

Helping Customers Innovate, Improve & Grow



Features

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

Applications

- Vibration Environment
- Portable Equipment
- Land Mobile Radio

Performance Specifications²

Frequency Stabilities ¹ (Standard Frequency range - 10 to 100 MHz)						
Parameter	Min	Typical	Max	Units	Condition	
vs. operating temperature range (referenced to +25°C)	-2.5		+2.5	ppm	-40 to +85°C	Options ⁴
	-1.0		+1.0	ppm	-40 to +85°C	
	-2.5		+2.5	ppm	-20 to +70°C	
	-1.0		+1.0	ppm	-20 to +70°C	
	-1.0		+1.0	ppm	-0 to +50°C	
-0.5		+0.5	ppm	-0 to +50°C		
Initial tolerance	-1.5		+1.5	ppm	at time of shipment, nominal EFC, 25°C	
vs. supply voltage change	-0.3		+0.3	ppm	V _s ±5% static	
vs. load change	-0.2		+0.2	ppm	Load ±10% static	
vs. aging / 1 year	-1.0		+1.0	ppm	after 30 days of operation	
vs. aging / 10 year	-2.5		+2.5	ppm	after 30 days of operation	
Frequency Stabilities ¹ (Stratum 3 TCXO Frequency range - 10 to 100 MHz)						
vs. operating temperature range (referenced to +25°C)	-0.8		+0.8	ppm	-40 to +85°C	Options ⁴
	-0.8		+0.8	ppm	-20 to +70°C	
	-0.28*		+0.28*	ppm	-20 to +70°C	
	-0.28*		+0.28*	ppm	-0 to +50°C	
Initial tolerance	-1.0		+1.0	ppm	at time of shipment, nominal EFC, 25°C	
vs. supply voltage change	-0.3		+0.3	ppm	V _s ±5% static	
vs. load change	-0.1		+0.1	ppm	Load ±10% static	
vs. aging / 20 years	-2.5		+2.5	ppm	after 30 days of operation	
overall tolerance	-4.6		+4.6	ppm	Note:	
* Stratum 3 per GR-1244-CORE: <±4.6 ppm for all causes and 20 Years aging, Holdover: <±0.37 ppm over 24 hours						

