



# Low Noise High Stability Oven Stabilized Oscillator AO200-51003CF-025.0M

OCXO



2111 Comprehensive Drive  
Aurora, Illinois 60505  
Phone: 630-851-4722  
Fax: 630-851-5040  
www.conwin.com

## Description

Connor-Winfield's high stability OCXO model AO200-51003CF-025.0M is an exceptionally precise frequency standard. Low phase noise, excellent short term stability, and high thermal stability make this the OCXO of choice for Audio applications.



## Features

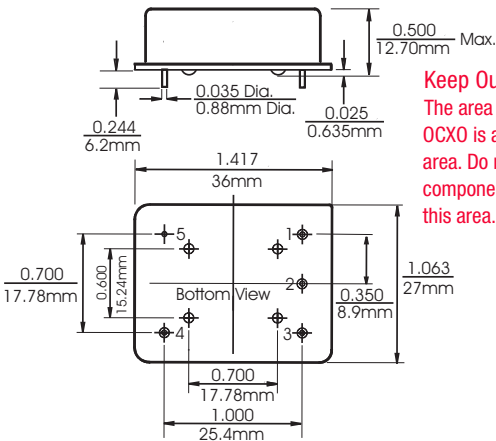
- Output Frequency: 25MHz
- OCXO - Fixed Frequency
- Supply Voltage: 3.3Vdc
- Frequency Stability:  $\pm 10$ ppb
- Temperature Range: 0 to 70°C
- LVCMS output
- Low Phase Noise / Phase Jitter
- Package: 1.1" x 1.4" x 0.5" (CO-8)
- RoHS Compliant / Lead Free

## Absolute Maximum Ratings

Parameter	Minimum	Nominal	Maximum	Units	Notes
Storage Temperature	-55	-	125	°C	
Supply Voltage (Vcc)	-0.5	-	3.6	Vdc	
Operating Supply Voltage (Vcc)	3.135	3.30	3.465	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.*

## Package Outline



**Keep Out Area:**  
The area under the OCXO is a keep-out area. Do not place any component parts in this area.

## Pin Connections

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

## Package Marking



Date Code (YYWW)  
Model Number  
Output Frequency  
Serial # Barcode  
Serial Number

Pin 1

## Ordering Information

AO200-	5	10	03	C	F	- 025.0M
Package AO200- = 1.1x1.4 CO8	Temperature 5 = 0 to 70°C	Frequency Stability 10 = $\pm 10$ ppb * <small>*<math>\{ \pm (F_{max} - F_{min}) / (2 \cdot F_0) \}</math></small>	Supply Voltage 03 = 3.3 Vdc	Output Type C = CMOS	OCXO Type F = Fixed Freq.	Output Frequency Frequency Format -xxx.xM Min -xxx.xxxxxM Max *Min 1 and Max 6 digits after the decimal point. M = MHz

Complete Part Number Example: AO200-51003CF-025.0M



**Attention: System Designers please review Application Note AN2093:  
Printed Circuit Board Layout Guidelines for OCXO Oscillators**  
[www.conwin.com/support.html](http://www.conwin.com/support.html)

## Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Center Frequency: (Fo)	-	25.0	-	MHz	
Operating Temperature Range:	0	-	70	°C	
Frequency Calibration:	-0.1	-	0.1	ppm	@ 25°C
Frequency Stability vs. Change in Temperature:	-10	-	10	ppb	1
Frequency Stability vs. Load	-5.0	-	5.0	ppb	±5%
Frequency Stability vs. Voltage	-5.0	-	5.0	ppb	±5%
Aging: Daily:	-1.0	-	1.0	ppb/day	2
Aging: First Year:	-50	-	50	ppb	
Lifetime Tolerance: (20 Years)	-300	-	300	ppb	3
Supply Voltage: (Vcc) Voltage Code 03	3.135	3.3	3.465	Vdc	
Power Consumption: Turn-On 0 to 70°C	-	-	3.00	W	4
Power Consumption: Steady State @ 25°C	-	-	1.10	W	4
Phase Jitter: (BW: 10 Hz to Fo/2)	-	0.25	0.3	ps rms	
Short Term Allan Deviation (1s)	-	5.0E-12	-		
Start-Up Time:	-	-	500	ms	
Warm Up Time @ 25°C:	-	-	5	minutes	5

### Notes:

1. Frequency stability vs. change in temperature  $[(F_{max}-F_{min})/(2 \cdot F_o)]$ .
2. At time of shipment after 48 hours of operation.
3. Inclusive of calibration, operating temperature, supply voltage change, load change and 20 years aging.
4. Measured with Vcc = Nominal, in calm air.
5. After 5 minutes of operation, the frequency at 25°C will be within ±100ppb of the final frequency observed 1 hour after turn on.

