

VFOV201

OCXO – High Frequency, High Stability

Features

- 5 to 250 MHz Frequency Range
- High stability (to 5 ppb over -40°C to +85°C)
- Sine wave or HCMOS output

Applications

- PLL reference for telecommunications systems
- Stratum 3E Timing (IEEE 1588)
- Base Station reference source
- GPS holdover
- Instrumentation / test and measurement



Dimensions: 20.2 × 20.2 x 12 mm

Ordering Information – Table 1

Model	Stability	Temperature Range	Supply Voltage	Aging	Output	Frequency, MHz
VFOV201	— 18	G	E	C	S	— xxxMxxx

Code	Stability
17	±1x10 ⁻⁷
58	±5x10 ⁻⁸
28	±2x10 ⁻⁸
18	±1x10 ⁻⁸
59	±5x10 ⁻⁹

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

Available Frequency Stabilities over Operating Temperature Ranges **

Code	Temperature Range	Stability				
		17 ±1x10 ⁻⁷	58 ±5x10 ⁻⁸	28 ±2x10 ⁻⁸	18 ±1x10 ⁻⁸	59 ±5x10 ⁻⁹
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	*	*	*	*	◇

* = Available for all frequencies. ◇ = Available only for frequencies ≤ 30 MHz

** Not all combinations are available. Consult factory for the right configurations that will meet your requirements.

Code	Per day	Per year	Freq Range
A	5 ppb	0.5 ppm	≤250 MHz
F	3 ppb	0.3 ppm	
B	2 ppb	0.2 ppm	
I	1.5 ppb	0.15 ppm	≤200MHz
C	1 ppb	0.1 ppm	
D	0.5 ppb	0.05 ppm	≤100MHz
G	0.2 ppb	0.02 ppm	≤50MHz
H	0.1 ppb	0.015 ppm	

Part Number Example: **VFOV201-18GECS-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}		11.4	12.0	12.6	Vdc
			4.75	5.0	5.25	
			3.15	3.3	3.45	
Power Consumption	Steady State; T _A = 25°C		-	1.0	1.2	W
	Start-up		-	3.2	3.5	
Load	HCMOS (10 MHz)		10 kΩ // 15pF			Ω
	HCMOS (100 MHz)		10 kΩ // 5pF			
	Sine wave		50			
Frequency Stability						
Frequency	F _{NOM}		5	-	250	MHz
Freq. vs Temperature	(See table 1 options)		-	-	±5	ppb
Freq. vs Supply Voltage	V _{CC} ±5%		-	±1	-	ppb
Freq. vs Time (Aging)	After 30 days of operation		-	-	±0.5	ppb/day
	(See table 1 options)		-	-	±50	ppb/year
G-Sensitivity	Worst direction		-	±1	-	ppb/g
Allan Deviation	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	Vdc
			-	-	0.4	
		V _{OH}	3.8	-	-	
			2.4	-	-	
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	+8	+11	dBm
	V _{CC} = 3.3V		+3	+4	+9	
Harmonics	Sinewave		-	-	-25	dBc
Sub-harmonics (Note 1)	Frequency < 30 MHz		-	None	-	dBc
	Frequency > 30 MHz (Sine)		-	-	-40	
	Frequency > 30 MHz (HCMOS)		-	-	-35	
Phase Noise (Note 2)	Offset		10 MHz (typical)		100 MHz (typical)	
	1 Hz		-100		-	
	10 Hz		-125		-100	
	100 Hz		-145		-125	
	1 kHz		-160		-140	
	10 kHz		-165		-150	
	100 kHz		-168		-150	



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	-	2.8	
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 output without sub-harmonics (up to 120 MHz), please refer to CTS Model VFOV101

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

Absolute Ratings

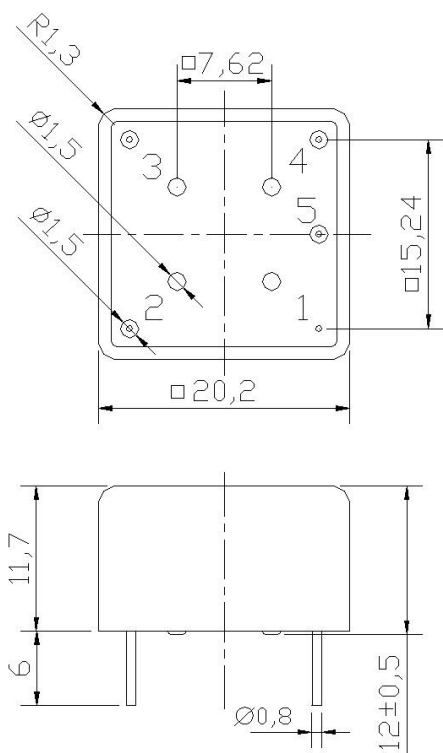
Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply breakdown voltage	V_{CC}		-0.5	-	$V_{CC} + 20\%$	V	
Control Voltage	V_C		-1	-	+6	V	

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.

Mechanical Specifications

Mechanical Outline

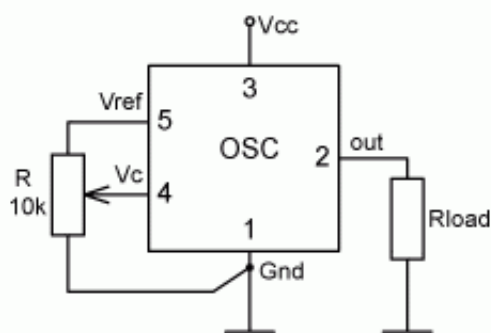


All dimensions: mm

Pin Assignments

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

Connection Diagram



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