

Helping Customers Innovate, Improve & Grow



LO-200

The LO-200 is a Low Phase Noise Ovenized Crystal Oscillator with a noise floor of -170 dBc/Hz in a compact 1" x 1" enclosure. The LO-200 has excellent stability performance with a daily aging rate of +/-0.5ppb and temperature stability of +/-20ppb over the temperature range of -40C to +85C. Designed for Low Earth Orbit applications that demand low noise sources and the stability of an OCXO.

Features

- -125 dBc/ Hz at 10 Hz offset
- -170 dBc/Hz at 100 kHz offset
- Available Output Frequency: 10 MHz to 20 MHz
- Radiation Tolerant
- Hermetic Seal

Applications

- Low Earth Orbit
- Nuclear Hardened Environments

Performance Specifications

Phase Noise at 10 MHz

Frequency Offset (Hz)	Value	Unit	Condition
1	-95	dBc/Hz	Maximum values All EFC settings
10	-125		
100	-150		
1000	-160		
10,000	-165		
100,000	-170		

Frequency Stabilities at 10 MHz

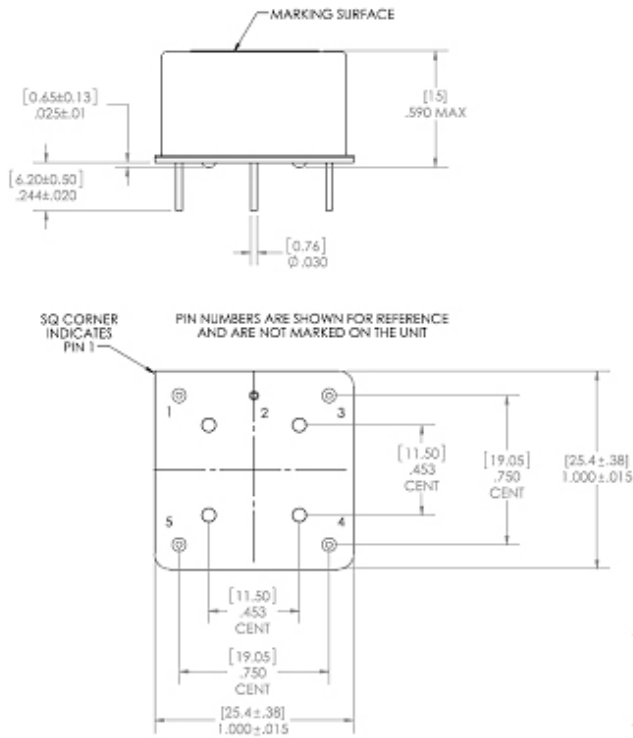
Parameter	Min	Typical	Max	Unit	Condition
vs. operating temperature range	-20		+20	ppb	-40 to +85°C (referenced to +25°C)
vs. Initial Tolerance	-100		+100	ppb	at time of shipment (+5V with EFC option)
Allan Deviation			5	E-12	0.1 to 1 second tau
vs. supply voltage change	-2		+2	ppb	±5% change
vs. load change	-2		+2	ppb	±5% change in load
vs. aging / 1 day	-0.5		+0.5	ppb	after 7 days of operation
vs. aging / 1 st 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 ±10 ppb of 2-hour frequency @+25°C

