



Helping Customers Innovate, Improve & Grow



VX-508

**Features**

- Low G-Sensitivity
- Vibration hardened
- Tight Tolerances
- Low Phase Noise

**Applications**

- Vibration Environment
- Airborne and Military Equipment
- Portable Equipment
- Tactical Weapons

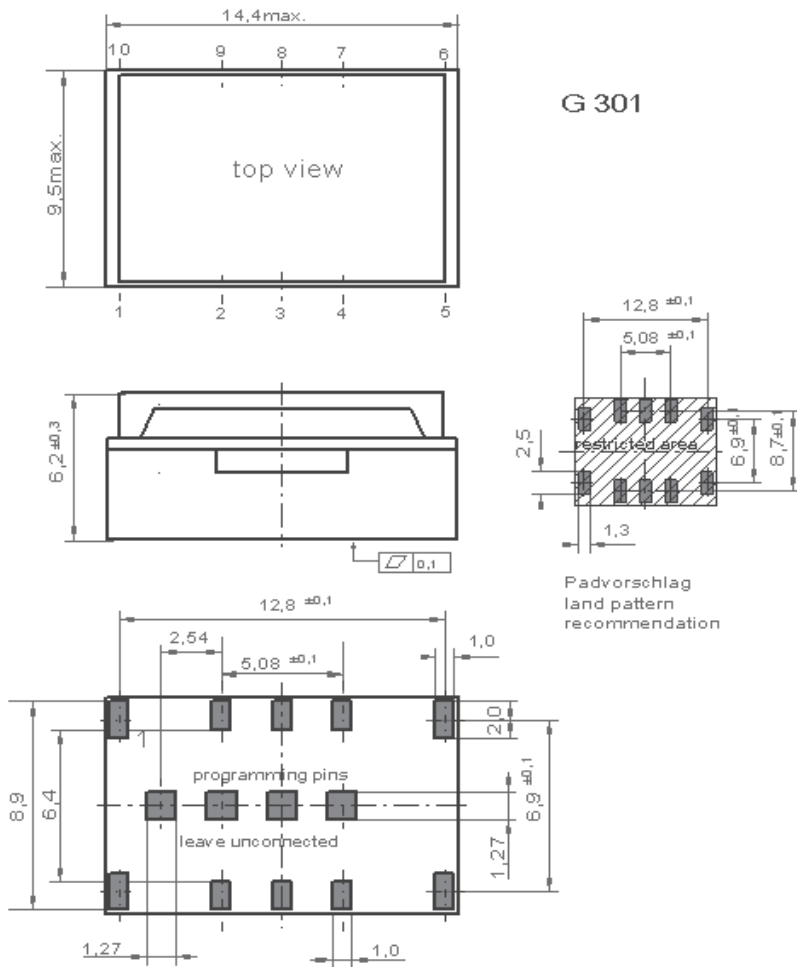
**Performance Specifications<sup>2</sup>**

Frequency Stabilities <sup>1</sup> (Frequency Range - 10 to 120 MHz)						
Parameter	Min	Typical	Max	Units	Condition	Options <sup>4</sup>
vs. operating temperature range (referenced to +25°C)	-15.0		+15.0	ppm	-20 to +70°C	Options <sup>4</sup>
	-25.0		+25.0	ppm	-40 to +85°C	
	-40.0		+40.0	ppm	-55 to +105°C	
Initial tolerance	-25.0		+25.0	ppm	25°C	
vs. supply voltage change	-3.0		+3.0	ppm	V <sub>s</sub> ±5% static	
vs. load change	-2.0		+2.0	ppm	Load ±10% static	
vs. aging / 1 year	-1.0		+1.0	ppm	after 30 days of operation	
vs. aging / 10 years	-5.0		+5.0	ppm	after 30 days of operation	

