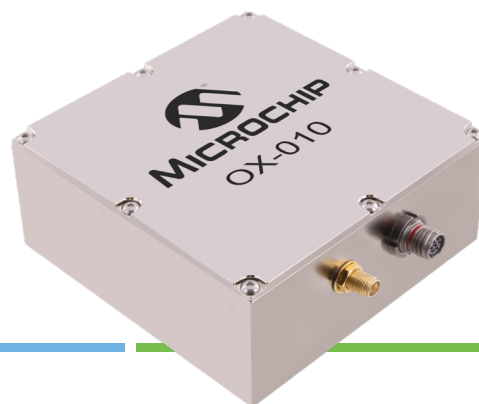


OX-010

Harsh Environment

Ultra-Low Phase Noise/Low g-Sensitivity

Oven-Controlled Crystal Oscillator (OCXO)



Summary

The OX-010 is an ultra-low phase noise, low g-sensitivity OCXO in a 100 × 100 mm package with a phase noise floor as low as -175 dBc/Hz and g-sensitivity of 0.1 ppb/g. The OX-010 achieves a temperature stability of ±10 ppb over the wide temperature range of -55°C to +90°C and an aging rate of ±0.2 ppb/day. This device uses active g-sensitivity cancellation and passive vibration isolation to achieve low g-sensitivity and can operate in harsh environments.

Features

- Temperature stability to 10 ppb
- Standard frequency of 10 MHz
- Sine wave RF output
- Ultra-low phase noise
- Low g-sensitivity
- Excellent shock and vibration performance

Applications

- Military radar
- Instrumentation and test equipment
- Synthesizers
- Military communication equipment
- DRO references
- Satellite communications

Performance Specifications

Phase Noise Ordering Codes at 10 MHz Sine Wave Output				
Frequency Offset (Hz)	A (12V only)	B (5V only)	Unit	Condition
1	-105	-105	dBc/Hz	Maximum values All EFC settings
10	-135	-135	dBc/Hz	
100	-157	-157	dBc/Hz	
1,000	-167	-167	dBc/Hz	
10,000	-175	-172	dBc/Hz	
100,000	-175	-172	dBc/Hz	

Frequency Stabilities ¹ (Stabilities listed for 10 MHz; for stabilities above 10 MHz, values may degrade, so please contact factory)					
Parameter	Min	Typ	Max	Units	Condition
vs. Operating Temperature Range (referenced to +25°C)	-10		+10	ppb	-55°C to +90°C
Initial Tolerance	-50		+50	ppb	At time of shipment, nominal EFC
vs. Supply Voltage Change	-2		+2	ppb	VS ± 5%
vs. Load Change	-2		+2	ppb	Load ± 5%
vs. Aging/Day	-0.2		+0.2	ppb	After 7 days of operation
vs. Aging/Year (Year 1)	-100		+100	ppb	After 7 days of operation
vs. Aging/Year (Following years)	+30		+30	ppb	
Retrace ²	-10		+10	ppb	
Warm-up Time			5	minutes	To ±10 ppb of final frequency (1 hour) @25°C
Supply Voltage (VS)					
Supply Voltage	4.75	5.0	5.25	VDC	Ordering option D
	11.4	12.0	12.6	VDC	Ordering option B
Power Consumption			5.0	Watts	During warm-up, all temperatures
			2.0	Watts	Steady state @ +25°C
		4.0		Watts	Steady state @ -55°C
		0.5		Watts	Steady state @ +90°C
RF Output					
Start Time		2		s	Time required to achieve 90% of amplitude
Signal	Sine Wave				
Load		50		Ohm	
Output Power	+7	+8	+10	dBm	VS = 12 VDC
	+4	+5	+7	dBm	VS = 5 VDC
Harmonics			-30	dBc	
Spurious			-80	dBc	

Frequency Tuning (EFC)					
Parameter	Min	Typical	Max	Units	Condition
Tuning Range	±400		±800	ppb	Fixed-frequency option available
Linearity		15		%	
Tuning Slope	Positive				
Input Impedance		100		kOhm	
Control Voltage Range	0.0		4.35	VDC	With VS = 5.0 VDC
	0.0		10	VDC	With VS = 12.0 VDC

