

**AE-X3A2XX-X Series
SINEWAVE HF VCXO**

Rev. R

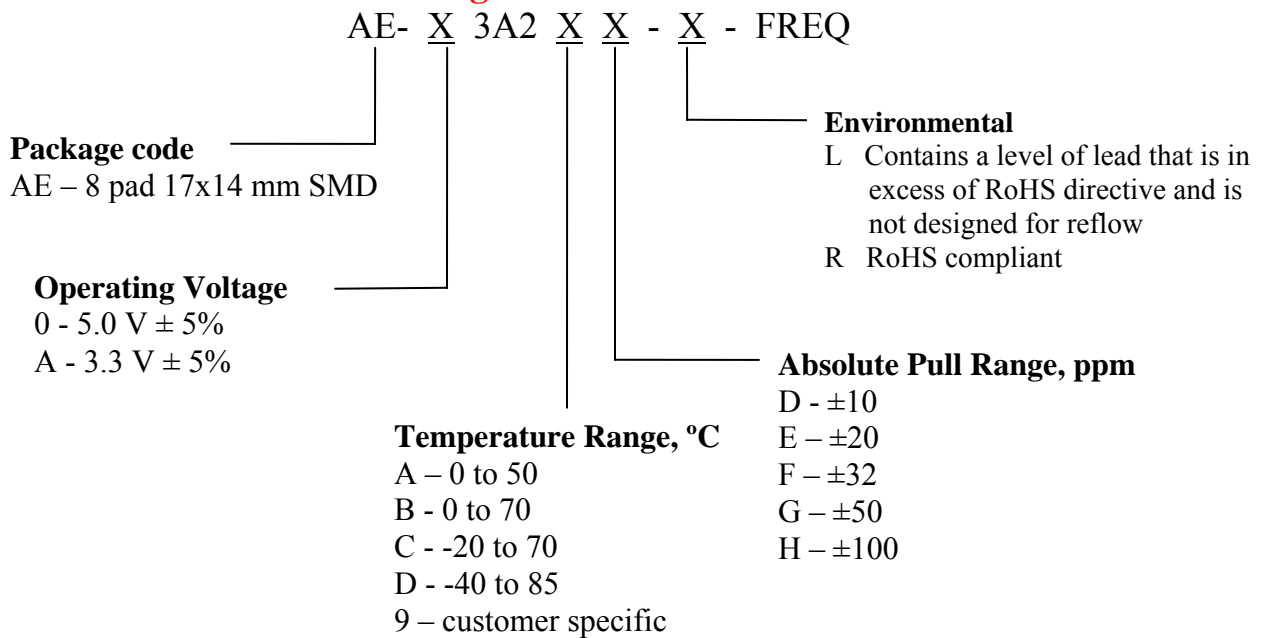
Description

The **AE-X3A2XX Series** of voltage controlled crystal oscillators (VCXO) provides high frequency with Sine-Wave output. The device does not use any 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
- No Multiplication
- Absolute Pull Range (APR) to $\pm 1,000$ ppm
- SONET ± 20 ppm overall free-run stability available
- High Shock Resistance, to 1000g
- COTS/Dual use

