# OCXO Specification OX914xC Series

CONNOR WINFIELD

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## Description:

Connor-Winfield's models OX914xC series are 3.3V, Oven Compensated Crystal Oscillators (OCXO) in a 9x14 mm surface mount package. The OX914xC series are low cost, high performance OCXO's.


## Features:

**Models: OX9141C or OX9142C**
3.3 Vdc Operation
SMT Package
Frequency Stability: +/-100 ppb
Temperature Ranges Available:
0 to 70°C or -20 to 70°C
LVCMOS Output Logic
RoHS Compliant / Lead Free

## Absolute Maximum Ratings

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|---|---|---|---|---|---|
| Storage Temperature | -55 | - | 85 | °C | |
| Supply Voltage (Vcc) | -0.5 | - | 5.5 | Vdc | |
| Input Voltage (Vc) | -0.5 | - | Vcc+0.5 | Vdc | |

Absolute Ratings: Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only. The functional operation of the device at those or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to conditions outside the "recommended operating conditions" for any extended period of time may adversely impact device reliability and result in failures not covered by warranty.

## Operating Specifications

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|---|---|---|---|---|---|
| Frequencies Available: (Fo) | | 10, 12.8,13, 19.2, 19.44, 20, 26 | | MHz | |
| Freq. Calibration @ 25°C | -1.0 | - | 1.0 | ppm | 1 |
| Freq. Stability vs. Temperature | -100 | - | 100 | ppb | 2 |
| Daily Aging | -40 | - | 40 | pbb | 3 |
| Aging per Year | -300 | - | 300 | ppb | 3 |
| Freq. Stability vs. Supply Voltage | -20 | - | 20 | ppb | (+/-5%) |
| Freq. Stability vs. Load Change | -10 | - | 10 | ppb | (+/-10%) |
| Short Term Stability | - | - | 1.0E-10/s | | |
| Total Frequency Tolerance (20 Years) | -4.60 | - | 4.60 | ppm | 4 |
| Operating Temperature Range: | | | | | |
| Models OX9141C | 0 | - | 70 | °C | |
| Models OX9142C | -20 | - | 70 | °C | |
| Supply Voltage: (+/-5%) (Vcc) | 3.135 | 3.30 | 3.465 | Vdc | |
| Power Consumption: Turn On | - | - | 3.00 | W | |
| Power Consumption: Steady State | - | - | 1.30 | W | |
| Warm Up Time (Within Specification @ 25°C) | | - | 60 | s | |
| Warm Up Time (Within Specification @ -40 C) | | - | 90 | s | |

## LVCMOS Output Characteristics

| Parameter | Minimum | Nominal | Maximum | Units | Notes |
|---|---|---|---|---|---|
| Load - | - | 15 | - | pF | |
| Voltage: High (Voh) | 2.2 | 2.4 | - | Vdc | |
| Low (Vol) | - | 0.3 | 0.4 | | |
| Duty Cycle at 50% of Vcc | 45 | 50 | 55 | % | |
| Rise / Fall Time: 10% to 90% | - | - | 6.5 | ns | |
| Period Jitter | - | 3 | 5 | ps rms | |
| Integrated Phase Jitter | - | 0.3 | 1.0 | ps rms | |
| SSB Phase Noise at 10Hz offset | - | - | -80 | dBc/Hz | |
| SSB Phase Noise at 100Hz offset | - | - | -110 | dBc/Hz | |
| SSB Phase Noise at 1KHz offset | - | - | -130 | dBc/Hz | |
| SSB Phase Noise at 10KHz offset | - | - | -145 | dBc/Hz | |

**Notes:**

1. *Initial calibration @ 25°C.*
2. *Frequency stability vs. change in temperature. [±(Fmax - Fmin)/(2*Fo)]*
3. *After 30 days of operation.*
4. *Inclusive of calibration @ 25°C, frequency vs. change in temperature, change in supply voltage (±5%), load change (±10%), shock and vibration and 20 years aging*

## Ordering Information

| OX914 | 1 | C | -020.0M |
|---|---|---|---|
| Oscillator Type<br><br>OX914 - OCXO<br>9x14 mm Package | Temperature Range<br><br>1 = 0 to 70°C<br>2 = -20 to 70°C | Frequency Stability<br><br>C = ±100 ppb | Output Frequency Frequency Format<br>-xxx.xM Min.*<br>-xxx.xxxxxxM Max* |

Example Part Number:
OX9141C-020.0M = OCXO, 9x14 mm package, 0 to 70°C, ±100 ppb, 20 MHz

*Amount of numbers after the decimal point. M = MHz

RoHS COMPLIANT

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| Date | 24 Sep 2013 |

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## Package Characteristics

Package: Non-hermetic package consisting of an FR4 substrate and Ryton R4 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. |

