



# Preliminary

Helping Customers Innovate, Improve & Grow



VX-990

## Features

- Ultra low Phase Noise
- Ultra low G-Sensitivity
- Vibration hardened
- Tight Tolerances

## Applications

- Vibration Environment
- Airborne and Military Equipment
- Portable Equipment
- Radar

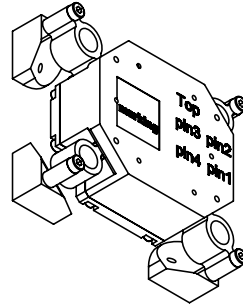
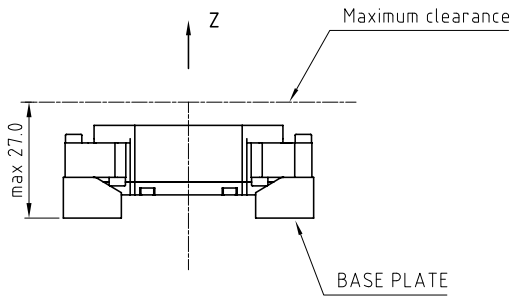
## Performance Specifications

Frequency Stabilities <sup>1</sup> (Frequency Range - 60 to 120 MHz)						
Parameter	Min	Typical	Max	Units	Condition	Options <sup>3</sup>
vs. operating temperature range (referenced to nominal frequency)	-15.0 -25.0		+15.0 +25.0	ppm ppm	-20 to +70°C -40 to +85°C	
Initial tolerance vs. supply voltage change	-15.0 -0.1		+15.0 +0.1	ppm ppm	25°C V <sub>s</sub> ±5% static Load ±10% static after 30 days of operation	
vs. load change	-0.1		+0.1	ppm		
vs. aging / 1 year	-1.0		+1.0	ppm		
vs. aging / 10 years	-3.0		+3.0	ppm		

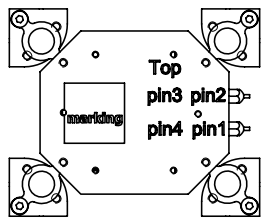
## Performance Specifications

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition	
Supply voltage (standard)	14.25	15	15.75	VDC		
Current consumption			100	mA		
RF Output						
Signal [standard]	Sinewave				50 Ω load	
Load	45	50	55	Ohm		
Output Power	11	13	15	dBm	50 Ω load	
Harmonics			-30	dBc	50 Ω load	
Spurious			-80	dBc	50 Ω load	
Frequency Tuning (EFC)						
Absolute Pulling Range	±0.0			ppm	Pulling range is sufficient to tune the oscillator over lifetime of 10 years and all circumstances to nominal frequency	
Linearity	<10%					
Tuning Slope	Positive					
Control Voltage Range	-4	0	+4	VDC	@ Vs=15V	
Frequency control input impedance	50			kOhm		
Additional Parameters						
Phase Noise <sup>2</sup>		-90 -127 -153 -167 -173 -175		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz 1000 kHz	@ 120 MHz 13 dBm sinewave no vibration
Weight		35	50	g		
Processing & Packing	Handling & Processing Note					
Additional Environmental Conditions						
Random Vibration	RTCA/DO-160 D, Section 8, Category R or R2 curve C and C1					
Shock	MIL-STD-202G; Method 213B; 15 g / 20 ms				for softest shock absorber i.e. lowest resonance frequency	
Absolute Maximum Ratings						
supply voltage (Vs)			16.0	V		
Output Load	45		55	Ω		
Operable Temperature Range	-40		+85	°C		
Storage Temperature Range	-55		+105	°C		

