

VFOV404

OCXO - Ultra Miniature, Ultra Low Power HCMOS / SINE WAVE



Features

- 5MHz to 250MHz frequency range
- Industry's smallest OCXO
- Fast warm-up
- Eco-friendly < 120mW power consumption
- Sine wave or HCMOS output
- Vibration resistant construction



RoHS Status

RoHS
6/6

Applications

- PLL Reference for Telecommunication Systems
- Portable (Battery Operated) Devices
- Guidance Systems
- Instrumentation / Test and Measurement

Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Frequency Range	F		5		250	MHz	
Frequency Stability	$\Delta F/F$	Vs. Operating temperature E: -30°C to +70°C		± 50		ppb	STD option shown. See "How to Order" chart
		Vs. Supply voltage		±2		ppb	Ref. V _{CC} 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) Note 1
Retrace		After 30 min.			±20	ppb	
G-Sensitivity		worst direction			±1	ppb/g	
Supply Voltage	V _{CC}		4.75 3.14	5.0 3.3	5.25 3.46	V	
Power Consumption	P	steady state, 25°C start-up		0.15 0.7	0.22 1.2	W	
Warm Up Time	τ	to 0.1ppm accuracy from +25°C		60	90	sec	

Note 1: See CTS Model VFOV504 for alternate product with enhanced phase noise at high frequencies and no sub-harmonics.



VFOV404

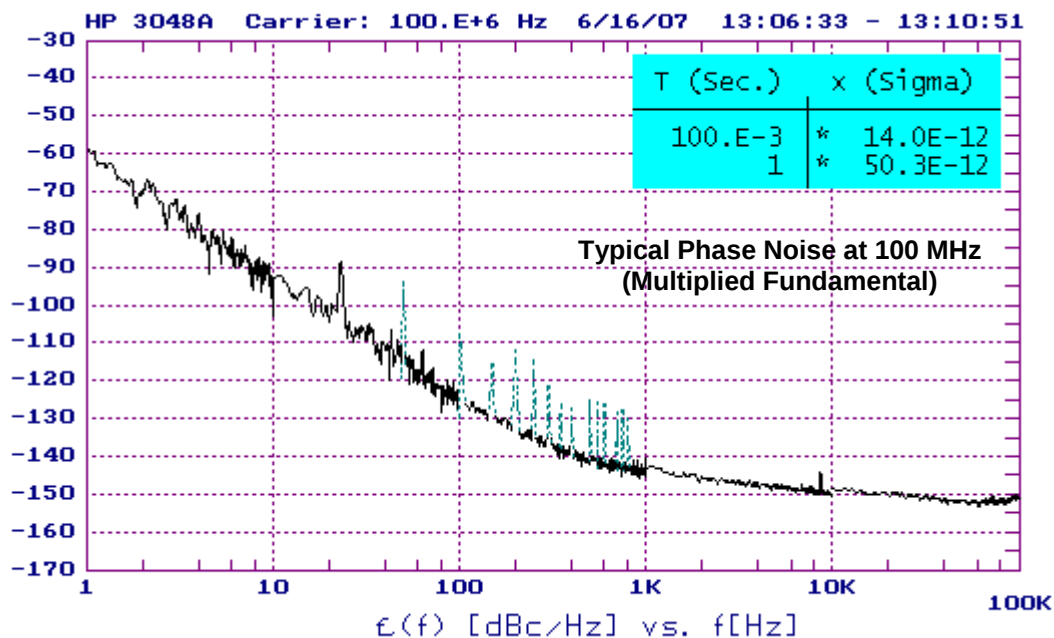
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HCMOS / SINE WAVE



Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
HCMOS / TTL Output Levels		HCMOS/TTL	10kOhms / 15pF				Order Code H
	V_H	$V_{CC}= 5.0V$ $V_{CC}=3.3V$	3.8 2.4			V	
	V_L				0.4	V	
Rise / Fall Time	T_R/T_F	At 10MHz			10	ns	
Duty Cycle			45		55	%	
Sine-Wave Output		$V_{CC}= 5.0V$	+6	+8		dBm	Order Code S
		$V_{CC}=3.3V$	+3	+5			
	R_L			50		Ω	
Harmonics					-25	dBc	
Sub-Harmonics		Frequency >30MHz			-40	dBc	Multiplied fundamental Note 1
Control Voltage	V_C	$V_{CC}= 5.0V$ $V_{CC}=3.3V$	0 0		4.2 2.8	V	
Pull Range		from F_{NOM}	± 0.5	± 1		ppm	
Deviation Slope		Monotonic, positive		0.6 0.45		ppm/V	$V_{CC} = 3.3V$ $V_{CC} = 5V$
Reference Output	V_{REF}	$V_{CC}= 5.0V$ $V_{CC}=3.3V$	4.05 2.70	4.20 2.80	4.35 2.90	V	



