

## LVDS SD-X2D00 Series

### Description

The **SD-X2D00 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.

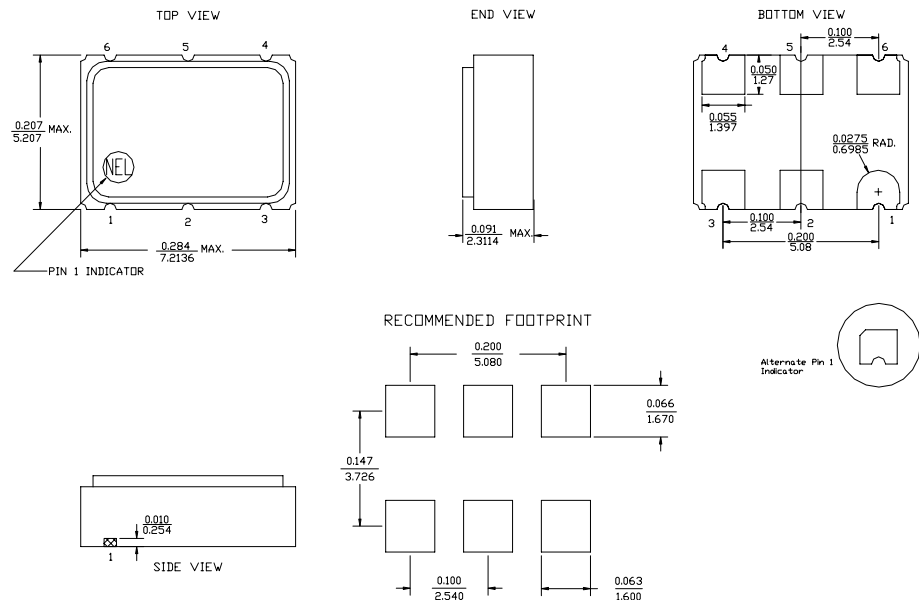
### Features

- Wide frequency range—80.0MHz to 312.5MHz
- User specified tolerance available
- Space-saving alternative to discrete component oscillators
- High shock resistance, to 1000g
- Metal lid electrically connected to ground to reduce EMI
- Enable/Disable
- LVDS output on pin 4, complement on Pin 5
- COTS/Dual use
- 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
- RoHS Compliant, Lead Free Construction

### Electrical Connection

NPin Connection

- |   |                   |
|---|-------------------|
| 1 | Enable/Disable.   |
| 2 | N.C               |
| 3 | Ground            |
| 4 | Output            |
| 5 | Output Complement |
| 6 | V <sub>CC</sub>   |



ALL DIMENSIONS:  $\frac{IN}{mm}$   
All tolerances are  $\pm 0.0005$  inches ( $\pm 0.127$  mm) unless otherwise specified.

**SD-X2D00 Series** Continued  
LVDS

Rev. V

## Operating Conditions and Output Characteristics

### Electrical Characteristics

| Parameter  | Symbol | Conditions   | Min                | Typical   | Max                |
|--|--------|--|--------------------|---|--------------------|
| Frequency  | -----  | -----  | 80.0MHz            | -----   | 312.5MHz           |
| Duty Cycle <sup>(2)</sup>                                  | -----  | @ V <sub>o</sub> /2  | 45/55%             | -----   | 55/45%             |
| Differential Output Voltage <sup>(2)</sup> V <sub>OD</sub> | -----  | -----  | 247mV              | 330mV   | 454mV              |
| Differential Output Error <sup>(2)</sup> ΔV <sub>OD</sub>  | -----  | -----  | -----              | -----   | 50mV               |
| Offset Voltage <sup>(2)</sup> V <sub>OS</sub>              | -----  | -----  | 1.125V             | 1.25V   | 1.375V             |
| Offset Error <sup>(2)</sup> ΔV <sub>OS</sub>               | -----  | -----  | -----              | -----   | 50mV               |
| Disable Voltage  | -----  | V <sub>EE</sub> =0V  | -----              | -----   | 0.3V <sub>CC</sub> |
| Enable Voltage <sup>(5)</sup>                              | -----  | V <sub>EE</sub> =0V  | 0.7V <sub>CC</sub> | -----   | -----              |
| Rise & Fall Time <sup>(2)</sup>                            | tr,tf  | 20-80%V <sub>o</sub>   | -----              | 0.8 ns  | 1.0 ns             |
| Tpd <sup>(4)</sup>   | -----  | -----  | -0.5 ns            | -----   | +0.5 ns            |
| Jitter, Integrated   | J      | Integrated from phase noise,<br>12kHz to 20MHz, RMS  | -----              | 0.1 ps  | -----              |
| Jitter, Wavecrest<br>Characterized <sup>(3)</sup>          | -----  | Random Period<br>Accum, pk-to-pk   | -----              | 2.3ps<br>28ps   | -----              |
| Phase Noise <sup>(6)</sup>                                 | f(Δf)  | 200MHz<br>@ 10Hz<br>@ 100Hz<br>@ 1kHz<br>@ 10kHz<br>@ 100kHz<br>@ >1MHz                        | -----              | -65 dBc/Hz<br>-100 dBc/Hz<br>-130 dBc/Hz<br>-143 dBc/Hz<br>-143 dBc/Hz<br>-145 dBc/Hz | -----              |
| Frequency Stability <sup>(1)</sup>                         | dF/F   | Overall conditions including:<br>voltage, calibration, temp.,<br>10 yr aging, shock, vibration | -100ppm            | -----   | +100ppm            |

### General Characteristics

| Parameter             | Symbol          | Conditions                           | Min              | Typical      | Max              |
|-----------------------|-----------------|--------------------------------------|------------------|--------------|------------------|
| Supply Voltage        | V <sub>CC</sub> | Code A:3.3V±5%<br>Code B:2.5V±5%     | 3.135V<br>2.375V | 3.3V<br>2.5V | 3.465V<br>2.625V |
| 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>  | 3.3V<br>2.5V                         | -----            | -----        | 277 mW<br>210 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:

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

| Creating a Part Number   |                              |
|--------------------------|------------------------------|
| <b>SD - X2D0X - FREQ</b> |                              |
| <b>Package Code</b>      | <b>Tolerance/Performance</b> |
| SD 6 Pad 5x7 SMD         | 0 ±100ppm 0-70°C             |
|                          | 1 ±50ppm 0-70°C              |
|                          | 7 ±25ppm 0-70°C              |
|                          | 9 Customer Specific          |
| <b>Input Voltage</b>     | A ±20ppm 0-70°C              |
| Code Specification       | B ±50ppm -40 to +85°C        |
| A 3.3V                   | C ±100ppm -40 to +85°C       |
| B 2.5V                   |                              |

SD-X2D00 Series Continued

Max Reflow Profile

