

VFOV101

OCXO – High Frequency, High Stability

Features

- 5 to 150 MHz Frequency Range
- High stability (to 0.5 ppb)
- -40°C to +85°C operating temperature range
- Sine wave or HCMOS output

Applications

- PLL reference for telecommunications systems
- Microwave communications / RADAR signal source
- GPS holdover
- Instrumentation / test and measurement



Dimensions: 20.2 x 20.2 x 12 mm

Ordering Information – Table 1

Model	Stability	Temperature Range	Supply Voltage	Aging	Output	Frequency, MHz
VFOV101	— 59	D	E	C	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	5.0V ±5%
E	3.3V ±5%
B	12V ±5%

Code	Output
H	HCMOS
S	Sine wave

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

Temperature Stability Matrix

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: **VFOV101-59GEDH-10M000**

Electrical Specifications

Parameter	Conditions & Remarks	Min	Typical	Max	Unit	
Operating Conditions						
Operating Temperature Range	T _{OP} (See table 1 options)	-40	-	85	°C	
Supply Voltage	V _{CC} (See table 1 options)	11.4	12.0	12.6	Vdc	
		4.75	5.0	5.25		
Power Consumption	Steady State; T _A = 25°C	3.14	3.3	3.47	W	
		-	1.0	1.2		
Load	HCMOS (10 MHz)	-	10 kΩ // 15pF	-	Ω	
	HCMOS (100 MHz)	-	10 kΩ // 5pF	-		
	Sine wave	-	50	-		
Frequency Stability						
Frequency (Note 1)	F _{NOM}	5	-	150	MHz	
Freq. vs Temperature (See table 1 options)	T _{OP} : Ref to +25°C (Airflow – 0.5 m/s max)	-	-	±10	ppb	
Freq. vs Supply Voltage	Referenced to V _{CC} typ.	-	±1	-	ppb	
Freq. vs Time (Aging)	After 30 days of operation (See table 1 options)	-	-	±3	ppb/day	
		-	-	±0.3	ppm/year	
G-Sensitivity	Worst direction	-	±1	-	ppb/g	
Allan Deviation (10 MHz)	1 sec	-	0.01	-	ppb	
Retrace	After 30 minutes	-	-	±20	ppb	
Warm-up time	@ 25°C, to within ±0.1 ppm referenced to the freq after 15 minutes on	-	2	3	min	
Output Parameters						
HCMOS Output Levels (Option H)	V _{CC} = 5.0 or 12V V _{CC} = 3.3V	V _{OL}	-	-	0.4	V
		V _{OH}	3.8	-	-	
Rise/Fall Times	10 MHz	-	-	10	ns	
	100 MHz	-	-	3		
Duty Cycle	@50% of output signal	45	50	55	%	
Sine Wave Output Levels (Option S)	V _{CC} = 5.0 or 12V	+6	-	+11	dBm	
	V _{CC} = 3.3V	+4	-	+9		
Harmonics		-	-	-25	dBc	
Sub-harmonics (Note 1)	No frequency multiplication		None		dBc	
Phase Noise (Note 2)	<u>Offset</u>		<u>10 MHz (typical)</u>	<u>100 MHz (typical)</u>	dBc/Hz	
	1 Hz	-100	-	-		
	10 Hz	-125	-	-95		
	100 Hz	-145	-	-123		
	1 kHz	-160	-	-145		
	10 kHz	-165	-	-165		
100 kHz	-168	-	-170			

Electrical Specifications (Continued)

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
Electronic Frequency Control - EFC (Optional)					
EFC Control Voltage	V _{CC} = 5.0 or 12V	0.0	-	4.3	Volts
	V _{CC} = 3.3V	0.0	-	2.9	
Frequency Tuning Range	From F _{NOM} sufficient range for 10 years aging	±0.3	±1	-	ppm
Deviation Slope	Positive, monotonic	-	0.4	-	ppm/V
Reference Output	V _{CC} = 5.0 or 12V	4.0	4.2	4.3	Volts
	V _{CC} = 3.3V	2.7	2.8	2.9	

Note 1 – For frequencies above 120MHz please refer to CTS Model VFOV201

Note 2 – For additional phase noise options, please consult factory

Absolute Ratings

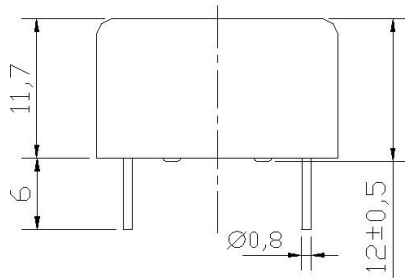
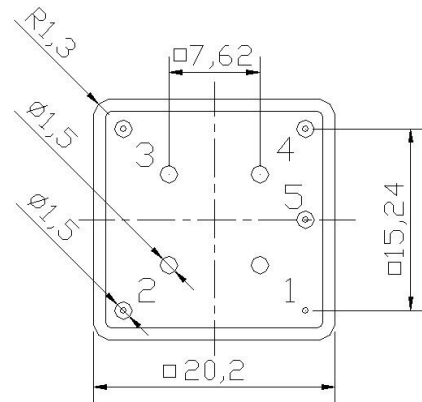
Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply breakdown voltage	V _{CC}		-0.5	-	V _{CC} + 20%	V	
Control Voltage	V _C		-1	-	6	V	

Mechanical and Environmental

Parameter	Condition
Storage Temperature Range	-60°C to +90°C
Humidity	Hermetically sealed
Mechanical Shock	MIL-STD-202G, meth 213B, 30g, 11ms, 1/2 sine pulse
Vibration	MIL-STD-202G, meth 204D, 1.5mm DA 10 to 55Hz, 10G pk sine to 2000Hz
Soldering Conditions	Hand solder only. 260°C, 10 seconds.
Markings	Epoxy ink or laser engraved

Mechanical Specifications

Mechanical Outline

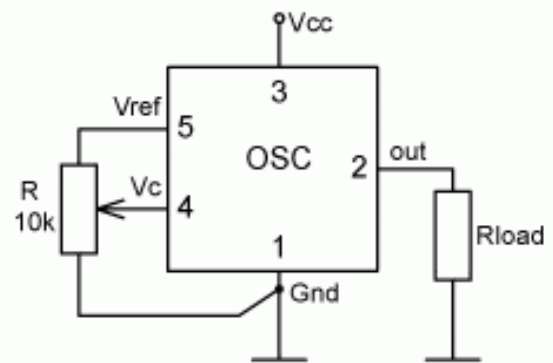


All dimensions: mm

Pin Assignments

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

Connection Diagram



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