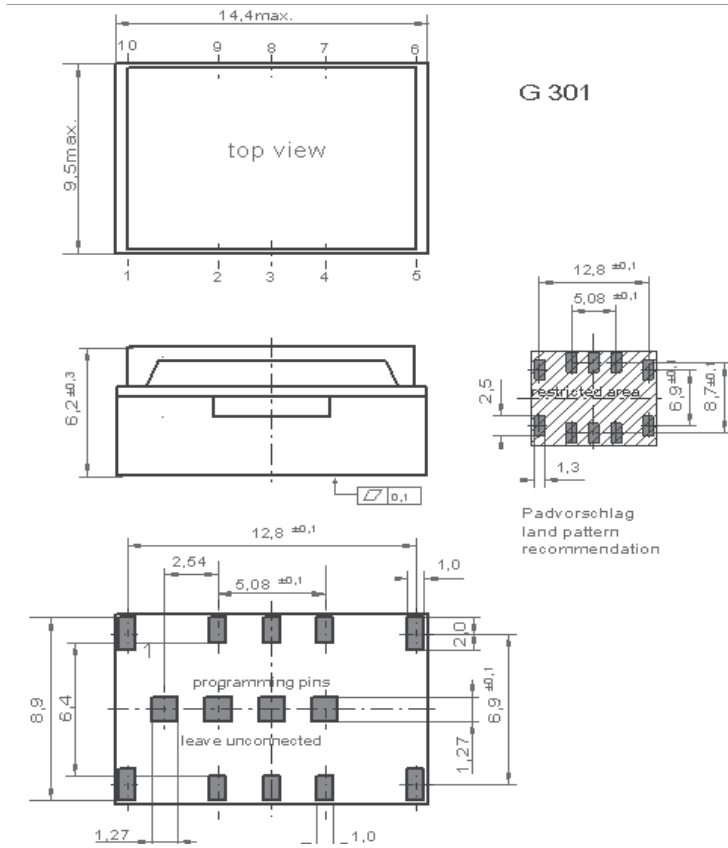
Performance Specifications²

Supply Voltage (Vs)						
Parameter	Min	Typical	Max	Units	Condition	
Supply voltage (standard) Current consumption	3.135	3.3	3.465 30	VDC mA	@LVCMOS	Option ⁴
Supply voltage Current consumption	4.75	5.0	5.25 40	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	Fixed TCXO; No adjust					Option ⁴
Tuning Range	±5.0 ±8.0	±12 ±14	±20 ±20	ppm ppm	S3 Version Standard Version	
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 ³		-95 -123 -143 -152 -155		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 10 MHz LVCMOS 3.3 V
Jitter		1.14		ps RMS	@ 12 kHz to 20 MHz	
Phase Noise ³		-74 -103 -134 -152 -160		dBc/Hz dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 kHz 10 kHz 100 kHz	@ 100 MHz LVCMOS 3.3 V
Jitter		0.073		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		

