Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!

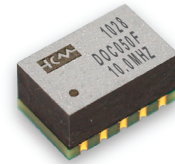## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832
Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

Surface Mount
Oven Stabilized Oscillator
DOC Series

CONNOR WINFIELD

Description:

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

These true surface mount OCXO / OCVCXO provide frequency stabilities in the range of ±20 ppb to ±100 ppb, over the commercial, extended commercial or the industrial temperature range.

The DOC 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.
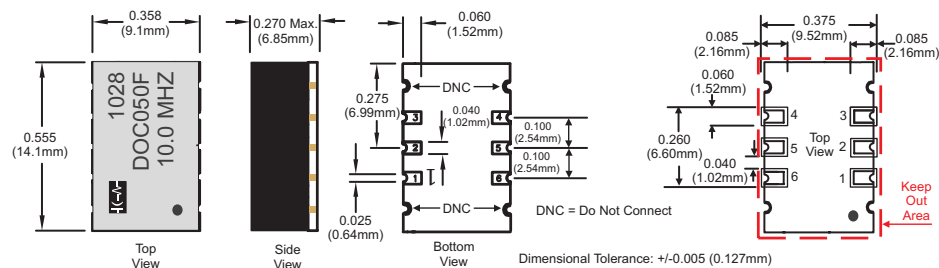
Features:

OCXO / OCVCXO

3.3 Vdc Operation

SMT Package

Frequency Stabilities Available:
±20 ppb, ±50 ppb or ±100 ppb

Temperature Ranges Available:
0 to 70°C, -20 to 75°, -40 to 85°C or -40 to 70°C

Low Phase Noise

LVCMOS Output

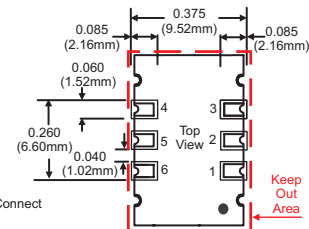Optional Electronic Frequency Tuning

RoHS Compliant / Lead Free

Package Outline

0.358 (9.1mm)
0.270 Max. (6.85mm)
0.060 (1.52mm)
0.555 (14.1mm)
1028 DOC050F 10.0 MHZ
0.275 (6.99mm)
0.040 (1.02mm)
0.100 (2.54mm)
0.100 (2.54mm)
0.025 (0.64mm)
DNC
DNC
DNC = Do Not Connect
Top View
Side View
Bottom View

Suggested Pad Layout

0.375 (9.52mm)
0.085 (2.16mm)
0.085 (2.16mm)
0.060 (1.52mm)
0.260 (6.60mm)
0.040 (1.02mm)
Top View
Keep Out Area
Dimensional Tolerance: +/-0.005 (0.127mm)

Attention: System Designers please review Application Note AN2093: System Design Information and Printed Circuit Board Layout Guidelines for OCXO Oscillators. @ www.conwin.com/technologies.html

Pad Connections

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

Ordering Information

DOC	05	0	F	-010.0M
Oscillator Type 3.3 Vdc LVCMOS Output Surface Mount OCXO	Frequency Stability 02 = ±20 ppb 05 = ±50 ppb 10 = ±100 ppb 25 = ±250 ppb	Temperature Range 0 = 0 to 70°C 1 = -20 to 75°C 2 = -40 to 85°C 3 = -40 to 70°C	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:

DOC050F-010.0M = 9x14mm package, ±50 ppb, 0 to 70°C, 3.3 Vdc, CMOS Output, OCXO, Output Frequency 10.0 MHz
DOC022V-020.0M = 9x14mm package, ±20 ppb, -40 to 85°C, 3.3 Vdc, CMOS Output, OCVCXO, 20.0 MHz