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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 Conditions

Parameter	Condition
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. Hand solder only – not reflow compatible
Markings	Epoxy ink or laser engraved

How to Order

Model	Stability	Temperature Range	Supply Voltage	Aging	Output	Frequency, MHz
VFOV404	W	D	E	C	H	10

Code	Specification
R	1×10^{-7}
T	5×10^{-8}
30	3×10^{-8}
U	2×10^{-8}
V	1×10^{-8}
W	5×10^{-9}

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

Code	Specification
H	HCMOS
S	Sine wave

Code	Per day	Per year	
A	5ppb	0.5ppm	$\leq 250\text{MHz}$
B	2ppb	0.2ppm	
I	1.5ppb	0.15ppm	
C	1ppb	0.1ppm	$\leq 150\text{MHz}$
D	0.5ppb	0.05ppm	
G	0.2ppb	0.02ppm	

Available Frequency Stabilities over Operating Temperature Ranges

Order Code	Temperature Range	Stability					
		R	T	30	U	V	W
		1×10^{-7}	5×10^{-8}	3×10^{-8}	2×10^{-8}	1×10^{-8}	5×10^{-9}
A	0°C to 50°C	*	*	*	*	*	D
B	0°C to 70°C	*	*	*	*	D	C
C	-10°C to 60°C	*	*	*	*	D	C
D	-20°C to 70°C	*	*	*	*	C	B
E	-30°C to 70°C	*	*	*	C	C	A
G	-40°C to 85°C	*	*	*	D	B	A

Stability Legend

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

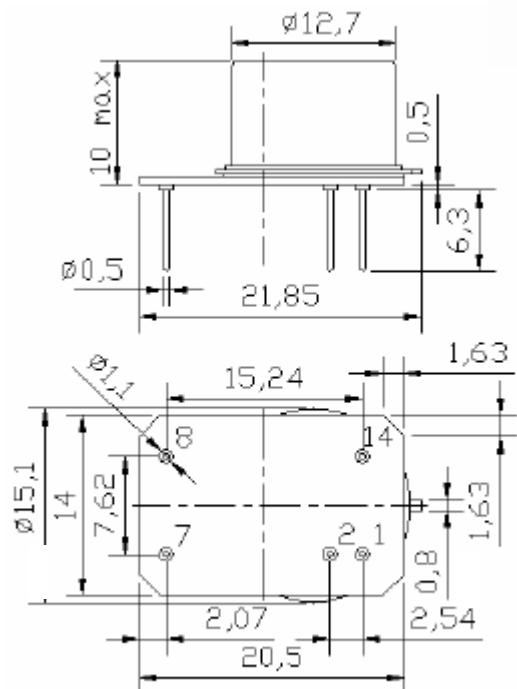
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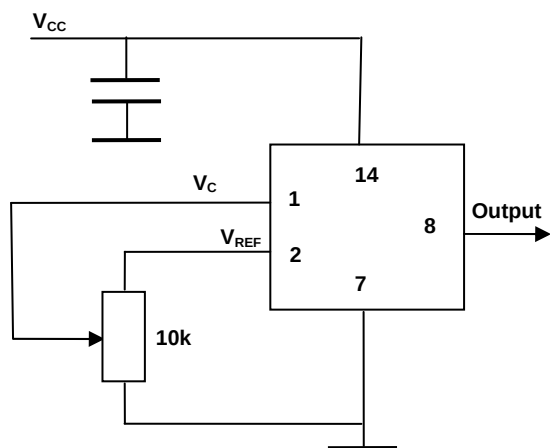
HCMOS / SINE WAVE

Package

VFOV404 HCMOS or Sine Wave



All tolerances 0.1mm (0.004")



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

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

CTS:

[VFOV404-TGDDS-25.6MHz](#)