

## ROM1490EA

The ROM1490EA uses Rakon's market-leading proprietary Mercury+™ technology, delivering the world's first ASIC-based Stratum 3E OCXO. This product family delivers  $\pm 10$  ppb frequency stability over  $-40$  to  $95^\circ\text{C}$  and ageing of less than 1 ppb/day; fully compliant with Stratum 3E specifications. The ROM1490EA is an ideal solution for Telecom Boundary Clocks (T-BC) Class C and Class D, which require low dynamic noise contribution from oscillators over the operating temperature range. Holdover of a few hours is available for select temperature profiles.

Mercury+™ ASIC-OCXOs enable lower Total Cost of Ownership of customer equipment through significantly enhanced reliability. With a small form factor and few discrete components, the ROM1490EA consumes only 0.4W at room temperature and has faster warm up times than traditional OCXOs.

### Features

- Stratum 3E grade stability and ageing
- Low ADEV and RMS phase jitter
- Miniature SC-cut crystal
- Fast warm up time
- Ultra-reliable OTP memory programming
- Lower customer Total Cost of Ownership through VLSI ASIC-integration

### Applications

- Stratum 3E
- PTP Enabled Ethernet Switches and Routers
- Cable Modem CMTS and Remote PHYs
- G.8262, G.8263, G.8273.2, G.8273.3, G.8273.4

