



# Surface Mount LVPECL Clock Oscillator

# CONNOR WINFIELD



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## Description:

The Connor Winfield Pxxx - Series are 5.0x7.0mm Surface Mount, LVPECL, 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 Pxxx - Series provides an LVPECL Differential Outputs with enable / disable function. The surface mount package is designed for high-density mounting and is optimum for mass production.



## Features:

### Model Pxxx - Series

5.0 x7.0mm Surface Mount Package  
2.5V or 3.3V Operation  
LVPECL Differential Outputs  
Frequency Stabilities Available:  
+/-20ppm, +/-25ppm, +/-50ppm, +/-100ppm  
Temperature Ranges Available:  
0 to 70°C, -40 to 85°C, 0 to 85°C, -20 to 70°C  
Low Jitter <1pS RMS  
Tri-State Enable/Disable on Pad 1 or 2  
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    | -       | 7.0       | Vdc   |       |
| Input Voltage (Vc)   | -0.5    | -       | Vcc + 0.5 | Vdc   |       |

## Operating Specifications

| Parameter                                       | Minimum   | Nominal | Maximum | Units  | Notes |
|---|---|---------|---------|--------|-------|
| Output Frequency (Fo)                           | 25  | -       | 312.5   | MHz    |       |
| Total Frequency Tolerance                       | (See Ordering Information for full part number) |         |         |        |       |
| Model Px4x                                      | -20   | -       | 20      | ppm    | 1     |
| Model Px1x                                      | -25   | -       | 25      | ppm    | 1     |
| Model Px2x                                      | -50   | -       | 50      | ppm    | 1     |
| Model Px3x                                      | -100  | -       | 100     | ppm    | 1     |
| Operating Temperature Range                     |   |         |         |        |       |
| Model P1xx                                      | 0   | -       | 70      | °C     |       |
| Model P2xx                                      | -40   | -       | 85      | °C     | 2     |
| Model P3xx                                      | 0   | -       | 85      | °C     |       |
| Model P4xx                                      | -20   | -       | 70      | °C     |       |
| Supply Voltage (Vcc)                            |   |         |         |        |       |
| Model Pxx2, Pxx5                                | 2.375   | 2.5     | 2.625   | Vdc    |       |
| Model Pxx3, Pxx4                                | 3.135   | 3.3     | 3.465   | Vdc    |       |
| Supply Current (Icc)                            | -   | 60      | 90      | mA     |       |
| Jitter:   |   |         |         |        |       |
| Period Jitter                                   | -   | 3.0     | 5.0     | ps RMS |       |
| Integrated Phase Jitter (BW = 12 KHz to 20 MHz) |   |         |         |        |       |
| 25 ≤ Fo ≤ 60 MHz                                | -   | 1.3     | 2.0     | ps RMS |       |
| 60 < Fo ≤ 80 MHz                                | -   | 0.80    | 1.0     | ps RMS |       |
| 80 < Fo ≤ 100 MHz                               | -   | 0.60    | 0.80    | ps RMS |       |
| 100 < Fo ≤ 160 MHz                              | -   | 0.45    | 0.60    | ps RMS |       |
| 160 < Fo ≤ 200 MHz                              | -   | 0.35    | 0.50    | ps RMS |       |
| 200 < Fo ≤ 312.5 MHz                            | -   | 0.30    | 0.45    | ps RMS |       |
| SSB Phase Noise                                 |   |         |         |        |       |
| @ 10 Hz offset                                  | -   | -60     | -       | dBc/Hz |       |
| @ 100 Hz offset                                 | -   | -90     | -       | dBc/Hz |       |
| @ 1 KHz offset                                  | -   | -115    | -       | dBc/Hz |       |
| @ 10 KHz offset                                 | -   | -140    | -       | dBc/Hz |       |
| @ 100 KHz offset                                | -   | -145    | -       | dBc/Hz |       |
| Start-Up Time                                   | -   | -       | 2       | ms     |       |

