

5.0x7.0mm Surface Mount LVC MOS Clock Oscillator Series

CONNOR WINFIELD



Description

The Connor Winfield Xxxx - Series is a 5.0x7.0mm Surface Mount, LVC MOS, Fixed Frequency Crystal Controlled Oscillator (XO) designed for applications requiring tight frequency stability, wide temperature range and low jitter. Operating at 2.5V or 3.3V supply voltage, the Xxxx - Series provides an LVC MOS Output with enable / disable function. The surface mount package is designed for high-density mounting and is optimum for mass production.



Features:

- Model Xxxx - Series**
- 5.0 x7.0mm Surface Mount Package
- 2.5V or 3.3V Operation
- LVC MOS Output Logic
- Frequency Stabilities Available:
 - X14x / X24x / X34x / X44x: +/-20ppm
 - X11x / X21x / X31x / X41x: +/-25ppm
 - X12x / X22x / X32x / X42x: +/-50ppm
 - X13x / X23x / X33x / X43x: +/-100ppm
- Temperature Ranges Available:
 - X1xx Series: 0 to 70°C
 - X2xx Series: -40 to 85°C
 - X3xx Series: 0 to 85°C
 - X4xx Series: -20 to 70°C
- Low Jitter <1ps RMS
- Tri-State Enable/Disable
- Tape and Reel Packaging
- RoHS Compliant / Lead Free

Model Specifications

ABSOLUTE MAXIMUM RATINGS

TABLE 1

PARAMETER	UNITS	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Storage Temperature		-55	-	125	°C	
Supply Voltage	(Vcc)	-0.5	-	5.0	Vdc	

OPERATING SPECIFICATIONS

TABLE 2

PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Frequency Range	(Fo)				
Models Xx4x, Xx1x Series	20	-	200	MHz	1
Models Xx2x, Xx3x Series	20	-	225	MHz	
Total Frequency Tolerance	(See Table 9 for full part number)				
Model Xx4x (See Table 9)	-20	-	20	ppm	2
Model Xx1x (See Table 9)	-25	-	25	ppm	2
Model Xx2x (See Table 9)	-50	-	50	ppm	2
Model Xx3x (See Table 9)	-100	-	100	ppm	2
Operating Temperature Range					
Model X1xx (See Table 9)	0	-	70	°C	
Model X2xx (See Table 9)	-40	-	85	°C	
Model X3xx (See Table 9)	0	-	85	°C	
Model X4xx (See Table 9)	-20	-	70	°C	
Supply Voltage	(Vcc)				
Model Xxx2 (See Table 9)	2.375	2.500	2.625	Vdc	
Model Xxx3 (See Table 9)	3.135	3.3	3.465	Vdc	
Supply Current	(Icc)				
40 to 79.999 MHz	-	-	15	mA	
80 to 89.999 MHz	-	-	26	mA	
90 to 124.999 MHz	-	-	36	mA	
125 to 164.999 MHz	-	-	46	mA	
165 to 225 MHz	-	-	61	mA	

INPUT CHARACTERISTICS

TABLE 3

PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
Enable Voltage (High) (Vih)	0.7Vcc	-	-	Vdc	3
Disable Voltage (Low) (Vil)	-	-	0.3Vcc	Vdc	3
Enable Time	-	-	2	ms	
Disable Time	-	-	200	ns	
Output Disable Current (Standby Current) (Icc)	-	-	10	uA	

LVC MOS OUTPUT CHARACTERISTICS

TABLE 4

PARAMETER	MINIMUM	NOMINAL	MAXIMUM	UNITS	NOTE
LOAD	-	-	15	pF	
Voltage (High) (Voh)	Vcc-0.4	-	-	Vdc	
(Low) (Vol)	-	-	0.4	Vdc	
Current (High) (Ioh)	-8	-	-	mA	
(Low) (Iol)	-	-	8	mA	
Duty Cycle at 50% of Vcc	45	50	55	%	
Rise / Fall Time 10% to 90%	-	1	2	ns	
Start-Up Time	-	-	2	ms	
Period Jitter	-	3	5	ps RMS	
Phase Jitter (BW=12kHz to 20MHz)	-	0.5	1	ps RMS	
Jitter: Peak to Peak (BW=10Hz to 20MHz)	-	-	25	ps pk tp pk	
SSB Phase Noise at 10Hz offset	-	-60	-	dBc/Hz	
SSB Phase Noise at 100Hz offset	-	-90	-	dBc/Hz	
SSB Phase Noise at 1KHz offset	-	-125	-	dBc/Hz	
SSB Phase Noise at 10KHz offset	-	-140	-	dBc/Hz	
SSB Phase Noise at 100KHz offset	-	-145	-	dBc/Hz	



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Bulletin **Sm118**
Page **1 of 2**
Revision **09**
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Notes

- 1) Maximum output frequency for the +/-20ppm and the +/-25ppm models is 200 MHz.
- 2) Inclusive of calibration @ 25°C, frequency vs. temperature stability, supply voltage change, load change, shock and vibration, 10 years aging.
- 3) When the oscillator is disabled, the outputs are at High Impedance. Output is enabled with no connection on pad 1.

