

Helping Customers Innovate, Improve & Grow



VX-990

Features

- Ultra low Phase Noise
- Ultra low G-Sensitivity
- Vibration hardened
- Tight Tolerances
- Frequency Range 60 - 120MHz
- Standard Frequency 120MHz

Applications

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

Performance Specifications

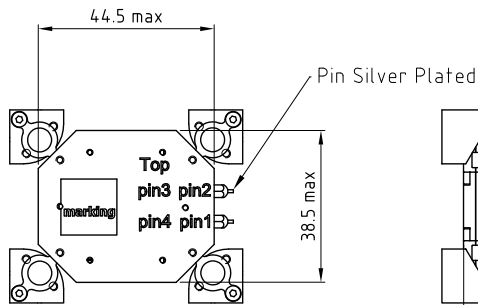
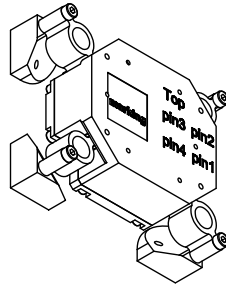
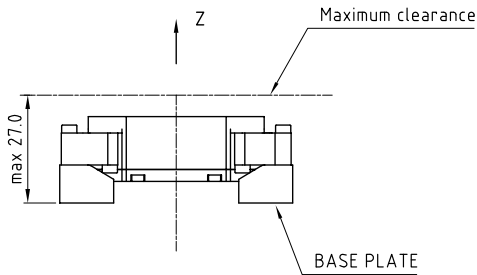
Frequency Stabilities ¹						
Parameter	Min	Typical	Max	Units	Condition	Options ³
vs. operating temperature range (referenced to nominal frequency)	-15.0 -25.0		+15.0 +25.0	ppm ppm	-20 to +70°C -40 to +85°C	
Initial tolerance	-15.0		+15.0	ppm	25°C	
vs. supply voltage change	-0.1		+0.1	ppm	V _s ±5% static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

Performance Specifications

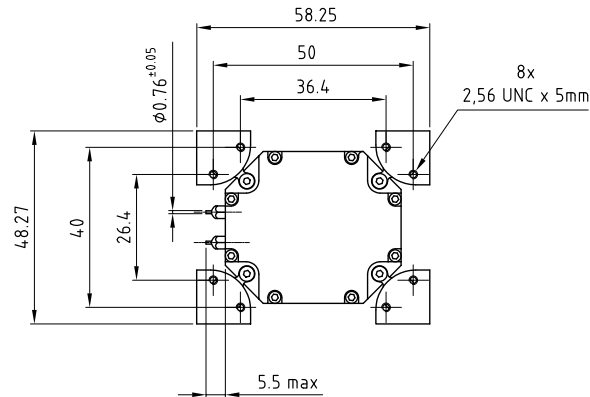
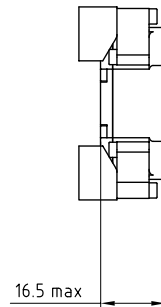
Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition	
Supply voltage (standard)	14.25	15	15.75	VDC		
Current consumption			100	mA		
RF Output						
Signal [standard]	Sinewave				50 Ω load	
Load	45	50	55	Ohm		
Output Power	10	13	16	dBm	50 Ω load	
Harmonics			-30	dBc	50 Ω load	
Spurious			-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	
Tuning Slope	Positive					
Control Voltage Range	-4	0	+4	VDC		
Frequency control input impedance	50			kOhm		
Additional Parameters						
Phase Noise ²		-90 -125 -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 1 MHz	@ 120 MHz 13 dBm sinewave no vibration
G-Sensitivity		0.5		ppb/g	without shock absorbers ³	
Weight		55	75	g		
Processing & Packing	Handling & Processing Note					
Additional Environmental Conditions						
Random Vibration	MIL-STD-202G; Method 214A; Cond H					
Shock	MIL-STD-202G; Method 213B; 15 g / 20 ms (for softest shock absorber i.e. lowest resonance frequency)					
Solderability	JEDEC J-STD-002: non RoHS compliant					
Solvent Resistance	non-washable device					
Absolute Maximum Ratings						
Supply voltage (Vs)			16.0	V		
Output Load	45		55	Ω		
Operable Temperature Range	-40		+85	°C		
Storage Temperature Range	-40		+105	°C		

