VFH3225

Extended Temperature/COTS XO, 3.2x2.5mm, SMD, CMOS

Features

- 25MHz to 160MHz frequency range
- 3.3V, 2.8V. 2.5V or 1.8V supply voltage
- Low Jitter
- Low power consumption
- Group A & B testing available

Part Dimensions: 3.2 x2.5 x 1.2 mm

Applications

- Military
- Industrial
- Portable

How to Order

VFH3225 — A D — Frequency, MHz

Frequency Stability	
Code	Stability
A	±100ppm
B	±50ppm

Supply Voltage	
Code	V_{DD}
D	3.3V
E	2.8V
F	2.5V
G	1.8V

Standard Available Frequencies:

25 MHZ, 33MHz, 50 MHz, 66 MHz, 75 MHz, 100 MHz, 125 MHz and 150 MHz

Consult Factory for Additional Available Frequencies.

Electrical Specifications

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Note
Frequency Range	F_{OUT}	3.3V 2.5V 1.8V	25	-	160	MHz	Consult Factory for standard frequencies
Frequency Stability	ΔF/F	vs. Operating Temperature	-	-	± 100 ± 50	ppm	Order Code A Order Code B
		vs. Supply Voltage vs. 1st year aging	-	-	± 3 ± 3		
Operating Temperature Frequency Range	T_A		-55	-	+125	°C	
Supply Voltage	V_{DD}		3.00 2.52 2.25 1.71	3.30 2.80 2.50 1.80	3.60 3.08 2.75 1.89	V	Order Code D Order Code E Order Code F Order Code G
Supply Current	I_{CC} MAX	25MHz ≤ F_O <160MHz	**3.3V** 10	**2.8V** **2.5V** 9 8	**1.8V** 7	mA	Max current across entire temp range
Tristate		Output Active or Enabled	$0.7V_{DD}$	-	-	V	
		Output in Tri-State (Disable)	-	-	$0.3V_{DD}$		
Rise / Fall Time	T_R/T_F	10% to 90% of V_{DD}	-	-	5.0	ns	
Duty Cycle			45	50	55	%	
Output		C_L= 15pF		LVCMOS			
Logic "1" Level	V_{OH}		90% V_{DD}	-	-	V	
Logic "0" Level	V_{OL}		-	-	10%V_{DD}	V	
Phase Noise	Φn	10Hz offset 100Hz 1kHz 10kHz 100kHz 1MHz	- - - - - -	-66 -101 -126 -138 -145 -149	- - - - - -	dBc/Hz	@66MHz
Start-Up Time			-	-	8	ms	
RMS Jitter	£	12KHz to 20MHz	-	0.25	>1	ps	
Storage Temperature	T_S		-55	-	+125°	°C	

Mechanical and Environmental

Parameter	Specification
Mechanical Shock	Per MIL-STD-202, Method 213, Condition E
Thermal Shock	Per MIL-STD-883, Method 1011, Condition A
Vibration	Per MIL-STD-883, Method 2007, Condition A
Soldering Conditions	260°C for 10s max
Hermetic Seal	Leak rate less than $5x10^{-8}$ atm.cc/s of helium

Table 1

Each unit undergoes screening for product level B class 2 oscillators by MIL-PRF-55310

Internal Visual	
Stabilization Bake	MIL-STD-883 Method 1008, COND. B
Temperature Cycling	MIL-STD-883 Method 1010, COND. B
Constant Acceleration	MIL-STD-883 Method 2001, COND. A
Fine Leak	MIL-STD-883 Method 1014, COND. A
Gross Leak	MIL-STD-883 Method 1014, COND. C
Burn-in	MIL-STD-883 Method 1015, COND. B (125°C for 160 hours with bias)
Electrical test at 25°C	
Current	Frequency at max V_{DD}
Rise Time	Frequency at min V_{DD}
Fall Time	"Zero" logic level
Duty Cycle	"One" logic level
Tristate	
Frequency at 25°C and frequency verification at temperature extremes	

Serialized test data on each unit available upon request for additional cost.

