OX-304 at 10 MHz

Ultra Low Phase Noise
Oven Controlled Crystal Oscillator



The OX-304 is an Ultra Low Phase Noise Ovenized Crystal Oscillator with a noise floor as low as -173 dBc/Hz in a compact 0.8" x 0.8" enclosure. Designed for applications that demand extremely low noise sources, including the reference oscillator for a phase-locked loop in the microwave spectrum. Custom frequencies available upon request.

Features

- -135 dBc/ Hz at 10 Hz offset
- -173 dBc/Hz at 10 kHz offset
- 10 MHZ standard, other frequencies available
- Compact 0.8" x 0.8" hermetic enclosure

Applications

- Military Radar
- Instrumentation and Test Equipment
- Synthesizers
- Military Communication Equipment
- DRO reference
- Satellite Communications

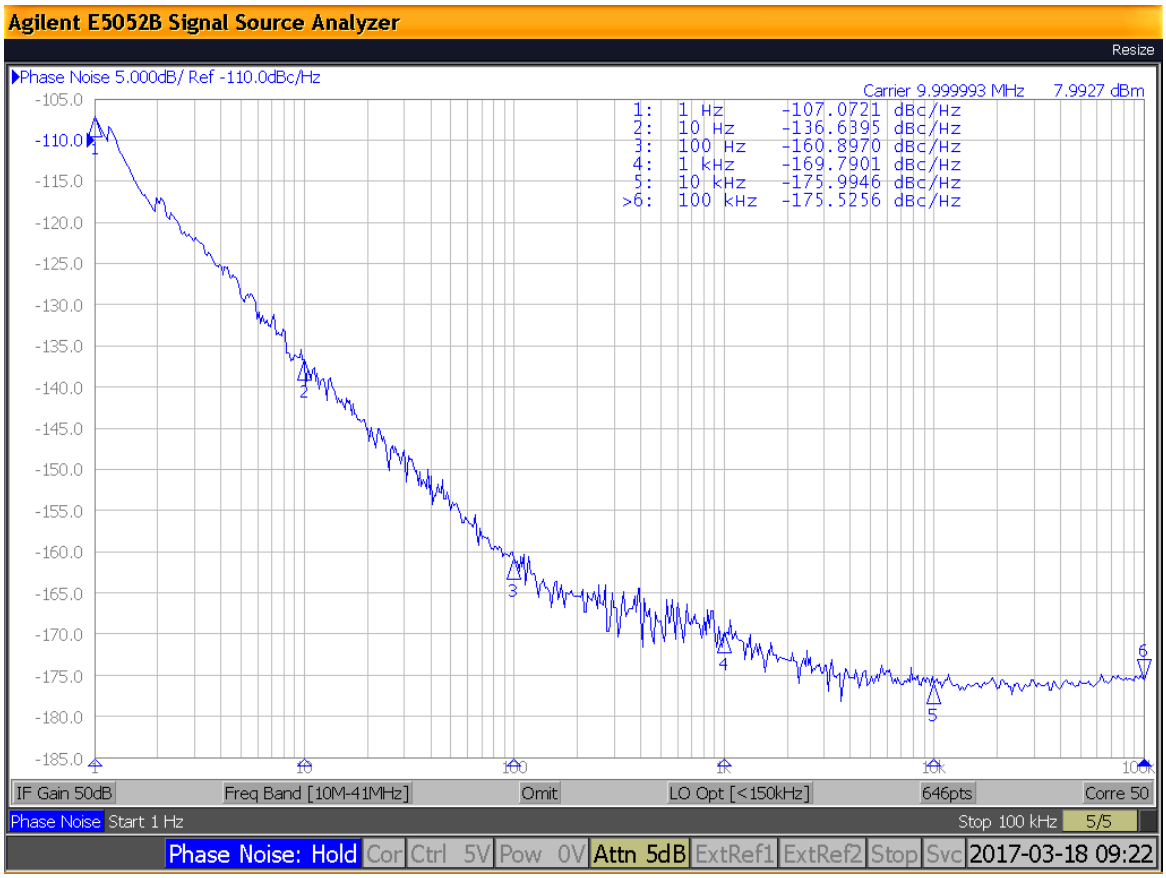
Performance Specifications

Phase Noise Ordering Codes at 10 MHz					
Frequency Offset (Hz)	A	B	C	Unit	Condition
1	-95	-100	-103	dBc/Hz	Maximum values All EFC settings
10	-125	-130	-135		
100	-150	-155	-157		
1000	-160	-165	-167		
10,000	-170	-170	-173		
100,000	-170	-170	-173		

