Rev. J

HCMOS TCXO/TCVCXO
S9-XB3XXX-X Series

Description

The S9-XB3XXX Series of quartz crystal oscillators provide excellent temperature stability with HCMOS output and very low phase noise. The device is packaged in a miniature, low profile leadless FR4 based package with gold plated pads, which enhances compatibility with PCB material. COTS/Dual use.

Creating a Part Number

S9 - X B3 X X X - X -FREQ

Package code
S9 – 4 pad 7.5x5x2 SMD

Operating Voltage
A 3.3 V ± 5%
B 2.5 V ± 5%

TCXO/TCVCXO Option
X No V. Control
Y w/V. Control

Temperature Range, ºC
A 0 to 50
B 0 to 70
C -20 to 70
D -40 to 85
9 customer specific

Temperature Stability, ppm
1 ±1
2 ±2.5
4 ±2
9 customer specific

Environmental
L Contains a level of lead that is in excess of RoHs directive

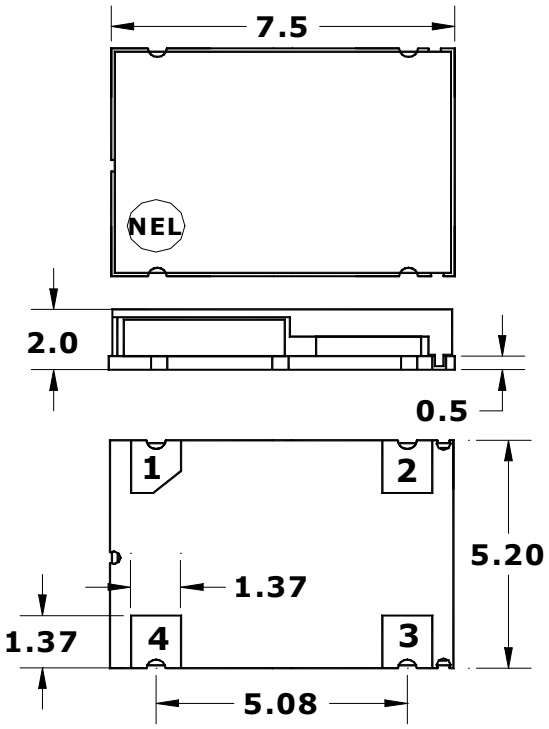
R RoHS compliant

NEL FREQUENCY CONTROLS, INC.
357 Beloit Street, Burlington, WI 53105 U.S.A. Phone 262/763-3591 FAX 2626262/763-2881
Email: nelsales@nelfc.com www.nelfc.com

Rev. J

HCMOS TCXO/TCVCXO
S9-XB3XXX-X Series

Drawing Specification



Pin Connections:

1 – N/C or Vc
2 – GND
3 – OUT
4 – Vcc

Dimensions are typical in mm

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 4.5	V
Voltage Control	Vc	0 to Vcc	V

NEL FREQUENCY CONTROLS, INC.

357 Beloit Street, Burlington, WI 53105 U.S.A. Phone 262/763-3591 FAX 2626262/763-2881

Email: nelsales@nelfc.com www.nelfc.com

Rev. J

HCMOS TCXO/TCVCXO
S9-XB3XXX-X Series

Electrical Parameters (2)

Parameter		Symb	Conditions, Note		MIN	TYP	MAX	Unit
Nominal Frequency		Fo			10.0		120	MHz
Supply Voltage		Vcc	Code A Code B		3.135 2.375	3.3 2.5	3.465 2.625	V
Supply current		Icc	Frequency and Vcc dependent, values for 50 MHz			20	25	mA
Output Logic Type						CMOS		
Load						15 pF/10 KOhm		Ohm
Output Levels		Voh Vol	overall		0.9Vcc		 0.1 Vcc	V
Duty Cycle (Symmetry)			At 50% Vcc		45/55	50/50	55/45	%
Rise/Fall Time		Tr/Tf	0.2Vcc to 0.8 Vcc; F< 70 MHz 70 MHz<F< 120 MHz			 3 2	 5 3	ns
Jitter	Integrated	J	Integrated from Phase Noise, 12 KHz to 20 MHz , RMS			0.2		ps
	Wavecrest characterized		Random period,	At 50 MHz		2.5 0.00012		ps UI
			Total, pk-to-pk	At 50 MHz		50 0.0025		ps UI
			Deterministic	F>40MHz At 50 MHz		15 0.0075		ps UI
Sub-harmonics				<40 M >40 M		-50 -45		dBc
Phase Noise (1)		£(Δf)	50 MHz	@ 10 Hz @100 Hz @1 KHz @10KHz @100KHz @>1MHz		-75 -105 -125 -138 -138 -140	 -135	dBc/Hz
Frequency stability		ΔF/F	Over Temp -30 to 80 C See chart Aging, 1st year Aging 10 years Load Vcc Reflow Calibration as shipped			2.5	 1 3.5 0.1 0.1/V 2 1	ppm
Pullability (Vc option)			0.3V to 3.0V		5			ppm

Footnote: 1) If phase noise data at a particular frequency is needed, contact factory.
2) All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.

NEL FREQUENCY CONTROLS, INC.

357 Beloit Street, Burlington, WI 53105 U.S.A. Phone 262/763-3591 FAX 2626262/763-2881

Email: nelsales@nelfc.com www.nelfc.com

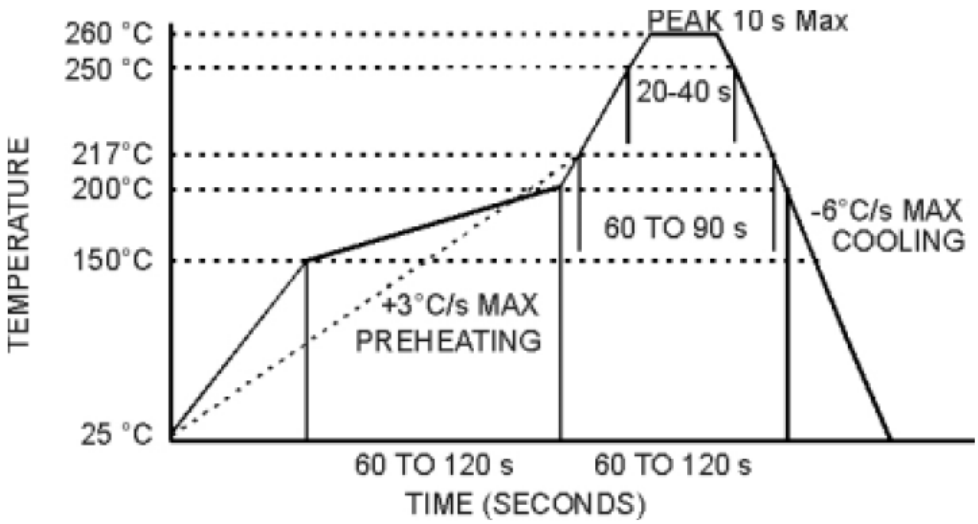
Rev. J

HCMOS TCXO/TCVCXO
S9-XB3XXX-X Series

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



The device may be reflowed once. Reflowing upside down is not allowed. NO CLEAN assembly is recommended.

NEL FREQUENCY CONTROLS, INC.

357 Beloit Street, Burlington, WI 53105 U.S.A. Phone 262/763-3591 FAX 2626262/763-2881

Email: nelsales@nelfc.com www.nelfc.com