

**LVDS  
SD-X2D1X-X Series**

Rev. E

**Description**

The **SD-X2D1-X Series** of quartz crystal oscillators provide LVDS compatible signals in a ceramic SMD package. Systems designers may now specify space-saving, cost-effective packaged LVDS oscillators to meet their timing requirements.

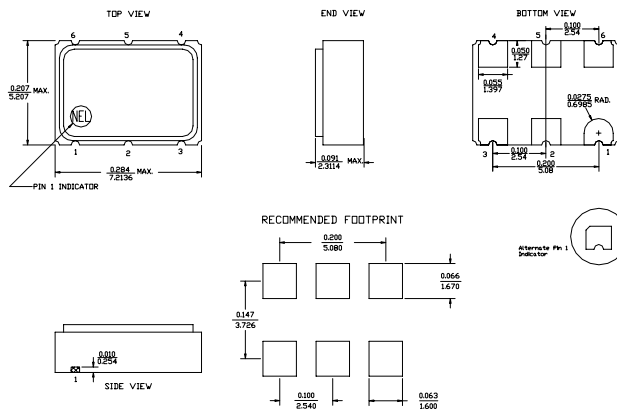
**Features**

- Wide frequency range—60.0MHz to 350.0MHz
- User specified tolerance available
- Space-saving alternative to discrete component oscillators
- High shock resistance, to 1000g
- 3.3 volt operation (other voltages available upon request)
- Metal lid electrically connected to ground to reduce EMI
- Enable/Disable
- LVDS output on pin 4, complement on Pin 5
- Low Jitter - Wavecrest jitter characterization available
- High Reliability - NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Overtone technology
- High Q Crystal actively tuned oscillator circuit
- Power supply decoupling internal
- No internal PLL avoids cascading PLL problems
- High frequencies due to proprietary design
- Gold plated pads
- COTS/Dual use

**Electrical Connection**

**Electrical Connection**

Pin	Connection
1	Enable/Disable
2	N/C
3	Ground
4	Output
5	/Output
6	V <sub>cc</sub>



## SD-X2D1X-X Series Continued

### LVDS

Rev. E

### Operating Conditions and Output Characteristics

#### Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Frequency	-----	-----	60.0MHz	-----	350.0MHz
Duty Cycle <sup>(2)</sup>	-----	@ V <sub>O</sub> /2	45/55%	-----	55/45%
Logic 0 <sup>(2)</sup>	V <sub>OL</sub>	-----	0.80V	-----	1.10V
Logic 1 <sup>(2)</sup>	V <sub>OH</sub>	-----	1.25V	-----	1.55V
Differential Voltage <sup>(2)</sup>	V <sub>OD</sub>	-----	250 mV	-----	450 mV
Disable Voltage	-----	V <sub>EE</sub> =0V	-----	-----	0.8V
Enable Voltage <sup>(5)</sup>	-----	V <sub>EE</sub> =0V	2.0V	-----	-----
Rise & Fall Time <sup>(2)</sup>	tr,tf	20-80%V <sub>O</sub>	-----	-----	700 ps
Tpd <sup>(4)</sup>	-----	-----	-0.5 ns	-----	+0.5 ns
Jitter, Integrated	J	Integrated from phase noise, 12kHz to 20MHz, RMS	-----	0.1 ps	-----
Jitter, Wavecrest Characterized <sup>(3)</sup>	-----	Random Period	-----	2.3ps	-----
		Accum, pk-to-pk	-----	28ps	-----
Phase Noise	£(Δf)	200MHz			
		@ 10Hz	-----	-65 dBc/Hz	-----
		@ 100Hz	-----	-100 dBc/Hz	-----
		@ 1kHz	-----	-130 dBc/Hz	-----
		@ 10kHz	-----	-143 dBc/Hz	-----
		@ 100kHz	-----	-143 dBc/Hz	-----
		@ >1Mhz	-----	-145 dBc/Hz	-----
Frequency Stability <sup>(1)</sup>	dF/F	Overall conditions including: voltage, calibration, temp., 10 yr aging, shock, vibration	-100ppm	-----	+100ppm

