MICROCHIP

Vectron™ Oscillators

OX-205 at 100 MHz

Ultra Low Phase Noise
Oven Controlled Crystal Oscillator



The OX-205 is an Ultra Low Phase Noise Ovenized Crystal Oscillator with a noise floor as low as -176 dBc/Hz in a compact 1" x 1" 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 100 Hz offset
- -176 dBc/Hz at 100 kHz offset
- 100 MHZ standard, other frequencies available
- Compact 1" x 1" hermetic enclosure

Applications

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

Performance Specifications

Phase Noise Ordering Codes at 100 MHz

Frequency Offset (Hz)	A	B	C	D (5V ONLY)	Unit	Condition
10	-100	-102	-105	-102	dBc/Hz	Maximum values All EFC settings Static Environment
100	-130	-132	-135	-132	dBc/Hz	
1000	-150	-156	-159	-151	dBc/Hz	
10,000	-165	-168	-170	-170	dBc/Hz	
100,000	-175	-175	-176	-172	dBc/Hz	

Frequency Stabilities at 100 MHz

Parameter	Min	Typical	Max	Unit	Condition
vs. operating temperature range	-100		+100	ppb	-20 to +70°C (referenced to +25°C)
	-200		+200	ppb	-40 to +85°C (referenced to +25°C)
vs. Initial Tolerance	-500		+500	ppb	at time of shipment and only applies to ordering codes with no EFC tuning
Allan Deviation			1	E-11	0.1 to 1 second tau
vs. supply voltage change	-10		+10	ppb	±5% change
vs. load change	-10		+10	ppb	5% change in load
vs. aging / 1 day	-5		+5	ppb	after 30 days of operation
vs. aging / 1st year	-200		+200	ppb	after 30 days of operation
vs. aging / 10 year	-1.5		+1.5	ppm	after 30 days of operation
Warm up time			5	minutes	to ±100 ppb of 2-hour frequency @+25°C

Performance Specifications

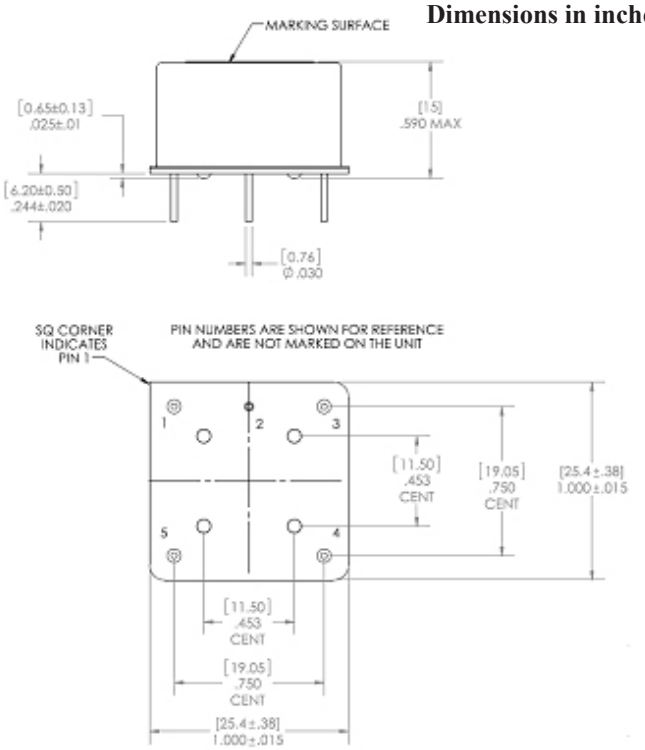
Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Unit	Condition
Supply Voltage	11.4	12.0	12.6	VDC	
Supply Voltage	4.75	5.0	5.25	VDC	
Power Consumption			4.5 1.8	Watts Watts	during warm-up steady state @ +25°C
Reference Voltage	9.8	10	10.2	VDC	12 V version
Reference Voltage	4.2	4.4	4.6	VDC	5 V version
RF Output					
Signal	Sinewave				
Load		50		Ohms	
Output Power	+4.0		+7.0	dBm	50 Ohm load @ Vs = 5V
Output Power	+9.0		+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	±1.5		±3.0	ppm	
Linearity			20	%	
Tuning Slope	Positive				
Control Voltage Range	0		10	VDC	Vs = 12V
Control Voltage Range	0		4.4	VDC	Vs = 5V
Input Impedance		20		kOhm	

Absolute Maximum Ratings					
Parameter	**Min**	**Typical**	**Max**	**Unit**	**Condition**
Supply Voltage (Vs)			15	V	12V version
Supply Voltage (Vs)			7	V	5V 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.