RoHS COMPLIANT

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	
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, 38.88, 40, 50 or 80			MHz	
Frequency Stability vs. Change in Temperature: (See Ordering Information)					
Stability Code 02	-20.0	-	20.0	ppb	1
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	
Temperature Code 3	-40	-	70	°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 (20 Years)	-4.60	-	4.60	ppm	4
Supply Voltage: (Vcc)	3.13	3.30	3.47	Vdc	5
Power Consumption: Vcc = Nominal Voltage					
Commercial Temperature Range, 0 to 70 °C					
Turn On	-	-	2.5	W	
Steady State @ 25°C	-	-	1.1	W	
Industrial Temperature Range, -40 to 85 °C					
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:	-	-	10	ms	
Warm Up Time (Within Specification @ 25°C)	-	-	60	s	
Warm Up Time (Within Specification @ -40°C)	-	-	90	s	

CMOS Output Characteristics

Parameter	Minimum	Nominal	Maximum	Units	Notes
Load	-	15	-	pF	6
Output Voltage:					
3.3 Vdc Models High (Voh)	2.70	-	-	V	
Low (Vol)	-	-	0.30		
Duty Cycle at 50% of Vcc	45	50	55	%	
Rise / Fall Time: 10% to 90%	-	-	6.5	ns	

Bulletin	**Cx207**
Page	**2 of 4**
Revision	**16**
Date	**19 Nov 2012**

Phase Noise Characteristics

Typical Phase Noise for DOC050F - 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	

OCVCXO Input Characteristics (Optional)

Parameter	Minimum	Nominal	Maximum	Units	Notes
Control Voltage Range:	0.30	1.65	3.00	V	7
Frequency Pullability:	±10.0	-	-	ppm	8
Input Impedance	100K	-	-	Ohms	
Linearity	±5	-	-	%	

Package Characteristics

Package	Package consisting of a FR4 substrate and Ryton-R4 cover. Water Resistant, non-hermetic seal.

Environmental Characteristics

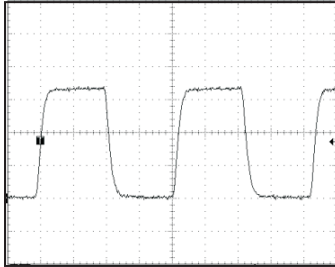|	
Shock	500 G's 1ms, Halfsine, 3 shocks per direction, per MIL-STD 202G, Method 213B Test Condition D.
Sinusoidal Vibration	0.06" D.A. or 10G's Peak, 10 to 500 Hz, per MIL-STD-202G, Method 204D, Test Condition A.
Random Vibration	5.35 G's rms. 20 to 2000 Hz per MIL-STD-202G, Method 214,Test Condition 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 4.

Recommended Cleaning Process

DOC Series Package	Wash only in a inline high pressure wash station that has an air knife and drying capabilities. (Drying temperature range from 85° to 100°C)

Notes:
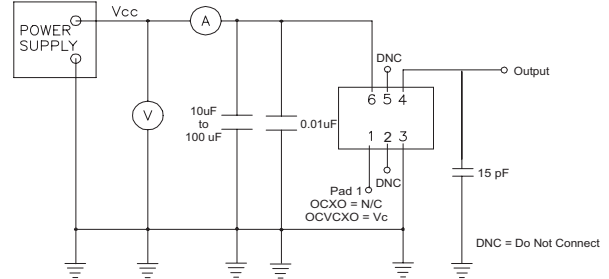
1. Frequency stability vs. change in temperature. [±(Fmax - Fmin)/2.Fo].
2. Initial calibration @ 25°C. For OCVCXO control voltage must be fixed.
3. After 30 days of operation
4. Inclusive of calibration @ 25°C, frequency vs. change in temperature, change in supply voltage (±5%), load change (±5%), shock and vibration and 20 years aging
5. Minimum "Power On Time" after rail rises from 0 to within +/-5% of Vcc = 1 second.
   Vcc ramp rate must be <0.3 volts per millisecond.
6. 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.
7. Positive slope. (Frequency increases as Vc voltage increases. To ensure proper operation of OCVCXO's the control voltage input must be biased the nominal control voltage. Failure to bias the Vc input will cause an unstable output condition.
8. Referenced to Fo.

