

Helping Customers Innovate, Improve &amp; Grow


**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**

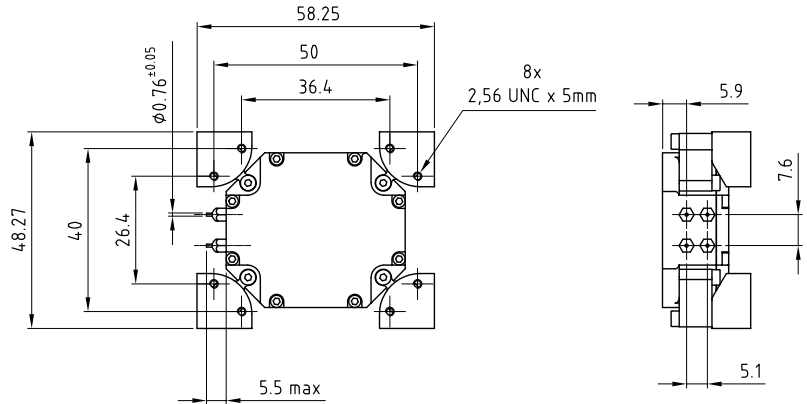
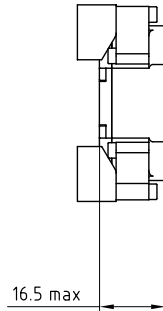
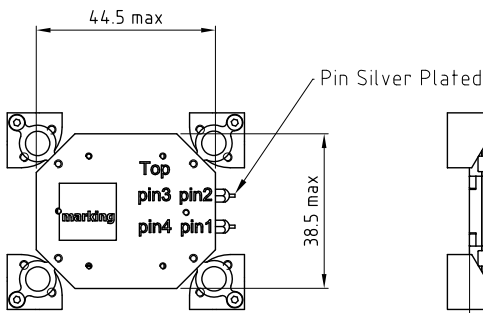
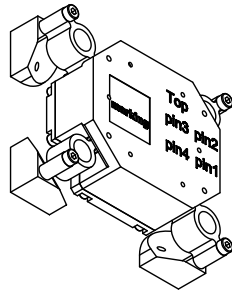
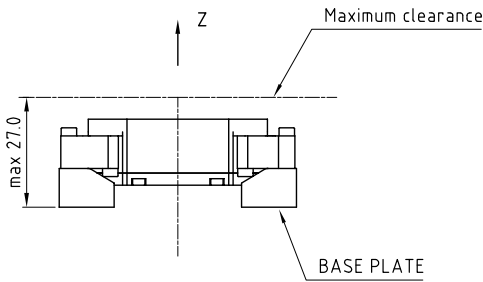
Frequency Stabilities <sup>1</sup>					
Parameter	Min	Typical	Max	Units	Condition
vs. operating temperature range (referenced to nominal frequency)	-200		+200	ppb	-40 to +70°C
vs. operating temperature range (referenced to nominal frequency)	-200		+200	ppb	optional -40 to +85°C extended temperature range might reduce performance <sup>3</sup>
Initial tolerance	-1.0		+1.0	ppm	25°C
vs. supply voltage change	-0.01		+0.01	ppm	V <sub>s</sub> ±5% static
vs. load change	-0.01		+0.01	ppm	Load ±10% static
vs. aging / day	-0.01		+0.01	ppm	after 30 days of operation
vs. aging / 1 year	-0.5		+0.5	ppm	after 30 days of operation
vs. aging / 10 years	-2.0		+2.0	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	@ Vsnom & 25°C @ Vsnom	
Current consumption stedy state			200	mA		
Current consupmtion during warm up			550	mA		
Warm up time			3	min	@ 25°C to final frequency	
RF Output						
Signal [standard]	Sinewave				50 Ω load	
Load	45	50	55	Ohm		
Output Power	7	10	13	dBm	50 Ω load <sup>3</sup>	
Output Power	10	13	16	dBm	optional 50 Ω load <sup>3</sup>	
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 circumstancers to nominal frquency	
Tuning Slope	Positive					
Control Voltage Range	-4	0	+4	VDC		
Frequency control input impedance	50			kOhm		
Additional Parameters						
Phase Noise <sup>2</sup>		-95		dBc/Hz	10 Hz	@ 120 MHz 10 dBm sinewave no vibration <sup>3</sup>
		-125		dBc/Hz	100 Hz	
		-150		dBc/Hz	1 kHz	
		-163		dBc/Hz	10 kHz	
		-170		dBc/Hz	100 kHz	
		-170		dBc/Hz	1 MHz	
Phase Noise <sup>2</sup>		-103		dBc/Hz	10 Hz	optional @ 120 MHz 13 dBm sinewave no vibration <sup>3</sup>
		-134		dBc/Hz	100 Hz	
		-158		dBc/Hz	1 kHz	
		-169		dBc/Hz	10 kHz	
		-174		dBc/Hz	100 kHz	
		-174		dBc/Hz	1 MHz	
G-Sensitivity		0.5		ppb/g	without shock absorbers <sup>3</sup>	
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

