

## RFPO45

The RFPO45 is from the world’s smallest and first ASIC-based OCXO and utilizes Rakon’s patented Mercury™ ASIC technology. This Stratum 3 compliant oscillator delivers temperature stability as low as ±10ppb (over -20 to 70°C) and is capable of short term aging typically less than ±2ppb per day.

With a highly integrated oven included, the RFPO45 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 ±10ppb over -20 to 70°C
- Low power consumption
- High reliability

### Applications

- Stratum 3
- Small Cells
- Switches and Routers
- Time & Frequency References
- SyncE and IEEE 1588

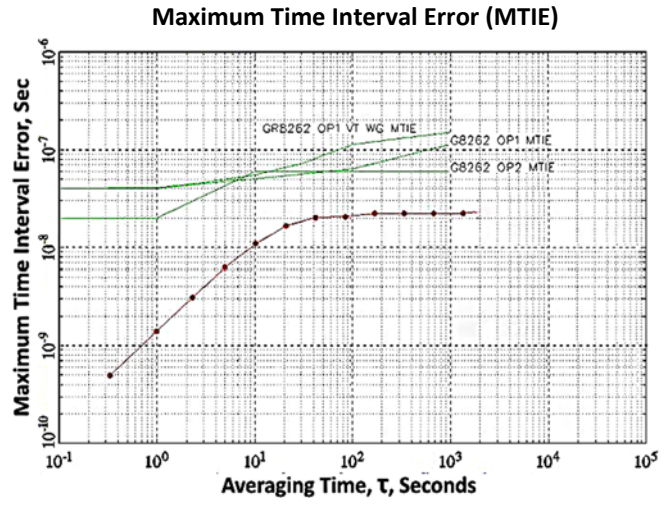
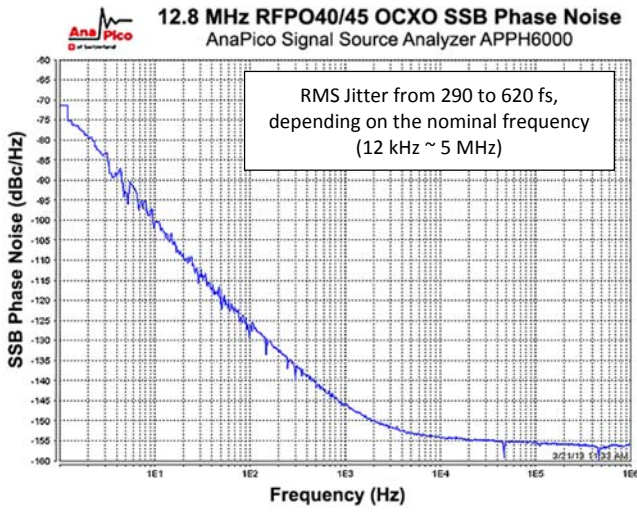
9.7 x 7.5 x 4.3 mm



