ROM1490E

The ROM1490E uses Rakon's market-leading proprietary Mercury+™ technology, delivering the world's smallest footprint Stratum 3E OCXO in a hermetic package. This product family delivers ±5 ppb frequency stability over -40 to 85°C and ageing of less than 1 ppb/day; fully compliant with Stratum 3E specifications. The ROM1490E 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 ROM1490E consumes only 0.4W at room temperature and has faster warm up times than traditional OCXOs.

Features

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

Applications

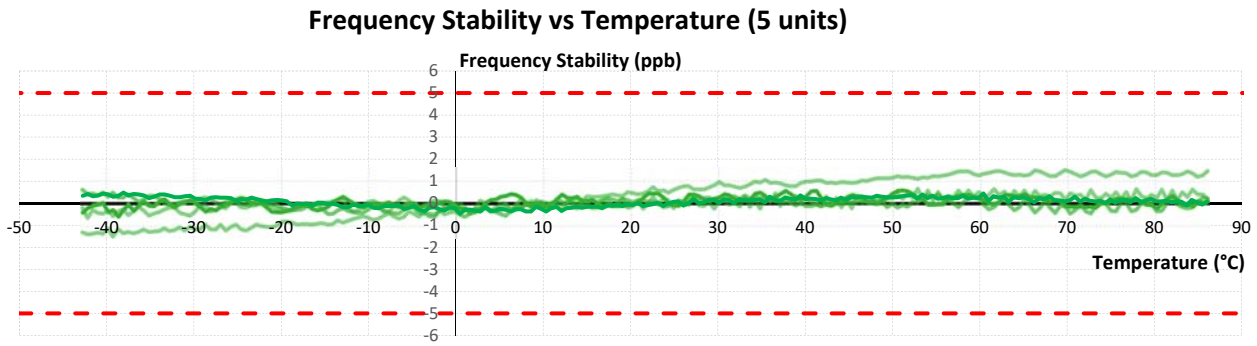
- Stratum 3E
- PTP Enabled Ethernet Switches and Routers
- Cable Modem CMTS and Remote PHYs
- G.8262, G.8263, G.8273.2, G.8273.3, G.8273.4

14.2 x 9.2 x 6.5 mm

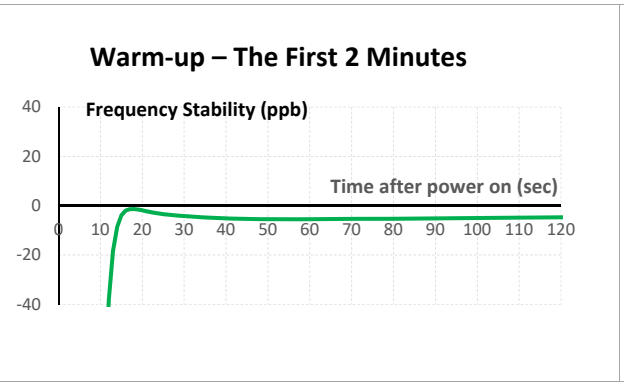
Standard Specifications

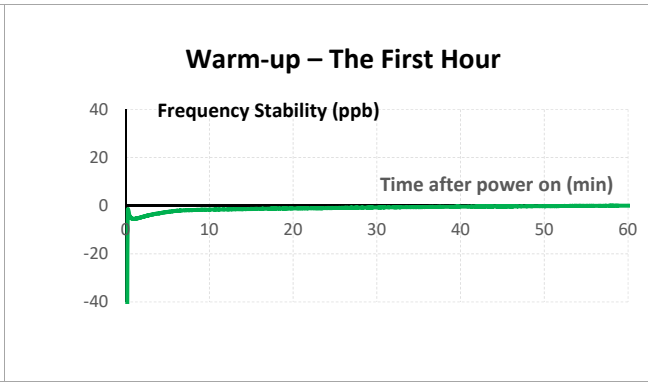
Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		10 – 50		MHz	Standard frequencies: 10, 12.8, 19.2, 20, 24.576, 25, 30.72, 38.4, 38.88, 49.152, 50 MHz
Frequency calibration			±0.2	ppm	Initial accuracy at 25°C ±2°C
Reflow shift			±0.2	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
Operating temperature range	-40		+85	°C	
Frequency stability temperature			±5	ppb	In still air. Reference to (FMAX + FMIN)/2
Frequency slope ΔF/ΔT in still air		±0.1	±0.5	ppb/°C	Temperature ramp ≤ 1°C/minute
All causes stability			±4.6	ppm	Including calibration, temperature, supply voltage & load changes and 20 years life, reference to Fn
Supply voltage stability		±5		ppb	±2% variation, frequency ≤ 26 MHz
Load sensitivity		±5		ppb	±10% variation, reference to frequency ≤ 26 MHz at 15pF
Warm-up time		15	60	sec	Time needed for frequency to be within ±20 ppb reference to frequency after 1 hour, at 25°C. 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)		$30*10^{-12}$ $20*10^{-12}$ $15*10^{-12}$ $15*10^{-12}$ $70*10^{-12}$			tau = 0.1s tau = 1.0s tau = 10s tau = 100s tau = 1000s
Supply voltage (Vcc)		2.7 – 5		V	±5%
Input power		1200 400	1500 440	mW	Warm up Steady state in still air at 25°C
Wander generation	› TDEV compliant with GR-1244 fig 5-4 & G.812 types II & III fig 2 › MTIE compliant with GR-1244 fig 5-5 & G.812 types II & III fig 1 › TDEV & MTIE compliant with G.8262, G.8263, G.8273.2				Oscillator stabilised 24 hours at constant temperature (±1°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 @ 19.2 MHz

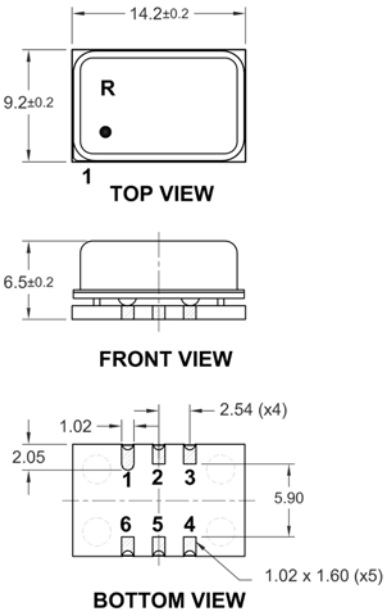


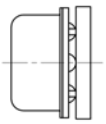
Warm-up Time @ 19.2 MHz

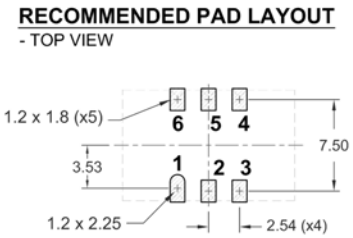




Model Outline and Recommended Pad Layout







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

NOTE

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