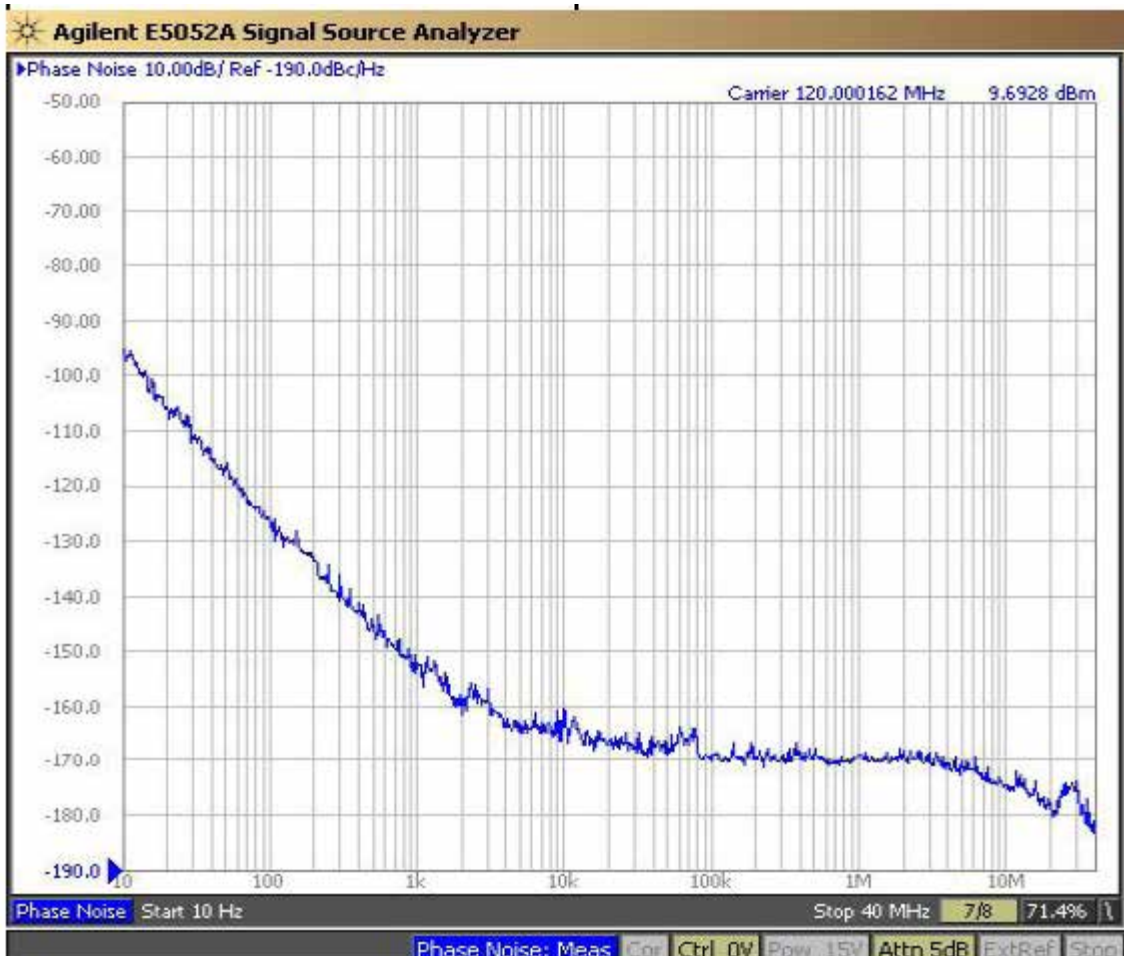
Pin Connections	
1	NC / Control Voltage Input (Vc) / Enable
2	Supply Voltage (Vs)
3	RF-Output
4	Ground (Case)

