

RK300NS

The RK300NS is a cost-effective and low power TCXO developed for the NewSpace market such as smallsats and constellations. This NewSpace TCXO is ideal for applications requiring high tolerance to Total Ionizing Dose (TID), very low power consumption, high stability, and good phase noise. It is designed for missions up to 7 years. The product can be adapted for longer missions.

The standard frequencies of the RK300NS are 80MHz and 100MHz. Custom frequencies are available from 60 to 120MHz. As a part of Rakon's NewSpace Low Noise & Low Power Oscillators offering, the RK300NS TCXO is available in a 25 x 25 x 13mm low profile Pin Through Hole (PTH) package.

Features

- Standard frequency: 80, 100MHz
- Supply voltage: 5V
- Voltage control function
- Steady state consumption: 150mW
- Low profile PTH: 25 x 25 x 13mm
- Output wave form: Sine
- TID limit: 30krads (1)
- Latch-up free up to LET: 43MeV.cm²/mg

Applications

- Frequency converters
- Synthesizers

25 x 25 x 13 mm



Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature	T _{OP}	-40	25	85	°C
Switch-on temperature	T _{SO}	-40	-	85	°C
Non-operating temperature	T _{NOP}	-40	-	85	°C
Random vibration	50 to 1000Hz: +6dB/oct 100 to 1000Hz: 0.6g ² /Hz 1000 to 2000Hz: -6dB/oct				
Shocks	Mechanical shock as per MIL-STD-202, Method 213 - Half sine with a peak acceleration of 2000g for a duration of 0.5ms				
Radiation	Total Ionizing Dose (TID) of 30krad (1), low dose rate (36 to 360rad/h) Latch up free up to LET = 43MeV.cm ² /mg				

Electrical Interface

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Power supply	V _{CC} / Maxing rating at 6V	4.75	5	5.25	V
Load impedance	Sine wave	45	50	55	Ω

Screening Options

Parameter	Condition / Remarks	EM Option	FM Option
Ageing	@ max operating temperature range	–	✓
Random acceleration	Level as per MIL-STD-202, Method 214, Condition I-D	–	✓
Thermal shocks	MIL-STD-202, Method 107, Condition A1	–	✓
Final measurement	MIL-STD-883, Method 2020, Condition B	✓	✓
External visual inspection	MIL-STD-883, Method 2009	✓	✓

(1) For higher TID limit, please contact the factory

Performances @ 100 MHz

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency	-	-	100	-	MHz
Initial frequency accuracy	Vacuum, at time of shipment, RAKON provides the value of an adjusted resistor	-	-	±1	ppm
Freq. stability vs temperature	Referenced to +25°C	-	±2	±4	ppm
Freq. stability vs supply voltage	-	-	±0.1	±0.5	ppm
Freq. stability vs load	For ±10% variation of load	-	±0.05	±0.2	ppm
Freq. stability vs pressure	Atm to vacuum	-	-	±0.5	ppm
Freq. ageing	1 st year 7 years	-	-	±1.5 ±4	ppm
Allan standard deviation	Tau = 1s @25°C	-	-	5E-11	-
Phase noise	10Hz offset 100Hz offset 1kHz offset 10kHz offset	-	-	-80 -110 -130 -140	dBc/Hz
Output waveform	-	Sine			-
Output power	50Ω	0	-	4	dBm
Harmonics	DC to 1GHz	-	-	-30	dBc
Spurious	DC to 5GHz	-	-	-80	dBc
Steady-state supply power	At V _{CC} =5V	-	100	150	mW

Model Outline and Pin Connections

Parameter	Package	Pin #	Connections
Package type	Pin through-hole Size: 25 x 25 x 13mm	1	F _{OUT} Frequency output
		2	GND Electrical & Mechanical ground
		3	R _{CTRL} Resistor Frequency Adjustment
		4	V _{REF} Reference voltage
		5	V _{CC} Supply voltage
		6 – 9	DNC Do Not Connect

Model outline

