VFOV650

Oven Controlled Crystal Oscillator

High Stability, DIL-14 package

Features

- High stability – small package - fast warmup time
- Low power consumption - low drift - tight holdover
- Very low phase noise (-174dBc floor available)
- 10 MHz to 50 MHz frequencies available
- Accurate clock with no tuning required
- Voltage control function available

RoHS Status

RoHS 6/6

Applications

- IEEE 1588 clock
- Stratum 3 holdover
- Wireless base stations
- Timing over packet
- Remote sensing instrumentation

Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Frequency Range			10.0		50.0	MHz	
Frequency Stability	ΔF/F	Initial Calibration ($\Delta F/F_{NOM}$)		±300	±500	ppb	For fixed frequency option only
		Vs. Operating Temperature (Ref to +25°C Frequency)		±10		ppb	See "How to Order" Chart for Available Options
		Vs. Supply Voltage		±2.0		ppb	V_{CC} Δ±5%
Aging	ΔF/F	Per day First year 10 years		±1.0 ±0.2 ±1.5		ppb ppm ppm	After 30 days. Values for ≤ 20 MHz frequency. For frequencies above 20MHz contact factory for aging limits.
Total Free Run Accuracy		Over all conditions for 10 year life			±2.5	ppm	For fixed frequency option only and frequency ≤20MHz
Operating Temperature Range	T		-40		+85	°C	See "How to Order" Chart for Available Options
SSB Phase Noise	L(f)	10 Hz 100 Hz 10 kHz 100 kHz 1 MHz		-110 -135 -160 -163 -163		dBc/Hz	At 20 MHz - Performance is dependent on frequency
		Enhanced phase noise versions available. Noise floor below -174dBc/Hz available. Contact factory for custom quotation.					
Supply Current	I_{CC}	Steady state, 25°C still air Steady state, -40°C still air Start-up Current		160 350 500	180 550	mA	V_{CC}=3.30V See Note 1

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Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply Voltage	V_{CC}		3.13	3.3	3.46	V	5V Option available – contact factory
Output Waveform/Load		HCMOS/TTL Compatible Square Wave	10KOhm||15pF				
Symmetry			45		55	%	
Rise/Fall Time	T_R/T_F	10KOhm || 15pf load		1.2		ns	
Control Voltage Range	V_C		0.0		3.3	V	For voltage control option only
Deviation Range (Voltage control option devices only)		From F_{NOM}		±1.5		ppm	Typical value. Actual value supplied is dependent on frequency
Warm-up time	τ	To +/-10 ppb of 30 minute frequency		1		min	at +25°C

Absolute Maximum Ratings

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Supply Break Down Voltage	V_{CC}		-0.5		4.0	V	
Storage Temperature	T_S		-55		125	°C	
Control Voltage	V_C		-1		6	V	

Environmental and Mechanical Conditions

Parameter	Condition
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Sine Vibration	MIL-STD-202, 5Gs Peak to 500 Hz
Random Vibration	MIL-STD-202F Method 214 5 Gs RMS 20 to 500Hz
Soldering/Processing	Hand/Wave Solder Compatible - Washable Hermetic Enclosure
Seal	Fully Hermetic
Moisture Sensitivity Level	MSL Level 1
Marking Permanency	MIL-STD-202F, Method 215
RoHS	Lead Free RoHS 6/6 compliant
Packaging	Antistatic Tubes

Note 1: Reduced power consumption versions available – contact factory

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How to Order

VFOV650 — [ ][ ][ ] — FREQUENCY, MHz

Temperature Stability

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

Temperature Range

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
G	-40°C to 85°C

Tuning

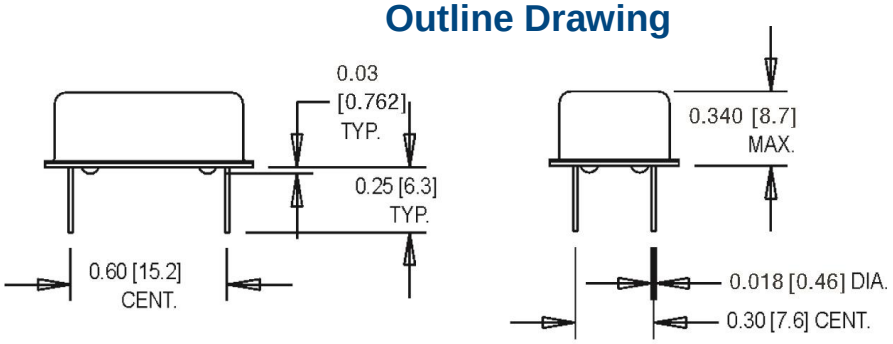
Code	Specification
	Fixed
V	Voltage Control

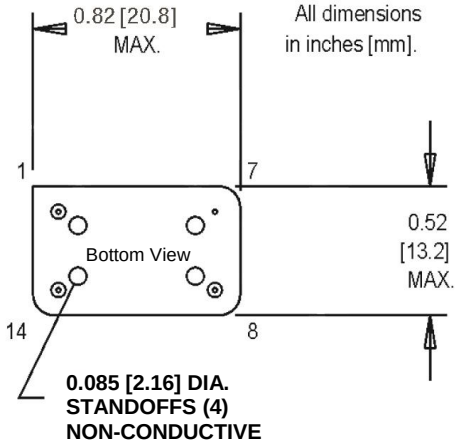
Available Stability Combinations

Code	Specification	0°C to 50°C	0°C to 70°C	-10°C to 60°C	-20°C to 70°C	-40°C to 85°C
R	±1x10^{-7}	×	×	×	×	×
T	±5x10^{-8}	×	×	×	×	×
U	±2x10^{-8}	×	×	×	×	×
V	±1x10^{-8}	×	o	o	o	

X = Available O = Available depending on Frequency – Consult Factory

Outline Drawing





Pin #	Connection
1	N/C (fixed frequency models) V_C (voltage control option models)
7	GND & Case
8	Output
14	V_{CC}