

Precision Ultra Low Phase Noise OCXO in 36x27 mm “Europack”



ESD Sensitive

36.1 x 27.2 x 16 mm
Datasheet #0835A

Features

- SC-cut crystal
- High Stability
- Low Aging
- Ultra Low Phase Noise Option:
 - Standard(L) -140dBc/Hz at 10Hz;
-169dBc/Hz on the floor
 - Premium(P) -145dBc/Hz at 10Hz;
-170dBc/Hz on the floor
 - Ultimate(U) -115dBc/Hz at 1 Hz
-146dBc/Hz at 10Hz;
-170dBc/Hz on the floor
 - Extraordinary(E) -120dBc/Hz at 1 Hz
-148dBc/Hz at 10 Hz
-170dBc/Hz on the floor
- Sine Wave or HCMOS/TTL output

Applications

- Instrumentation
- GPS
- Telecommunication Systems
- Radar
- COTS/Dual use

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
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”

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Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency	F		8	10.000	13	MHz	
Frequency stability	$\Delta F/F$	vs. Temp.		± 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			
		15 years		2.7E-7			
Allan Deviation		0.1s		5E-13			Premium version, Option “P”
		1s		2E-12			
		10s		5E-12			
SSB Phase Noise (achieved after 10 minutes warm-up)		1Hz		-105			Standard version, option L
		10 Hz			-140		
		100 Hz			-155		
		1 KHz			-162		
		10 KHz			-168		
		100 KHz			-169		
		1Hz			-112		Premium version, option P
		10 Hz			-145		
		100 Hz			-155		
		1 KHz			-162		
		10 KHz			-169		
		100 KHz			-170		
		1Hz			-115		Ultimate version, option U
		10 Hz			-146		
		100 Hz			-156		
		1 KHz			-163		
10 KHz			-169				
100 KHz			-170				
1Hz			-120		Extraordinary version, option E, available with slope options N or L		
10 Hz			-148				
100 Hz			-160				
1 KHz			-168				
10 KHz			-170				
100 KHz			-170				
Retrace		After 30 minutes			± 10	ppb	24 Hours off 3*
G-sensitivity		worst direction			± 1.0	ppb/G	
Input Voltage	Vcc		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 1*
		steady state, -30°C		1.7			
		start-up @ -30°C		2.5	3.2		
Spectral Purity		Subharmonics		none		dBc	
		Spurious			-80		
		Harmonics		-35	-30		
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	

All parameters for 10 MHz



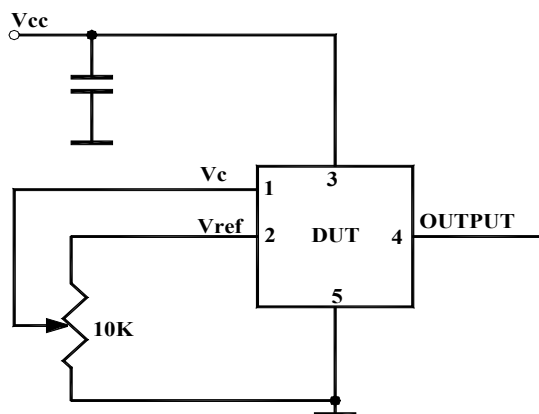
Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes	
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 -4.0 0		Vref 4.0 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	Note 8	
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	±0.4	±0.6		ppm		
Deviation slope		Monotonic, positive Monotonic, negative Monotonic, positive		1.2/Vref -0.15 0.14		ppm/V	Slope option “P” Slope option “N” Slope option “L”	
Setability	Vc0	@25°C, Fnom. No internal bias for Slope option “L”		Vref/2 ± 0.5 0 ± 0.5 5 ± 0.5		V	Slope option “P” 3* Slope option “N” Slope option “L”	