Creating a Part Number



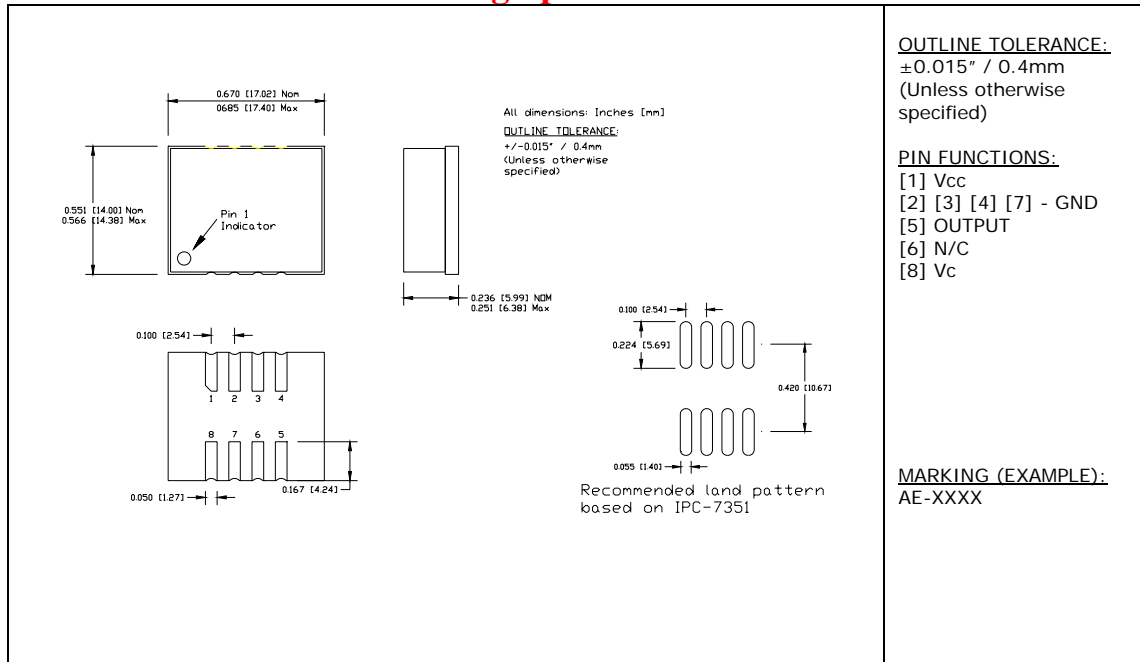
**FREQUENCY
CONTROLS, INC.**

357 Beloit Street, P.O. Box 457, Burlington, WI 53105-0457 U.S.A. Phone 262/763-3591
FAX 262/763-2881

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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 (1)

Parameter		Symb	Conditions, Note	MIN	TYP	MAX	Unit
Nominal Frequency		Fo		12		250	MHz
Supply Voltage		Vcc	Code 0 Code A	4.75 3.135	5.0 3.3	5.25 3.465	V
Supply current		Icc	No load, Vcc=3.3V 100MHz		60	160	mA
Output Logic Type					Sine		
Load			Internally AC coupled	45	50	55	Ohm
Harmonic		Ph				-25	dBc
Sub-Harmonics				None			
Output Power		Po	Into 50 ohm, 5V 3.3V	7 5	10 7		dBm
Jitter	Integrated, RMS	J	Integrated from Phase Noise, 12 KHz to 20 MHz RMS		0.1	0.15	ps
			100Hz to 80KHz,RMS			0.5	ps
			50 KHz to 80 MHz		0.2		ps
	Wavecrest characterized	Random period,			2.5		ps
		Accumul., pk-to-pk			17		ps
		Determin.			0		ps
Phase Noise		£(Δf)	100 MHz, 3.3V APR 32 ppm or less	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz	-85 -115 -145 -168 -171 -172	-80 -110 -140 -166 -169 -170	dBc/Hz
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 <u>part # creation</u>	10, 20, 32, 50, 100			ppm
Input impedance		Zin	@ Fmod < 100 KHz	50			KOhm
Modulation Bandwidth			At Vc = Vcc/2, -3dB	20			KHz

Note 1. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.



