

VFOV202

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: 35.4 x 26.7 x 12.65 mm

Ordering Information – Table 1

Model	Stability	Temperature Range	Supply Voltage	Aging	Output	Frequency, MHz
VFOV202	— W	D	E	D	H	10.000MHz

Code	Stability
R	1x10 ⁻⁷
T	5x10 ⁻⁸
U	2x10 ⁻⁸
V	1x10 ⁻⁸
W	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

Code	Per day	Per year	
B	2 ppb	0.2 ppm	
I	1.5 ppb	0.15 ppm	≤250 MHz
C	1 ppb	0.1 ppm	
D	0.5 ppb	50 ppb	≤100 MHz
G	0.2 ppb	30 ppb	≤50 MHz

Available Frequency Stabilities over Operating Temperature Ranges **

Code	Temperature Range	Stability				
		R	T	U	V	W
		±1x10 ⁻⁷	±5x10 ⁻⁸	±2x10 ⁻⁸	±1x10 ⁻⁸	±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	*	*	*	*	◇

Legend

- * = 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.

Part Number Example:
VFOV202-WDEDH-10.000MHz

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				
	HCMOS (100 MHz)	10 kΩ // 5pF				
	Sine wave	50			Ω	
Frequency Stability						
Frequency	F _{NOM}	5	-	250	MHz	
Freq. vs Temperature (See table 1 options)	Ref to 25°C, air flow 0.5 m/s max	-	-	±5	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	
		-	-	±50	ppb/year	
G-Sensitivity	Worst direction	-	±1	-	ppb/g	
Allan Variance	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	-	+11	dBm	
	V _{CC} = 3.3V	+4	-	+9		
Harmonics	Sinewave	-	-	-25	dBc	
Sub-harmonics	Frequency < 30 MHz	-	-	None		
	Frequency > 30 MHz (Sine)	-	-	-40	dBc	
	Frequency > 30 MHz (HCMOS)	-	-	-35		
Phase Noise	Offset		10 MHz (typical)	100 MHz (typical)		
	1 Hz		-90	-		
	10 Hz		-120	-90		
	100 Hz		-140	-120		
	1 kHz		-150	-140	dBc/Hz	
	10 kHz		-158	-145		
For additional phase noise performance options, consult factory.	100 kHz		-160	-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_0	± 0.5	± 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	

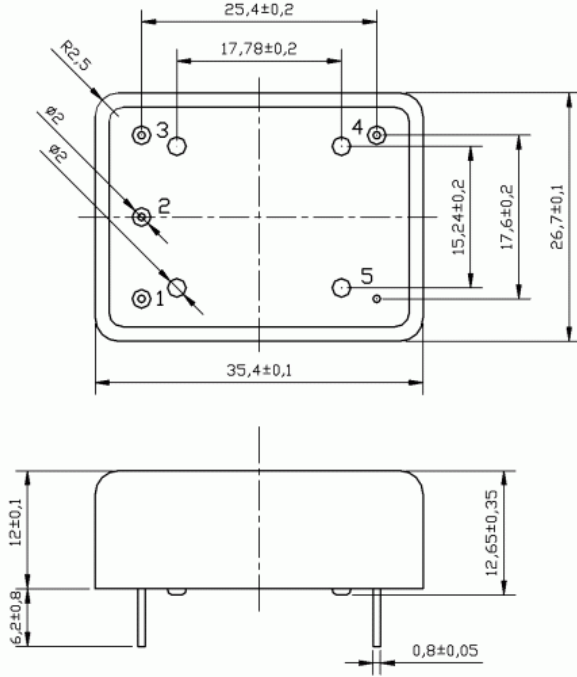
Absolute Ratings

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

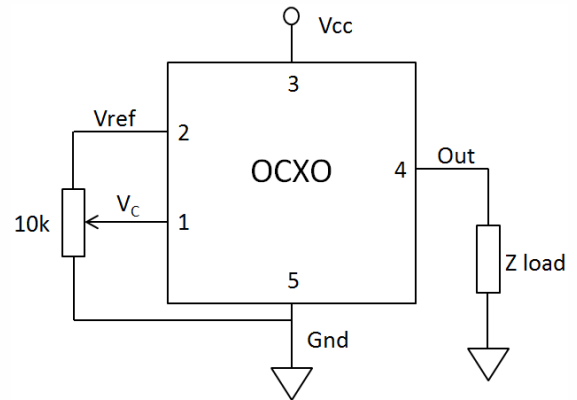
Parameter	Condition
Storage Temperature Range	$-60^{\circ}C$ to $+90^{\circ}C$
Humidity	Hermetically sealed
Mechanical Shock	MIL-STD-202G, meth 213B, 30g, 11ms, 1/2 sine pulse
Vibration	MIL-STD-202G, meth 204D, 1.5mm DA 10 to 55Hz, 10G pk sine to 500Hz
Soldering Conditions	Hand solder only – not reflow compatible. $260^{\circ}C$, 10 seconds.

Mechanical Specifications



All dimensions: mm

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



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