

LNO100SA

The LNO100SA is a high reliability and ultra Low Noise OCXO (LNO) available in 80 to 125 MHz output frequencies. They are specially designed to meet the requirements of the most demanding phase noise applications in airborne environments. The OCXOs deliver excellent close-in phase noise. As an example, a 100 MHz LNO100SA provides a guaranteed phase noise floor as low as -172 dBc/Hz.

Proprietary technologies allow us to use a compact package with shock absorbers, provide accurate acceleration stability, minimise model outline and reduce power consumption. As a result, this OCXO achieves a low *g*-sensitive ≤ 0.5 ppb/*g*. The LNO100SA is an ideal solution for end applications requiring limited SWaP (Size, Weight, and Power).

Features

- Frequency: 80 to 125 MHz
- Guaranteed low phase noise @100 MHz:
 - 1 kHz offset: -160 dBc/Hz
 - 100 kHz offset: -172 dBc/Hz
- Low *g*-sensitivity 0.5 ppb/*g*
- Supply voltage: 12 V
- Frequency stability vs temperature: ± 0.5 ppm
- Ageing: ± 1.8 ppm/10 years

Applications

- Airborne military equipment
- Radar
- Military communications

Package / Weight

96 x 80 x 35 mm / 350 g

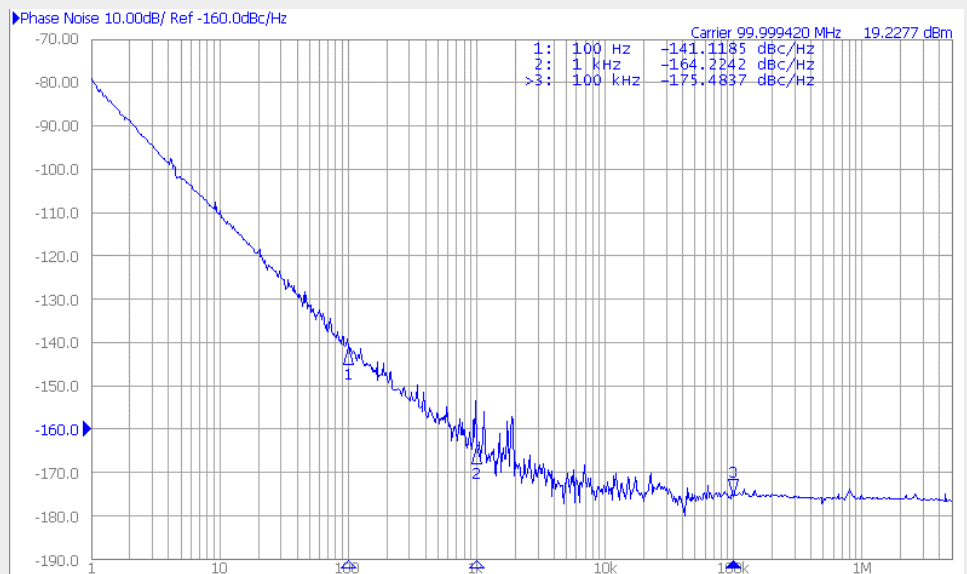


Phase Noise

Parameter

Condition / Remarks

LNO100SA Phase Noise
- Typical value @100 MHz



Guaranteed static phase noise (Min)

Frequency (MHz)	100 Hz	1 kHz	10 kHz	100 kHz	Unit
100	-132	-160	-170	-172	dBc/Hz

Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature (T _{OP})	Option A Option B	-20 -40	25 25	70 85	°C
Switch-on temperature (T _{SO})	-	-40	-	85	°C
Non-operating temperature (T _{NOF})	-	-55	-	125	°C
Relative humidity	as defined by MIL-STD-810G Method 507 Procedure I				
Random vibration	as defined by MIL-STD-810G, Method 514.6, Category 7_C-17,				
Shocks	as defined by MIL-STD-810G, Method 516.6, Procedure I (20g peak / 11ms / sawtooth)				

Electrical Interface

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Power supply (V _{CC})	-	11.4	12	12.6	V
Load impedance	-	45	50	55	Ω

