

VFOV103

OCXO – Ultra Low Noise, Ultra Stable

Features

- 5MHz to 150MHz frequency range
- Ultra Low Phase Noise: (fundamental crystal)
 - -155 dBc/Hz @ 1kHz offset
 - -168 dBc/Hz floor
- Sinewave or HCMOS output



Dimensions: 25.4 x 25.4 x 13.25 mm

Applications

- PLL reference for Telecommunication Systems
- Microwave Communications / RADAR signal source
- GPS holdover
- Instrumentation / Test and Measurement

Table 1 - Ordering Information

Model	Stability	Temp Range	Supply Voltage	Aging	Output	Frequency		
VFOV103	—	28	B	E	B	H	—	xxxMxxx

Code	Stability
17	1x10 ⁻⁷
58	5x10 ⁻⁸
28	2x10 ⁻⁸
18	1x10 ⁻⁸
59	5x10 ⁻⁹
29	2x10 ⁻⁹
19	1x10 ⁻⁹
51	5x10 ⁻¹⁰

Code	Temp range
A	0 to 50°C
B	0 to 70°C
C	-10 to 60°C
D	-20 to 70°C
E	-30 to 70°C
G	-40 to 85°C

Code	Supply
D	5V ± 5%
E	3.3V ± 5%
B	12V ±5%

Code	Output
H	HCMOS
S	Sinewave

Code	Per day	Per year	Freq Range
A	5 ppb	0.5 ppm	≤150MHz
F	3 ppb	0.3 ppm	≤120MHz
B	2 ppb	0.2 ppm	
C	1 ppb	0.1 ppm	≤40MHz
D	0.5 ppb	60 ppb	≤20MHz
E	0.4 ppb	50 ppb	
G	0.2 ppb	20 ppb	≤10MHz
H	0.1 ppb	15 ppb	

Available Frequency Stabilities over Operating Temperature Ranges

Temperature	Stability (10MHz/100MHz)			
	0 to 50°C	0 to 70°C	-10 to 60°C	-20 to 70°C

Available Frequency Stabilities over Operating Temperature Ranges

Code	Temperature Range	Stability (10MHz/100MHz)			
		59	29	19	51
		±5x10 ⁻⁹	±2x10 ⁻⁹	±1x10 ⁻⁹	±5x10 ⁻¹⁰
A	0 to 50°C	*/*	*/*	*/	*/
B	0 to 70°C	*/*	*/*	*/	
C	-10 to 60°C	*/*	*/*	*/	*/
D	-20 to 70°C	*/*	*/*	*/	
E	-30 to 70°C	*/*	*/*	*/	
G	-40 to 85°C	*/*	*/	*/	

Part Number Example: VFOV103-28BEBH-50M000



Electrical Specifications

Parameter	Conditions & Remarks	Min	Typical	Max	Unit	
Operating Conditions						
Operating Temperature Range	See “Ordering Information” table	-30	-	+70	°C	
Supply Voltage	V _{CC}	3.15	3.3	3.45	Vdc	
		4.75	5.0	5.25		
		11.4	12.0	12.6		
Power Consumption	During warm up	-	3.2	3.5	W	
	Steady state @ 25°C	-	1.0	1.2		
	Steady state @ -30°C	-	2.0	2.2		
Load	HCMOS (10 MHz)	10Kohm / 15pF			Ω	
	HCMOS (100 MHz)	10Kohm / 5pF				
	Sine wave	50				
Frequency Stability						
Frequency	F _{NOM}	5		150	MHz	
Freq. vs Temperature (See Table 1 options)	Ref to 25°C, air flow 0.5 m/s max	-	-	±10	ppb	
Freq. vs Supply Voltage	V _{CC} ±5%	-	±1	-	ppb	
Freq. vs Time (Aging) (See Table 1 options)	After 30 days of operation	-	-	±0.5	ppb/day	
		-	-	±60	ppb/year	
G-Sensitivity	Worst axis	-	1	-	ppb/g	
Allan Deviation	1 sec	-	0.01	-	ppb	
Retrace	After 30 minutes	-	-	±20	ppb	
Warmup-Up Time	T _A =25°C; to within 0.1 ppm accuracy of freq. @ 30 min	-	2	3	minutes	
Output Parameters						
HCMOS/TTL (order code H)	V _{CC} = 5.0 or 12V V _{CC} = 3.3V	V _{OL}	-	-	0.4	V
			-	-	0.4	
		V _{OH}	3.8	-	-	V
			2.4	-	-	
Rise / Fall Times	10 MHz	-	-	10	ns	
	100 MHz			3		
Duty Cycle	@50% of output signal	45	50	55	%	
Sinewave Output (order code S)	V _{CC} = 5.0 or 12V	+6	-	+11	dBm	
	V _{CC} = 3.3V	+4	-	+9		
Harmonics		-	-	-25	dBc	
Sub-harmonics			None			

