Rev. D

LVCMOS
B6-X144X Series

Description

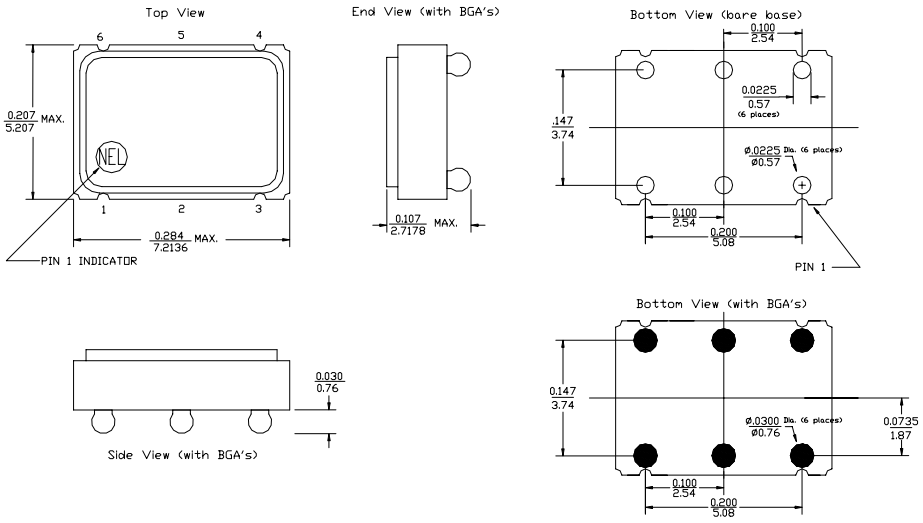
The **B6-X144X Series** of quartz crystal oscillators provide enable/disable 3-state LVCMOS compatible signals for bus connected systems. Supplying Pin 1 of the B6-X144X units with a logic "1" or open enables its Pin 4 output. In the disable mode, a high impedance is presented to the load.

Features

- Wide frequency range: 10.0MHz to 220MHz
- User specified tolerance available
- 3.3 & 2.5Volt operation
- High shock resistance, to 1000g
- Low Jitter - Wavecrest jitter characterization available
- COTS/Dual use
- High Reliability - NEL HALT/HASS qualified for crystal oscillator start-up conditions
- Power supply decoupling internal
- No internal PLL avoids cascading PLL problems
- Metal lid electrically connected to ground to reduce EMI
- Ball Grid Array Material: 63Sn/37Pb .030"

Electrical Connection

Pin	Connection
1	Enable/Disable
2	Ground
3	Ground
4	Output
5	NC
6	V_{DD}



*** PRELIMINARY DRAWING ***

ALL DIMENSIONS: IN / mm
OUTER PACKAGE TOLERANCES ARE ±0.010 IN (±0.254 MM)
PACKAGE PAD LOCATION AND DIAMETER TOLERANCES ARE ±0.002 IN (±0.05 MM)

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

B6-X144X Series Continued
LVCMOS

Rev. D

Operating Conditions and Output Characteristics (5)

Electrical Characteristics

Parameter	Symbol	Conditions	Min	Typical	Max
Frequency	-----	-----	10.0MHz	-----	220.0MHz
Duty Cycle	-----	@ V_{DD}/2	45/55%	-----	45/55%
Logic 0	V_{OL}	@ 600µA	-----	-----	0.2V
Logic 1	V_{OH}	@ 600µA	V_{DD}-0.2V	-----	-----
Rise & Fall Time	tr,tf	10-90%V_O	-----	-----	2.0 ns
Jitter, Integrated	J	Integrated from phase noise, 12kHz to 20MHz, RMS	-----	0.1 ps	-----
Jitter, Wavecrest Characterized (2)	-----	Random Period	-----	2.3ps	-----
		Accum, pk-to-pk	-----	26ps	-----
Phase Noise (4)	£(Δf)	@ 10Hz	-----	-70 dBc/Hz	-----
		@100Hz	-----	-105 dBc/Hz	-----
		@1kHz	-----	-130 dBc/Hz	-----
		@10kHz	-----	-145 dBc/Hz	-----
		@100kHz	-----	-150 dBc/Hz	-----
		@ >1Mhz	-----	-150 dBc/Hz	-----
T_{pz}	-----	-----	-----	-----	100 ns
Enable Voltage	-----	-----	2.0V	-----	-----
Disable Voltage	-----	-----	-----	-----	0.8V
Frequency Stability (1)	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 (3)	V_{DD}	3.3V±10%	2.97V	3.3V	3.63V
		2.5V±10%	2.25V	2.5V	2.75V
Supply Current	I_{DD}	No Load	0.0 mA	40 mA	60 mA
Output current	I_O	Low level Output Current	0.0 mA	-----	±25.0 mA
Operating temperature	T_A	------	0°C	-----	70°C
Storage temperature	T_S	-----	-55°C	-----	125°C
Power Dissipation	P_D	3.3V	-----	-----	218 mW
		2.5V	-----	-----	165 mW
Load	-----	-----	-----	-----	15pf
Start-up Time	t_s	-----	-----	-----	10 ms

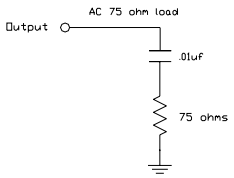
Environmental and Mechanical Characteristics

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^{-8} atm.cc/sec of helium

Footnotes:

1) Standard frequency stability (±20,±25,±50ppm & others availble)
2) Jitter performance is frequency dependent. Please contact factory for full Wavecrest characterization.
3) Internal high frequency power source decoupling.
4) If phase noise data at a particular frequency is needed, contact factory.
5) All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.

Test Load:



Creating a Part Number

B6 - X144X - FREQ

Package Code
B6 6 Solder Joint 5x7mm SMD 0.030" BGA

Input Voltage

Code	Specification
A	3.3V
B	2.5 V

Tolerance/Performance

0	±100ppm 0-70°C
1	±50ppm 0-70°C
7	±25ppm 0-70°C
9	Customer Specific
A	±20ppm 0-70°C
B	±50ppm -40 to +85°C
C	±100ppm -40 to +85°C

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

B6-X144X Series Continued

Recommended Reflow Profile

