RDO5757NS

The RDO5757NS is a high-performance Phase Locked Dielectric Resonator Oscillator (PLDRO) designed for precision microwave signal generation. The device output frequency (fo), available from 7 to 30 GHz across the C-, X-, Ku- and Ka-bands, delivers ultra-low phase noise (-125 dBc/Hz floor @18.0GHz) and high spectral purity (-70 dBc). The RDO5757NS supports both internal reference locking and optional external high-stability reference, with an integrated OCXO available where no external reference is present. This architecture makes it ideally suited for aerospace, SATCOM, and other high-reliability microwave systems.

Combining a high-Q dielectric resonator for low close-in phase noise with a phase-locked loop (PLL), the RDO5757NS delivers accurate, stable reference-derived performance in demanding applications.

The RDO5757NS is available in a standard version with a single RF output (F_{OUT}).

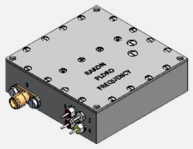
Key Specifications

- Nominal Frequency (Fn):
  7 to 30 GHz. Supporting C-, X-, Ku- and Ka-bands
- Operating temperature: -20 to 60°C
- Reference input frequency: 80 to 125 MHz
- Voltage supply: 12V, 5% tolerance
- Harmonics: -25 dBc
- Spurious: -70 dBc
- 20 krad (Si) TID,
  SEL-free up to LET 60 MeV • cm^2/mg
- Low phase noise:
  @ 18 GHz, 1 MHz offset: -125 dBc/Hz

