

## RK408 PS1

The RK408 PS1 platform is a Space OCXO generating an ultra-low noise signal at low and high frequencies. This frequency source is featured by a remarkable frequency stability vs. temperature range down to  $\pm 20$  ppb under vacuum and a noise floor down to -165 dBc/Hz.

The RK408 PS1 can be screened following the guidance of MIL-PRF-55310 (Class 1, type 4, level S) or to an optimised and shorter flow. This product platform is ideal for navigation, positioning and SAR systems.

### Features

- Frequency: 10 to 125 MHz
- Short lead time for 10, 20, 40, 50, 80, 100 and 120 MHz frequencies
- FvT:  $\pm 20$  ppb under Vacuum
- Low phase noise
- Steady state consumption:  
2 W under vacuum  
3 W under atmospheric pressure
- Supply voltage: 5 or 12 V
- Warm up consumption: 5 W max
- Ageing  $\pm 300$  ppb max over 18 years at 10 MHz
- Output wave form: sine 50  $\Omega$
- Output level: 10 to 12 dBm
- Component selected as per ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C
- Materials selected as per ECSS-Q-ST-70

### Applications

- Transponders
- GNSS receivers
- Navigation
- Converters
- On-board calculators
- Synthesizers
- Frequency generator unit (FGU)

### 40 x 50 x 20 mm



### Environmental Conditions

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Operating temperature (TO <sub>P</sub> )	Option A	-5	25	60	°C
	Option B	-20	25	70	
	Option C	-40	25	70	
	Option D	-40	25	75	
Switch-on temperature	TS <sub>O</sub>	-40		85	°C
Non-operating temperature	TNO <sub>P</sub>	-40		85	°C
Random vibration	MIL-STD-202 Method 214, conduction K (46.3 grms)				
Sine vibration	MIL-STD-202 Method 204, Condition D (20G)				
Mechanical shock	MIL-STD-202, Method 213, conduction F: Half sine with a peak acceleration of 1500g for duration of 0.5ms				
Radiation	Total Ionizing Dose (TID) of 100 kRad, low dose rate (36 to 360 rad/h), No SEL up to LET=60 MeV/mg/cm <sup>2</sup>				

### Electrical Interface

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Power supply	Option 1 (5 V)	4.8	5	5.3	V
	Option 2 (12 V)	11	12	13	
Load impedance		45	50	55	$\Omega$
Supply voltage (Vs)	Option 1 (5 V)	3.1	3.2	3.3	V
	Option 2 (12 V)	6.75	7.25	7.75	
Control voltage (Vc)	When Vc option is selected	0		Vref	V

### Phase Noise

Parameter	Condition / Remarks	@ 10 MHz	@ 100 MHz	@ 120 MHz	Unit
Phase noise (max.)	1 Hz offset	-100	-70	-65	dBc
	10 Hz offset	-130	-100	-95	dBc
	100 Hz offset	-150	-130	-125	dBc
	1 kHz offset	-160	-152	-150	dBc
	10 kHz offset	-165	-162	-162	dBc
	100 kHz offset	-165	-165	-165	dBc
Note: Products with better phase noise performance can be delivered if required					

## Frequency Characteristics

Parameter	Condition / Remarks	Min.	Typ.	Max.	Unit
Nominal frequency	Standard frequencies: 10, 100, 120 MHz		10 – 120		MHz
Steady state input current power	Vacuum @ -20°C			3	W
Warm up supply power	Vacuum, End of Life (EOL)			5	W
Initial frequency accuracy	Frequency pulling option 1 Frequency pulling option 2			±0.1	ppm
Allan variance	tau = 1s		5*10 <sup>-12</sup>	1*10 <sup>-11</sup>	
Frequency warm up	Time needed to reach the initial frequency accuracy (1h ref.)			10	mn
Output waveform	Sine				
Output level	Beginning of Life (BOL), Vs: Option 1 Beginning of Life (BOL), Vs: Option 2	0 10		0 12	dBm
Harmonics level				-30	dBc
Non harmonics level				-85	dBc
Frequency adjustment (Positive slope, option 2)	10 MHz typ. 100 MHz typ. 120 MHz typ.	±0.4 ±1.1 ±1.3			ppm

Parameter	Condition / Remarks	10 MHz	100 MHz	120 MHz	Unit
Frequency stability vs. Temperature (FvT)	TO <sub>P</sub> option A, max value	±10	±20	±20	ppb
	TO <sub>P</sub> option B, max value	±20	±40	±40	
	TO <sub>P</sub> option C, max value	±30	±60	±60	
	TO <sub>P</sub> option D, max value	±60	±120	±120	
Supply voltage (Vs) sensitivity	Over operating temperature, max value.	±1	±2	±2	ppb
Load sensitivity	Over operating temperature, max value.	±25	±50	±50	ppb
Pressure	Over operating temperature, max value.	±100	±200	±200	ppb
Ageing over 1 day	Over operating temperature, max value.	±100	±300	±500	ppb
Ageing over 18 years	Over operating temperature, max value.	±300	±1000	±1200	ppb

## Ordering Part Example

