PLO-S NS [PRELIMINARY]

The PLO-S NS is a part of Rakon's Phase Locked Oscillator (PLO) series featuring high frequencies. This SAW-based PLO delivers a stable frequency with excellent close-in and noise floor. High 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-S NS are available from 500 MHz up to 1.4 GHz with a lifetime of up to 12 years. LEO Broadband, GNSS and Earth Observation are the typical applications targeted by this PLO.

This NewSpace Saw-based 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. Specific tests and screening flow data are available according to customer requirements.

Key Features

- Output Frequency: 500 to 1400 MHz
- Compact package
- Supply voltage: 12 V
- Guaranteed phase noise @500 MHz
  - -120 dBc/Hz (@1 kHz)
  - -145 dBc/Hz (@10 kHz)
  - -175 dBc/Hz (@1 MHz)
- Overall frequency stability: depends on the reference
- Output power: 10 dBm

Base Line

- Single output @500 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		65	°C
Random vibration	Level as per MIL-STD-202 Method 214, conduction 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)			500		MHz
Current consumption				100	mA
Overall frequency drift	Same as reference				
Fault alarm	TTL, 3.3 V when phase lock				
Output waveform	Sine				
Output power level		8	10	12	dBm
Harmonics level				-15	dBc
Spurious level	100 Hz to 5 GHz			-70	dBc

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Phase Noise @500 MHz

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Phase noise @500 MHz	1 Hz offset		-76		dBc/Hz
	10 Hz offset		-103		dBc/Hz
	100 Hz offset		-113		dBc/Hz
	1 kHz offset			-120	dBc/Hz
	10 kHz offset			-145	dBc/Hz
	1 MHz offset			-175	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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