

Helping Customers Innovate, Improve & Grow



Description

The VS-501 VCSO (Voltage Controlled Saw Oscillator) from Vectron is a high frequency, ultra low phase noise oscillator designed to support high speed data converters and 100G coherent optical receivers. The VS-501 provides 12fs rms jitter in a 12kHz to 20MHz integration bandwidth and is available from 1.3GHz to 1.8GHz.

Features

- Frequency Range 1.3 to 1.8 GHz
- Ultra low jitter performance
- Typical Jitter: 12fsec rms, 12kHz to 20MHz
- 5V supply voltage
- Sinewave output
- 9x14 mm SMD package
- See table on Page 4 for standard frequencies

Applications

- High Speed ADCs
- 40G & 100G Coherent Receivers
- Test & Measurement

Performance Specifications

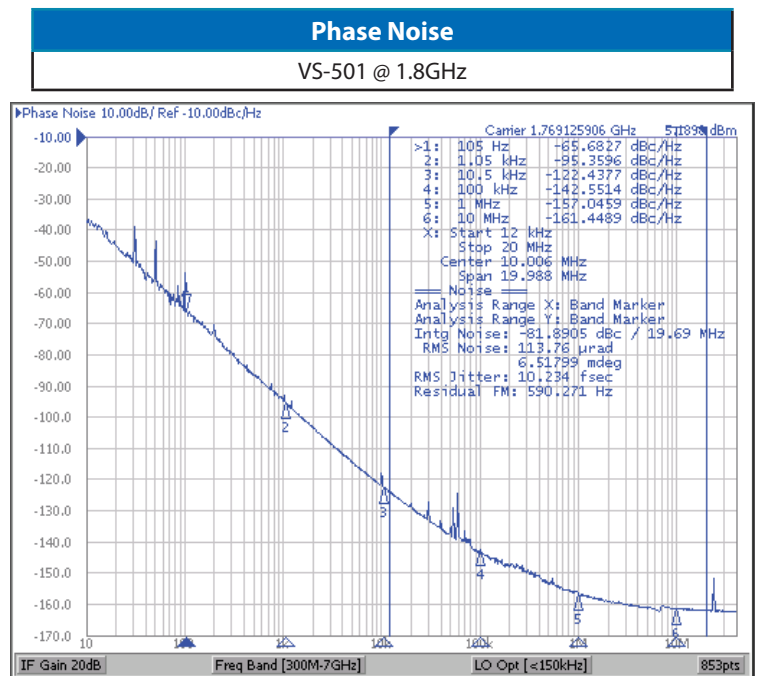
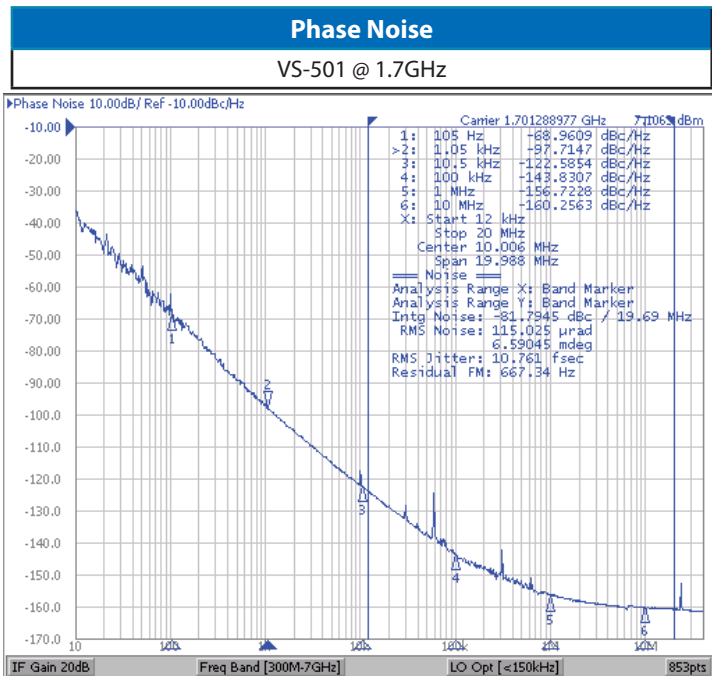
| Pulling Characteristics | | | | | |
|-----------------------------------|------|------|------|-------|---|
| Parameter | Min | Typ | Max | Units | Notes |
| Absolute Pull Range (APR) | ±20 | | | ppm | Includes df vs: •Operating temperature range +10 .. 85°C •Aging 10 years •Supply Voltage Change 5% •Load change 10% |
| Tuning Slope | | | | | Positive |
| Control Voltage Range | 0.5 | 2.5 | 4.5 | V DC | with $V_s = 5V$ |
| Frequency control input impedance | 10 | | | kΩ | |
| Supply Voltage (V_s) | | | | | |
| Supply voltage (standard) | 4.75 | 5.00 | 5.25 | V DC | |
| Current consumption | | | 100 | mA | |

