

Oven-Stabilized Ultra Low Noise S-Band DRO for fixed frequencies between 2.850GHz and 3050GHz

Developed for extremely jitter sensitive applications like electron beam accelerators, this voltage-controlled Dielectric-Resonator Oscillator delivers ultimate phase noise performance, comparable to quartz crystal oscillators.

While developed for 2.998GHz, the design can be factory ordered for any frequency within 2850MHz to 3050MHz with the same guaranteed and comparable typical performance.

With a high performance dielectric resonator at its heart, phase noise typically reaches -130dBc/Hz at 1kHz, -160dBc/Hz at 10kHz offset and -180dBc/Hz in the noise floor, yielding attosecond jitter performance when integrated from 1kHz to 30MHz.

Double buffering on the output keeps pulling below 1ppm (typically) and a two tier voltage stabilization scheme virtually eliminates pushing.

The tuning port accepts 0..6V for a ± 45 kHz tuning range and easy integration into phase-locked loops.

The DRO runs off a single +5,7V supply voltage. In addition a +15V supply, drawing a maximum current of 1100mA, is required to keep the unit at a stable temperature of +35°C, ensuring frequency accuracy.

Available option:

ALC: Amplitude stabilization to $< \pm 0.1$ dB.



Low-Noise Signal Sources

Data Sheet:
Ultra Low Noise
S-Band DRO
for 2.850 .. 3050 MHz

Technical Data:

Operating Frequency: 2.850GHz .. 3050MHz factory set (± 0.5 MHz mechanical tuning)

Output Power: +19 dBm

Output Power Variation: $< \pm 1.5$ dB (typ. $< \pm 0.75$ dB)

Return Loss: > 20 dB, VSWR < 1.22 (typ. < 25 dB, VSWR < 1.12)

Harmonic Distortion: < -40 dBc (typ. < -50 dBc)

Discrete Spurious Tones: < -20 dBc - $20\log(f_m)$ dBc for Offsets < 100 kHz
 < -120 dBc for Offsets > 100 kHz

		Guaranteed	Typical
Phase Noise:	@ 100Hz:	< -95 dBc/Hz	- 100 dBc/Hz
	@ 1kHz:	< -125 dBc/Hz	- 130 dBc/Hz
	@ 10kHz:	< -155 dBc/Hz	- 160 dBc/Hz
	@ 100kHz:	< -170 dBc/Hz	- 180 dBc/Hz
	@ 1MHz:	< -175 dBc/Hz	- 180 dBc/Hz
	@ 10MHz:	< -175 dBc/Hz	- 180 dBc/Hz
AM Noise:	@ 100Hz:	< -140 dBc/Hz	- 145 dBc/Hz
	@ 1kHz:	< -160 dBc/Hz	- 165 dBc/Hz
	@ 10kHz:	< -170 dBc/Hz	- 173 dBc/Hz

Electronic Tuning: 0 .. +6V (-45kHz .. +45kHz)

Tuning Slope: 15 kHz/V

Modulation Bandwidth: 160 kHz

Power Supply: +5.7 V/450 mA +15 V/1100 mA max. (Heater)

Dimensions: Milled Aluminum Case 125mm x 130mm x 61mm

Connectors: 2 x SMA (RF-Output, VCO-Tuning Port), Feed-Through for +5.7 V and +15 V, 2 x Ground Solder Pins

