

VFOV100

OCXO – Ultra Low Noise, Ultra Stable

Features

- 5 to 150 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 × 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	— 28	G	E	D	S	— 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	≤150MHz
F	3 ppb	0.3 ppm	≤120MHz
B	2 ppb	0.2 ppm	≤40MHz
C	1 ppb	0.1 ppm	≤40MHz
D	0.5 ppb	60 ppb	≤20MHz
G	0.2 ppb	20 ppb	≤10MHz
H	0.1 ppb	15 ppb	≤10MHz

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

Part Number Example: **VFOV100-28GEDS-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		
		3.14	3.3	3.46		
Power Consumption	Steady State; T _A = 25°C	-	1.0	1.5	W	
	Steady State; T _A = -30°C	-	2.0	2.2		
	Start-up	-	3.2	3.6		
Load	HCMOS (10 MHz)	10 kΩ // 15pF				
	HCMOS (100 MHz)	10 kΩ // 5pF				
	Sine wave	50			Ω	
Frequency Stability						
Frequency	F _{NOM}	5	-	150	MHz	
Freq. vs Temperature (See table 1 options)	Ref to 25°C, air flow 0.5 m/s max	-	±10	-	ppb	
Freq. vs Supply Voltage	V _{CC} ±5%	-	±3	±5	ppb	
Freq. vs Time (Aging) (See table 1 options)	After 30 days of operation	-	±3	-	ppb/day	
		-	±0.3	-	ppm/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 30 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				-25	dBc	
Sub-harmonics				none		
Phase Noise	<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		
For additional phase noise performance options, consult factory.	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} at time of shipment. Sufficient range for 10 years aging.	± 0.3	± 1	-	ppm
Deviation Slope (Positive/monotonic)	$V_{CC} = 5.0$ or $12V$	0.14	-	-	ppm/V
	$V_{CC} = 3.3V$	0.2	-	-	
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	

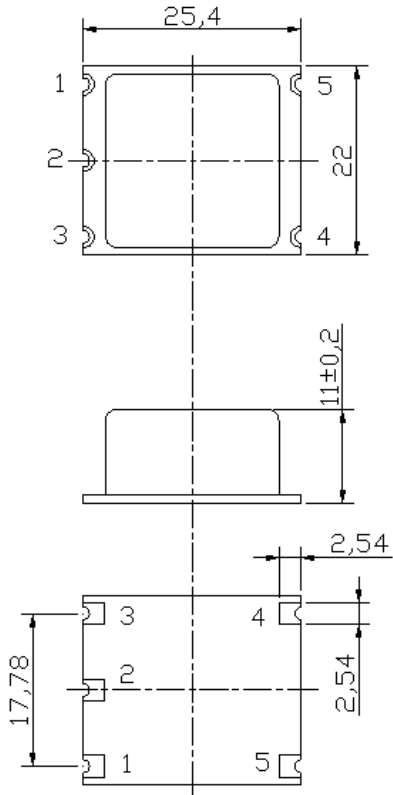
Absolute Ratings

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	

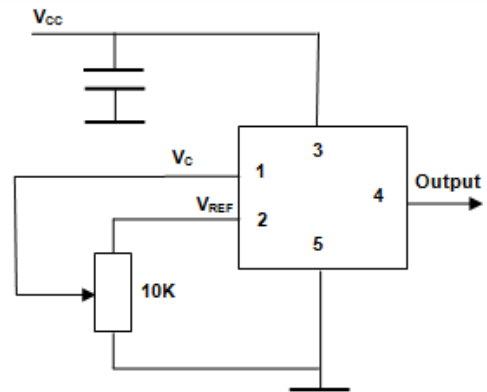
Mechanical and Environmental

Parameter	Condition
Storage Temperature Range	$-60^{\circ}C$ to $+90^{\circ}C$
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	$260^{\circ}C$, 10 seconds. Hand solder only – not reflow compatible.
Markings	Laser engraved

Mechanical Specifications



Pin Assignments	
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.

All dimensions: mm

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