OCXO - OCVCXO
Specification:
BOC Series

CONNOR WINFIELD

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Description:

Connor-Winfield's high stability BOC - series are exceptionally precise frequency standards, excellent for use in cellular base stations, test equipment, Synchronous Ethernet and VSAT applications.

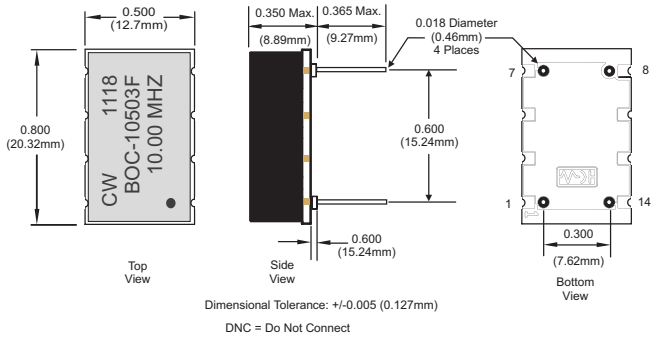
These 14 Pin DIP or SMT packaged OCXO / OCVCXO provide temperature stabilities in the range of ±50 ppb to ±100 ppb, over the commercial, extended commercial or the industrial temperature range.

The BOC - series is available with a CMOS output along with optional Electronic Frequency Tuning (OCVCXO). These oscillators provide outstanding phase noise characteristics that will meet the most stringent requirements.

Features:

OCXO / OCVCXO
Frequencies Available:
10, 12.8, 19.44, 20, 25 or 38.88 MHz
3.3 or 5.0 Vdc Operation
14 Pin DIP or SMT Package
Frequency Stabilities Available:
±50 ppb or ±100 ppb
Temperature Ranges Available:
0 to 70°C, -20 to 75°C or -40 to 85°C
CMOS Output / Low Phase Noise
Optional Electronic Frequency Tuning
RoHS Compliant / Lead Free

BOC-1 Package Outline



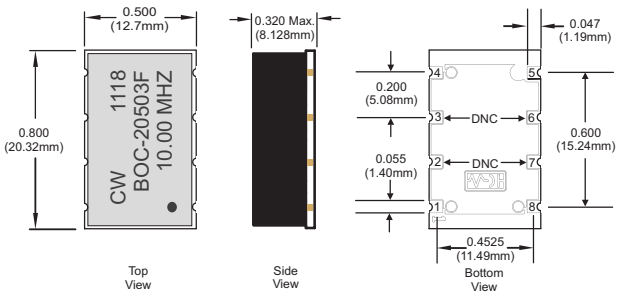
Dimensional Tolerance: +/-0.005 (0.127mm)

DNC = Do Not Connect

Pin Connections

1: N/C or Vc (optional)
7 Ground:
8: Output
14: Supply Voltage (Vcc)

BOC-2 Package Outline



Dimensional Tolerance: +/-0.005 (0.127mm)

DNC = Do Not Connect

Pad Connections

1: N/C or Vc (optional)
2: Do Not Connect
3: Do Not Connect
4 Ground
5: Output
6: Do Not Connect
7: Do Not Connect
8: Supply Voltage (Vcc)

RoHS COMPLIANT

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Ordering Information

BOC-	1	05	0	3	F	-010.0M
Oscillator Type OCXO OCVCXO	Package Type 1 =14 Pin DIP 2 = Surface Mount	Frequency Stability 05 = ±50 ppb 10 = ±100 ppb	Temperature Range 0 = 0 to 70°C 1 = -20 to 75°C 2 = -40 to 85°C	Supply Voltage 3 = 3.3 Vdc 5 = 5.0 Vdc	Voltage Control Option F = OCXO (Fixed Freq.) V = OCVCXO (Voltage Controlled)	Output Frequency Frequency Format -xxx.xM Min.* -xxx.xxxxxxM Max*

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

Example Part Numbers:

BOC-10503F-010.0M = 14 Pin DIP package, ±50 ppb, 0 to 70°C, 3.3 Vdc, LVCMOS Output, OCXO, Output Frequency 10.0 MHz

BOC-20525V-020.0M = 20x14mm SMT package, ±50 ppb, -40 to 85°C, 5.0 Vdc, HCMOS Output, OCVCXO, 20.0 MHz

