

## Low-G 222 Series OCXO

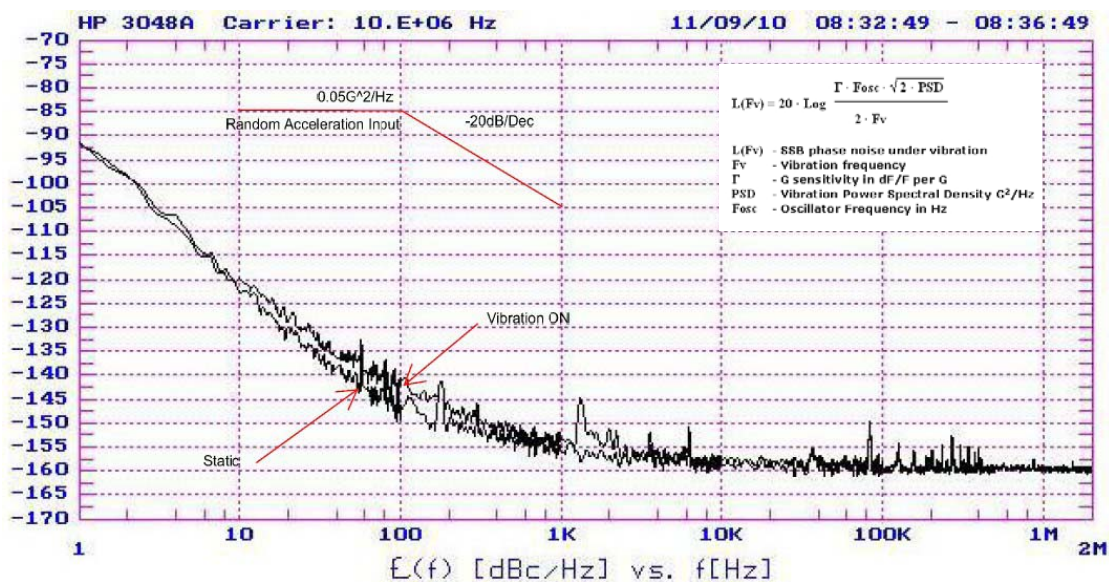
The 222 Series is a rugged Oven Controlled Crystal Oscillator ideal for demanding military applications such as UAVs, rotorcraft, and tracked vehicles as well as harsh industrial environments. The primary focus of the 222 Series are those applications requiring significantly reduced acceleration sensitivity beyond the levels obtainable through conventional solutions. Operating as a stand alone product or in tandem with mechanical shock and vibration systems, the 222 Series is capable of reducing the effects of acceleration on phase noise to levels near or below the noise floor.

## Features

- Low g-sensitivity < 2.0E-10/g/axis
- Internal 24-bit D/A converter for non-volatile calibration via I<sup>2</sup>C
- Factory optimized for your vibration profile
- Hermetic packaging
- Thermal stability to ±1.0E-08 over 100°C
- Wide temperature range available (-55°C to +95°C)
- Small package size (1.0"x1.0"x.565")
- Low static phase noise
- Optional internal ROM data storage
- Optional screening per MIL-PRF-55310
- Optional shock & vib systems