Ordering Information

X	1	2	3	-	133.33M
Type: Clock Series 5x7mm	Temperature Range: 1 = 0 to 70° C 2 = -40 to 85° C 3 = 0 to 85° C 4 = -20 to 70° C	Frequency Stability: 4 = +/-20 ppm 1 = +/-25 ppm 2 = +/-50 ppm 3 = +/-100 ppm	Supply Voltage: 2 = 2.5Vdc. 3 = 3.3Vdc.		Output Frequency: Frequency Format -xxx.xM Min.* -xxx.xxxxxM Max.* *Amount of numbers after the decimal point. M = MHz

Example: X123-133.33M = LVCMOS Clock, 0 to 70°C, ±50ppm, 3.3V @ 133.33 MHz

Package Characteristics

Package	Ceramic surface mount package
Moisture Sensitive Level	MSL - 1
Termination Finish	0.7um Gold over 2.5um Nickel

TABLE 5

Environmental Characteristics

Vibration:	Vibration per Mil Std 883E Method 2007.3 Test Condition A
Shock:	Mechanical Shock per Mil Std 883E Method 2002.4 Test Condition B.
Soldering:	SMD product suitable for Convection Reflow soldering. Peak temperature 260°C. Maximum time above 220°C, 60 seconds.
Solderability	Solderability per Mil Std 883E Method 2003

TABLE 6

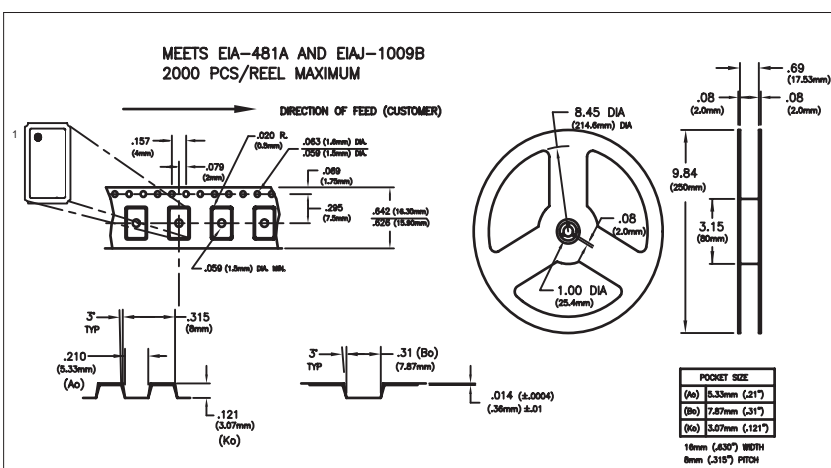
Pad Connections - Enable / Disable Function

TABLE 7		TABLE 8	
Pad	Connection	Enable / Disable Function (Pad 1)	Output
1	Enable/Disable	High or Open	Enable
2	Ground	Low	Disable (High Impedance)
3	Output		
4	Vcc		

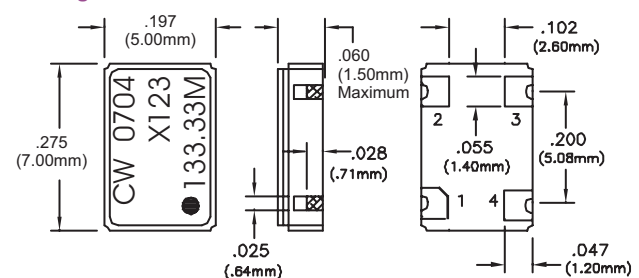
Model Matrix

TABLE 9					
Frequency Tolerance ±20ppm	Frequency Tolerance ±25ppm	Frequency Tolerance ±50ppm	Frequency Tolerance ±100ppm	Supply Voltage	Temperature Range
X142	X112	X122	X132	2.5Vdc	0 to 70°C
X242	X212	X222	X232	2.5Vdc	-40 to 85°C
X342	X312	X322	X332	2.5Vdc	0 to 85°C
X442	X412	X422	X432	2.5Vdc	-20 to 70°C
X143	X113	X123	X133	3.3Vdc	0 to 70°C
X243	X213	X223	X233	3.3Vdc	-40 to 85°C
X343	X313	X323	X333	3.3Vdc	0 to 85°C
X443	X413	X423	X433	3.3Vdc	-20 to 70°C

Tape and Reel Specifications

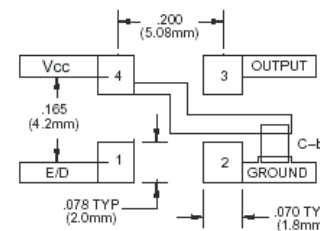


Package Outline



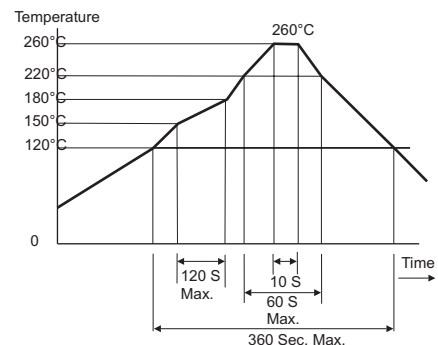
Suggested Pad Layout

Dimensional Tolerance: ±.02" (±0.5mm)
±.008" (±0.2mm)

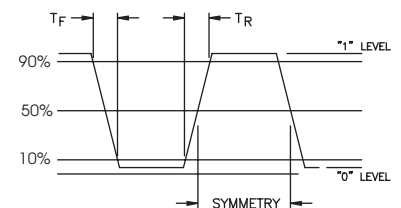


Bypass capacitor, C-by, should be ceramic capacitor ≥.01uf.

Solder Profile



LVCMOS Output Waveform



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Bulletin	SM118
Page	2 of 2
Revision	09
Date	02 Apr 2009