

ROM7050PA

The ROM7050PA mini SMD OCXO utilises Rakon's market-leading proprietary Mercury+™ technology. This compact OCXO is a low-power and small footprint in 7.5 x 5.5 mm solutions for radio and small cell applications. This product family achieves excellent frequency stability of ± 20 ppb over -40 to 95°C, with long-term ageing less than 1.5 ppm in 10 years and frequency sensitivity to temperature (i.e. slope) as low as 0.1 ppb/°C. Low *g*-sensitivity and extended operating temperature options are available on request. Using Rakon's innovative high-Q quartz crystals, ROM7050PA 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 (TCO) of customer equipment through improved reliability. With a miniature footprint, the ROM7050PA consumes only 400 mW at room temperature and has a faster warm-up time than traditional OCXOs.

Features

- Smallest OCXO footprint industrywide: 7 x 5 mm
- Excellent frequency stability: ± 20 ppb (-40 to 95°C, -40 to 105°C available upon request)
- Low-frequency slope: 0.1 ppb/°C
- Superior close-in phase noise; noise floor as low as -160 dBc/Hz for 10 MHz devices
- Fast warm-up time (± 20 ppb): <15s at -25°C, <20s at -40°C
- Long-term stability: ≤ 1.5 ppm/10 years
- Excellent *g*-sensitivity: 1 ppb/*g*

Applications

- 5G RRHs
- 4G/5G small cells
- Fronthaul switches & routers
- G.8273.x boundary clocks
- Optical network equipment
- Microwave transmission systems

7.5 x 5.5 x 3.3 mm



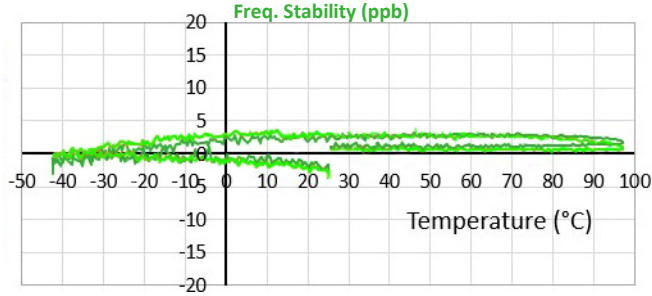
Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description				
Nominal frequency (Fn)		10 – 50		MHz	Standard frequencies: 10, 12.8, 19.2, 20, 25, 30.72, 38.4, 50 MHz				
Frequency calibration ¹			±0.2	ppm	Initial accuracy at 25°C ±2°C				
Reflow shift			±0.5	ppm	After 1 hour recovery at 25°C				
Operating temperature range	-40		+95	°C	105°C available upon request				
Frequency stability over temperature in still air			±20	ppb	Reference to (FMAX + FMIN)/2				
Frequency slope ΔF/ΔT in still air		±0.1		ppb/°C	Temperature ramp ≤ 1°C/minute				
Supply voltage stability		±5		ppb	±2% variation, reference to frequency at 3.3 V				
Load sensitivity		±5		ppb	±10% variation, reference to frequency at 15 pF				
Warm-up time (F0 – F1) ²		3	20	s	Time after power on needed for frequency F0 to be within ±25 ppb reference to frequency F1 after 1 hour				
All causes stability (Ageing)			±4.6	ppm	Including calibration, temperature, supply voltage & load changes over a 10 year life				
Vibration sensitivity (Optional)		0.7	1	ppb/g	Gamma vector				
Supply voltage (Vcc)		2.7 – 5		V	Nominal value in the range ±5% variation				
Input power (Vcc = 3.3V)		1200 400	1500 440	mW	Warm-up Steady-state in still air at 25°C				
Root Allan Variance (RAV)		30x10 ⁻¹² 20x10 ⁻¹² 15x10 ⁻¹² 40x10 ⁻¹² 20x10 ⁻¹¹			tau = 0.1s tau = 1.0s tau = 10s tau = 100s tau = 1000s				
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
	10 MHz	-82	-114	-144	-158	-160	-160	-160	dBc/Hz

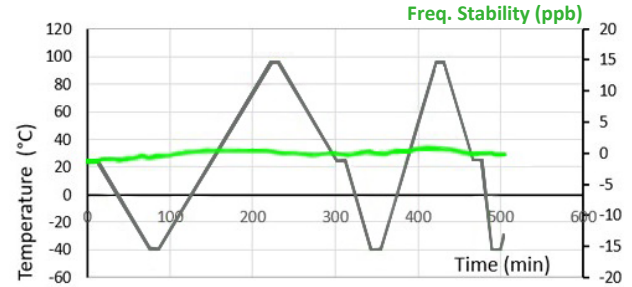
¹ Frequency calibration's limit is ± 0.5 ppm when offering low *g*-sensitivity performance. | ² Parameter is assembly and operating history dependent.

