RK407

The RK407 is a Hi-Rel Space OCXO in the 10^{-7} frequency stability class. It is designed for scenarios where low power consumption is required, but where the frequency stability of a Space TCXO is insufficient. The RK407 delivers low phase noise in a compact flat pack package.

Screening to MIL-PRF-55310 (Class 1, type 4, level S) guidelines or to an optimised and shorter flow are available for this product. The RK407 is ideal for communication equipment such as signal generation, transponders, digital cards, down and up converters and synthesizers. This Space OCXO is available with short lead-times.

Features

- Wide frequency range from 10 to 130 MHz with standard frequencies 10, 40, 100 and 125 MHz
- Low consumption: 0.7 W
- Supply voltage: +5 or +12 V
- Warm up consumption: 2.1 W
- Frequency stability vs. temperature: ±0.25 ppm under vacuum
- Ageing: ±1 ppm over 18 years

- Output wave form: sine 50 Ω
- Compatible with flat pack TCXO pin-out
- Component selected as per ECSS-Q-ST-60C
- Materials selected as per ECSS-Q-ST-70
- Manufacturing in accordance with ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C

Applications

- Transponders
- GNSS receivers
- Navigation
- Converters
- On-board calculators
- Synthesizers

25.6 x 25.6 x 17 mm

Flat pack 10 leads

Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature	T_{OP}	-40	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: 20 to 100 Hz: +6 dB/oct; 100 to 1000 Hz: 2.6 g²/Hz; 1000 to 2000 Hz: -6 dB/oct; Overall : 61 grms				
Sine vibration	Level as per MIL-STD-202 Method 204, Condition D (20 g)				
Mechanical shock	Level as per MIL-STD-202, Method 213: Half sine with a peak acceleration of 3000 g or duration of 0.3 ms				
Radiation	Total Ionizing Dose (TID) of 100 krad, low dose rate (36 to 360 rad/h). Latch up free up to LET = 60 MeV/mg/cm²				

Electrical Interface

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Power supply (V_{CC})	Option 1 (12 V)	11.40	12	12.60	V
	Option 2 (5 V)	4.75	5	5.25	
Load impedance		45	50	55	Ω
Reference voltage (V_{REF})	Option 1 (12 V)	5.4	6	6.6	V
	Option 2 (5 V)	2.85	3	3.15	
Control voltage (V_C)	Frequency adjustment: Option 2 (5 V) only	0	-	V_{REF}	V

Phase Noise (Maximum value)

Parameter	10 to 45 MHz	90 to 110 MHz	120 to 130 MHz	Unit
1 Hz offset	-65	-55	-55	dBc/Hz
10 Hz offset	-95	-85	-85	dBc/Hz
100 Hz offset	-125	-115	-115	dBc/Hz
1 kHz offset	-145	-135	-135	dBc/Hz
10 kHz offset	-152	-150	-150	dBc/Hz

Frequency Characteristics

sales@rakon.com

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency (Fn)	Standard frequencies: 10, 40, 100 and 120 MHz	-	10 – 130	-	MHz
Steady state supply power	Vacuum, EOL, @-40 °C	-	-	1.1	W
Warm up supply power	Vacuum, EOL	-	-	2.1	W
Initial frequency accuracy	Vacuum (with V_C)	-	-	±0.4	ppm
Frequency adjustment	With V_C	-	-	±1.2	ppm
Frequency stability over temperature (FvT)	-20°C to 70°C -40°C to 70°C	-	-	±0.1 ±0.25	ppm
Supply voltage stability (FvT)	Over operating temperature	-	-	±0.05	ppm
Load sensitivity (FvT)	Over operating temperature	-	-	±0.05	ppm
Pressure (FvT)	Atm to vacuum	-	-	±0.2	ppm
Ageing (FvT) over 1 day	Fnom: 10 to 45 MHz Fnom: 90 to 130 MHz	-	-	±5 ±10	ppb
Ageing (FvT) over 1 year	Fnom: 10 to 130 MHz	-	-	±0.3	ppm
Ageing (FvT) over 18 years	Fnom: 10 to 130 MHz	-	-	±1	ppm
Allan variance	tau = 1 s	-	-	5E-11	-
Frequency warm up	Time needed to reach the initial frequency accuracy (1h ref.)	-	-	7	mn
Output waveform	Sine	-	-	-	-
Output level	BOL: 12 V BOL: 5 V	5 4	-	6 5	dBm
Harmonics level		-	-	-25	dBc
Spurious level	100 Hz to 100 kHz 100 kHz to 5 GHz	-	-	-100 -85	dBc

Ordering Part Example

RK407 1 1 FM 10M000000

Product Family
RK = Rakon
4xx = OCXO
07 = 10⁻⁷ stability class

Supply Voltage
1 = 12 V
2 = 5 V

Frequency Adjustment
1 = Internal calibration
2 = Voltage controlled

Model Option
EM = EM
EQM = EQM
FM = FM

Frequency (Fn)
100M000000 = 10 MHz (Fn)

sales@rakon.com