

**AE-X36DXXX-X Series  
PECL/LVPECL UHF VCXO**

Rev. R

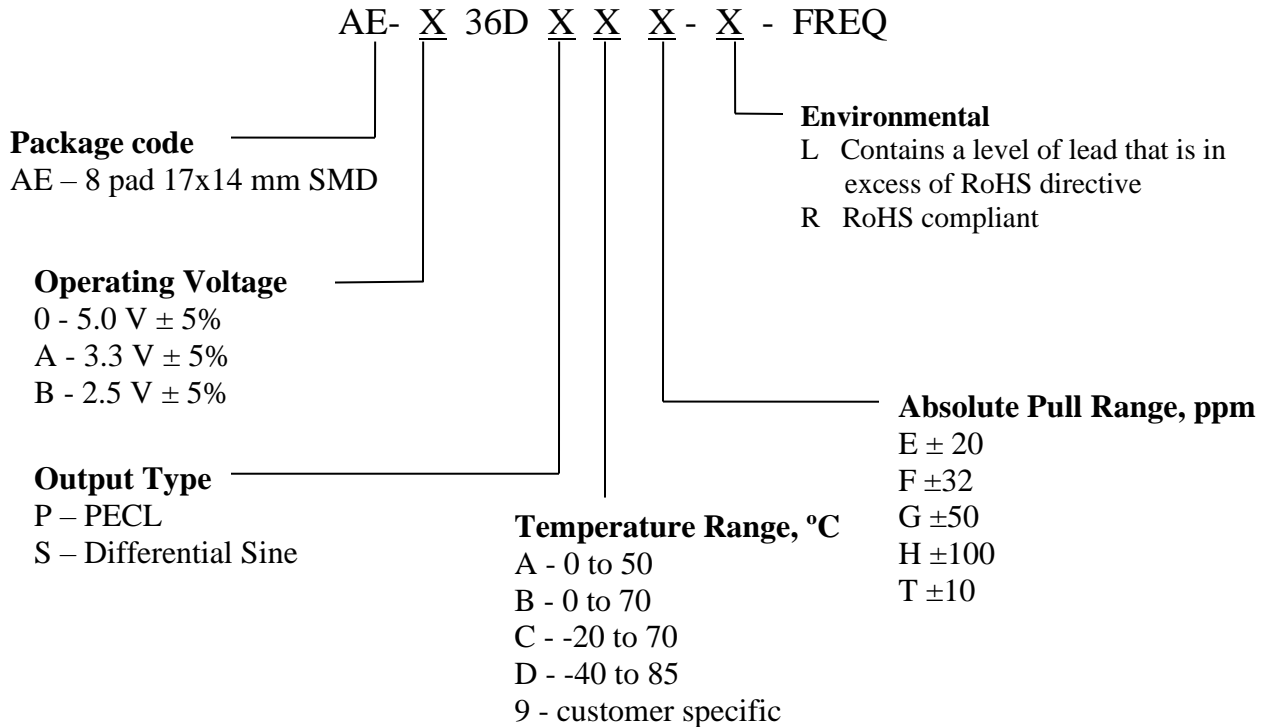
**Description**

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
- Ultra Low Phase Noise and Jitter
- Frequency Range to 2,000 MHz
- 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

