

O-CEH-XXYZXX-X-X-HS-X

Precision Ultra Low Phase Noise, wide pull range OCXO in 36x27 mm “Europack”

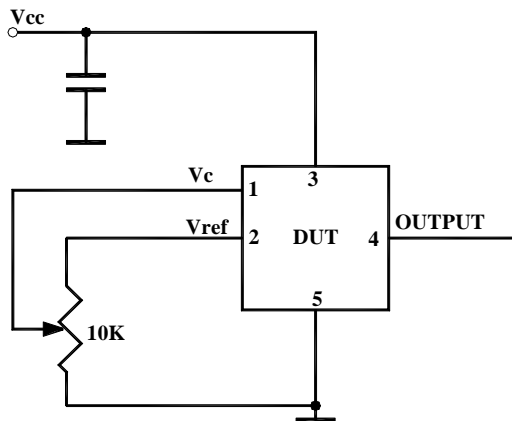
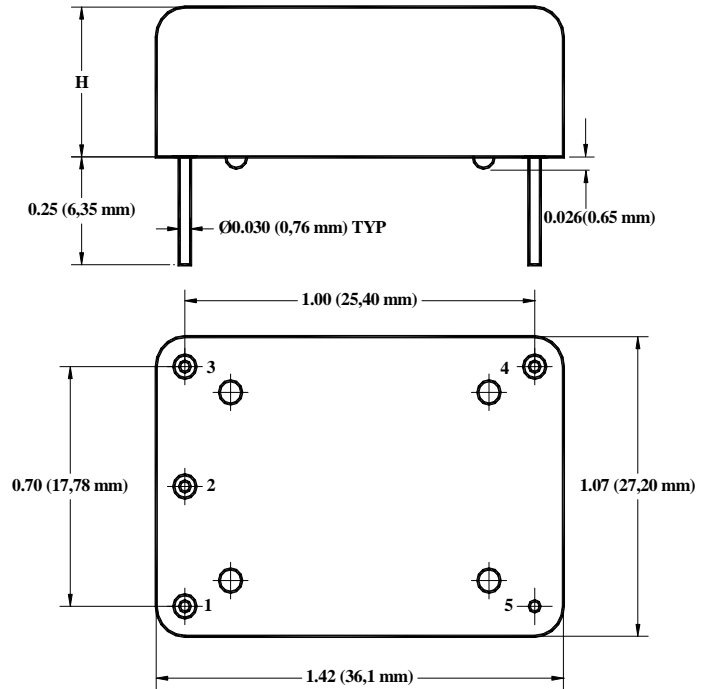
Product Data Sheet

Features

- SC-cut crystal
- High Stability
- Low Aging
- Ultra Low Phase Noise Option:
 Premium(P) -135dBc/Hz at 10Hz;
 -178dBc/Hz on the floor
 Ultimate(U) -145dBc/Hz at 10Hz;
 -178dBc/Hz on the floor
- Very high pull slope (0.25 ppm/V)

Applications

- Instrumentation
- Data Communications
- GPS
- COTS/Dual use



H code	Height, inches, TYP
5	0.5 (12.7 mm)
6	0.63 (16 mm)
7	0.75 (19 mm)

Code 6 is standard unless code 5 is requested. Code 7 is for special requirements.

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Input Break Down Voltage	V _{cc}	12 V supply 5 V supply	-0.5 -0.5		13.0 5.5	V	
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1 -5 -1		5.5 5 11	V	Slope option "P" Slope option "N" Slope option "L"

Electrical (6)

Frequency	F		8	10.000	13	MHz		All parameters for 10 MHz
Frequency stability	ΔF/F	vs. Temp. 4*		20		ppb	See chart below	
		vs. Supply		0.2	0.3	ppb/10% V _{cc}		
Aging		per day		5E-10			after 30 days 5E-8 available	
		per year, first year		1E-7				
		second year		3E-8				
		10 years		2.5E-7				
Allan Deviation		0.1s		5E-13			Premium version, Option "P"	
		1s		5E-12				
		10s		1E-11				
		1Hz		-100				
	10 Hz		-140	-135				
	100 Hz		-163	-160				
	1 KHz		-173	-170				
	10 KHz		-175	-172				
		100 KHz		-178	-175			
		1Hz		-110			Ultimate version, option U	
		10 Hz		-145	-140			
		100 Hz		-165	-162			
		1 KHz		-173	-170			
		10 KHz		-175	-172			
		100 KHz		-178	-175			
Retrace		After 30 minutes			±10	ppb	24 Hours off 3*	
G-sensitivity		worst direction			±1.0	ppb/G		
Input Voltage	V _{cc}		4.75 11.4	5.0 12.0	5.25 12.6	V	See chart below to specify	
Power consumption, Still air	P	steady state, 25°C		1.0	1.4	W	Standard Operating Temperature*	
		steady state, -30°C start-up @ -30°C		1.7 2.5	3.2			
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}		0.7 V _{ref}			V	Output Code T	
Logic 0 (CMOS)	V _{ol}				0.1 V _{ref}	V	Output Code T	
Control voltage	V _c		0		V _{ref}	V	Slope option "P" Slope option "N" Slope option "L"	
			-4.5		4.5			
			0		10.0			
Input impedance	Z _{in}	At V _c pin	10			KOhm		
Modulation bandwidth	F _m		DC		1	KHz		



Reference Voltage	Vref	Vcc = 12V Vcc = 5V		5 or 4.5 4.5		V	N/A with slope options “N” and “L”
Output Impedance		At Vref pin		100		Ohm	
Pull range		from nominal F	±0.5 ±1.0	±0.6 ±1.25		ppm	Slope option “P” Slope option “N” or “L”
Deviation slope		Monotonic, positive Monotonic, negative Monotonic, positive	0.22 -0.22 0.22	0.25 -0.25 0.25		ppm/V	Slope option “P” Slope option “N” Slope option “L”
Setability	Vc0	@25°C, Fnom.	Vref/2 ± 0.5 0 ± 0.5 5 ± 0.5			V	Slope option “P” 3* Slope option “N” 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.
- 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*. Temperature stability is specified in total peak to peak frequency excursion over entire operating range, not in ± from RT measurement. Over-specifying may cause cost increase.
- 5*. Pin 2 is connected to Vref only for Slope Option “P”.
- 6. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.
- 8. Older and stock units may have MBW of 150 Hz Max.

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-Vc ; Pin#2 – Vref or N/C (5*); Pin #3 – Vcc; Pin #4- Output ; Pin #5- GND;
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Creating a Part Number

O - C E H X X YZ XX - X - X - HS - X FREQ

O - OCXO
Conventional Power Package Code
 E 5 pin 36x27mm

Height code per dwg

Supply Voltage

Code	Specification
0	5V ± 5%
F	12V ± 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 7*
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

High Pull Slope

Phase Noise (See Table)

Code	Specification
P	Premium
U	Ultimate 6*

6*Consult factory on "U" code phase noise

Deviation slope

Code	Specification
P	Positive, 0 to Vref
N	Negative, -4.5 to 4.5V
L	Positive, 0 to 10 V

Not all combinations are available. Consult Factory.

7*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		



NOISE XT

Phase Noise Plot

