

**AE-X36DXXX-X Series
PECL/LVPECL UHF VCXO**

Rev. N

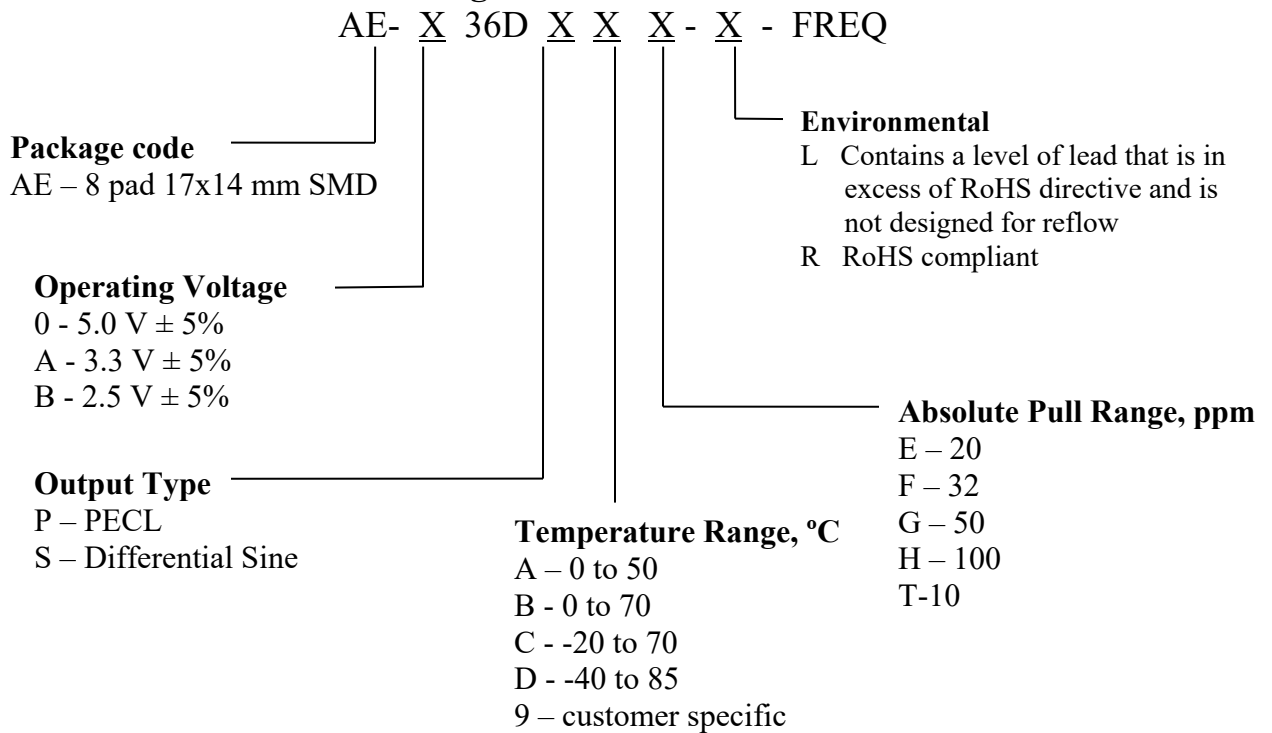
Description

The AE-XXXX Series of voltage controlled crystal oscillators (VCXO) 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 2,000 MHz
- Absolute Pull Range (APR) to ± 1,000 ppm
- SONET ± 20 ppm overall free-run stability available
- High Shock Resistance, to 1000g
- COTS/Dual use