Performance Specifications

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Unit	Condition	
Supply Voltage	11.4 4.75	12.0 5.0	12.6 5.25	VDC VDC	ordering code B ordering code D	
Power Consumption			4.0 1.8	Watts Watts	during warm-up steady state @ +25°C	
Reference Voltage	9.8 4.15	10 4.35	10.2 4.55	VDC VDC	with Vs=12V with Vs=5V	1ma source current
RF Output						
Signal	Sinewave					
Load		50		Ohms		
Output Power	+7.0 +4.0		+13.0 +7.0	dBm dBm	with Vs=12V, 50 Ohm load with Vs=5V, 50 Ohm load	
Harmonics			-30	dBc	50 Ohm load	
Spurious			-80	dBc	50 Ohm load	
Frequency Tuning (EFC)						
Tuning Range	±400		±800	ppb	enough for aging over 10 year lifetime	
Linearity			15	%		
Tuning Slope	Positive					
Control Voltage Range	0 0		10 4.35	VDC VDC	with Vs=12V with Vs=5V	
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 7	V V	with Vs=12V with Vs=5V	
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 D, 500g, 1ms					
Random Vibration (Endurance)	MIL-STD-202, Method 214, Condition I-D, 11.95g RMS					
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 Compliant					
Radiation, Total Ionizing Dose (TID)	50 krad (Si)					
Latchup, Single Event (SEL)	5e7 protons / cm²sec flux level					
Storage Temperature Range	-55		+125	°C		

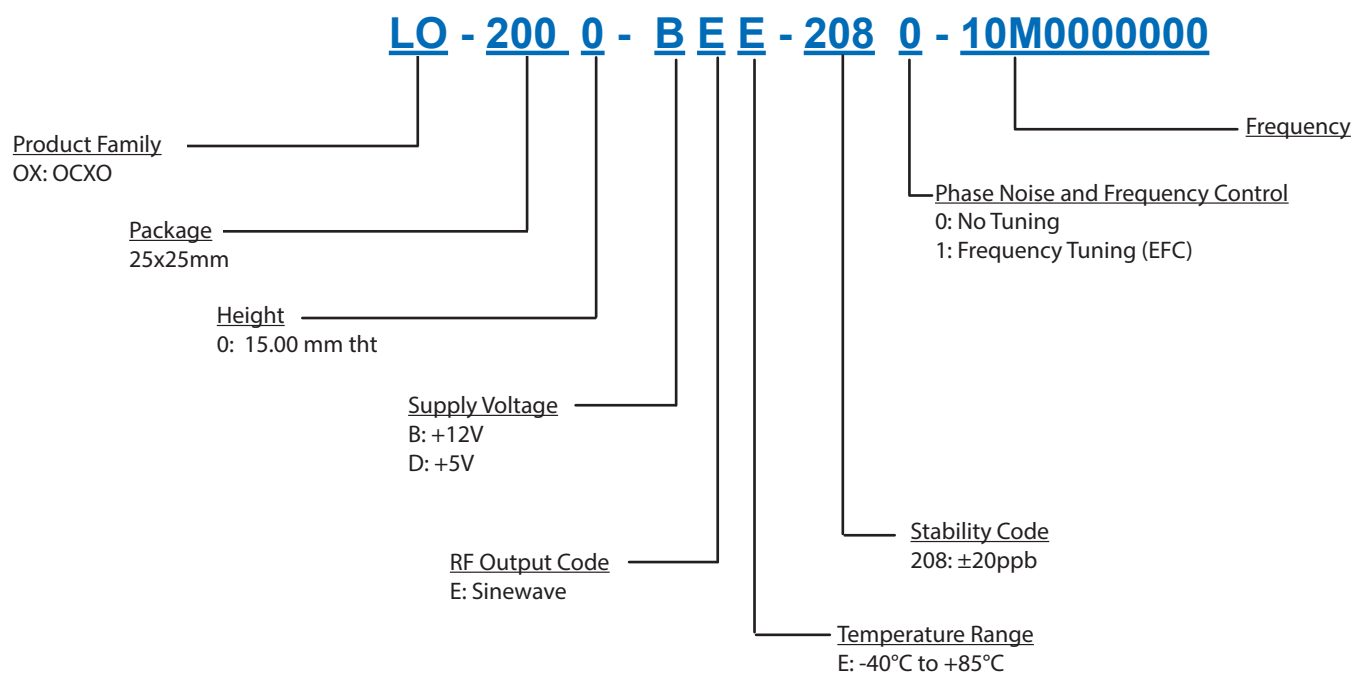
Outline Drawing

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)/ No Connect	
4	Reference Voltage	
5	Supply Voltage Input (VS)	

Ordering Information



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).

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