OC-x87 Series

NEL FREQUENCY CONTROLS
Powered By ABRACON

Micro-miniature OCXO

ESD Sensitive

20.3 x 12.7 x 11 mm
Datasheet #0635A

Features

- **Low Cost DIL 14 package**
- **High Vacuum Sealed Crystal**
- **Low Power Consumption (500 mW)**
- **Fast Warm-up Time (2 minutes)**
- **Stratum3 or better Stability**
- **Low Aging less than 3ppm over life**
- **Very Low Phase Noise (-155dBc/Hz TYP)**
- **HCMOS/TTL or Sine-Wave output**
- **8 MHz to 160 MHz Frequencies Available**
- **Voltage Control Option**

Applications

- **Telecommunications**
- **Data Communications**
- **Instrumentation**
- **COTS/Dual use**

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	Vcc		-0.5		5.5	V	3.3V or 5V Vcc
Storage temper.	Ts		-40		85	°C	
Control Voltage	Vc		-1		6	V	

Electrical (3)*

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes	
Frequency	F		8	10.000	160	MHz	1*	All parameters for 10 MHz
Frequency stability	ΔF/F	vs. Temp.		±100	±280	ppb	See chart below	
		vs. Supply		10	50	ppb/V		
Aging		per day first year 15 years		5E-9 3E-7	 3E-6		after 30 days	
Allan deviation		.1s to 100s		5E-11				
Calibration		No voltage control		±0.5	±2	ppm		
Vcc sensitivity				5E-8/V				
Load sensitivity		For 10% change			5E-8			
SSB Phase Noise		10 Hz 100 Hz 1 KHz 10 KHz >100 KHz		-100 -130 -140 -150 -155		dBc/Hz	2*	
Retrace		After 30 minutes			±100	ppb		
G-sensitivity		worst direction			±2.0	ppb/G		
Input Voltage	Vcc		4.75 3.15	5.0 3.3	5.25 3.45	V	See chart below	
Power consumption	P	steady state, 25°C steady state, -30°C start-up		0.5	0.7 1.5 2.5	W	Upper operating temperature <70°C, add 20% for UOT 85°C	
Load	10KOhm//15pF Internally AC coupled 50 Ohm						CMOS Output Sine-wave output	

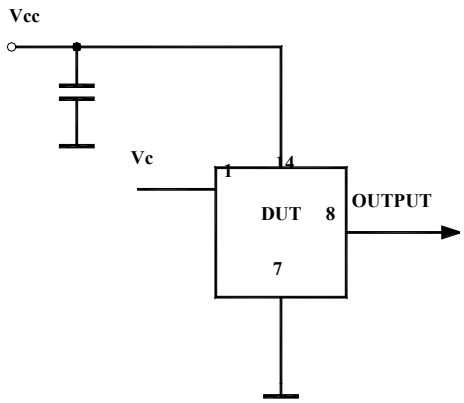
Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Warm-up time	τ	to 0.3 ppm accuracy		2	3	min	
Sub-Harmonics				-50	-40	dBc	At higher F 1*
Output Waveform		3.3V HCMOS/TTL compatible, 4 ns Tr/Tf, 40/60% duty cycle Sine-wave,+7 dBm ±3 dBm into 50 Ohm, -30 dBc harmonics					See chart below
Control Voltage	Vc		0		4.0	V	
Pull range		from nominal F	±5	±10		ppm	Customer specified
Deviation slope		Monotonic, posit		5		ppm/V	Customer specified
Setability	Vc0	@25°C, Fnom	1.0	2.0	3.0	V	5V/3.3 supply
Modulation Bandwidth	Fm		DC		1	KHz	4*

Environmental and Mechanical

Parameter	Description
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, 5G to 2000 Hz
Soldering Conditions	Leads Temperature 260°C, for 10s, Max
Hermetic seal	Leak rate less than $1x10^{-8}$ atm. ccm/s of helium

Test Circuit



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Creating a Part Number

OC - X 87 X X XX X - X – XXX.XXX MHZ - X

Package Code
OC→ 0.8x0.5" 4 pin (14 pin)

Packaging	
Blank	Bulk

Output Frequency
Please specify the frequency in units of MHz out to 3-digit accuracy after the decimal.
Example: 10.000MHZ

