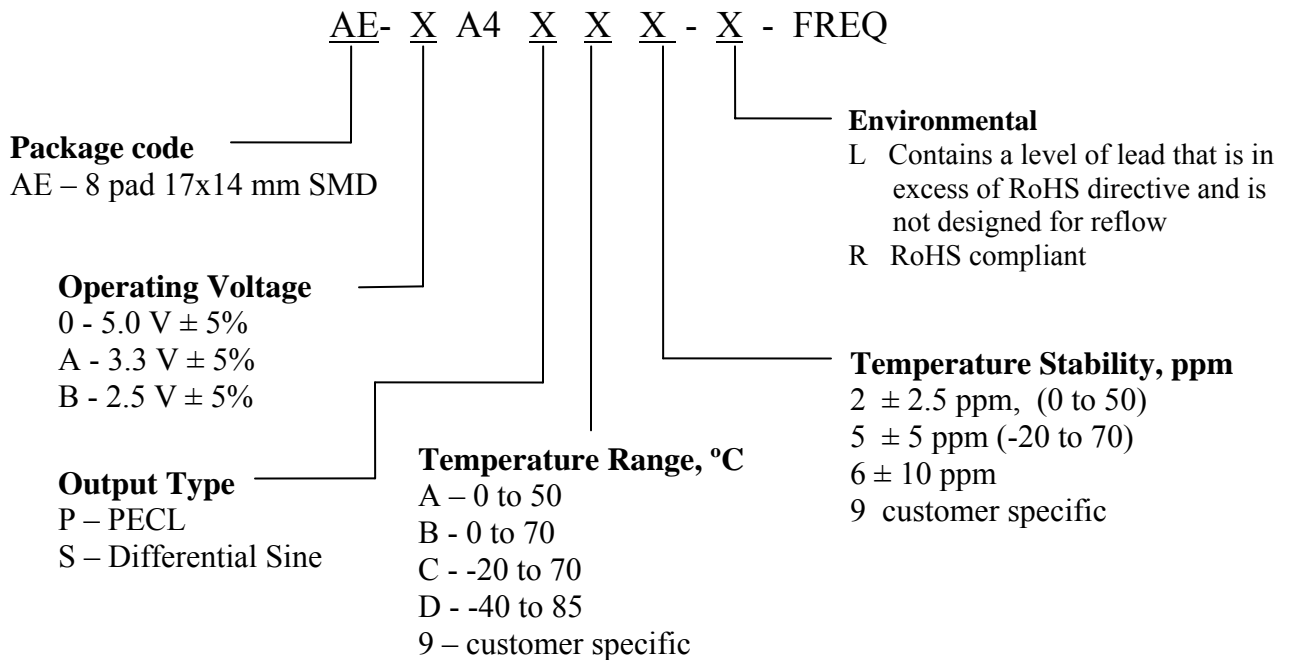
**Description**

The **AE-XA4XXX Series** of temperature compensated crystal oscillators (TCXO) provides ultra high frequency with PECL/LVPECL or differential Sine-Wave complementary outputs. The device is based on low noise analog harmonic frequency multiplication, providing exceptionally low Phase Noise and Jitter. It's packaged in a miniature, FR-4 based 17x14 mm SMD package.

**Applications and Features**

- Fiber Channel; 10 GbE; Infiniband; Network Processors; SONET/SDH
- High Reliability – NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Extremely Low Phase Noise and Jitter
- Frequency Range to 2,500 MHz
- High Shock Resistance, to 1000g
- COTS/Dual use