## Performance Specifications<sup>2</sup>

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition	
Supply voltage (standard) Current consumption	3.135	3.3	3.465	VDC mA	@LVCMOS	Option <sup>1</sup>
Supply voltage Current consumption	4.75	5.0	5.25	VDC mA	@HCMOS	
RF Output						
Signal [standard]	LVCMOS/HCMOS					
Load	13.5	15	16.5	pF		
Signal Level (Vol) LVCMOS			0.3	VDC	@ Vs=3.3V and 15pF Load	
Signal Level (Voh) LVCMOS	3.0			VDC	@ Vs=3.3V and 15pF Load	
Signal Level (Vol) HCMOS			0.5	VDC	@ Vs=5.0V and 15pF Load	
Signal Level (Voh) HCMOS	4.5				@ Vs=5.0V and 15pF Load	
Duty Cycle	40		60	%	@ (Voh-Vol)/2	
Rise and Fall time			5	ns	@15 pF 10 to 90 %	
Frequency Control (EFC)						
Tuning Range	±50.0			ppm	Frequency > 30 MHz	
	±100.0			ppm	Frequency < 30 MHz	
Linearity	<10%					
Tuning Slope	Positive					
Control Voltage Range	0.3	1.65	3.0	VDC	@ Vs=3.3V	
Control Voltage Range	0.5	2.5	4.5	VDC	@ Vs=5.0V	
Frequency control input impedance	10			kOhm		
Additional Parameters						
Phase Noise <sup>3</sup>		-78		dBc/Hz	10 Hz	@ 120 MHz LVCMOS 3.3 V
		-105		dBc/Hz	100 Hz	
		-125		dBc/Hz	1 kHz	
		-145		dBc/Hz	10 kHz	
		-160		dBc/Hz	100 kHz	
Jitter		0.064		ps RMS	@ 12 kHz to 20 MHz	
Weight			8.0	g		
Processing & Packing	Handling & Processing Note					
Additional Environmental Conditions						
Random Vibration	MIL-STD-202G; Method 214A; Condition II-J				1g2/Hz / 43.92 grms guaranteed (Qualification testing performed at MIL-STD-202G; Method 214A; Condition II-K, 1.5g2/Hz / 53.79 grms)	
Sine Vibration	MIL-STD-883; Method 2007				Test Condition B 50 g (Qualification testing performed at MIL-STD-883; Method 2007; Test Condition C 70 g)	
Shock	MIL-STD-883G; Method 2002.4; Condition D				5000 g / 0.3 ms higher values on request	
Solderability	JEDEC J-STD-002 100% RoHS 6 compliant					
Solvent Resistance	non-washable device					
Absolute Maximum Ratings						
supply voltage (Vs)			6.0	V		
Output Load			50	pF		
Operable Temperature Range	-55		+105	°C		
Storage Temperature Range	-55		+105	°C		