Performance Specifications (Continued)

| RF Output | | | | | |
|-------------------------------|----------|------|-----|----------|----------------------------|
| Parameter | Min | Typ | Max | Units | Notes |
| Signal | Sinewave | | | | |
| Load | 45 | 50 | 55 | Ω | |
| Output Power | 7 | 8.5 | 12 | dBm | |
| Phase Noise: 100Hz offset | | -68 | | dBc/Hz | @ 1.7GHz Sinewave 5V |
| Phase Noise: 1kHz offset | | -96 | | dBc/Hz | |
| Phase Noise: 10kHz offset | | -122 | | dBc/Hz | |
| Phase Noise: 100kHz offset | | -145 | | dBc/Hz | |
| Phase Noise: 1MHz offset | | -156 | | dBc/Hz | |
| Phase Noise: 10MHz offset | | -160 | | dBc/Hz | |
| Jitter: 12kHz to 20MHz offset | | 12 | | fs rms | |

| Additional Parameters | | | | |
|-----------------------------|------------------------------|------|--------------------|-------|
| Weight | 2.0g | | | |
| Processing and Packing | Handling and Processing Note | | | |
| Absolute Maximum Ratings | | | | |
| Parameter | Min | Max | Units | Notes |
| Supply Voltage (V_S) | | 6.0 | V | |
| Operating Temperature Range | -40 | +85 | $^{\circ}\text{C}$ | |
| Storage Temperature Range | -55 | +125 | $^{\circ}\text{C}$ | |

Typical Performance

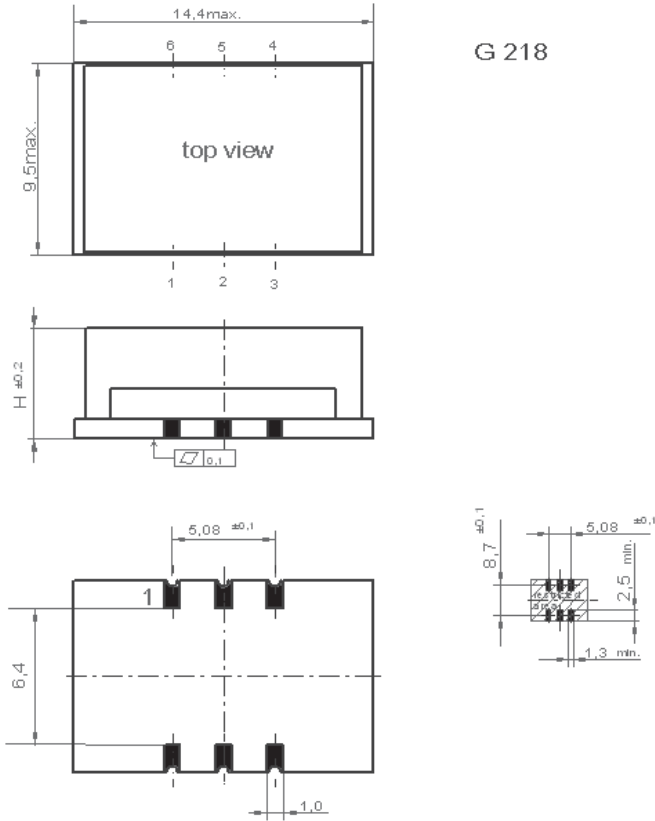


Outline Drawing / Enclosure

| Package Codes | | |
|---------------|------------|----------------|
| Code | Height "H" | Pin Length "L" |
| G218C | 2.3 | NA |

