

## PLO-D NS [PRELIMINARY]

The PLO-D NS is a part of Rakon's Phase Locked Oscillator (PLO) series and is based on a Dielectric Resonator Oscillator featuring superior phase noise performance. This high frequency PLO delivers excellent close-in phase noise and noise floor. It is suitable for LEO satellites and satellite constellations where high-frequency signals and low phase noise are critical and is ideal for LEO Broadband, GNSS or Earth Observation.

The small form factor is a key feature of the phase-locked NewSpace PLO-D. This PLO takes an external 100 MHz reference as input, which delivers a high and low noise frequency signal. 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. Tests and screening flow can be tailored according to customer requirements to reduce cost and lead time.

### Key Features

- Output frequency: 28 GHz
- Compact package
- Power voltage: 12 V
- Typical phase noise @100 MHz
  - 80 dBc/Hz (@100 Hz)
  - 100 dBc/Hz (@1 kHz)
  - 107 dBc/Hz (@10 kHz)
  - 110 dBc/Hz (@100 kHz)
  - 125 dBc/Hz (@ 1 MHz)
- Overall frequency stability: depends on the reference
- Output power 13 dBm

### Baseline

- Single outputs: @28 GHz
- External reference: 100 MHz
- SMA output frequency
- Fault alarm

### Options

- Internal reference: 100 MHz
- Several outputs
- Different output frequencies
- High output level: 28 dBm

### 20 x 20 x 15 mm



### Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature	TO <sub>p</sub>	-20	25	70	°C
Non-operating temperature	Qualification	-25		80	°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/cm <sup>2</sup>				
Lifetime	Up to 12 years				

### Typical performance characteristics

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency			28		GHz
Current consumption				500	mA
Overall frequency drift	Same as reference				
Fault Alarm	TTL, 5V when phase lock				
Output waveform	Sine				
Output power level		13	15		dBm
Harmonics level				-20	dBc
Spurious level	100 Hz to 5 GHz			-70	dBc

### Phase Noise @ 28 GHz

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Phase noise @28 GHz	100 Hz offset		-80		dBc/Hz
	1 kHz offset		-100		dBc/Hz
	10 kHz offset		-107		dBc/Hz
	100 kHz offset		-110		dBc/Hz
	1 MHz offset		-125		dBc/Hz

### Mode Outline and Pin Connectors

Parameter	Package	RF-OUT (RF OUT)	Details
Package type	Pin through-hole Size: 20 x 20 x 15 mm	External reference (Ref I)	SMA
		Supply Voltage (Vin)	SMA
		Phase Voltage (Vp)	EMI feed-thru
		Lock Detect (LD)	EMI feed-thru