

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

 ESD Sensitive 36.1 x 27.2 x 16 mm
Datasheet #1512A

Features

- SC-cut crystal
- High Stability
- Low Aging
- Ultra Low Phase Noise Options:
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

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	Vcc	12 V supply 5 V supply	-0.5 -0.5		13.0 5.5	V	
Storage temper.	Ts		-50		90	°C	
Control Voltage	Vc		-1 -5 -1		5.5 5 11	V	Slope Option “P” Slope Option “N” Slope Option “L”

Electrical (6*)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency	F		8	10.000	13	MHz	
Frequency stability	$\Delta F/F$	vs. Temp. 4*		20		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10%Vcc	
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			
SSB Phase Noise		1 Hz		-100			Premium version, option P
		10 Hz		-140	-135		
		100 Hz		-163	-160		
		1 KHz		-173	-170		
		10 KHz		-175	-172		
		100 KHz		-178	-175		
		1 Hz		-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	Vcc		4.75	5.0	5.25	V	See chart below to specify
			11.4	12.0	12.6		

All parameters for 10 MHz

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Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Power consumption, Still air	P	steady state, 25°C steady state, -30°C start-up @ -30°C		1.0 1.7 2.5	1.4 3.2	W	Standard Operating Temperature 1*
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		0.7 Vref			V	Output Code T
Logic 0 (CMOS)	Vol				0.1 Vref	V	Output Code T
Control Voltage	Vc		0 -4.5 0		Vref 4.5 10.0	V	Slope option “P” Slope option “N” Slope option “L”
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation Bandwidth	Fm		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 \pm 0.5 0 \pm 0.5 5 \pm 0.5		V	Slope option “P” 3* Slope option “N” Slope option “L”

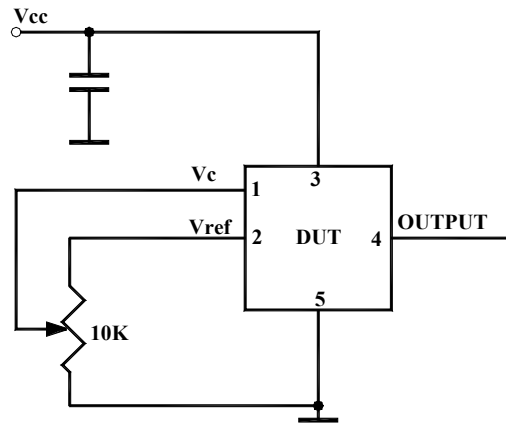
Environmental and Mechanical

Parameter	Description
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

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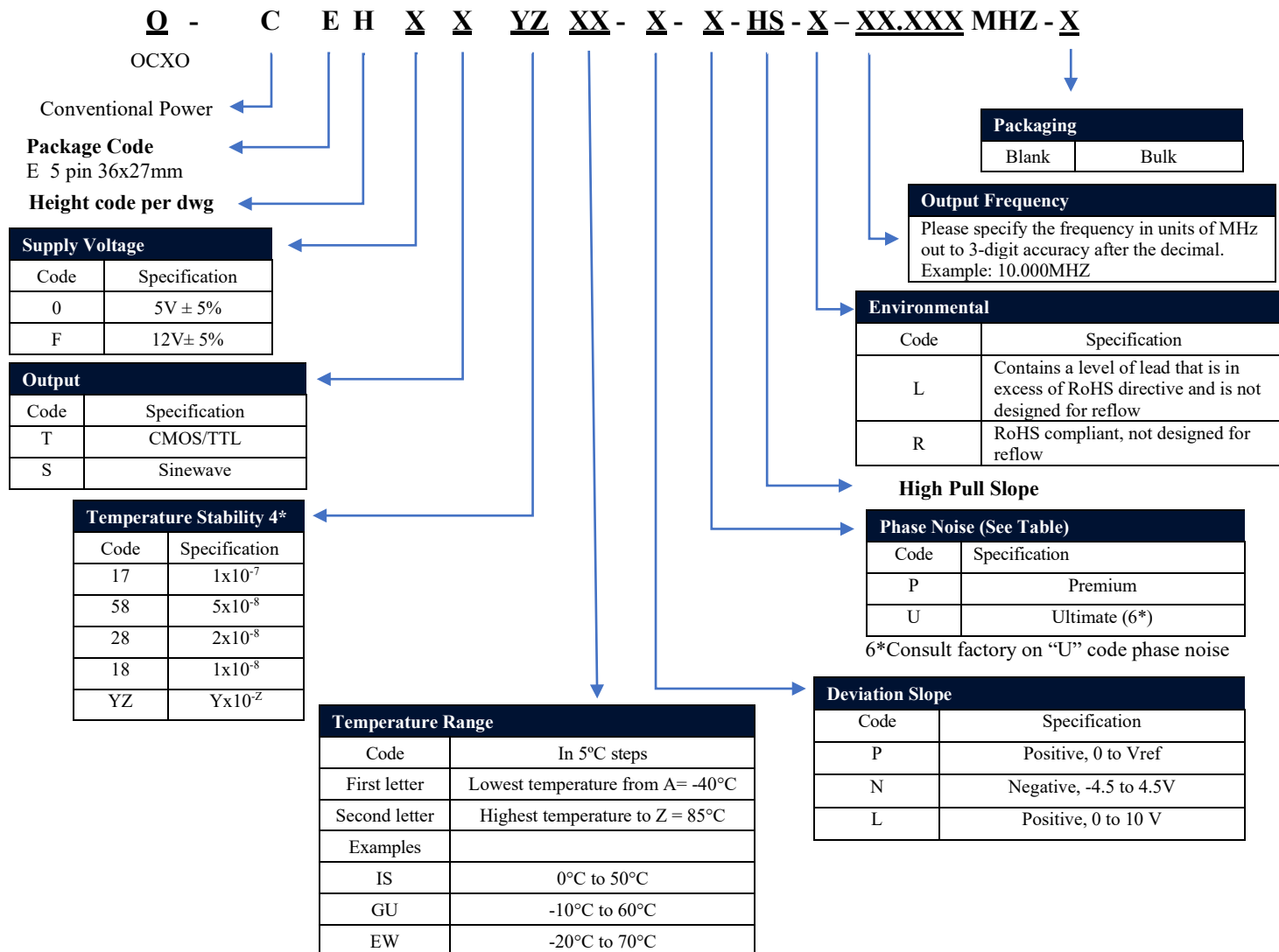
Test Circuit



