RSV2522

The RSV2522 is a low power Voltage Controlled SAW Oscillator (VCSO). Its advanced Surface Acoustic Wave technology enables the ultimate in performance for excellent phase noise performance at very high frequencies. This miniature +5V low power supply SMD package VCSO is ideal for the latest generation of high speed converters, which require a high frequency clock with low jitter.

The VCSO series uses high performance SAW resonators to generate 800MHz and 1GHz frequency outputs, and each are combined with a frequency doubler to reach 1.6GHz and 2GHz frequencies, respectively. The RSV2522 can be easily locked to a stable reference through a Phase Locked Loop system, or they can be used as a SAW clock without the need for external circuitry.

Features

- Excellent phase noise performance:
  - ✓ 1 kHz offset: -115 dBc/Hz
  - ✓ 10 kHz offset: -141 dBc/Hz
  - ✓ Noise floor: -172 dBc/Hz
- Broadband jitter: < 10 fs (offset frequency 10 kHz to 40 MHz)
- Low power consumption: <40mA

Applications

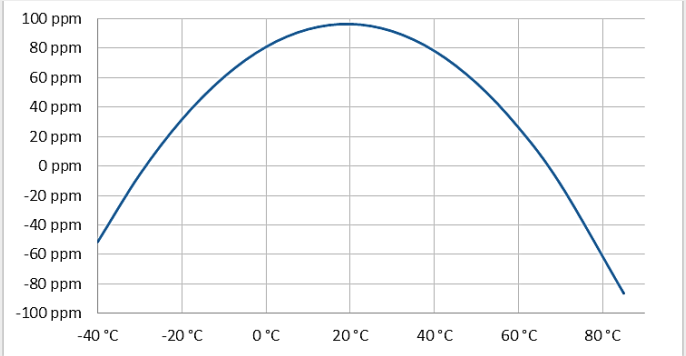
- Instrumentation, test and measurement
- High speed converter and low jitter applications
- Ground based military equipment
- Avionics
- Telecommunications

25.4 x 22 x 5 mm³

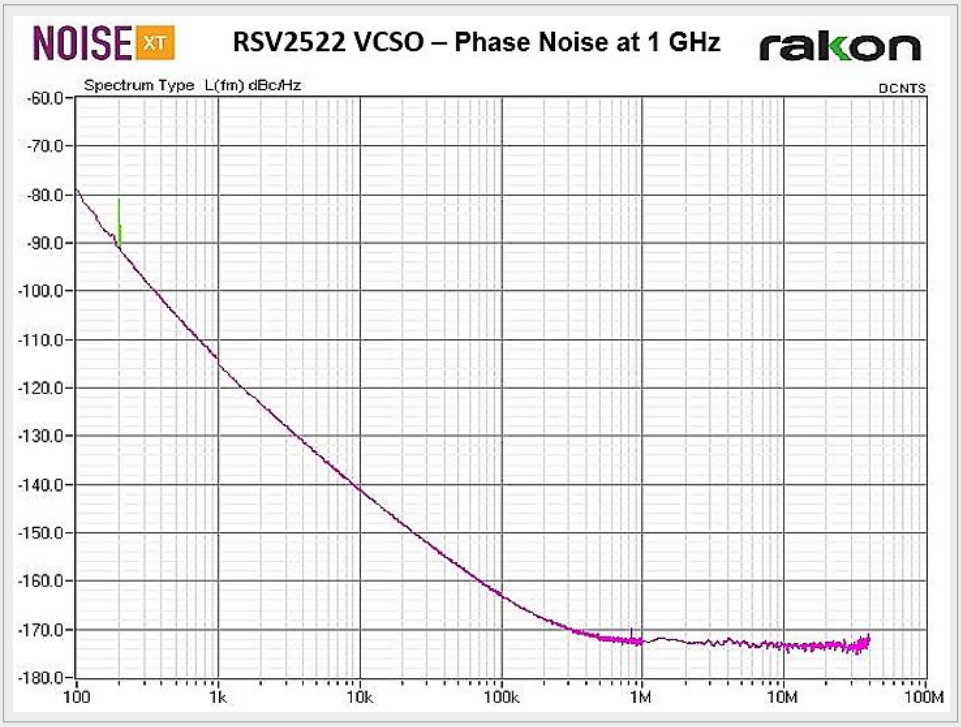
1. Environmental Conditions

Parameter	Condition / Remarks	Typ.	Guaranteed	Unit
Operating & storage temperature		-40 to 85		°C
G-sensitivity	On each axis	1	<2	ppb/g
Shock & random vibration	As per MIL-PRF-28800F, Class 3, test equipment			

