


**VS-507**

## Description

The VS-507 VCSO (Voltage Controlled Saw Oscillator) from Vectron is an ultra high frequency, ultra low phase noise oscillator. The VS-507 provides 10fs rms jitter in a 12kHz to 20MHz integration bandwidth and is available from 3 to 6 GHz.

## Features

- Frequency Range 3.0 to 6.0 GHz
- Ultra low jitter performance
- Typical Jitter: 10fsec rms, 12kHz to 20MHz
- 3.3 supply voltage
- Output: Sinewave & Balanced Sinewave
- 9x14 mm SMD package
- See table on Page 5 for standard frequencies

## Applications

- High Speed ADCs
- 100G & 400G Coherent Receivers
- 5G BTS
- Test & Measurement
- Military

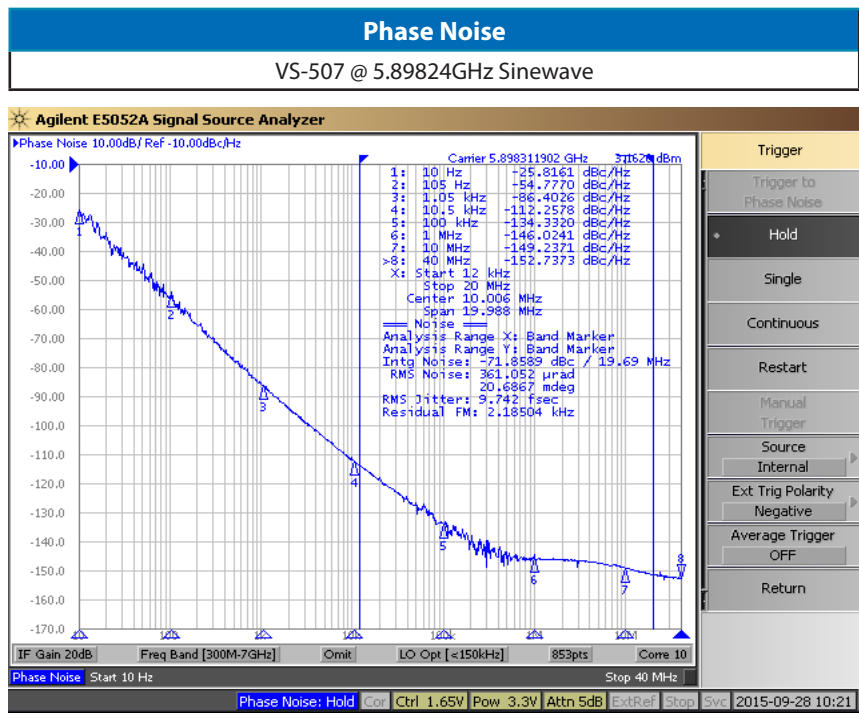
## Performance Specifications

Pulling Characteristics					
Parameter	Min	Typ	Max	Units	Notes
Absolute Pull Range (APR)	±5			ppm	Includes df vs: •Operating temperature range -40 .. 85°C •Aging 10 years •Supply Voltage Change 5% •Load change 10%
Tuning Slope					Positive
Control Voltage Range	0	1.65	3.3	V DC	with $V_s = 3.3V$
Frequency control input impedance	100			kΩ	
Modulation bandwidth	20			kHz	@ -3dB
Supply Voltage ( $V_s$ )					
Supply voltage (standard)	3.135	3.3	3.465	V DC	
Current consumption			85	mA	

RF Output					
Parameter	Min	Typ	Max	Units	Notes
Signal	Sinewave				
Load	45	50	55	$\Omega$	
Output Power	0	3	6	dBm	
Signal	Balanced Sinewave				
Load	45	50	55	$\Omega$	
Output Power	0	3	6	dBm	
Phase Noise: 100Hz offset		-54		dBc/Hz	@ 5.89824GHz Sinewave 3.3V
Phase Noise: 1kHz offset		-86		dBc/Hz	
Phase Noise: 10kHz offset		-112		dBc/Hz	
Phase Noise: 100kHz offset		-134		dBc/Hz	
Phase Noise: 1MHz offset		-146		dBc/Hz	
Phase Noise: 10MHz offset		-149		dBc/Hz	
Jitter: 12kHz to 20MHz offset		10		fs rms	

