VFOV203

OCXO – High Frequency, High Stability

Features

- 5MHz to 250MHz frequency range
- High Stability: up to 5ppb over -40° – 85°C
- Sinewave or HCMOS output

Dimensions: 25.4 x 25.4 x 13.25 mm

Applications

- PLL reference for Telecommunication Systems
- Stratum 3E clock systems
- Base Station reference source
- GPS holdover
- Instrumentation / Test and Measurement

Table 1 - Ordering Information

Model		Stability	Temp Range	Supply Voltage	Aging	Output		Frequency
VFOV203	—	28	B	E	B	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	5V ± 5%
E	3.3V ± 5%
B	12V ±5%

Code	Output
H	HCMOS
S	Sinewave

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: VFOV203-28BEBH-50M000

Electrical Specifications

Parameter	Conditions & Remarks		Min	Typical	Max	Unit
Operating Conditions						
Operating Temperature Range	See "Ordering Information" table		-30	-	+70	°C
Supply Voltage	V_{CC}		3.10 4.75 11.4	3.3 5.0 12.0	3.50 5.25 12.6	Vdc
Power Consumption	During warm up Steady state @ 25°C Steady state @ -30°C		- - -	3.2 1.0 2.0	3.5 1.2 2.2	W
Load	HCMOS (10 MHz) HCMOS (100 MHz) Sine wave			10Kohm / 15pF 10Kohm / 5pF 50		Ω/pF Ω/pF 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		-	-	±20	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 ±0.1	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	T_A=25°C; to within 0.1 ppm accuracy of freq. @ 30 min		-	2	3	minutes
Output Parameters						
HCMOS/TTL Output Levels (order code H)	V_{CC} = 5.0 or 12V V_{CC} = 3.3V	V_{OL}	- -	- -	0.4 0.4	V
		V_{OH}	3.8 2.4	- -	- -	V
Rise / Fall Times	10 MHz 100 MHz		- -	- -	10 3	ns
Duty Cycle	@50% of output signal		45	50	55	%
Sinewave Output (order code S)	V_{CC} = 5.0 or 12V V_{CC} = 3.3V		+6 +3	+8 -	+10 +9	dBm
Harmonics			-	-	-25	dBc
Sub-harmonics	Frequency <30MHz Frequency >30MHz (Sine) Frequency >30MHz (HCMOS)		- - -	None - -	- -40 -35	dBc

Output Parameters - continued

Parameter	Conditions & Remarks	Min	Typical	Max
Phase Noise For additional phase noise performance options, consult factory.	Offset 1Hz 10Hz 100Hz 1KHz 10KHz 100KHz	10MHz (typical) -100 -125 -145 -160 -165 -168	100MHz (typical) - -100 -125 -140 -150 -150	dBc/Hz

Electronic Frequency Control

Control Voltage	V_C	V_{CC} = 5.0 or 12V V_{CC} = 3.3V	0 0	- -	4.3 2.8	V
Frequency Tuning Range	From F_O - sufficient range for 10 years aging.		±0.3	±1	-	ppm
Deviation Slope	Monotonic, positive		-	0.4	-	ppm/V
Reference output	V_{REF}	V_{CC} = 5.0 or 12V V_{CC} = 3.3V	4.0 2.7	4.2 2.8	4.3 2.9	V

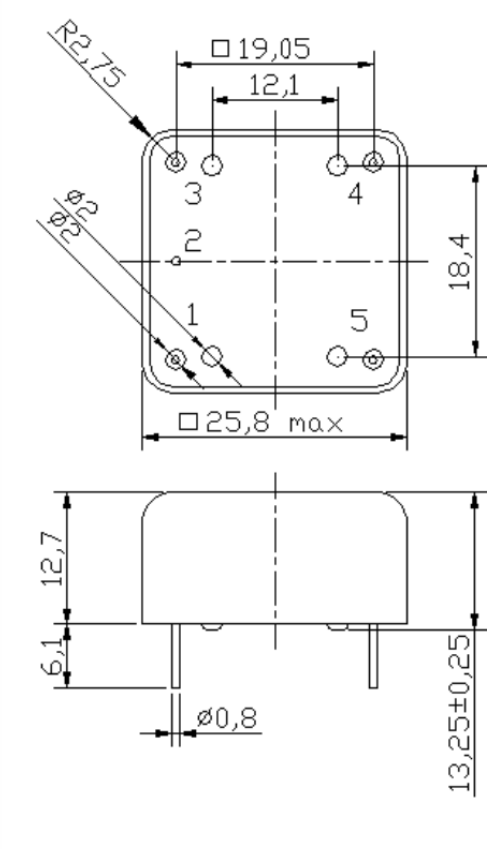
Absolute Maximum Ratings

Supply Breakdown Voltage	V_{CC}	-0.5	-	V_{CC} + 20%	V
Control Voltage	V_C	-1	-	9	V

Mechanical and Environmental

Storage Temperature	-60°C to +90°C
Humidity	Hermetically sealed
Mechanical Shock	Per MIL-STD-202G, meth 213B, 30g, 11 ms, ½ sine pulse
Vibration	Per MIL-STD-202G, meth 204D, 1.5mm DA 10 to 55Hz, 10g pk sine to 2000Hz
Soldering Conditions	260°C for 10s. Hand solder only – not reflow compatible

Mechanical Specifications



All dimensions: mm

Pin Assignments

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

Connection Diagram