Rev. F

SU-X29PXXX-X Series
PECL/LVPECL UHF XO

Description

The SU-X29PXXX Series of crystal oscillators (XO) provides ultra high frequency with PECL/LVPECL complementary outputs. The outputs can be disabled for test automation or combining multiple clocks. 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 9x14 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 1,800 MHz
- SONET ± 20 ppm overall stability available
- High Shock Resistance, to 1000g
- COTS/Dual use

Creating a Part Number

SU - X 29P X X X - X - FREQ

Package code
SU 6 pad 9x14 mm SMD

Operating Voltage
A 3.3 V ± 5%
B 2.5 V ±5%

Enable Option
L Enable Low
N N/C
H Enable High, see note

Temperature Range, ºC
A 0 to 50
B 0 to 70
C -20 to 70
D -40 to 85
9 Customer Specific

Frequency Stability, ppm
E ±20
F ±25
G ±50
H ±100
J ±32
9 Customer specific

Environmental
L Contains a level of lead that is in excess of RoHS directive and is not designed for reflow
R RoHS compliant

NEL FREQUENCY CONTROLS, INC.

357 Beloit Street, P.O. Box 457, Burlington, WI 53105-0457 U.S.A. Phone 262/763-3591 FAX 262/763-2881

Email: nelsales@nelfc.com www.nelfc.com

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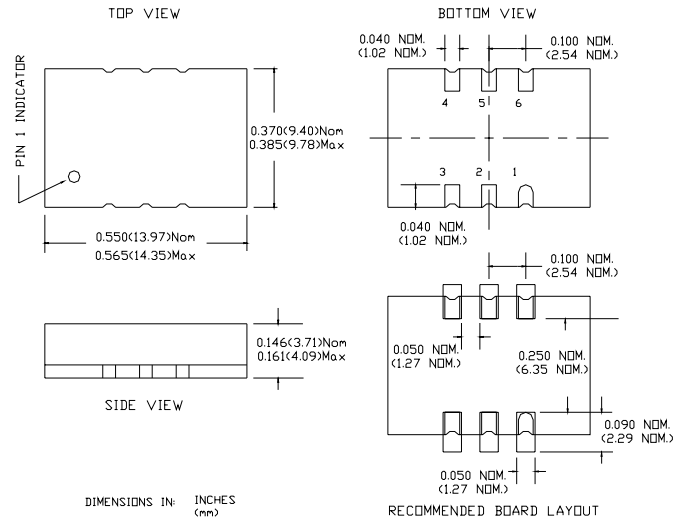
Drawing Specification



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

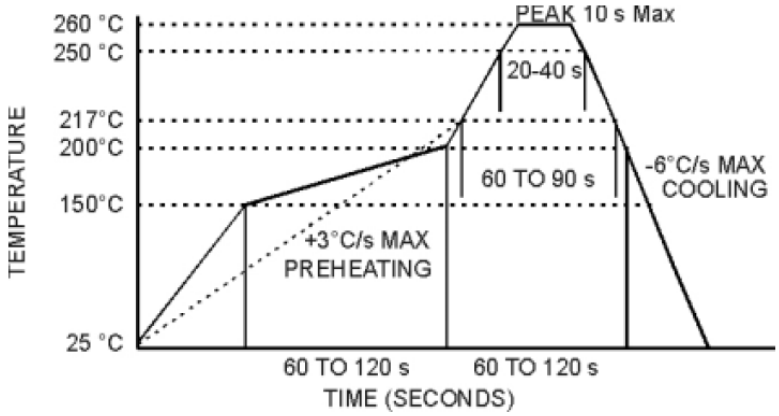
PIN FUNCTIONS:
[1] N/C
[2] EN / DIS or N/C
[3] CASE / GROUND
[4] OUTPUT
[5] COMP. OUTPUT
[6] SUPPLY VOLTAGE

MARKING (EXAMPLE):
SU-XXXX

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.

MAX Reflow Profile



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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 4.5	V
Enable/Disable Voltage	Ven/dis	0 to Vcc	V

Electrical Parameters

Parameter		Symb	Conditions, Note		MIN	TYP	MAX	Unit
Nominal Frequency		Fo	At Vcc=2.5V, Fmax is 1.6 GHz		200		1,800	MHz
Supply Voltage		Vcc	Code A Code B		3.135 2.375	3.3 2.5	3.465 2.625	V
Supply current		Icc				110	130	mA
Output Logic Type						LVPECL		
Load			Output to Vcc-2V, or Thevenin Equivalent			50		Ohm
Output Levels		Voh Vol	Overall, at F> 1.0 GHz output swing may deteriorate, consult factory		Vcc-1.025		 Vcc-1.620	V
Duty Cycle (Symmetry)			At 50% of output voltage swing		45/55	50/50	55/45	%
Rise/Fall Time		Tr/Tf	20 to 80, 80 to 20 %	F< 1GHz F> 1 GHz		0.4 0.2	0.5 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			36		ps
			Determin.			6	12	ps
Phase Noise*		£(Δf)	622.080MHz	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz		-60 -90 -118 -135 -140 -145	-55 -85 -113 -130 -135 -140	dBc/Hz
Sub-harmonics			At 622.08 MHz			-50	-46	dBc
Frequency Stability		ΔF/F	Overall, including initial calibration, temperature, aging 10 years, shock and vibration				From ±20, see table for part number	ppm
Enable			Pin 2 = Low or floating, 0 to Vcc-1.62 V		Enabled			V
Disable			Pin 2 = High, Vcc-1.025 V to Vcc		Disabled, Pin4 = Logic “1”, Pin5 = Logic “0”			V
Enable High (CMOS level) at F< 650 MHz available, consult factory								

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Notes:

1. * Phase noise and phase jitter are frequency dependent. Phase noise deteriorates approximately 20logN ("N" if frequency ratio) with rising the frequency. Please consult factory for detailed Phase Noise and Phase Jitter characterization at your frequency of interest.
2. All parameters, unless noted otherwise are specified for nominal conditions, i.e. ambient temperature is 25 ºC, Vcc – nominal.

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