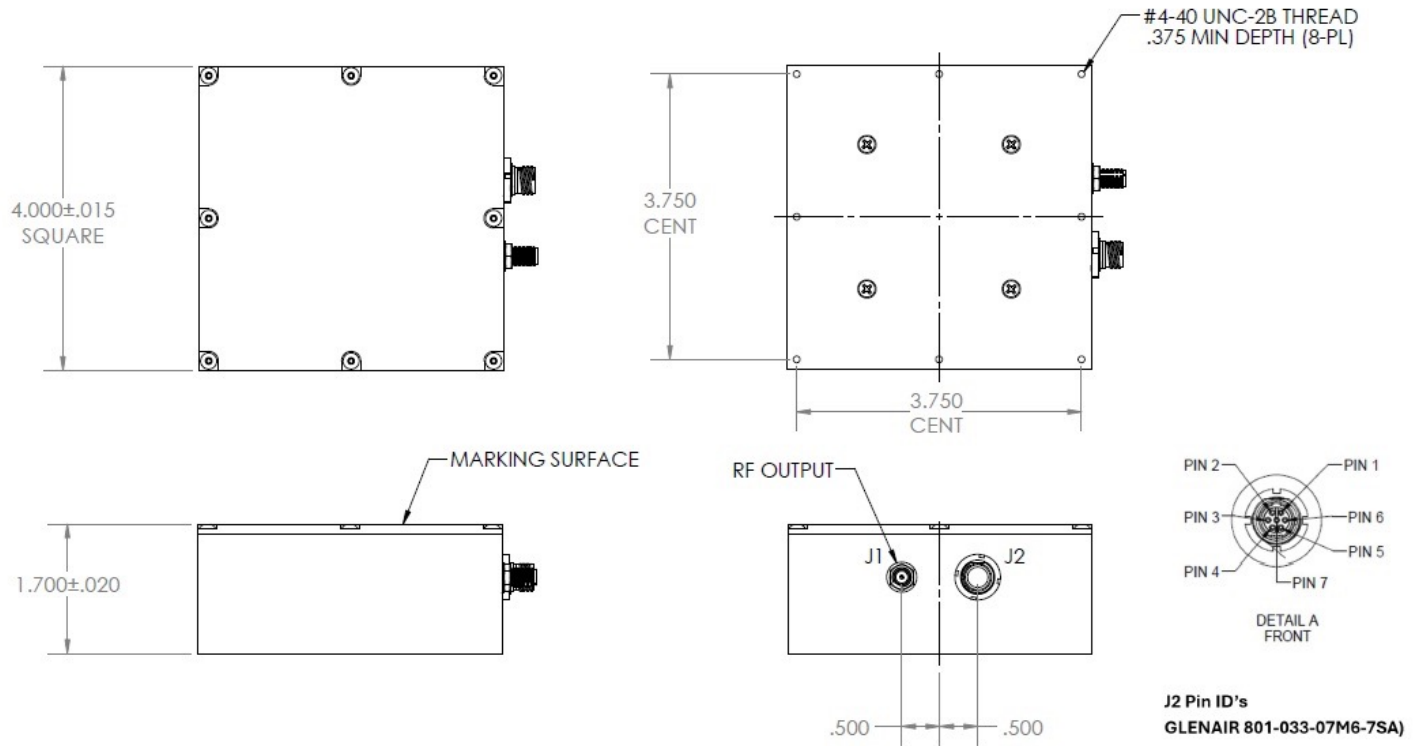
Additional Parameters					
Parameter	Min	Typical	Max	Units	Condition
Allan Deviation		2	5	E-12	0.1 s tau
		1	3	E-12	1 s tau
		1.5	4	E-12	10 s tau
		1.8	5	E-12	100 s tau
		2	5	E-12	1,000 s tau
g-Sensitivity			0.1	ppb/g	10 Hz to 2,000 Hz
Weight			0.38	kg	

Absolute Maximum Ratings					
Supply Voltage			6.5	VDC	With VS = 5.0 VDC
			15.0	VDC	With VS = 12.0 VDC
Output Load	25		Open	Ohms	
Operable Temperature Range	-55		+95	°C	Operable temperature range implies the device will continue to operate with no long- term damage to unit; however, it will not be specification compliant outside the operating temperature range.

Environmental and Product Classification	
Shock (Endurance)	MIL-STD-202, Method 213, Condition A, except 50g, 6 ms
Sine Vibration (Endurance)	MIL-STD-202, Method 201 and 204, Condition D
Random Vibration (Endurance)	MIL-STD-202, Method 214, Condition I-F
Humidity	MIL-STD-202, Method 103, Condition B, 100% rh
Seal	MIL-STD-202, Method 112, Condition D, hermetic, washable
Altitude	MIL-STD-202, Method 105, sea level to space
Reliability	MTBF = 37,399 Hrs/ground mobile
Moisture Sensitive Level	1
RoHS	6 compliant
Storage Temperature Range	-55°C to +125°C

Outline Drawing/Enclosure

Dimensions in inches



Pin Connections

1	Supply voltage input (VS)
2	Ground (case)
3	Electronic Frequency Control (EFC) No connect for fixed-frequency oscillators
4	No connect
5	No connect
6	No connect
7	No connect

Ordering Information³

	OX	010 0	B E X	108	1	10M0000000	
Product Family OX: OCXO							Frequency
Model 010							Frequency Control 0: No Tuning, Phase Noise Code A 1: No Tuning, Phase Noise Code B 2: Frequency Tuning, Phase Noise Code A 3: Frequency Tuning, Phase Noise Code B
Height and Package 0: 43.1 mm							
Supply Voltage B: 12V D: 5V							Stability Code 108 ±10 ppb
RF Output Code E: Sine Wave							Temperature Range X: -55°C to +90°C

Notes:

1. Unless otherwise stated, all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load and temperature (25°C)
2. Retrace is defined as $f_1 - f_0$ where f_0 is the reading after the unit has been on power for 24 hours, and f_1 is the frequency after it is off for 24 hours followed by on for 60 minutes
3. Not all options and codes available at all frequencies

Technical Support

North and South America

Microchip Technology Inc.
FTS Group
3870 North First Street San Jose, CA 95134-1702
Toll-free in North America: 1-888-367-7966, option 3
Telephone: 408-428-7907
Email: SJO-FTD.Support@microchip.com
Web: <https://microchipsupport.force.com/s/>

Asia

Microchip Technology India Pvt. Ltd.
Phase 1, Plot No. 149/B, Block A, EPIP,
Whitefield, Industrial Area, Bengaluru 560066,
Karnataka, India
Email: SJO-FTD.Support@microchip.com
Web: <https://microchipsupport.force.com/s/>

Europe, Middle East and Africa

Microchip FTS EMEA
Altlaufstrasse 42
85635 Hoehenkirchen-Siegersbrunn Germany
Telephone: +49 700 3288 6435
Email: FTD.EMESupport@microchip.com
Web: <https://microchipsupport.force.com/s/>