Voltage Controlled Crystal Oscillators

Data Sheet 0716C

Rev. H

AA-A3DDXXX-X Series
LVDS VCXO

Description

The AA-A3DDXXX Series of crystal oscillators (XO) provides low phase noise LVDS complementary outputs. The outputs can be disabled for test automation or combining multiple clocks. The device packaged in a miniature, low profile, leadless FR-4 based package with gold plated pads, which enhances compatibility with PCB material.

Applications and Features

- Low Phase Noise
- Wimax, Fiber Channel; 10 GbE; Infiniband; Network Processors; SOHO Routing
- High Reliability – NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Fast Rise and Fall times
- Low cost
- COTS/Dual use

Creating a Part Number

AA - A 3DD X X X - X - FREQ

Package code
AA 6 pad 7.5x5.2mm SMD

Operating Voltage
A 3.3 V ± 5%

Enable Option
L Enable Low
N N/C

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 (APR), ppm
E ±20
F ±32
G ±50
H ±100
9 Customer specific

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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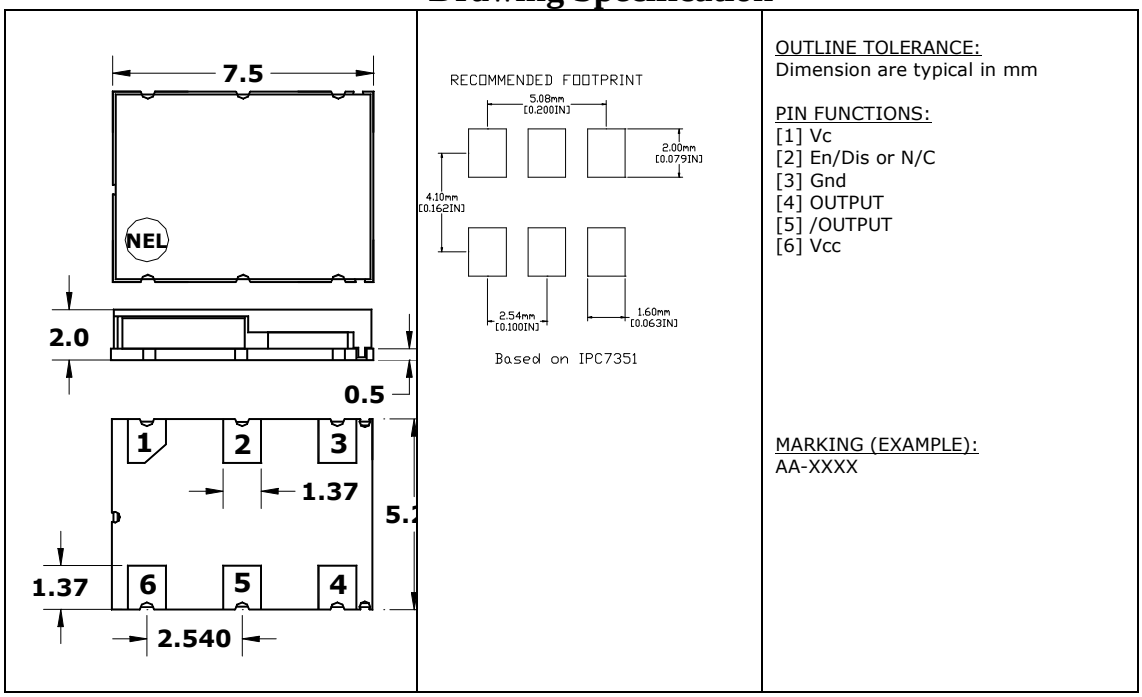
Drawing Specification



OUTLINE TOLERANCE:
Dimension are typical in mm

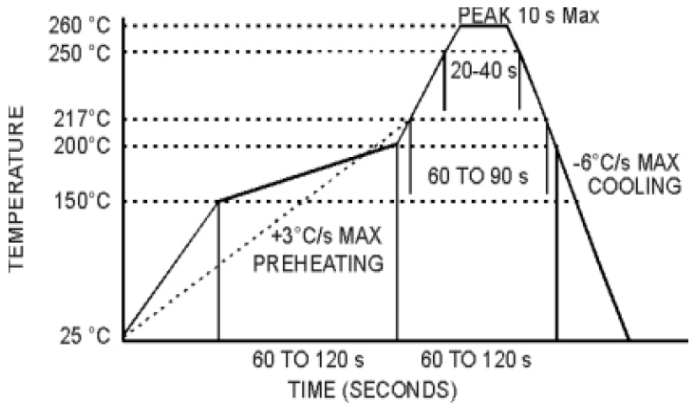
PIN FUNCTIONS:
[1] Vc
[2] En/Dis or N/C
[3] Gnd
[4] OUTPUT
[5] /OUTPUT
[6] Vcc

MARKING (EXAMPLE):
AA-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 5.5	V
Control Voltage	Vc	-0.5 to 5.5	
Enable/Disable Voltage	Ven/dis	0 to Vcc	V

Electrical Parameters (1)

Parameter		Symb	Conditions, Note		MIN	TYP	MAX	Unit
Nominal Frequency		Fo			1		260	MHz
Supply Voltage		Vcc	Code A		3.135	3.3	3.465	V
Supply current		Icc				60	80	mA
Output Logic Type						LVDS		
Load			At receiving end between the outputs		90	100	110	Ohm
Output Levels		Vod	Differential amplitude		247	330	454	mV
			Amplitude error				50	mV
		Vof	Offset Voltage		1.125	1.25	1.375	V
			Offset voltage error				50	mV
Duty Cycle (Symmetry)			At outputs crossing, room temperature		45/55	50/50	55/45	%
Rise/Fall Time		Tr/Tf	20 to 80, 80 to 20 %			0.5	0.7	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-			17		ps
			Determin	F>52 MHz		6		ps
Sub-harmonics			F > 52 MHz			-50	-42	dBc
Phase Noise		£(Δf)	155.52 MHz,	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz		-70 -100 -125 -140 -145 -145		dBc/Hz
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		0.4 Vcc	0.5 Vcc	0.6 Vcc	V
Absolute Pull Range		APR	Over all conditions, see part # creation		20, 32, 50, 100			ppm
Input impedance		Zin	@ Fmod < 100 KHz		50			KOhm
Modulation Bandwidth			At Vc = Vcc/2, -3dB		20			KHz
Enable			Pin 2 = Low, 0 to Vcc-1.62 V, or floating		Enabled			V
Disable			Pin 2 = High, Vcc-1.025 V to Vcc		Disabled, Pin4 = Logic “1”, Pin5 = Logic “0”			V

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

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