Low Noise Oscillator series

LNO 2000 B1 OCSO @ 2 GHz

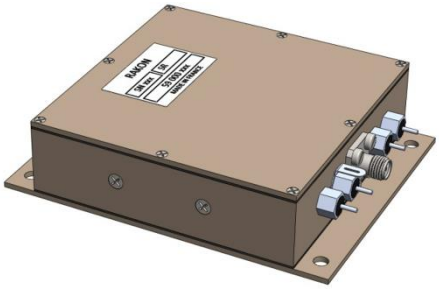
Specific request can be addressed to RAKON hirel@rakon.com

Product Description

LNO 2000 B1 is a low noise OCVCSO (Oven Controlled, Voltage controlled, SAW Oscillator) at 2 GHz.

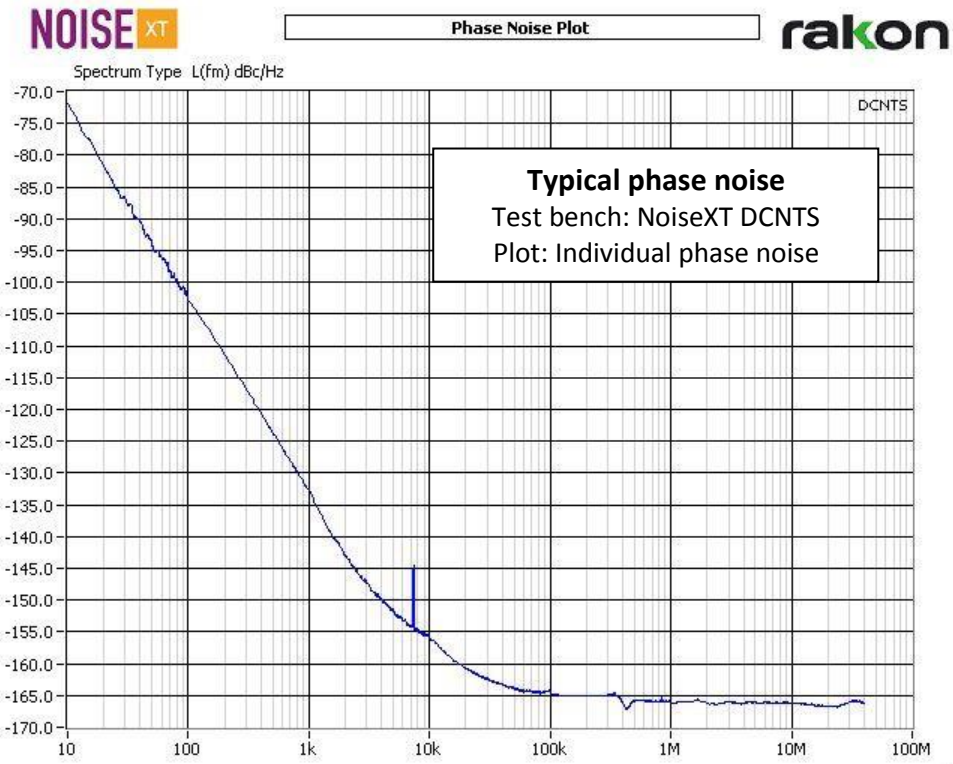
It is composed of a SAW oscillator at 500 MHz fundamental frequency, followed by a frequency quadrupler.

LNO 2000 B1 is designed for routine environment (test equipment, shelter, ground based military equipment...). It is available in a 95.3mm x 76.2mm x 23.3mm package.



Features

- Excellent phase noise performance (typical value) :
  - -132 dBc/Hz @ 1kHz offset
  - -166 dBc/Hz noise floor



- Broadband jitter < 10 fs (offset frequencies from 10 kHz to 40 MHz)

Applications

- Instrumentation (test equipment, simulator)
- Ground based military equipment as per MIL-PRF-28800F, Class 3
- Low jitter clock for high speed ADC

Specifications

1.0 Environmental conditions

Line	Parameter	Test Condition	Min	Max	Unit
1.1	Operating temperature range		0	+50	°C
1.2	Storage temperature range		-40	+85	°C
1.3	Shock	As per MIL-PRF-28800F, Class 3, test equipment			
1.4	Random vibration	As per MIL-PRF-28800F, Class 3, test equipment			

2.0 Electrical interface

Line	Parameter	Test Condition	Operating Range	Absolute Maximum	Unit
2.1	Supply voltage	Pin 2	+10 ± 0.2	0 to +15	VDC
2.2	Load impedance	Pin 3, 50Ω all phases	< 1.3:1	-	VSWR
2.3	Control input voltage	Pin 4	+2 to +7	-0.3 to +10	VDC
2.4	Control input impedance	Pin 4	> 10	-	kΩ