Absolute Maximum Ratings

Operable Temperature Range	-40	+85	°C
Storage Temperature Range	-55	+105	°C

Outline Drawing / Enclosure



Dimensions in mm

TX-508

Height "H"	Pin Length "L"
6.2	NA

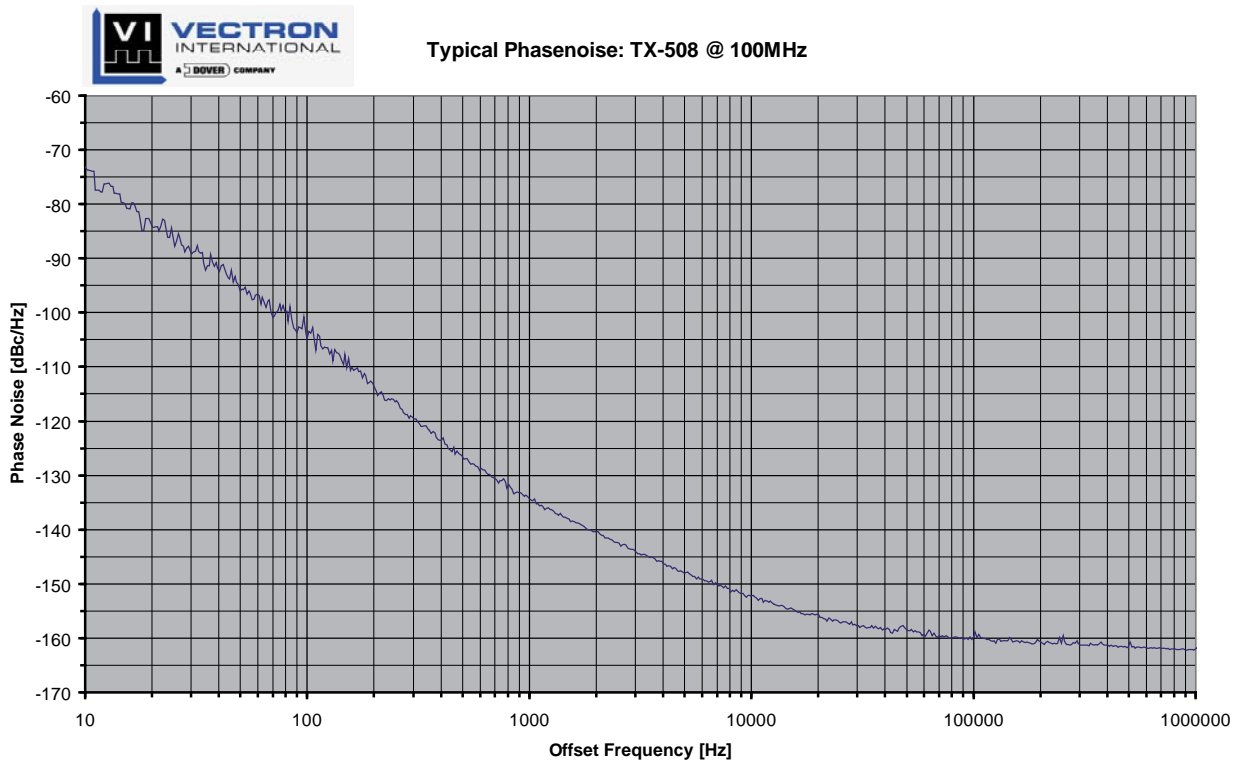
Pin Connections

1	N/C
2	NC / 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)

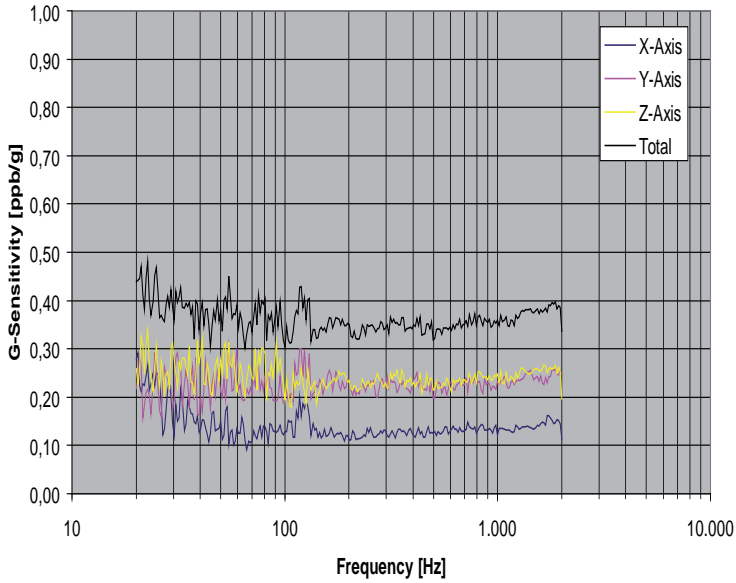
Pin 3	Pin 7
High	Data
Open	Data
Low	High Tristate