# Outline Drawing / Enclosure



G 301

Dimensions in mm

VX-508	
Height "H"	Pin Length "L"
6.2	NA

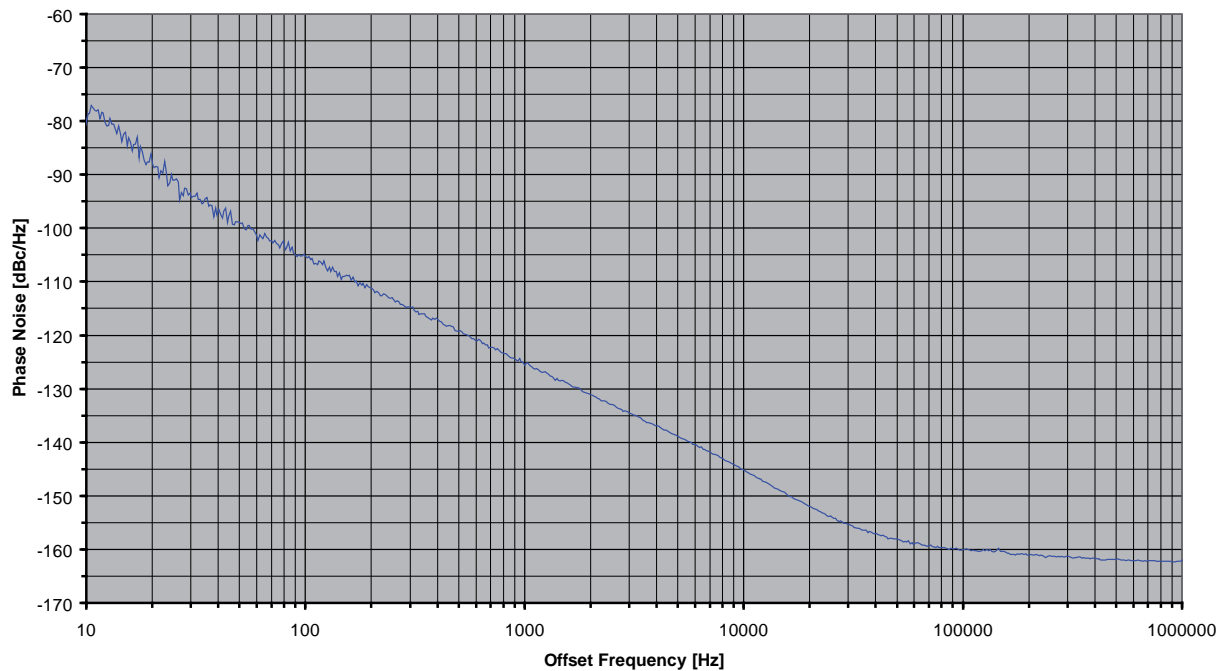
Pin Connections	
1	N/C
2	Control Voltage Input (Vc)
3	N/C / Enable (optional)
4	Ground (Case)
5	NC
6	NC
7	RF-Output
8	NC
9	Supply Voltage (Vs)
10	NC