Outline Drawing / Enclosure

Parameter	Min	Typical	Max	Units	Condition
G295 including vibration isolators. Mechanical resonance frequency	35		110	Hz	Please specify vibration profile and phase noise max values under vibration



Dimensions in mm



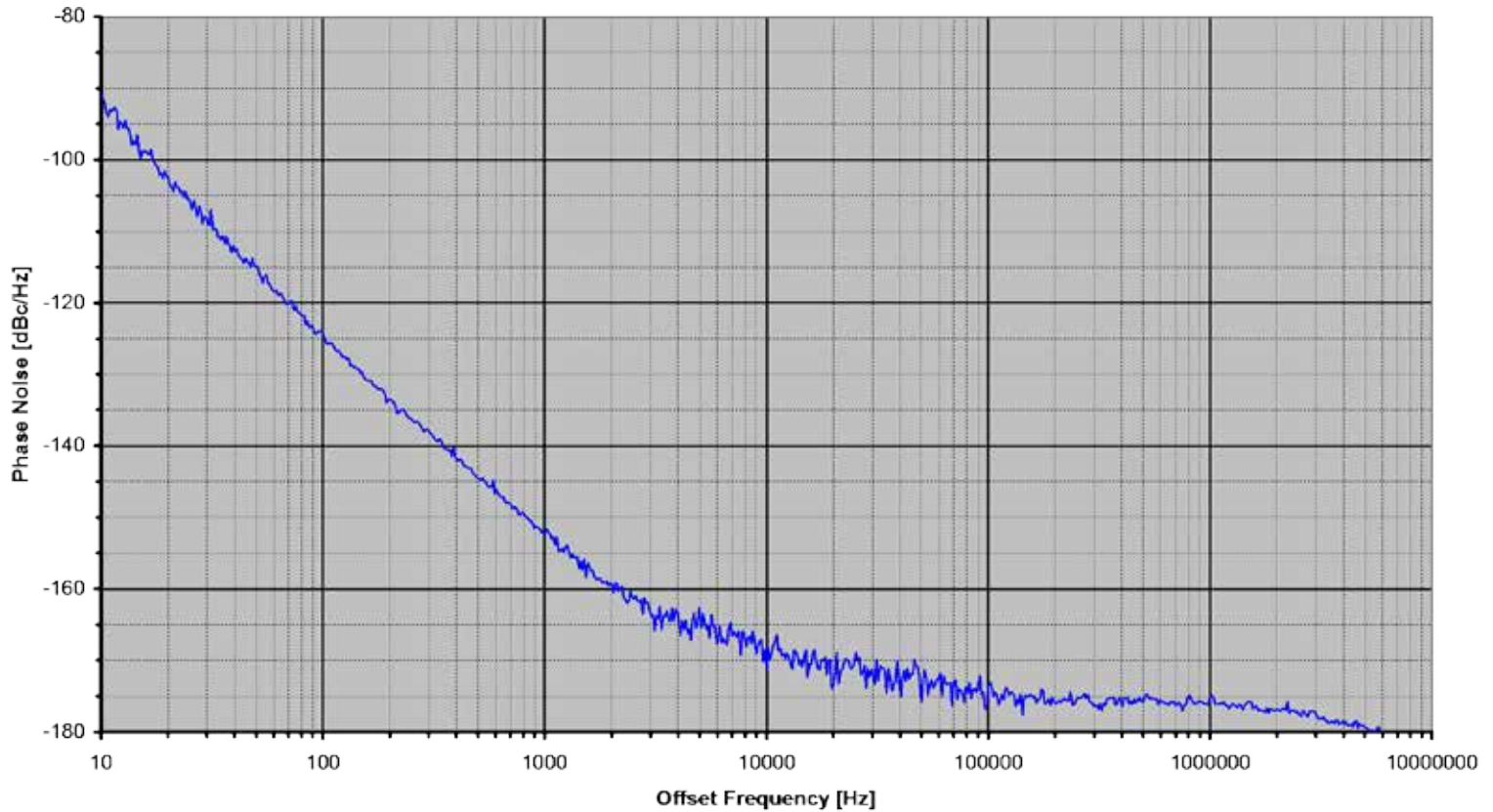
Pin Connections	
1	Control Voltage Input (Vc)
2	Supply Voltage (Vs)
3	RF-Output
4	Ground (Case)