**Creating a Part Number**



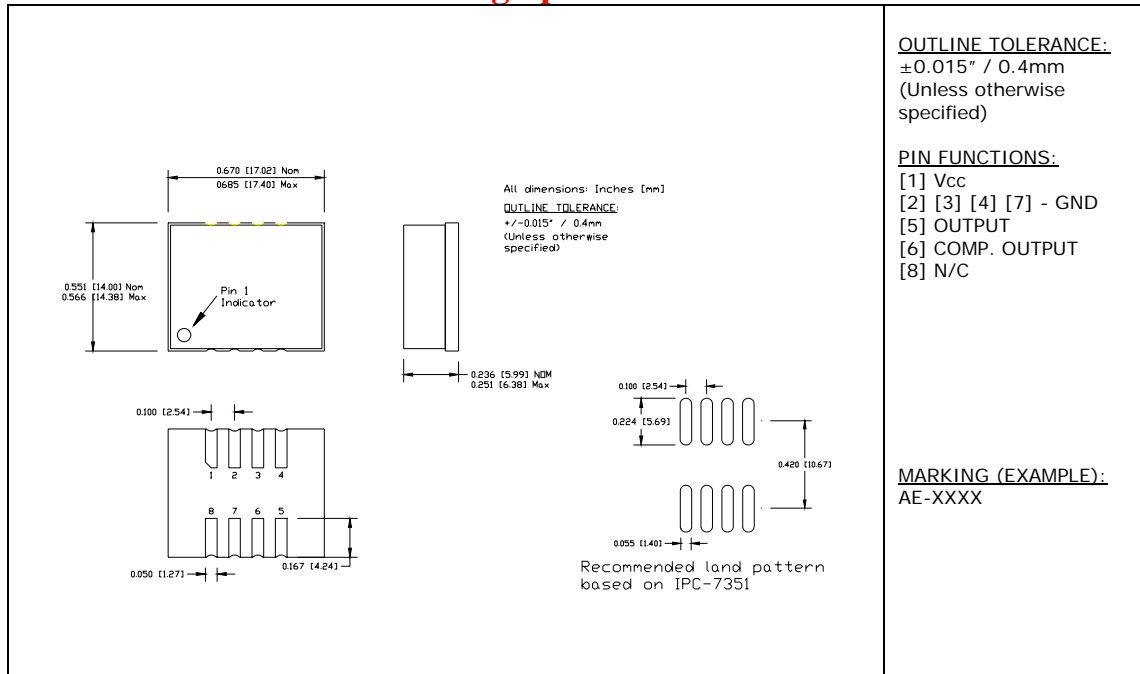
**FREQUENCY  
CONTROLS, INC.**

357 Beloit Street, P.O. Box 457, Burlington, WI 53105-0457 U.S.A. Phone 262/763-3591  
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**Drawing Specification**



**Absolute Maximum Ratings**

Parameter	Symbol	Value	Unit
Operating Temperature Range	To	-40 to +85	°C
Storage Temperature Range	Tst	-50 to +90	°C
Supply Voltage	Vcc	-0.5 to 5.5	V
Control Voltage	Vc	-0.5 to 5.5	V

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**Electrical Parameters**

Parameter		Symb	Conditions, Note	MIN	TYP	MAX	Unit
Nominal Frequency		Fo		700		2,500	MHz
Supply Voltage		Vcc	Code 0 Code A Code B	4.75 3.135 2.375	5.0 3.3 2.5	5.25 3.465 2.625	V
Supply current		Icc			140	160	mA
Output Logic Type					LVPECL Sine		
Load			Output to Vcc-2V, or Thevenin Equivalent, PECL Sine – internally AC coupled		50		Ohm
Output Levels		Voh  Vol	PECL  Sine	Vcc- 1.025	  -3 dBm	Vcc- 1.620	V
Duty Cycle (Symmetry), PECL			At 50% of output voltage swing	45/55	50/50	55/45	%
Rise/Fall Time, PECL		Tr/Tf	20 to 80, 80 to 20 %		0.25	0.3	ns
<b>Jitter</b>	Integrated	J	Integrated from Phase Noise, 12 KHz to 20 MHz, RMS		0.1	0.2	ps
			100Hz to 80KHz,RMS			1.0	ps
			50 KHz to 80 MHz		0.3		ps
	Wavecrest characterized	J	Random period,		2.5		ps
			Accumul. pk-to-pk		25		ps
			Determin.		1		ps
Phase Noise		£(Δf)	1,500 MHz, APR 50 ppm or less	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz	-50 -80 -115 -130 -130 -135	-45 -75 -110 -125 -125 -130	dBc/Hz
Sub-harmonics			At 1,500 MHz		-50	-46	dBc
Frequency Stability, calibration plus temp. Aging Voltage and load Reflow		ΔF/F	See chart  First year At room			±1 ±1 ±2	ppm



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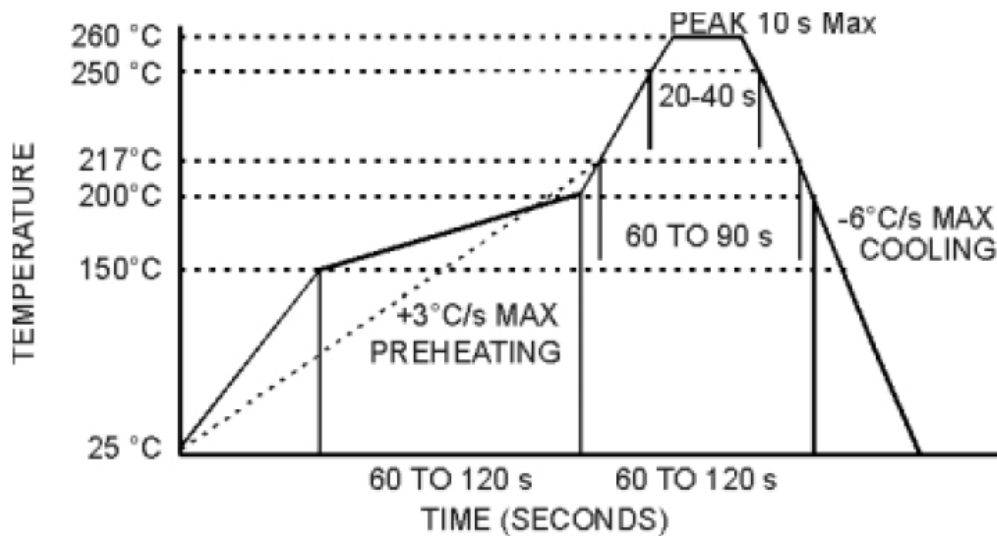
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**Environmental and Mechanical Characteristics**

<b>Operating temp. range</b>	see part # table
<b>Mechanical Shock</b>	Per MIL-STD-202, Method 213, Cond. A
<b>Thermal Shock</b>	Per MIL-STD-883, Method 1011, Cond. A
<b>Vibration</b>	Per MIL-STD-883, Method 2007, Cond. A
<b>Hermetic Seal</b>	Leak rate less than $5 \times 10^{-8}$ atm.cc/s of helium , crystal only.
<b>Soldering conditions</b>	See MAX reflow profile below; The device may be reflowed once. Reflowing upside down is not allowed. NO CLEAN assembly is recommended.

**MAX Reflow Profile**



The device may be reflowed once. Reflowing upside down is not allowed. NO CLEAN assembly is recommended.



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