Enable true table (optional)	
Pin 3	Pin 7
High	Data
Open	Data
Low	High Tristate

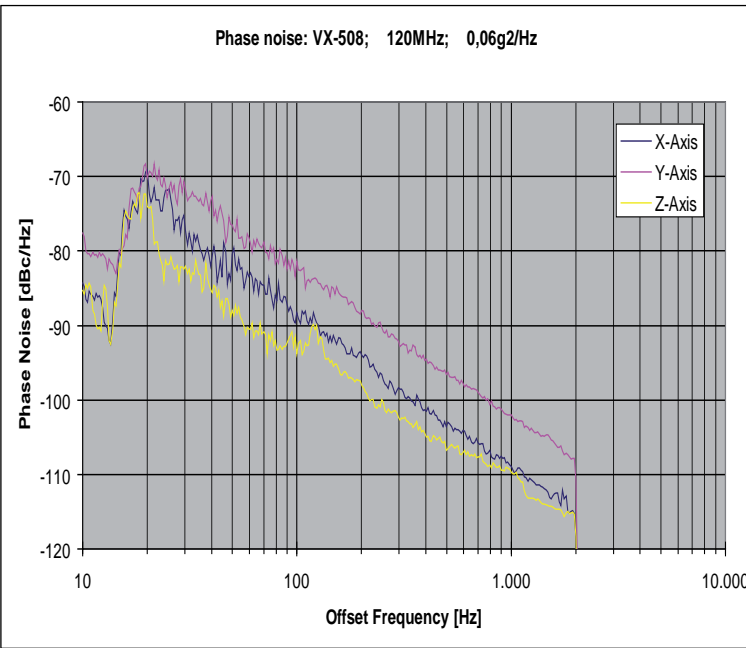
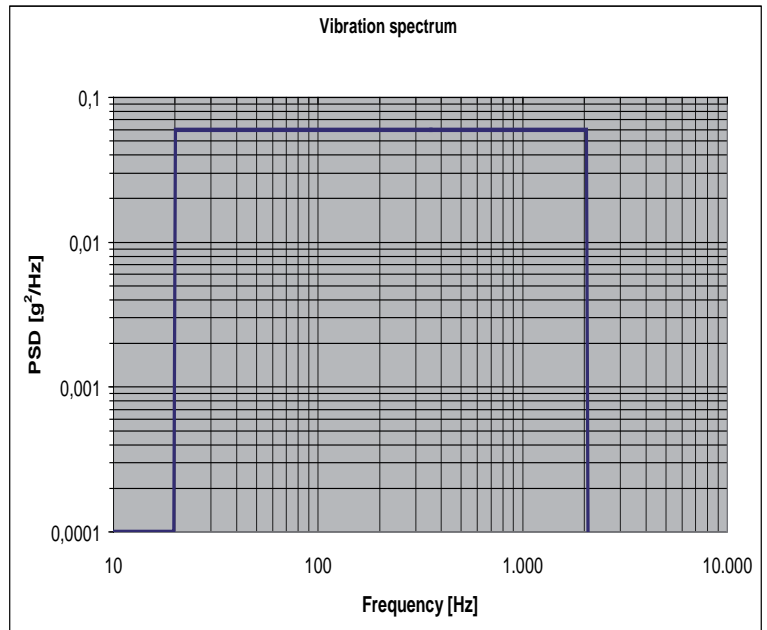
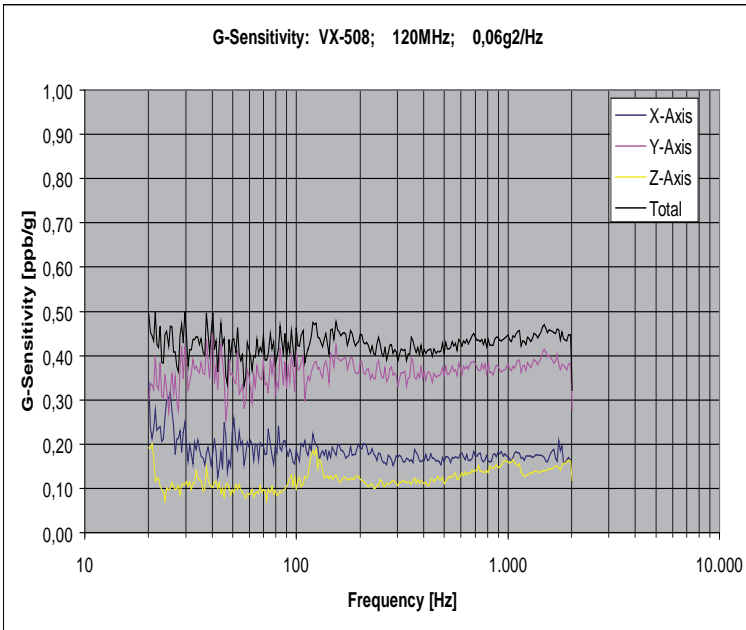
## Typical Phase Noise @ 120 MHz HCMOS



Typical Phasenoise: VX-508 @ 120MHz



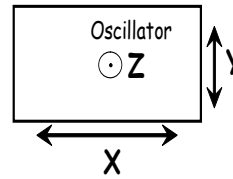
# Typical G-Sensitivity @120 MHz; HCMOS



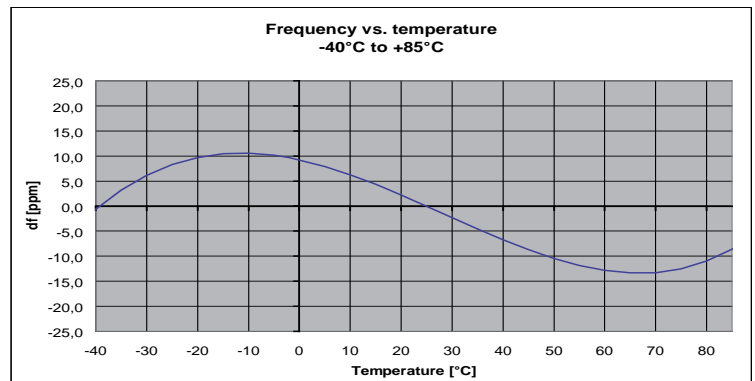
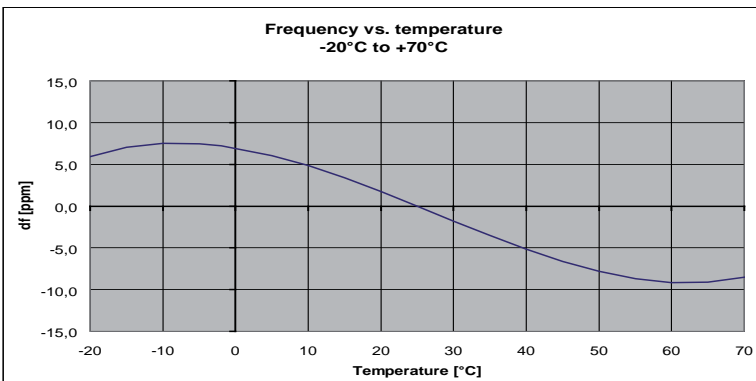
Calculation equation according to Vig-Tutorial