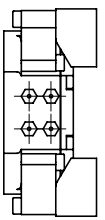
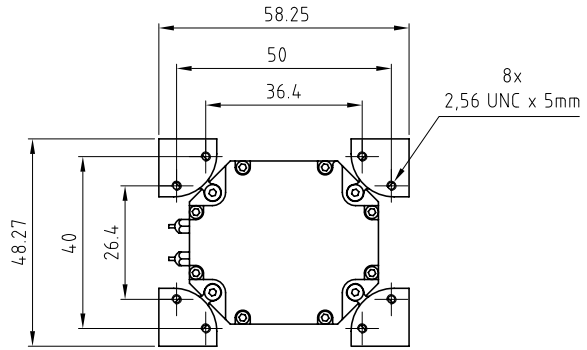
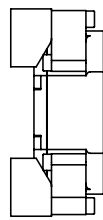
# Outline Drawing / Enclosure



Pin Connections	
1	Control Voltage Input (Vc)
2	Supply Voltage (Vs)
3	RF-Output
4	Ground (Case)



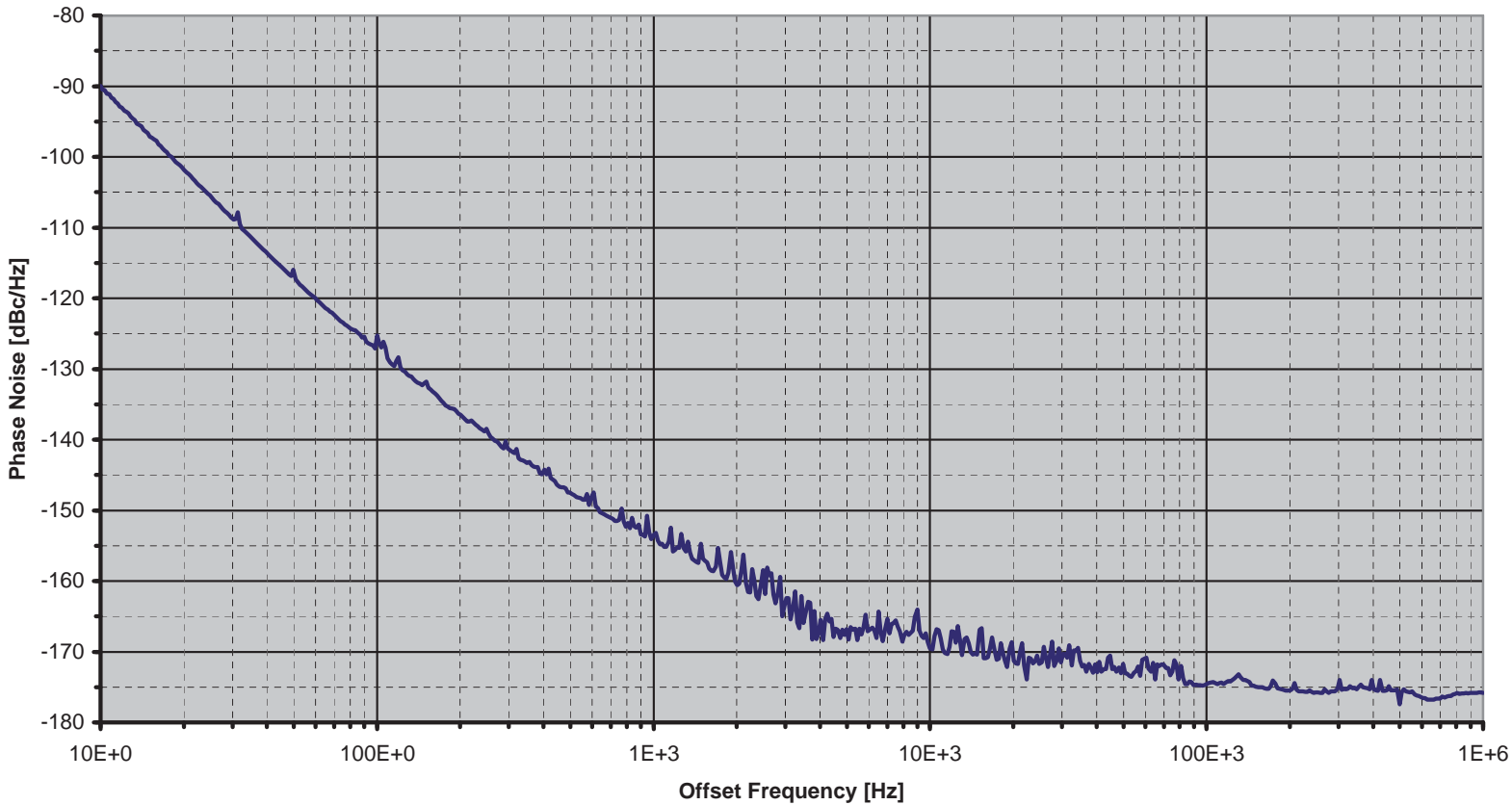
Dimensions in mm



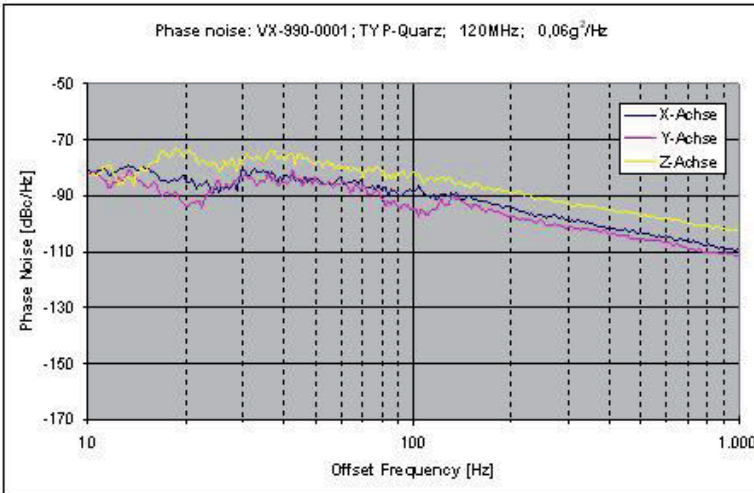
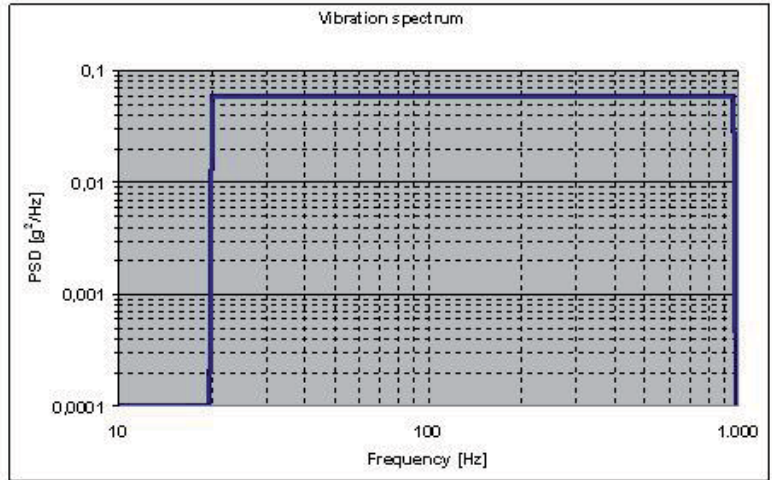
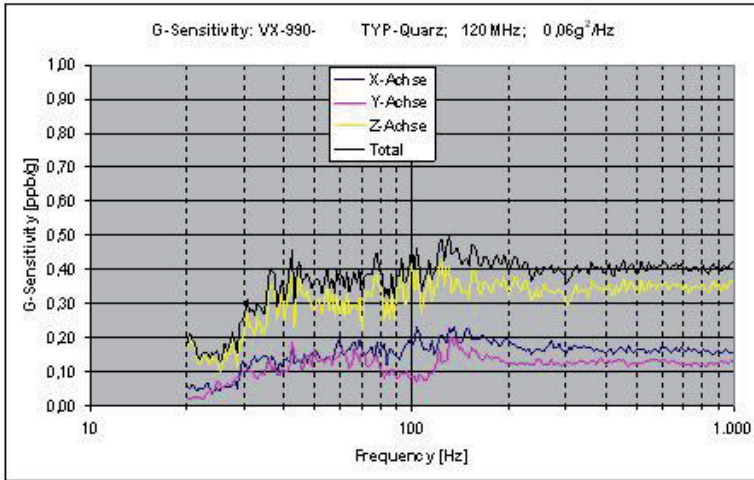
## Typical Phase Noise @ 120 MHz without vibration