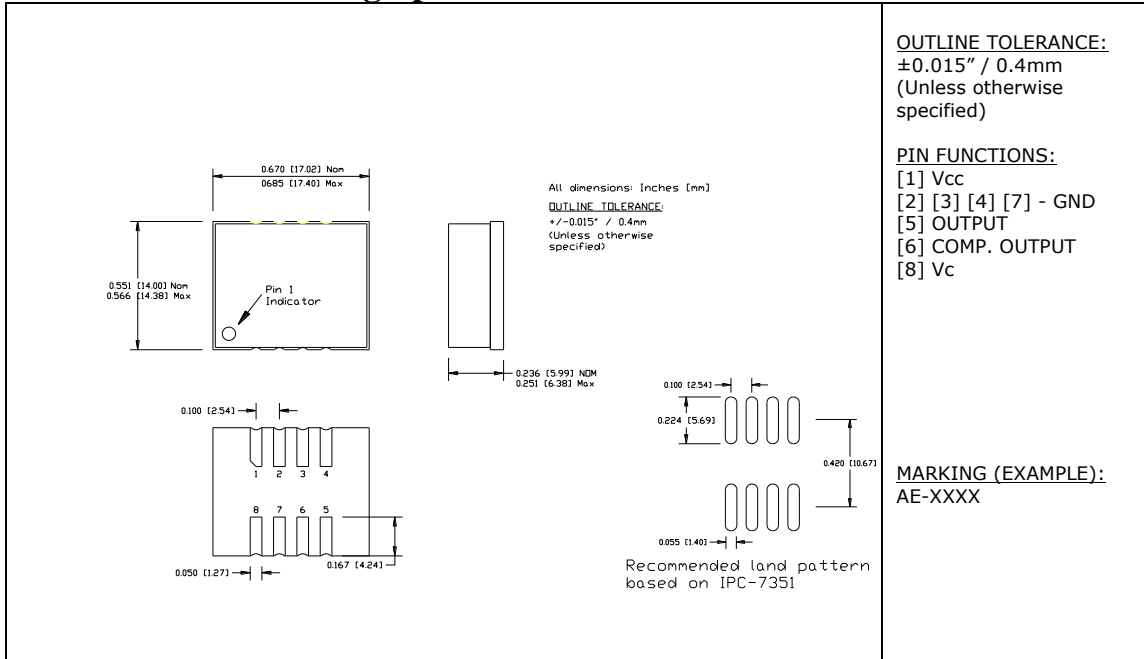
**Creating a Part Number**



**AE-X36DXXX-X Series**

Rev. R

**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	°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



### AE-X36DXXX-X Series

Rev. R

### 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		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
<b>Jitter</b>	Integrated	J	Integrated from Phase Noise, 12 KHz to 20 MHz RMS		0.1	0.2	ps
			100Hz to 80KHz,RMS			1.0	ns
			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.



**AE-X36DXXX-X Series**

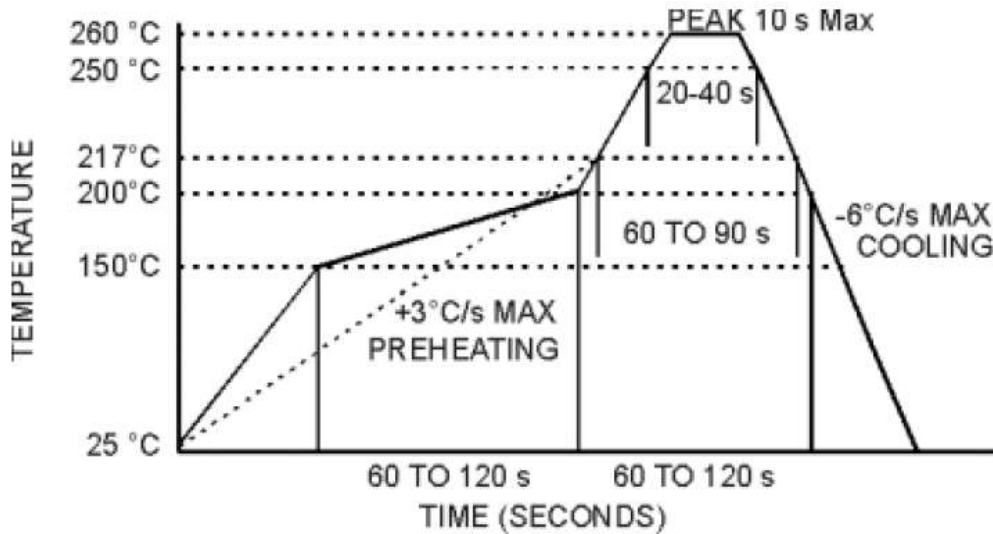
Rev. R

**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 $1 \times 10^{-8}$ 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.

Note: For lower frequencies, please refer to NEL AB series of VCXO

**MAX Reflow Profile**



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

