

# 5.0x7.0mm Surface Mount LVPECL Clock Oscillator Series



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## Description

The Connor Winfield Pxxx - Series is a 5x7.0mm 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 Output Logic  
Frequency Stabilities Available:  
P14x / P24x / P34x / P44x: +/-20ppm  
P11x / P21x / P31x / P41x: +/-25ppm  
P12x / P22x / P32x / P42x: +/-50ppm  
P13x / P23x / P33x / P43x: +/-100ppm  
Temperature Ranges Available:  
P1xx Series: 0 to 70°C  
P2xx Series: -40 to 85°C  
P3xx Series: 0 to 85°C  
P4xx 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 1.0

| Parameter           | Units | Minimum | Nominal | Maximum | Units | Note |
|---------------------|-------|---------|---------|---------|-------|------|
| Storage Temperature |       | -55     | -       | 125     | °C    |      |
| Supply Voltage      | (Vcc) | -0.5    | -       | 7.0     | Vdc   |      |
| Input Voltage       |       | -0.5    | -       | Vcc+0.5 | Vdc   |      |

### Operating Specifications

Table 2.0

| Parameter                                  |       | Minimum                            | Nominal | Maximum | Units  | Note |
|--|-------|------------------------------------|---------|---------|--------|------|
| Center Frequency                           | (Fo)  | 25                                 | -       | 260     | MHz    |      |
| Total Frequency Tolerance                  |       | (See Table 9 for full part number) |         |         |        |      |
| Model Px4x (See Table 9)                   |       | -20                                | -       | 20      | ppm    | 1    |
| Model Px1x (See Table 9)                   |       | -25                                | -       | 25      | ppm    | 1    |
| Model Px2x (See Table 9)                   |       | -50                                | -       | 50      | ppm    | 1    |
| Model Px3x (See Table 9)                   |       | -100                               | -       | 100     | ppm    | 1    |
| Operating Temperature Range                |       |                                    |         |         |        |      |
| Model P1xx (See Table 9)                   |       | 0                                  | -       | 70      | °C     |      |
| Model P4xx (See Table 9)                   |       | -20                                | -       | 70      | °C     |      |
| Model P3xx (See Table 9)                   |       | 0                                  | -       | 85      | °C     |      |
| Model P2xx (See Table 9)                   |       | -40                                | -       | 85      | °C     |      |
| Supply Voltage                             | (Vcc) |                                    |         |         |        |      |
| Model Pxx2 (See Table 9)                   |       | 2.375                              | 2.500   | 2.625   | Vdc    |      |
| Model Pxx3 (See Table 9)                   |       | 3.135                              | 3.3     | 3.465   | Vdc    |      |
| Supply Current                             | (Icc) | -                                  | 60      | 90      | mA     |      |
| Period Jitter                              |       | -                                  | 3       | 5       | ps RMS |      |
| Phase Jitter- BW=12kHz to 20MHz (Fo >70M)  |       | -                                  | 0.5     | 1.0     | ps RMS |      |
| Phase Jitter- BW=12kHz to 20MHz (Fo ≤ 70M) |       | -                                  | 1.5     | 2.0     | ps RMS |      |
| 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 |      |
| Startup Time                               |       | -                                  | -       | 2       | ms     |      |

### Input Characteristics

Table 3.0

| Parameter                               |       | Minimum | Nominal | Maximum | Units | Note |
|---|-------|---------|---------|---------|-------|------|
| Disable Input Voltage (Low)             | (Vil) | -       | -       | 0.3Vcc  | Vdc   | 2    |
| Enable Input Voltage (High)             | (Vih) | 0.7Vcc  | -       | -       | Vdc   | 2    |
| Enable Time                             |       | -       | -       | 2       | ms    |      |
| Disable Time                            |       | -       | -       | 200     | ns    |      |
| Standby Current (when part is Disabled) | (Icc) | -       | -       | 30      | uA    |      |