## Housing Options

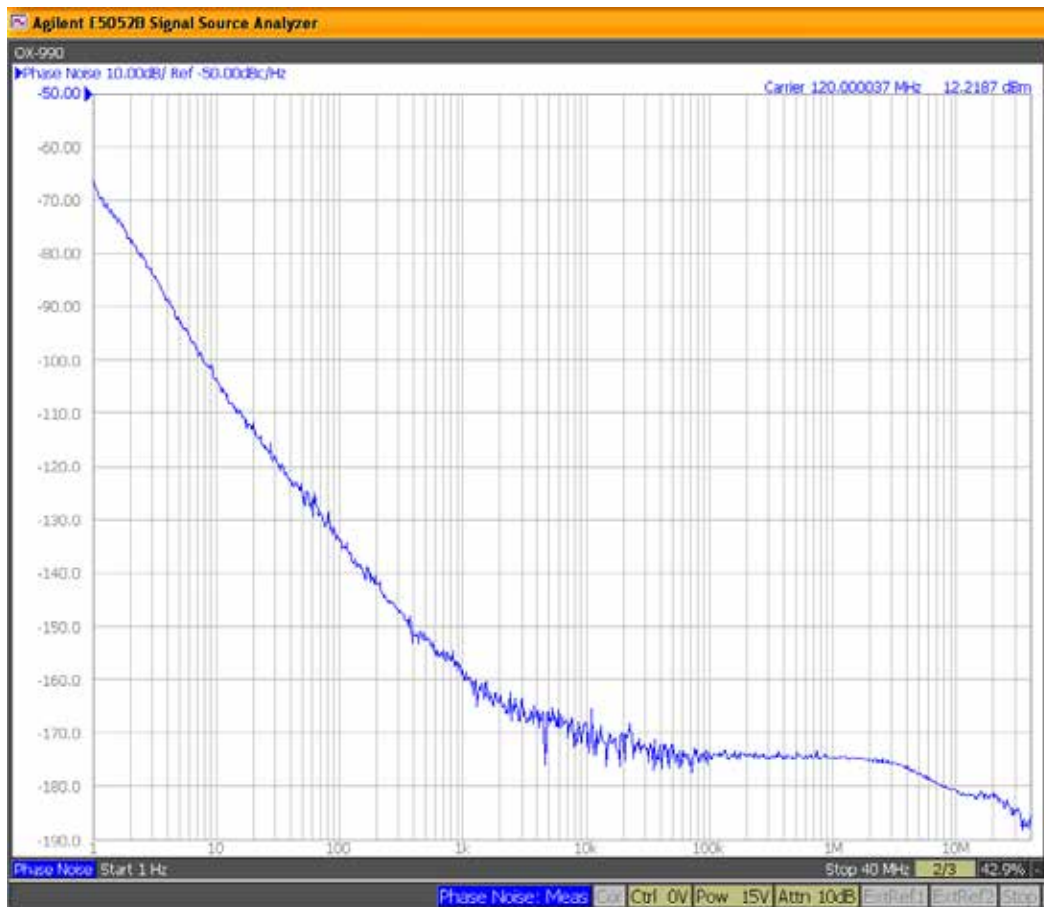
Parameter	Note
G295 Standard with vibration isolators	Option please specify vibration profile and phase noise max values under vibration
G313 without vibration isolators	Option please specify vibration profile and phase noise max values under vibration