Creating a Part Number



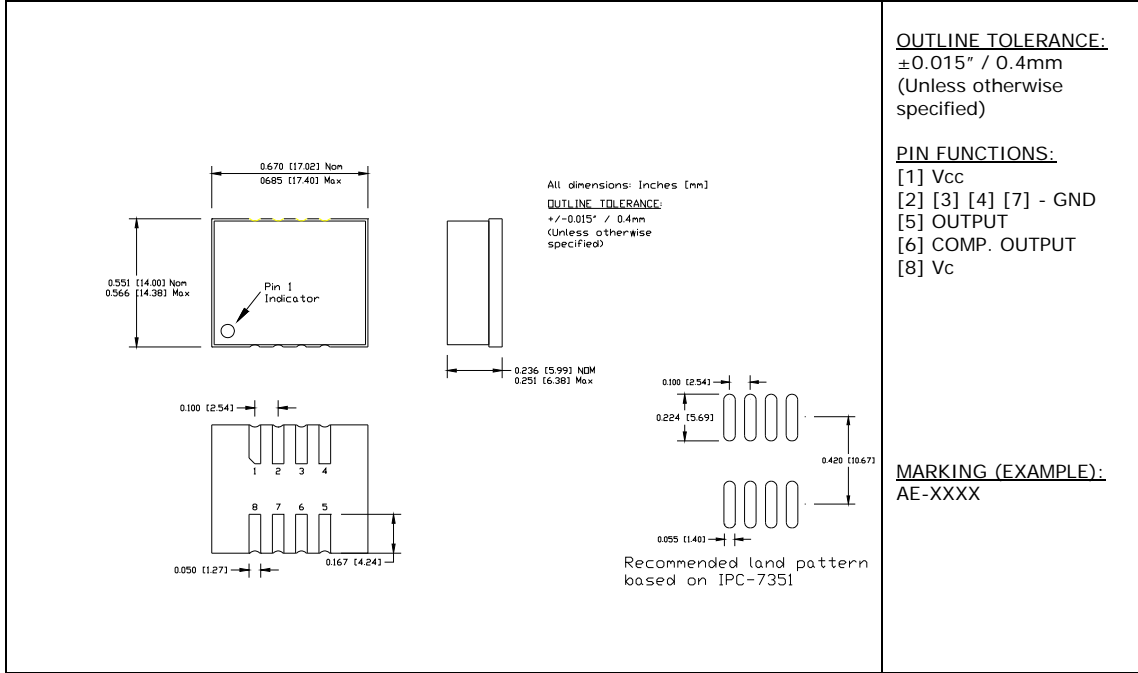
**FREQUENCY
CONTROLS, INC.**

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	See Note below	250		2,000	MHz	
Supply Voltage	Vcc	Code 0	4.75	5.0	5.25	V	
		Code A	3.135	3.3	3.465		
		Code B	2.375	2.5	2.625		
Supply current	Icc	Code 0			220	mA	
		Code A			195		
		Code B			160		
Output Logic Type				LVPECL Sine			
Load		Output to Vcc-2V, or Thevenin Equivalent, PECL Sine – internally AC coupled		50		Ohm	
Output Levels	Voh	PECL	Vcc-1.025			V	
	Vol	Sine		-3 dBm	Vcc-1.620		
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	
Jitter	Integrated	J	Integrated from Phase Noise, 12 KHz to 20 MHz RMS		0.1	0.2	ps
			100Hz to 80KHz.RMS			1.0	ns
			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		-50	-45	dBc/Hz
			@100 Hz		-80	-75	
			@1 KHz		-115	-110	
			@10KHz		-130	-125	
			@100KHz		-130	-125	
			@>1MHz		-135	-130	
Sub-harmonics		At 1,500 MHz		-50	-46	dBc	
Frequency Stability, usually not specified – unless necessary, APR is specified to incorporate stability	ΔF/F	Overall, including temperature, aging 10 years, shock and vibration @Vc=Vcc/2; APR 50 ppm, or less	±20	±30		ppm	
Control Voltage Range	Vc		0V		Vcc	V	
Setability	Vcs	Vc to set the F at Fo; T, Vcc, load – nominal, as shipped	0.4 Vcc	0.5 Vcc	0.6 Vcc	V	
Absolute Pull Range	APR	Over all conditions, see part # creation	10,20, 32, 50, 100			ppm	
Input impedance	Zin	@ Fmod < 100 KHz	50			KOhm	
Modulation Bandwidth		At Vc = Vcc/2, -3dB	20			KHz	

*Note: All parameters, unless noted otherwise are specified for nominal conditions, ie: ambient temperature is 25°C, Vcc – nominal.



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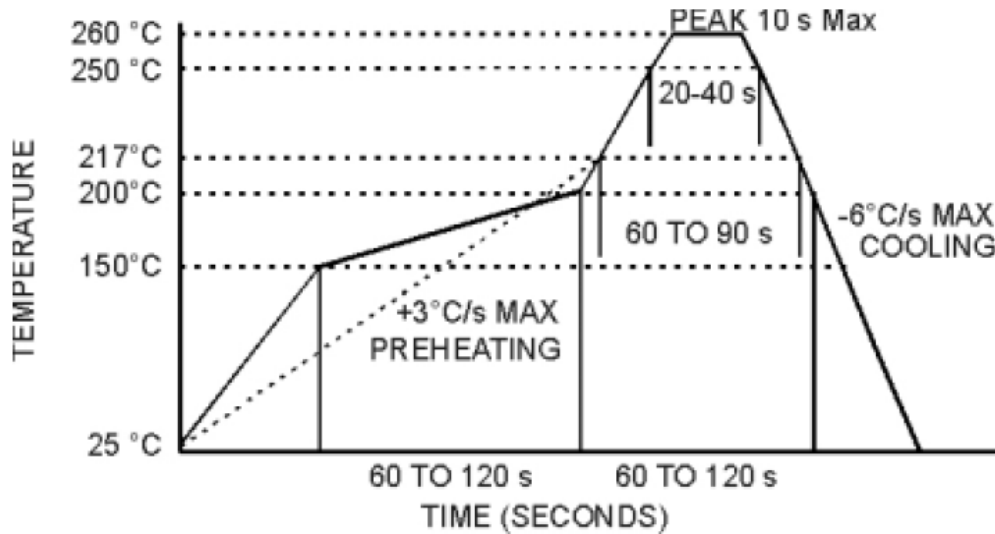
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Environmental and Mechanical Characteristics

Operating temp. range	see part # table
Mechanical Shock	Per MIL-STD-202, Method 213, Cond. A
Thermal Shock	Per MIL-STD-883, Method 1011, Cond. A
Vibration	Per MIL-STD-883, Method 2007, Cond. A
Hermetic Seal	Leak rate less than 1×10^{-8} atm.cc/s of helium, crystal only.
Soldering conditions	See MAX reflow profile below; The device may be reflowed once. Reflowing upside down is not allowed. NO CLEAN assembly is recommended.

Note: For lower frequencies, please refer to NEL AB series of VCXO

MAX Reflow Profile



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



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