



# OX200-SC 10 MHz VCOCXO CO-8 Package

# CONNOR WINFIELD



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## Description:

Connor-Winfield model OX200-SC is a 12 Vdc, Oven Compensated Crystal Oscillator with Voltage Control Option (VCOCXO) in a CO-8 package. The OX200-SC is designed for use with applications that require a LVCMOS output, very high frequency stability, low jitter and low phase noise.



## Features:

- VCOCXO
- 12 Vdc Operation
- CO-8 Footprint
- Frequency Stability:  $\pm 1.5$  ppb
- Temperature Range: 0 to 70°C
- LVCMOS Output
- Low Jitter and Phase Noise
- RoHS Compliant / Lead Free

## Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units	Notes
Storage Temperature	-55	-	125	°C	
Operable Temperature Range:	-55	-	85	°C	
Supply Voltage (Vcc)	-	-	15	Vdc	
Output Load	-	-	50	pF	CMOS Signal

## Frequency Stabilities

Parameter	Minimum	Nominal	Maximum	Units	Notes
Center Frequency: (Fo)	-	10.0	-	MHz	
Frequency Calibration	-25	-	25	ppb	1
Frequency Stability					
vs. Temperature (0 to 70 °C)	-1.5	-	1.5	ppb	2
vs. Warm Up (60 minutes on)	-200	-	200	ppb	7 days off
vs. Warm Up (120 minutes on)	-100	-	100	ppb	7 days off
vs. Warm Up (24 hours on)	-200	-	200	ppb	unlimited time off
vs. Warm Up (72 hours on)	-100	-	100	ppb	unlimited time off
vs. Supply Voltage Change	-0.3	-	0.3	ppb	Vcc $\pm 5\%$
vs. Load Change	-0.3	-	0.3	ppb	Load $\pm 5\%$
vs. Aging per day	-0.2	-	0.2	ppb	30 days operation
vs. Aging 5 Years	-60	-	60	ppb	72 hrs. operation
Total Tolerance	-100	-	100	ppb	3
Operating Temperature Range:	0	-	70	°C	

## Supply Voltage (Vcc)

Parameter	Minimum	Nominal	Maximum	Units	Notes
Supply Voltage: (Vcc)	11.4	12.0	12.6	Vdc	
Power Consumption:					
Turn On	-	-	9	W	Warm up
Steady State	-	-	3	W	@ 25°C

## Input Characteristics - Voltage Control (Vc)

Parameter	Minimum	Nominal	Maximum	Units	Notes
Tuning Range	$\pm 0.2$	-	-	ppm	
Tuning Sensitivity	0.1	-	0.3	ppm/V	
Linearity	-	-	20	%	
Control Voltage Range	0.0	2.5	4.0	Vdc	
Tuning Slope		Positive			

## LVCMOS Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load	-	-	15	pF	
Voltage: High (Voh)	3.0	-	3.6	Vdc	
Low (Vol)	-	-	0.2		
Duty Cycle (Voh-Vol/2)	45	50	55	%	
Output Current	-	-	2.5	mA	
SSB Phase Noise at 1Hz offset	-	-	-90	dBc/Hz	
SSB Phase Noise at 10Hz offset	-	-	-115	dBc/Hz	
SSB Phase Noise at 100Hz offset	-	-	-135	dBc/Hz	
SSB Phase Noise at 1KHz offset	-	-	-140	dBc/Hz	
SSB Phase Noise at 10KHz offset	-	-	-140	dBc/Hz	

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## Package Characteristics

Package CO-8 footprint, resistive welded package with grounded case.

