

ROD2522S2 [Preliminary]

The ROD2522S2 is a 0.5 ppb pk-pk PPS OCXO for telecommunications applications. Taking advantage of Rakon's proprietary smart compensation techniques and unique circuitry design, the ROD2522S2 delivers a 24-hour holdover (1.5 μ s) across 4°C temperature windows.

The ROD2522S2 is the first 25 x 22 mm SMD oscillator that is able to provide 24-hour holdover performance. The device accepts a primary reference traceable clock and, using advanced compensation algorithms, compensates for ageing related frequency variations dynamically. Taking advantage of the thermo-mechanical construction, the advanced package design extends the product's operating temperature range from -40°C up to 95°C. Its compensated frequency ageing is as low as 0.02 ppb/day. These unique features make the ROD2522S2 an ideal solution where 24-hour holdover, highly accurate and precise frequency stability are critical.

Features

- 24-hour holdover (1.5 μ s, 4°C temperature windows)
- Frequency stability (FvT): <0.5 ppb pk-pk over -40 to 85°C
- low ageing: <0.2 ppb/day
- Compensated ageing: <0.02 ppb/day
- Small form factor and low height

Applications

- Edge grand masters
- DU/CU/servers
- Cell-site routers
- Front-haul switches
- NIC time cards
- Test equipment
- GNSS modules

25.4 x 22.0 x 12.1 mm



Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency		10 – 20		MHz	Standard frequencies: 10, 12.8 and 20 MHz
Operating temperature range	-40		85	°C	-40 to 95°C temperature range available on request
Frequency stability over temperature		0.5		ppb	Peak to peak
Free-run accuracy (20 years)		±1		ppm	
Supply voltage stability		±0.5		ppb	±5% at 25°C
24-hour holdover performance			±1.5	μ s	After 3 days of continuous power on, constant temperature and calm air
Hysteresis		0.3		ppb	Over -40 to +85°C, gradient 10°C / hour
Long term stability (Ageing)		±0.2 ±10 ±50		ppb/day ppb/month ppb/year	After 1 week of operation
Compensated ageing		±0.02		ppb/day	
Short term 1s to 10s integration time		±0.005		ppb	
Retrace at 25°C		±1		ppb	After 24 hours off and 1 hour on
Supply voltage (V _{CC})		3.3		V	±5%. Standard options 5.0 V
Power consumption			3.5 1.5	W W	During warm-up Steady state at 25°C calm air
Warm-up time			±5	mn	Within 10 ppb of prior steady state output frequency at the time of power-off. 24 hours on min. + 24 hours off max.
Oscillator output – Compatible CMOS					
Output voltage level high (V _{OH})	2.4			V	
Output voltage level low (V _{OL})			0.4	V	
Rise & fall time			5	ns	

Simulated Plots

Figure 1:

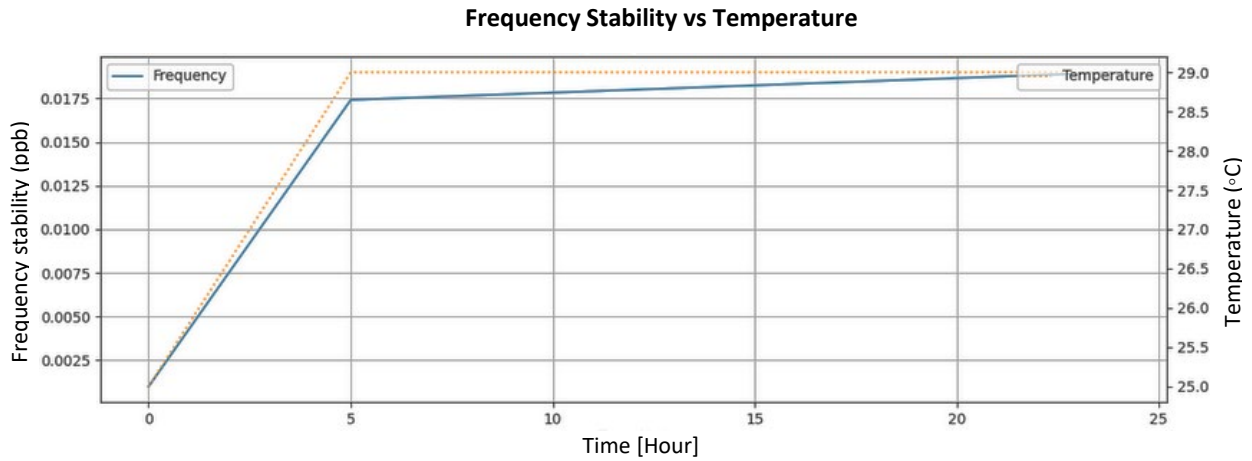


Figure 2:

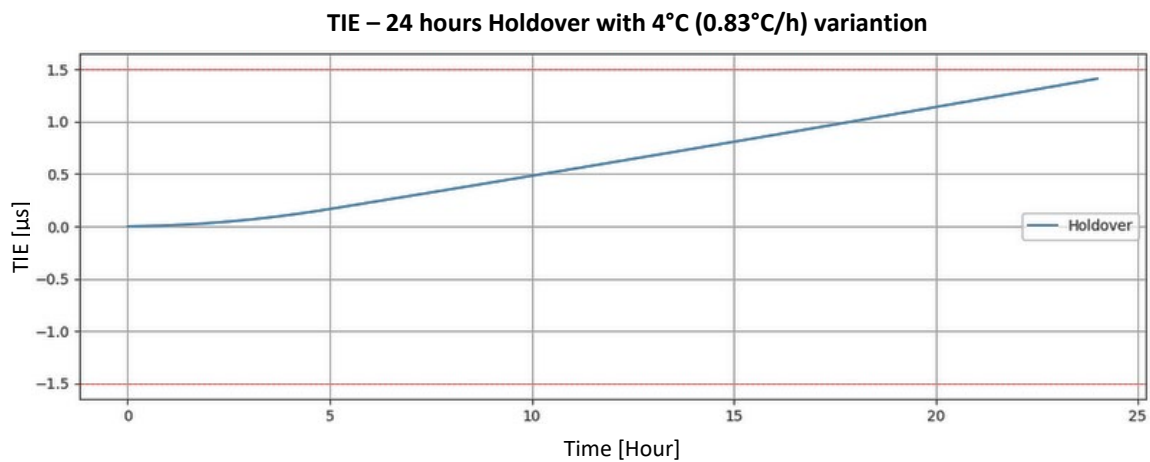
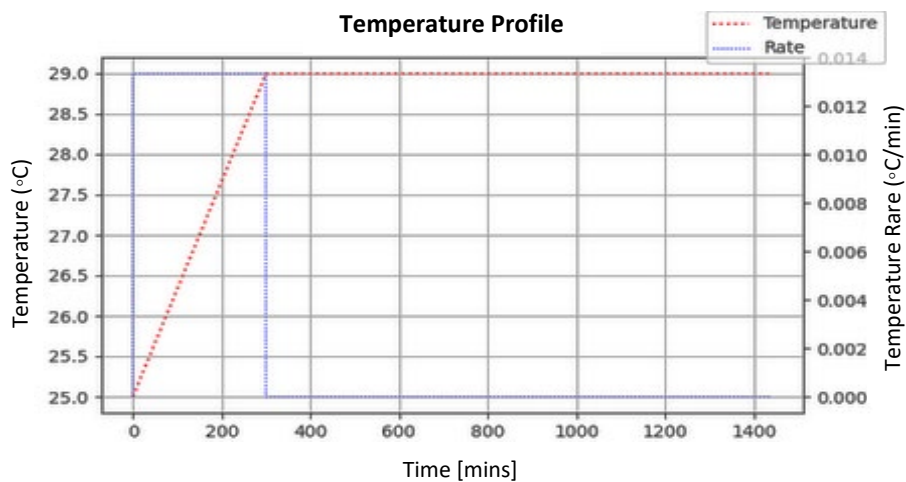
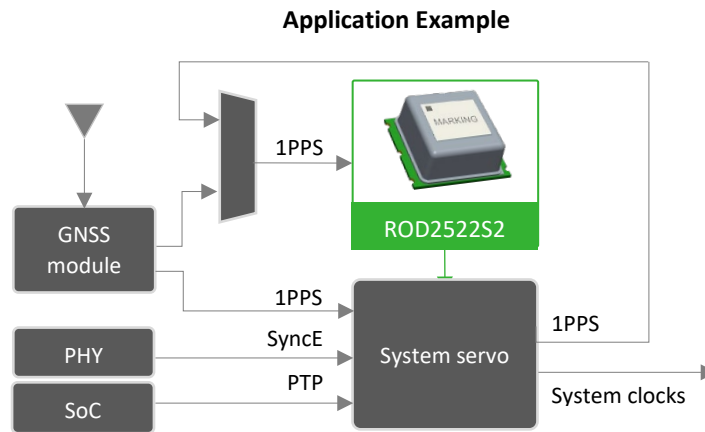


Figure 3:

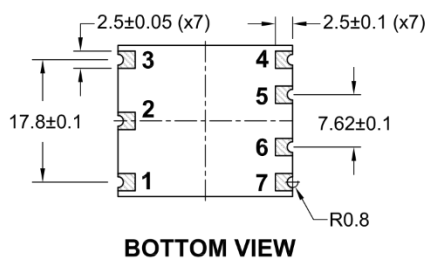
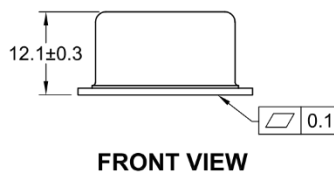
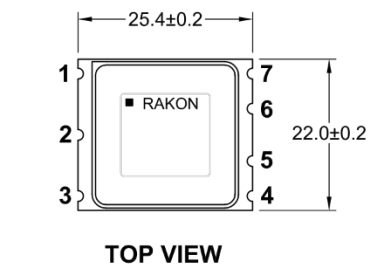


Application Example Block Diagram

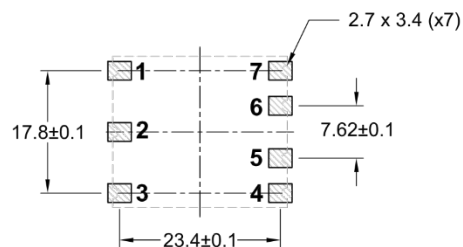
Figure 4:



Model Outline



RECOMMENDED PAD LAYOUT - TOP VIEW



Pin	Connections
1	PPS Input
2	PPS Output
3	Supply Voltage (Vcc)
4	RF Output
5	I ² C bus – SCL
6	I ² C bus – SDA
7	GND (mechanical & electrical)

NOTE

- Planarity of the bottom PCB ≤0.15mm typica ≤0.1mm / PCB interfacing with customer's board
- No via, no trace on bottom side
- Unit: Unit: mm. Tolerance is ±0.2 mm if it has not been indicated.