

VFOV200

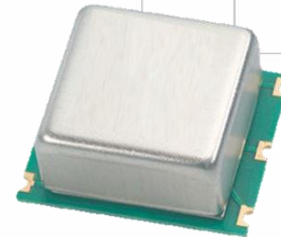
OCXO – Ultra Low Noise, Ultra Stable

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 Clock Systems
- Base Station reference source
- GPS holdover
- Instrumentation / test and measurement



Dimensions: 25.4 × 22.1 × 11.2 mm

Ordering Information – Table 1

Model	Stability	Temperature Range	Supply Voltage	Aging	Output	Frequency, MHz
VFOV200	— W	D	E	C	H	10.000MHz

Code	Stability	Code	Temp range	Code	Supply	Code	Output
R	1x10 ⁻⁷	A	0 to 50°C	D	5.0V ±5%	H	HCMOS
T	5x10 ⁻⁸	B	0 to 70°C	E	3.3V ±5%	S	Sine wave
U	2x10 ⁻⁸	C	-10 to 60°C	B	12V ±5%		
V	1x10 ⁻⁸	D	-20 to 70°C				
W	5x10 ⁻⁹	E	-30 to 70°C				
		G	-40 to 85°C				

Code	Per day	Per year
I	1.5 ppb	0.15 ppm
C	1 ppb	0.1 ppm
D	0.5 ppb	50 ppb
G	0.2 ppb	30 ppb

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:
VFOV200-WDECH-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 4.75 3.15	12.0 5.0 3.3	12.6 5.25 3.45	Vdc
Power Consumption	Steady State; T _A = 25°C Start-up	- -	1.0 3.2	1.2 3.5	W
Load	HCMOS (10 MHz) HCMOS (100 MHz) Sine wave		10 kΩ // 15pF 10 kΩ // 5pF 50		Ω
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 (See table 1 options)	- -	- -	±0.5 ±50	ppb/day 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} - 3.8 2.4	- - - -	0.4 0.4 - -	Vdc
Rise/Fall Times	10 MHz 100 MHz	- -	- -	10 3	ns
Duty Cycle	@50% of output signal	45	50	55	%
Sine Wave Output Levels (Option S)	V _{CC} = 5.0 or 12V V _{CC} = 3.3V	+6 +3	+8 +4	+10 +5	dBm
Harmonics		-	-	-25	dBc
Sub-harmonics (Note 1)	Frequency < 30 MHz Frequency > 30 MHz only	None -	- -	- -40	dBc
Phase Noise (Note 2)	Offset		10 MHz (typical)	100 MHz (typical)	
	1 Hz		-90	-	
	10 Hz		-120	-90	
	100 Hz		-140	-120	
	1 kHz		-155	-140	dBc/Hz
	10 kHz		-165	-160	
	100 kHz		-168	-165	



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	-	4.2	Volts
	$V_{CC} = 3.3V$	0.0	-	2.8	
Frequency Tuning Range	From F_O	± 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	

Note 1 – For output without sub-harmonics above 30 MHz, please refer to CTS Model VFOV100

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

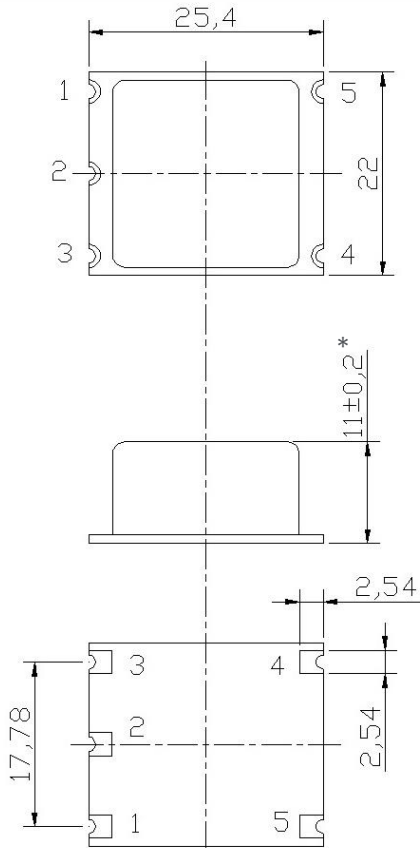
Absolute Ratings

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	

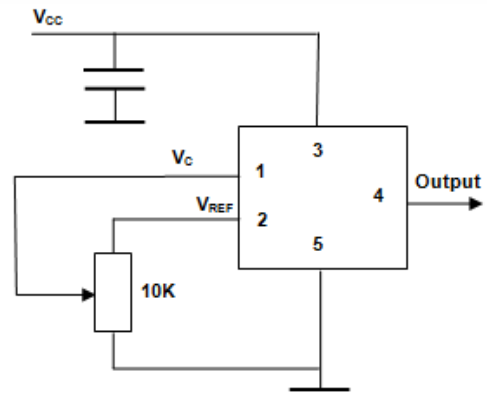
Mechanical and Environmental

Parameter	Condition
Storage Temperature Range	$-60^{\circ}C$ to $+90^{\circ}C$
Seal	Non hermetic – cleaning by liquid immersion is not recommended
Humidity	Non-condensing 95%
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.
Markings	Epoxy ink or laser engraved

Mechanical Specifications



Pin	Connection
1	V_C
2	V_{REF}
3	V_{CC}
4	Output
5	Ground



* 12.7 mm height is required for some high stability options. Consult factory.

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