Housing Options

Parameter	Note
G295 Standard with vibration isolators	Option please specify vibration profile and phase noise max values under vibration
G313 without vibration isolators	Option please specify vibration profile and phase noise max values under vibration

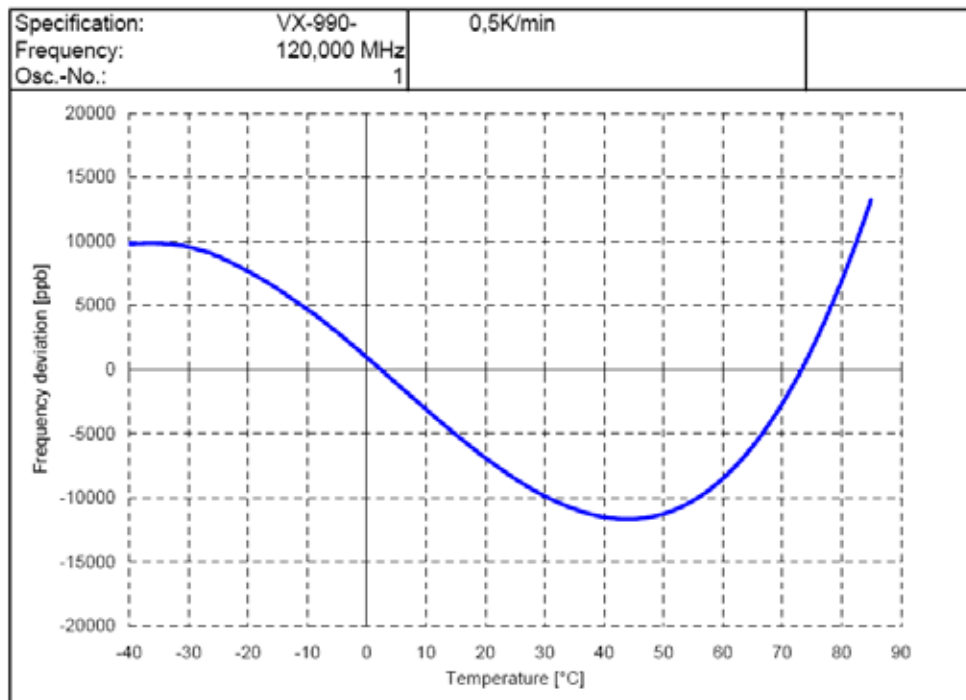
Note: Customized housings are possible. Please specify housing and vibration profile and phase noise max values under vibration

