

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: 21.51 x 15.1 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	$\pm 1 \times 10^{-7}$
T	$\pm 5 \times 10^{-8}$
U	$\pm 2 \times 10^{-8}$

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	Spec.
H	HCMOS
S	Sinewave

Code	Specification
D	5V $\pm$ 5%
E	3.3V $\pm$ 5%

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	T	U
		$\pm 1 \times 10^{-7}$	$\pm 5 \times 10^{-8}$	$\pm 2 \times 10^{-8}$
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)	-30 to +70°C; standard option shown.	-	±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 Variance	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} ≤ 50 MHz		10kOhms / 15 pF			
	50 < F _{NOM} ≤ 80 MHz		10kOhms / 10 pF			
	80 < F _{NOM} ≤ 100 MHz		10kOhms / 8 pF			
	F _{NOM} ≥ 100 MHz		10kOhms / 5 pF			
	V _H	V _{CC} = 5.0V	3.8	-	-	V
		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	$V_{CC} = 5.0V$	0	-	4.2	V
		$V_{CC} = 3.3V$	0	-	2.8	
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}	$V_{CC} = 5.0V$	4.1	4.2	4.3	V
		$V_{CC} = 3.3V$	2.73	2.8	2.87	

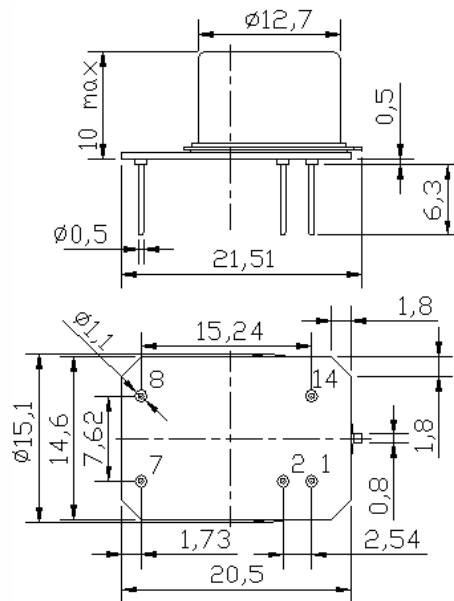
Absolute Maximum Ratings

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

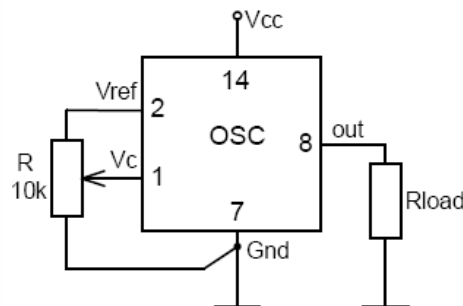
Mechanical and Environmental

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}