

Rev. F

# O-L24HXXXXYY-X-X-X

## Precision Low Power Consumption

### SC-cut OCXO in miniature 20x20 mm Package

### With DIL14 Compatible Pinout

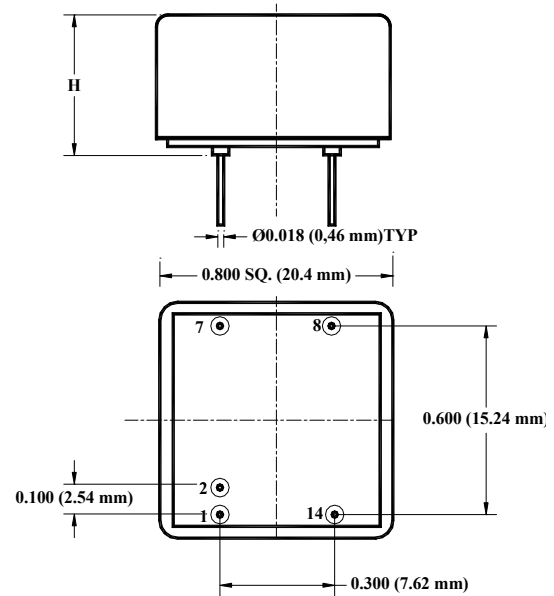
#### Product Data Sheet

#### Features

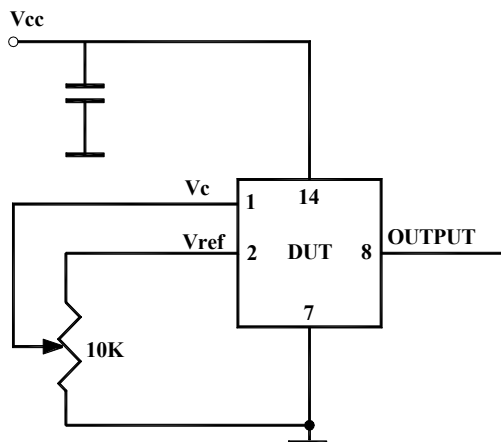
- SC-cut crystal
- Low Power Consumption
- Excellent Stability
- Fast Warm-up Time (1 minute)
- Very Low Phase Noise (-130 dBc/Hz @ 10 Hz)
- Hermetically sealed package
- DIL14 Pinout

#### Applications

- Instrumentation
- Battery powered equipment
- Telecommunication Systems
- Data Communications
- GPS
- COTS/Dual use



Height, H	Code
0.433" (11 mm)	4
0.533" (13.5 mm)	5



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Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
<i>Absolute Maximum Ratings</i>							
<b>Input Break Down Voltage</b>	V <sub>cc</sub>		-0.5		5.5	V	V <sub>cc</sub> = 5 V
<b>Storage temper.</b>	T <sub>s</sub>		-40		85	°C	
<b>Operating temper.</b>	T <sub>o</sub>		-40		85	°C	
<b>Control Voltage</b>	V <sub>c</sub>		-1		6	V	

*Electrical (6)*

<b>Frequency</b>	F		8.0	10.000	100.000	MHz	*	All parameters for 10 MHz
<b>Frequency stability</b>	ΔF/F	vs. Temp.		10		ppb	See chart below	
		vs. Supply		1	2	ppb/5%V <sub>cc</sub>		
<b>Aging</b>		per day per year, first year 10 years		5E-10 1E-7			after 30 days 5E-8 available 1*	
<b>Allan Deviation</b>		.1s to 1s		5E-12				
<b>SSB Phase Noise</b>		1Hz		-100	-98	dBc/Hz	2*	
		10 Hz		-135	-130			
		100 Hz		-153	-150			
		1 KHz		-162	-160			
		10 KHz		-165	-164			
		100 KHz		-168	-165			
<b>Power consumption, Still air 3*, 10MHz</b>	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"	
<b>Spectral Purity</b>		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc		
<b>Retrace</b>		After 30 minutes			±10	ppb	24 hrs off	
<b>Input Voltage</b>	V <sub>cc</sub>		4.75 3.165	5.0 3.30	5.25 3.465	V	See chart below to specify	All Parameters for 60MHz
<b>SSB Phase Noise</b>		1Hz		-90	-85	dBc/Hz	2*	
		10 Hz		-115	-112			
		100 Hz		-135	-132			
		1 KHz		-145	-142			
		10 KHz		-152	-150			
<b>Power consumption, Still air 3*, 10MHz</b>	P	steady state, 25°C, Operating temp range to 70°C start-up @ -30°C		0.65 0.5 0.35 2.0	0.75 0.6 0.45 2.5	W	Grade "N" Grade "A" Grade "X"	
<b>Spectral Purity</b>		Subharmonics Spurious Harmonics		-50 -35	-45 -80 -30	dBc		
<b>Load</b>		10KOhm//15pF (HCMOS/TTL), AC-coupled 50 Ohm (Sine-wave)					Output Code T Output Code S	
<b>Warm-up time</b>	τ	to 0.10ppm accuracy to 0.25 ppm			90 60	seconds		
<b>Output Power</b>			+5	+7		dBm	10 MHz, Output Code S	
<b>Logic 1 (CMOS)</b>	V <sub>oh</sub>		0.7 V <sub>ref</sub>			V	Output Code T	
<b>Logic 0 (CMOS)</b>	V <sub>ol</sub>				0.1 V <sub>ref</sub>	V	Output Code T	
<b>Control voltage</b>	V <sub>c</sub>		0		V <sub>ref</sub>	V	4*	
<b>Reference Voltage</b>	V <sub>ref</sub>			4.5 3.0		V	5 V supply 3.3 V supply	



<b>Pull range</b>		from nominal F, 10 MHz	±0.5 ±0.4	±0.7 ±0.5		ppm	5 V supply 3.3 V supply
<b>Deviation slope</b>		Monotonic, posit. 10 MHz		0.3 0.33		ppm/V	5 V supply 3.3 V supply
<b>Input impedance</b>	Zin	At Vc pin	10			KOhm	
<b>Modulation bandwidth</b>	Fm		DC		1	KHz	8*
<b>Setability</b>	Vc0	@25°C, Fnom.	Vref/2- 0.25	Vref/2	Vref/2 + 0.25	V	10 MHz 5*
<b>Initial Calibration</b>		Vc = Vref/2 @25°C			±100	ppb	10 MHz

***Environmental and Mechanical***

<b>Operating temp. range</b>	-20°C to 70°C Standard, Other options – see chart below
<b>Mechanical Shock</b>	Per MIL-STD-202, 30G, 11ms
<b>Vibration</b>	Per MIL-STD-202, 5G to 2000 Hz
<b>Soldering Conditions</b>	260°C for 10s Max leads only

***Electrical Connections***

<b>Pin Out</b>	Pin #1-- Vc ; Pin#2 – Vref (optional 7*); Pin #7 - GND Pin #8 – Output Pin #14 – Vcc;
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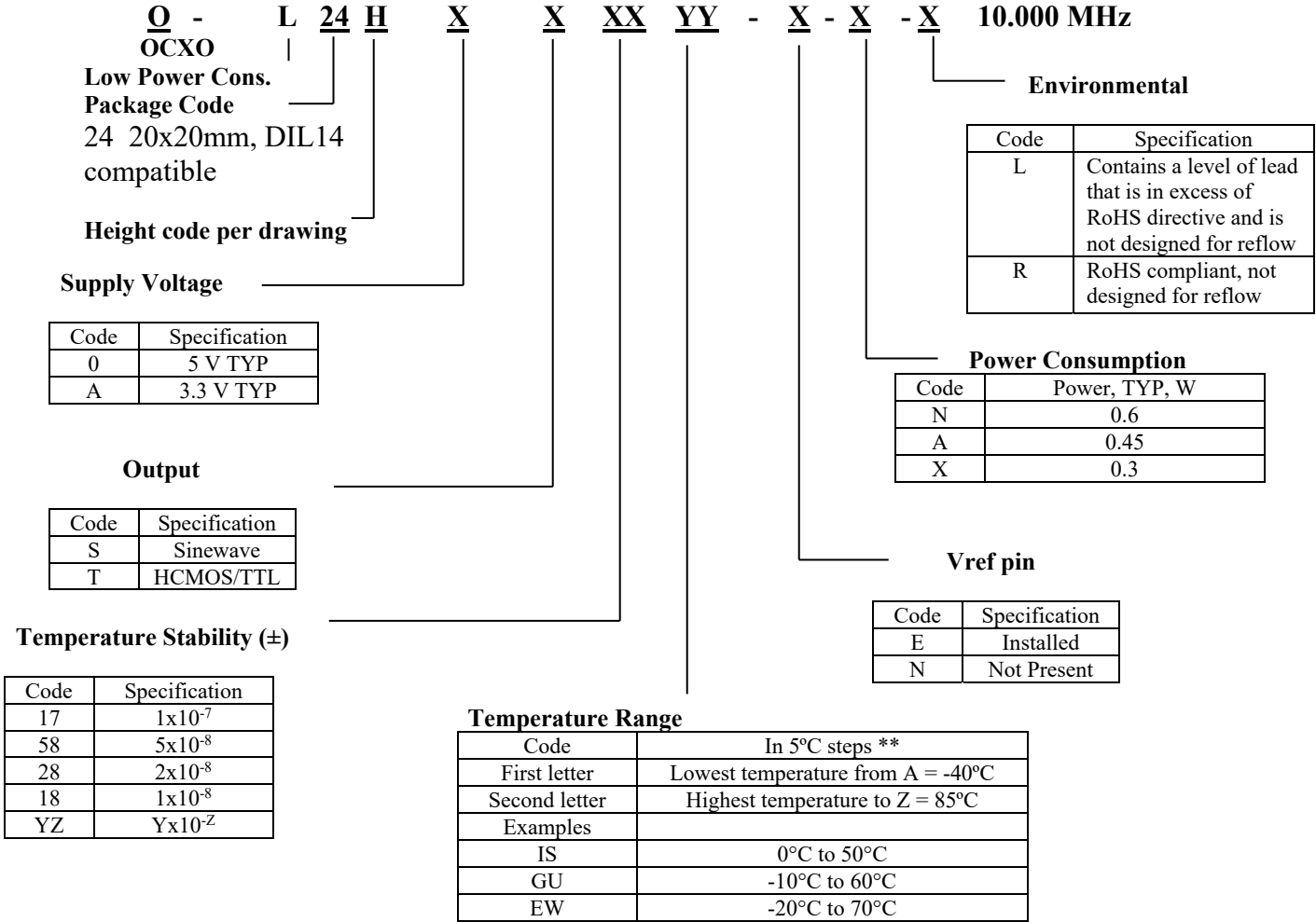
Notes:

- \* Units with frequency at and above 30 MHz are built with low noise harmonic multiplication technique.
- 1. Aging rates are proportional to the operating frequency for unit without multiplication. Pull range will be adjusted accordingly to provide for lifetime possibility to set on frequency
- 2. Close to the carrier phase noise deteriorates with increase in frequency.
- 3. Power consumption listed in the table is for 10.000 MHz, Sine-wave output, 0.5” height unit. With increase in upper operating temperature, the power consumption will increase about 40 mW per 5°C. CMOS output option will decrease consumption by about 25 mW. 0.4” units will have about 5% more power consumption.
- 4. If Vref is not used for adjusting the frequency, Vc range can be increased to 5.0 V with either Vcc option.
- 5. The Vc input may or may not be internally biased to roughly Vref/2. If internal bias is needed – it has to be specified on PO.
- 6. All parameters, unless otherwise specified, are at nominal conditions, i.e. : T=25°C, Nominal Vcc & Nominal Load.
- 7. Pin #2 Vref is optional, please see part number creation.
- 8. Older and stock units may have MBW of 150 Hz Max.
- 9. For higher frequency the only height option available is 5.

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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		

