# High Frequency 5.0 x 7.0mm VCXO

CONNOR WINFIELD

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## Description


The Connor Winfield models V975 and V976 are 3.3V, Surface Mount 5.0x7.0mm, Voltage Controlled Crystal Oscillator (VCXO) with LVDS differential outputs and enable/ disable function. The V975 and V976 are designed for use with applications utilizing a PLL system requiring very high frequency and low jitter. The surface mount package is designed for high-density mounting and is optimum for mass production.

## Features

**Models: V975 / V976**

3.3V Operation
Absolute Pull Range (APR): +/-30ppm
Temperature Range: -40 to 85°C
Differential LVDS Outputs
Low Jitter 0.1pS RMS Typical
Enable / Disable Function:
- Models: V975: Enable Low
- Models: V976: Enable High

5.0x7.0mm Surface Mount Package
Tape and Reel Packaging
RoHS Compliant / Lead Free

## Specifications

### Absolute Maximum Ratings

| Parameter | Symbol | Minimum | Nominal | Maximum | Units | Note |
|---|---|---|---|---|---|---|
| Storage Temperature | | -55 | - | 125 | °C | |
| Supply Voltage | (Vcc) | -0.5 | - | 4.6 | Vdc | |
| Control Voltage | (Vc) | -0.5 | - | Vcc+0.5 | Vdc | |

### Operating Specifications

| Parameter | Symbol | Minimum | Nominal | Maximum | Units | Note |
|---|---|---|---|---|---|---|
| Center Frequency | (Fo) | 300 | - | 710 | MHz | |
| Operating Temperature Range | | -40 | - | 85 | °C | |
| Supply Voltage | (Vcc) | 3.135 | 3.3 | 3.465 | Vdc | |
| Supply Current | (Icc) | - | - | 100 | mA | |
| Integrated Phase Jitter | | - | 0.1 | 0.25 | ps rms | 1 |
| Period Jitter RMS | | - | 4 | 6 | ps rms | |
| Period Jitter Peak to Peak | | - | 25 | 30 | ps pk - pk | |
| Typical Phase Noise for a 622.08 MHz | | | | | | |
| SSB Phase Noise at 10Hz offset | | - | -45 | - | dBc/Hz | |
| SSB Phase Noise at 100Hz offset | | - | -85 | - | dBc/Hz | |
| SSB Phase Noise at 1KHz offset | | - | -110 | - | dBc/Hz | |
| SSB Phase Noise at 10KHz offset | | - | -130 | - | dBc/Hz | |
| SSB Phase Noise at 100KHz offset | | - | -137 | - | dBc/Hz | |
| SSB Phase Noise at 1MHz offset | | - | -148 | - | dBc/Hz | |
| SSB Phase Noise at 10MHz offset | | - | -150 | - | dBc/Hz | |
| Sub harmonics | | | | | | |
| 25% Fo | | - | -55 | -50 | dBc | |
| 50% Fo | | - | -35 | -30 | dBc | |
| 75% Fo | | - | -45 | -40 | dBc | |

### Input Characteristics

| Parameter | Symbol | Minimum | Nominal | Maximum | Units | Note |
|---|---|---|---|---|---|---|
| Control Voltage Range | (Vc) | 0.3 | 1.65 | 3.0 | Vdc | |
| Tuning Slope (Kv) | | - | 80 | - | ppm/V | |
| Absolute Pull Range: (APR) | | ±30 | - | - | ppm | 2 |
| Monotonic Linearity | | -10 | - | 10 | % | |
| Input Impedance | | 130K | 180K | - | Ohm | |
| Modulation Bandwidth (3dB) | | 25 | - | - | KHz | |
| Model: V975 / Disable Function | | | | | | |
| Enable Input Voltage (Low) | (Vil) | - | - | 30%Vcc | Vdc | 3 |
| Disable Input Voltage (High) | (Vih) | 70%Vcc | - | - | Vdc | 3 |
| Models: V976 / Disable Function | | | | | | |
| Enable Input Voltage (High) | (Vil) | 70%Vcc | - | - | Vdc | 3 |
| Disable Input Voltage (Low) | (Vih) | - | - | 30%Vcc | Vdc | 3 |

### LVDS Output Characteristics

| Parameter | Symbol | Minimum | Nominal | Maximum | Units | Note |
|---|---|---|---|---|---|---|
| LOAD | | - | - | 100 | Ohms | 4 |
| Output Differential Voltage | (Vod) | 250 | - | 450 | mV | |
| Duty Cycle at 50% Level | | 45 | 50 | 55 | % | |
| Differential Clock Rise / Fall Time | | - | 0.5 | 0.7 | nS | |

### Package Characteristics

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

RoHS COMPLIANT

| | |
|---|---|
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## Notes

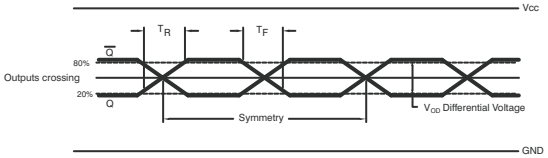
1.0 Bandwidth = 12kHz to 20MHz.

