

O-CIHXXYZXX-X-X-X-X Series

Precision Ultra Low Phase Noise OCXO in 1"x1" package

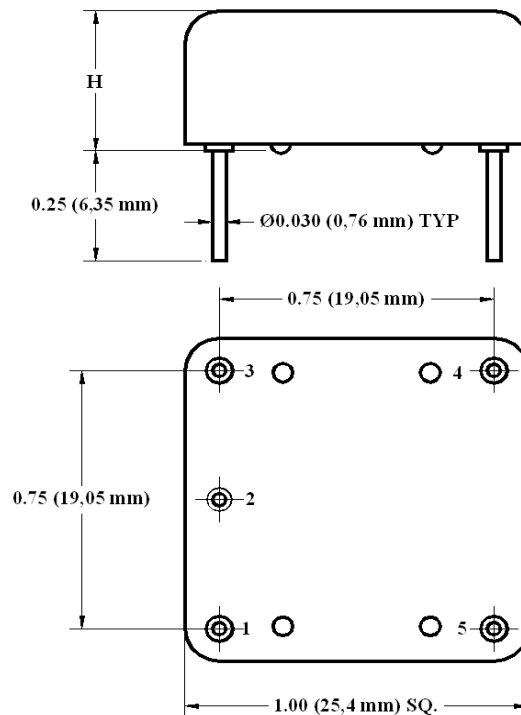
Product Data Sheet

Features

- SC-cut crystal
- High Stability
- Compact Package
- Low Aging
- Ultra Low Phase Noise Option:
 Premium(P) -145dBc/Hz at 10Hz;
 -172dBc/Hz on the floor
 Ultimate(U) -115 dBc/Hz at 1 Hz
 -146dBc/Hz at 10Hz;
 -172dBc/Hz on the floor
- Sine Wave or HCMOS/TTL output

Applications

- Instrumentation
- Tele/Data Communications
- GPS



Stand-off positions may vary.

H Code	Height, inches, Typ
4	0.4 (10.2mm)
5	0.5 (12.7mm)

Code 5 is standard unless Code 4 is requested.

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Input Break Down Voltage	V _{cc}		-0.5 -0.5		13.0 6.5	V	V _{cc} option F V _{cc} option 0
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1 -1		5.5 11	V	Slope option "P" Slope option "L"

Electrical

Frequency	F		8	10.000	13	MHz		
Frequency stability	ΔF/F	vs. Temp. from 25°C		±20		ppb	See chart below	
		vs. Supply		0.2	0.3	ppb/10%V _{cc}		
Aging		per day per year, first year second year		5E-10 5E-8 3E-8			after 30 days of continuous operation	
Allan Deviation		0.1s 1s 10s		5E-13 2E-12 5E-12			Premium version, Option "P"	
	S _φ	1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-112 -145 -155 -162 -169 -172	dBc/Hz	Premium version, option "P"	
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-115	-114 -146 -156 -163 -169 -172	dBc/Hz	Ultimate version, option "U" 2*	
Retrace		After 30 minutes			±10	ppb	24 Hours off 3*	
G-sensitivity		worst direction			±1.0	ppb/G		
Input Voltage	V _{cc}	12V±5%	11.4	12.0	12.6	V	Option "F"	
		5V±5%	4.75	5.0	5.25	V	Option "0"	
Power consumption, Still air 4*	P	steady state, 25°C, start-up @ -30°C		0.7 2.0	0.9 2.5	W	Operating temp range to 70°C	
Spectral Purity		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc		
	Load	10KOhm//15pF (HCMOS/TTL), AC-coupled 50 Ohm (Sine-wave)						Output Code T Output Code S
	Warm-up time	τ	to 0.1ppm accuracy	3	5	minutes		
Output Waveform		HCMOS/TTL compatible or Sinewave						
Output Power			+10 +13			dBm	Output Code S	
Logic 1 (CMOS)	V _{oh}		3.3			V	Output Code T	
Logic 0 (CMOS)	V _{ol}				0.1	V	Output Code T	
Control voltage	V _c		0 0		4.5 10.0	V	Slope option "P" Slope option "L"	
		Optional on Pin 4 with V _{cc} option F	0 11.4		1.5 13	V V	Oscillator Off 5* Oscillator On	
Input impedance	Z _{in}	At V _c pin	10			KOhm		
Modulation bandwidth	F _m				1,000	Hz		
Reference Voltage	V _{ref}			4.5		V	V _{cc} option "0" 5*	
Output Impedance		At V _{ref} pin		100		Ohm		

All parameters for 10 MHz



Pull range		from nominal F	±0.4	±0.6		ppm	
Deviation slope		Monotonic, positive Monotonic, positive		1.0/Vref 0.12		ppm/V	Slope option "P" Slope option "L"
Setability	Vc0	@25°C, Fnom. Internal bias is optional, specify on PO 2.25 V for "P", 4.5 V for "L"	2.25 ± 0.5 5 ± 0.5			V	Slope option "P" 3* Slope option "L"

Notes:

- *. For highest operating temperature higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.
- 2*. This specification is preliminary. It is recommended to specify Slope option "L" for Ultimate Phase noise performance. Recommended test equipment – Symmetricom 5120A-01 Phase Noise and Allan Deviation Test Set (be aware of limitations on the floor, especially if the DUT frequency is not 10.000 MHz), Noise XT DCNTS, or Holtzworth HA7000B series. "Clean" analog power supply i.e. HP E3610A or equivalent. It's assumed that phase noise test is performed under static conditions (no vibration), in still air, and care is taken for minimizing EMI.
- 3*. Longer storage time, especially at low temperatures, may affect both retrace and setability parameters. It may require few days on power for re-stabilization.
- 4*. The power consumption is affected by the operating temperature range (the higher the highest temperature – the higher the power consumption. The values in the table are for high operating temperature at 70°C.
- 5*. Vref out is available at Vcc option "0", while Oscillator on/off function available at Vcc option "F". Applies to assignment of Pin 4 function.

Environmental and Mechanical

Operating temp. range	0°C to 70°C Standard, Other options – see chart below
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Vibration	Per MIL-STD-202, 5G to 2000 Hz
Soldering Conditions	260°C for 10s Max leads only

Electrical Connections

Pin Out	Pin #1-- Output ; Pin#2 – GND; Pin #3 – Vc; Pin #4 – On/Off Control or Vref; Pin #5 - Vcc;
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Creating a Part Number

O - **C** **I** **H** **X** **X** **YZ** **XX** - **X** - **X** - **X** - **X** **FREQ**

OCXO
Conventional Power
Package Code
1'x1' 5 pin
Height per table

Supply Voltage

Code	Specification
0	5 V ± 5%
F	12 V ± 5%

Output

Code	Specification
T	CMOS/TTL
S	Sinewave

Temperature Stability 4*

Code	Specification
17	1x10 ⁻⁷
58	5x10 ⁻⁸
28	2x10 ⁻⁸
18	1x10 ⁻⁸
YZ	Yx10 ^{-Z}

Temperature Range

Code	In 5°C steps 6*
First letter	Lowest temperature from A = -40°C
Second letter	Highest temperature to Z = 85°C
Examples	
IS	0°C to 50°C
GU	-10°C to 60°C
EW	-20°C to 70°C

Environmental

Code	Specification
L	Contains a level of lead that is in excess of RoHS directive and is not designed for reflow
R	RoHS compliant, not designed for reflow

OSC On/Off Option

Code	Function
N	Vref out
E	Per table

Phase Noise (See Table)

Code	Specification
P	Premium
U	Ultimate

Deviation slope

Code	Specification
P	Positive, 0 to Vref
L	Positive, 0 to 10 V

Not all combinations are available. Consult Factory.

6*Temperature Code Table

Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C
A	-40	F	-15	K	10	P	35	U	60	Z	85
B	-35	G	-10	L	15	Q	40	V	65		
C	-30	H	-5	M	20	R	45	W	70		
D	-25	I	0	N	25	S	50	X	75		
E	-20	J	5	O	30	T	55	Y	80		