Frequency Stabilities at 10 MHz					
Parameter	Min	Typical	Max	Unit	Condition
vs. operating temperature range	-15		+15	ppb	-20 to +70°C (referenced to +25°C)
	-20		+20	ppb	-40 to +85°C (referenced to +25°C)
vs. Initial Tolerance	-100		+100	ppb	at time of shipment and 5V efc
Allan Deviation			5	E-12	0.1 to 1 second tau
vs. supply voltage change	-2		+2	ppb	±5% change
vs. load change	-2		+2	ppb	5% change in load
vs. aging / 1 day	-0.5		+0.5	ppb	after 7 days of operation
vs. aging / 1st year	-100		+100	ppb	after 7 days of operation
vs. aging / year	-30		+30	ppb	after first year of operation
Warm up time			5	minutes	to ±15ppb of 2-hour frequency @+25°C

Product Performance Data

Phase Noise

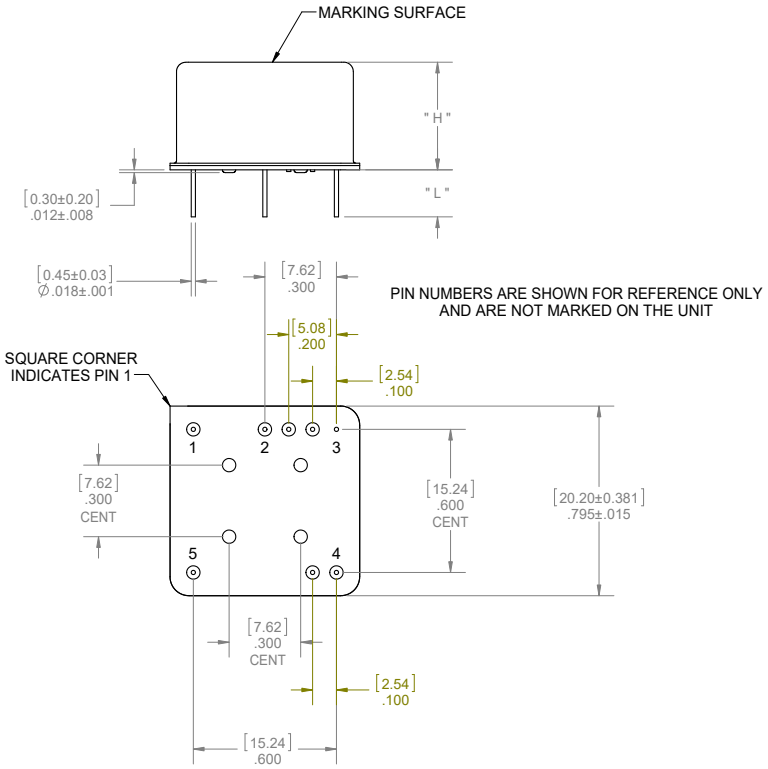


Performance Specifications

Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Unit	Condition
Supply Voltage	11.4	12.0	12.6	VDC	
Power Consumption			4.0 1.8	Watts Watts	during warm-up steady state @ +25°C
Reference Voltage		10		VDC	12 V version
RF Output					
Signal	Sinewave				
Load		50		Ohms	
Output Power	+7.0		+13.0	dBm	50 Ohm load @ Vs=12V
Harmonics			-30	dBc	50 Ohm load
Spurious			-80	dBc	50 Ohm load
Frequency Tuning (EFC)					
Tuning Range	±400		±800	ppb	enough for aging over 15 year lifetime
Linearity			15	%	
Tuning Slope	Positive				
Control Voltage Range	0		10	VDC	Vs=12V
Input Impedance		100		kOhm	
Modulation Bandwidth	150			Hz	
Additional Parameters					
g-sensitivity			1.5	ppb/g	
Weight			20	grams	