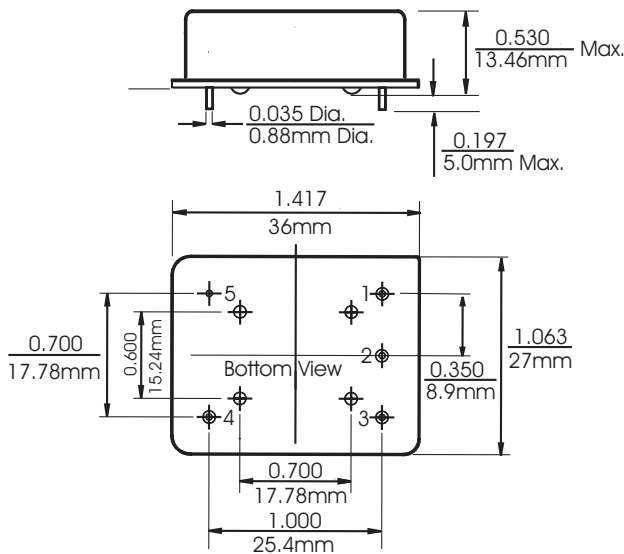
## Environmental Characteristics

Shock	500 G's 1ms, Halfsine, 3 shocks per direction, per MIL-STD 202F, Method 213B Test Condition D.
Sinusoidal Vibration	0.06" D.A. or 10G's Peak, 10 to 500 Hz, per MIL-STD-202F, Method 204D, Test Condition A.
Random Vibration	5.35 G's rms. 20 to 2000 Hz per MIL-STD-202F, Method 214, Test Condition 1A, 15 minutes each axis.
Moisture	10 cycles, 95% RH, Per MIL-STD-202F, Method 112.
Marking Permanency	Per MIL-STD-202F, Method 215J.
Attachment Method PCB	Through-hole mounted, see Note 4.
Resistance to Solder Heat	Per MIL-STD-202F, Method 210, Condition E.

### Notes:

1. At time of shipment after 60 minutes of operation, @25°C, Vc = 2.5 Vdc.
2. Frequency stability vs. change in temperature  $[\pm(F_{max}-F_{min})/(2 \cdot F_0)]$ .
3. Five years from time of shipment after 72 hours of operation and Vc = 2.5 Vdc.
4. To preserve the high precision characteristics of this device, low ambient temperature assembly methods are recommended, e.g. manual assembly, selective solder, or wave solder.

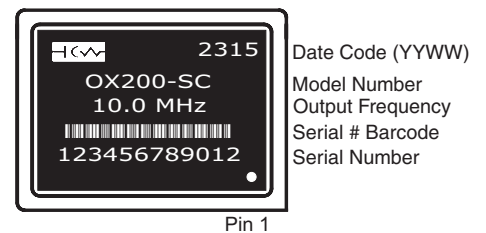
## Package Outline



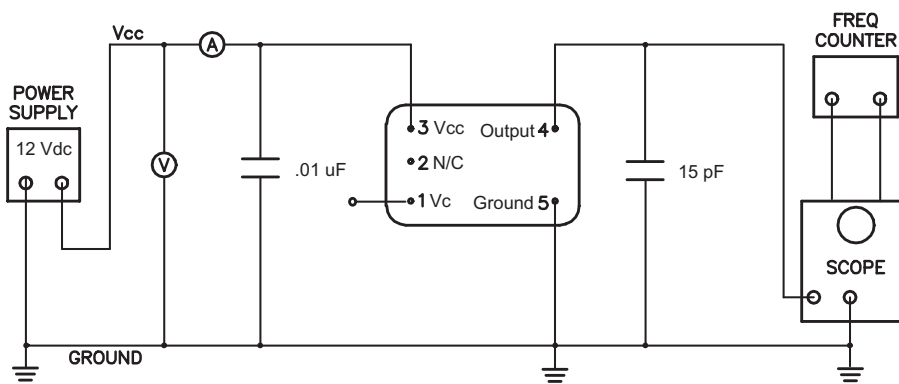
## Pin Connections

Pin	Connection
1:	Voltage Control (Vc)
2:	N/C
3:	Supply Voltage (Vcc)
4:	RF Output
5:	Ground (Case)