### VX-990 @ 120MHz



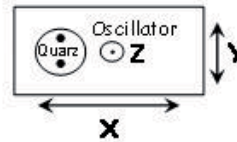
# Typical G-Sensitivity @120 MHz without shock absorber



Calculation equation according to Vig-Tutorial

$$G_{\text{sensitivity}} = \frac{2 \cdot f_v}{A_{\text{peak}} \cdot f_0} \cdot 10^{\frac{Z(f)}{20}}$$

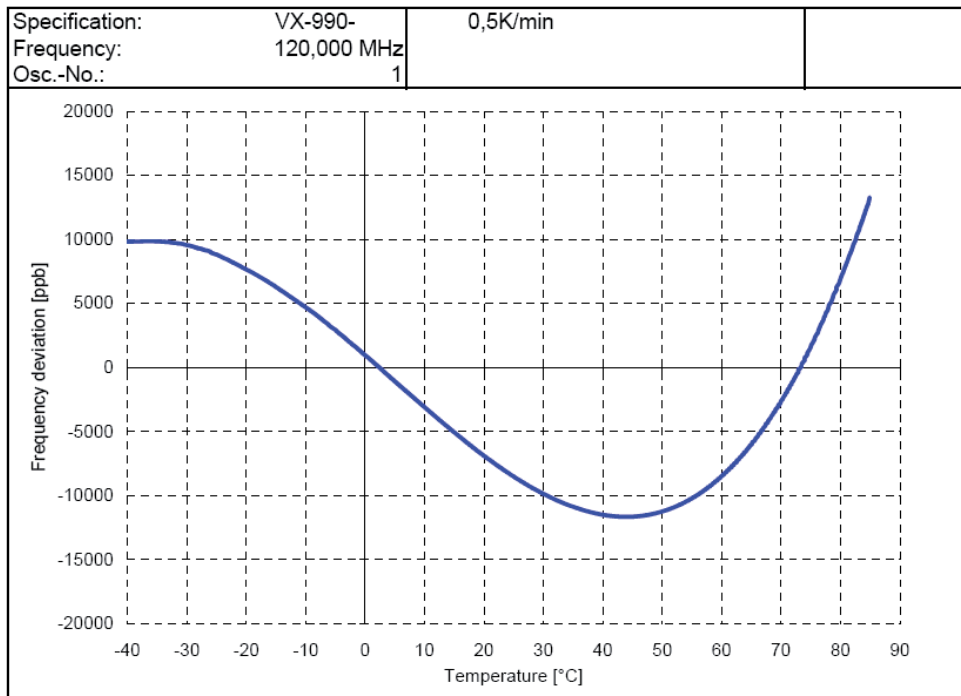
$$A_{\text{peak}} = \sqrt{PSD} \cdot 2$$