2.0 Absolute pull range (APR) is the minimum guaranteed pull range of the VCXO under all conditions over the lifetime operation. Including calibration @ 25°C, frequency vs. change in temperature, frequency vs. change in supply voltage, frequency vs. change in load, shock and vibration and aging for ten years. The APR is referenced to Fo. Positive Transfer Function.

3.0 Outputs are enabled with no connection on pad 2. When oscillator is disabled both outputs are in a high impedance state.

4.0 Vod measured with 100 ohm resistor between the true output and the complementary outputs.

## Output Waveform




## Enable / Disable Function

**Models: V975**

| Enable / Disable Function (Pad 2) | Output |
|---|---|
| No Connection | Enable |
| Low | Enable |
| High | Disable (High Impedance) |

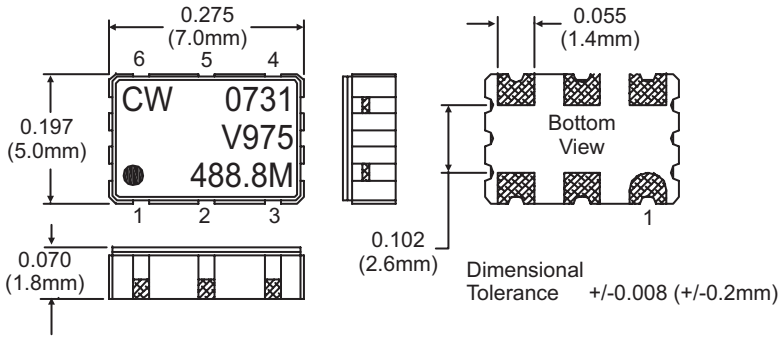
**Models: V976**

| Enable / Disable Function (Pad 2) | Output |
|---|---|
| No Connection | Enable |
| High | Enable |
| Low | Disable (High Impedance) |

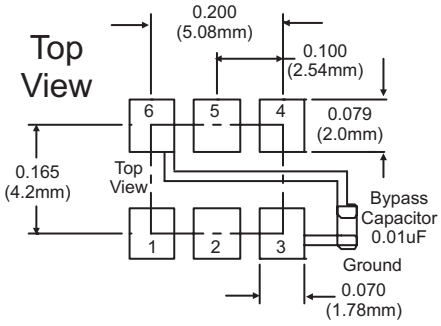
## Pad Connections

| Pad | Pad Connection |
|---|---|
| 1 | Control Voltage |
| 2 | Enable / Disable |
| 3 | Ground (Case) |
| 4 | Output Q |
| 5 | Output $\overline{Q}$ |
| 6 | Vcc |

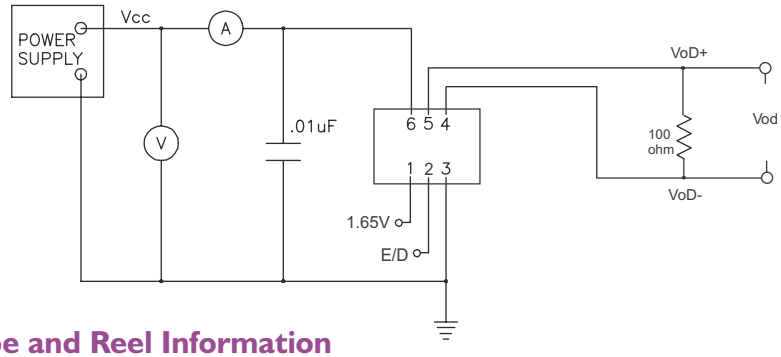
## Package Layout



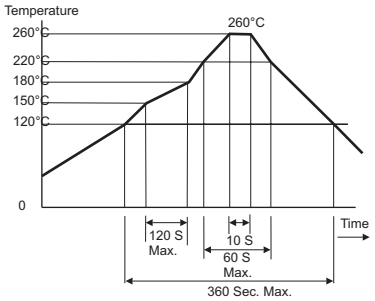

## Suggested Pad Layout



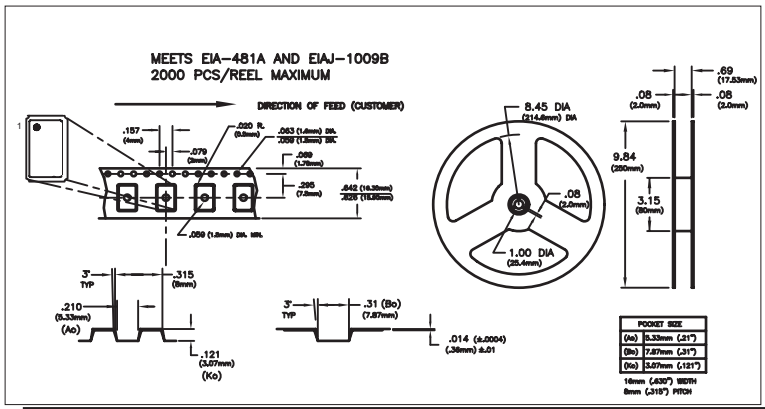

## Test Circuit




## Solder Profile




## Tape and Reel Information




## Ordering Information

V975 - 488.8M

VCXO SERIES — CENTER FREQUENCY

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