

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

**OCXO**

**CONNOR  
WINFIELD**



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## 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

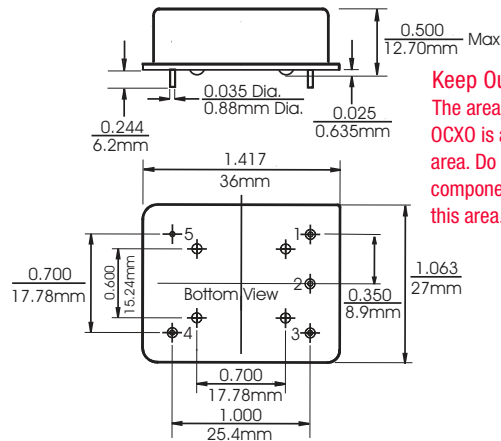
- Output Frequency: 25MHz
- OCXO - Fixed Frequency
- Supply Voltage: 3.3Vdc
- Frequency Stability:  $\pm 10$ ppb
- Temperature Range: 0 to 70°C
- LVC MOS output
- Low Phase Noise / Phase Jitter
- Package: 1.1" x 1.4" x 0.5" (CO-8)
- RoHS Compliant / Lead Free

## 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

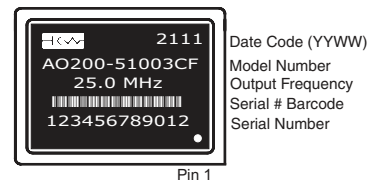


**Keep Out Area:**  
The area under the OCXO is a keep-out area. Do not place any component parts in this area.

## Pin Connections

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

## Package Marking



## Ordering Information

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

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



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**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)              | -       | -       | 2.0     | 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  $[\pm(F_{max}-F_{min})/(2 \cdot F_o)]$ .
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 |       |



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## Package Characteristics

AO200 Package Hermetically sealed, resistive welded package with grounded case.

## Environmental Characteristics

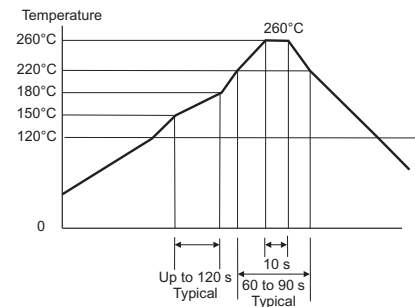
|                           |  |
|---------------------------|--|
| Shock                     | 500 G's 1ms, Halfsine, 3 shocks per direction, per MIL-STD 202G, Method 213B Test Condition D.     |
| Sinusoidal Vibration      | 0.06" D.A. or 10G's Peak, 10 to 500 Hz, per MIL-STD-202G, Method 204D, Test 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 *                 |

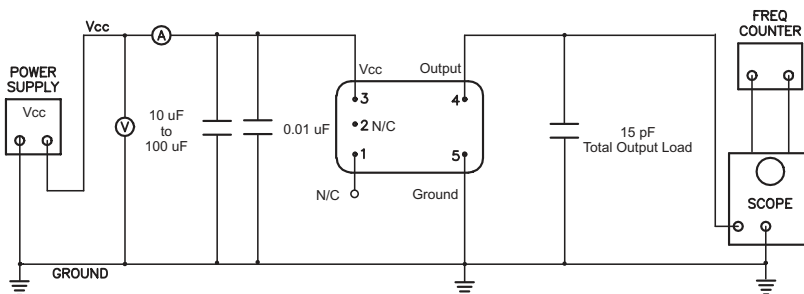
\* For a given off time, the time required to meet daily aging, short term stability and TEV requirements.

## Solder Profile

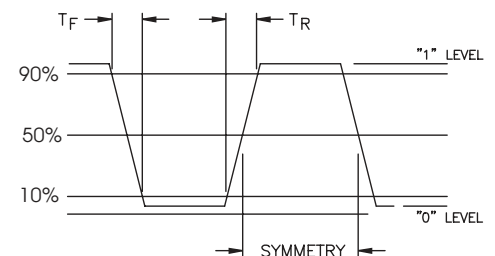


Meets IPC/JEDEC J-STD-020C

## Test Circuit



## CMOS Output Waveform



## Revision History

| Revision | Date     | Changes     |
|----------|----------|-------------|
| 00       | 07/20/21 | New release |



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