

Precision Ultra Low Phase Noise OCXO in 20x20 mm Package



20.4 x 20.4 x 12.7 mm
Datasheet #1342B

Features

- SC-Cut crystal
- High Stability
- Low to Very Low Power consumption (0.3 W)
- Low Aging
- Ultra Low Phase Noise Option:
 - Standard (L) -137dBc/Hz at 10Hz;
-168dBc/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 1Hz
-148dBc/Hz at 10Hz
-170dBc/Hz on the floor
- Sine wave or HCMOS/TTL output

Applications

- Instrumentation
- Battery Powered Equipment
- Tele/Data Communications
- GPS

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	V _{cc}	5 V supply	-0.5		5.5	V	
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1 -1		5.5 11	V	Slope option "P" 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 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"			
SSB Phase Noise (achieved after 10 minutes warm-up)	S_{ϕ}	1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz				-108 -137 -155 -160 -166 -168	Standard version, option "L"			
						-112 -145 -155 -162 -169 -170	Premium version, option "P"			
				-115	-114 -146 -156 -163 -169 -170	Ultimate version, option "U" 2*				
					-120 -148 -160 -168 -170 -170	Extraordinary version, option E, available with slope option L				
		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		
		Power consumption, Still air 4*	P	steady state, 25°C, Operating temp range to 70°C start-up @ -30°C		0.6 0.45 0.3 2.0	0.7 0.55 0.4 2.5		W	Grade "N" Grade "A" Grade "X"
							none	-80	dBc	
							-35	-30		

All parameters for 10 MHz

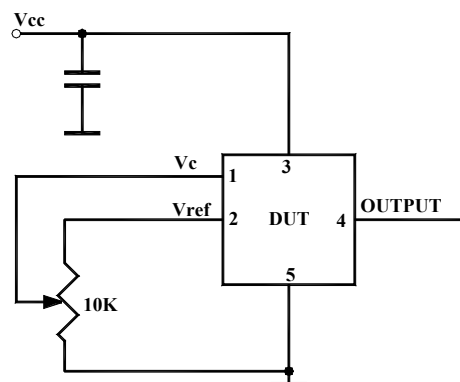
Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Load		10K Ohm//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 "P" Slope option "L"
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation bandwidth	Fm				1000	Hz	
Reference Voltage	Vref			4.5		V	
Output Impedance		At Vref pin		100		Ohm	
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 \pm 0.5 5 \pm 0.5		V	Slope option "P" 3* Slope option "L"