Absolute Maximum Ratings

Parameter		Minimum	Nominal	Maximum	Units	Notes
Storage Temperature		-55	-	125	°C	
Supply Voltage:	3.3 Vdc (Vcc)	-0.5	-	4.5	Vdc	
	5.0 Vdc (Vcc)	-0.5	-	6.0	Vdc	
Control Voltage (Vc)		-0.5	-	Vcc+0.5	Vdc	

Operating Specifications

Parameter	Minimum	Nominal	Maximum	Units	Notes
Center Frequency: (Fo)		10, 12.8, 19.44, 20, 25 or 38.88		MHz	
Frequency Stability vs. Change in Temperature: (See Ordering Information)					
Stability Code 05	-50.0	-	50.0	ppb	1
Stability Code 10	-100.0	-	100.0	ppb	1
Operating Temperature Range: (See Ordering Information)					
Temperature Code 0	0	-	70	°C	
Temperature Code 1	-20	-	75	°C	
Temperature Code 2	-40	-	85	°C	
Frequency Calibration:	-1.0	-	1.0	ppm	2
Frequency Stability vs. Load	-20	-	20	ppb	±5%
Frequency Stability vs. Voltage	-20	-	20	ppb	±5%
Aging: Daily:	-10	-	10	ppb/day	3
Aging: First Year:	-300	-	300	ppb	3
Total Frequency Tolerance	-4.6	-	4.6	ppm	4
Supply Voltage: (Vcc) (See Ordering Information)					
Supply Voltage Code 3	3.13	3.30	3.47	Vdc	±5%
Supply Voltage Code 5	4.75	5.00	5.25	Vdc	±5%
Power Consumption: Vcc = Nominal Voltage					
Turn On	-	-	3.0	W	
Steady State @ 25°C	-	-	1.3	W	
Phase Jitter: (BW: 12 KHz to Fo/2)	-	0.5	1.0	ps RMS	
Short Term Stability	-	-	1.0E-9/s		
Start-Up Time:	-	-	1	ms	
Warm Up Time (Within Specification @ 25°C)	-	-	60	s	
Warm Up Time (Within Specification @ -40°C)	-	-	90	s	

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OCVCXO Input Characteristics (Optional)

Parameter	Minimum	Nominal	Maximum	Units	Notes
Control Voltage Range:					
Vcc = 3.3 Vdc	0.30	1.65	3.00	V	5
Vcc = 5.0 Vdc	0.5	2.5	4.5	V	5
Frequency Pullability:	±10.0	-	-	ppm	6
Input Impedance	100K	-	-	Ohms	
Linearity	±5	-	-	%	

CMOS Output Characteristics

Parameter		Minimum	Nominal	Maximum	Units	Notes
Load		-	15	-	pF	7
Output Voltage:						
Vcc = 3.3 Vdc	High (Voh)	2.70	-	-	V	
	Low (Vol)	-	-	0.30	V	
Vcc = 5.0 Vdc	High (Voh)	4.00	-	-	V	
	Low (Vol)	-	-	0.50	V	
Duty Cycle at 50% of Vcc		45	50	55	%	
Rise / Fall Time: 10% to 90%		-	-	6.5	ns	

Phase Noise Characteristics

Typical Phase Noise for BOC-10503F - 010.0M

Parameter	Minimum	Nominal	Maximum	Units	Notes
@ 1 Hz offset	-	-67	-	dBC/Hz	
@ 10 Hz offset	-	-100	-	dBC/Hz	
@ 100 Hz offset	-	-130	-	dBC/Hz	
@ 1 KHz offset	-	-148	-	dBC/Hz	
@ 10 KHz offset	-	-154	-	dBC/Hz	
@ 100 KHz offset	-	-155	-	dBC/Hz	

Package Characteristics

BOC-Series Package	Package consisting of a FR4 substrate and a Ryton-R4 cover.

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.
Solder Process	RoHS compliant, lead free. See solder profile on page 3.

Notes:

1 Frequency stability vs. change in temperature. [±(Fmax - Fmin)/2.Fo].
2 Initial calibration @ 25°C. For OCVCXO control voltage must be fixed.
3 After 30 days of operation
4. Inclusive of calibration @ 25°C, frequency vs. change in temperature, change in supply voltage (±5%), load change (±5%), shock and vibration and 20 years aging
5 Positive slope. (Frequency increases as Vc voltage increases.)
6 Referenced to Fo.
7 Attention: To achieve optimal frequency stability, and in some cases to meet the specification stated on this data sheet, it is required that the circuit connected to this OCXO output must have the equivalent input capacitance that is specified by the nominal load capacitance. Deviations from the nominal load capacitance will have a graduated effect on the stability of approximately 20 ppb per pF load difference.

