

Helping Customers Innovate, Improve & Grow



OH-171

The OH-171 is an Ultra Low Phase Noise ovenized crystal oscillator in a 28 x 38 mm package with a phase noise floor as low as -175 dbc/Hz. The OH-171 achieves a temperature stability of +/-10ppb over the wide temperature of -55C to +90C and an aging rate of +/-0.2ppb/day. The OH-171 is designed to operate in harsh environment applications.

Features

- Temperature Stability to 10 ppb
- Frequency Range 10 to 20 MHz
- Standard Frequency:10 MHz
- CMOS and Sinewave Options
- Ultra Low Phase Noise
- 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 , Sinewave 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	
1000	-167	-167	dBc/Hz	
10,000	-175	-172	dBc/Hz	
100,000	-175	-172	dBc/Hz	

Phase Noise Ordering Codes at 10 MHz, CMOS Output

Frequency Offset (Hz)	C (5V only)	Unit	Condition
1	-105	dBc/Hz	Maximum values All EFC settings
10	-135	dBc/Hz	
100	-155	dBc/Hz	
1000	-160	dBc/Hz	
10,000	-165	dBc/Hz	
100,000	-165	dBc/Hz	

Performance Specifications

Parameter	Min	Typical	Max	Units	Condition
Allan Deviation		2	5	E-12	0.1s 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	1000 s tau
					@ 10MHz

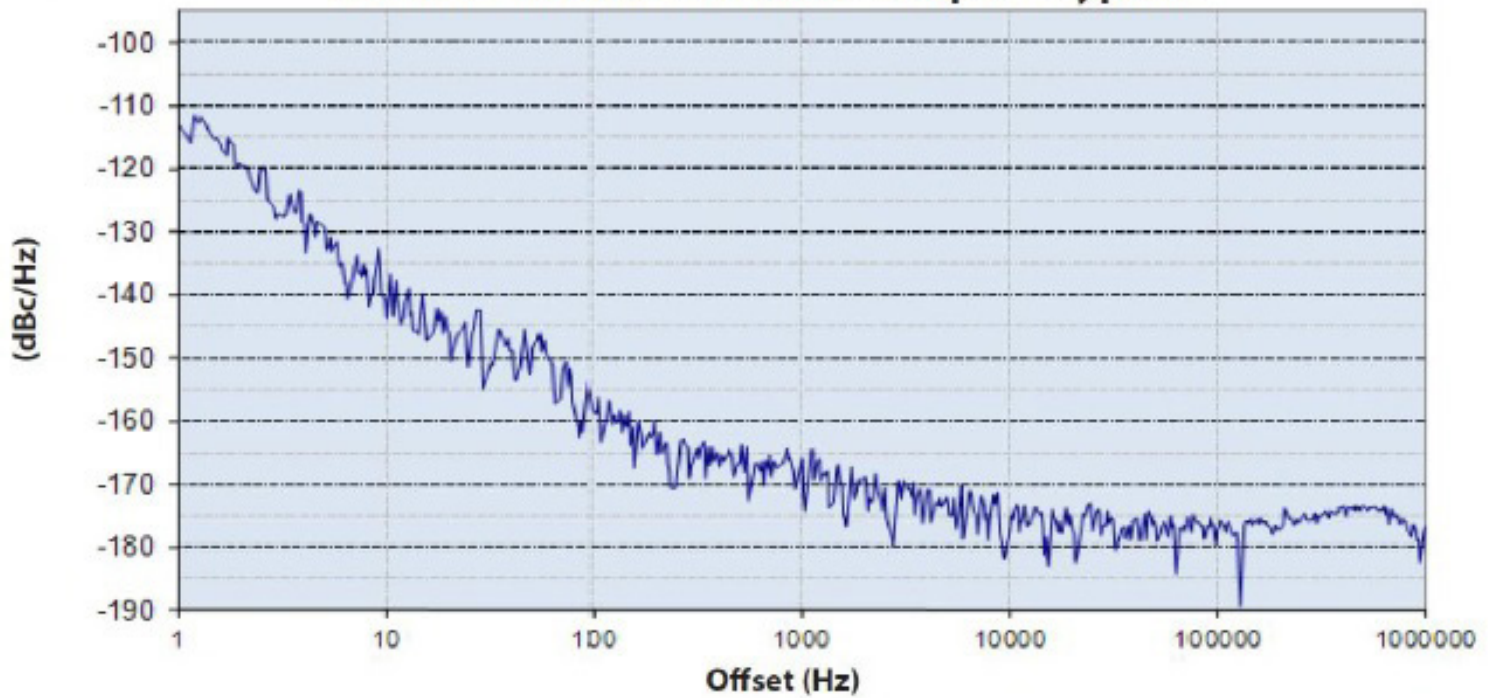
Frequency Stabilities ¹ (Stabilities listed for 10 MHz. For stabilities above 10 MHz values may degrade. Please contact factory)					
Parameter	Min	Typical	Max	Units	Condition
vs. Operating Temperature Range (referenced to +25°C)	-10		-10	ppb	-55 to +90°C
Initial Tolerance	-50		+50	ppb	at time of shipment, nominal EFC
vs. Supply Voltage Change	-2		+2	ppb	$V_s \pm 5\%$
vs. Load Change	-2		+2	ppb	Load $\pm 5\%$
vs. Aging / Day	-0.2		+0.2	ppb	after 7 days operation
vs. Aging / 1 st Year	-100		+100	ppb	after 7days 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 reading) @ +25°C

