AE-XA4XXX-X Series
Rev. N

PECL/LVPECL UHF TCXO

Description

The AE-XA4XXX Series of temperature compensated crystal oscillators (TCXO) 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
- High Shock Resistance, to 1000g
- COTS/Dual use

Creating a Part Number

AE- X A4 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

Temperature Stability, ppm
2 ± 2.5 ppm, (0 to 50)
5 ± 5 ppm (-20 to 70)
6 ± 10 ppm
9 customer specific

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

NEL FREQUENCY CONTROLS, INC.
357 Beloit Street, Burlington, WI 53105 U.S.A. Phone 262/763-3591 FAX 2626262/763-2881
Email: nelsales@nelfc.com www.nelfc.com

CRYSTAL OSCILLATORS

Data Sheet 0701A

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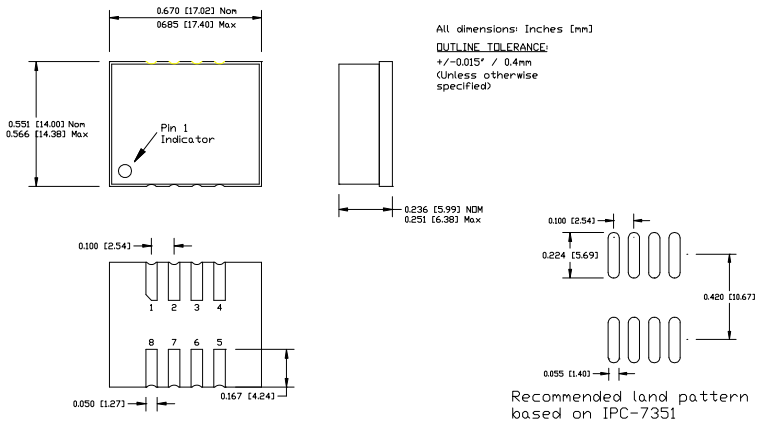
Drawing Specification



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

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

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 (1)

Parameter		Symb	Conditions, Note		MIN	TYP	MAX	Unit
Nominal Frequency		Fo			700		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				140	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
			Determin.			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, calibration plus temp. Aging Voltage and load Reflow		ΔF/F	See chart First year At room				 ±1 ±1 ±2	ppm

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

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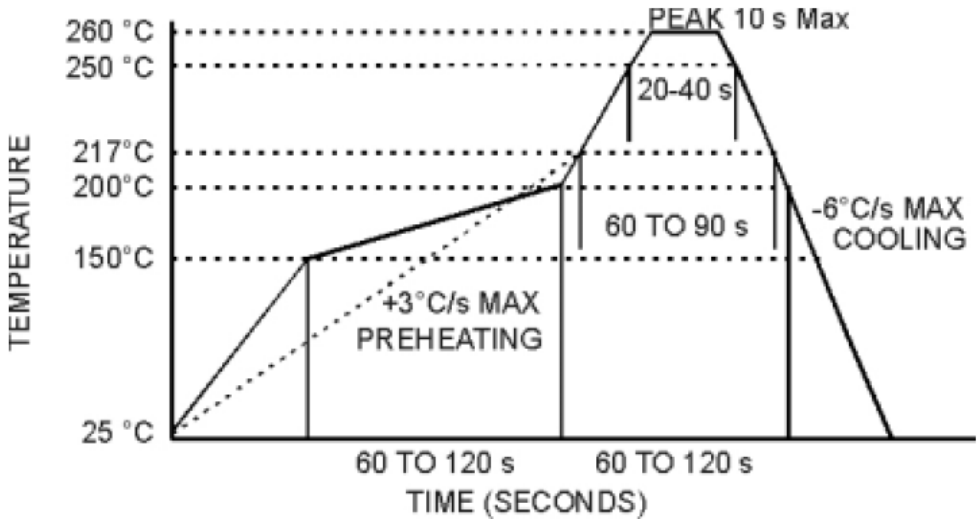
Environmental and Mechanical Characteristics

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

MAX Reflow Profile



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