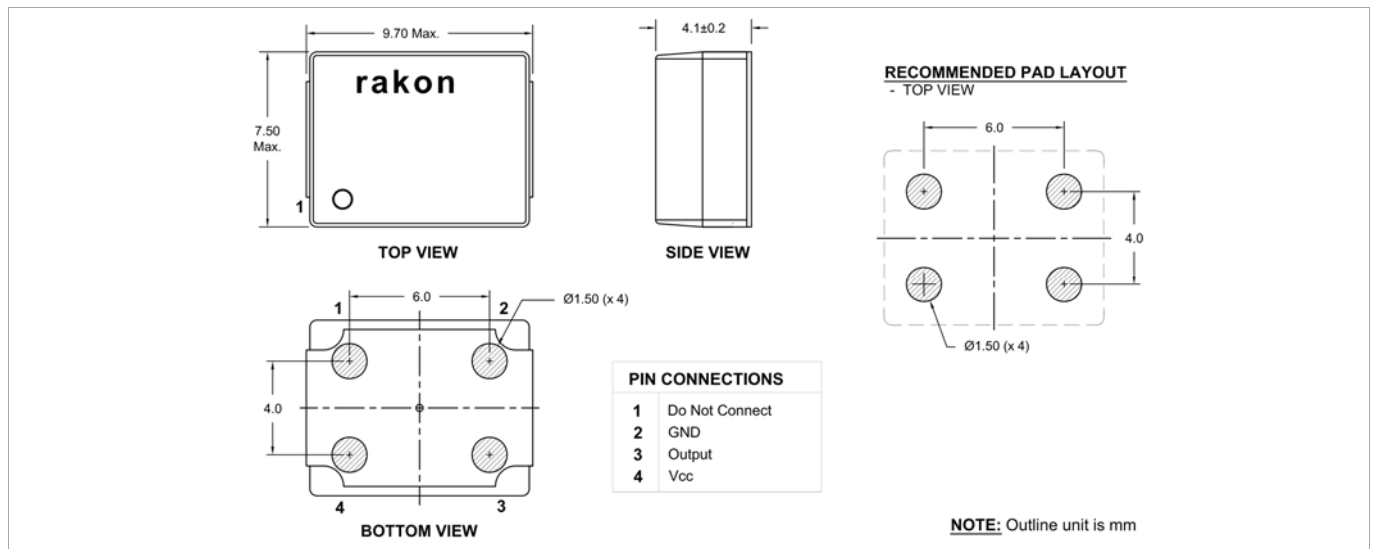
### Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		10 – 26		MHz	Standard frequencies: 10, 12.8, 19.2, 19.44, 20, 24.576, 25 and 26MHz
Frequency calibration			±0.5	ppm	Initial accuracy at 25°C ±2°C
Reflow shift			±1	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
Frequency stability over temperature in still air			±10 – ±100	ppb	Reference to (FMAX + FMIN)/2
Frequency slope ΔF/ΔT in still air			±0.5 – ±2	ppb/°C	Temperature ramp ≤ 1°C/minute
Operating temperature range	-40		85	°C	
Supply voltage stability		±10		ppb	±5% variation, frequency ≤ 26MHz
Load sensitivity		±10		ppb	±5pF / ±10% variation, frequency ≤ 26MHz
Warm-up time		< 3		minutes	The time needed for the frequency to be within ±20ppb 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
Holdover drift		< ±2.5 – 4		ppb	24 hours, temperature variation ≤ ±1°C. After 30 days of continuous operation
Free-run accuracy		±4.6		ppm	All causes, 20 years life, reference to nominal frequency
Loop bandwidth for wander generation compliance	3			mHz	MTIE compliant with GR-1244 Fig 5-5 & G.812 Type III Fig1 (≤ 100 ns), TDEV compliant with GR-1244 Fig 5-4 & G.812 Type III Fig2 (≤ 10 ns), oscillator stabilised 24 hours at Constant temperature (±1°C, still air), data collected over 100,000 seconds at 1 second intervals (-3dB cut-off, 2nd order high pass loop filter)
Long term stability (ageing)		< ±2	±1 ±3	ppb ppm ppm	Per day (after 30 days of continuous operation) First year 10 years
Root Allan Variance (20MHz)		7.10 <sup>-11</sup>			tau = 1.0s
Supply voltage (Vcc)		2.7 – 5.5		V	±5%
Input power (warm up)		1000		mW	-40 to 85°C devices
Input power (steady state in still air, 25°C)			400	mW	-40 to 85°C devices
Oscillator output – HCMOS					
Output voltage level high (V <sub>OH</sub> )			10% Vcc	V	
Output voltage level high (V <sub>OL</sub> )	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) and MTIE



Model Outline and Recommended Pad Layout



Model Code Builder

RFPO 45 XX X XX

**PRODUCT CODE:**  
RFPO = Mercury™ OCXO

**PACKAGE CODE**  
45 = 9 x 7 x 4 mm SMD  
3.3V HCMOS for Stratum 3+

**RoHS CODE**  
LF = RoHS compliant

**FREQUENCY ADJUSTMENT CODE**  
B = Pin 1 Do Not Connect

**TEMPERATURE STABILITY CODE**

Temperature range	Stability (±ppb)					
	10	20	25	30	50	100
-20°C to 70°C	US	VS	PS	WS	RS	-
-40°C to 85°C	-	VX	PX	WX	RX	SX