Additional Parameters					
Parameter	Min	Typ	Max	Units	Notes
Weight	2.0g				
Subharmonics			-25	dBc	
Processing and Packing	Handling and Processing Note				
Absolute Maximum Ratings					
Parameter	Min	Typ	Max	Units	Notes
Supply Voltage ( $V_s$ )			6.0	V	
Operable Temperature Range	-40		+85	$^{\circ}\text{C}$	
Storage Temperature Range	-40		+95	$^{\circ}\text{C}$	

## Typical Performance



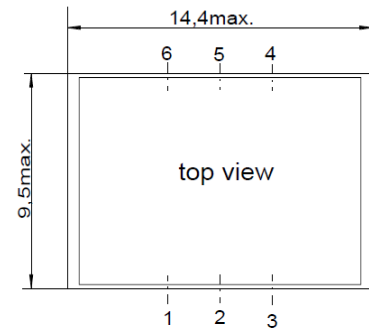
## Outline Drawing / Enclosure

Package Codes		
Code	Height "H"	Pin Length "L"
G218C	2.8	N/A
G218E	4.7	N/A

Dimensions in mm

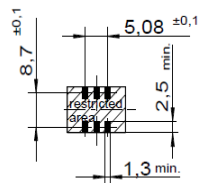
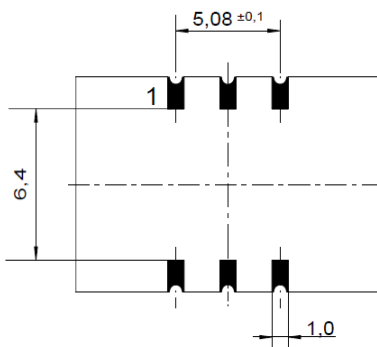
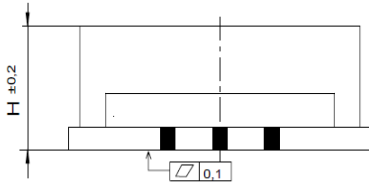
Pin Assignment Sinewave	
1	Control Voltage ( $V_c$ )
2	GND
3	GND
4	RF Out
5	N.C.
6	Supply Voltage Input ( $V_s$ )

Pin Assignment Balanced Sinewave	
1	Control Voltage ( $V_c$ )
2	GND
3	GND
4	RF Out
5	RF-Out Compl. (180° phase shifted)
6	Supply Voltage Input ( $V_s$ )