Absolute Maximum Ratings					
Parameter	**Min**	**Typical**	**Max**	**Unit**	**Condition**
Supply Voltage (Vs)			15	V	12V version
Output Load			25	Ohms	
Operable Temperature Range	-55		+95	°C	Device will not sustain damage when operated at temperatures between the operating range and the operable range, but will not be specification compliant
Environmental and Product Classification					
Shock (Endurance)	MIL-STD-202, Method 213, Condition J, 30g 11 ms				
Sine Vibration (Endurance)	MIL-STD-202, Method 201 and 204, Condition A, except 5g to 500 Hz, 1 sweep each axis				
Random Vibration (Endurance)	MIL-STD-202, Method 214, Condition I-D				
Humidity	MIL-STD-202, Method 103, Condition B, 100% rh				
Seal	MIL-STD-202, Method 112, Condition D				
Altitude	MIL-STD-202, Method 105, sea level to space				
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition A,B,C				
Terminal Strength	MIL-STD-202, Method 11, Condition C (5 bends at 45°, 2 lbs)				
Moisture Sensitive Level	1				
RoHS	6 (fully compliant) - no pure tin options available upon request, the device will be assigned a customer part number , not orderable through ordering codes				
Storage Temperature Range	-55		+125	°C	

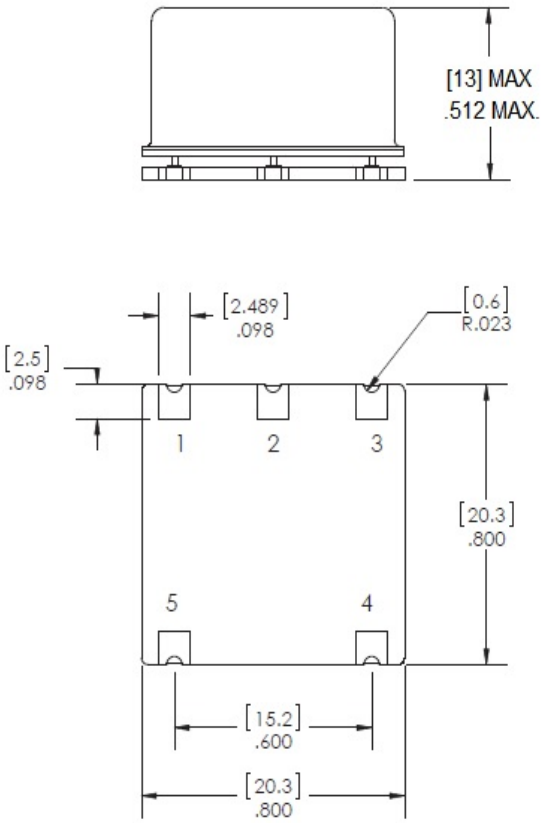
Outline Drawing



Code	Height "H"	Pin Length "L" Min
0	13.0	5.0
Pin Connections		
1	Supply Voltage Input (VS)	
2	RF Output	
3	Ground (case)	
4	Electronic Frequency Control (EFC)	
5	Reference Voltage (Vref)	

Dimensions in [mm] inches

unnumbered pins are no connects and are removed at the factory.



Code	Height "H"	Pin Length "L" Min
1	13.0 mm	na
Pin Connections		
1	Electronic Frequency Control (EFC)	
2	Reference Voltage (Vref)	
3	Supply Voltage Input (Vs)	
4	RF output	
5	Ground (case)	

Dimensions in [mm] inches

Ordering Information

OX - 304 0 - B E E - 208 0 - 10M0000000

Product Family
OX: OCXO

Package
20x20mm

Height
0: 13.00 mm tht
1: 13.00 mm smd

Supply Voltage
B: +12V

RF Output Code
E: Sinewave

Temperature Range
E: -40°C to +85°C
J: -20°C to +70°C

Stability Code
158: ±15ppb (Temp Code J only)
208: ±20ppb

Phase Noise and Frequency Control
0: No Tuning, phase noise code A
1: No Tuning, phase noise code B
2: No Tuning, phase noise code C
3: Frequency Tuning, phase noise code A
4: Frequency Tuning, phase noise code B
5: Frequency Tuning, phase noise code C
6: No Tuning, phase noise code D
7: Frequency Tuning, phase noise code D

Frequency

Notes:

1. Contact factory for improved stabilities or additional product options including no pure tin options.
2. Certain codes available for sampling and short lead time requests. Please review website for codes.
3. 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).
4. Contact factory for other frequencies. Phase noise degrades for frequencies greater than 10 MHz.
5. Subject to technical modification.
6. Contact factory for availability.

Contact Information

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Rev: 5/2/2019 jar