2. Frequency Characteristics

Parameter	Condition / Remarks	Typ.	Guaranteed	Unit
Nominal frequency (Fnom)	Fnom = 800, 1000, 1600 or 2000 MHz @ 25°C without external control	Fnom x (1 + 10^{-4})		MHz
Frequency calibration	With regards to nominal frequency	±100		ppm
Frequency drift	On operating temperature range	±100		ppm
Long term stability (Ageing)	1st year 10 years		< ±5 < ±10	ppm
Tuning range	For control voltage 0.5 – 4.5V	600	>500	ppm
Tuning sensitivity	Positive slope	150		Ppm/V
Start-up time			<10	ms
Power consumption	@ 5V	30	<40	mA
Output power	Sine wave into 50 Ω load		+10±2	dBm
Output impedance	@ Fnom ± 1MHz		<2.0:1	VSWR
Frequency drift vs Temperature @ 1 GHz output frequency				

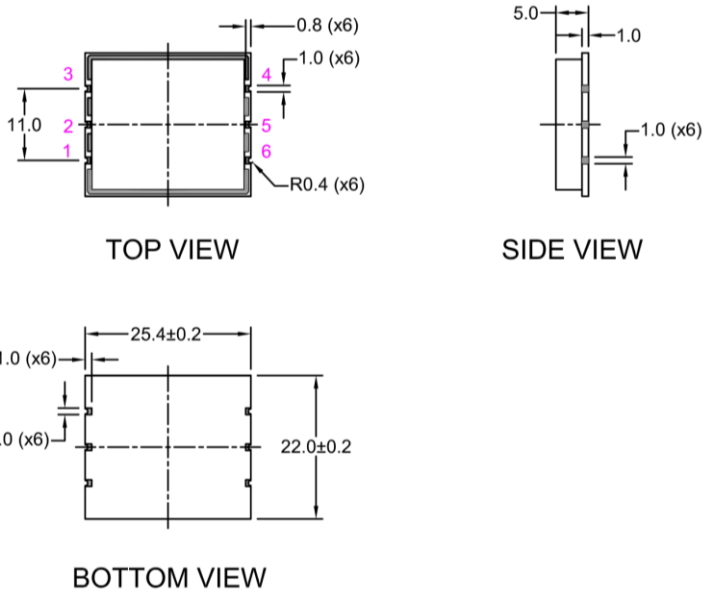
3. Single Side Band Phase Noise (PN) @ 1 GHz and Time Jitter

Parameter	Condition / Remarks		Typ.	Guaranteed	Unit
Phase noise (Static conditions at 25°C)	Guaranteed values on full temperature range	@ 1 kHz offset @ 10 kHz offset @ 1 MHz offset	-115 -141 -172	<-110 <-138 <-170	dBc/Hz
Harmonic distortion			-40	<-30	dBc
Spurious	Non-harmonics			<-80	dBc
Broadband jitter	From 10 kHz to 40 MHz		4	<10	fs
Phase Noise plot @ 1GHz output frequency					

4. Electrical Interface

Parameter	Condition / Remarks		Typ.	Guaranteed	Unit
Power supply (Vcc)	Pin 4	- Absolute maximum - Operating range		+5±2.5 <+6	V
Load impedance	Pin 1	50Ω all phases		<1.3:1	VSWR
Control input voltage (VCTRL)	Pin 3			0.5 to +4.5	V
Control input impedance	Pin 3		2		kΩ
Control input modulation bandwidth	Pin 3			>10	kHz

5. Model Outline, Pin Connections



PIN CONNECTIONS	
1	RF OUT (Frequency output)
2	GND (Ground)
3	V_{CTRL} (Control input)
4	V_{CC} (Power supply)
5	GND (Ground)
6	GND (Ground)

NOTE: Outline unit is mm.

6. Pb-free Reflow Profile

The assembly of this SMD module must be performed through a “Pb-free” reflow process and according to recommended standards defined in IPC/JEDEC J-STD-020.