VFOV514

Low Power OCXO

Features

- 8MHz to 150MHz frequency range
- Fast warm-up
- Very low power consumption
- Sinewave or HCMOS output
- Vibration resistant construction

Dimensions: 21.6 x 15.3 x 9.5 mm

Description

The VFOV514 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.

Table 1 - Ordering Information

Model	Stability	Temp Range	Supply Voltage	Aging	Output	Voltage control	Package Type	Mech Shock		Frequency
VFOV514	— 28	D	E	C	H	N	T	__	—	xxxMxxx

Code	Stability
17	$\pm 1x10^{-7}$
58	$\pm 5x10^{-8}$
38	$\pm 3x10^{-8}$
28	$\pm 2x10^{-8}$
18	$\pm 1x10^{-8}$
59	$\pm 5x10^{-9}$
39	$\pm 3x10^{-9}$
19	$\pm 1x10^{-9}$

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%

Code	Output
H	HCMOS
S	Sinewave

Code	Spec.
blank	EFC (std)
N	No EFC

Code	Pkg
T	Thru hole
S	SMD

Code	Per day	Per year	
A	5ppb	0.5ppm	≤150MHz
F	3ppb	0.3ppm	≤120MHz
B	2ppb	0.2ppm	
I	1.5ppb	0.15ppm	≤50MHz
C	1ppb	0.1ppm	≤40MHz
D	0.5ppb	0.05ppm	≤20MHz
L	0.3ppb	0.03ppm	≤10MHz
G	0.2ppb	0.02ppm	

Code	Shock Level
blank	30G (std)
5	500G

Table 2 - Available Frequency Stabilities vs. Operating Temperature

		Stability							
		17	58	38	28	18	59	39	19
Code	Temperature Range	$\pm 1x10^{-7}$	$\pm 5x10^{-8}$	$\pm 3x10^{-8}$	$\pm 2x10^{-8}$	$\pm 1x10^{-8}$	$\pm 5x10^{-9}$	$\pm 3x10^{-9}$	$\pm 1x10^{-9}$
A	0 to 50°C	*	*	*	*	D	C	C	B
B	0 to 70°C	*	*	*	*	C	B	B	A
C	-10 to 60°C	*	*	*	*	C	B	B	A
D	-20 to 70°C	*	*	D	D	C	A	B	
E	-30 to 70°C	*	*	D	D	C	A	B	
G	-40 to 85°C	*	*	D	D	B	A	A	

Stability Legend

* = Available for all frequencies
A = ≤10 MHz
B = ≤30 MHz
C = ≤50 MHz
D = ≤100 MHz

Deviations of parameters from those indicated are available to meet specific customer requirements. Consult factory.

Part Number Example: VFOV514-28DECHNT-10M000

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Electrical Specifications

Parameter	Conditions & Remarks		Min	Typical	Max	Unit
Operating Conditions						
Operating Temperature Range	See Table 1		-40	-	+85	°C
Supply Voltage	V_{CC}		4.75 3.15	5 3.3	5.25 3.45	Vdc
Power Consumption	During warm up Steady state @ 25°C		- -	- 150	1200 -	mW
Frequency Stability						
Frequency Range	F_{NOM}		8	-	150	MHz
Frequency Calibration	Voltage Control option 'N' only		-	±200	-	ppb
Temperature Stability	See Table 2 for options		-	±5	-	ppb
Voltage Stability	V_{CC} ±5%		-	±2	-	ppb
Aging (After 30 days)	See Table 1 for options	Per day	-	-	±0.5	ppb
		Per year	-	-	±0.05	ppm
Allan Deviation	1s		-	0.02	-	ppb
Retrace	After 30 minutes		-	-	±20	ppb
G-Sensitivity (Note 1)	Worst axis (0 ~ 1kHz)		-	1*	-	ppb/g
Warmup-Up Time	T_A=25°C; to within 0.1 ppm accuracy of freq. @ 15 min		-	60	-	seconds
Output Parameters						
HCMOS/TTL (order code H)	Load	≤50 MHz ≤80 MHz ≤150 MHz		10kOhms / 15 pF 10kOhms / 10 pF 10kOhms / 5 pF		
	V_H	V_{CC} = 5.0V V_{CC} = 3.3V	3.8 2.4	- -	- -	V
	V_L		-	-	0.4	V
Rise / Fall Times	@ 10MHz/100MHz		-	-	10/3	ns
Duty Cycle			45		55	%
Sinewave Output (order code S)	V_{CC} = 5.0V V_{CC} = 3.3V		+7 +4	- -	- -	dBm
	R_L		-	50	-	Ω
Harmonics			-	-	-25	dBc
Sub-harmonics				None		

Phase Noise (Note 2)	Offset	10 MHz (typ)	100 MHz (typ)	
	1 Hz	-90	-	dBc/Hz
	10 Hz	-120	-90	
	100 Hz	-145	-120	
	1 kHz	-155	-145	
	10 kHz	-165	-165	
	100 kHz	-165	-165	

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

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Electrical Specifications continued

