Rev. E

O-L14XXXXYY-X
Precision Low Power Consumption
SC-cut OCXO in miniature DIL14 Package

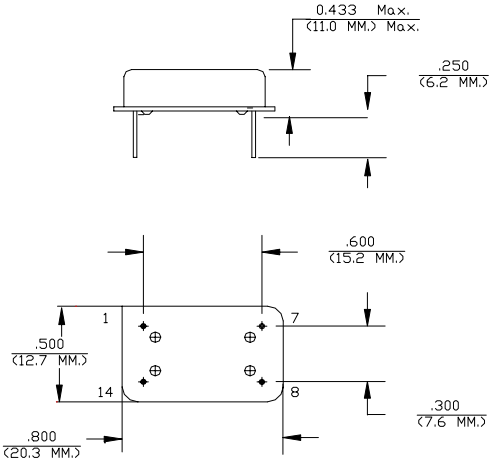
Product Data Sheet

Features

- **SC-cut crystal**
- **Low Power Consumption**
- **Excellent Stability**
- **Fast Warm-up Time (1 minute)**
- **Low Phase Noise (-120 dBc/Hz @ 10 Hz)**
- **Hermetically sealed package**

Applications

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



ALL DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED

NEL FREQUENCY CONTROLS, INC.

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Parameter	Symb	Condition	Min	Typ	Max	Unit	Note	
Absolute Maximum Ratings								
Input Break Down Voltage	Vcc		-0.5		5.5	V	Vcc = 5 V	
Storage temper.	Ts		-40		85	°C		
Operating temper.	To		-40		85	°C		
Control Voltage	Vc		-1		6	V		
Electrical (5)								
Frequency	F		8.0	10.000	40.000	MHz	*	All parameters for 10 MHz
Frequency stability	ΔF/F	vs. Temp.		20		ppb	See chart below	
		vs. Supply		1	2	ppb/5%Vcc		
Aging		per day per year, first year 10 years		1E-9 1E-7	 3.5E-7		after 30 days 1*	
Allan Deviation		.1s to 1s		1E-11				
SSB Phase Noise		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-90 -120 -143 -150 -155 -156	-85 -115 -140 -148 -154 -155	dBc/Hz	2*	
Retrace		After 30 minutes			±10	ppb	24 hrs off	
								All parameters for 20 MHz
Allan Variance		.1s to 1s		1E-11				
SSB Phase Noise		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-84 -114 -139 -153 -165 -168	-80 -109 -136 -150 -160 -165	dBc/Hz	2*	
G-sensitivity		worst direction		±1.0		ppb/G		
Input Voltage	Vcc		4.75 3.165	5.0 3.30	5.25 3.465	V	See chart below to specify	
Power consumption	P	steady state, 25°C steady state, -20°C start-up		0.5 0.8 2.2	0.55 2.5	W	 All values in still air 3*	
Spectral Purity		Subharmonics Spurious Harmonics		none -35	 -80 -30	dBc	 Sine-wave output	
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		45	60	seconds		
Output Power			+5	+7		dBm	Output Code S	
Logic 1 (CMOS)	Voh		0.9 Vref			V	Output Code T	
Logic 0 (CMOS)	Vol				0.1 Vref	V	Output Code T	
Control voltage	Vc		0		Vref	V	4*	
Reference Voltage	Vref			4.5 3.0		V	5 V supply 3.3 V supply	
Pull range		from nominal F, 10 MHz	±0.5	±0.7		ppm		
Deviation slope		Monotonic, posit. 10 MHz		0.3 0.33		ppm/V	5 V supply 3.3 V supply	
Input impedance	Zin	At Vc pin	10			KOhm		

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Modulation bandwidth	Fm		DC		1	KHz	6*
Setability	Vc0	@25°C, Fnom.	Vref/2-0.25	Vref/2	Vref/2 + 0.25	V	5*
Initial Calibration		Vc = Vref/2 @25°C			±100	ppb	10 MHz

Environmental and Mechanical

Operating temp. range	-20°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#7 – GND/CASE; ; Pin #8 – Output; Pin #14 – Vcc

Notes:

* All the specifications for frequencies above 20 MHz are very preliminary

1. Aging rates are proportional to the operating frequency above 20 MHz. 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 5ºC. CMOS output option will decrease consumption by about 25 mW. 0.4" units will have about 5% more power consumption.
4. 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.
5. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.
6. Older and stock units may have MBW of 150 Hz Max.

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Creating a Part Number

O - L 14 X X XX YY - X 10.000 MHz

OCXO
Low Power Cons.
Package Code
14 4 pin DIL14

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

Supply Voltage

Code	Specification
0	5 V TYP
A	3.3 V TYP

Output

Code	Specification
S	Sinewave
T	HCMOS/TTL

Temperature Stability (±)

Code	Specification
17	$1x10^{-7}$
58	$5x10^{-8}$
28	$2x10^{-8}$
18	$1x10^{-8}$
YZ	$Yx10^{-Z}$

Temperature Range

Code	In 5ºC steps **
First letter	Lowest temperature from A = -40ºC
Second letter	Highest temperature to Z = 85ºC
Examples	
IS	0°C to 50°C
GU	-10°C to 60°C
EW	-20°C to 70°C

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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