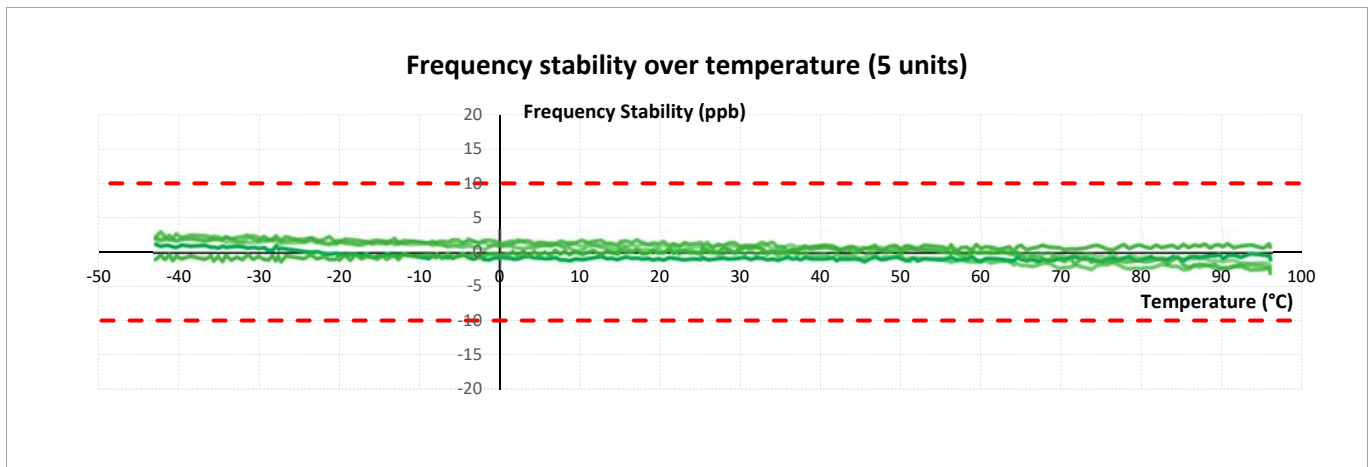
14.3 x 9.1 x 5.9 mm



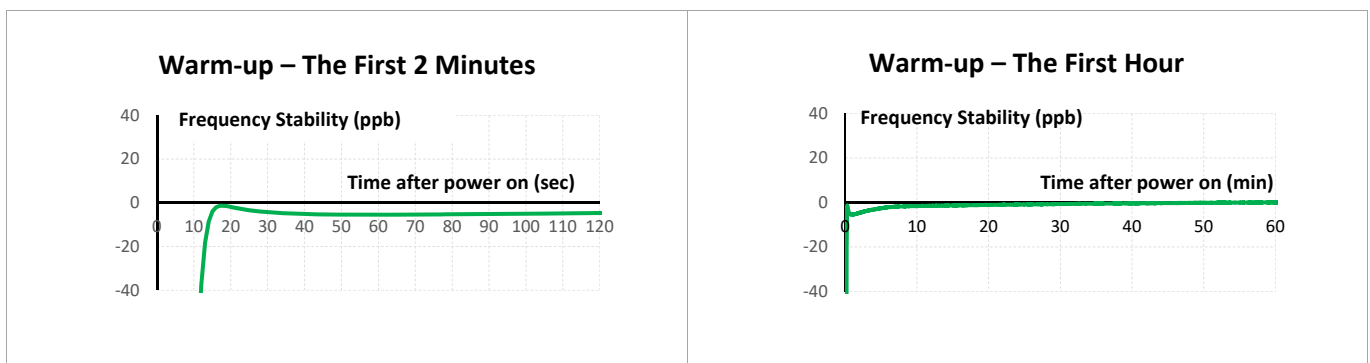
### Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		10 – 50		MHz	Standard frequencies: 10, 12.8, 19.2, 20, 24.576, 25, 30.72, 38.4, 38.88, 49.152, 50 MHz
Frequency calibration			$\pm 0.2$	ppm	Initial accuracy at $25^\circ\text{C} \pm 2^\circ\text{C}$
Reflow shift			$\pm 0.2$	ppm	Pre to post reflow $\Delta F$ (measured $\geq 60$ minutes after reflow)
Operating temperature range	-40		+95	$^\circ\text{C}$	
Frequency stability temperature			$\pm 10$	ppb	In still air. Reference to $(F_{\text{MAX}} + F_{\text{MIN}})/2$
Frequency slope $\Delta F/\Delta T$ in still air		$\pm 0.1$	$\pm 0.5$	ppb/ $^\circ\text{C}$	Temperature ramp $\leq 1^\circ\text{C}/\text{minute}$
All causes stability			$\pm 4.6$	ppm	Including calibration, temperature, supply voltage & load changes and 20 years life, reference to $F_n$
Supply voltage stability		$\pm 5$		ppb	$\pm 2\%$ variation, frequency $\leq 26$ MHz
Load sensitivity		$\pm 5$		ppb	$\pm 10\%$ variation, reference to frequency $\leq 26$ MHz at 15pF
Warm-up time		15	60	sec	Time needed for a frequency to be within $\pm 20$ ppb reference to frequency after 1 hour, at $25^\circ\text{C}$ . The parameter is frequency, assembly and operating history dependent
Long term stability (Ageing)			1 0.3 2.5	ppb ppm	Per day, after 60 days of continuous operation First year 20 years
Root Allan Variance (ADEV)		$30 \cdot 10^{-12}$ $20 \cdot 10^{-12}$ $15 \cdot 10^{-12}$ $15 \cdot 10^{-12}$ $70 \cdot 10^{-12}$			$\tau = 0.1\text{s}$ $\tau = 1.0\text{s}$ $\tau = 10\text{s}$ $\tau = 100\text{s}$ $\tau = 1000\text{s}$
Supply voltage (Vcc)		2.7 – 5		V	$\pm 5\%$
Input power		1200 400	1500 440	mW	Warm up Steady state in still air at $25^\circ\text{C}$
Wander generation		<ul style="list-style-type: none"> <li>› TDEV compliant with GR-1244 fig 5-4 &amp; G.812 types II &amp; III fig 2</li> <li>› MTIE compliant with GR-1244 fig 5-5 &amp; G.812 types II &amp; III fig 1</li> <li>› TDEV &amp; MTIE compliant with G.8262, G.8263, G.8273.2</li> </ul>			Oscillator stabilised 24 hours at constant temperature ( $\pm 1^\circ\text{C}$ , still air). Data subjected to relevant loop filter values (-3dB cut-off, 2nd order high pass)
Oscillator output		Regulated CMOS output (1.0, 1.8, 2.5V) or standard CMOS (options)			

## Frequency Stability over Temperature @ 30.72 MHz



## Warm-up Time @ 19.2 MHz



## Model Outline and Recommended Pad Layout

Pin	Connections
1	Do not connect (GND optional)
2	Do not connect (GND optional)
3	GND
4	Output
5	NC
6	Supply Voltage (Vcc) <i>for correct operation decouple the supply voltage with a 10 μF capacitor close to the oscillator</i>

**NOTE**

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

**RECOMMENDED PAD LAYOUT**