## CMOS Output Characteristics (Output Code C)

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load	-	15	-	pF	
Output Voltage: 3.3 Vdc Models					
High (Voh)	3.0	-	-	V	
Low (Vol)	-	-	0.3		
Duty Cycle at 50% of Vcc	45	50	55	%	
Rise / Fall Time: 10% to 90%	-	-	6	ns	
Spurious Output	-	-	-80	dBc	

## Phase Noise Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
<b>SSB Phase Noise</b>					
@1Hz offset	-	-90	-	dBc/Hz	
@ 10Hz offset	-	-115	-	dBc/Hz	
@ 100Hz offset	-	-140	-	dBc/Hz	
@ 1KHz offset	-	-150	-	dBc/Hz	
@ 10KHz offset	-	-155	-	dBc/Hz	
@ 100KHz offset	-	-158	-	dBc/Hz	



**Attention: System Designers please review Application Note AN2093:**  
**Printed Circuit Board Layout Guidelines for OCXO Oscillators**  
[www.conwin.com/support.html](http://www.conwin.com/support.html)

Bulletin	<b>Cx314</b>
Page	<b>2 of 3</b>
Revision	<b>02</b>
Date	<b>22 May 2024</b>

## Package Characteristics

AO200 Package	Hermetically sealed, resistive welded package with grounded case
Moisture Sensitivity Level	MSL-1

## Environmental Characteristics

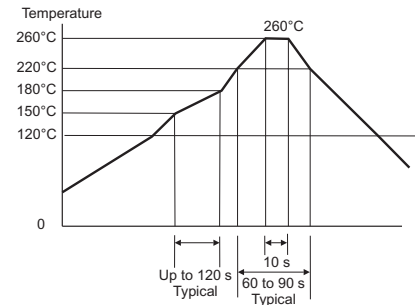
Shock	500 G's 1ms, Halfsine, 3 shocks per direction, per MIL-STD 202G, Method 213B Test Condition D.
Sinusoidal Vibration	0.06" D.A. or 10G's Peak, 10 to 500 Hz, per MIL-STD-202G, Method 204D, Test Condition A.
Random Vibration	5.35 G's rms. 20 to 2000 Hz per MIL-STD-202G, Method 214, Test Condition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

## Re stabilization Time

Off Time	Re stabilization Time
<1 Hour	<2 Hours *
<6 Hour	<12 Hours *
<24 Hour	<48 Hours *
1 to 16 Days	48 Hours + 1/4 Off Time *
>16 Days	<6 Days *

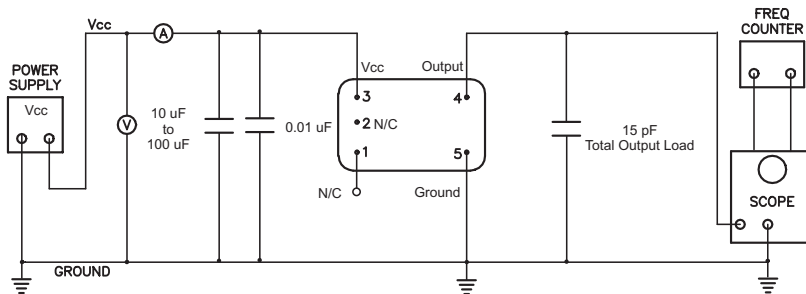
\* For a given off time, the time required to meet daily aging, short term stability and TEV requirements.

## Solder Profile

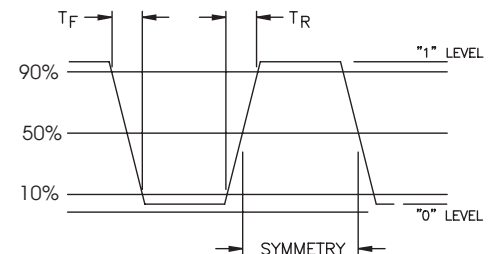


Meets IPC/JEDEC J-STD-020C

## Test Circuit



## CMOS Output Waveform



## Revision History

Revision	Date	Changes
00	07/20/21	New release
01	01/16/24	Updated phase jitter specification
02	05/22/24	Add Digi-Key availability note, and Moisture Sensitivity Level



**Attention: System Designers please review Application Note AN2093:**  
**Printed Circuit Board Layout Guidelines for OCXO Oscillators**  
[www.conwin.com/support.html](http://www.conwin.com/support.html)

Bulletin	<b>Cx314</b>
Page	<b>3 of 3</b>
Revision	<b>02</b>
Date	<b>22 May 2024</b>