

RFPO40

The RFPO40 is from the world's smallest and first ASIC-based OCXO product family and utilises Rakon's patented Mercury™ ASIC technology. It delivers temperature stability as low as ± 10 ppb (over -20 to 70°C) and is capable of short term aging typically less than ± 2 ppb per day.

With a highly integrated oven included, the RFPO40 ensures short warm-up times and consumes very low power – only 350mW at room temperature. The ASIC architecture delivers a 1000x reliability improvement when compared to traditional discrete OCXOs.

Features

- Small form factor
- Frequency stability over temperature as low as ± 10 ppb over -20 to 70°C
- Low power consumption
- High reliability

Applications

- Small Cells
- Switches and Routers
- Time & Frequency References
- SyncE and IEEE 1588

9.7 x 7.5 x 4.3 mm



Standard Specifications

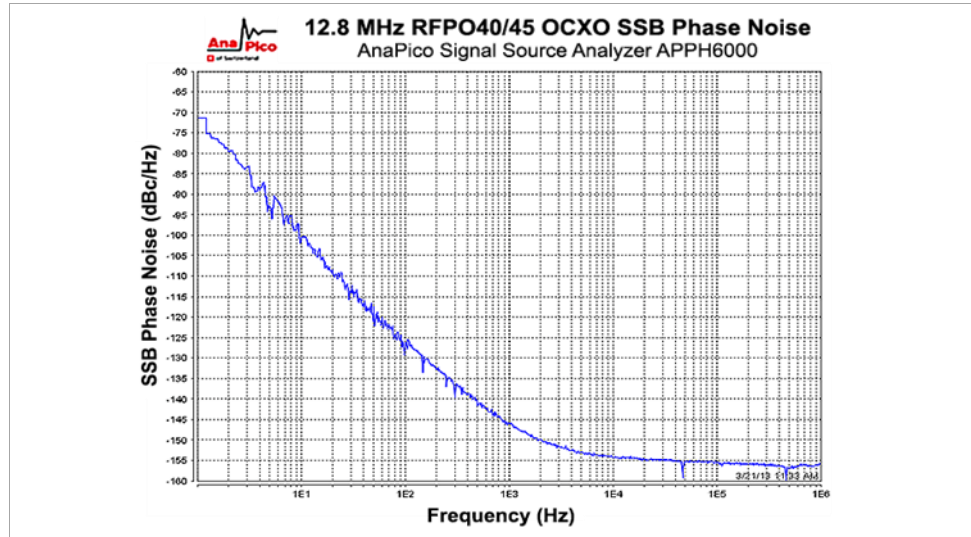
Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		5 – 50		MHz	Standard frequencies: 10, 12.8, 19.2, 19.44, 20, 24.576, 25, 26, 30.72 and 40MHz
Frequency calibration			± 0.5	ppm	Initial accuracy at 25°C $\pm 2^\circ\text{C}$
Reflow shift			± 1	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
Frequency stability over temperature in still air			$\pm 10 - \pm 100$	ppb	Reference to $(F_{\text{MAX}} + F_{\text{MIN}})/2$
Frequency slope $\Delta F/\Delta T$ in still air			$\pm 0.5 - \pm 2$	ppb/ $^\circ\text{C}$	Temperature ramp $\leq 1^\circ\text{C}/\text{minute}$
Operating temperature range	-40		85	$^\circ\text{C}$	
Supply voltage stability		± 10		ppb	$\pm 5\%$ variation, frequency ≤ 26 MHz
Load sensitivity		± 10		ppb	$\pm 5\text{pF} / \pm 10\%$ variation, frequency ≤ 26 MHz
Warm-up time		< 3		minutes	The time needed for the frequency to be within ± 20 ppb of the frequency after 1 hour, at 25°C. This parameter is frequency, assembly and operating history dependent
Acceleration sensitivity		< 2		ppb/g	Gamma vector of all 3 axes, 30 to 1500Hz
Long term stability (aging)		$< \pm 2$	± 1 ± 3	ppb ppm ppm	Per day (after 30 days of continuous operation) First year 10 years
Root Allan Variance (20MHz)		7.10^{-11}			$\tau = 1.0\text{s}$
Supply voltage (Vcc)		2.7 – 5.5		V	$\pm 5\%$
Input power (warm up)		1000 800		mW mW	-40 to 85°C devices -20 to 70°C devices
Input power (steady state in still air at 25°C)			400 350	mW mW	-40 to 85°C devices -20 to 70°C devices
Control voltage (Vc)		0.5 – 2.5		V	The GND of Vc needs to be connected directly to pin 2 as ground lead impedance may cause performance degradation
Frequency tuning		± 5		ppm	Reference to frequency at $V_c = 1.5\text{V}$
Slope		+8		ppm/V	
Linearity ¹			1	%	
Port input impedance	80			k Ω	
Modulation bandwidth		3.5		kHz	
Oscillator output – C/Sinewave	0.8	1.1		Vpk-pk	At minimum supply voltage, 10k Ω //10pF load

¹ The difference between the measured tuning characteristic and an ideal straight line fitted through it, expressed as a percentage of the total tuning range.

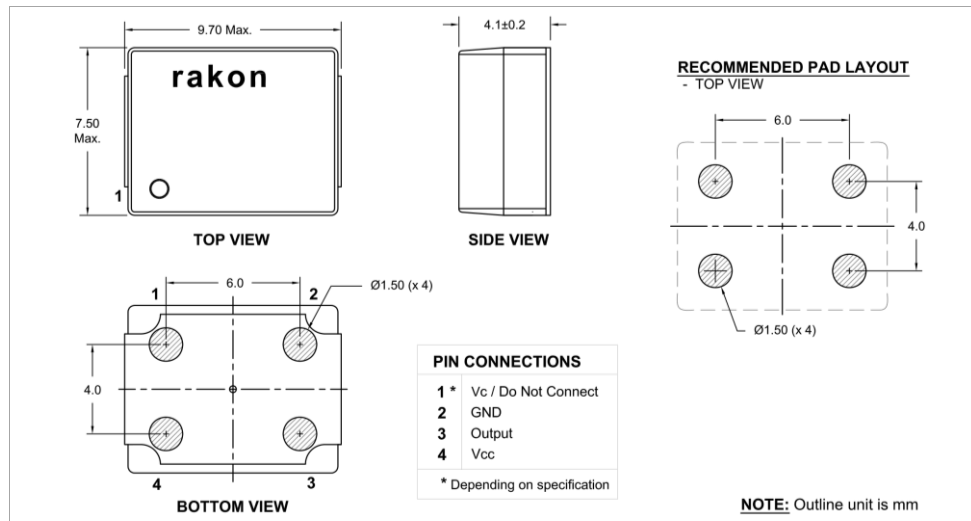
Parameter Min. Typ. Max. Unit Test Condition / Description

Oscillator output – HCMOS					
Output voltage level high (V _{OH})			10% V _{CC}	V	
Output voltage level low (V _{OL})	90% V _{CC}			V	
Duty cycle	45		55	%	At 50% level
Rise and fall times			4	ns	10 to 90%
Load	0	15	30	pF	

SSB Phase Noise (Typical Value at 25°C)



Model Outline and Recommended Pad Layout



Model Code Builder

