

VFOV400 Series

OCXO - Ultra Miniature, Ultra Low Power

HCMOS / SINEWAVE

Features

- 5MHz to 250MHz Frequency Range
- Industry's smallest OCXO
- Fast Warm-up (30s typical)
- Eco-friendly < 120mW power consumption
- Sine Wave or HCMOS output
- Multiple package options
- Vibration resistant construction

RoHS Status

RoHS
6/6

Applications

- PLL reference for Telecommunication Systems
- Portable (battery operated) devices
- Guidance Systems
- Instrumentation / Test and Measurement

Replaces Valpey Fisher Part Number(s): VFT14A, VFT14AS, VFT8S

Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Frequency Range	F		5 5		250 50	MHz	VFOV404, VFOV406 VFOV405
Frequency Stability	$\Delta F/F$	Vs. Operating Temp. E: -30°C to +70°C		± 50		ppb	STD option shown. See "How to Order" Chart below
		Vs. Supply Voltage		±2		ppb	Ref. Vcc typ.
		Vs. Aging / Day Vs. Aging / Year			0.5 ±0.05	ppb ppm	After 30 days. Enhanced option shown. See "How to Order" chart
Operating Temperature Range	T		-40°		+85°	°C	STD option shown. See "How to Order" chart
Allan Variance		1s		20e-12			
SSB Phase Noise		1Hz 10Hz 100Hz 1KHz 10KHz		-90 -125 -145 -155 -165		dBc/Hz	For 10MHz Oscillator (For 100MHz see noise plot)
Retrace		After 30 min.			±20	ppb	
G-sensitivity		worst direction			±1	ppb/g	
Supply Voltage	Vcc		4.75 3.14	5.0 3.3	5.25 3.46	V	
Power Consumption	P	steady state, 25°C start-up		0.12 0.7	0.15 1.2	W	
Warm up time	τ	to 0.1ppm accuracy from +25°C		30	60	sec	Note 1

*Note 1: Warm up time is affected by input voltage, initial accuracy, frequency, aging and other conditions.

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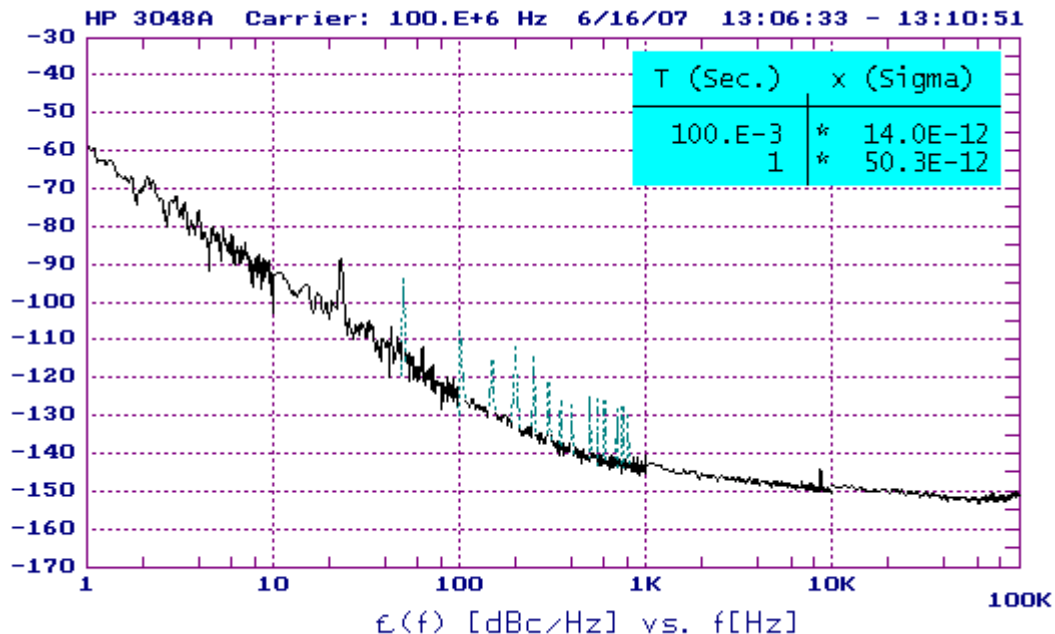
HCMOS / SINEWAVE



Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
HCMOS / TTL Output Levels		HCMOS/TTL	10KOhm / 15pF				Order Code H
	V _H	V _{cc} = 5V V _{cc} =3.3V	3.9 2.4			V	
	V _L				0.4	V	
Rise / Fall time		At 10MHz			10	ns	
Duty Cycle			45		55	%	
Sine-Wave Output (VFOV404 & VFOV406 only)		V _{cc} =5V	+6	+8		dBm	Order Code S
		V _{cc} =3.3V	+3	+5			
	R _L			50		Ω	
Harmonics					-25	dBc	
Sub-Harmonics (VFOV404 only)		Frequency >30MHz			-40	dBc	**Multiplied fundamental
Control Voltage	V _c	V _{cc} = 5 V _{cc} =3.3V	0 0		4.3 2.8	V	
Pull Range		from nominal F	±0.5	±1		ppm	At 100MHz
Deviation slope		Monotonic, Positive		0.6 0.45		ppm/ V	V _{cc} = 3.3V V _{cc} = 5V
Reference output	V _{ref}	V _{cc} = 5 V _{cc} =3.3V	4.05 2.70	4.20 2.80	4.35 2.90	V	

