

**CMOS/LVCMOS HF VCXO  
AE-X32BXX-X Series**

Rev. N

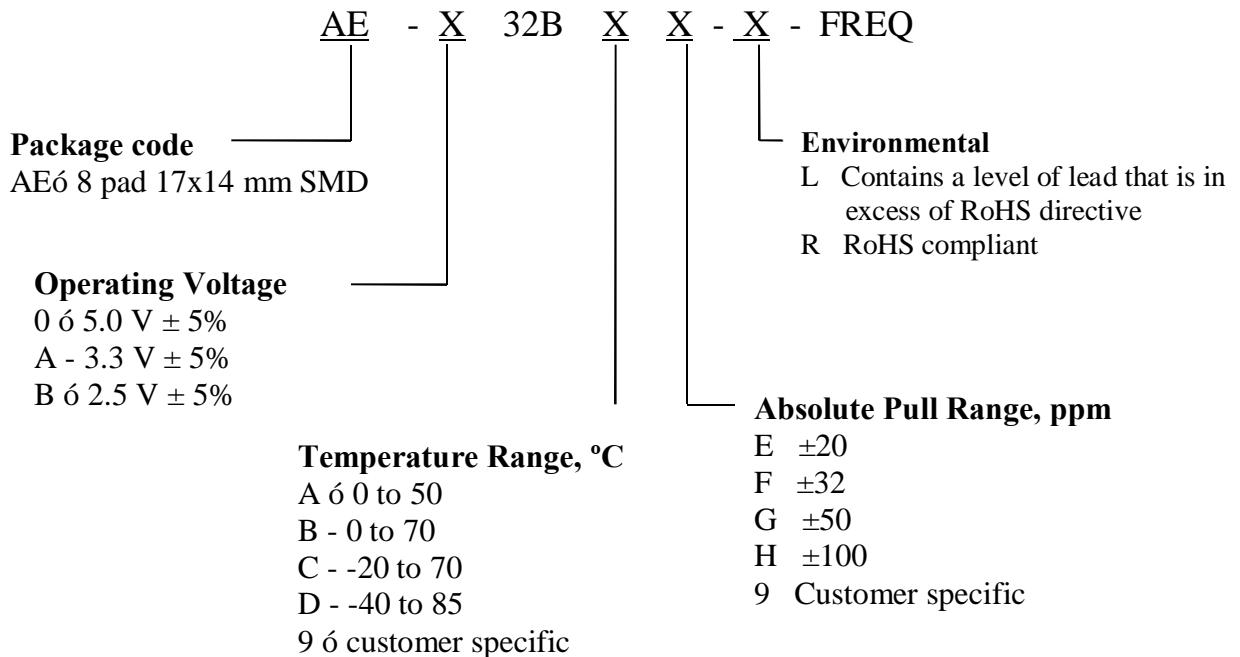
**Description**

The **AE-X32BXX Series** of voltage controlled crystal oscillators (VCXO) provides high frequency with CMOS/LVCMOS 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**

- Frequency Synthesizers, Exceptionally Low Phase Noise Reference
- High Reliability ó NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Ultra Low Phase Noise and Jitter
- No Multiplication
- Absolute Pull Range (APR) to ± 1,000 ppm
- SONET ± 20 ppm overall free-run stability available
- High Shock Resistance, to 1000g
- COTS/Dual use

