

**LVPECL UHF CLOCK (XO)**  
**SD-A29KXXX Series (3.3 Volt)**  
**SD-B29KXXX Series (2.5 Volt)**

**Description**

The **SD-X29KXXX Series** of quartz crystal oscillators provides ultra high frequency with LVPECL complementary outputs. The outputs can be Tri-stated for test automation or combining multiple clocks. The device is based on low noise analog harmonic multiplication for higher frequencies, and packaged in a miniature, low profile leadless ceramic SMD package with 6 gold plated pads.

**Applications and Features**

- Wide frequency range – 38.0MHz to 640.000MHz
- Fiber Channel; 10 GbE; Infiniband; Network Processors; SOHO Routing
- High Reliability - NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Low Phase Noise, Low Jitter
- High shock resistance, to 1000g
- Ultra High Frequency
- Tight frequency stability -  $\pm 20$  ppm overall available
- Grounded lid and internal by-pass capacitor reduce EMI
- RoHS Compliant, Lead Free Construction

**Creating a Part Number**

---

**SD - X 29K X X X - FREQ**

<p><b>Package Code</b> _____</p> <p>SD 6 pad 5x7mm SMD</p> <p><b>Input Voltage</b> _____</p> <p>A 3.3V<math>\pm</math>5%</p> <p>B 2.5V<math>\pm</math>5%</p> <p><b>Enable Option</b> _____</p> <p>H Enable High</p> <p>L Enable Low</p>	<p><b>Overall Frequency Stability, ppm</b></p> <p>E <math>\pm 20</math></p> <p>F <math>\pm 25</math></p> <p>G <math>\pm 50</math></p> <p>H <math>\pm 100</math></p> <p>9 Customer specific</p> <p><b>Temperature Range, °C</b></p> <p>A 0 to 50</p> <p>B 0 to 70</p> <p>C -20 to 70</p> <p>D -40 to 85</p> <p>9 Customer specific</p>
---	--

**SD-X29KXXX Series Continued**  
**LVPECL UHF CLOCK (XO)**

### 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 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		38		640	MHz
Supply Voltage	Vcc	Code A Code B	3.135 2.375	3.3 2.5	3.465 2.625	V
Supply current	Icc			80	100	mA
Output Logic Type				LVPECL		
Load		Output to Vcc-2V, or Thevenin Equivalent		50		Ohm
Output Levels	Voh Vol	overall	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 %		0.5	0.7	ns
<b>Jitter</b>	Integrated	J	Integrated from Phase Noise, 12 KHz to 20 MHz, RMS	0.3		ps
	Wavecrest characterized	Random period,	<320 M >320 M	2.5 2.5		ps
		Accumul., pk-to-pk	<320 M >320 M	30 43		ps
		Deterministic	<320 M >320 M	6 18		ps
Sub-harmonics			<320 M >320 M	-50 -35		dBc
Phase Noise	£(Δf)	212.5 MHz	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz	-65 -95 -125 -140 -145 -148		dBc/Hz
Frequency Stability	ΔF/F	Overall, including initial calibration, temperature, aging 10 years, shock and vibration	See "Creating a Part Number" Not all combinations available, consult factory			ppm
Enable High Option Pin 2 Enabled Pin 2 Disabled		CMOS logic 1 or N/C CMOS logic 0	0.7 Vcc 0		Vcc 0.3 Vcc	V
Enable Low Option Pin 2 Disabled Pin 2 Enabled		CMOS logic 1 or N/C CMOS logic 0	0.7 Vcc 0		Vcc 0.3 Vcc	V

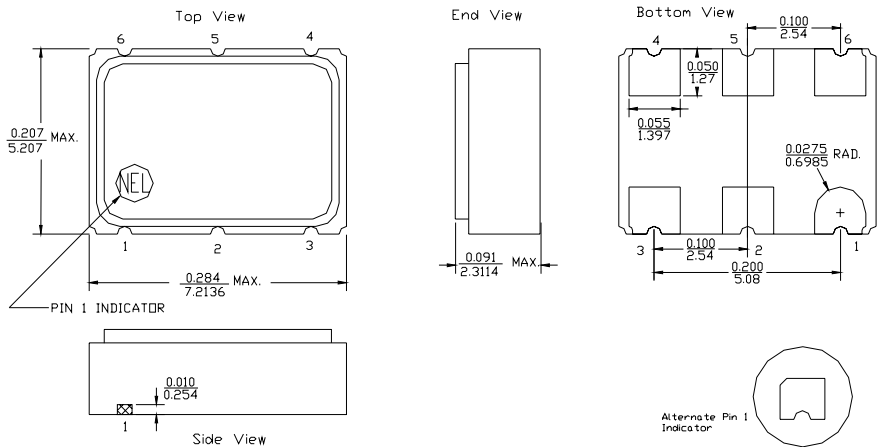


Rev. B

## SD-X29KXXX Series Continued LVPECL UHF CLOCK (XO)

### Electrical Connection

Pin	Connection
1	Enable/Disable
2	N.C.
3	$V_{EE}$ /Ground
4	Output
5	/Output
6	$V_{CC}$

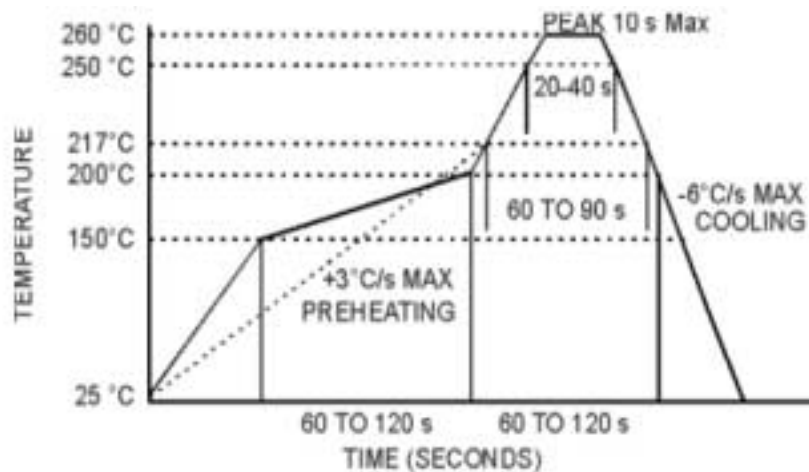


ALL DIMENSIONS:  $\frac{IN}{mm}$   
All tolerances are  $\pm 0.005$  inches ( $\pm 0.127$  mm) unless otherwise specified.

## Environmental and Mechanical Characteristics

<b>Operating temp. range</b>	see part # table
<b>Mechanical Shock</b>	Per MIL-STD-202, Method 213, Cond. E
<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
<b>Soldering conditions</b>	See MAX reflow profile below

### Maximum Reflow Profile



**FREQUENCY  
CONTROLS, INC.**