Supply Voltage (Vs)					
Parameter	Min	Typical	Max	Units	Condition
Supply Voltage (Vs)	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 @ +95°C
RF Output					
Start Time		2		s	time required to achieve 90% of amplitude
Signal	HCMOS				5 Volt only
Load		15		pF	
Signal Level (Vol)			0.5		
Signal Level (Voh)	3.5				
Duty Cycle	45		55	%	@ (Voh-Vol)/2
Rise and Fall Time (Tr/Tf)			10	ns	
Signal	Sine Wave				
Load		50		Ω	
Output Power	+7	+8	+10	dBm	$V_s=12$ VDC
	+4	+5	+7	dBm	$V_s=5$ VDC
Harmonics			-30	dBc	
Spurious			-80	dBc	

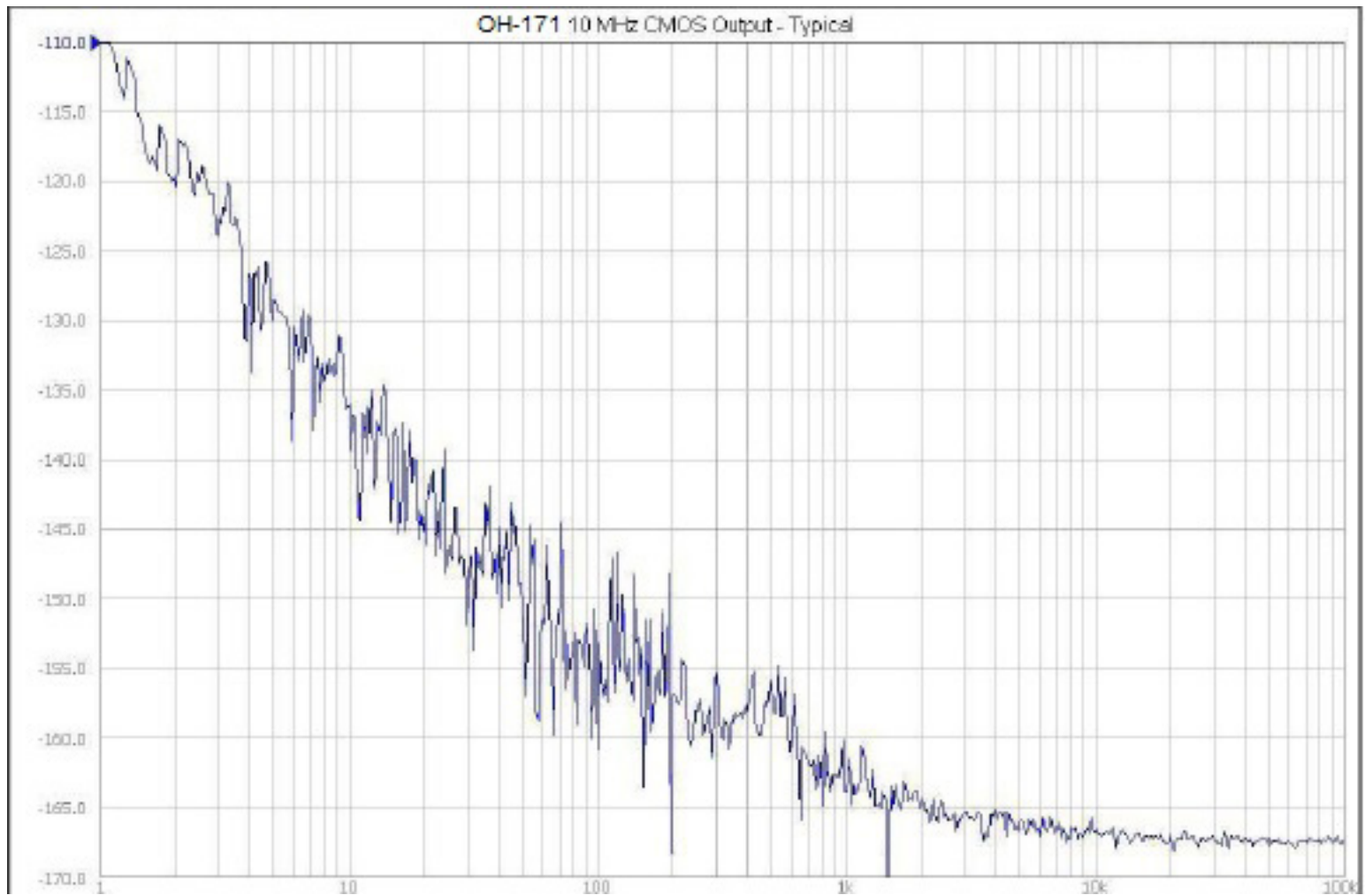
Frequency Tuning (EFC)					
Parameter	Min	Typical	Max	Units	Condition
Tuning range	±400		±800	ppb	(fixed frequency option available)
Linearity		15		%	
Tuning Slope	Positive				
Input Impedance		100		kOhm	
Control Voltage Range	0.0		4.35	VDC	with Vs=5.0 VDC
	0.0		10	VDC	with Vs=12.0 VDC