### LVPECL Output Characteristics

Table 4.0

| Parameter                   |       | Minimum | Nominal | Maximum | Units | Note |
|-----------------------------|-------|---------|---------|---------|-------|------|
| LOAD                        |       | -       | -       | 50      | Ohms  | 3    |
| Voltage (Vcc = 2.5V) (High) | (Voh) | 1.475   | -       | -       | Vdc   |      |
| (Vcc = 2.5V) (Low)          | (Vol) | -       | -       | 0.880   | Vdc   |      |
| Voltage (Vcc = 3.3V) (High) | (Voh) | 2.275   | -       | -       | Vdc   |      |
| (Vcc = 3.3V) (Low)          | (Vol) | -       | -       | 1.68    | Vdc   |      |
| Duty Cycle                  |       | 45      | 50      | 55      | %     | 4    |
| Rise / Fall Time 20% to 80% |       | -       | 0.5     | 1       | ns    |      |



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### Notes

- Notes
- 1) Includes initial tolerance, deviation over temperature, supply and load variations, shock, vibration and 20 years aging.
  - 2) When the oscillator is disabled, the outputs are at High Impedance. Output is enabled with no connection on pad 1.
  - 3) Output must be terminated into 50 ohms to Vcc - 2V or Thevenin equivalent.
  - 4) Duty Cycle measured at 50% of output swing.

### Ordering Information

|   |   |  |  |          |  |
|---|---|--|--|----------|--|
| <b>P</b>  | <b>1</b>  | <b>2</b>   | <b>3</b>   | <b>-</b> | <b>155.52M</b>   |
| <b>Type:</b><br>LVPECL<br>Clock Series<br>5x7mm | <b>Temperature Range:</b><br>1 = 0 to 70° C<br>2 = -40 to 85° C<br>3 = 0 to 85° C<br>4 = -20 to 70° C | <b>Frequency Stability:</b><br>4 = +/-20 ppm<br>1 = +/-25 ppm<br>2 = +/-50 ppm<br>3 = +/-100 ppm | <b>Supply Voltage:</b><br>2 = 2.5Vdc.<br>3 = 3.3Vdc. |          | <b>Output Frequency:</b><br>Frequency Format<br>-xxx.xM Min.*<br>-xxx.xxxxxM Max.*<br>*Amount of numbers after the decimal point.<br>M = MHz |

Example: P123-155.52M = LVPECL Clock, 0 to 70°C, +/-50ppm, 3.3Vdc @ 155.52 MHz

### Package Characteristics

Table 5.0

|                   |  |
|-------------------|--|
| Package           | Hermetically sealed ceramic package and metal cover. |
| Soldering Process | RoHS compliant, see solder profile on page 2.        |

### Environmental Characteristics

Table 6.0

|               |   |
|---------------|---|
| 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  |

### Pad Connections - Enable / Disable Function

Table 7.0

| Pad | Connection       |
|-----|------------------|
| 1   | Enable / Disable |
| 2   | N/C              |
| 3   | Ground           |
| 4   | Q Output         |
| 5   | Q̄ Output        |
| 6   | Vcc              |

Table 8.0

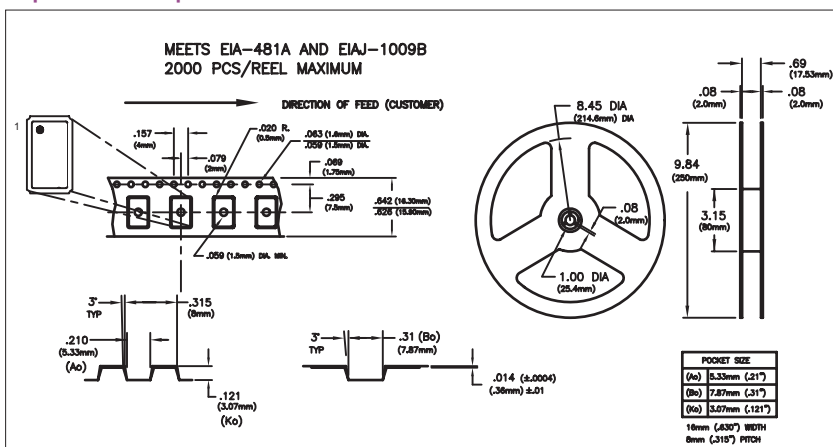
| Enable / Disable Function (Pad 1) | Output                   |
|-----------------------------------|--------------------------|
| High or Open                      | Enable                   |
| Low                               | Disable (High Impedance) |