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

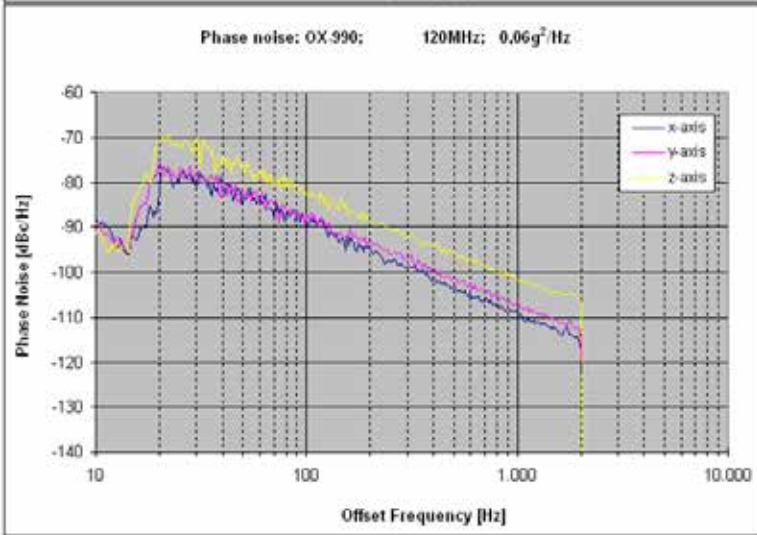
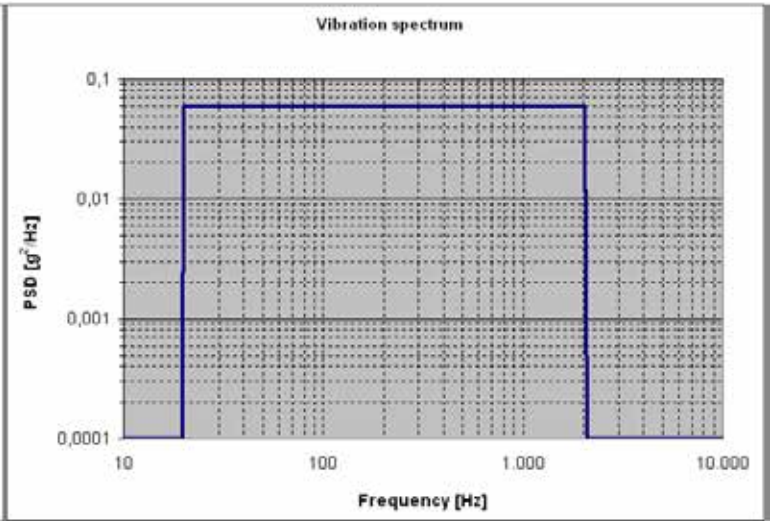
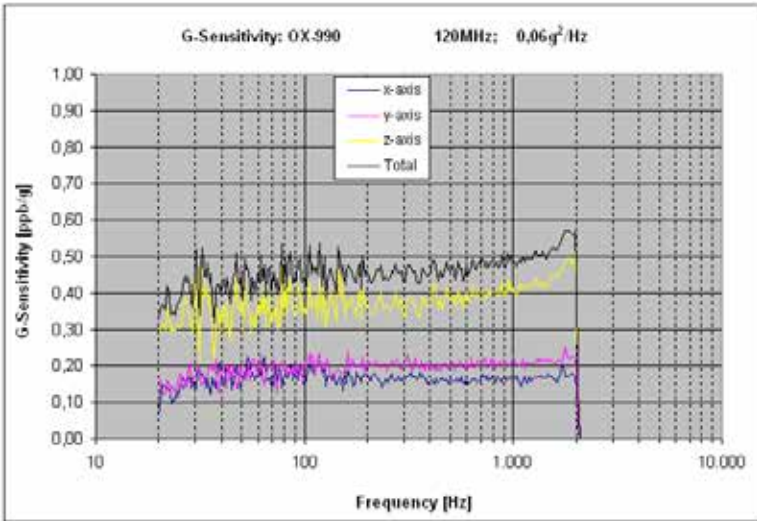
# Typical Phase Noise @ 120 MHz 10 dBm without vibration