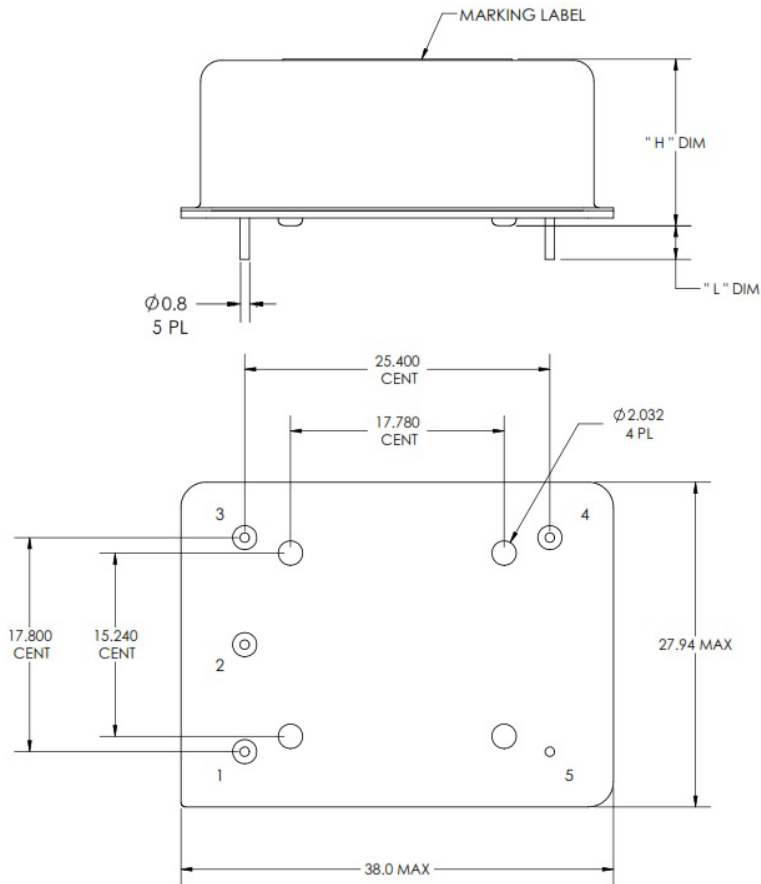
Additional Parameters					
Parameter	Min	Typical	Max	Units	Condition
g-sensitivity			0.3 0.6	ppb/g ppb/g	10Hz to 1kHz 1kHz to 2kHz (linear slope 1kHz to 2kHz)
Weight			25	g	
Supply Voltage (Vs)			6.5	VDC	with Vs= 5.0 VDC
			15.0	VDC	with Vs= 12 VDC
Output Load	25		open 50	Ω pF	Sinewave CMOS
Operable 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 C, 100g 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				
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition A,B,C				
Terminal Strength	MIL-STD-202, Method 211, Condition C (5 bends at 45°, 2 lbs)				
Moisture Sensitive Level	1				
RoHS	6 Compliant				
Storage Temperature Range	-55		+125	°C	