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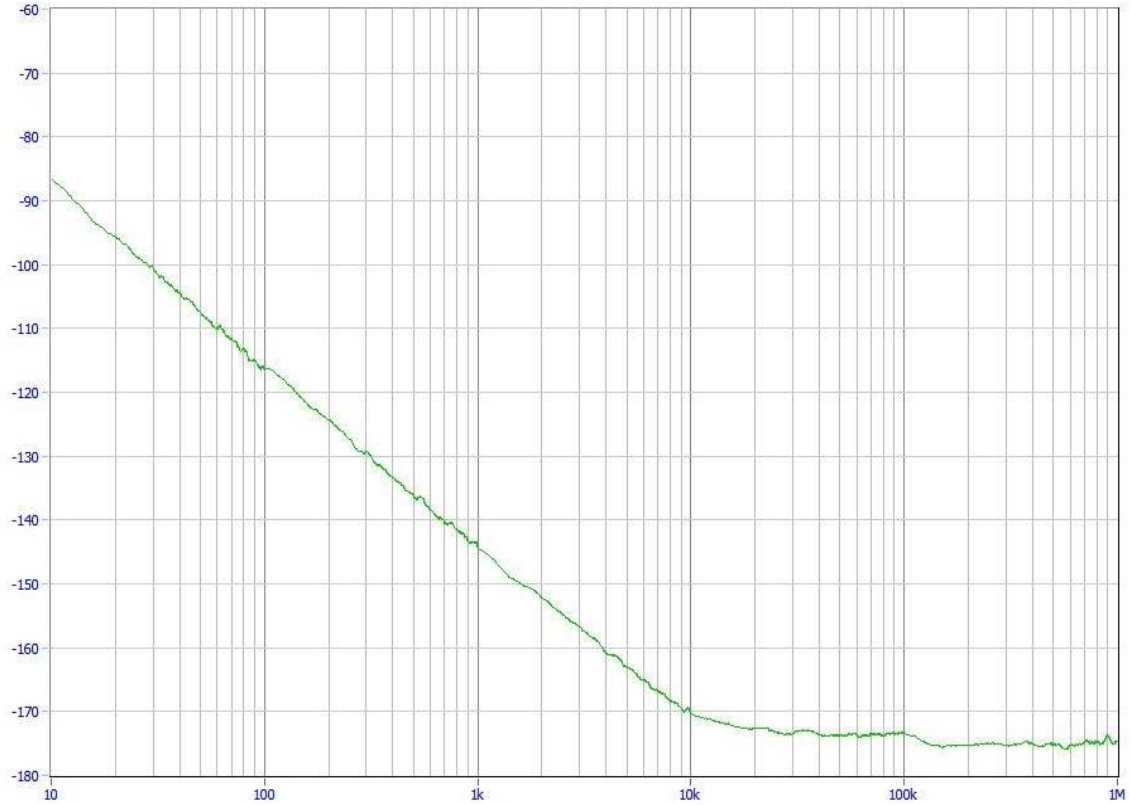
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Typical Phase Noise at 100 MHz



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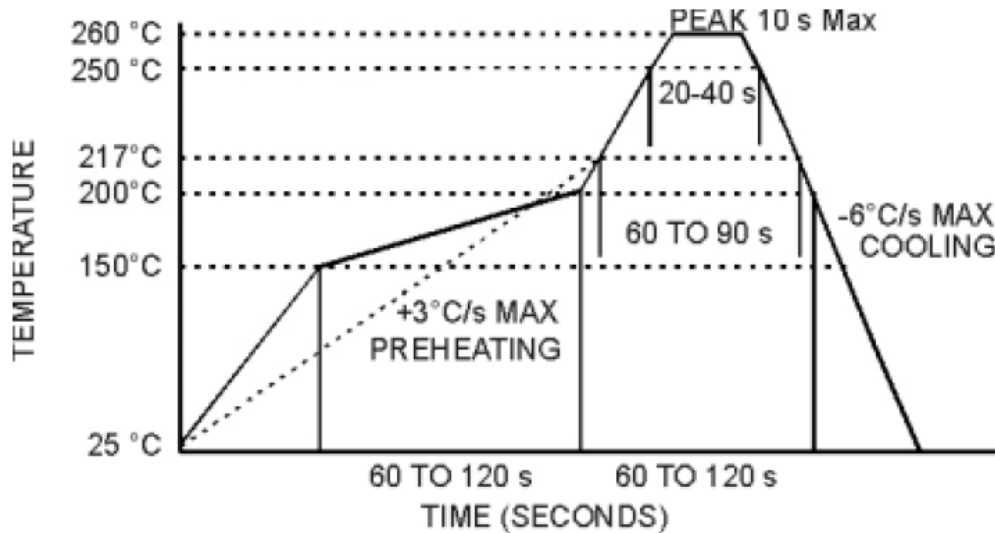
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Environmental and Mechanical Characteristics

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 5×10^{-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.

MAX Reflow Profile



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



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