# Typical Phase Noise @ 120 MHz, with optional 13 dBm, without vibration optional



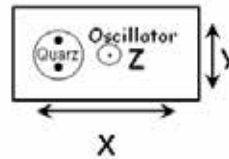
# Typical G-Sensitivity @120 MHz without shock absorber



Calculation equation according to Vig-Tutorial

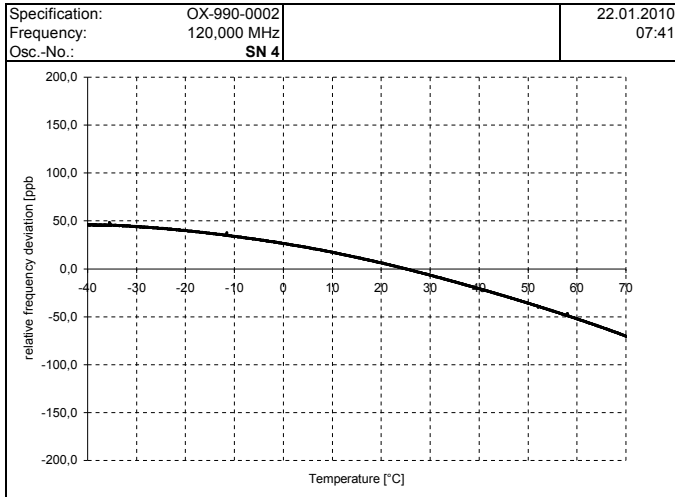
$$g\text{-sensitivity} \quad G = \frac{2 \cdot f_s}{A_{peak} \cdot f_0} \cdot 10^{\frac{L(f)}{20}}$$