OH-171 10 MHz Sinewave Output - Typical



OH-171 10 MHz CMOS Output - Typical





Through hole Package configuration A

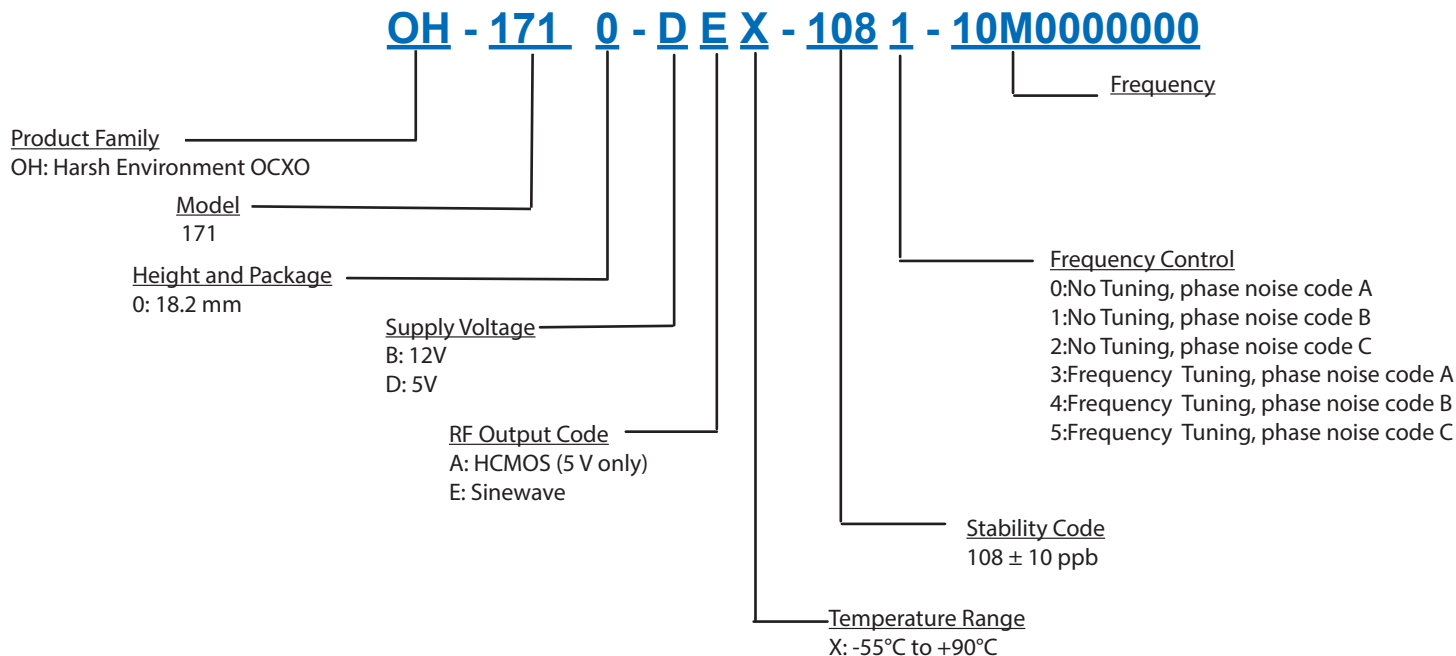
	Height "H"	Pin Length "L"
0	18.2 max	4.5 mm min

Pin Connections

1	Electronic Frequency Control Input (EFC) No Connect for Fixed frequency Oscillators
2	No Connect
3	Supply Voltage Input (Vs)
4	RF Output
5	Ground (Case)

Dimensions in mm

Ordering Information³



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 the frequency difference between the end of two 24 hour on power periods with a 24 hour off period in between while at a constant temperature.
3. Not all options and codes available at all frequencies.

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