

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

Rev. M

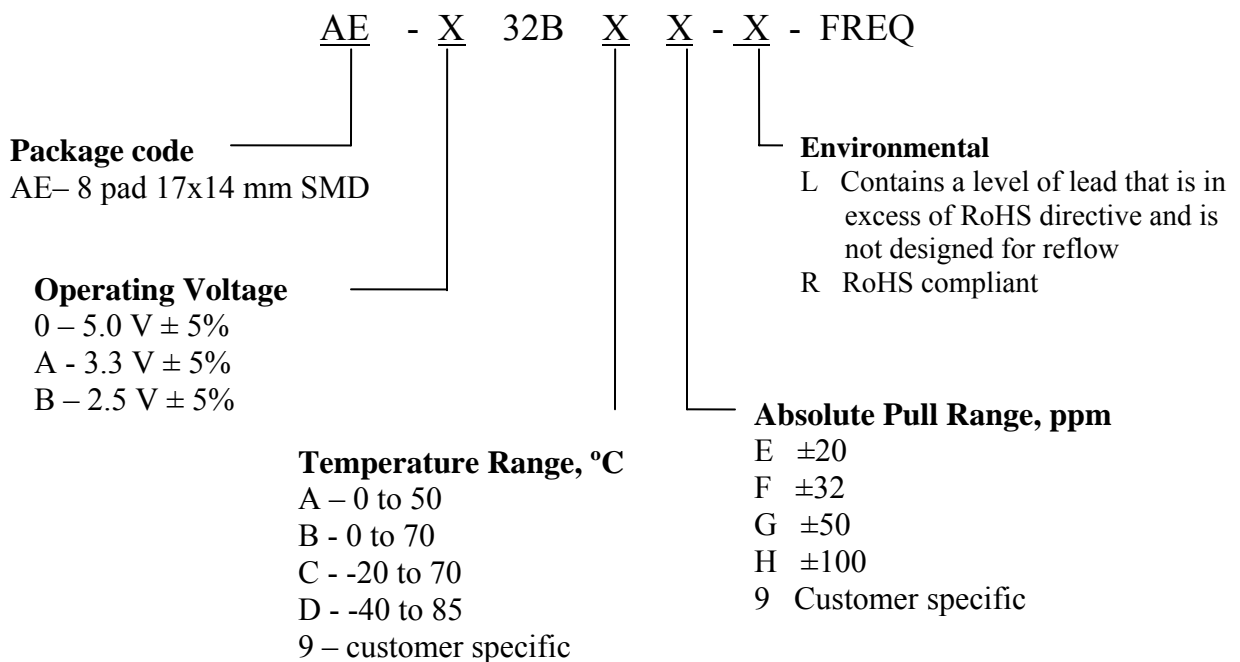
**Description**

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 – 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  $\pm 20$  ppm overall free-run stability available
- High Shock Resistance, to 1000g
- COTS/Dual use

**Creating a Part Number**





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### Electrical Parameters (1)

**Rev. M**

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	£(Δf)	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 – 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	