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

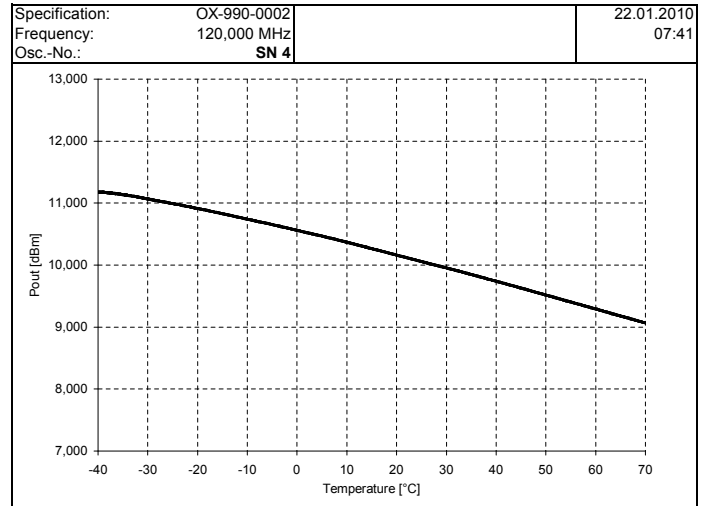


# Typical Frequency Stability vs Temperature @ 10 dBm -40..+70°C

**Frequency vs. Temperature**

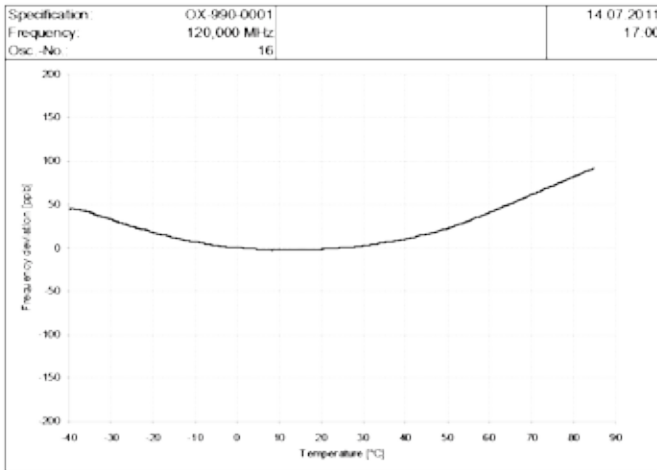


**Pout vs. Temperature**

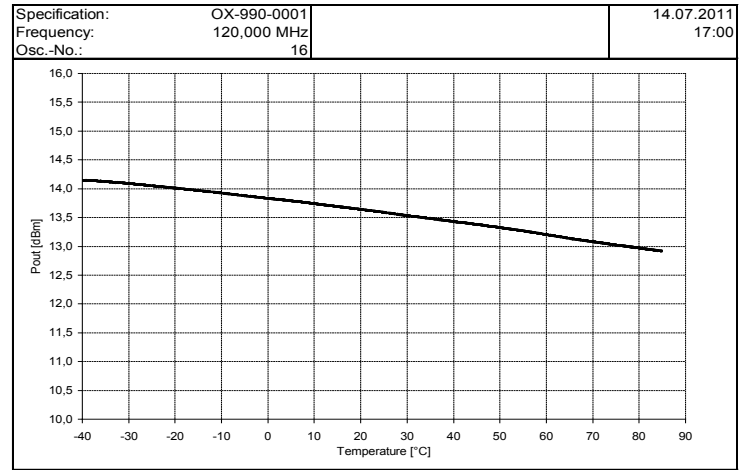


# Typical Frequency Stability vs Temperature @ 13 dBm -40..+85°C optional

**Frequency vs. Temperature**



**Pout vs. Temperature**



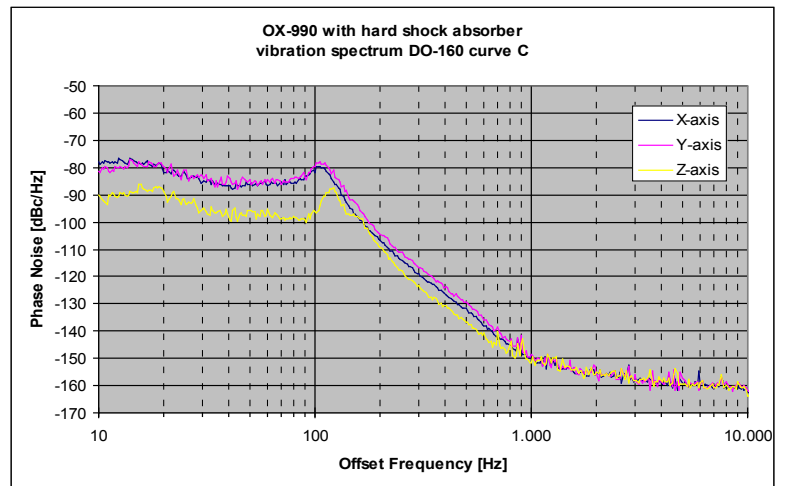
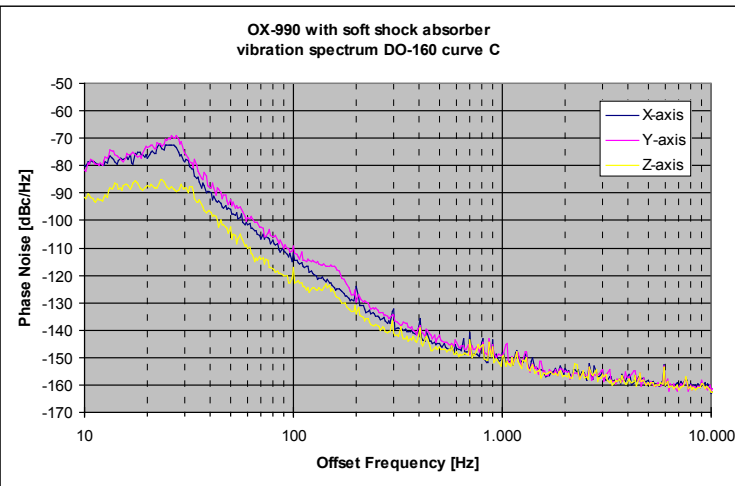