Typical Phase Noise @ 100 MHz HCMOS

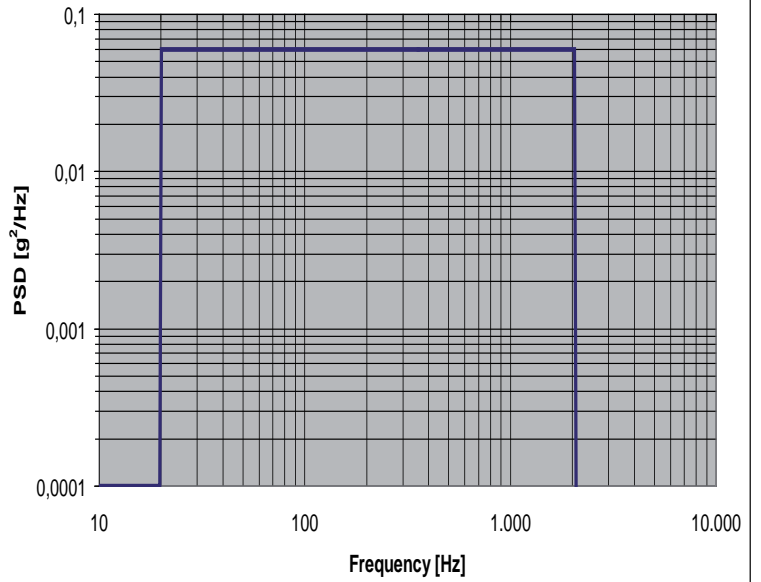


Typical G-Sensitivity @10 MHz; HCMOS

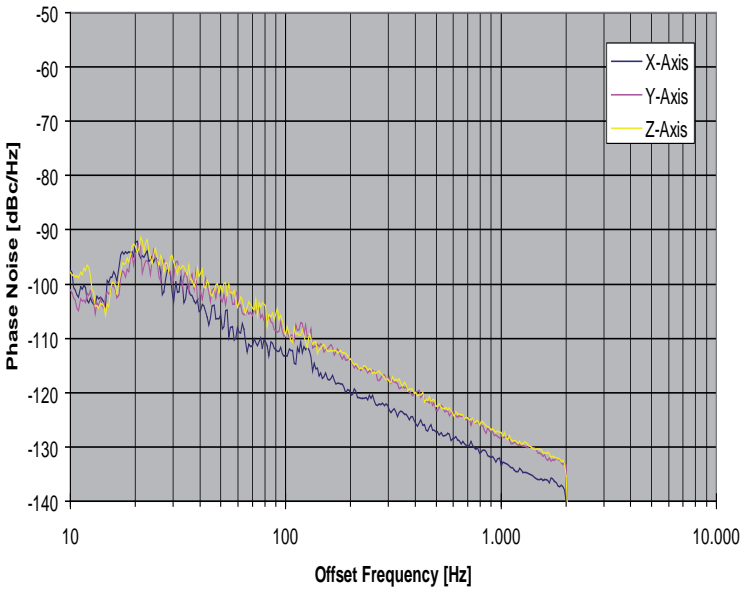
G-Sensitivity: TX-508; 10 MHz; 0,06g2/Hz



Vibration spectrum



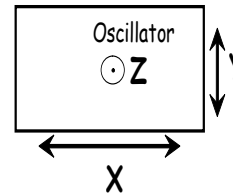
Phase noise: TX-508; 10 MHz; 0,06g2/Hz



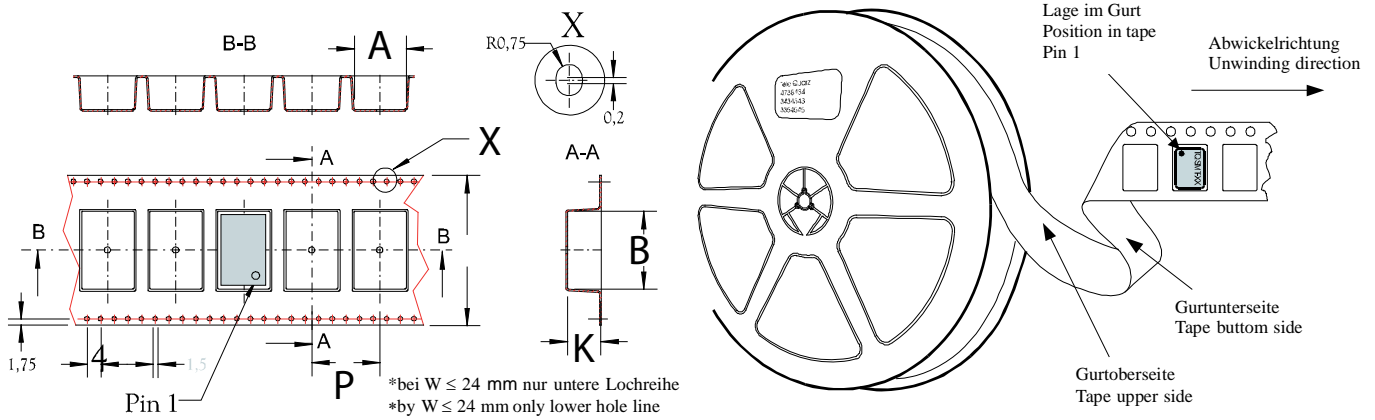
Calculation equation according to Vig-Tutorial