#### General Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Supply Voltage	V <sub>CC</sub>	3.3V±5%	3.135V	3.3V	3.465V
Supply Current	I <sub>CC</sub>	-----	0.0 mA	-----	80 mA
Output current	I <sub>O</sub>	Continuous Output Current	0.0 mA	-----	±50.0 mA
Operating temperature	T <sub>A</sub>	-----	0°C	-----	70°C
Storage temperature	T <sub>S</sub>	-----	-55°C	-----	125°C
Power Dissipation	P <sub>D</sub>	-----	-----	-----	277 mW
Load		100 ohms across differential outputs			
Start-up time	t <sub>S</sub>	-----	-----	2 ms	10 ms

#### Environmental and Mechanical Characteristics

Mechanical Shock	Per MIL-STD-202, Method 213, Condition E
Thermal Shock	Per MIL-STD-883, Method 1011, Condition A
Vibration	0.060" double amplitude 10 Hz to 55 Hz, 35g's 55Hz to 2000 Hz
Hermetic Seal	Leak rate less than 1 x 10 <sup>-8</sup> atm.cc/sec of helium

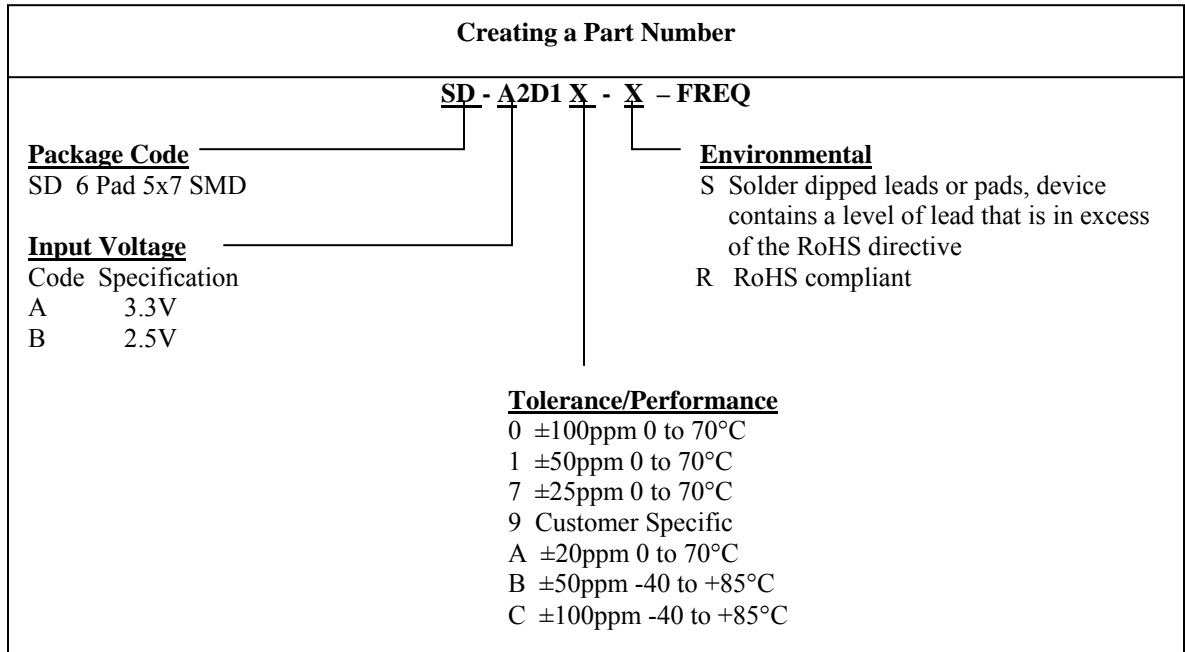
#### Footnotes:

- 1) Standard frequency stability (±20,±25,±50ppm & others available)
- 2) With Load of 100 ohms across differential outputs.
- 3) Jitter performance is frequency dependent. Please contact factory for full Wavecrest characterization.
- 4) Tpd is phase shift between the falling edge of pin 4 and the rising edge of pin
- 5) Open to enable also enables output.



SD-X2D1X-X Series

Rev. E



**Max Reflow Profile**