** High frequency fundamental (up to 120MHz) available without sub-harmonics. Please refer to VFOV500.



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Absolute Maximum Ratings

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply Break Down Voltage	V _{cc}		-0.5		V _{cc} +20%	V	
Control Voltage	V _c		-1		9	V	

Environmental and Mechanical

Parameter	Specification
Storage Temperature	-60°C to +90°C
Humidity	Non-condensing, 95%
Mechanical Shock	Per MIL-STD-202, 30g, half sine, 11ms
Vibration	Per MIL-STD-202, 10g swept Sine to 2000Hz
Soldering Conditions	260°C for 10s

How to Order

Model	Stability	Temperature Range	Supply Voltage	Aging	Output	Frequency, MHz
VFOV405	W	D	E	C	H	10

Package Dimensions (mm)	
VFOV401	20 x 20
VFOV404	21.85 x 15.1
VFOV405	14 x 14
VFOV406	21.85 x 19 SMD

Code	Specification
A	0°C to 50°C
B	0°C to 70°C
C	-10°C to 60°C
D	-20°C to 70°C
E	-30°C to 70°C
G	-40°C to 85°C

Code	Per day	Per year
C	1ppb	0.1ppm
D	0.5ppb	0.05ppm

Code	Specification
R	1x10 ⁻⁷
T	5x10 ⁻⁸
U	2x10 ⁻⁸
V	1x10 ⁻⁸
W	5x10 ⁻⁹

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

Code	Specification
H	HCMOS
S	Sinewave

Available Frequency Stabilities over Operating Temperature Ranges

Order Code	Temperature Range	Stability				
		1x10 ⁻⁷	5x10 ⁻⁸	2x10 ⁻⁸	1x10 ⁻⁸	5x10 ⁻⁹
A	0°C to 50°C	*	*	*	*	◇
B	0°C to 70°C	*	*	*	◇	
C	-10°C to 60°C	*	*	*	*	◇
D	-20°C to 70°C	*	*	*		
E	-30°C to 70°C	*	*	*		
G	-40°C to 85°C	*	◇	◇		

◇ Only available below 30Mhz



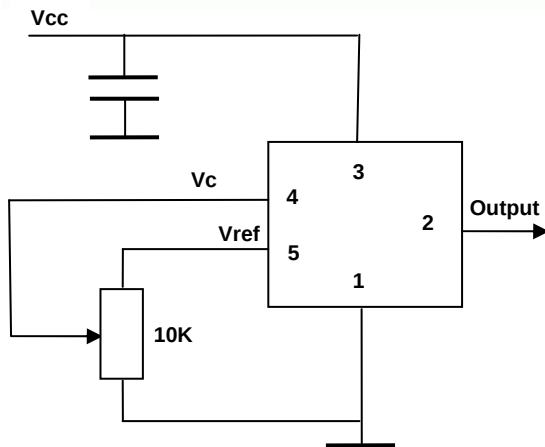
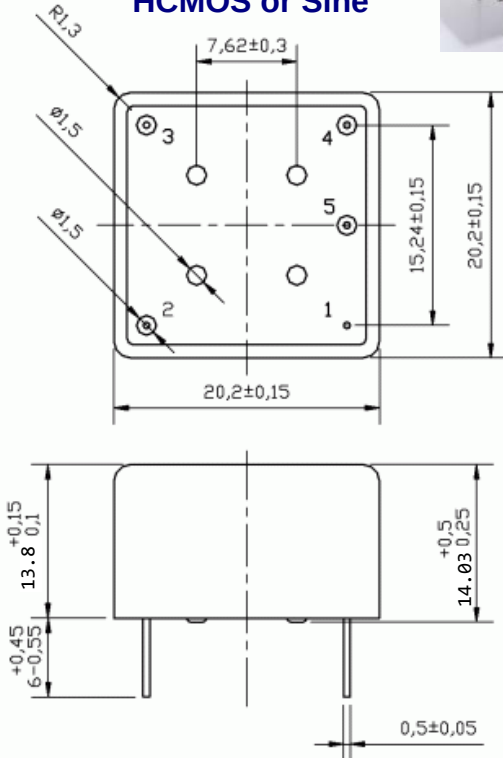
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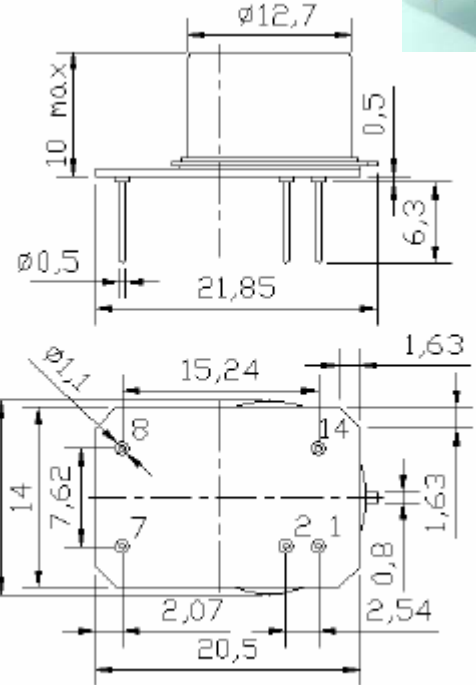
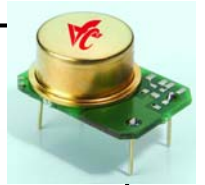
Package Options

