AE-X36DXXX-X Series
PECL/LVPECL UHF VCXO

Rev. R

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

AE- X 36D X X X - X - FREQ

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%

Output Type
P – PECL
S – Differential Sine

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

Absolute Pull Range, ppm
E ± 20
F ±32
G ±50
H ±100
T ±10

Environmental
L Contains a level of lead that is in excess of RoHS directive
R RoHS compliant

NEL FREQUENCY CONTROLS, INC.

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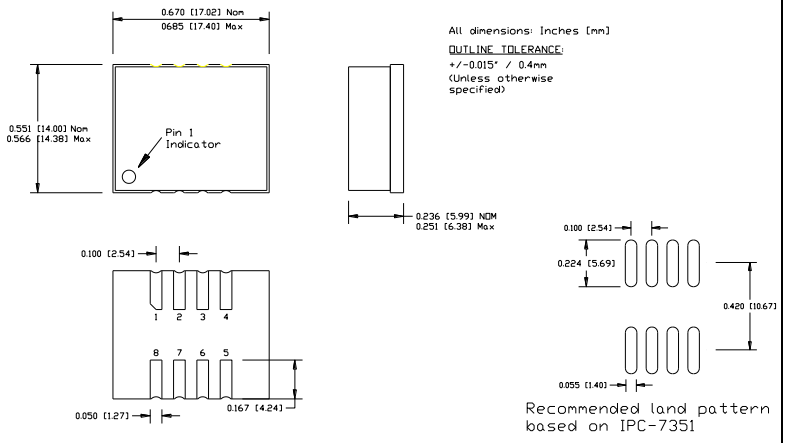
Drawing Specification



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

PIN FUNCTIONS:
[1] Vcc
[2] [3] [4] [7] - GND
[5] OUTPUT
[6] COMP. OUTPUT
[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

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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 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	Code 0 Code A Code B			220 195 160	mA
Output Logic Type				LVPECL Sine		
Load		Output to Vcc-2V, or Thevenin Equivalent, PECL Sine – internally AC coupled		50		Ohm
Output Levels	Voh Vol	PECL Sine	Vcc-1.025	 -3 dBm	 Vcc-1.620	V
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	ps
		50 KHz to 80 MHz		0.3		ps
Wavecrest characterized		Random period,		2.5		ps
		Accumul., pk-to-pk		25		ps
		Determine.		1		ps
Phase Noise	£(Δf)	1,500 MHz, APR 50 ppm or less @ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz		-50 -80 -115 -130 -130 -135	-45 -75 -110 -125 -125 -130	dBc/Hz
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, i.e.: ambient temperature is 25°C, Vcc – nominal.

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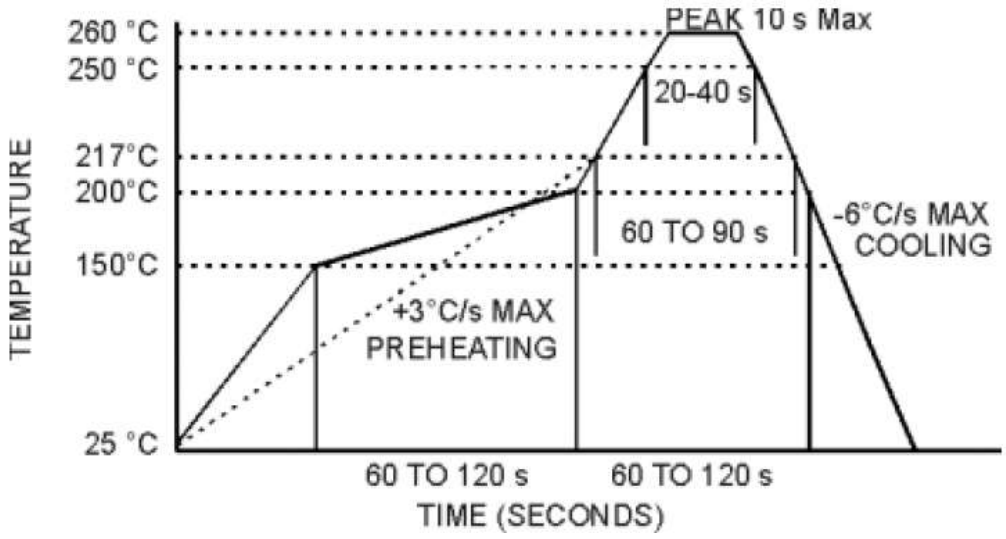
Environmental and Mechanical Characteristics

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 $1x10^{-8}$ 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



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