Output Parameters - continued

Parameter	Conditions & Remarks	Min	Typical	Max
Phase Noise	Offset	10MHz (typical)	100MHz (typical)	
	1Hz	-100	-	
	10Hz	-125	-95	
	100Hz	-145	-125	dBc/Hz
	1KHz	-160	-145	
	10KHz	-165	-165	
For additional phase noise performance options, consult factory.		100KHz	-168	-170

Electronic Frequency Control

Control Voltage	V_C	$V_{CC} = 5.0$ or $12V$	0	-	4.3	V
		$V_{CC} = 3.3V$	0	-	2.9	
Frequency Tuning Range	From F_{NOM} - sufficient range for 10 years aging.		± 0.3	± 1	-	ppm
Deviation Slope	Monotonic, positive	$V_{CC} = 5.0$ or $12V$	0.14	-	-	ppm/V
		$V_{CC} = 3.3V$	0.2	-	-	
Reference output	V_{REF}	$V_{CC} = 5.0$ or $12V$	4.0	4.2	4.3	V
		$V_{CC} = 3.3V$	2.7	2.8	2.9	

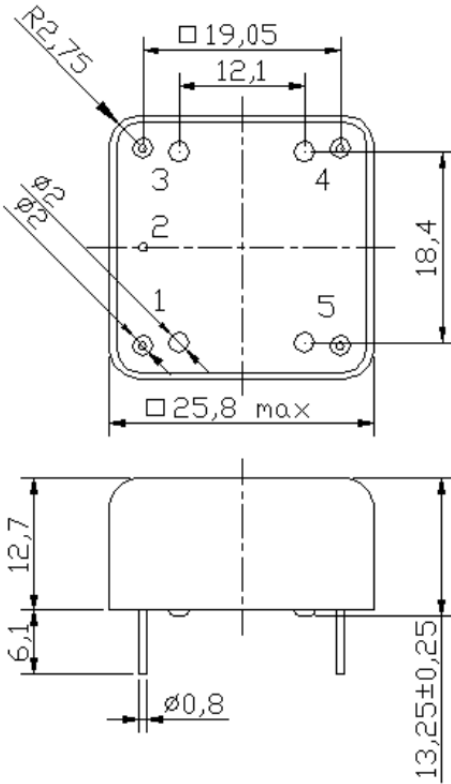
Absolute Maximum Ratings

Supply Breakdown Voltage	V_{CC}	-0.5	-	$V_{CC} + 20\%$	V
Control Voltage	V_C	-1	-	6	V

Mechanical and Environmental

Storage Temperature	-60°C to +90°C
Humidity	Hermetically sealed
Mechanical Shock	Per MIL-STD-202G, meth 213B, 30g, 11 ms, ½ sine pulse
Vibration	Per MIL-STD-202G, meth 204D, 1.5mm DA 10 to 55Hz, 10g pk sine to 2000Hz
Soldering Conditions	260°C for 10s. Hand solder only – not reflow compatible

Mechanical Specifications

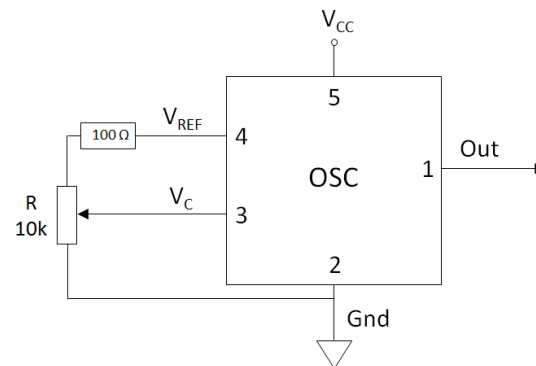


All dimensions: mm

Pin Assignments

Pin	Connection
1	Output
2	Ground
3	V _C
4	V _{REF}
5	V _{CC}

Connection Diagram



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