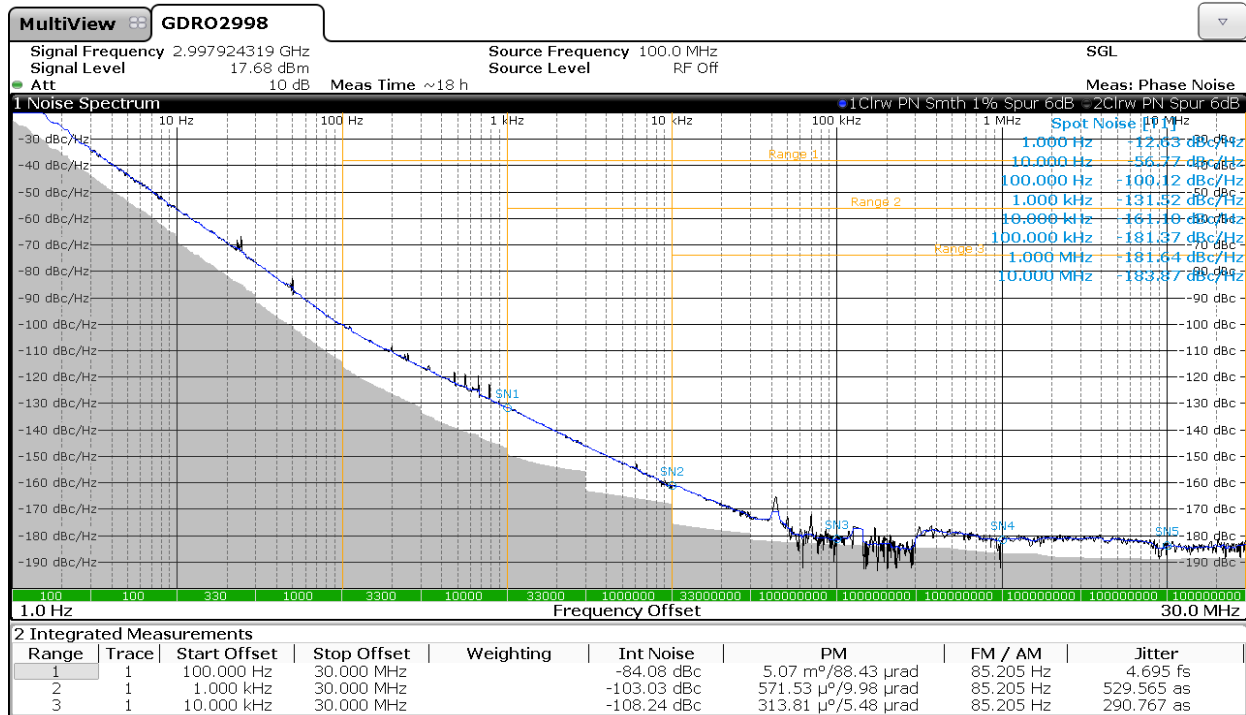
Temperature Range: +5°C .. 40°C operating (-40°C .. +71°C storage), non Condensing

Oven warm-up Time: < 5 min for < 30 kHz frequency error

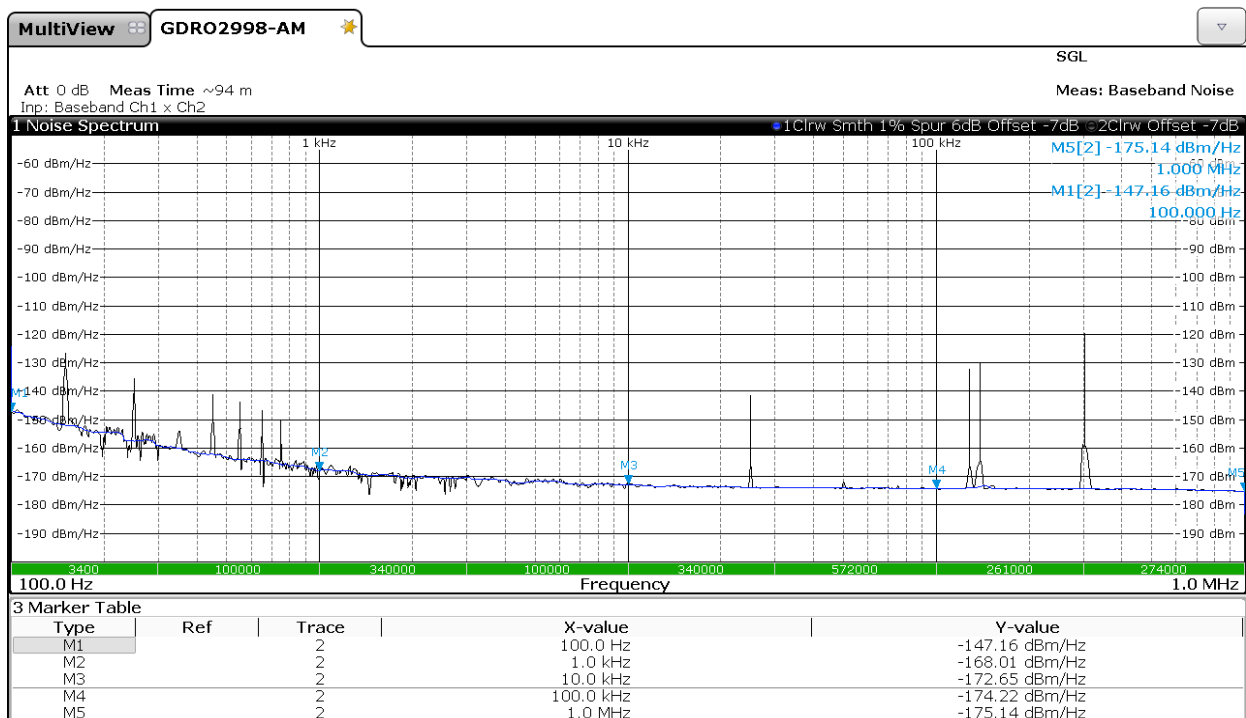
Oven Status Indicator: 3.3V: Oven regulated / 0V: Oven unregulated

Option ALC: **Output Power:** +19 dBm
Output Power Variation: $< \pm 0.1$ dB

Typical Phase Noise Plot:



Typical AM Noise Plot:



Mechanical Drawings:

