

# 5x7mm Surface Mount LVDS Clock Oscillator

# CONNOR WINFIELD



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## Description:

The Connor-Winfield LMxxx - Series are 5x7mm Surface Mount, LVDS, Fixed Frequency Crystal Controlled Oscillator (XO). The LMxxx - Series are designed for applications requiring tight frequency stability, wide temperature range, and low jitter. Operating at 2.5 or 3.3 Vdc supply voltage, the LMxxx - Series provides LVDS Differential Outputs with an enable / disable function. The design utilizes PLL multiplication to produce a high frequency output from a low frequency fundamental crystal.



## Features:

### Model LMxxx - Series

5 x7mm Surface Mount Package  
2.5 or 3.3 Vdc Operation  
LVDS Differential Outputs  
Frequency Stabilities Available:  
+/-20 ppm, +/-25 ppm, +/-50 ppm or +/-100 ppm  
Temperature Ranges Available:  
0 to 70°C, -40 to 85°C, 0 to 85°C or -20 to 70°C  
Low Jitter <1ps RMS  
Tri-State Enable/Disable on Pad 1  
Tape and Reel Packaging  
RoHS Compliant / Lead Free

## Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units	Notes
Storage Temperature	-55	-	125	°C	
Supply Voltage (Vcc)	-0.5	-	4.6	Vdc	
Input Voltage	-0.5	-	Vcc + 0.5	Vdc	

## Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Output Frequency (Fo)	98	-	670	MHz	1
Total Frequency Tolerance	(See Ordering Information or Model Matrix for full part number)				
Model LMx4x	-20	-	20	ppm	2
Model LMx1x	-25	-	25	ppm	2
Model LMx2x	-50	-	50	ppm	2
Model LMx3x	-100	-	100	ppm	2
Operating Temperature Range	(See Ordering Information or Model Matrix for full part number)				
Model LM1xx	0	-	70	°C	
Model LM2xx	-40	-	85	°C	
Model LM3xx	0	-	85	°C	
Model LM4xx	-20	-	70	°C	
Supply Voltage (Vcc)	(See Ordering Information or Model Matrix for full part number)				
Model LMxx2	2.375	2.5	2.625	Vdc	
Model LMxx3	3.135	3.3	3.465	Vdc	
Supply Current (Icc)	-	70	75	mA	
Jitter:					
Period Jitter	-	3.0	5.0	ps RMS	
Integrated Phase Jitter	-	0.6	1.0	ps RMS	
SSB Phase Noise (Fo = 155.52 MHz)					
@ 10 Hz offset	-	-40	-	dBc/Hz	
@ 100 Hz offset	-	-75	-	dBc/Hz	
@ 1 KHz offset	-	-95	-	dBc/Hz	
@ 10 KHz offset	-	-110	-	dBc/Hz	
@ 100 KHz offset	-	-115	-	dBc/Hz	
Sub-Harmonics	-	-60	-50	dBc	
Start-Up Time	-	-	2	ms	

## Enable / Disable Input Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Enable Input Voltage - (High) - (Vih)	70%Vcc	-	-	Vdc	3
Disable Input Voltage - (Low) - (Vil)	-	-	30%Vcc	Vdc	3

## LVDS Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load	-	100	-	Ohm	
Output Differential Voltage (Vod)	250	-	450	mV	4
Duty Cycle at 50% Level	45	50	55	%	5
Rise / Fall Time: 20% to 80%	-	0.3	0.7	ns	

## Package Characteristics

Package	Hermetically sealed ceramic package and metal cover
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## 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 Process:	RoHS compliant lead free. See soldering profile on page 2.

## Notes:

- All output frequencies may not be available, please contact the factory with your output frequency requirements.
- Includes calibration @ 25°C, frequency stability vs. change in temperature, supply voltage and load variations, shock and vibration and 20 years aging.
- When the oscillator is disabled the outputs are at high impedance. Outputs are enabled with no connection on E/D pad 1.
- Vod measured with a 100 ohm resistor between the true output and the complementary output.
- Duty cycle measured at 50% of output voltage swing.

Specifications subject to change without notice. All dimensions in inches. © Copyright 2010 The Connor-Winfield Corporation



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## Ordering Information

LM	1	2	3	- 155.52M
Type LVDS Clock Series 5x7 mm	Temperature Range 1 = 0 to 70°C 2 = -40 to 85°C 3 = 0 to 85°C 4 = -20 to 70°C	Frequency Tolerance 4 = ±20 ppm 1 = ±25 ppm 2 = ±50 ppm 3 = ±100 ppm	Supply Voltage 2 = 2.5 Vdc, 3 = 3.3 Vdc,	Output Frequency Frequency Format -xxx.xM Min -xxx.xxxxxM Max *Amount of numbers after the decimal point. M = MHz

### Example Part Number:

LM123-155.52M = LVDS Output, 0 to 70°C, +/-50ppm, 3.3Vdc, E/D Pad 1, Output Frequency 155.52 MHz

Note: Not all temperature and frequency tolerance combinations are available.  
See Model Matrix below for available models

## Model Matrix

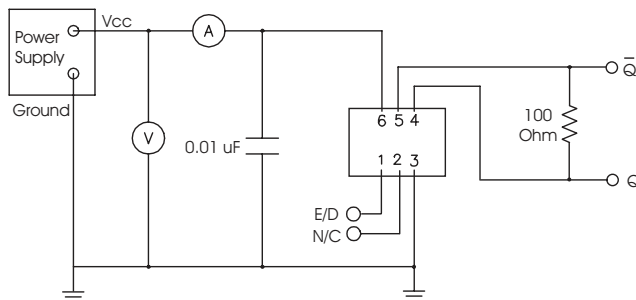
Frequency Tolerance ±20 ppm	Frequency Tolerance ±25 ppm	Frequency Tolerance ±50 ppm	Frequency Tolerance ±100 ppm	Supply Voltage	Temperature Range
LM142	LM112	LM122	LM132	2.5 Vdc	0 to 70°C
LM442	LM412	LM422	LM432	2.5 Vdc	-20 to 70°C
LM342	LM312	LM322	LM332	2.5 Vdc	0 to 85°C
X	X	LM222	LM232	2.5 Vdc	-40 to 85°C
LM143	LM113	LM123	LM133	3.3 Vdc	0 to 70°C
LM443	LM413	LM423	LM433	3.3 Vdc	-20 to 70°C
LM343	LM313	LM323	LM333	3.3 Vdc	0 to 85°C
X	X	LM223	LM233	3.3 Vdc	-40 to 85°C

X = Models not available

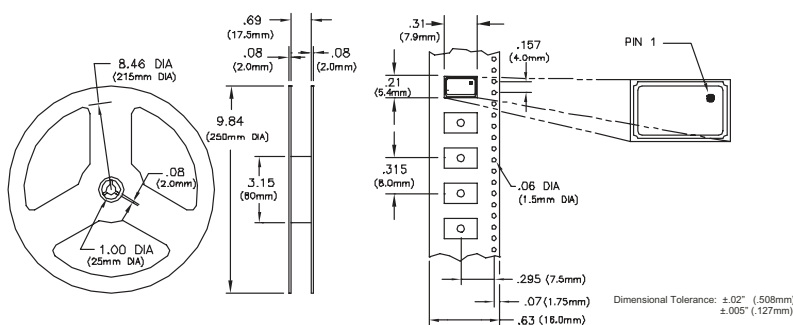
## Enable / Disable Function

Pad 1 Input:          Output State:           
Low:          Disabled (High Impedance)  
High or Open:          Enabled

## Test Circuit

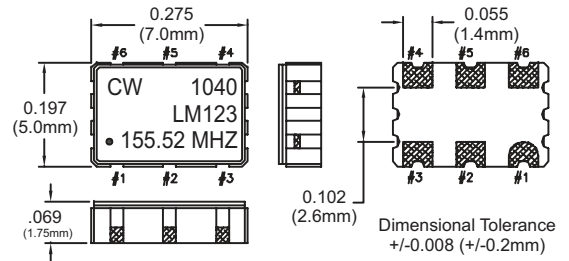


## Tape and Reel Dimensions

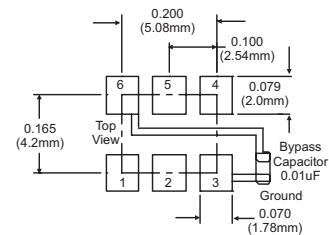


MEETS EIA-481A AND EIAJ-1009B  
2,000 PCS/REEL

## Package Outline



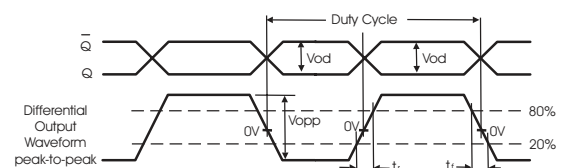
## Suggested Pad Layout



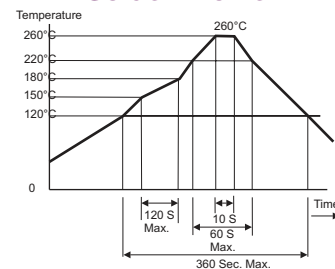
## Pad Connections

- 1: Enable / Disable
- 2: N/C
- 3: Ground
- 4: Output Q
- 5: Complementary Output  $\bar{Q}$
- 6: Supply Voltage (Vcc)

## Output Waveform



## Solder Profile



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