Typical Phase Noise @ 120 MHz without vibration

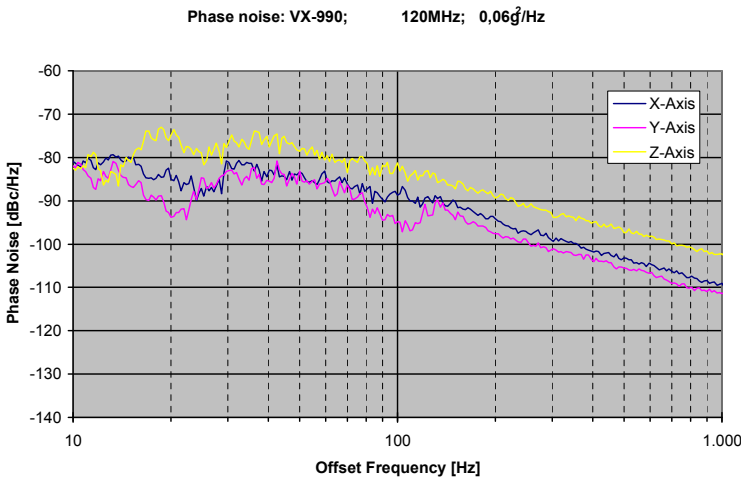
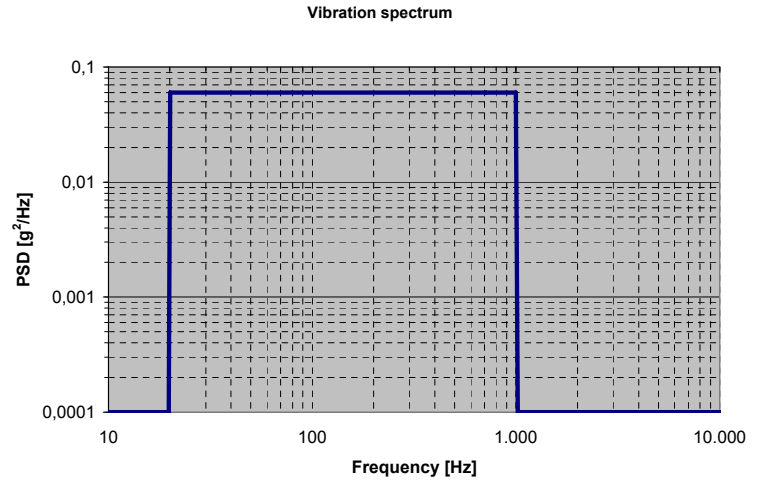
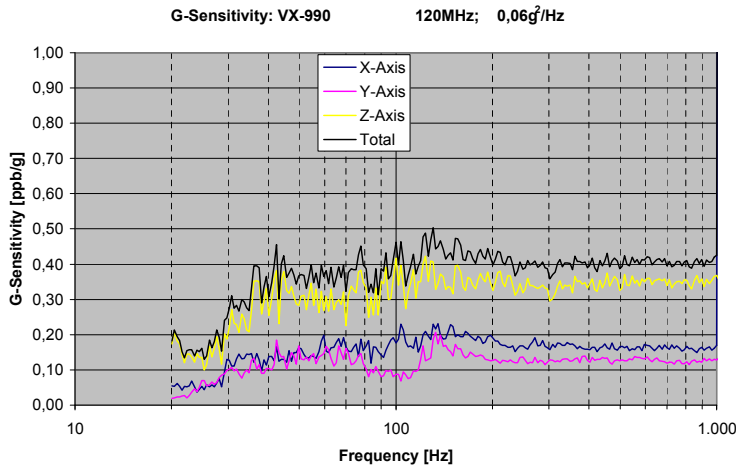


Typical Frequency Stability vs Temperature

Frequency vs. Temperature



Typical G-Sensitivity @120 MHz without shock absorber



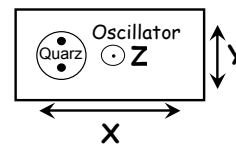
Calculation equation according to Vig-Tutorial

g-sensitivity:

$$G = \frac{2 \cdot f_v}{A_{peak} \cdot f_0} \cdot 10^{\frac{L(f_v)}{20}}$$

Peak g-level:

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



Notes:

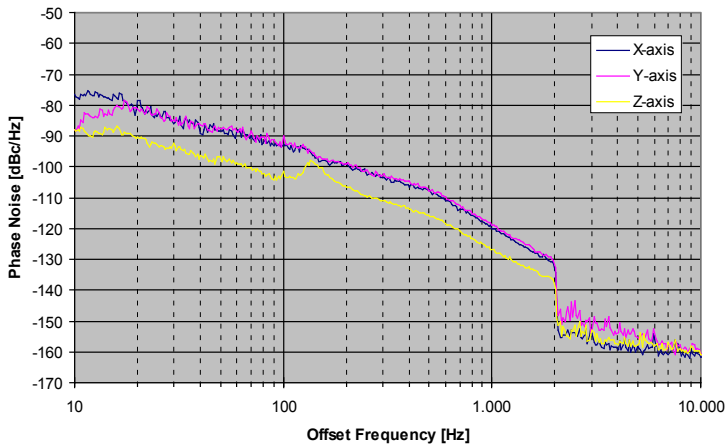
1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Phase noise degrades with increasing output frequency.
3. Contact factory for availability.