Dimensions in mm

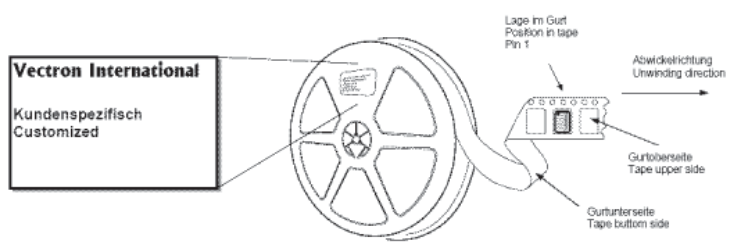
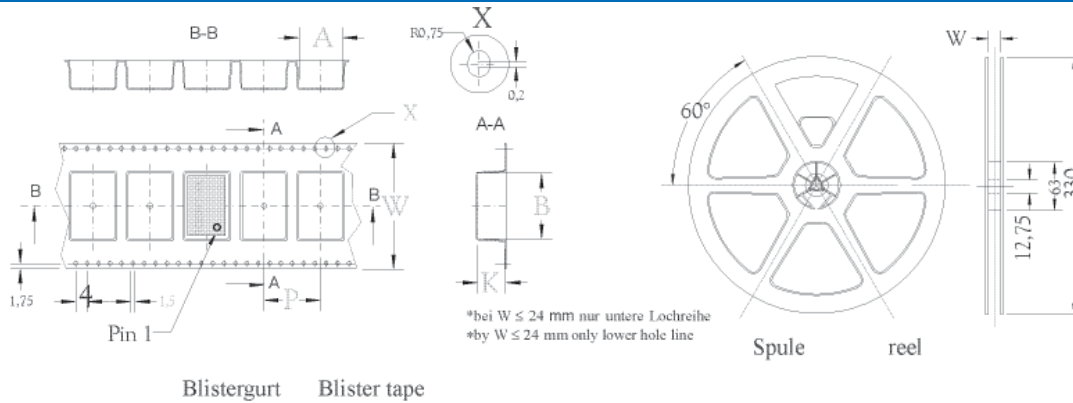
| Pin Assignment | |
|----------------|--------------------------------|
| 1 | Control Voltage (V_c) |
| 2 | GND |
| 3 | GND |
| 4 | RF Out |
| 5 | GND |
| 6 | Supply Voltage Input (V_s) |



G 218

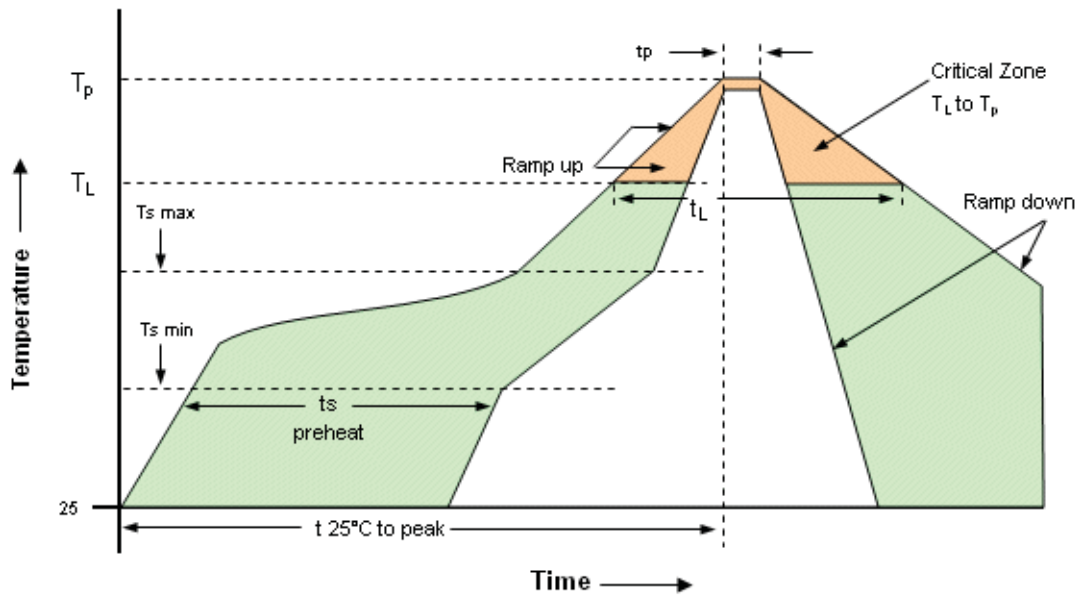
| Marking | |
|-------------|--|
| VS-501-xxxx | |
| Frequency | |
| •AYYWW | |

Standard Shipping Method



| Enclosure Type | Tape Width W (mm) | Quantity per meter | Quantity per reel | Dimension P (mm) |
|----------------|-------------------|--------------------|-------------------|------------------|
| G218C | 24 | | 1700 | 12 |

Recommended Reflow Profile



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

| Standard Frequencies (MHz) | | | | | | |
|----------------------------|---------|-------------|------------|-------------|-------------|----------|
| 1701.32 | 1707.08 | 1747.030837 | 1747.62305 | 1748.366885 | 1748.793733 | 1769.145 |
| 1769.18 | | | | | | |

Other Frequencies Available Upon Request

Ordering Information

VS - 501 0 - D E X - 205 X - 1747M030837

Product Family
VS: VCSCO

Package
9x14mm SMT

Height
0: 2.8mm (G218C)

Supply Voltage
D: +5.0V

RF Output Code
E: Sinewave

Temperature Range
X: +10°C to +85°C

APR Code
205: ±20ppm

Enable
X: No Enable

Frequency

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. Subject to technical modification.
5. Contact factory for availability.

For Additional Information, Please Contact

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Rev: 12/2011