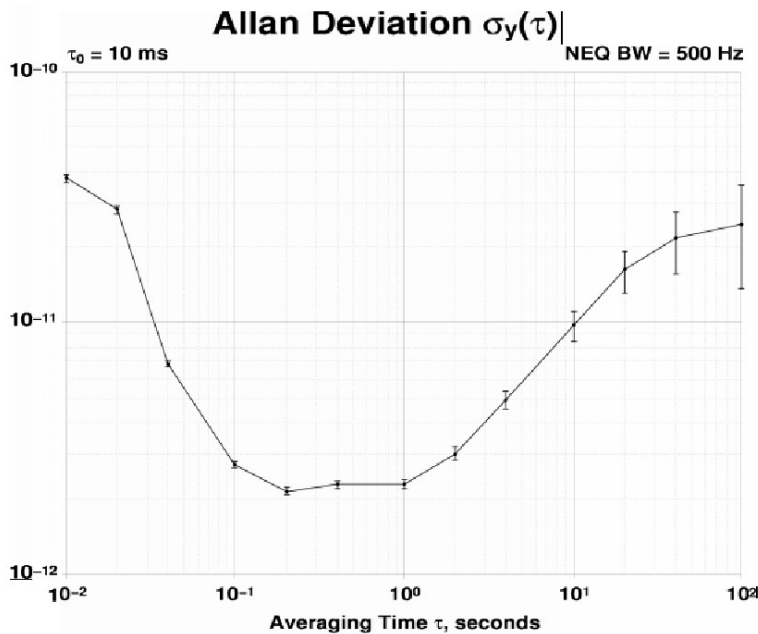


## Phase Noise under Random Vibration



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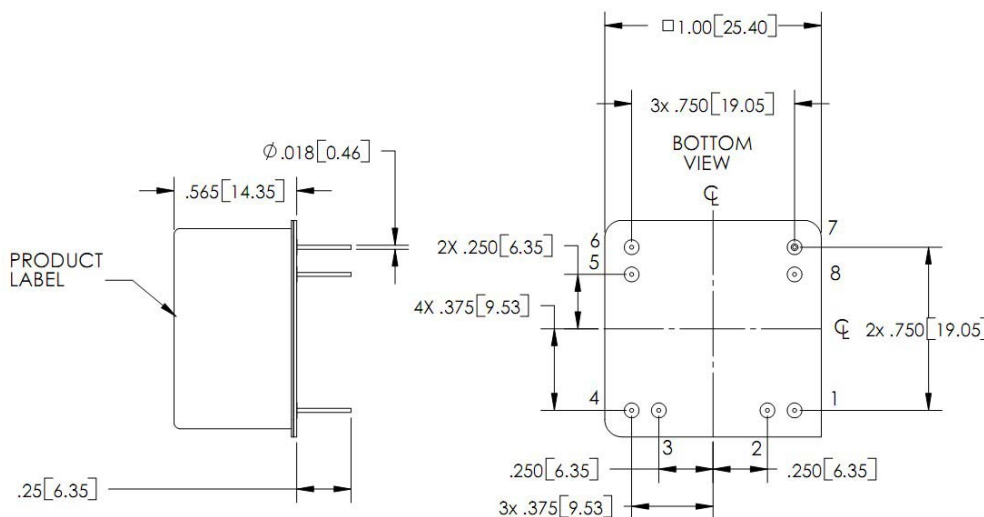
Vibration effects can be a significant problem in high frequency communication, navigation and RADAR systems often causing large phase excursions and degradation in phase noise performance and short-term stability. The 222 Series is designed to operate in high acceleration and vibration environments (up to 20 Grms, 20Hz - 2KHz) where its exceptional g-sensitivity and excellent overall stability make it the ideal choice for clean-up loops following GPS clocks, Cesium or Rubidium frequency standards and optical communications links. The 222 Series features a high resolution digital tuning interface via 24-bit DAC for precise control in critical applications. Optionally, a traditional analog tuning voltage input is also available. MTI can customize the 222 Series Oscillator for your specific application and vibration profile.



## Applications

- UAVs
- Manned Aircraft
- Rotocraft
- Tracked Vehicles
- Shipboard
- Mobile Equipment
- Industrial Installations
- RADAR
- Tactical Radio
- Secure Communications
- Precision Navigation

## 222 Series Interface Control Drawing





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## QUARTZ CRYSTAL OSCILLATOR SPECIFICATION

Customer :		Updated :	2012-5-15
Model # :	222-XXXX	Created :	2012-5-15
ICD # :		Page :	1 of 3

Electrical Parameter	Specification	Note #	Comments
Frequency	: 1.00000000E+07 Hz	3	
Initial Tolerance	: ± 0.0E+00		
Crystal Cut	: SC		
Overtone	: 3		
Thermal Stability	: 2.0E-08		
Temperature Range			
Minimum	: -30 °C		
Maximum	: 75 °C		
Aging			
Per Day	: 1.0E-09		
Per Month	: 0.0E+00	1	
Per Year	: 1.0E-07		
Output Type	: SINE	2	
Nominal	: 9.000 dBm		
Minimum	: 7.000 dBm		
Maximum	: 11.000 dBm		
Harmonics	: -20 dBc		
Subharmonics	: 0 dBc	1	
Spurious	: -80 dBc		
Phase Noise at Offsets of			
1 Hz	: -90 dBc/Hz	5	
10 Hz	: -120 dBc/Hz		
100 Hz	: -140 dBc/Hz		
1000 Hz	: -150 dBc/Hz		
10000 Hz	: -157 dBc/Hz		
100000 Hz	: -160 dBc/Hz		
Short Term Stability			
1 sec	: 1.0E-11		
10 sec	: 0.0E+00	1	

MTI-Milliren Technologies, Inc., Oscillator Specification

Customer :  
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 ICD # : 0

Updated : 2012-5-15  
 Created : 2012-5-15  
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Electrical Parameter	Specification	Note #	Comments
Supply Voltage Sensitivity	(±5%)		
df/dV	: 5.0E-09		
Load Sensitivity	(±5%)		
df/dL	: 5.0E-09		
g-sensitivity			
df/dg	: 2.0E-11	4	
Warm-up		6	
Time	: 3.0 Min		
df/f	: 5.0E-08		
Reference Time	: 30.0 Min		
Retrace			
df/f	: 5.0E-09		
Time Off	: 24.0 Hrs		
Time On	: 2.0 Hrs		
Warm-up			
Typical	: 4.500 W		
Minimum	: 0.000 W		
Maximum	: 5.500 W		
Continuous Power		6	
Typical	: 1.300 W		
Minimum	: 0.000 W		
Maximum	: 1.500 W		
Supply Voltage			
Nominal	: 6.50 V		
Minimum	: 6.18 V		
Maximum	: 6.82 V		
Reference Voltage			
Minimum	: 4.7 V		
Maximum	: 5.3 V		
Source Resistance	: 1.000E+02 Ω		
Tuning Voltage			
Minimum	: 0.0 V		
Maximum	: 5.0 V		
Tuning Slope	: Positive		
Tuning Input			
Resistance	: 5.000E+04 Ω		
Bandwidth	: 5.000E+02 Hz		
Tuning Linearity	: 20 %		
Electrical Tuning			
Minimum	: ± 8.0E-07		
Maximum	: ± 2.4E-06		
Mechanical Tuning			
Minimum	: ± 0.0E+00	1	
Maximum	: ± 0.0E+00	1	

## MTI-Milliren Technologies, Inc., Oscillator Specification

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### Notes

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1. Not applicable
2. Into a 50  $\Omega$  load
3. Initial Tolerance Not Applicable
4. Sensitivity per axis. Operational vibration level:
  - 10 Hz 0.05g<sup>2</sup>/Hz
  - 100 Hz 0.05g<sup>2</sup>/Hz
  - 100Hz to 1kHz -20dB/decade
  - Shock 30g, 11ns half sine
5. Static Noise Measurement
6. Still Air at 25°C