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).

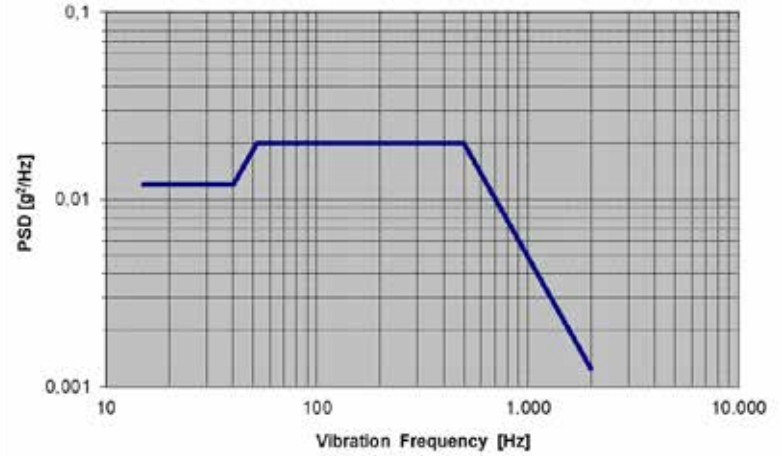
Subject to technical modification.

Typical Phase Noise @ 120 MHz under vibration

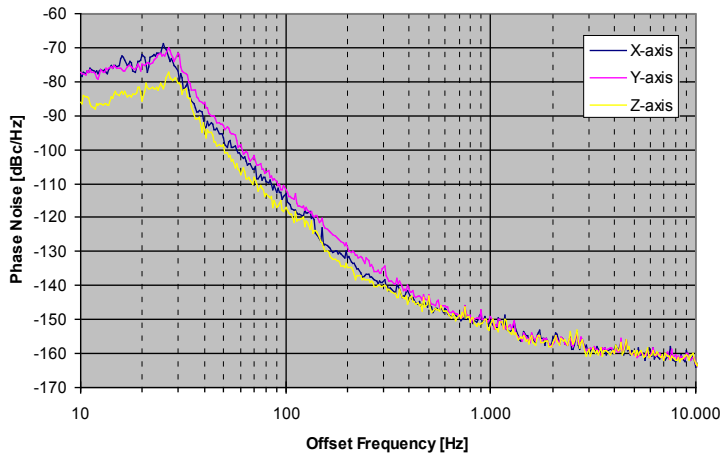
VX-990 without shock absorber
vibration spectrum DO-160 curve C



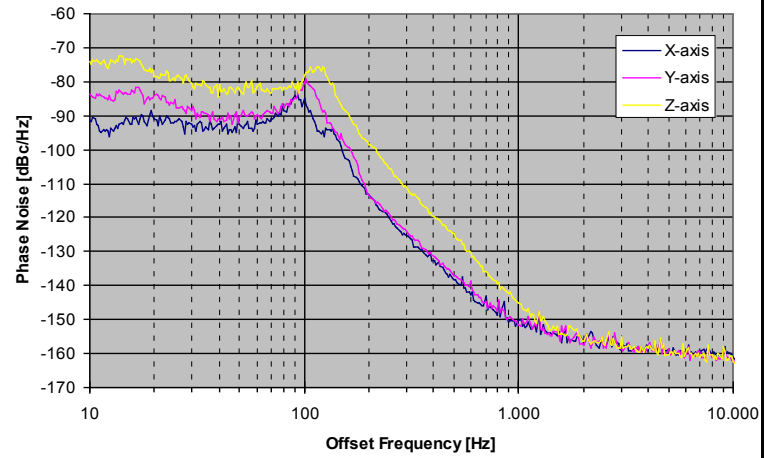
Vibration spectrum
RTCA / DO160-E; Curve C



Typical Phase noise: VX-990
vibration spectrum DO-160 curve C



Typical Phase Noise: VX-990
vibration spectrum DO-160 curve C



Ordering Information

All Oscillators from the 990s Product Group are Customized. Please include your complete specification, including vibration profile and required phase noise and phase noise under vibration to your inquiry.

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