Series **FOC1**

Micro-miniature OCXO

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 < 3 ppm over life**
- **Very Low Phase Noise (-160dBc/Hz TYP)**
- **HCMOS/TTL or Sine-Wave output**
- **8 MHz to 160 MHz Frequencies Available**
- **Voltage Control Optional**
- **Good Performance**
- **COTS/Dual use**

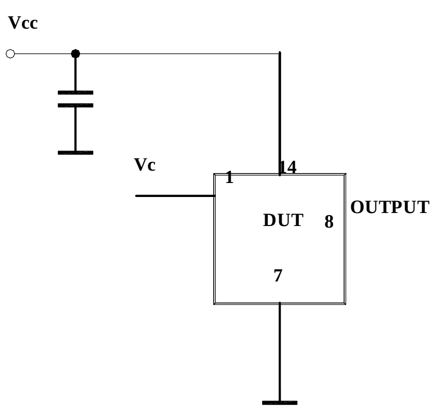
Applications

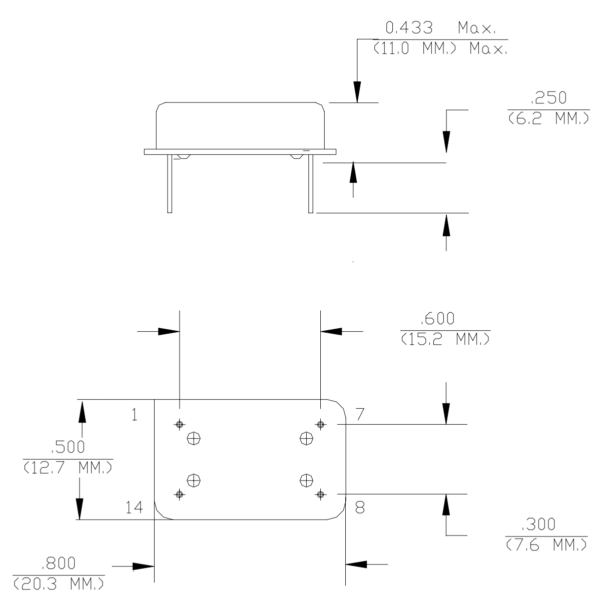
- **Telecommunications**
- **Data Communications**
- **Instrumentation**
- **Military/Space**

Part Numbering Example: FOC1FS17DVM - XX.XXXX M

FOC1		S	17	D	V	M	XX.XXXXM
SERIES	VOLTAGE	OUTPUT	STABILITY	OPERATING TEMP.	VOLTAGE CONTROL	GRADE	FREQUENCY
	0= 5.0V A= 3.3V	H=Cmos/TTL S=Sinemave	$17=1\times10^{-7}$ $58=5\times10^{-8}$ $28=2\times10^{-8}$ $18=1\times10^{-8}$ $YZ=Y\times10^{-Z}$	A = 0 ℃ to 50 ℃ B = -20 ℃ to 70 ℃ C = -30 ℃ to 70 ℃ D = -40 ℃ to 85 ℃	V=Voltage Controil O=No Voltage Control	N = Industrial Std M=MIL-STD-883B B= MIL-PFR-55310D	8.00 ~160.000 MHz

Not all combinations are available. Consult Factory





ALL DIMENSIONS ARE TYPICAL UNLESS OTHERWISE NOTED

Electrical Connections

Pin Out	Pin 1- Vc; Pin 7- Case, GND; Pin8 – Output; Pin 14 - Vcc

Micro-miniature OCXO

Specifications:

Parameter	Symb	Condition	Min	Typ	Max	Unit	Note	
Absolute Maximum Ratings								
Input Break Down Voltage	Vcc		-0.5 -0.5		5.5 13	V	3.3V or 5V Vcc 12 V Vcc	
Storage temper.	Ts		-40		85	℃		
Control Voltage	Vc		-1		6	V		
Electrical								
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 Variance		.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 -130 -145 -160		dBc/Hz	2*	
Retrace		After 30 minutes			±100	ppb		
G-sensitivity		worst direction			±2.0	ppb/G		
Input Voltage	Vcc		4.75 3.15 11.4	5.0 3.3 12.0	5.25 3.45 12.6	V	See chart below	
Power consumption	P	steady state, 25 ℃ steady state, -30 ℃ start-up		0.5	0.7 1.5 2.5	W	Upper operating temperature < 70 ℃, add 20% for UOT 85 ℃	
Load	10KOhm//15pF Internally AC coupled 50 Ohm						CMOS Output Sine-wave output	
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 ℃, Fnom.	1.0	2.0	3.0	V	5V/3.3 supply	

Environmental and Mechanical

Operating temp. range	-30 ℃ to 70 ℃ 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 ℃, for 10s, Max
Hermetic Seal	Leak rate less than $1x10^{-8}$ atm.ccm/s of helium

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* 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.