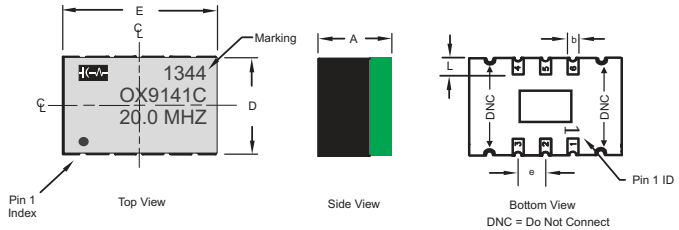
## Recommended Cleaning Process

Wash only in a in-line high pressure wash station that has an air knife and drying capabilities. (Drying temperature range from 85° to 100°C

## Pad Connections

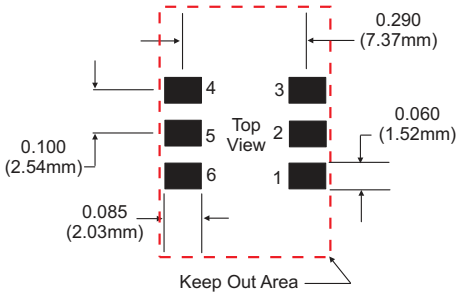
1: N/C
2: N/C
3 Ground:
4: Output
5: N/C
6: Supply Voltage (Vcc)

## Package Outline



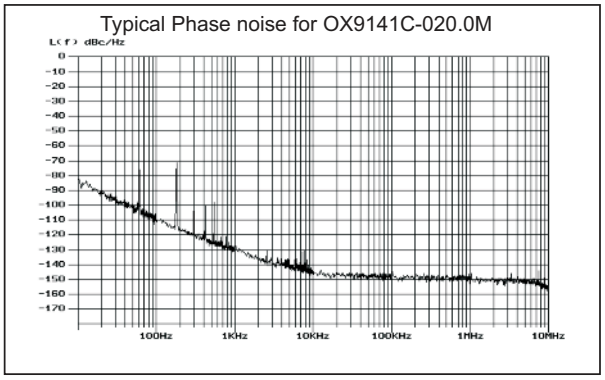

| | mm | | | inches | | |
|---|---|---|---|---|---|---|
| Symbol | Min | Nom. | Max. | Min | Nom. | Max. |
| A | - | - | 7.92 | - | - | 0.312 |
| D | 8.89 | 9.02 | 9.15 | 0.350 | 0.355 | 0.360 |
| E | 13.34 | 13.47 | 13.60 | 0.545 | 0.550 | 0.555 |
| A1 | - | 2.36 | - | - | 0.093 | - |
| L | - | 1.52 | - | - | 0.060 | - |
| b | - | 1.02 | - | - | 0.040 | - |
| e | - | 2.54 | - | - | 0.100 | - |

## Suggested Pad Layout

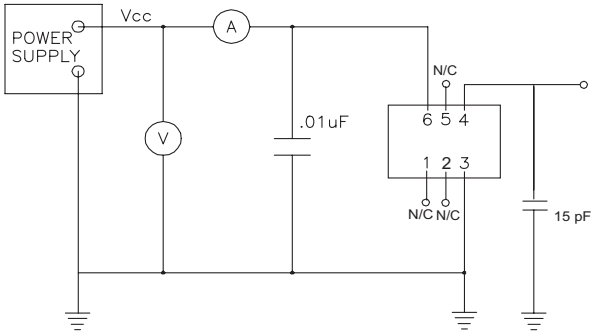



Keep Out Area Note: Do not route any traces under the device in the keep out area.

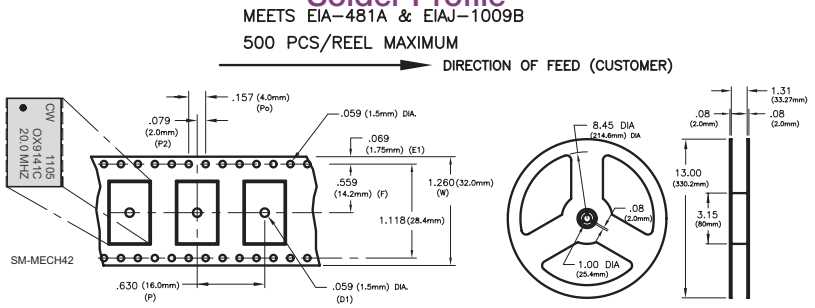
## Phase Noise Plot




## Test Circuit




## Solder Profile

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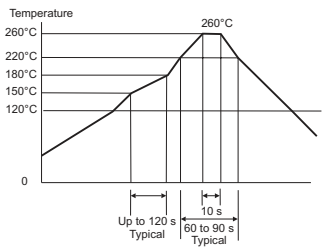


Meets IPC/JEDEC J-STD-020C

## Revision History

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|---|---|
| Revision 00 | Data sheet released. 07/13/09 |
| Revision 01 | Updated note 1 10/21/09. |
| Revision 02 | Updated package drawings to the latest version. 02/01/11 |
| Revision 03 | Added frequency stability note and Recommended Cleaning Process. 04/22/11 |
| Revision 04 | Updated specifications. 05/25/11 |
| Revision 05 | Updated package drawing and suggested layout to IPC. 09/24/13. |

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| Date | **24 Sep 2013** |