

ROM9070PA

The ROM9070PA uses Rakon's market-leading proprietary Mercury+™ technology, delivering the world's smallest and lowest power OCXO for Radio applications. This product family achieves ± 10 ppb frequency stability over -40 to 95°C , with short term ageing less than 1 ppb/day and frequency slope as low as 0.1 ppb/ $^{\circ}\text{C}$. Low-g sensitivity and extended operating temperature options are available on request. Using Rakon's innovative high-Q quartz crystals, ROM9070PA offers superior close-in phase noise performance, enabling Remote Radio Head PLLs to use a single reference clock to meet both network synchronisation requirements and air interface requirements.

Mercury+™ ASIC-OCXOs enable lower Total Cost of Ownership of customer equipment through improved reliability. With a small 9×7 mm form factor and few discrete components, a ROM9070PA consumes only 0.4W at room temperature and has faster warm up times than traditional OCXOs.

Features

- Miniature SC-cut OCXO with fast warm up time
- Superior close-in phase noise with high-Q crystal
- $< 1\%$ VCO linearity
- Patented tilt compensation for lifetime performance
- Ultra-reliable OTP memory programming
- Lower customer Total Cost of Ownership through VLSI ASIC-integration

Applications

- Base Stations
- 5G RRH
- Small Cells
- Microwave transmission systems

9.7 x 7.5 x 3.9 mm

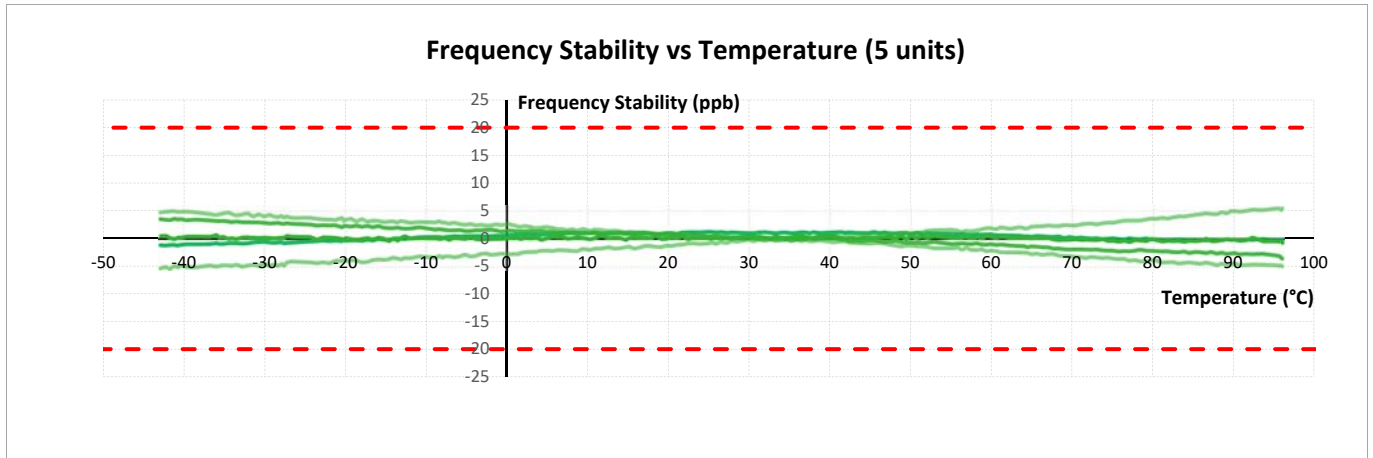


Standard Specifications

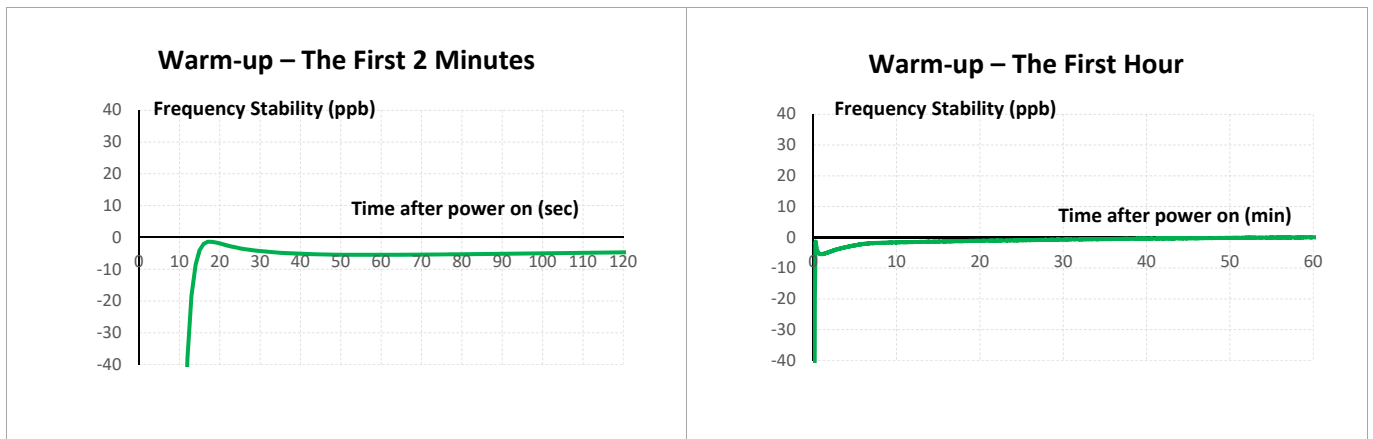
Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description				
Nominal frequency		10 – 50		MHz	Standard frequencies: 10, 19.2, 20, 25, 25.6, 30.72, 38.4, 50 MHz				
Frequency calibration			± 0.2	ppm	Initial accuracy at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$				
Reflow shift			± 0.2	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)				
