

ISSUE 1; February 2020

Description

- A low noise and low power OCVCSO (Oven Controlled, Voltage controlled, SAW Oscillator) at 400MHz, powered by a low voltage 5V power supply. The signal is generated from a high-Q SAW resonator at 400MHz fundamental frequency. It is designed for lab environment (test equipment, shelter, ground based military equipment). Manufactured for us by Rakon.



Frequency Parameters

- Frequency: 400.0MHz
- Frequency Tolerance Max: $\pm 1.00\text{ppm}$
- Tolerance Condition: @ 25°C
- Frequency Stability: $\pm 2.00\text{ppm}$
- Ageing: $\pm 1\text{ppm}$ max in 1st year, $\pm 6\text{ppm}$ max in 10yrs
- G-sensitivity (on each axis): 1ppb/g typ, 2ppb/g max

Electrical Parameters

- Supply Voltage: 5.0V $\pm 0.25\text{V}$
- Power Consumption
Warm Up: 2.0W typ, 2.5W max
Steady State (@ 25°C): 1.0W typ, 1.5W max
- Warm Up Time (@ 25°C, $\pm 1\text{ppm}$ with reference to frequency reached after 1hr of continuous operation): 2 minutes max.
- Supply Voltage, Absolute Maximum Rating: +6V

Frequency Adjustment

- Pulling: $\pm 6\text{ppm}$ min to $\pm 10\text{ppm}$ typ
- Control Voltage: 2.5V $\pm 2.0\text{V}$
- Input Impedance: 10k Ω min
- Slope (Positive): 5ppm/V typ, 3ppm/V min

Operating Temperature Ranges

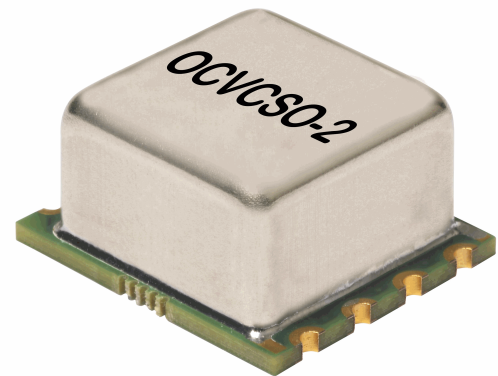
- 0 to 50°C

Output Details

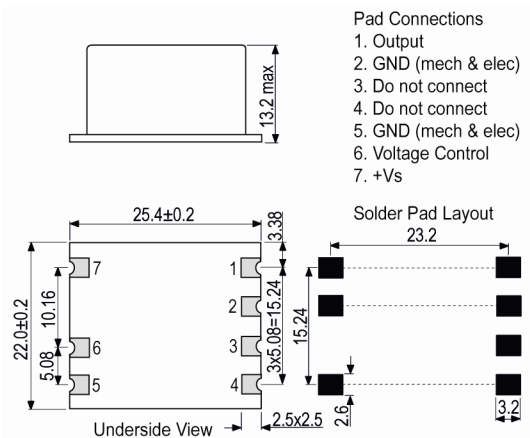
- Output Compatibility: Sinewave
- Drive Capability: 50 Ω (@ <1.3:1 VSWR)
- Output level: 10dBm $\pm 2\text{dBm}$
- Output impedance (@ 400MHz $\pm 1\text{MHz}$): <2.0:1 VSWR

Noise Parameters

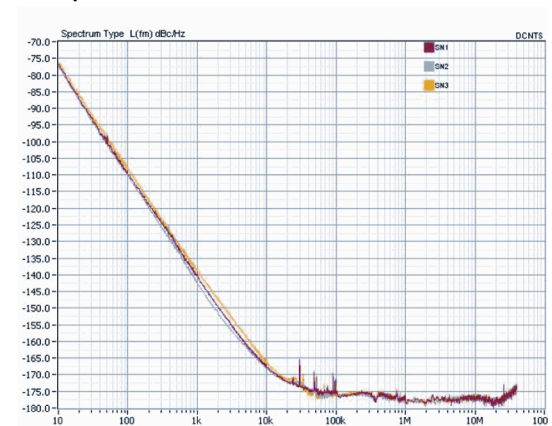
- Phase Noise (static condition at 25°C, guaranteed values over full temperature range):
(@ 1kHz): -140dBc/Hz typ, -135dBc/Hz max guaranteed
(@ 10kHz): -167dBc/Hz typ, -162dBc/Hz max guaranteed
(@ 1MHz): -177dBc/Hz typ, -174dBc/Hz max guaranteed
- Harmonic Distortion (all sub-harmonics, 2nd and 3rd harmonics): -40dBc typ, -30dBc max
- Spurious (Non Harmonic): -80dBc max
- Jitter:
Full offset range from 10Hz to 40MHz: 100fs typ, 200fs max
Broadband: from 10kHz to 40MHz: 5fs max



Outline (mm)



Example Phase Noise



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Environmental Parameters

- Storage Temperature Range: -40 to 85°C
- Shock: as per MIL-PRF-28800F, Class 3, test equipment.
- Random Vibration: As per MIL-PRF-28800F, Class 3, test equipment.

Manufacturing Details

- Reliability (ref MIL-HDBK-217F, Ground fixed, at 25°C):
FIT: 6018 fails/10⁹ hours typ
MTBF: 19 years typ
- RoHS Reflow 240°C max for 30secs max

Compliance

- RoHS Status (2011/65/EU) Compliant
- REACH Status Compliant
- MSL Rating (JDEC-STD-033): 3

Packaging Details

- Pack Style: Bulk Loose in bulk pack
Pack Size: 1

Electrical Specification - maximum limiting values 5.00V ±0.25V

Frequency Min	Temperature Range	Stability (Min)	Current Draw	Rise and Fall Time	Duty Cycle
	°C	ppm	mA	ns	%
400.0MHz	0 to 50	±2.00	-	-	-

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