Environmental and Mechanical

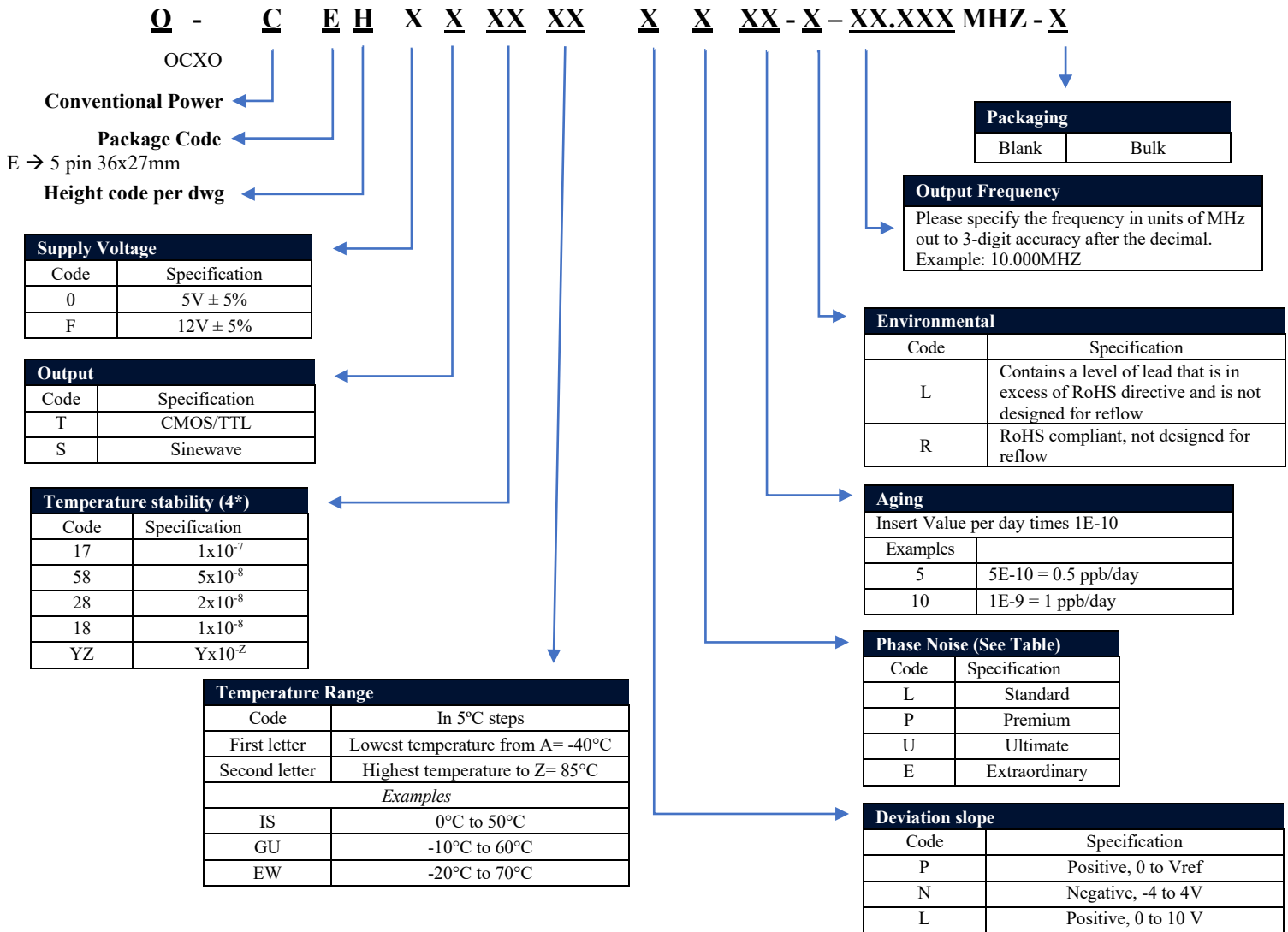
Parameter	Description
Operating temp. range	-30°C to 70°C Standard, Other options – see chart below
Storage Temperature	-50°C to 90°C
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Vibration	Per MIL-STD-202, 5G to 2000 Hz
Soldering Conditions	260°C for 10s Max leads only

Test Circuit





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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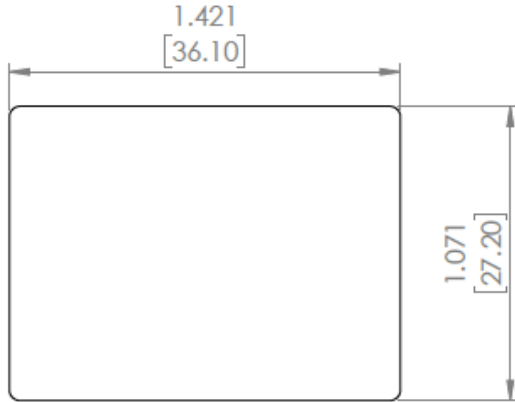
36.1 x 27.2 x 16 mm
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Notes:

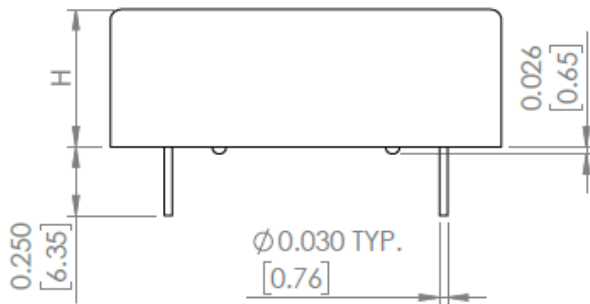
- 1* For highest operating temperature higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.
- 3* Longer storage time, especially at low temperatures, may affect both retrace and stability parameters. It may require a few days on power for re-stabilization.
- 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.



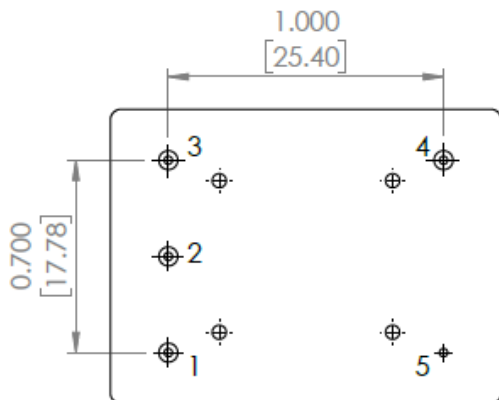
Mechanical Dimensions



TOP VIEW



FRONT VIEW



BOTTOM VIEW

H Code #	Height
5	0.50 [12.7]
6	0.63 [16.0]
7	0.75 [19.0]

CODE 6 IS STANDARD UNLESS
CODE 5 IS REQUESTED
CODE 7 IS FOR SPECIAL REQUIREMENTS

Pin #	Function
1	V _c
2	V _{ref} or N/C (5*)
3	V _{cc}
4	Output
5	GND

Dimensions: inches [mm]