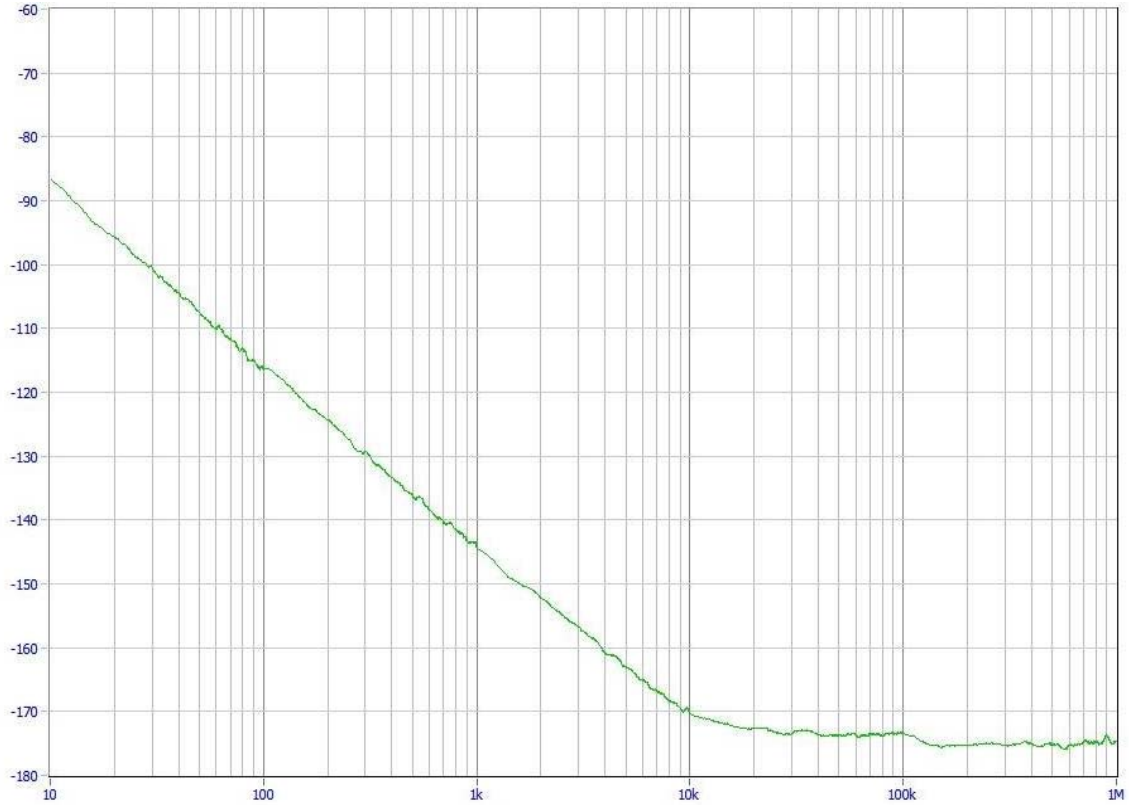
Note 1. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.



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Typical Phase Noise at 100 MHz



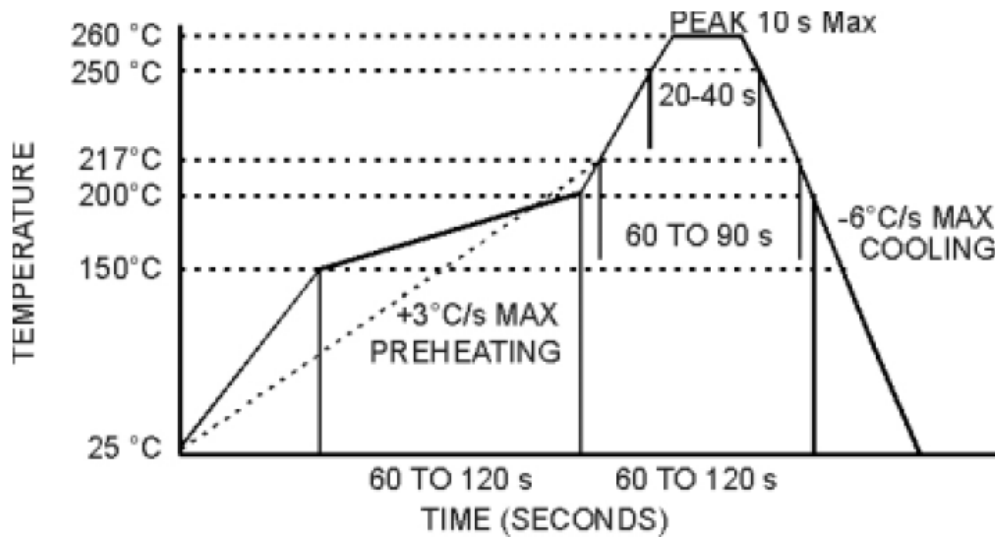
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**Rev. M**

**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.