Comments:  
Measured without shock absorbers

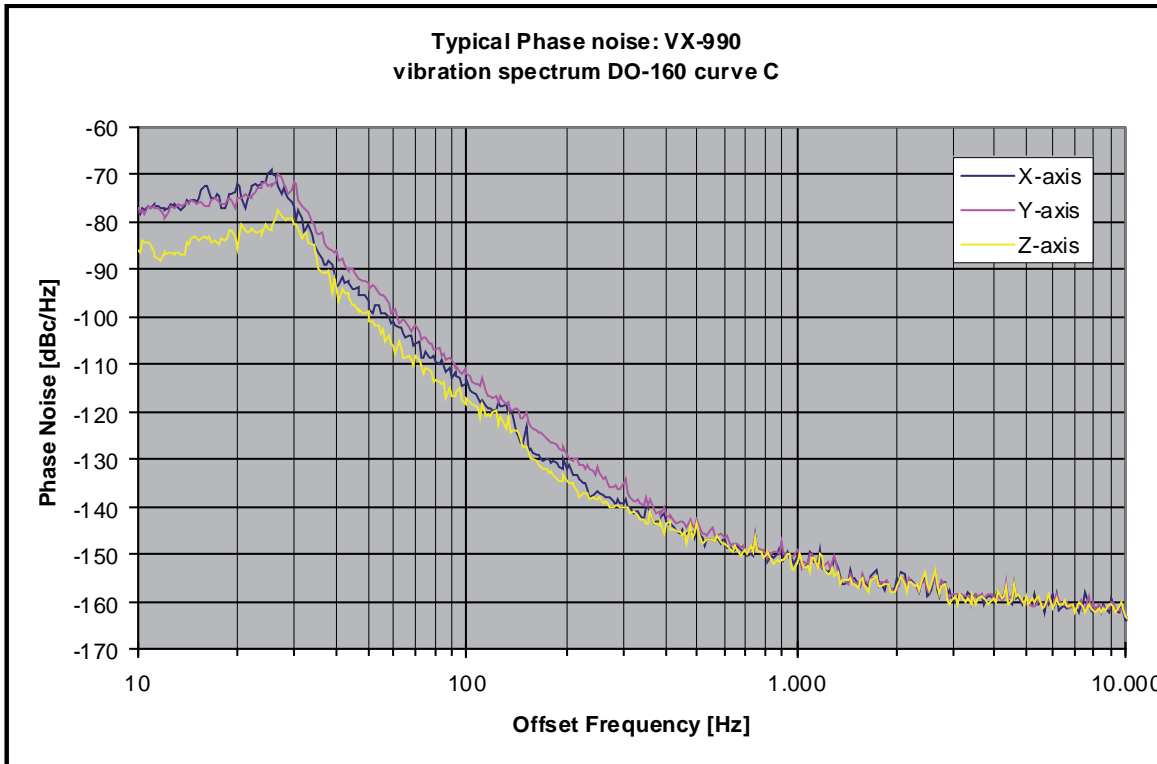
# Typical Frequency Stability vs Temperature