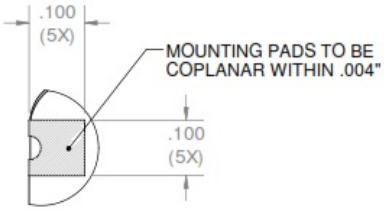
Environmental and Product Classification	
Shock (Endurance)	MIL-STD-202, Method 213, Condition J, 30 g 11 ms
Sine Vibration (Endurance)	MIL-STD-202, Method 201 and 204, Condition A, except 5 g to 500 Hz, 1 sweep each axis
Random Vibration (Endurance)	MIL-STD-202, Method 214, Condition I-D
Humidity	MIL-STD-202, Method 103, Condition B, 100% rh
Seal	MIL-STD-202, Method 112, Condition D
Altitude	MIL-STD-202, Method 105, sea level to30,000 ft
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

Outline Drawing

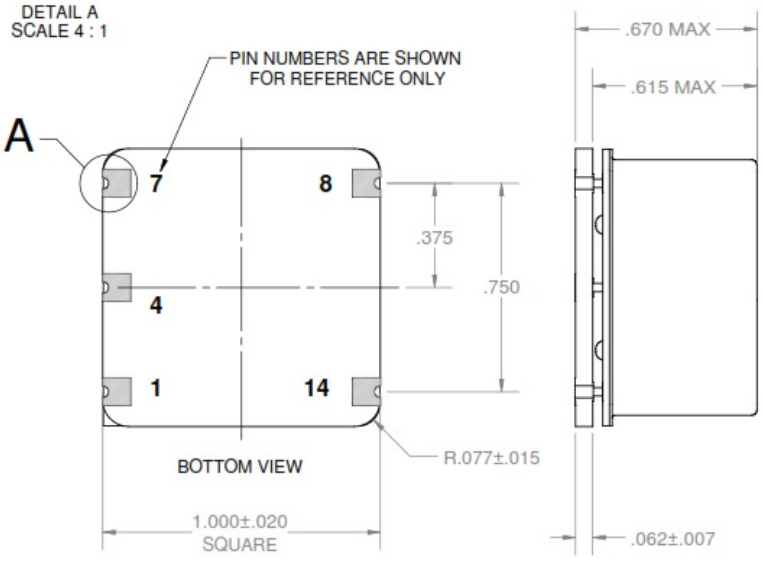
Dimensions in inches [mm]



Code	Height "H"	Pin Length "L" Min
0	15.0	6.2
Pin Connections		
1	RF Output	
2	Ground (Case)	
3	Electronic Frequency Control Input (EFC)	
4	Reference Voltage	
5	Supply Voltage Input (VS)	



Dimensions in inches



Code	Height "H"	Pin Length "L" Min
1	17.0 mm	na
Pin Connections		
1	RF Output	
4	Ground (Case)	
7	Electronic Frequency Control Input (EFC) No Connect for Fixed frequency Oscillators	
8	Reference Voltage	
14	Supply Voltage Input (VS)	

Ordering Information

OX - 205 0 - B E E - 207 0 - 100M000000

Product Family
OX: OCXO

Package
25x25mm

Height
0: 15.00 mm tht
1: 17.00 mm smd

Supply Voltage
B: +12V
D: +5V

RF Output Code
E: Sinewave

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

Stability Code
107: ±100ppb (Temp Code J only)
207: ±200ppb

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. 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. Contact factory for other frequencies. Phase noise degrades for frequencies greater than 100 MHz.
3. Subject to technical modification.
4. Contact factory for availability.

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