### Model Matrix

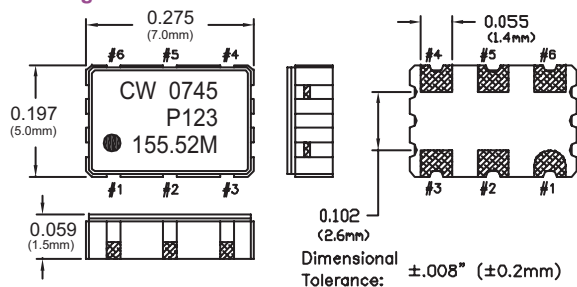
Table 9.0

| Frequency Tolerance ±20ppm | Frequency Tolerance ±25ppm | Frequency Tolerance ±50ppm | Frequency Tolerance ±100ppm | Supply Voltage | Temperature Range |
|----------------------------|----------------------------|----------------------------|-----------------------------|----------------|-------------------|
| P142                       | P112                       | P122                       | P132                        | 2.5Vdc         | 0 to 70°C         |
| P442                       | P412                       | P422                       | P432                        | 2.5Vdc         | -20 to 70°C       |
| P342                       | P312                       | P322                       | P332                        | 2.5Vdc         | 0 to 85°C         |
| P242                       | P212                       | P222                       | P232                        | 2.5Vdc         | -40 to 85°C       |
| P143                       | P113                       | P123                       | P133                        | 3.3Vdc         | 0 to 70°C         |
| P443                       | P413                       | P423                       | P433                        | 3.3Vdc         | -20 to 70°C       |
| P343                       | P313                       | P323                       | P333                        | 3.3Vdc         | 0 to 85°C         |
| P243                       | P213                       | P223                       | P233                        | 3.3Vdc         | -40 to 85°C       |

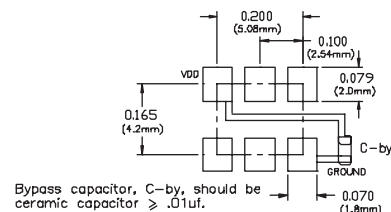
### Tape and Reel Specifications



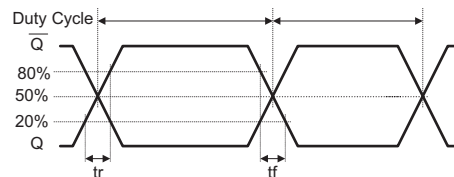
### Package Outline



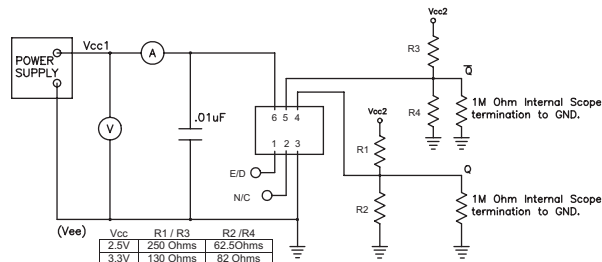
### Suggested Pad Layout



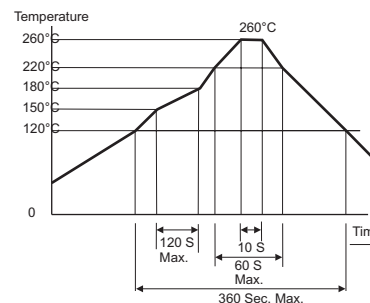
### LVPECL Output Waveform



### Test Circuit



### Solder Profile



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