Operating temperature range	-40		+95	$^{\circ}\text{C}$	Operating temperatures up to 105°C are available on request				
Frequency stability temperature			± 20 ± 10	ppb	In still air. Reference to $(F_{\text{MAX}} + F_{\text{MIN}})/2$ ± 20 ppb (Vc), ± 10 ppb (Fixed frequency)				
Frequency slope $\Delta F/\Delta T$ in still air		± 0.1	± 0.5	ppb/ $^{\circ}\text{C}$	Temperature ramp $\leq 1^{\circ}\text{C}/\text{minute}$				
Supply voltage stability		± 5		ppb	$\pm 2\%$ variation, reference to frequency at 3.3V				
Load sensitivity		± 5		ppb	$\pm 10\%$ variation, reference to frequency at 15pF				
Warm-up time		15	60	sec	Time needed for frequency to be within ± 20 ppb reference to frequency after 1 hour, at 25°C . Parameter is frequency, assembly and operating history dependent				
Long term stability (Ageing)		1	0.3 1.5	ppb ppm ppm	Per day, after 30 days of continuous operation First year 10 years				
Supply voltage (Vcc)		2.7 – 5		V	$\pm 5\%$				
Input power		1200 400	1500 440	mW	Warm up Steady state in still air at 25°C				
Control voltage (Vc) ¹	0.25	1.25	2.25	V					
Frequency tuning	± 1.9		± 3.3	ppm	Reference to frequency at $V_c = 1.25$ V				
Linearity			1	%	Deviation from straight line curve fit				
Oscillator output	Regulated CMOS output (1.0, 1.8, 2.5V) or standard CMOS (options)								
SSB Phase Noise (Typical value at 25°C)	Frequency	1 Hz	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	Unit
	19.2 MHz	-80	-110	-138	-154	-159	-160	-161	dBc/Hz
	30.72 MHz	-73	-105	-133	-153	-158	-160	-161	
	38.4 MHz	-70	-102	-132	-150	-155	-157	-159	

¹ The GND of the control voltage (Vc) needs to be connected directly to pin 2 (GND) as ground lead impedance may cause performance degradation.

Frequency Stability over Temperature @ 30.72 MHz



Warm-up Time @ 19.2 MHz



Model Outline and Recommended Pad Layout