### G 218

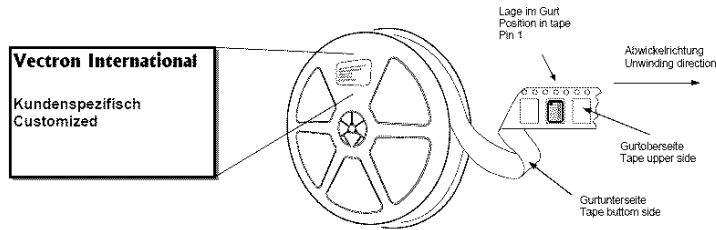
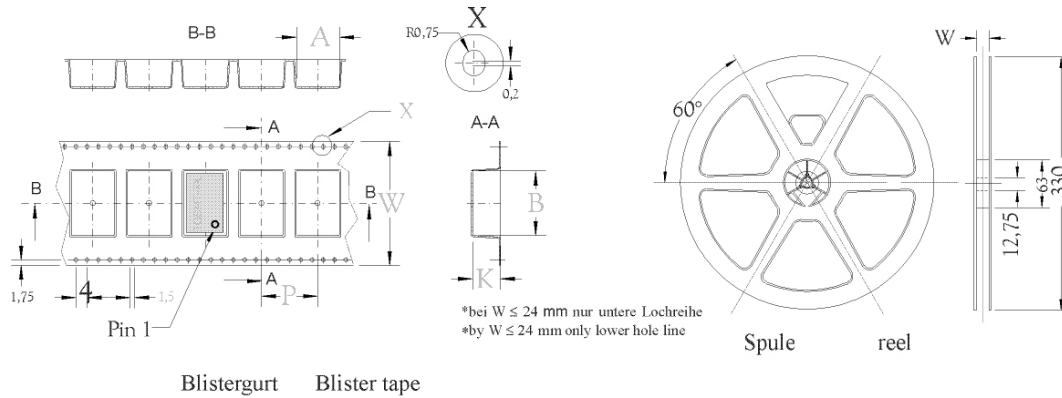
H = 5,9 ; G218 B  
 H = 2,8 ; G218 C  
 H = 2,6 ; G218 D  
 H = 4,7 ; G218 E  
 H = 5,7 ; G218 F  
 H = 5,4 ; G218 G  
 H = 4,9 ; G218 H



Padvorschlag  
 land pattern  
 recommendation

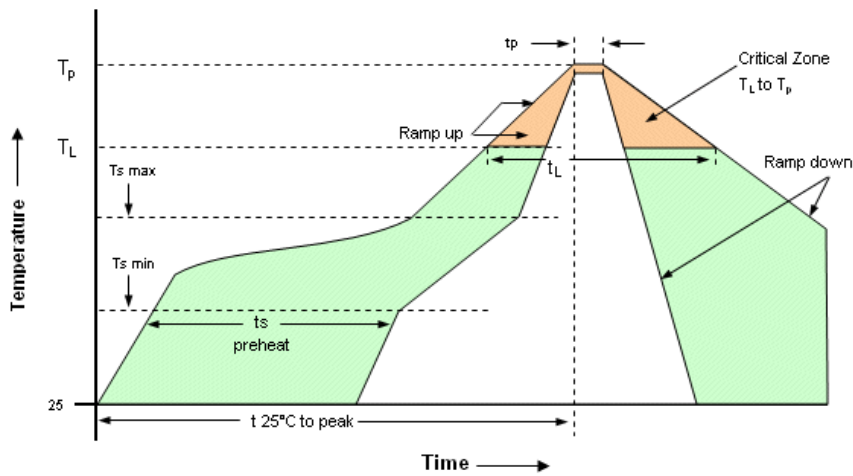
Marking	
VS-507-xxxx	
Frequency	
•AYYWW	

## Standard Shipping Method



Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P (mm)
G218C	24		1700	12
G218E	24		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 $T_{Sma}$ -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.  
SMD oscillators must be on the top side of the PCB during the reflow process.

## Ordering Information

### VS - 507 1 - E E E - 506 X - 5898M24

**Product Family**  
VS: VCISO

**Package**  
9x14mm SMT

**Height**  
0: 2.8mm (G218C)  
1: 4.7mm (G218E)

**Supply Voltage**  
E: +3.3V

**RF Output Code**  
E: Sinewave  
F: Balanced Sinewave

**Temperature Range**  
E: -40°C to +85°C

**APR Code**  
506: ±5ppm

**Frequency**  
**Enable**  
X: No Enable

Standard Frequencies (MHz)						
3137.95842	3328	3468.75	3494.061674	3799.904088	3922.418236	3973.638766
4000	4096.9586	4137.350272	4160	4270.747196	4800	4915.2
5120	5898.24					

Other frequencies and temperature ranges available upon request

**Notes:**

- Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
- 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).
- Phase noise degrades with increasing output frequency.
- Subject to technical modification.
- Contact factory for availability.

## For Additional Information, Please Contact

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