CONNOR WINFIELD

CMOS Output Waveform

CMOS Test Circuit

POWER SUPPLY

Vcc

A

V

10uF to 100 uF

0.01uF

DNC

6 5 4

1 2 3

DNC

Pad 1
OCXO = N/C
OCVCXO = Vc

Output

15 pF

DNC = Do Not Connect

Phase Noise Plot

Typical phase noise plot for DOC050F-010.0M

RoHS Solder Profile

Temperature

260°C
220°C
180°C
150°C
120°C
0

260°C

Up to 120 s
Typical

10 s

60 to 90 s
Typical

Meets IPC/JEDEC J-STD-020C
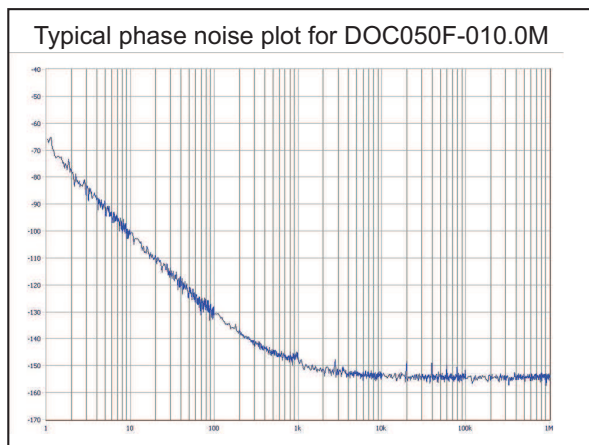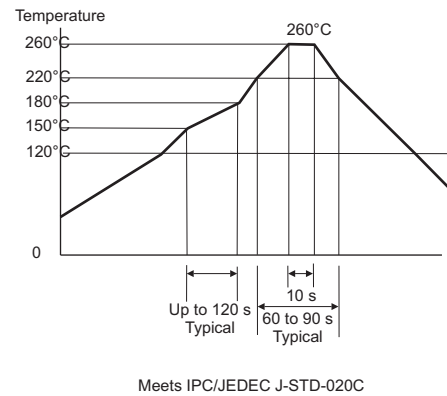
Tape and Reel Information

MEETS EIA−481A & EIAJ−1009B
500 PCS/REEL MAXIMUM

DIRECTION OF FEED (CUSTOMER)

.157 (4.0mm) (Po)

.079 (2.0mm) (P2)

.059 (1.5mm) DIA.

.069 (1.75mm) (E1)

.559 (14.2mm) (F)

1.260 (32.0mm) (W)

1.118 (28.4mm)

.630 (16.0mm) (P)

.059 (1.5mm) DIA. (D1)

1028 DOC050F 10.0 MHZ

SM-MECH42

8.45 DIA (214.6mm) DIA

.08 (2.0mm)

1.00 DIA (25.4mm)

1.31 (33.27mm)

.08 (2.0mm)

.08 (2.0mm)

13.00 (330.2mm)

3.15 (80mm)
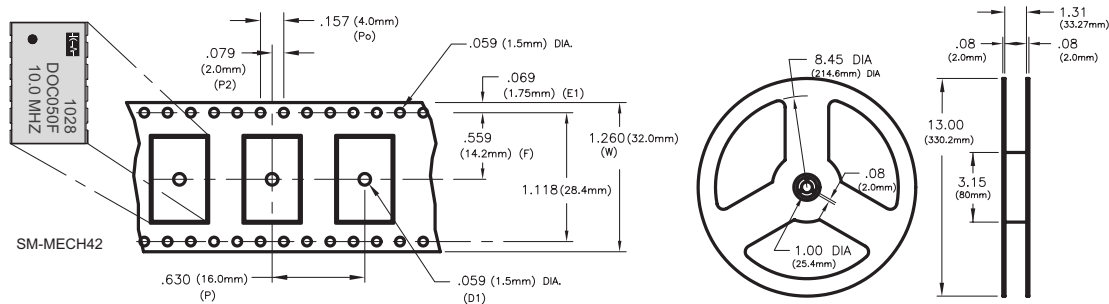
Bulletin	Cx207
Page	4 of 4
Revision	16
Date	19 Nov 2012