Electronic Frequency Control option (EFC)

Control Voltage	V_C	V_{CC} = 5.0V V_{CC} = 3.3V	0 0	- -	4.2 2.8	V
Tuning Range	Sufficient for 10 yrs aging; Slope positive, monotonic		±0.3	±1	-	ppm
Reference output	V_{REF}	V_{CC} = 5.0V V_{CC} = 3.3V	4.0 2.7	4.2 3.0	4.3 3.1	V

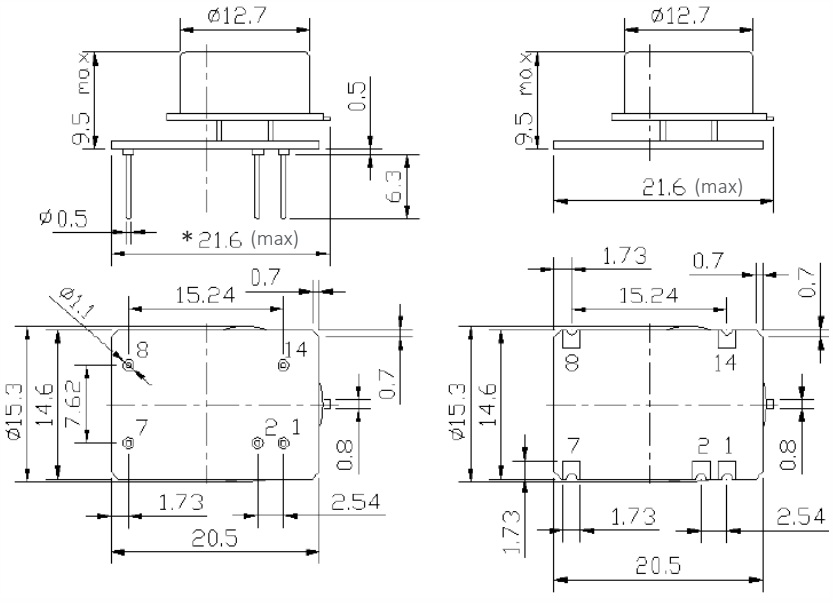
Absolute Maximum Ratings

Supply Breakdown Voltage	V_{CC}	-0.5	-	V_{CC} + 20%	V
Control Voltage	V_C	-1	-	6	V

Mechanical and Environmental

Storage Temperature	-60°C to +85°C
Air flow	0.5 m/s max.
Humidity	Non-condensing, 95%
Mechanical Shock	Per MIL-STD-202, 30g, half sine, 11 ms (500G, 1ms option "5")
Vibration	Per MIL-STD-202, 10g, swept sine to 2000Hz
Altitude	Meets all electrical specifications to 70,000 ft elevation
Soldering Conditions	260°C for 10s. **Hand solder only – not reflow compatible ****
Marking	Laser engraved

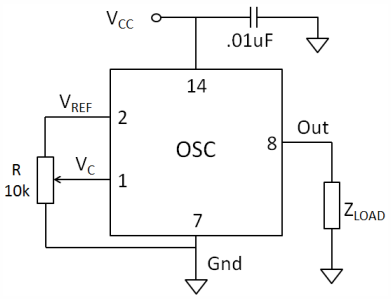
Mechanical Specifications



All tolerances – 0.254mm (0.01")

**Not reflow compatible

Connection Diagram



Pin Assignments

Pin	Connection
1	V_C or N.C.
2	V_{REF} or N.C.
7	Ground
8	Output
14	V_{CC}

* Note - The tab on the metal enclosure may be rotated 180° for certain frequency and performance combinations.

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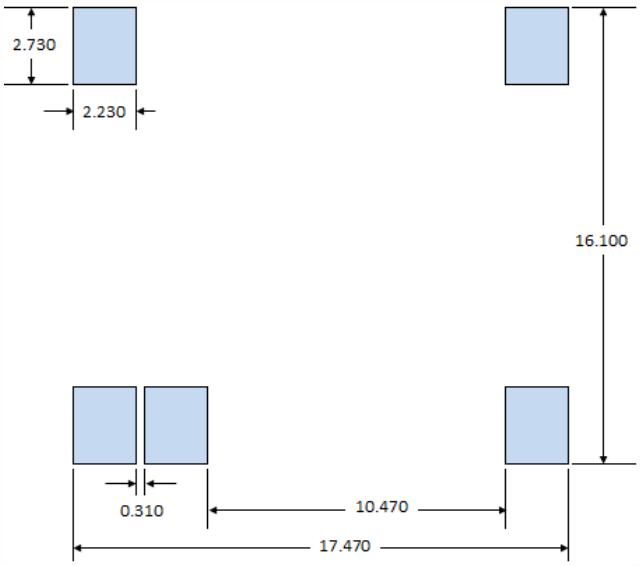
Recommended SMD Solder Pad Geometry



This product is specified for use only in standard commercial applications. Supplier disclaims all express and implied warranties and liability in connection with any use of this product in any non-commercial applications or in any application that may expose the product to conditions that are outside of the tolerances provided in its specification.

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