

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



## Models CWX813 and CWX823 in Stock at Digi-Key

### Description

The Connor-Winfield CWX8xx - series is a RoHS compliant 5.0x7.0mm Surface Mount, Fixed Frequency Crystal Controlled Oscillator (XO). Designed for use in applications requiring tight frequency stability and low jitter. The surface mount package is designed for high-density mounting and is optimum for mass production.



### Features

#### Model CWX8xx - Series

5.0 x7.0mm Surface Mount Package  
3.3V or 5.0V Operation  
CMOS Output Logic  
Frequency Stabilities Available:  
+/-25ppm or +/-50ppm  
Temperature Range: -20 to 70°C  
Low Jitter <1ps RMS  
Tri-State Enable/Disable  
Tape and Reel Packaging ✓RoHS

### Absolute Maximum Rating

| Parameter                   | Units | Minimum | Nominal | Maximum | Units | Note |
|-----------------------------|-------|---------|---------|---------|-------|------|
| Storage Temperature         |       | -55     | -       | 125     | °C    |      |
| Supply Voltage (Vcc=3.3Vdc) | (Vcc) | -0.5    | -       | 5.0     | Vdc   |      |
| Supply Voltage (Vcc=5.0Vdc) | (Vcc) | -0.5    | -       | 7.0     | Vdc   |      |
| Input Voltage               |       | -0.5    | -       | Vcc+0.5 | Vdc   |      |

### Operating Specifications

| Parameter                           | Units | Minimum | Nominal | Maximum | Units | Note |
|-------------------------------------|-------|---------|---------|---------|-------|------|
| Frequency Range                     | (Fo)  | 1.0     | -       | 156.25  | MHz   |      |
| Total Frequency Tolerance           |       |         |         |         |       |      |
| Models CWX813-CWX815                |       | -25     | -       | 25      | ppm   | 1    |
| Models CWX823-CWX825                |       | -50     | -       | 50      | ppm   | 1    |
| Operating Temperature Range         |       | -20     | -       | 70      | °C    |      |
| Supply Voltage                      | (Vcc) |         |         |         |       |      |
| Models CWX813-CWX823                |       | 3.135   | 3.3     | 3.465   | Vdc   |      |
| Models CWX815-CWX825                |       | 4.5     | 5.0     | 5.5     | Vdc   |      |
| Supply Current                      | (Icc) |         |         |         |       |      |
| Models CWX813-CWX823 (Vcc = 3.3Vdc) |       | -       | -       | 30      | mA    |      |
| Models CWX815-CWX825 (Vcc = 5.0Vdc) |       | -       | -       | 45      | mA    |      |

### Input Characteristics

| Parameter       | Units        | Minimum | Nominal | Maximum | Units | Note |
|-----------------|--------------|---------|---------|---------|-------|------|
| Enable Voltage  | (High) (Vih) | >70%Vcc | -       | -       | Vdc   | 2    |
| Disable Voltage | (Low) (Vil)  | -       | -       | <30%Vcc | Vdc   | 2    |

### Output Characteristics

| Parameter                                   | Units | Minimum | Nominal | Maximum | Units  | Note |
|---------------------------------------------|-------|---------|---------|---------|--------|------|
| Load                                        |       |         |         |         |        |      |
| Models CWX813-CWX823 (LVCMOS)               |       | -       | 15      | -       | pF     |      |
| Models CWX815-CWX825 (HCMOS)                |       | -       | -       | 50      | pF     |      |
| Voltage (High)                              | (Voh) | Vcc-0.4 | -       | -       | Vdc    |      |
| (Low)                                       | (Vol) | -       | -       | 0.4     | Vdc    |      |
| Duty Cycle at 50% of Vcc                    |       | 40      | 50      | 60      | %      |      |
| Rise / Fall Time 10% to 90%                 |       | -       | 2       | 6       | ns     |      |
| Start-Up Time                               |       | -       | -       | 10      | ms     |      |
| Period Jitter                               |       | -       | 3       | 5       | ps RMS |      |
| Integrated Phase Jitter (BW=12kHz to 20MHz) |       | -       | 0.5     | 1       | 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 |      |

### Package Characteristics

|                   |                                                          |
|-------------------|----------------------------------------------------------|
| Package           | Hermetically sealed ceramic package                      |
| Soldering Process | RoHS compliant, lead free. See solder profile on page 2. |

### Notes

- 1) Inclusive of calibration @ 25°C, frequency vs. temperature stability, supply voltage change, load change, shock and vibration, 10 years aging.
- 2) When the oscillator is disabled, the outputs are at high impedance. Output is enabled with no connection on pad 1.