## Frequency vs. Temperature



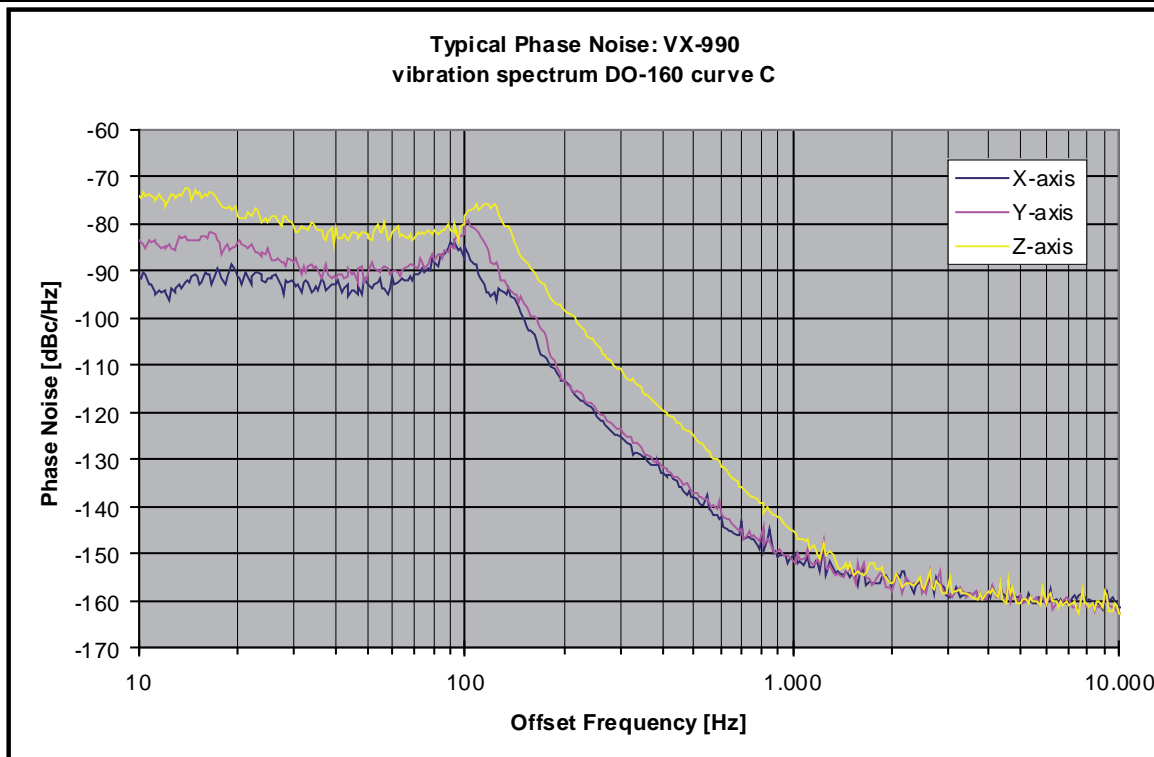
phase noise under vibration

Specification:	VX-990	using soft shock absorbers	
Frequency:	120,000 MHz		

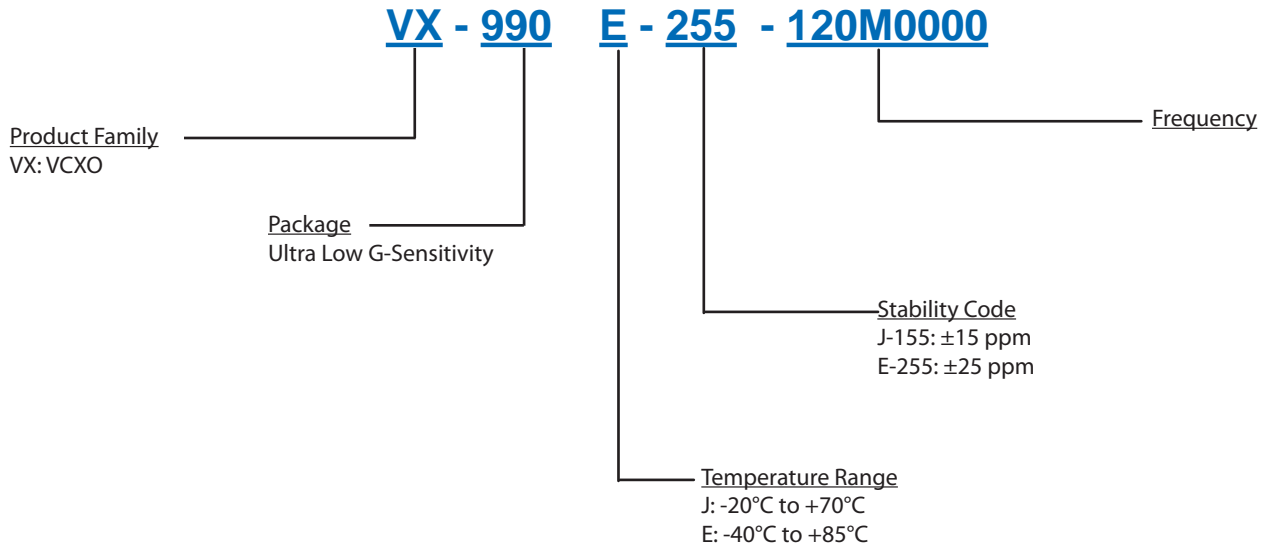


phase noise under vibration

Specification:	VX-990	using hard shock absorbers	
Frequency:	120,000 MHz		



## Ordering Information



### Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Phase noise degrades with increasing output frequency.
3. Contact factory for availability.

Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).

Subject to technical modification.

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Rev: 10/2010