Performances

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency (Fn)	Standard Fn: 80, 100, 120 MHz	80	100	125	MHz
Initial frequency accuracy	@25°C, control voltage range is providing to reach the initial frequency accuracy at shipment	-	-	±0.5	ppm
Freq. stability vs temperature	Option A: -20°C to 70°C / Temperature slope 1°C/min Option B: -40 to 85°C / Temperature slope 1°C/min	-	±0.1 ±0.5	±0.25 ±1	ppm
Freq. variation vs supply voltage	@ V _{CC} ±5% / @ 25°C	-	-	±0.05	ppm
Freq. stability vs load	@ ±10% variation of load / @25°C	-	-	±0.05	ppm
Frequency warm-up	Time to be within the initial frequency accuracy compared to frequency after 1hour	-	-	10	mn
<i>g</i> -sensitivity ^{1, 2}	Static 10 Hz offset 30 Hz offset (close to the resonance) 100 Hz offset 1000 Hz offset	-	-	±0.5 ±0.6 ±2 ±0.08 ±0.005	ppb/g
Long-term stability (ageing) ³	1 st year 10 years	-	±0.2 ±1	±0.5 ±1.6	ppm
Allan deviation	Tau = 1s Tau = 10s	-	-	5E-11 5E-10	-
Output level	Sine Option A Option B	10 17	- -	13 20	dBm
VSWR	F ₀ ±1MHz	-	-	2:1	-
Harmonic level	Bandwidth from DC to 10 x Fn	-	-	-25	dBc
Non-harmonic level (spurious)	Bandwidth from DC to 5 GHz	-	-100	-90	dBc
Warm-up input power	-	500	-	-	mA
Steady-state supply power	@ 25°C	250	-	2.2	mA

¹ LNOs with lower *g*-sensitivity can be provided on specific request

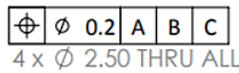
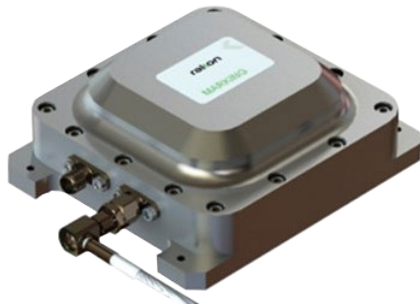
² The *g*-sensitivity sanction is done by calculation

³ The projected change for 1 year or other periods is not calculated as per as MIL-PRF-55310. The fit calculation is based on measurement during 30 days minimum; the measurements obtained are fitted using the method of least squares to function defined in MIL-PRF-55310. The projected total frequency change for one year is determined by using this.