Specifications subject to change without notice. All dimensions in inches. © Copyright 2008 The Connor-Winfield Corporation

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## Ordering Information

| CWX                            | 8                                      | 1                                                      | 3                                             | - | 16.384M                                                                                                                                  |
|--------------------------------|----------------------------------------|--------------------------------------------------------|-----------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------|
| Type:<br>Clock Series<br>5x7mm | Temperature Range:<br>8 = -20 to 70° C | Frequency Stability:<br>1 = +/-25 ppm<br>2 = +/-50 ppm | Supply Voltage:<br>3 = 3.3Vdc.<br>5 = 5.0Vdc. |   | Output Frequency:<br>Frequency Format<br>-xxx.xM Min.*<br>-xxx.xxxxxM Max.*<br>*Amount of numbers<br>after the decimal point.<br>M = MHz |

Example: CWX813-016.384M = LVCMOS Clock, -20 to 70°C, ±25ppm, 3.3V @ 16.384 MHz

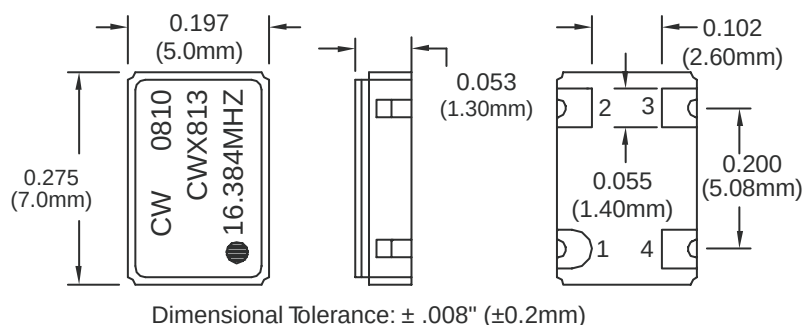
## Environmental Characteristics

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

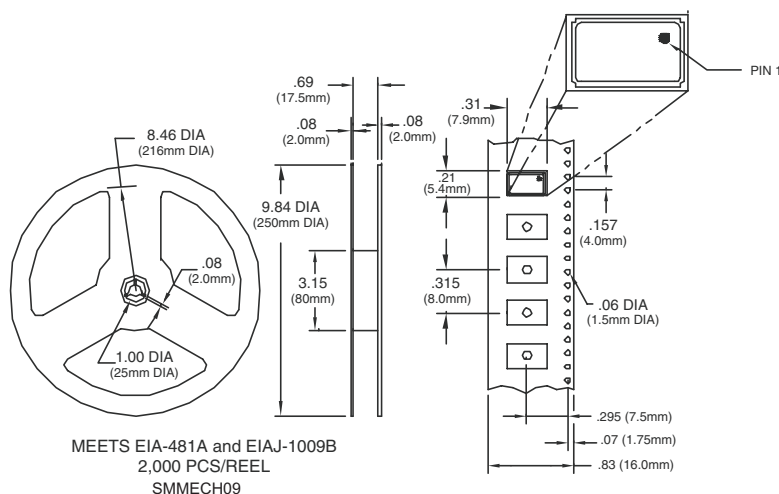
## Pad Connections and Enable / Disable Function

| 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            |                                   |                          |

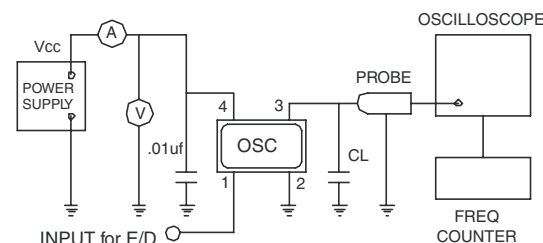
## Package Outline



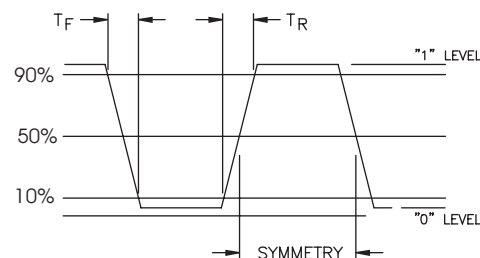
## Tape and Reel Dimensions



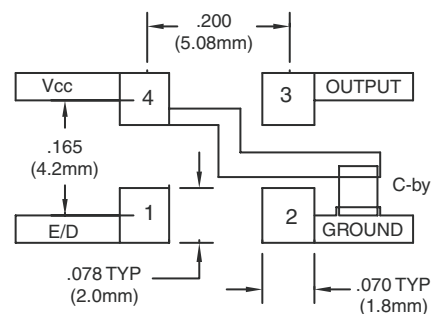
## Test Circuit



## Output Waveform

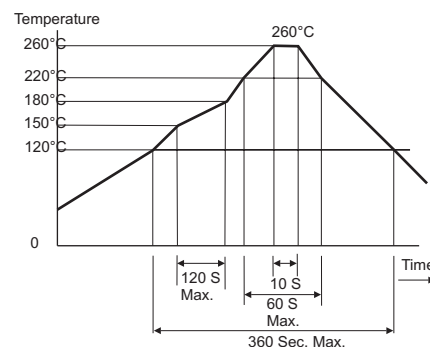


## Suggested Pad Layout



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

## Solder Profile



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