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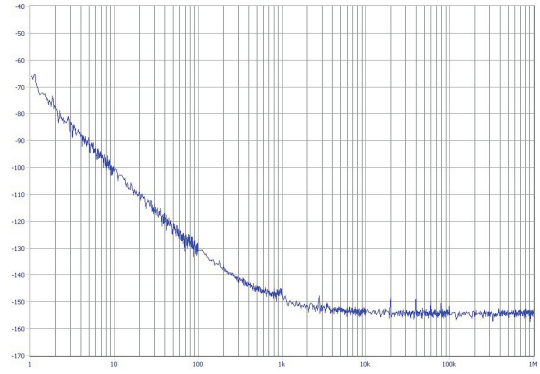
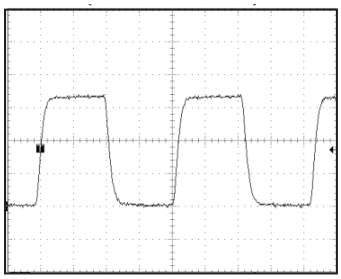
Phase Noise Plot

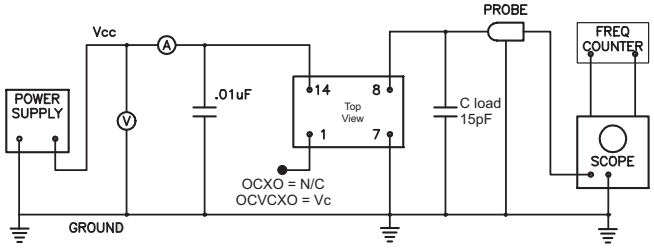
Typical phase noise plot for BOC-10503F-010.0M



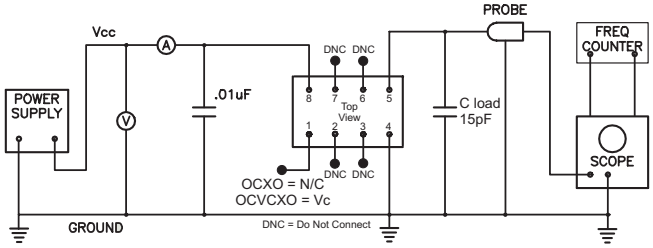
CMOS Output Waveform



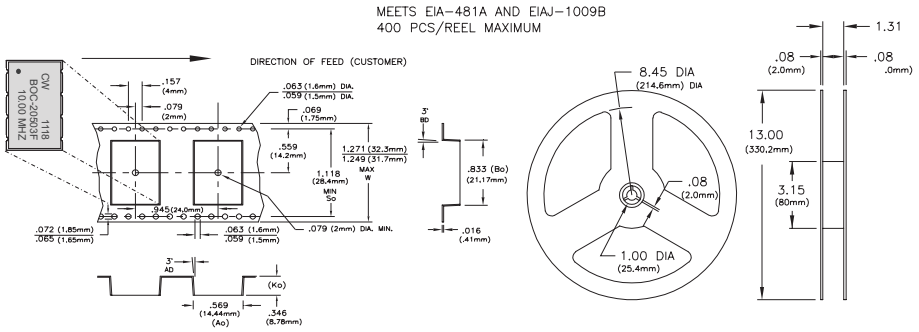
BOC-1-Series Test Circuit



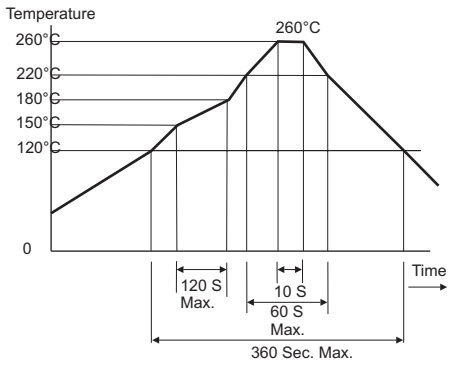
BOC-2-Series Test Circuit



Tape and Reel Information for BOC-2 Series



RoHS Solder Profile



Meets IPC/JEDEC J-STD-020C

Revision History

Revision A00	Advanced information data sheet released 05/19/11
Revision P01	Added page 4 information and released data sheet 07/11/11