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	— 18	D	E	D	H	— 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

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	
C	1 ppb	0.1 ppm	≤200MHz
D	0.5 ppb	0.05 ppm	≤100MHz
G	0.2 ppb	0.02 ppm	≤50MHz
H	0.1 ppb	0.015 ppm	

Available Frequency Stabilities over Operating Temperature Ranges **

Code	Temperature Range	Stability				
		17	58	28	18	59
		±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	*	*	*	*	◊

* = 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: VFOV202-59DEDH-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 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)	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 ±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} V_{OL}	- -	- -	0.4 0.4	Vdc
		V_{OH} V_{OH}	3.8 2.4	- -	- -	
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	- -	+11 +9	dBm
Harmonics	Sinewave		-	-	-25	dBc
Sub-harmonics	Frequency < 30 MHz Frequency > 30 MHz (Sine) Frequency > 30 MHz (HCMOS)		- - -	None - -	- -40 -35	dBc

Phase Noise For additional phase noise performance options, consult factory.	Offset	10 MHz (typical)	100 MHz (typical)	dBc/Hz
	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 V_{CC} = 3.3V	0.0 0.0	- -	4.3 2.8	Volts
Frequency Tuning Range	From F_{NOM} – sufficient for 10 years aging	±0.3	±1	-	ppm
Deviation Slope	Positive, monotonic	-	0.4	-	ppm/V
Reference Output	V_{CC} = 5.0 or 12V V_{CC} = 3.3V	4.0 2.7	4.2 2.8	4.3 2.9	Volts

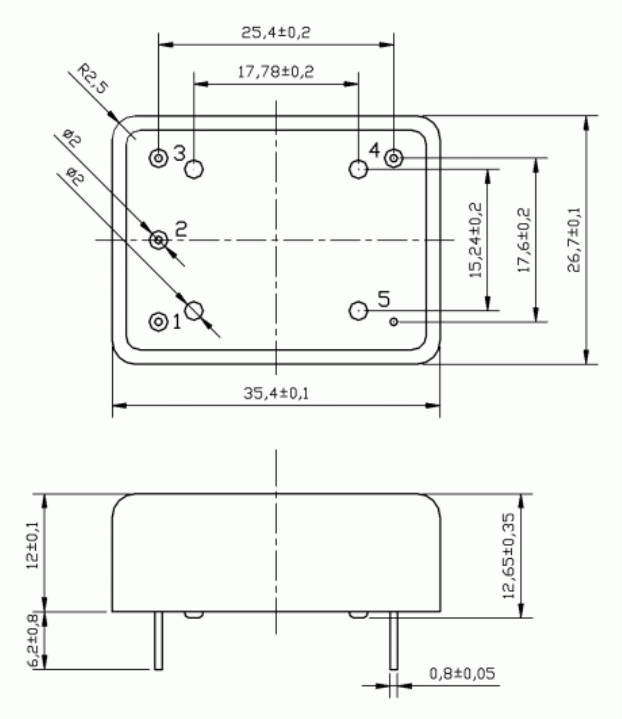
Absolute Ratings

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
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 – not reflow compatible. 260°C, 10 seconds.

Mechanical Specifications



All dimensions: mm

Pin Assignments

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

Connection Diagram