ROM7050PA

The ROM7050PA utilises Rakon's market-leading proprietary Mercury+™ technology, delivering the world's smallest and lowest power OCXO 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 3 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: ≤3 ppm/10 years
- Excellent *g*-sensitivity: 1 ppb/*g*

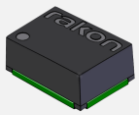
Applications

- 5G RRHs
- Small cells
- Optical networks
- Microwave transmission systems

7.5 x 5.5 x 3.3 mm

RoHS COMPLIANT

Pb FREE



Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		10 – 50		MHz	Standard frequencies: 10, 12.8, 19.2, 20, 25, 30.72, 38.4, 50 MHz
Frequency calibration			±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	±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)[1]		15	60	s	Time after power on needed for frequency F0 to be within ±25 ppb reference to frequency F1 after 1 hour
All causes stability			±4.6	ppm	Including calibration, temperature, supply voltage & load changes over a 10 year life
Vibration sensitivity		0.7	1	ppb/*g*	Gamma vector
Supply voltage (Vcc)		5		V	±2% variation, reference to frequency at 3.3 V
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 $^{-12}$ 15x10 $^{-12}$ 70x10 $^{-12}$			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)				

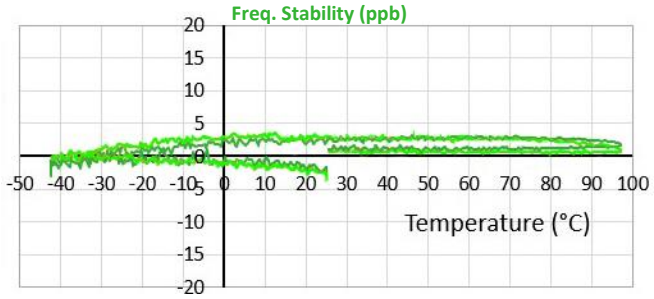
SSB Phase Noise (Typical value at 25°C)

Frequency	1 Hz	10 Hz	100 Hz	1 kHz	10 kHz	100 kHz	1 MHz	Unit
10 MHz	-94	-118	-145	-159	-160	-160	-160	dBc/Hz

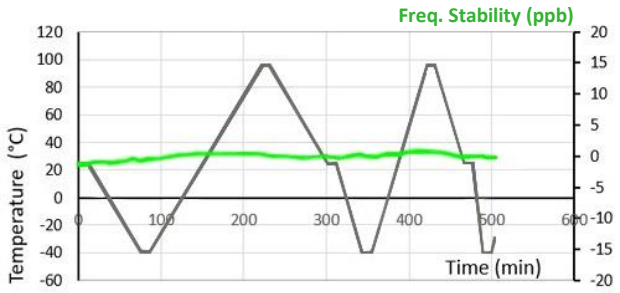
[1] Parameter is assembly and operating history dependent.

Frequency Stability over Temperature (FvsT)

FVST

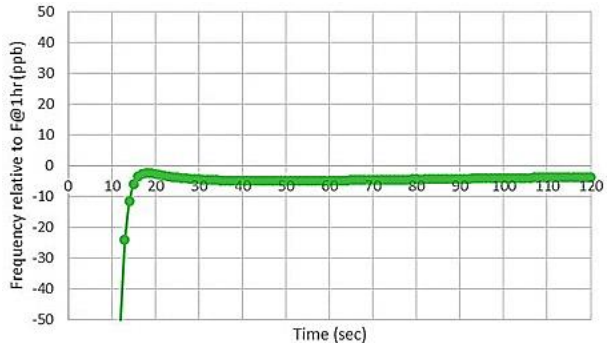


FVST AND TIME PROFILE

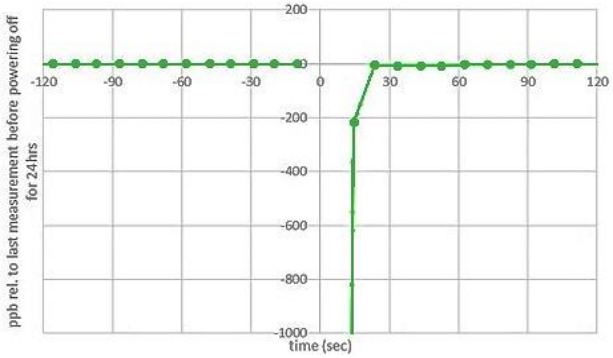


Warm-Up Time

WARM-UP TIME (≤±20 PPB): < 15S @ -25°C

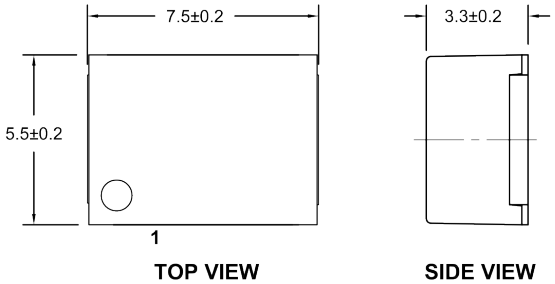


WARM-UP TIME (≤±20 PPB): < 20S @ -40°C

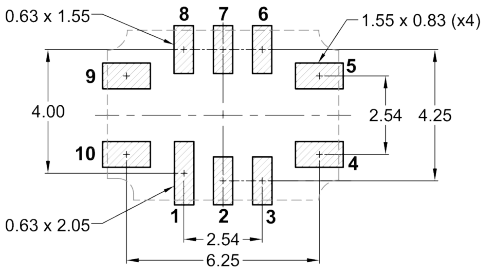


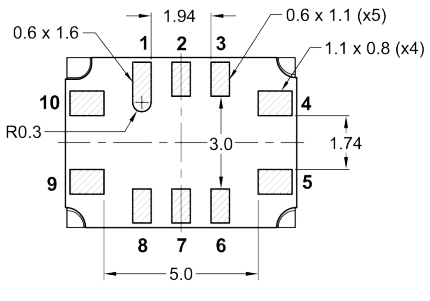
Model Outline and Recommended Pad Layout

MODEL OUTLINE



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 µm Gold over 3 ~ 6 µm Nickel