## Input Characteristics

| Parameter                               | Minimum | Nominal | Maximum | Units | Notes |
|---|---------|---------|---------|-------|-------|
| Enable / Disable Option:                |         |         |         |       |       |
| Models Pxx2, Pxx3 E/D Pad 1. N/C Pad 2  |         |         |         |       |       |
| Models Pxx4, Pxx5 E/D Pad 2. N/C Pad 1  |         |         |         |       |       |
| Enable Input Voltage - (High) - (Vih)   | 70%Vcc  | -       | -       | Vdc   | 3     |
| Disable Input Voltage - (Low) - (Vil)   | -       | -       | 30%Vcc  | Vdc   | 3     |
| Enable Time                             | -       | -       | 2       | ms    |       |
| Disable Time                            | -       | -       | 200     | ns    |       |
| Standby Current (When Osc. is disabled) | -       | -       | 30      | uA    |       |

## LVPECL Output Characteristics

| Parameter                          | Minimum | Nominal | Maximum | Units | Notes |
|------------------------------------|---------|---------|---------|-------|-------|
| Load                               | -       | 50      | -       | Ohm   | 4     |
| Voltage (High) (Vcc = 2.5 V) (Voh) | 1.475   | -       | -       | V     |       |
| (Low) (Vcc = 2.5 V) (Vol)          | -       | -       | 0.880   | V     |       |
| Voltage (High) (Vcc = 3.3 V) (Voh) | 2.275   | -       | -       | V     |       |
| (Low) (Vcc = 3.3 V) (Vol)          | -       | -       | 1.680   | V     |       |
| Duty Cycle at 50% Level            | 45      | 50      | 55      | %     | 5     |
| Rise / Fall Time: 20% to 80%       | -       | 0.5     | 1.0     | ns    |       |



**RoHS  
COMPLIANT**

Bulletin **Ec217**  
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Revision **10**  
Date **22 Mar 2010**



**Notes:**

1. Includes calibration @ 25°C, frequency stability vs. change in temperature, supply voltage and load variations, shock and vibration and 20 years aging. Models P242, P243 P244 and P245 are not available above 260 MHz.
2. Models P242, P243 P244 and P245 are not available above 260 MHz.
3. When the oscillator is disabled the outputs are at high impedance. Outputs are enabled with no connection on E/D pad.
4. Outputs must be terminated into 50 ohms to Vcc - 2V or Thevenin equivalent.
5. Duty cycle measured at 50% of output voltage swing.

**Ordering Information**

|                            |  |   |  |   |
|----------------------------|--|---|--|---|
| <b>P</b>                   | <b>1</b>   | <b>2</b>  | <b>3</b>   | <b>- 155.52M</b>  |
| Type                       | Temperature Range  | Frequency Stability                                       | Supply Voltage   | Output Frequency  |
| LVPECL Clock Series 5x7 mm | 1 = 0 to 70°C<br>2 = -40 to 85°C<br>3 = 0 to 85°C<br>4 = -20 to 70°C | 4 = ±20 ppm<br>1 = ±25 ppm<br>2 = ±50 ppm<br>3 = ±100 ppm | 2 = 2.5 Vdc, E/D Pad 1<br>3 = 3.3 Vdc, E/D Pad 1<br>4 = 3.3 Vdc, E/D Pad 2<br>5 = 2.5 Vdc, E/D Pad 2 | Frequency Format<br>-xxx.xM Min<br>-xxx.xxxxxM Max<br>*Amount of numbers after the decimal point. M = MHz |

Example: Part Number

P123-155.52M = LVPECL Output,

0 to 70, +/-20ppm, 3.3Vdc, E/D Pad 1, Output Frequency 155.52MHz

**Attention: Models P242, P243, P244 and P245 are not available above 260 MHz.**

**Package Characteristics**

Package Hermetically sealed ceramic package and metal cover

**Environmental Characteristics**

Vibration: Vibration per Mil Std 883E Method 2007.3 Test Condition A.