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

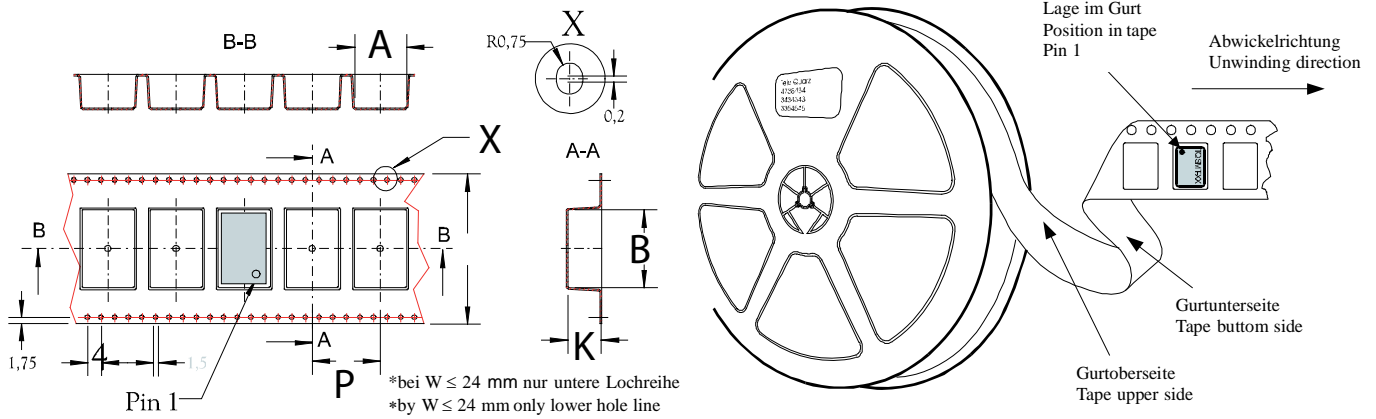
$$\text{Peak g-level: } A_{peak} = \sqrt{PSD \cdot 2}$$



