CMOS/LVCMOS HF VCXO
AE-X32BXX Series

Rev. B

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 ± 1,000 ppm
- RoHS compliant
- SONET ± 20 ppm overall free-run stability available
- High Shock Resistance, to 1000g

Creating a Part Number

AE - X 32B X X

Package code
AE– 8 pad 17x14 mm SMD

Operating Voltage
0 – 5.0 V ± 5%
A - 3.3 V ± 5%
B – 2.5 V ± 5%

Absolute Pull Range, ppm
E ±20
F ±32
G ±50
H ±100
9 Customer specific

Temperature Range, °C
A – 0 to 50
B - 0 to 70
C - -20 to 70
D - -40 to 85
9 – customer specific

NEL FREQUENCY CONTROLS, INC.
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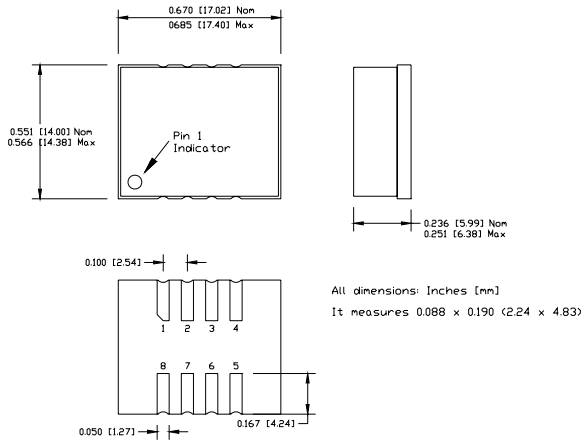
Drawing Specification



OUTLINE TOLERANCE:
±0.015" / 0.4mm
(Unless otherwise specified)

PIN FUNCTIONS:
[1] Vcc
[2] [3] [4] [7] - GND
[5] OUTPUT
[6] N/C
[8] Vc

MARKING (EXAMPLE):
AE-XXXX

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Operating Temperature Range	To	-40 to +85	ºC
Storage Temperature Range	Tst	-50 to +90	ºC
Supply Voltage	Vcc	-0.5 to 5.5	V
Control Voltage	Vc	-0.5 to 5.5	V
Enable/Disable Voltage	Ven/dis	0 to Vcc	V

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Electrical Parameters

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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
Jitter	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 -170 -172 -175	-75 -105 -135 -168 -170 -172	dBc/Hz
Frequency Stability, usually not specified – unless necessary, APR is specified to incorporate stability		ΔF/F	Overall, including initial calibration, 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

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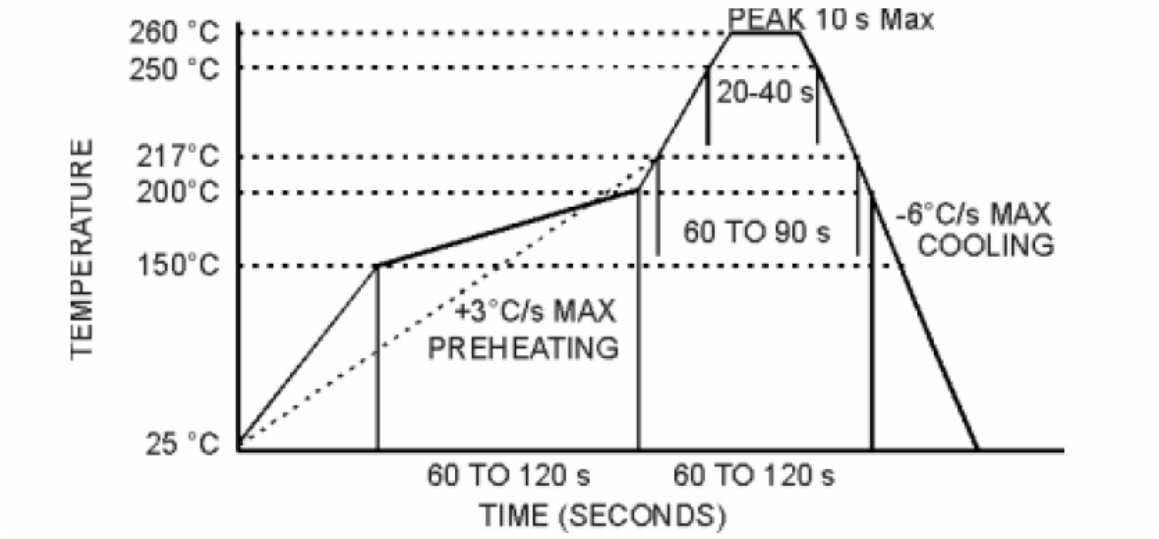
Environmental and Mechanical Characteristics

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 $5x10^{-8}$ atm.cc/s of helium , crystal only.
Soldering conditions	See MAX reflow profile below

MAX Reflow Profile



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