

RFPT100

An emergency distress beacon is a small battery-powered device that can be carried onboard ships (called EPIRB = Emergency Position Indicating Radio Beacon), aircraft (called ELT = Emergency Locator Transmitter) and on one's person (called PLB = Personal Locator Beacon). Once activated it transmits a signal that is detectable by government search and rescue authorities. These beacons are regulated by Cospas-Sarsat, an international organisation for the search and rescue of persons in distress. The Cospas-Sarsat system uses a constellation of satellites orbiting the globe and a network of earth stations to provide distress alerts and location information to rescue teams worldwide. Using the signals transmitted by the beacon, the system calculates its position to within a few km. The beacon's correct operation depends to a great extent on the stability of the reference oscillator that is used to generate the 406 MHz transmitter signal.

Traditionally Oven Controlled Crystal Oscillators (OCXO) have been used for this function. However, an OCXO needs significant power and time to heat the internal oven whereas the Rakon RFPT100 TCXO has a power consumption of only 6mW (typ.) and instantaneously provides a stable output frequency. This results in increased battery life or allows the use of a smaller battery. The smaller battery reduces system costs and enables future beacons to be smaller and lighter.

The RFPT100 TCXO makes use of Rakon's Pluto™ ASIC which is a fourth-order temperature-compensation chip. The Pluto™ ASIC uses certain patented features, which enable it to achieve critical Medium Term Stability (MTS), previously unattainable with any TCXO. This unique performance, for the first time, has enabled the use of compact, low-cost TCXOs in emergency beacon applications. The Pluto™ TCXO employs One-Time Programmable (OTP) non-volatile memory which ensures lifetime reliability under adverse conditions.

Features

- LOW POWER CONSUMPTION
- COSPAS-SARSAT compliant
- MTS¹: 100% tested
- Test data supplied with each unit
- Clipped sinewave and voltage control options
- Non-volatile memory for lifetime reliability

Applications

- Emergency beacon (EPIRB, ELT, PLB)
- Argos beacon
- Personal survival radio

7.0 x 5.0 x 1.8 mm

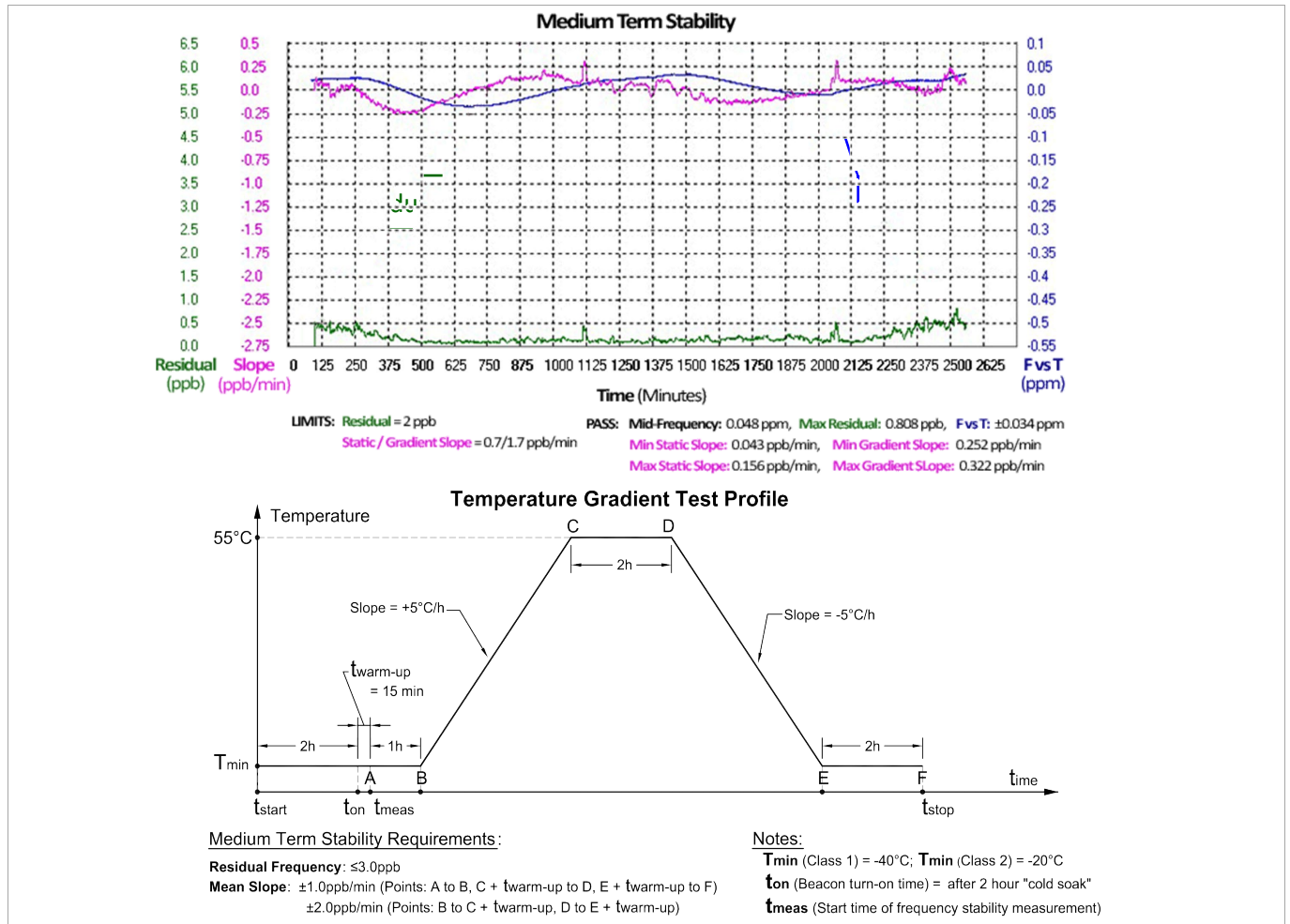


Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency (Fn)		10 – 20		MHz	Standard frequencies: 10.0, 12.688469, 12.688750 or 16.367 MHz
Frequency calibration			±0.5	ppm	Initial tolerance at 25°C
Reflow shift			±1	ppm	Pre to post reflow ΔF (measured ≥ 60 minutes after reflow)
Operating temperature range	-40 -20		55 55	°C	Class I Class II
Frequency stability over temperature (FvT)			±0.2	ppm	Reference to (F _{MAX} + F _{MIN})/2
Supply voltage stability			±0.1	ppm	±10% variation, reference to frequency at 3.3V
Load sensitivity			±0.1	ppm	±5pF variation, reference to frequency at 15pF
Medium term stability (MTS) ¹			±0.7	ppb/min	Mean slope (dF/dt), steady state conditions
			±1.7	ppb/min	Mean slope (dF/dt), during and 15 minutes after variable temperature conditions
			±2.0	ppb	Residual dF from slope
Long term stability (LTS)			±1	ppm	1 year
			±3	ppm	10 years
Supply voltage (V _{CC})		3.3		V	±10%
Supply current		2.5		mA	Depending on nominal frequency
Root Allan Variance			1*10 ⁻⁹		tau = 100ms
Oscillator output options	Clipped Sinewave: 10kΩ //10pF nominal load. HCMOS: 15pF nominal load.				

¹ Medium term stability specified and measured according to Cospas-Sarsat 406MHz distress beacon specifications T.001, issue 3 and T.007, issue 4 (averaged over 18 measurements in 15 minute period and following 15 minute power up period). Test results shipped with each device, identified by date and serial number, retained for 10 years.

Medium Term Stability (MTS)



Model Outline and Recommended Pad Layout