VFOV401 Hermetically Sealed HCMOS or Sine

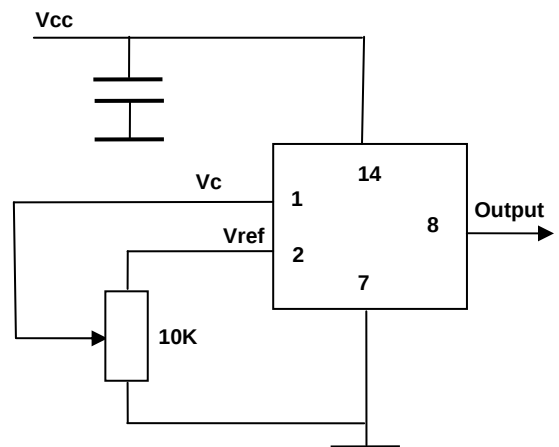


Pin #	Connection
1	Gnd, Case
2	Output
3	Vcc
4	Vc
5	Vref

VFOV404 HCMOS or Sine



All tolerances 0.1mm (0.004")

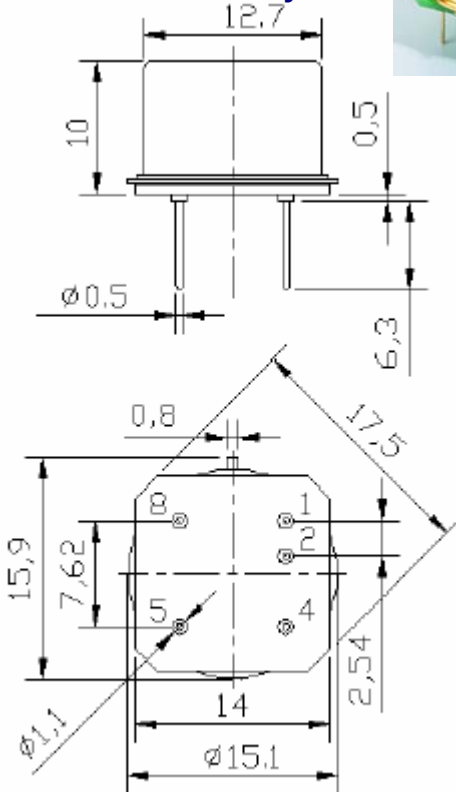


Pin	Connection
1	Vcontrol
2	Vref.
7	GND
8	Output
14	Vcc

Valpey Fisher Corporation
High Frequency, Low Phase Noise Timing Solutions

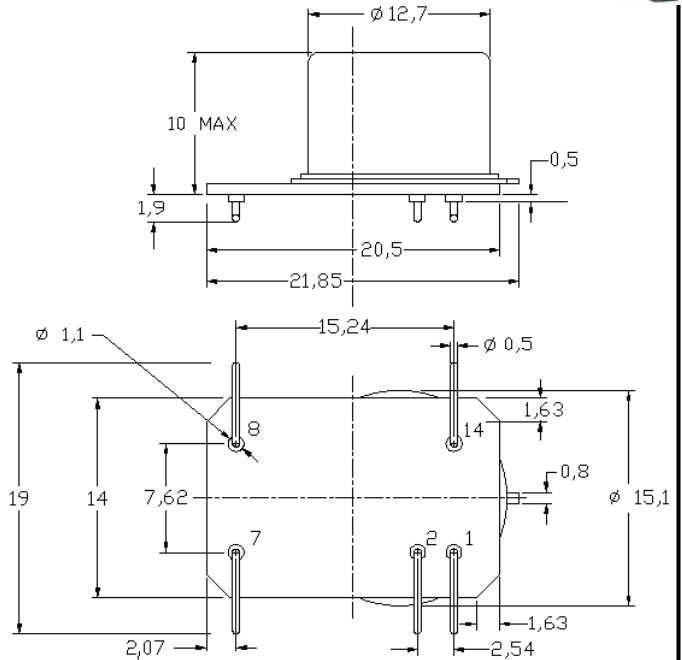
VFOV405

HCMOS only



VFOV406

HCMOS or Sine



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