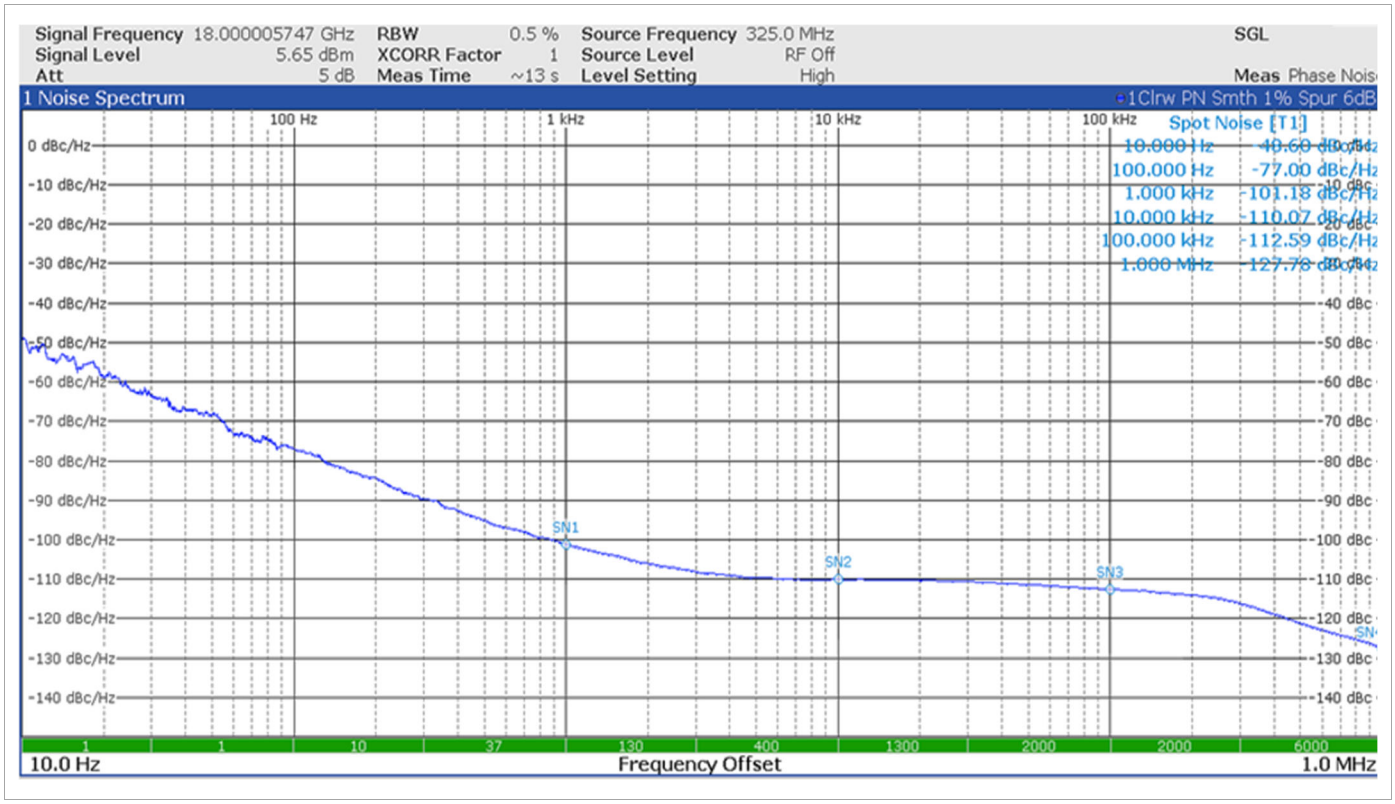
Applications

- Radar systems
- Satellite communication terminals
- Industrial electronic warfare systems
- Microwave transceivers
- Aerospace and space platforms
- Test and measurement equipment

57.14 x 57.14 x 18.54 mm



Phase Noise at 18.0 GHz (supporting Ku-band)



Electrical Characteristics

Parameter	Condition / Remarks	Min	Typ.	Max.	Units
Nominal frequency range (Fn)	C-Band X-band Ku-Band Ka-Band	6 8 12 18		8 12 18 30	GHz
Reference input frequency ($F_{REF, IN}$)		80		125	MHz
Supply voltage (V_{CC})	5% tolerance	11.4	12.0	12.6	V
Start-up current				700	mA
Steady-state current	@25°C			400	mA
Warm-up time	to reach <±1ppm @25°C			3	Min

Performances

Parameter	Min	Typ.	Max.	Units	Condition / Remarks
Output power C-band X-band Ku-band Ka-band		 13 10 7 3		dBm	
Power level variation			±1.5	dBm	
Phase noise @ 18 GHz: 10 kHz offset 100 kHz offset 1 MHz offset		 -105 -110 -125		dBc/Hz	
Harmonics			-25	dBc	
Spurious			-70	dBc	@Fn ±500 kHz (1 MHz span centred on Fn)
Output VSWR		1.5 : 1			

Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Storage temperature		-40		85	°C
Operating temperature		-20		60	°C
Marking/serialisation	In accordance with the device specification				
External visual	MIL-STD-883, Method 2009				
Thermal cycles	MIL-STD-883, Method 1010, Condition A, 10 cycles, -55°C to +85°C; dwell time ≥10 min at each extreme				
Electrical measurements	Per applicable device specification @25°C				
Constant acceleration	MIL-STD-883, Method 2001; 3,000g's (Y1 direction only), duration: 1 min				
Electrical parameters	In accordance with applicable device specification @ 25°C				
Dynamic burn-in	MIL-STD-883, Method 1015, 648 hrs @+70°C				
Final electrical measurement	Per applicable device specification @ 25°C, @ -20°C and @ 60°C				
Radiographic	MIL-STD-883, Method 2012, Condition Y1				
External visual	MIL-STD-883, Method 2009				

