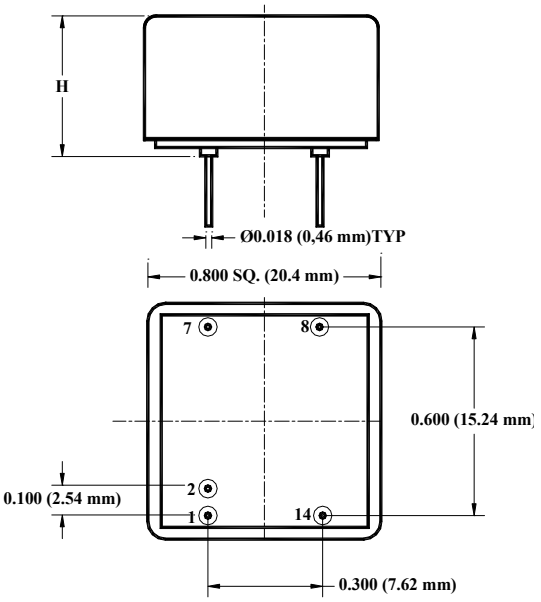
Rev. F

O-L24HXXXXYY-X-X-X
Precision Low Power Consumption SC-cut OCXO in miniature 20x20 mm Package With DIL14 Compatible Pinout



Product Data Sheet

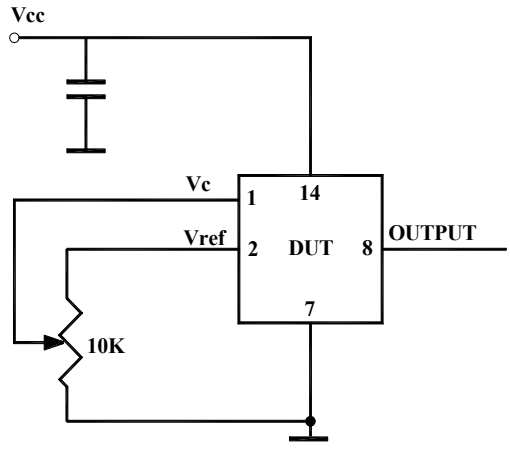
Features

- 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



NEL FREQUENCY CONTROLS, INC.
357 Beloit Street, P.O. Box 457, Burlington, WI 53105-0457 U.S.A. Phone 262/763-3591 FAX 262/763-2881
Email: nelsales@nelfc.com www.nelfc.com

O-L24HXXXXXYY –X-X-X

Rev. F

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 (6)								
Frequency	F		8.0	10.000	100.000	MHz	*	All parameters for 10 MHz
Frequency stability	ΔF/F	vs. Temp.		10		ppb	See chart below	
		vs. Supply		1	2	ppb/5%Vcc		
Aging		per day per year, first year 10 years		5E-10 1E-7	 3.5E-7		after 30 days 5E-8 available 1*	
Allan Deviation		.1s to 1s		5E-12				
SSB Phase Noise		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-100 -135 -153 -162 -165 -168	-98 -130 -150 -160 -164 -165	dBc/Hz	2*	
Power consumption, Still air 3*, 10MHz	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"	
Spectral Purity		Subharmonics Spurious Harmonics		none -35	 -80 -30	dBc		
Retrace		After 30 minutes			±10	ppb	24 hrs off	
Input Voltage	Vcc		4.75 3.165	5.0 3.30	5.25 3.465	V	See chart below to specify	
SSB Phase Noise		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz		-90 -115 -135 -145 -152 -155	-85 -112 -132 -142 -150 -152	dBc/Hz	2*	All Parameters for 60MHz
Power consumption, Still air 3*, 10MHz	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"	
Spectral Purity		Subharmonics Spurious Harmonics		-50 -35	-45 -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 0.10ppm accuracy to 0.25 ppm			90 60	seconds		
Output Power			+5	+7		dBm	10 MHz, 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		Vref	V	4*	
Reference Voltage	Vref			4.5 3.0		V	5 V supply 3.3 V supply	

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Pull range		from nominal F, 10 MHz	±0.5 ±0.4	±0.7 ±0.5		ppm	5 V supply 3.3 V supply
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	
Modulation bandwidth	Fm		DC		1	KHz	8*
Setability	Vc0	@25°C, Fnom.	Vref/2-0.25	Vref/2	Vref/2 + 0.25	V	10 MHz 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#2 – Vref (optional 7*); Pin #7 - GND Pin #8 – Output Pin #14 – Vcc;

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 5ºC. 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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CRYSTAL OSCILLATORS

Data Sheet 1202A

O-L24HXXXXXYY –X-X-X

Rev. F

Creating a Part Number

O - L 24 H X X XX YY - X - X - X 10.000 MHz

OCXO

Low Power Cons.

Package Code

24 20x20mm, DIL14 compatible

Height code per drawing

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

Vref pin

Code	Specification
E	Installed
N	Not Present

Power Consumption

Code	Power, TYP, W
N	0.6
A	0.45
X	0.3

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

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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