Frequency Stability over Temperature (FvST)

FvST

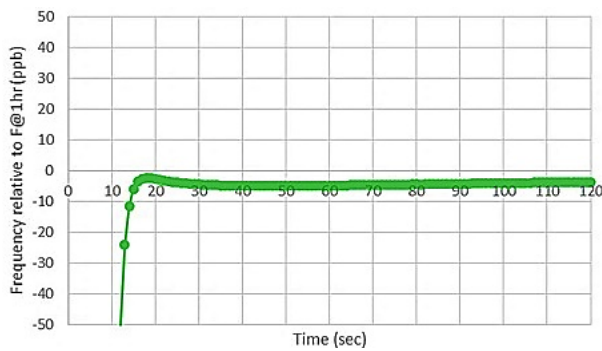


FvST AND TIME PROFILE

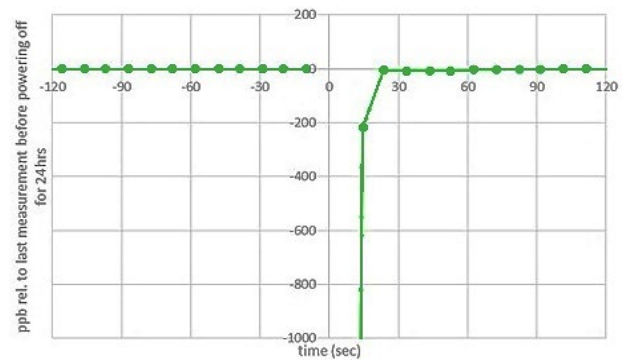


Warm-Up Time

WARM-UP TIME ($\leq \pm 20$ PPB): < 15s @ -25°C

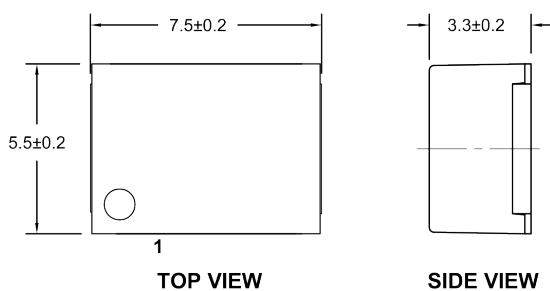


WARM-UP TIME ($\leq \pm 20$ PPB): < 20s @ -40°C

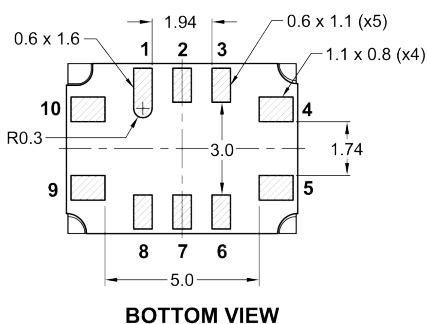
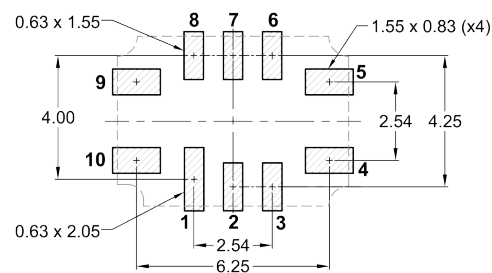


Model Outline and Recommended Pad Layout

ROM7050PA 10-pad 3D model



RECOMMENDED PAD LAYOUT - TOP VIEW



Pin	Connections
1, 2	NC
3	Do not connect (GND optional)/ Vc_GND
4	GND
5	Output
6, 7, 8	NC
9	Supply Voltage (Vcc)
10	Do not connect (GND optional)/ Vc

NOTE

- Unit: mm
- Cover: plastic
- Base: FR4
- Finish: 0.05 ~ 0.13 μ m Gold over 3 ~ 6 μ m Nickel