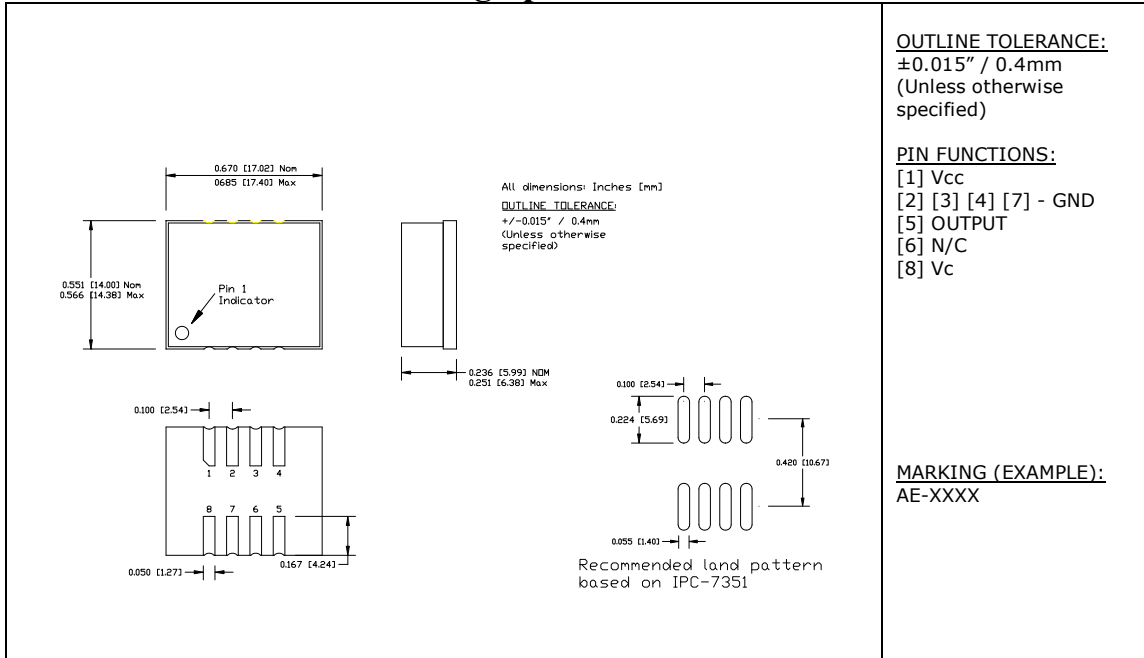
**Creating a Part Number**



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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 Code B	4.75 3.135 2.375	5.0 3.3 2.5	5.25 3.465 2.625	V
Supply current		Icc	No load, Vcc = 3.3 V 40 MHz			80	mA
Output Logic Type					CMOS		
Load					15 pF/10 KOhm		Ohm
Output Levels		Voh Vol	overall	0.9Vcc		0.1 Vcc	V
Duty Cycle (Symmetry)			At 50% Vcc	45/55	50/50	55/45	%
Rise/Fall Time		Tr/Tf	0.2Vcc to 0.8 Vcc; F< 70 MHz 70 MHz<F< 125 MHz 125MHz<F<250MHz		3 2 1.5	5 3 2.5	ns
<b>Jitter</b>	Integrated, RMS	J	Integrated from Phase Noise, 12 KHz to 20 MHz , RMS		0.1	0.15	ps
			100Hz to 80KHz,RMS			0.8	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
Sub-harmonics					None		dBc
Phase Noise		£( f)	125 MHz, 3.3 V APR 50 ppm or less	@ 10 Hz @ 100 Hz @ 1 KHz @ 10KHz @ 100KHz @ >1MHz	-80 -110 -140 -168 -171 -172	-75 -105 -135 -166 -169 -170	dBc/Hz
Frequency Stability, usually not specified ó unless necessary, APR is specified to incorporate stability		F/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 ó 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