## Marking Diagram



## Test Circuit

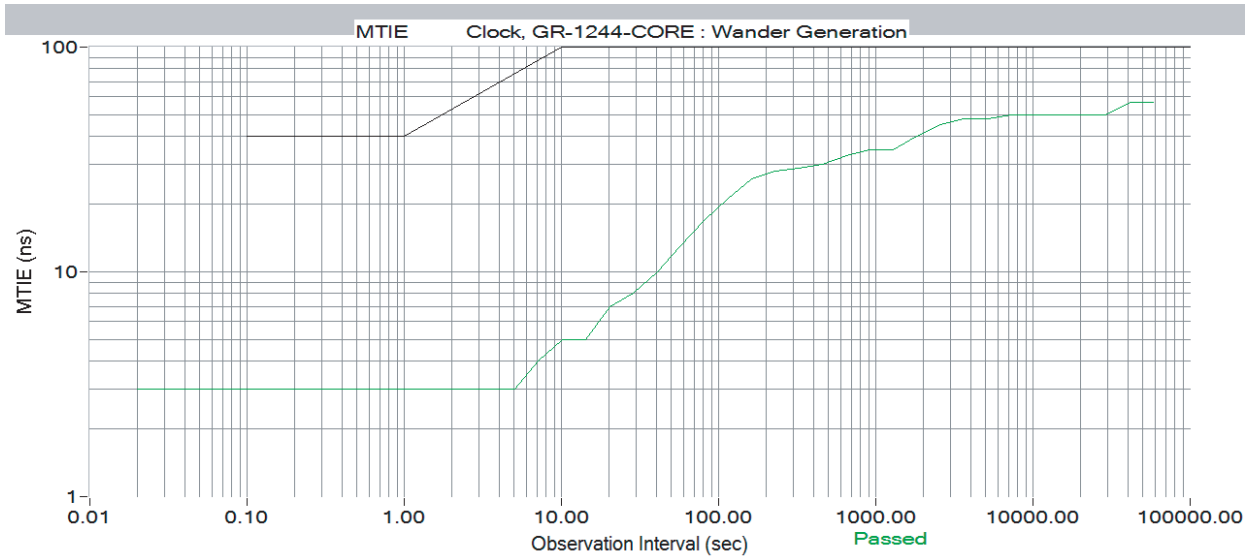


## Ordering Information

OX200-SC - 010.0M  
 OXCO SERIES - CENTER FREQUENCY

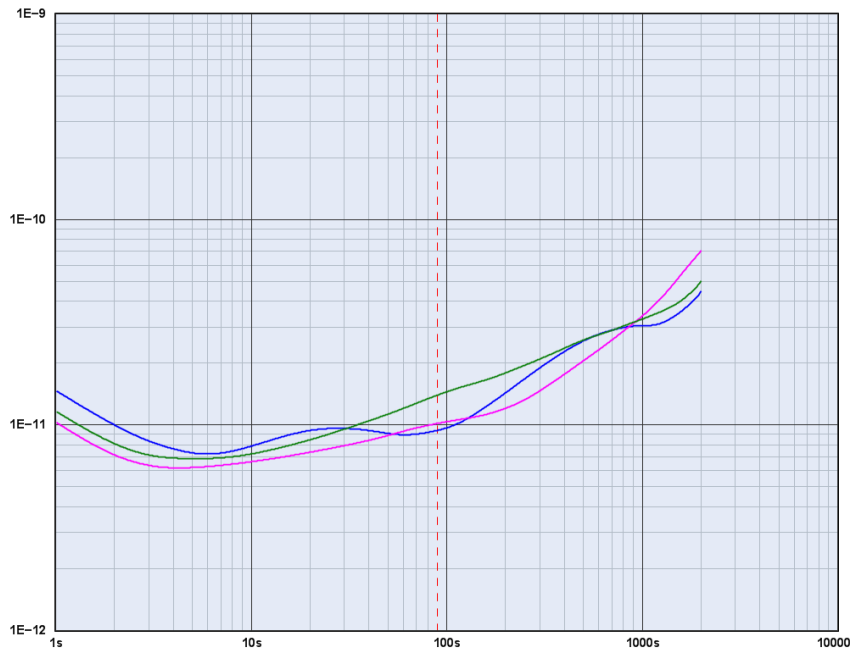
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**OX200-SC-010.0M MTIE per Stratum 3E (OCXO is covered)  
Loop Bandwidth = 0.0016 Hz**



**ADEV Plot**

Modified Allan Deviation (Mod  $\sigma_y(\tau)$ )



**Revision History**

Revision	Date	Description
00	11/12/09	New issue
01	11/30/10	Added aging 5 years
02	04/05/12	Changed from 3ppb absolute to +/-1.5ppb
03	09/18/12	Updated marking information
04	04/10/13	Changed HCMOS to LVC MOS
05	11/19/13	Added Voltage Control
06	07/12/18	Added MTIE and ADEV performance plots
07	04/20/23	Added Note 4 regarding attachment methods.

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