VFOV504

OCXO – Ultra Low Power

Features

- 30MHz to 150MHz frequency range
- Fast warm-up
- Ultra low power consumption
- Sinewave or HCMOS output
- Low phase noise fundamental mode

Dimensions: 21.6 x 15.3 x 10 mm

Description

The VFOV504 is a high stability, low power OCXO that utilizes Internal Heating Resonator (IHR) technology. The entire oven control system along with the SC resonator are housed inside of the TO-8 vacuum enclosure to reduce OCXO size, power consumption and warm-up time. Applications for this product include PLL reference for telecom systems, Portable equipment, Instrumentation/Test and Measurement, and Microwave communications.

Ordering Information – Table 1

Model		Stability	Temp Range	Supply Voltage	Aging	Voltage Control (EFC)	Output	Sinewave Output Level		Frequency
VFOV504	-	U	B	E	B	N	H		-	50MHz

Code	Specification
R	±1x10^{-7}
T	±5x10^{-8}
U	±2x10^{-8}

Code	Specification
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	Per day	Per year
A	5ppb	0.5ppm
F	3ppb	0.3ppm
B	2ppb	0.2ppm

Code	Specification
D	5V ± 5%
E	3.3V ± 5%

Code	Spec.
H	HCMOS
S	Sinewave

Code	Spec.
V	EFC
N	No EFC

Consult factory to specify alternative sinewave output level.

Examples:
For standard – leave this option blank

Enter “8” for +8 dBm min, or “5” for +5 dBm minimum.

Enter “82 for +8 dBm, ±2 dB, or “53” for +5 dBm, ±3 dB.

Available Frequency Stabilities over Operating Temperature Ranges

Code	Temperature Range	Stability R ±1x10^{-7}	Stability T ±5x10^{-8}	Stability U ±2x10^{-8}
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	*	*	

Part Number Examples:

VFOV504-TDEBNS-50MHz
or
VFOV504-TDEBNS8-50MHz
or
VFOV504-TDEBNS82-50MHz

Electrical Specifications

Parameter	Conditions & Remarks	Min	Typical	Max	Unit
Operating Conditions					
Operating Temperature Range	See "Ordering Information" table	-40	-	+85	°C
Supply Voltage	V_{CC}	3.135 4.75	3.3 5.0	3.465 5.25	Vdc
Power Consumption	During warm up	-	-	1.5	W
	Steady state @ 25°C	-	0.12	0.23	
	Steady state @ -30°C	-	0.4	0.6	
Frequency Stability					
Frequency Range	F_{NOM}	30		150	MHz
Calibration	Without voltage control option	-	-	±100	ppb
Temperature Stability	See options Table 1	-	±50	-	ppb
Voltage Stability	V_{CC} ±5%	-	±5	-	ppb
Aging (After 30 days)	Per day	-	±3	-	ppb/day
	Per year	-	±0.3	-	ppm/year
Allan Deviation	1s	-	0.02	-	ppb
Retrace	After 30 minutes	-	-	±20	ppb
G-Sensitivity (Note 1)	Worst axis	-	1*	-	ppb/g
Warmup-Up Time	T_A=25°C; to within 0.1 ppm accuracy of freq. @ 30 min	-	60	90	seconds
Phase Noise -100MHz (See Note 2)	10Hz	-	-90	-	dBc/Hz
	100Hz	-	-120	-	
	1KHz	-	-140	-	
	10KHz	-	-160	-	
	100KHz	-	-165	-	
Output Parameters					
HCMOS/TTL (order code H)	$F_{NOM} \le 50$ MHz		10kOhms / 15 pF		
	$50 < F_{NOM} \le 80$ MHz		10kOhms / 10 pF		
	$80 < F_{NOM} \le 100$ MHz		10kOhms / 8 pF		
	$F_{NOM} \ge 100$ MHz		10kOhms / 5 pF		
	V_H V_{CC} = 5.0V	3.8	-	-	V
	V_H V_{CC} = 3.3V	2.4	-	-	
	V_L	-	-	0.4	V
Rise / Fall Times	@ 100MHz	-	-	3	ns
Duty Cycle		45		55	%
Sinewave Output (order code S)	V_{CC} = 5.0V	+7.5	+8	+10	dBm
	V_{CC} = 3.3V	+4	+5	+7	
	R_L	-	50	-	Ω
Harmonics		-	-	-25	dBc
Sub-harmonics			none		

Note 1. Lower G-sensitivity performance is available. Consult factory.
Note 2. For additional phase noise options, consult factory

Electrical Specifications continued

Electronic Frequency Control (option)

Control Voltage	V_C	V_{CC} = 5.0V V_{CC} = 3.3V	0 0	- -	4.2 2.8	V
Pull Range	Sufficient range to reset to F_{NOM} for 10 years.		-	±1	-	ppm
Deviation Slope	Monotonic, positive		-	0.8	-	ppm/V
Reference output	V_{REF}	V_{CC} = 5.0V V_{CC} = 3.3V	4.1 2.73	4.2 2.8	4.3 2.87	V

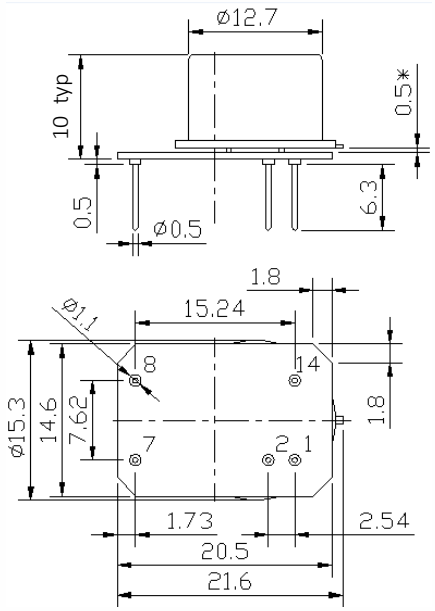
Absolute Maximum Ratings

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

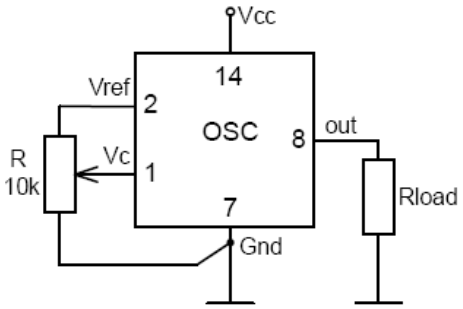
Mechanical and Environmental

Storage Temperature	-60°C to +90°C
Humidity	Non-condensing, 95%
Mechanical Shock	Per MIL-STD-202, 30g, half sine, 11 ms
Vibration	Per MIL-STD-202, 10g, swept sine to 2000Hz
Soldering Conditions	260°C for 10s. Hand solder only – not reflow compatible
Marking	Epoxy ink or laser engraved

Mechanical Specifications



All tolerances – 0.254mm (0.01")



Pin	Connection
1	V_C
2	V_{REF}
7	Ground
8	Output
14	V_{CC}