

## RMO1490A

Using Rakon's proprietary Mercury ASIC, the OXCO is capable of short term ageing of typically less than  $\pm 2$  ppb per day, with temperature stability down to  $\pm 10$  ppb. The miniature, highly integrated oven used ensures short warm up times with a typical power consumption of only 440 mW at room temperature. The RMO1490A features a typical noise floor of  $-166\text{dBc/Hz}$ .

### Features

- Frequency stability over temperature as low as  $\pm 10$  ppb
- Excellent phase noise performance

### Applications

- Small Cells
- Base stations
- Time & frequency reference
- Network timing, synchronisation and IP timing

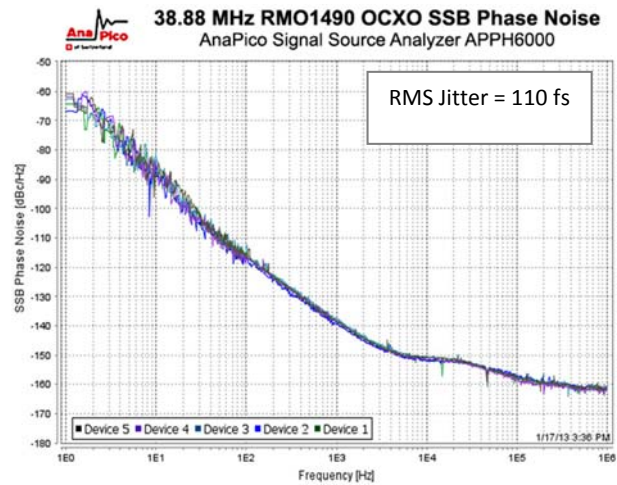
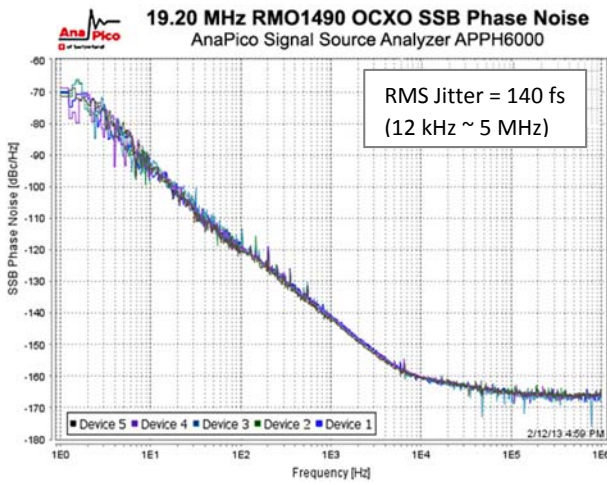
14.6 x 9.7 x 6.7 mm



