

RK409NS

The RK409NS is a cost-effective and low noise OCXO dedicated to the New Space market, such as mini-satellites and constellations. It is an ideal choice for applications where tolerance to TID, an excellent phase noise performance are required for a mission life of up to 12 years.

The 10^{-9} frequency stability class Space OCXO is in a 50 x 50 mm pin through-hole package. 10 MHz is the standard frequency of RK409NS. Additional frequencies from 10 to 40 MHz are available on request.

Features

- Frequency: 10 MHz
- Package: 50 x 50 x 30 mm
- Supply voltage: 12 V
- Steady state consumption: 1 W
- Frequency stability: ± 0.2 ppm over 12 years
- 2 inputs power supplies on specific request
- Phase noise: < -110 dBc/Hz (@1Hz)
- Phase noise @10Hz : < -137 dBc/Hz (10 dBc/Hz)
- Output wave form: sine 50 Ω or square
- TID limit: 30 kRads
- Latch up free up to LET: 43 MeV/mg/cm²

Applications

- Reference MRO
- Synthesizers

50 x 50 x 30 mm



Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature	T _{OP}	-20	25	70	°C
Switch-on temperature	T _{SO}	-40	-	85	°C
Non-operating temperature	T _{NOP}	-40	-	85	°C
Random Vibration	Level as per MIL-STD-202, Method 214, 30 grms				
Sine vibration	20 Hz-2000 Hz: 24g (MIL-STD-202, Method 204)				
Shocks	Mechanical shock as per MIL-STD-202, Method 213 Half sine with a peak acceleration of 2000 g for duration of 0.5 ms				
Radiation	Total Ionizing Dose (TID) of 30 kRad, low dose rate (36 to 360 rad/h), Latch up free up to LET = 43 MeV/mg/cm ²				

Electrical Interface

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Power supply	V _{CC}	11.4	12	12.6	V
Load impedance	VSWR 1.1 reference	45	50	55	Ω
Reference voltage	V _{REF} / 1 mA max.	7.5	-	9.5	k Ω
Control voltage	V _{CTRL}	0	-	V _{REF}	V

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	✓	✓

Performances @ 10 MHz

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency		-	10	-	MHz
Initial frequency accuracy	at ambient temperature at DC/DC turn ON within 1.5 hour	-	-	±20	ppb
Frequency adjustment	Positive slope	±350	-	±500	ppb
Frequency stability Vs. temperature	For any 24 hours at any temperature within acceptance temperature range	-	-	±0.5	ppb
Overall Frequency drift	Initial, temperature range, EOL (5y)	-	-	±500	ppb
Frequency ageing	Per day after 1 month	-	-	±0.5	ppb
	Per month	-	-	±5	ppb
	First year	-	-	±30	ppb
	Over lifetime (12y), including radiations, and over acceptance temperature range with regards to the frequency at initial setting and at ambient temperature	-	-	±200	ppb
Output waveform	Sine			-	
Output level	Over lifetime	4	-	8	dBm
Output level stability	Over life time and over acceptance temperature range	-	-	2	dBpp
Non-harmonic (spurious) level	From 10 Hz to 1 MHz offset	-	-110	-100	dBc/Hz
	From 1 to 70 MHz	-	-90	-80	dBc/Hz
Harmonics level	From DC to 1GHz	-	-	-40	dBc
Phase noise	1 Hz offset	-	-115	-110	dBc/Hz
	10 Hz offset	-	-140	-137	
	100 Hz offset	-	-150	-147	
	1 kHz offset	-	-158	-155	
	10 kHz offset	-	-161	-160	
Steady state supply power	Vacuum @ -20°C. EOL	-	-	2.5	W
	Vacuum @ -25°C. EOL	-	-	1.5	W
Warm-up time	Meet all the requirements (DC power, output power, etc ...)	-	-	20	mn
Warm-up supply power	EOL	-	3	3.5	W

Model Outline and Pin Connections

Parameter	Package	Pin #	Connections
Package type	Pin through-hole Size: 50 x 50 x 30 mm	1	V _{CTRL} Voltage Control for Electrical Tuning
		2	V _{REF} (Reference voltage output)
		3	RF output
		4	GND (Ground)
		5, 6*	V _{CC} (Supply voltage) <i>* Power supply could be separated on specific request</i>
		7**	NC (Do not connect) <i>** Telemetry could be provided as an option</i>

Model outline