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

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

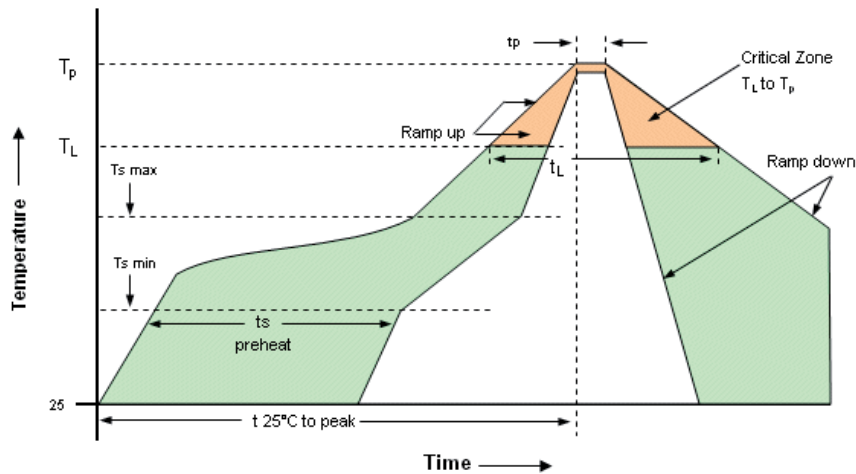


Standard Shipping Method (TX-508)



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

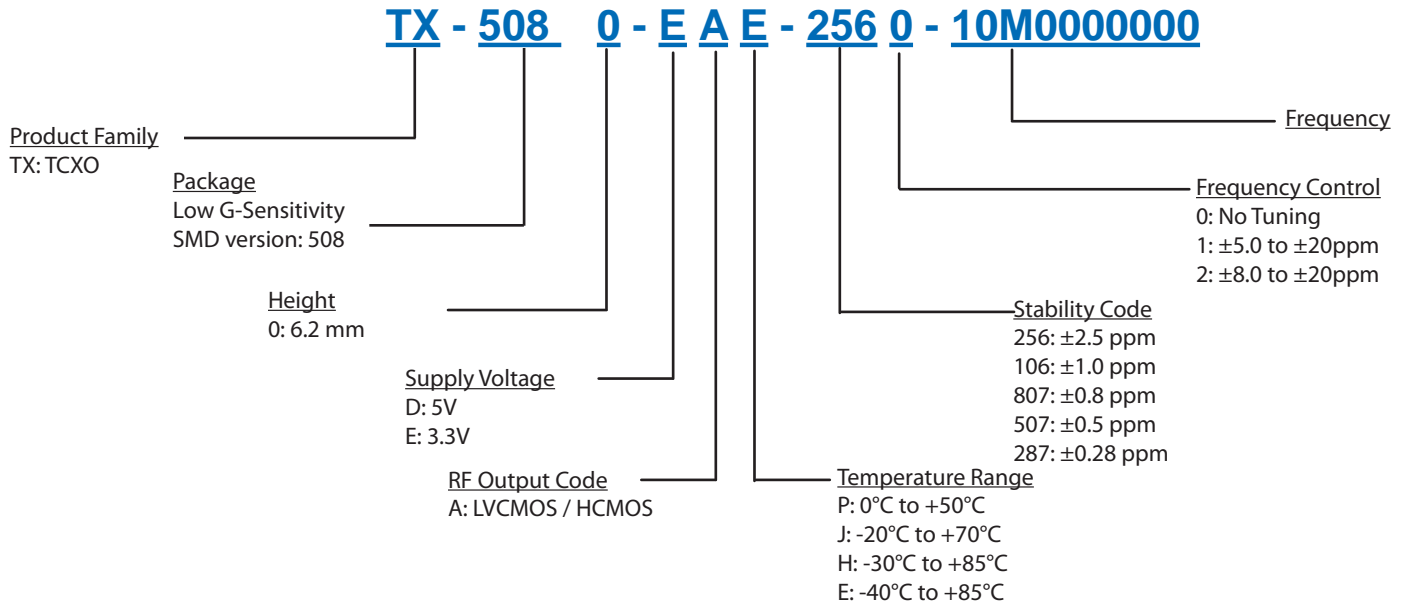
Recommended Reflow Profile



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.

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