PLO NS LN [PRELIMINARY]

The PLO NS LN is a part of Rakon's Phase Locked Oscillator (PLO) series featuring superior low phase noise performance. This PLO delivers ultra-stable frequency with excellent close-in phase noise and floor noise. Precise frequency stability and low phase noise make the device suitable for Low Earth Orbit (LEO) satellites and satellite constellations where stable frequency sources are critical. Output frequencies of the PLO NS LN are available from 10 to 120 MHz with a lifetime of up to 12 years. LEO Broadband, GNSS and Earth Observation are the typical applications targeted by this PLO.

A 100 MHz-output low noise NewSpace PLO can be customised by taking an external 10 MHz reference as its input frequency. The ultra-low phase noise discrete Phase Lock Loop (PLL) oscillator delivers stable frequency signals and is a state-of-the-art frequency source generator. This PLO can be customised to have several outputs, a higher output level, or a more stable internal reference. It is a cost-effective solution with short lead times. The test and screening flow can be tailored according to customer requirements to reduce cost and lead time.

Key Features

- Output frequency: 10 to 120 MHz
- Compact package
- Power voltage: 12 V
- Typical phase noise @10 MHz
  - -120 dBc/Hz (@100 Hz)
  - -140 dBc/Hz (@1 kHz)
  - -150 dBc/Hz (@10 kHz)
  - -155 dBc/Hz (@100 kHz)
  - -155 dBc/Hz (@ 1 MHz)
- Overall frequency stability: depends on the reference
- Output power 5 dBm

Baseline

- Single outputs: @100 MHz
- External reference: 10 MHz
- SMA output frequency
- Fault alarm

Options

- Internal reference: 10 MHz
- Several outputs
- Different output frequencies
- High output level: 28 dBm

50 x 50 x 16 mm

Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature	TO_P	-25	25	60	°C
Non-operating temperature	Qualification	-30		63	°C
Random vibration	Level as per MIL-STD-202, Method 214, Condition K (46.3 grms)				
Sine vibration	Level as per MIL-STD-202 Method 204, Condition D (20G)				
Mechanical shock	Level as per MIL-STD-202, Method 213, Conduction F: Half sine with a peak acceleration of 1500 *g* for a duration of 0.5 ms				
Radiation	Total Ionizing Dose (TID) of 40 kRad, low dose rate (36 to 360 rad/h) No SEL up to LET = 43 MeV/mg/cm²				
Lifetime	Up to 12 years				

Typical Performance Characteristics

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency (Fn)			100		MHz
Current consumption				50	mA
Overall frequency drift	Same as reference				
Fault alarm	TTL, 3.3V when phase lock				
Output waveform	Sine				
Output power level		5			dBm
Harmonics level				-15	dBc

Issue: A0, xxx.110, 12 November 2021
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Spurious level	100 Hz to 5 GHz			-70	dBc

Phase Noise @ 100 MHz

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Phase noise @100 MHz	1 Hz offset			-90	dBc/Hz
	10 Hz offset			-110	dBc/Hz
	100 Hz offset			-120	dBc/Hz
	1 kHz offset			-140	dBc/Hz
	10 kHz offset			-150	dBc/Hz
	100 kHz offset			-155	dBc/Hz
	1 MHz offset			-155	dBc/Hz

Model Outline and Connectors

Parameter	Package	RF-OUT (RF OUT)	Details
Package type	Pin through-hole Size: 50 x 50 x 16 mm	External reference (Ref I)	SMA
		Supply Voltage (Vin)	SMA
		Phase Voltage (Vp)	EMI feed-thru
		Lock Detect (LD)	EMI feed-thru

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