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Creating a Part Number



Not all combinations are available. Consult Factory.

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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Notes:

1* 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 a 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 \pm from RT measurement. Over-specifying may cause cost increase.

5* Pin 2 is connected to Vref only for Slope Option “P”.

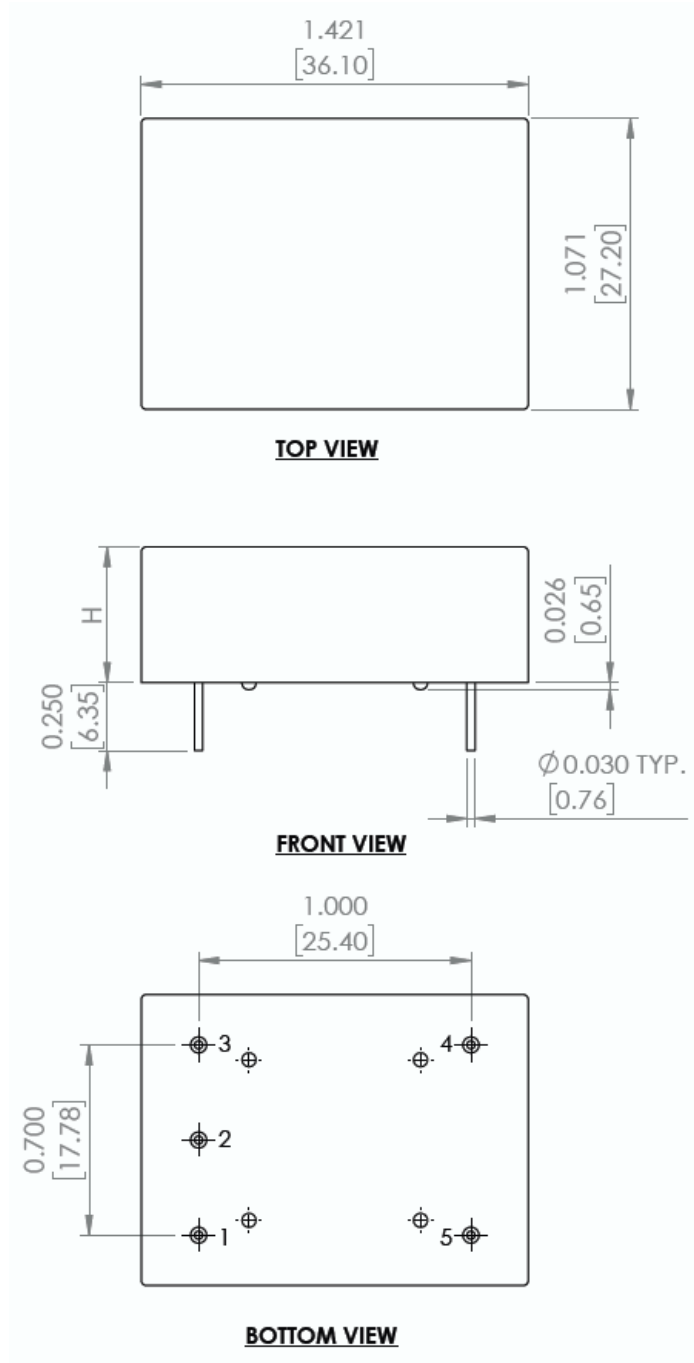
6* All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.

8) Older and stock units may have MBW of 150 Hz Max

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Mechanical Dimensions



H Code #	Height, inches (mm) TYP
5	0.5 [12.7]
6	0.63 [16]
7	0.75 [19]


Code 6 is standard unless code 5 is requested.

Code 7 is for special requirements.

Pin #	Function
1	Vc
2	Vref or N/C (5*)
3	Vcc
4	Output
5	GND

Dimensions: inches [mm]

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Phase Noise Plot