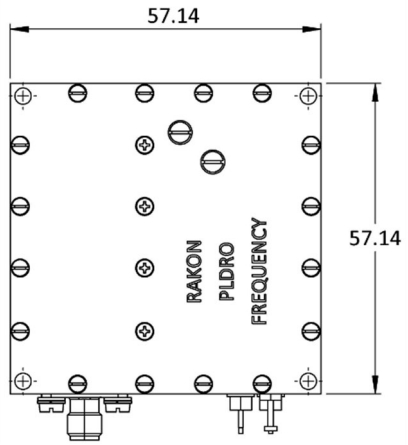
Qualification Tests

Parameter	Condition / Remarks
Vibration (Sinusoidal)	MiL-STD-202, Method 204, Condition D.
Shock (non-operating)	MiL-STD-202, Method 213, Condition I.
Random vibration	MiL-STD-202, Method 214, Condition F
External visual examination	MIL-STD-883, Method 2009
End point electrical	As per device specification @ ambient
Thermal shock (non- operating)	MiL-STD-202, Method 107, Condition B, 50 Cycles (-55°C to +85°C)
Radiation hardness (TID)	MIL-STD-883, Method 1019, 20 krad (Si) min.
Pre-life electrical measurements	In accordance with the device specification at ambient
Life test	MiL-STD-202, Method 108, 1,000 hours at +85°C or equivalent with nominal supply voltage and load
End -point electrical	In accordance with device specification at ambient, min. & max. operating temperature
Internal visual inspection	De-lidded samples inspected for visual anomalies at high magnification after life testing
Terminal strength (lead integrity)	MiL-STD-202, Method 211
Solderability	MiL-STD-202, Method 208
Resistance to solvents (Not applicable for laser marking)	MiL-STD-202, Method 215

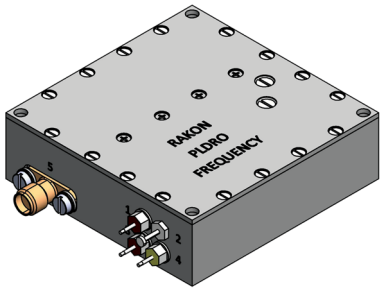
Product Outline Output, 3D Model and Pin Connections

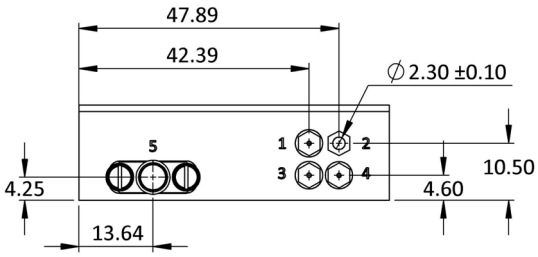
Parameter	Package
Package	57.14 x 57.14 x 18.54 mm. Machined aluminium housing. Mounting provision with screws.
Mass	120 g typ.
3D STEP file	RDO5757S 1-Output 3D models *To open or view the STP file, you will need to import it into one of the following software programs: Autodesk Fusion 360, CATIA, SolidWorks, Solid Edge, TurboCAD, Kubotek KeyCreator, FreeCAD, ABViewer, ShareCAD, or eMachineShop.*

Model outline

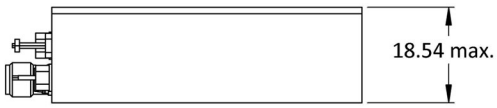


TOP VIEW

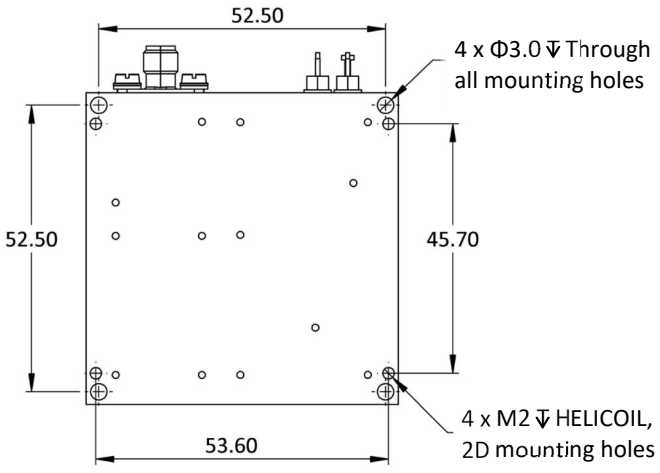




FRONT VIEW



SIDE VIEW



BOTTOM VIEW

PIN CONNECTIONS

Pin	Diameter	Symbol	Connections
1	Φ0.75±0.05	ALM	Alarm
2	Φ2.3±0.10	GND	Ground
3	Φ0.75±0.05	NC	Not connected
4	Φ0.75±0.05	V_{CC}	Supply voltage
5	SMA Female	F_{OUT}	Radio frequency output

NOTE:

- Dimensions are in mm.
- General tolerance: ±0.20 mm unless otherwise specified.
- Parts shall be electroless nickel plated, thickness 8 –12 µm.
- Package material: Aluminium 6082 or 6061.