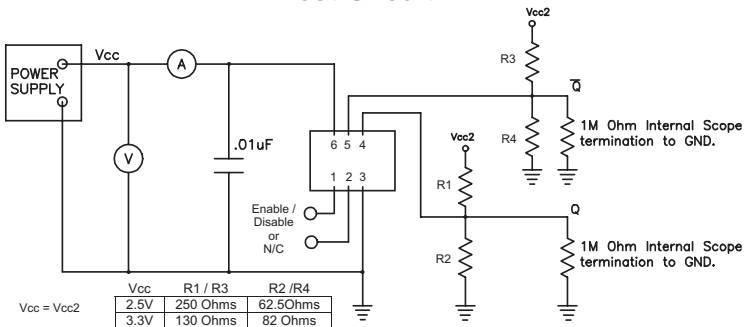
Shock: Mechanical Shock per Mil Std 883E Method 2002.4 Test Condition B.

Soldering Process; RoHS compliant lead free. See soldering profile on page 2.

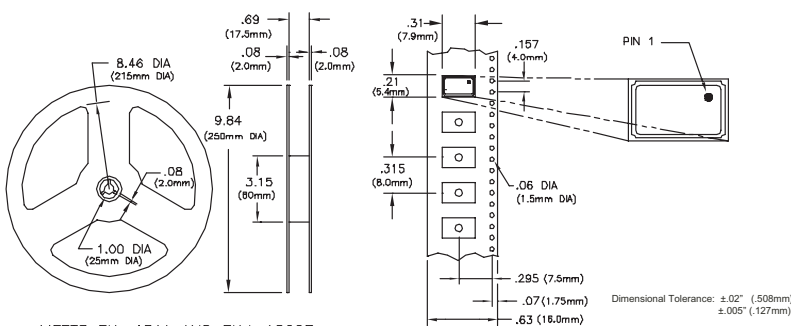
**Enable / Disable Function**

|               |                           |
|---------------|---------------------------|
| Function:     | Output                    |
| Low:          | Disabled (High Impedance) |
| High or Open: | Enabled                   |

**Test Circuit**

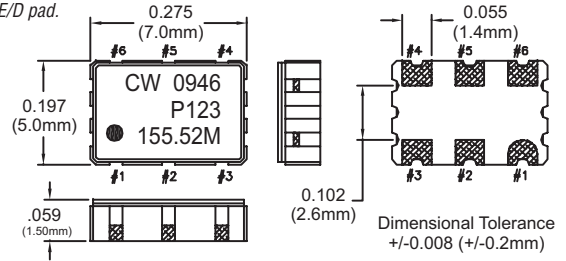


**Tape and Reel Dimensions**

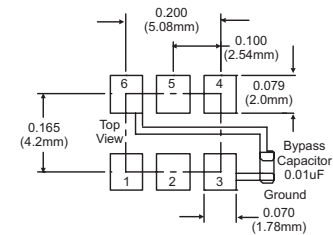


MEETS EIA-481A AND EIAJ-1009B  
2,000 PCS/REEL

**Package Outline**



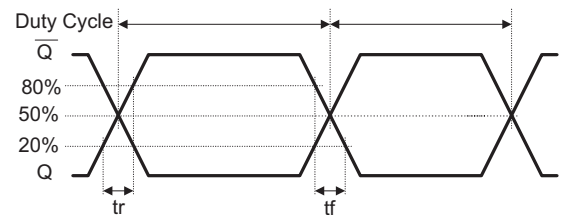
**Suggested Pad Layout**



**Pad Connections**

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| <b>Models: Pxx2, Pxx3</b>         | <b>Models Pxx4, Pxx5</b>          |
| 1: Enable / Disable               | 1: N/C                            |
| 2: N/C                            | 2: Enable / Disable               |
| 3: Ground                         | 3: Ground                         |
| 4: Output Q                       | 4: Output Q                       |
| 5: Complementary Output $\bar{Q}$ | 5: Complementary Output $\bar{Q}$ |
| 6: Supply Voltage (Vcc)           | 6: Supply Voltage (Vcc)           |

**Output Waveform**



**Solder Profile**