3.0 Performances

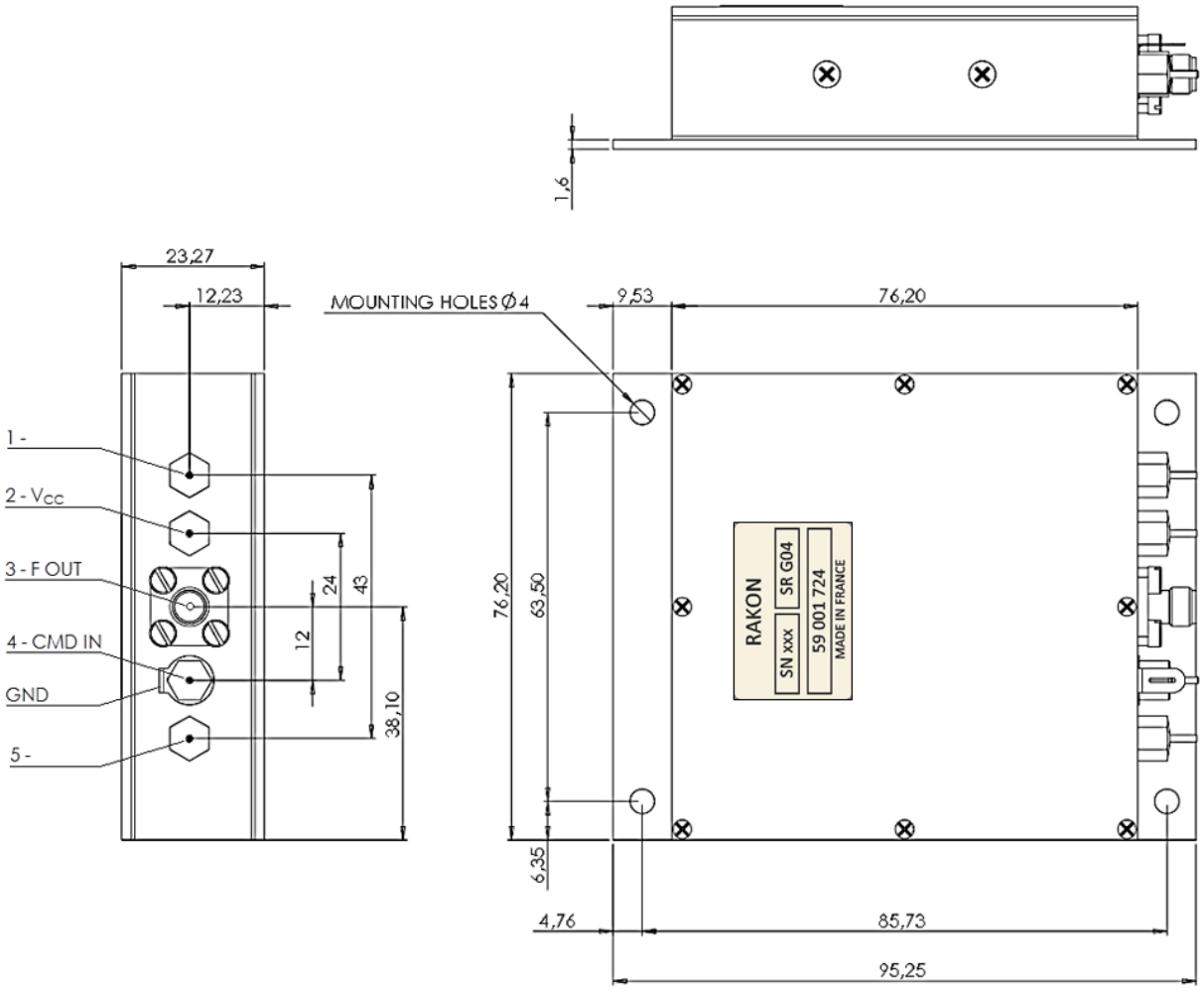
Line	Parameter	Test Condition	Typ. Value	Guaranteed	Unit
3.1	Nominal output frequency	Definition	2000		MHz
3.2	Output frequency calibration	Factory calibration @25°C	±0.2	< ±0.5	ppm
3.3	Output frequency stability	On full temperature range	-	< ±2	ppm
3.4	Long term stability	After 30 days of continuous operation 1st year 10 years	 - -	 < ±1 < ±6	 ppm ppm
3.5	Warm-up power consumption		7	< 9	W
3.6	Steady state power consumption	@25 °C (calm air)	3	< 4	W
3.7	Warm-up time	±1 ppm with reference to frequency reached after 1 hour of continuous operation	-	< 5	minutes
3.8	Frequency tuning	For full control input operating range	±5	> ±4	ppm
3.9	Slope	Positive	2	1.5 to 3	ppm/V
3.10	Output power	Sine wave into 50 Ω load	-	+10 ±1	dBm
3.11	Output impedance	At 2000 ± 1MHz	-	< 2.0:1	VSWR

4.0 Single side band phase noise (PN) and time jitter

Line	Parameter	Test Condition	Typ. Value	Guaranteed	Unit
4.1	PN power density @ 1 kHz offset	Static conditions, at 25°C (guaranteed values on full temperature range)	-132	< -128	dBc/Hz
4.2	PN power density @ 10 kHz offset		-156	< -153	dBc/Hz
4.3	PN power density @ 1 MHz offset		-166	< -164	dBc/Hz
4.4	Harmonic distortion	All sub-harmonics, 2^{nd} and 3^{rd} harmonics	-40	< -30	dBc
4.5	Spurious	Non-harmonics	-	< -80	dBc
4.6	Full offset range	From 10 Hz to 100 MHz	100	< 200	fs
4.7	Broadband	From 10 kHz to 40 MHz	-	< 10	fs

5.0 Mechanical features

Outline in mm, nominal values (general tolerances : ±0.15mm).



6.0 Pin description

Line	Pin number	Name	Description
6.1	1	-	Do not connect
6.2	2	Vcc	Input supply voltage (+)
6.3	3	F OUT	RF output signal
6.4	4	CMD IN	Input control voltage
6.5	Lug (4)	GND	Mechanical and electrical ground (-)
6.6	5	-	Do not connect