Rev A

O-CIHXXYZXX-X-X-X-X Series
Precision Ultra Low Phase Noise OCXO in 1”x1” package

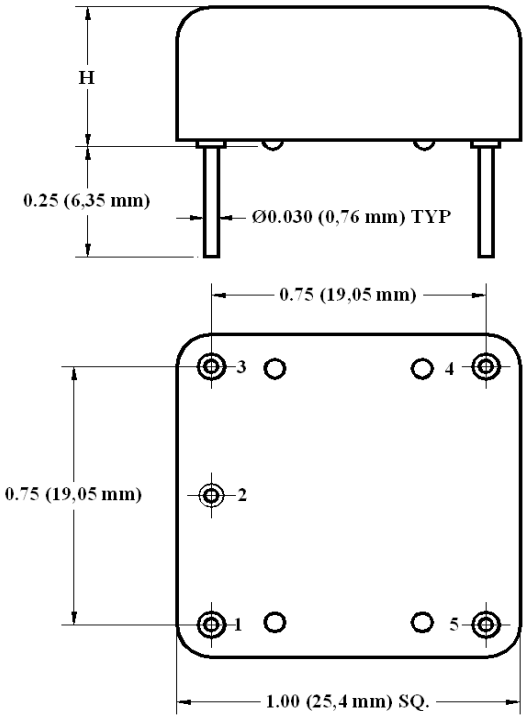
Product Data Sheet

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.

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OVEN-CONTROLLED CRYSTAL OSCILLATORS

Data Sheet 1439A

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Input Break Down Voltage	Vcc		-0.5 -0.5		13.0 6.5	V	Vcc option F Vcc option 0
Storage temper.	Ts		-50		90	°C	
Control Voltage	Vc		-1 -1		5.5 11	V	Slope option ñPò Slope option ñLò
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%Vcc	
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 ñPò
SSB Phase Noise (achieved after 10 minutes warm-up)	Sű	1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-112 -145 -155 -162 -169 -172	dBc/Hz	Premium version, option ñPò
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-115	-114 -146 -156 -163 -169 -172	dBc/Hz	Ultimate version, option ñUò 2*
Retrace		After 30 minutes			±10	ppb	24 Hours off 3*
G-sensitivity		worst direction			±1.0	ppb/G	
Input Voltage	Vcc	12V±5%	11.4	12.0	12.6	V	Option ñFò
		5V±5%	4.75	5.0	5.25	V	Option ñ0ò
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)	Voh		3.3			V	Output Code T
Logic 0 (CMOS)	Vol				0.1	V	Output Code T
Control voltage	Vc		0 0		4.5 10.0	V	Slope option ñPò Slope option ñLò
Oscillator On/Off Control		Optional on Pin 4 with Vcc option F	0 11.4		1.5 13	V V	Oscillator Off 5* Oscillator On
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation bandwidth	Fm				1,000	Hz	
Reference Voltage	Vref			4.5		V	Vcc option ñ0ò 5*
Output Impedance		At Vref pin		100		Ohm	

All parameters for 10 MHz

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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 ñPò Slope option ñLò
Setability	Vc0	@25°C, Fnom. Internal bias is optional, specify on PO 2.25 V for ñPò, 4.5 V for ñLò	2.25 ± 0.5 5 ±0.5			V	Slope option ñPò 3* Slope option ñLò

Notes:
*. For highest operating temperature higher than 70ºC the power consumption will be higher (about 20% for 85ºC). 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 ñLò for Ultimate Phase noise performance. Recommended test equipment ï 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. ñCleanò analog power supply i.e. HP E3610A or equivalent. Itôs 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 ï 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 ñ0ò, while Oscillator on/off function available at Vcc option ñFò. Applies to assignment of Pin 4 function.

Environmental and Mechanical

Operating temp. range	0°C to 70°C Standard, Other options ï 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 ï GND; Pin #3 ï Vc; Pin #4 ï 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

O OCXO
C Conventional Power
I Package Code
H 1'x1' 5 pin
X Height per table

X Supply Voltage

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

X Output

Code	Specification
T	CMOS/TTL
S	Sinewave

YZ Temperature Stability 4*

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

XX Temperature Range

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

X Deviation slope

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

X Phase Noise (See Table)

Code	Specification
P	Premium
U	Ultimate

X OSC On/Off Option

Code	Function
N	Vref out
E	Per table

X 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

FREQ

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		

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