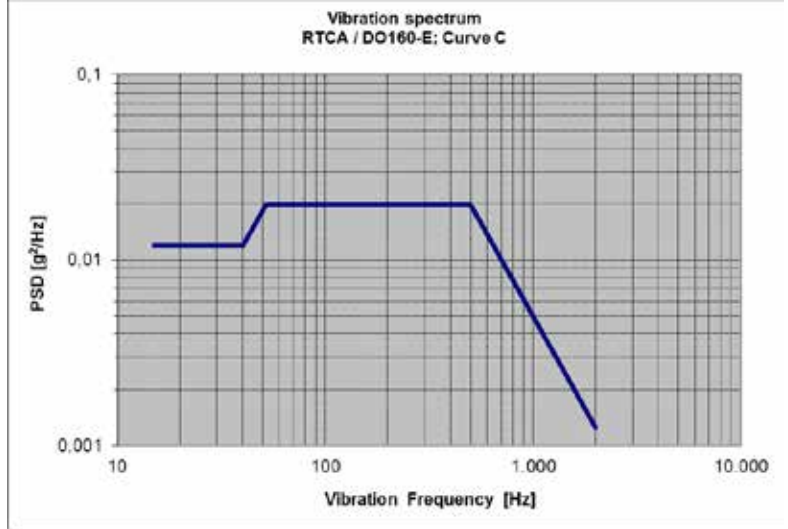
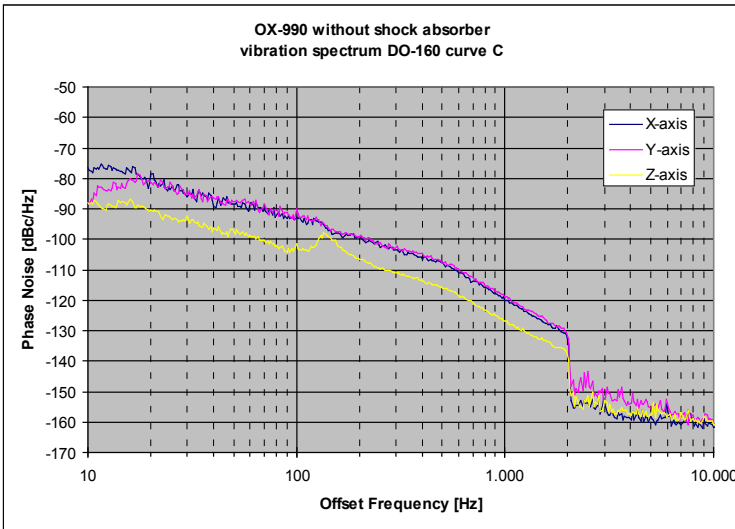
**Notes:**

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 with vibration



## 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.**



**Microsemi Headquarters**  
 One Silvercreek, Austin, Texas, TX 78748 USA  
 Within the USA: +1 (800) 713-4333  
 Outside the USA: +1 (248) 380-6100  
 Sales: +1 (248) 380-6130  
 Fax: +1 (248) 215-4998  
 email: sales.support@microsemi.com  
 www.microsemi.com

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