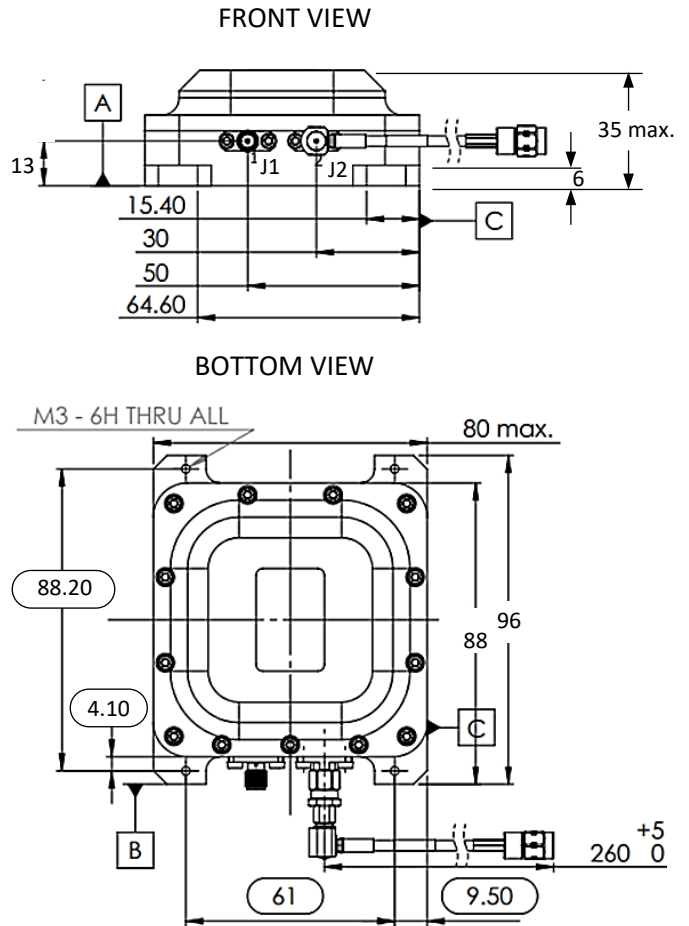
Model Outline and Pin Connections

Parameter	Package	Pin #	Connections
Package and pin connection	CON1 Size: 96 x 80 x 35 mm	J1	F _{OUT} Frequency output
		J2	V _{CC} Supply voltage

Model outline



NOTE:
 Unit: mm
 General tolerance: ± 0.2 mm



Ordering Part Example

LNO100SA D CON1 A A 12 100M000000

Product Series

LNO = Low Noise OCXO
100 = Fn option 80 to 125 MHz
SA = Shock Absorbers

Application Grade

A = Instrumentation
B = Harsched environments without shock
C = Harsched environments with visible shock
D = Harsched environments with non-visible shock

Package Type

CON1 = SMA-SMA

RF Level

A = 13 dBm; **B** = 20 dBm

Frequency (Fn)**

100M000000 = 100 MHz

Supply Voltage*

12 = 12V

Temperature Stability

A = -20°C to 70°C, ± 0.25 ppm
B = -40°C to 85°C, ± 1 ppm

* Supply voltage 15V available on request.

** Standard frequencies: 80, 100, 120, 125 MHz.

Annexe

Figure 1:
g-sensitivity

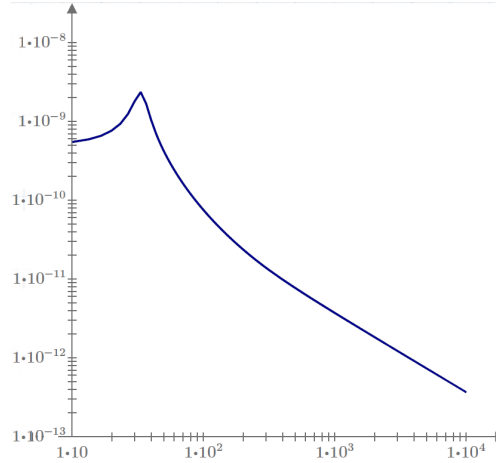


Figure 2:
Spectrum of random vibration
(DO-160G / B4)

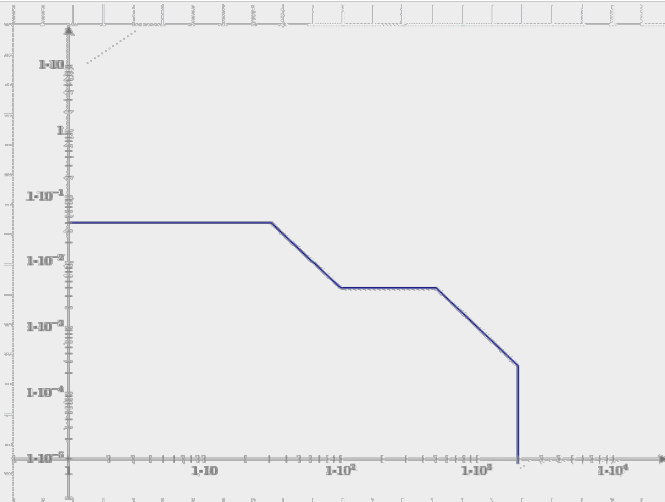


Figure 3:
Phase noise curves @ 100 MHz
under random vibration
(DO-160G / B4)

Represented in black, is the theoretical curve of the phase noise in static conditions and red the phase noise in dynamic conditions.

