Rev. R

OD-X8HXXXXX-R

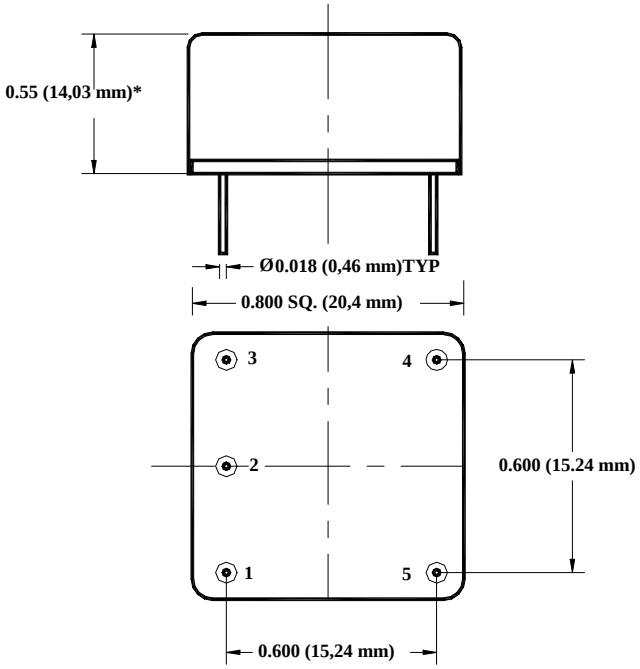
Precision, Low Power Consumption, Fast Warm-up SC-cut OCXO in 20x20 mm Through Hole Package

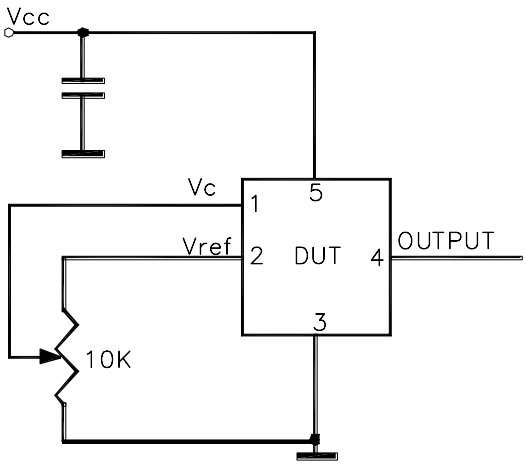
Features

- **SC-cut crystal**
- **Extremely Low Power Consumption (150 mW)**
- **Fast Warm-up Time (60 s)**
- **High Stability (up to ± 1x10^{-8})**
- **Low Aging (5x10^{-10}/day, 5x10^{-8}/year)**
- **Very Low Phase Noise**
- **Sine Wave or HCMOS/TTL output**
- **5 MHz to 250 MHz Frequencies Available**

Applications

- **Telecommunication Systems**
- **Data Communications**
- **GPS**
- **Battery Powered Systems and Equipment**
- **Instrumentation**
- **COTS/Dual use**





* 12.95mm height available; please consult factory

NEL FREQUENCY CONTROLS, INC.

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OD-X8HXXXXX-R Series

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note
Absolute Maximum Ratings							
Storage temper.	Ts		-60		90	°C	
Electrical (4)							
Frequency	F		5	10.000	250	MHz	1*
Frequency stability	ΔF/F	vs. Temp.		±50		ppb	See chart below
		vs. Supply		2		ppb/V	
Aging		per day per year			5E-10 5E-8		after 30 days 2*
Allan Deviation		.1s		20E-12			
SSB Phase Noise		1Hz 10 Hz 100 Hz 1 KHz 10 KHz		-90 -125 -145 -155 -165		dBc/Hz	3*
Retrace		After 30 minutes			±10	ppb	
G-sensitivity		worst direction		±1.0		ppb/G	
Input Voltage	Vcc		4.75 3.15	5.0 3.3	5.25 3.45	V	See chart below to specify
Power consumption	P	steady state, 25°C start-up		0.15 0.5	0.7	W	Standard Operating Temperature, for Op Temp. 85 °C ad 20%
Spectral Purity		Subharmonics Harmonics/Sine			-40 -25	dBc	At Higher Frequencies
Load	10KOhm//15pF (HCMOS/TTL), 50 Ohm (Sinewave)						
Warm-up time	τ	to 0.1ppm accuracy	15	60		s	
Output Waveform		3.3V HCMOS/TTL compatible or Sinewave +5dBm @3.3V/ +8dBm @5V (± 2dBm)					
Control voltage	Vc	5V 3.3V	0		4.2V 2.8V	V	
Pull range		from nominal F	±0.5	±1		ppm	
Setability	Vc0	@25°C, Fnom.	Vref/2-1	Vref/2	Vref/2+1	V	

All parameters for 10 MHz

Notes:

1* Higher frequencies can be achieved either by using higher frequency crystals or by low noise analog harmonic multiplication. Both methods have advantages and drawbacks. If lowest possible phase noise on the noise floor is most important – high frequency crystal will be used. If phase noise close to the carrier and aging are more important – multiplication will be used. Please consult factory for your specific requirement.

2* Aging rate is usually proportional to the operating frequency, unless higher frequency is achieved by multiplication. Keep it in mind while specifying aging.

3* Phase noise deteriorates with frequencies going higher. If analog multiplication is used to achieve higher frequency the phase noise roughly follows the formula of additional 20LogN, where N is a multiplication factor across entire frequency offset range. If higher frequency is achieved by using higher frequency crystal phase noise close to the carrier deteriorates due to the lower Q of the crystal and is usually worse, compared to multiplied solution. On the noise floor, however it remains more or less the same. This design usually starts utilizing multiplication techniques in the range of 25 MHz to 35 MHz.

4. All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.

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CRYSTAL OSCILLATORS

Data Sheet 0635H

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Environmental and Mechanical

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

Electrical Connections

Pin Out	Pin #1-Vc ; Pin#2 – Vref; Pin #3 – GND; Pin #4- Output ; Pin #5- Vcc

Creating a Part Number

OD - X 8H X XX X X - R - FREQ

Package Code
OD 5 pin 20x20mm package

Supply Voltage

Code	Specification
0	5V ± 5%
A	3.3V± 5%

Output

Code	Specification
T	TTL/HCMOS
S	Sinewave

Temperature Stability

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

Environmental

Code	Specification
R	RoHS compliant, not designed for reflow

Aging, per day/per year

Code:	Specification	Note:
B	2x10-10 / 3E-8	Below 50MHz
C	5x10-10 / 5E-8	
D	1xE-9 / 1E-7	
E	1.5E-9 / 1.5E-7	
F	2E-9 / 2E-7	Above 50MHz
G	3E-9 / 3E-7	
H	5E-9 / 5E-7	

Temperature Range

Code	Specification
A	0°C to 50°C
B	0°C to 70°C
C	-20°C to 70°C
D	-40°C to 85°C
E	-10°C to 60°C
F	-40°C to 80°C
G	-30°C to 70°C

Not all combinations are available. Consult Factory.

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