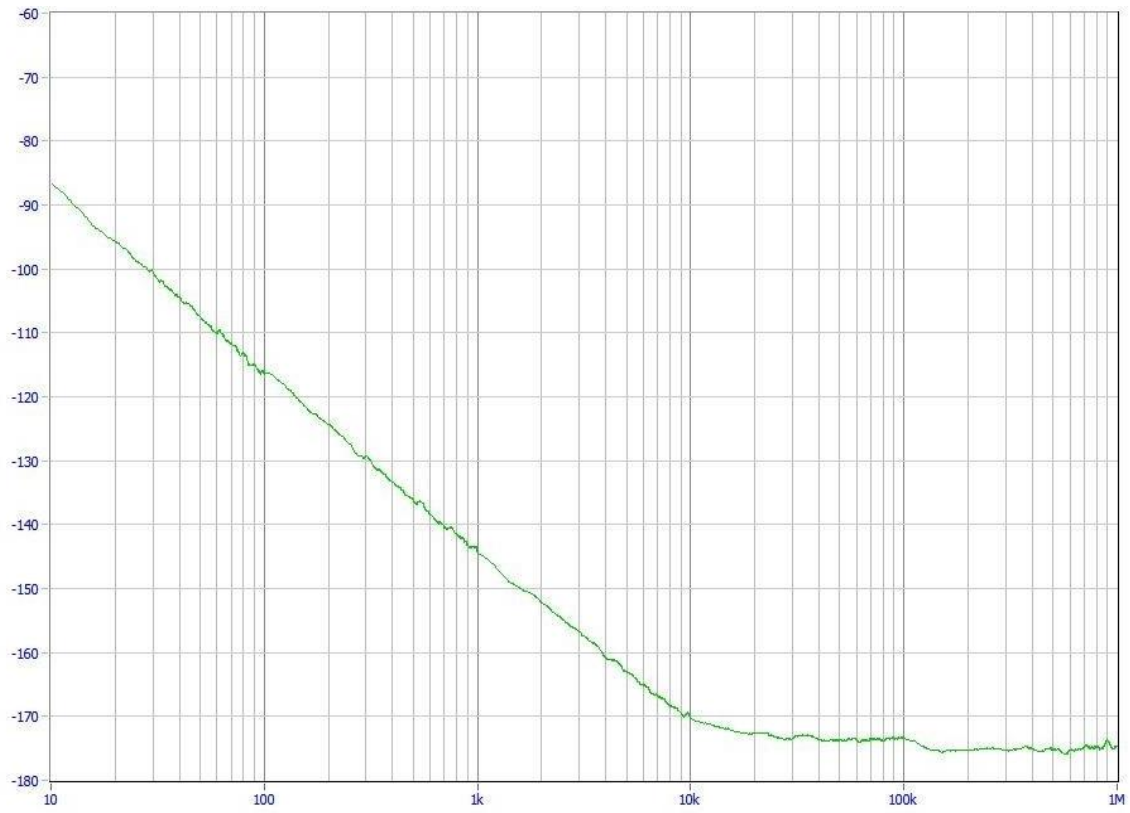
Note 1. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.



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Typical Phase Noise at 100 MHz



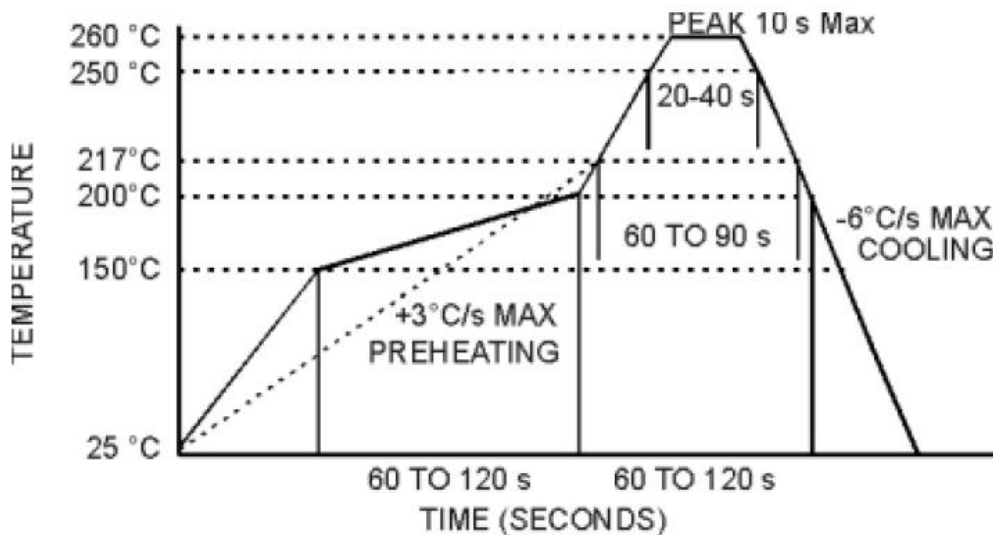
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**Environmental and Mechanical Characteristics**

<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.