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

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

Voltage Control	
Code	Specification
V	Voltage Control
0	No Voltage Control

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
9	Customer Specific

Output	
Code	Specification
T	TTL / CMOS
S	Sine

Temperature Stability	
Code	Specification
58	$5x10^{-8}$
17	$1x10^{-7}$
S3	$2.8x10^{-7}$
37	$3x10^{-7}$
57	$5x10^{-7}$
YZ	$Yx10^{-Z}$

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		

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 the factory for your specific requirement.
2* 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.
3* All parameters, unless otherwise specified, are at nominal conditions, ie: T=25°C, Nominal Vcc & Nominal Load.
4* Older and stock units may have MBW of 150 Hz Max

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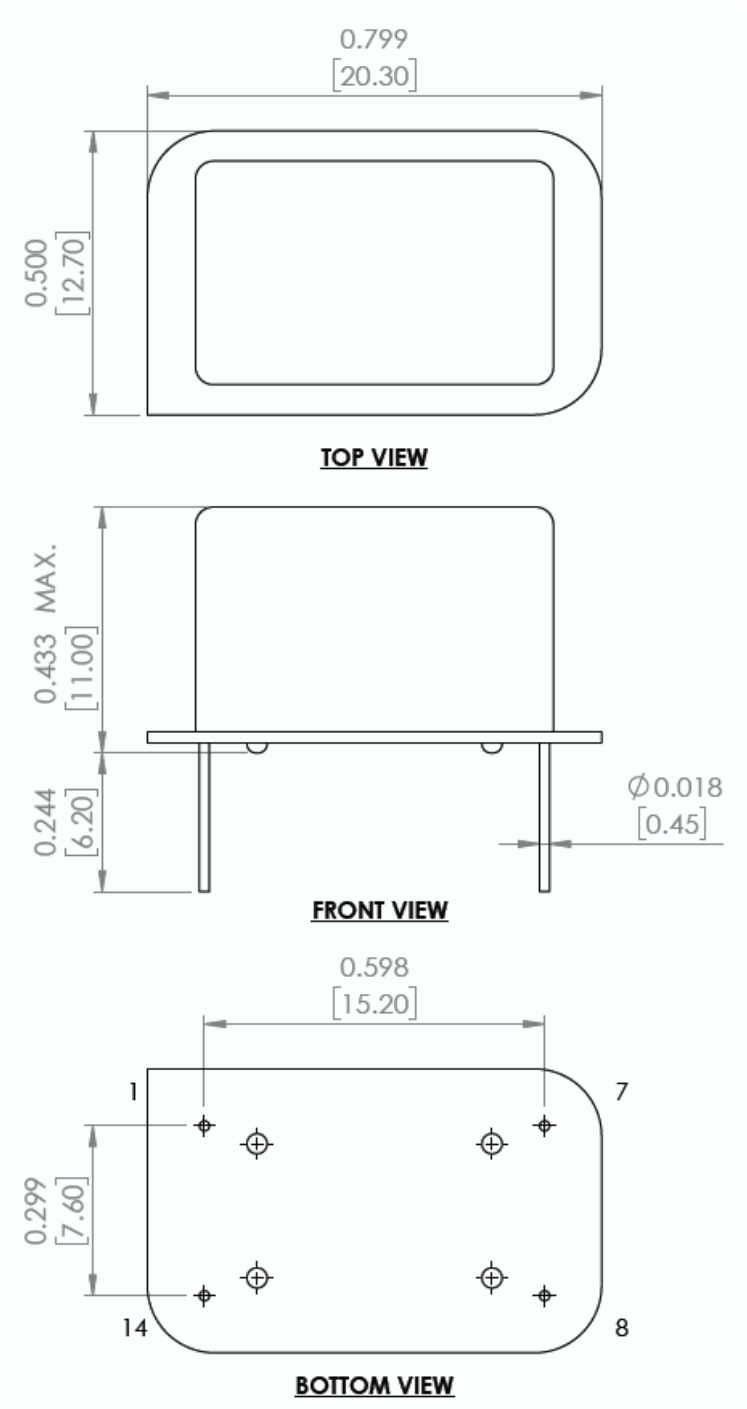
Mechanical Dimensions



Pin #	Function
1	Vc
7	Case, GND
8	Output
14	Vcc

Dimensions: inches [mm]