# Typical Frequency Stability vs Temperature

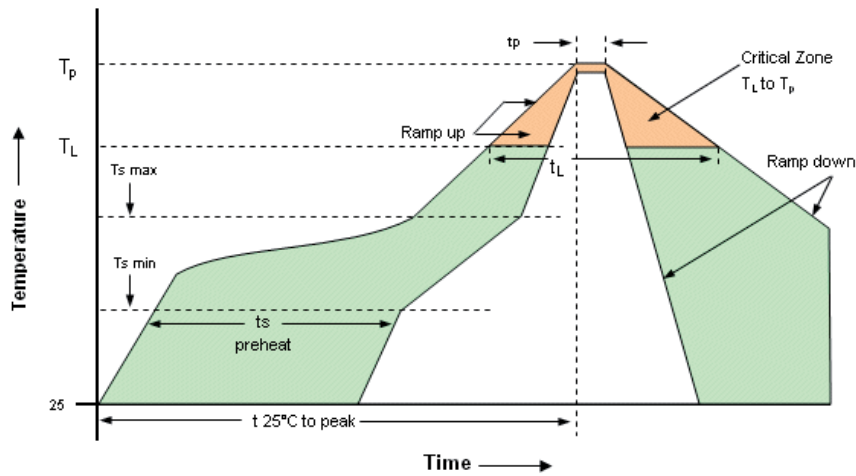


# Standard Shipping Method (VX-508)



Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P
G301	24	83,3	850	12

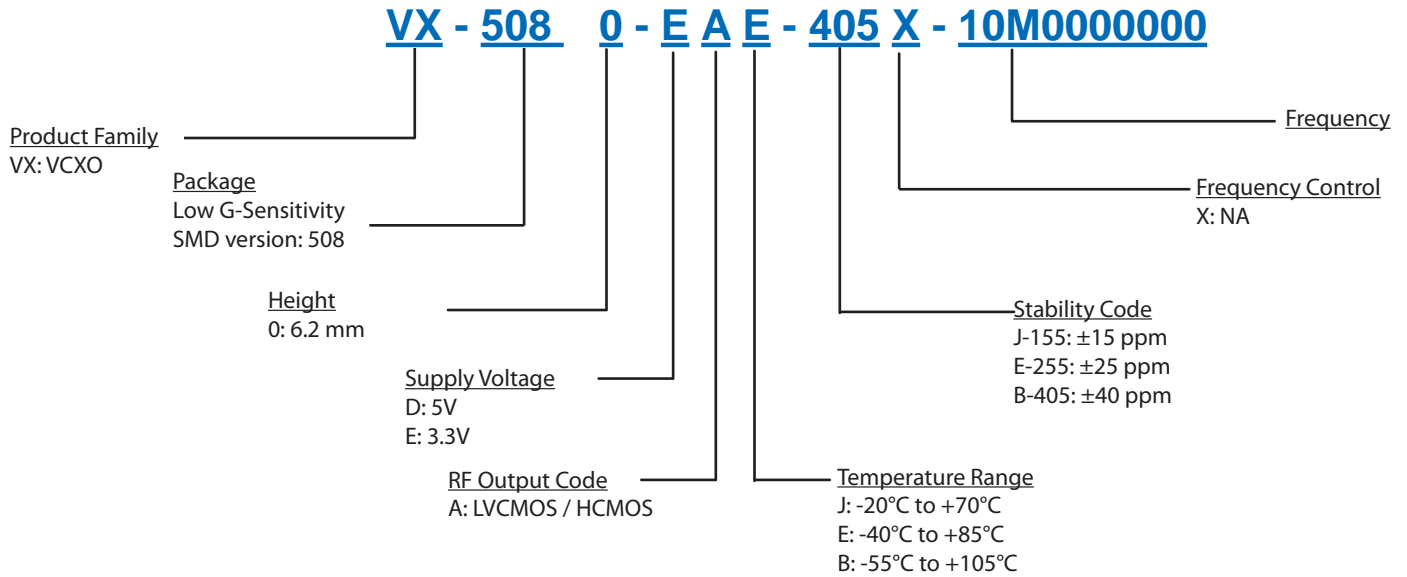
## Recommended Reflow Profile



Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly	Profile Feature	Pb-Free Assembly/ Sn-Pb Assembly
Average ramp-up rate ( $T_L$ to $T_p$ )	3°C/second max.	Time 25°C to Peak Temperature	8 minutes max.
Preheat -Temperature Min $T_{Smin}$ -Temperature Min $T_{Smax}$ -Time (min to max) $t_s$	150°C 200°C 60-180 seconds	Time maintained above -Temperature ( $T_L$ ) -Time ( $t_L$ )	217°C 60-150 seconds
$T_{Smax}$ to $T_L$ -Ramp-up Rate	3°C/second max		
Time maintained above -Temperature ( $T_L$ ) -Time ( $t_L$ )	217°C 60-150 seconds	Time within 5°C of actual Peak Temperature ( $t_p$ )	20-40 seconds
Peak Temperature ( $T_p$ )	max 260°C	Ramp-down Rate	6°C/ second max

**Note:** All temperatures refer to topside of the package, measured on the package body surface.

## Ordering Information



**Notes:**

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

Subject to technical modification.

## For Additional Information, Please Contact

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