Thermal Characteristics

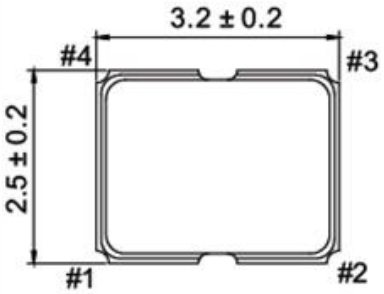
Thermal Resistance

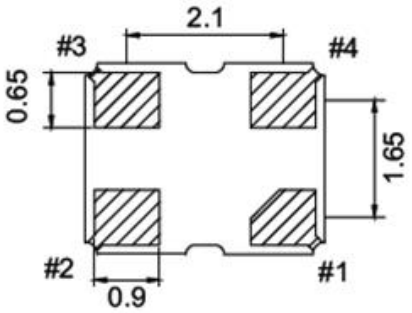
From Junction to Case, RØjc 16 °C/Watt

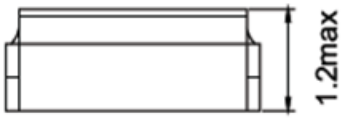
Surface Mount Application

These packages are designed for reflow soldering in accordance with recommended profiles. For hand-soldering, the temperature of the iron should not exceed 400°C for three seconds.

Mechanical Specifications







Pin Assignment

Pin #	Connection
1	Tristate
2	GND
3	Output
4	V_{DD}

Table 2

Reliability Test Procedures and Conditions for Quartz Crystal Oscillators

1. Group A

Electrical Characteristics at 25°C

Frequency at nominal supply voltage and endpoints
- Input current
- Symmetry (Duty Cycle)
- Zero/One levels
- Rise/Fall times
- Frequency (verify frequency at the temperature extremes)

Physical Dimensions
- Length/width
- Height
- Package finish (Corrosion, discoloration, etc.)
- Marking placement/legibility

2. Group B

1000 hrs at or above 125°C, nominal voltage, proper load (sample size by MIL -PRF-55310 table 6, max. aging within 15 years requirement without catastrophic failures)

3. Group C- All units have passed Group A testing

A. Subgroup 1: 8 pcs.

Standard	Condition	Description	End Point Measurement
MIL-STD-883	Method 2002 COND.B	Mechanical Shock 1500 g's, 0.5ms 5 drops, 6 axis	Frequency Output waveform
MIL-STD-883	Method 2007 COND. A	Vibration, var. freq. 20 g's, 0.06" disp., 20-20, 000-20 Hz	Frequency Output waveform
MIL-STD-883	Method 2003	Solderability	Visual 95% Coverage

Test data is available for additional cost.

B. Subgroup 2: 4 pcs (One-half of Subgroup 1)

Standard	Condition	Description	End point Measurement
MIL-STD-883	Method 1011 COND. B	Thermal Shock Liq. To liq. 15 cycles	Frequency Output waveform
MIL-STD-202	Method 105 COND. B	Altitude, 3.44 inch Hg. 12 hrs	Frequency Output waveform
MIL-STD-883	Method 1004	Moisture resist. with supply voltage applied 25°C to 65°C, 90 to 100% RH, 10 cycles	Frequency Output waveform
MIL-STD-202	Method 210 COND. A	Resistance to Solder Heat Immersion @350ºC 3.5 sec	Frequency Output waveform

C. Subgroups 3: 4 pcs. (One half of Subgroup 1)

Standard	Condition	Description	End point Measurement
	Storage Temp. No. Oper	24 hrs. @ -55°C 24 hrs. @ 125°C	Frequency Output waveform
MIL-STD-883	Method 1009 COND. A	Salt Atmosphere 24 hrs. @ 35°C 0.5-3.0% Solution	Frequency Output waveform Visual
MIL-STD-883	Method 1014 COND. A	Fine Leak	Qs <5 $X10^{-8}$
MIL-STD-883	Method 1014 COND. C	Gross Leak	Visual in 125°C Detector fluid