

For this product, full and detailed specifications can be delivered on request.

Specific request can be addressed to RAKON hirel@rakon.com

Product Description

This Low Noise Space OCXO is designed for Clocks, Navigation and Positioning Systems. It is used in such applications as GPS receivers, digital cards, onboard calculators, down and up converters, synthesizers.

This frequency source is featured by remarkable frequency stability vs. temperature range down to ± 20 ppb under vacuum and a noise floor down to -165 dBc/Hz.

The RK408 is manufactured following the guidelines of MIL-PRF-55310 (Class 1, type 4, level S), is available in different packages in a volume of 40 x 50 x 20 mm.



Features

- ITAR-Free
- Low phase noise
- Frequency Range: 10 to 125 MHz
- Supply Voltage: 5 or 12 V
- Multi-package
- Warm up consumption: 5 W max
- Steady state Consumption: 2 W under vacuum and 3 W under atmospheric pressure
- Frequency Stability vs. Operating Temperature Range: ± 20 ppb under vacuum
- Ageing: ± 0.3 ppm max over 18 years at 10 MHz
- Output Wave Form: sine 50 Ω
- Output Level: from 10 to 12 dBm
- Component selected as per ECSS-Q-ST-60C
- Materials selected as per ECSS-Q-ST-70
- Manufactured following the guidelines of:
 - MIL-PRF-55310 (Class 1, type 4, level S)
 - ECSS-Q-ST-70-08C and ECSS-Q-ST-70-38C
- Standard frequencies: 10, 100 and 120 MHz
- Short lead time for standard frequencies

Applications

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

Specifications

Environmental conditions

Parameters	Conditions/remarks	Min	Nom	Max	Unit
Operating Temperature	Option A	-5	25	60	°C
	Option B	-20	25	70	°C
	Option C	-40	25	70	°C
	Option D	-40	25	75	°C
Switch-on Temperature	TSo	-40		85	°C
Non-Operating Temperature	TNOp	-55		125	°C
Random Vibration	Level as per MIL-STD-202 Method 214, condition K (46.3Grms)				
Sine Vibration	Level as per MIL-STD-202 Method 204, condition D (20G)				
Shocks	Mechanical shock as per MIL-STD-202, Method 213, Condition F (half sine with a peak acceleration of 1500g for duration of 0.5 msec)				
Radiation	TID : 100 kRad, low dose rate (36 to 360 rad/h)				

Electrical interface

Parameters	Conditions/remarks	Min	Nom	Max	Unit
Power supply	Option 1 (5V)	4.8	5	5.3	V
	Option 2 (12V)	11	12	13	V
Load Impedance		45	50	55	
Reference voltage	Supply voltage option 1	3.1	3.2	3.3	V
	Supply voltage option 2	6.8	7.25	7.8	V
Control voltage	when voltage control option is selected	0		Vref	V

Performance for standard frequencies

Parameters	Conditions/Remarks	Unit	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Unit
Nominal Frequency		MHz		10			100			120		MHz
Steady state input current power	Vacuum @ -20°C	W			3			3			3	W
Warm up supply power	Vacuum, EOL	W			5			5			5	W
Initial frequency accuracy	Frequency pulling Option 1	ppm			± 0.25			± 0.5			± 0.5	ppm
	Frequency pulling Option 2	ppm			± 0.1			± 0.1			± 0.1	ppm
Frequency adjustment	Positive slope (option 2)	ppm	± 0.4			± 1.1			± 1.3			ppm
Frequency stability vs temperature	Option A	ppb			± 10			± 20			± 20	ppb
	Option B	ppb			± 20			± 40			± 40	ppb
	Option C	ppb			± 30			± 60			± 60	ppb
	Option D	ppb			± 60			± 120			± 120	ppb
Frequency variation vs. supply voltage	Over Operating Temperature	ppb			± 1			± 2			± 2	ppb
Frequency variation vs. load	Over Operating Temperature	ppb			± 25			± 50			± 50	ppb
Frequency variation vs pressure		ppb			± 100			± 200			± 200	ppb
Frequency ageing	Over 1 year	ppb			± 100			± 300			± 500	ppb
	Over 18 years	ppb			± 300			± 1000			± 1200	ppb
Allan variance	1s			5.E-12	1.E-11		5.E-12	1.E-11		5.E-12	1.E-11	
Frequency warm up	Time needed to reach the initial frequency accuracy (1h ref.)	mn			10			10			10	mn
Output waveform			Sine									
Output level	BOL, Supply voltage option 1	dBm	0			0			0			dBm
	BOL, Supply voltage option 2	dBm	10		12	10		12	10		12	dBm
Harmonics level		dBc			-30			-30			-30	dBc
Non harmonics level		dBc			-85			-85			-85	dBc
Phase noise	1 Hz	dBc/Hz			-100			-70			-65	dBc/Hz
	10 Hz	dBc/Hz			-130			-100			-95	dBc/Hz
	100 Hz	dBc/Hz			-150			-130			-125	dBc/Hz
	1kHz	dBc/Hz			-160			-152			-150	dBc/Hz
	10 kHz	dBc/Hz			-165			-162			-162	dBc/Hz

Package name	Description	Dimensions	Image	
MS1	Micro D+SMA	40x50x20 mm		
PS1	Pin side+SMA	40x50x20mm		

Ordering part number definition

RK 408 PS1 A 1 1 FM 10M000000

RAKON

Serie

OCXO (4xx)
10⁻⁸ stability class

Package

MS1= 40x50x20 Micro D + SMA

PS1 = 40x50x20 Pin side + SMA

Temperature stability (1)

A = -5°C to +60°C, ± 10 to ± 20 ppb

B = -20°C to +70°C, ± 20 to ± 40 ppb

C = -40°C to +75°C, ± 30 to ± 60 ppb

D = -40°C to +75°C, ± 60 to ± 120 ppb

Frequency, F_{nom}

Model

EM

EQM

FM

Frequency pulling

1 = internal calibration

2 = voltage controlled

Supply voltage

1 = 5 V

2 = 12 V

Note 1: the stability over temperature range depends on the frequency

November, 5th 2013

Specifications subject to change without notice