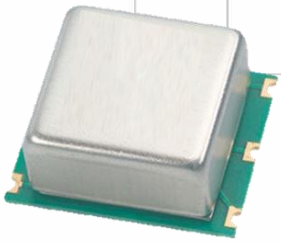
VFOV100

OCXO – Ultra Low Noise, Ultra Stable

Features

- 5 to 120 MHz Frequency Range
- Ultra low phase noise available
  - -155 dBc/Hz @ 1kHz
  - -168 dBc/Hz floor
- Sine wave or HCMOS output
- Fundamental crystal – no multiplication



Dimensions: 25.4 × 22.1 x 11 mm

Applications

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

Ordering Information – Table 1

Model	Stability	Temperature Range	Supply Voltage	Aging	Output		Frequency, MHz
VFOV100	— W	G	E	D	S	—	10.000MHz

Code	Stability
R	$1x10^{-7}$
T	$5x10^{-8}$
U	$2x10^{-8}$
V	$1x10^{-8}$
W	$5x10^{-9}$
29	$2x10^{-9}$

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	
A	5 ppb	0.5 ppm	≥50MHz
F	3 ppb	0.3 ppm	
B	2 ppb	0.2 ppm	
D	0.5 ppb	60 ppb	<50MHz
E	0.4 ppb	50 ppb	

* All temperature stabilities are not available for all frequencies. Consult factory for specific options.

Part Number Example:

VFOV100-WGEDS-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 3.14	12.0 5.0 3.3	12.6 5.25 3.46	Vdc
Power Consumption	Steady State; T_A = 25°C Steady State; T_A = -30°C Start-up	- -	1.0 2.0 3.2	1.2 2.2 3.5	W
Load	HCMOS Sine wave		10 kΩ // 15pF 50		Ω
Frequency Stability					
Frequency	F_{NOM}	5	-	120	MHz
Freq. vs Temperature	(See table 1 options)	-	±10	-	ppb
Freq. vs Supply Voltage	V_{CC} ±5%	-	±3	±5	ppb
Freq. vs Time (Aging)	After 30 days of operation	- -	±3 ±0.3	- -	ppb/day ppm/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} V_{OL}	- -	- -	0.4 0.4	Vdc
		V_{OH} V_{OH}	3.8 2.4	- -	- -	
Rise/Fall Times	100 MHz		-	-	10	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				none		

Phase Noise (Note 1)	Offset	10 MHz (typical)	100 MHz (typical)	dBc/Hz
	1 Hz	-90	-	
	10 Hz	-120	-90	
	100 Hz	-140	-120	
	1 kHz	-155	-140	
	10 kHz	-165	-160	
	100 kHz	-168	-165	

Note 1 – For additional phase noise options, consult factory.

Electrical Specifications (Continued)

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
Electronic Frequency Control - EFC (Optional)					
EFC Control Voltage	V_{CC} = 5.0 or 12V V_{CC} = 3.3V	0.0 0.0	- -	4.2 2.8	Volts
Frequency Tuning Range	From F_O	±0.5	±1	-	ppm
Deviation Slope (Positive/monotonic)	V_{CC} = 5.0 or 12V V_{CC} = 3.3V	0.125 0.4	-	-	ppm/V
Reference Output	V_{CC} = 5.0 or 12V V_{CC} = 3.3V	4.1 2.7	4.2 2.8	4.3 2.9	Volts

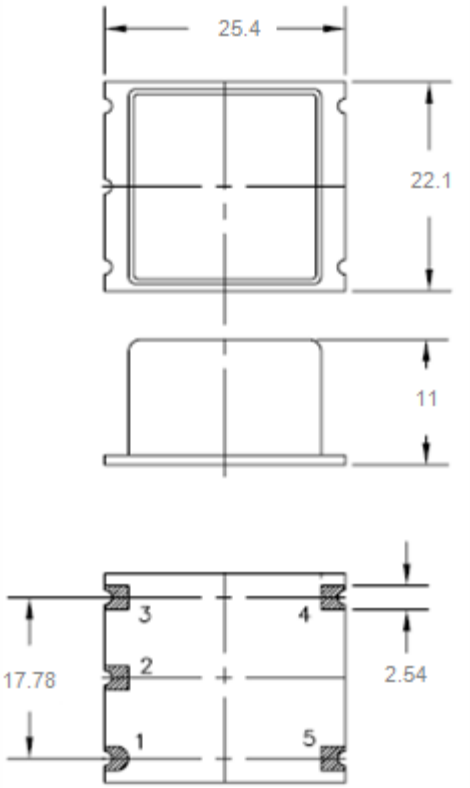
Absolute Ratings

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	

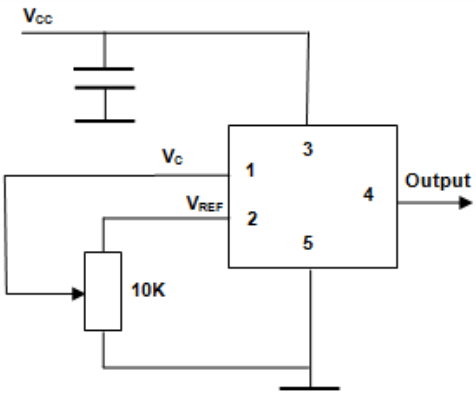
Mechanical and Environmental

Parameter	Condition
Storage Temperature Range	-60°C to +90°°C
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°C, 10 seconds.
Markings	Epoxy ink or laser engraved

Mechanical Specifications



Pin	Connection
1	$V_{CONTROL}$ (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.