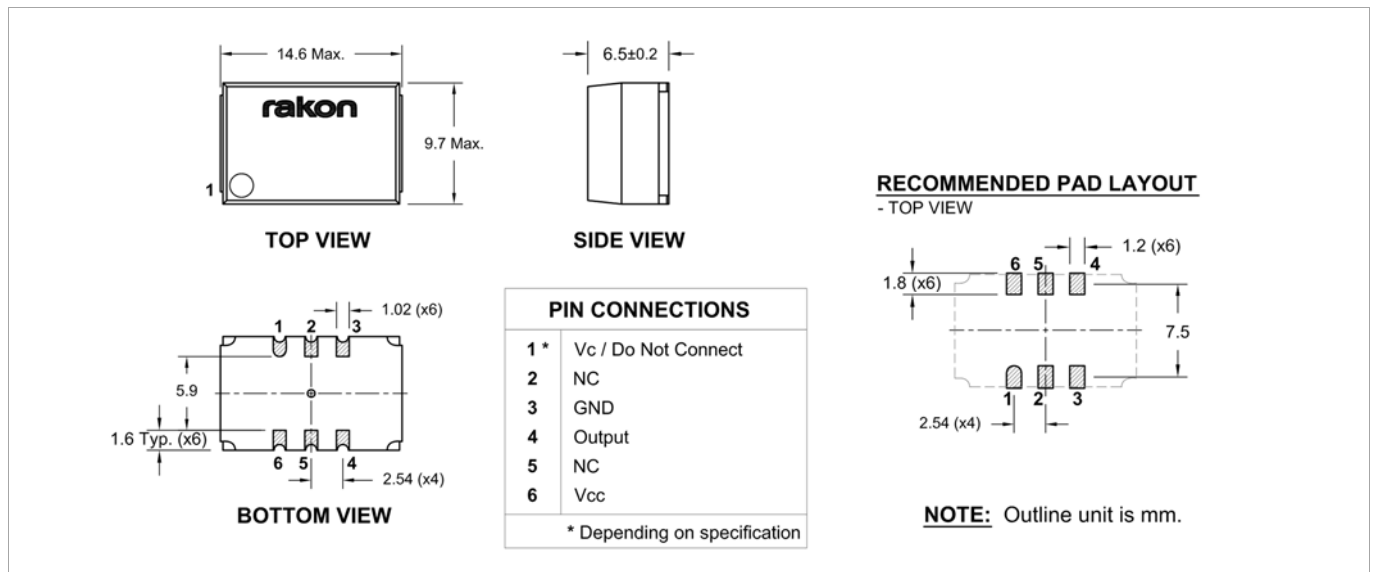
## Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		5 - 50		MHz	Standard frequencies: 10, 12.8, 19.2, 20, 25, 26 and 38.88MHz
Frequency calibration			$\pm 0.5$	ppm	Initial accuracy at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$
Reflow shift			$\pm 1$	ppm	Pre to post reflow $\Delta F$ (measured $\geq 60$ 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			$\pm 1 - \pm 3$	ppb/ $^{\circ}\text{C}$	Temperature ramp $\leq 1^{\circ}\text{C}/\text{minute}$
Operating temperature range	-40		85	$^{\circ}\text{C}$	
Supply voltage stability		$\pm 10$		ppb	$\pm 5\%$ variation, frequency $\leq 26\text{MHz}$
Load sensibility		$\pm 10$		ppb	$\pm 5\text{pF}$ variation, reference to frequency $\leq 26\text{MHz}$ at $15\text{pF}$
Warm-up time		$< 3$		minutes	The time needed for the frequency to be within $\pm 20$ ppb of the frequency after 1 hour, at $25^{\circ}\text{C}$ . This parameter is frequency, assembly and operating history dependent
Acceleration sensitivity		$< 2$		ppb/g	Gamma vector of all 3 axes from 30 to 1500Hz
Long term stability (Ageing) Frequency $\leq 26\text{MHz}$		$< \pm 2$	$\pm 1$ $\pm 3$	ppb ppm ppm	Per day First year 10 years
Root Allan Variance (20 MHz)		7		$10^{-11}$	$\tau = 1.0\text{s}$
Supply voltage (Vcc)		2.7 – 5.5		V	$\pm 5\%$
Input power (warm up)		1500 1200		mW mW	Warm up, $-40$ to $85^{\circ}\text{C}$ devices Warm up, $-20$ to $70^{\circ}\text{C}$ devices
Input power (Steady state in still air at $25^{\circ}\text{C}$ )			500 440	mW mW	Steady state in still air at $25^{\circ}\text{C}$ , $-40$ to $85^{\circ}\text{C}$ devices Steady state in still air at $25^{\circ}\text{C}$ , $-20$ to $70^{\circ}\text{C}$ devices
Control voltage (Vc)		0.5 – 2.5		V	The GND of the control voltage needs to be connected directly to pin 3 as ground lead impedance may cause performance degradation
Frequency tuning		$\pm 5$		ppm	Reference to frequency at $V_c = 1.5\text{V}$
Slope		+7		ppm/V	
Linearity			1	%	Deviation from linear over control voltage range in accordance with MIL-PRF-55310
Port input impedance	80			k $\Omega$	
Modulation bandwidth		3.5		kHz	
Oscillator output – HCMOS					
Output voltage level high ( $V_{OH}$ )			10% Vcc	V	
Output voltage level high ( $V_{OL}$ )	90% Vcc			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**