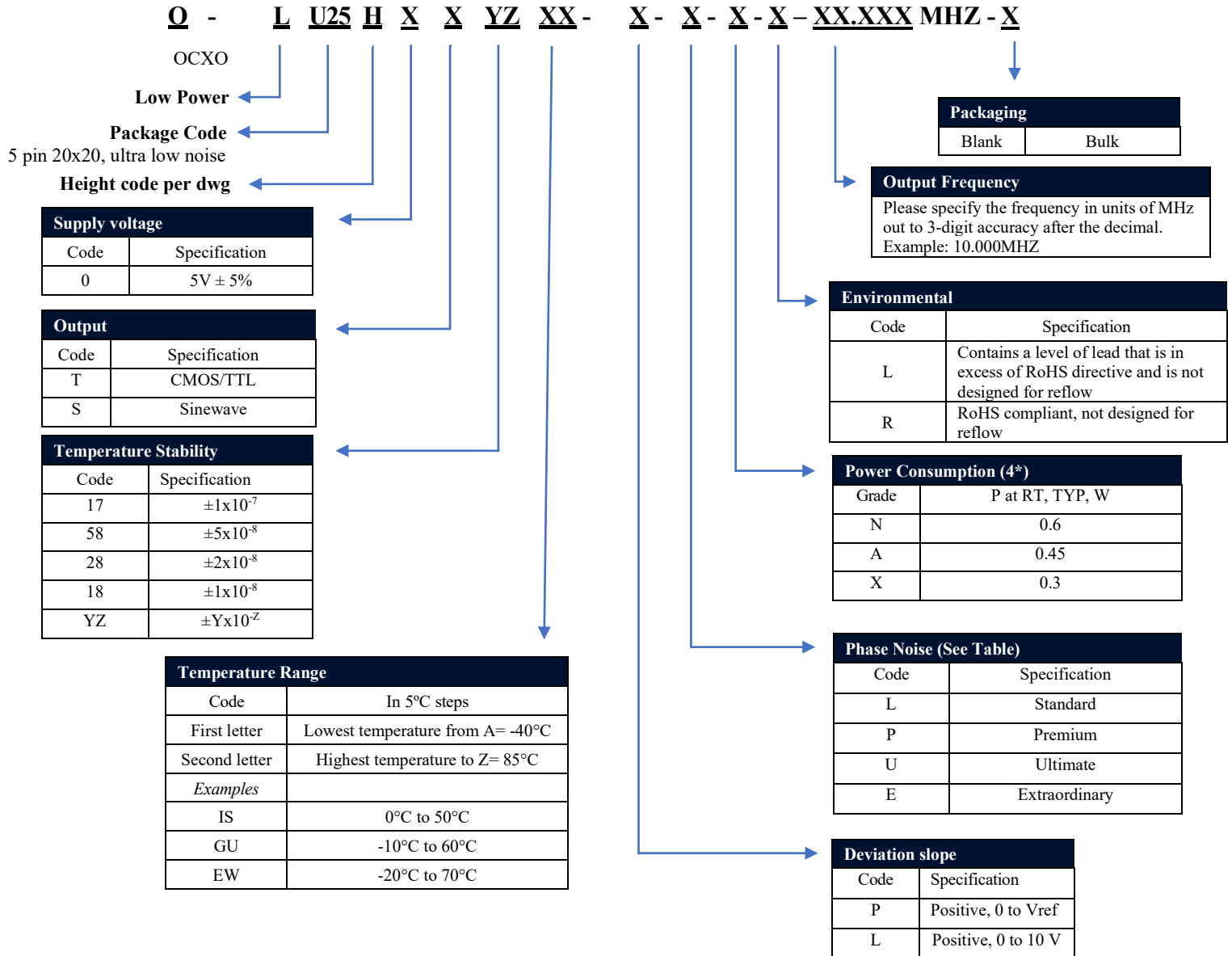
Environmental and Mechanical

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

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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ESD Sensitive

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Notes:

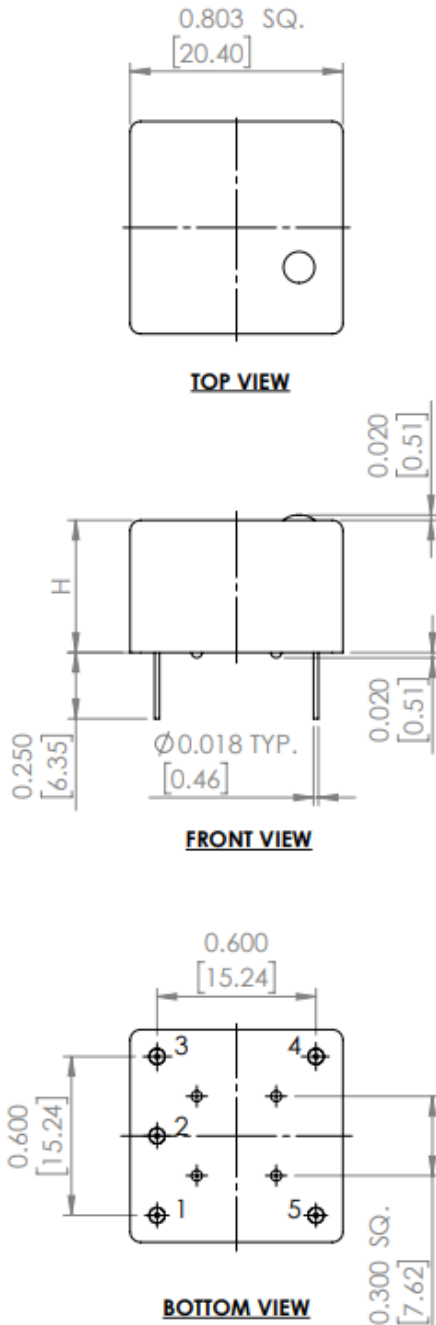
1) For highest operating temperature higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.

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 HA 7000B 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 stability 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), and by the height of the cover (the shorter the cover – the higher the power). The values in the table are for high operating temperature at 70°C, and height option “5”.

Mechanical Dimensions



H Code #	Height, H
4	0.4" [10.2 mm]
5	0.5" [12.7 mm]

Pin #	Function
1	Vc
2	Vref
3	Vcc
4	Output
5	GND

Dimensions: inches [mm]