

## ROD5242T1

The ROD5242T1 is a high-end PPS-disciplined OCXO designed for applications requiring extended holdover and precise frequency stability. The device achieves extreme accuracy with 50 ppt frequency stability across a wide operating temperature range of  $-40$  to  $+85^{\circ}\text{C}$ . It delivers 24-hour holdover ( $\leq 1.5 \mu\text{s}$ ) within a  $20^{\circ}\text{C}$  temperature window at a drift rate of  $0.8^{\circ}\text{C}/\text{minute}$ . The ROD5242T1 supports nominal output frequencies of 10 MHz and 20 MHz.

Leveraging proprietary smart compensation techniques, unique circuitry design, and a double-oven package construction, the ROD5242T1 minimises the impact of temperature and airflow changes, achieving an unprecedented 50 ppt stability. The device accepts a primary reference traceable 1PPS clock and, through advanced compensation algorithms, dynamically corrects ageing-related frequency variations. Its premium resonator exhibits limited random and hysteresis effects. By addressing all key parameters influencing holdover, the ROD5242T1 delivers atomic clock-like performance, making it ideal for telecom, test, and instrumentation applications.

### Key specifications

- Frequency (Fn): 10 – 20 MHz
- Holdover:  $\leq 1.5 \mu\text{s}$  over 24 hour at  $20^{\circ}\text{C}$  ( $0.8^{\circ}\text{C}/\text{min}$  temp drift)
- Frequency stability (FvT):  $\leq 50$  ppt pk-pk
- Operating temperature:  $-40$  to  $85^{\circ}\text{C}$
- Low ageing:  $< 0.1$  ppb/day
- Compensated ageing:  $< 0.0075$  ppb/day
- I<sup>2</sup>C bus device status and commands

### Applications

- Telecom and 5G synchronisation systems  
*Edge grandmasters, DU/CU servers, cell-site routers, front-haul switches*
- Wireless holdover and resilient timing:  
*GNSS modules and precision timing in degraded or GNSS-denied environments*
- Timing and frequency control modules  
*NIC time cards, GNSS, time/frequency references*
- Rubidium clock replacement solutions  
*Telecom infrastructure and test & measurement systems*
- Test, measurement, instrumentation, and broadcasting equipment

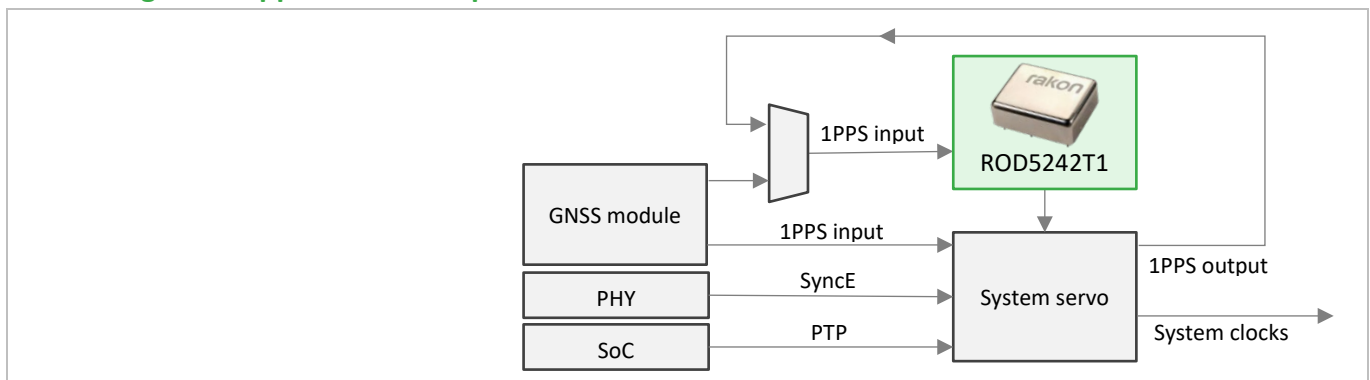
52 x 42 x 14 mm



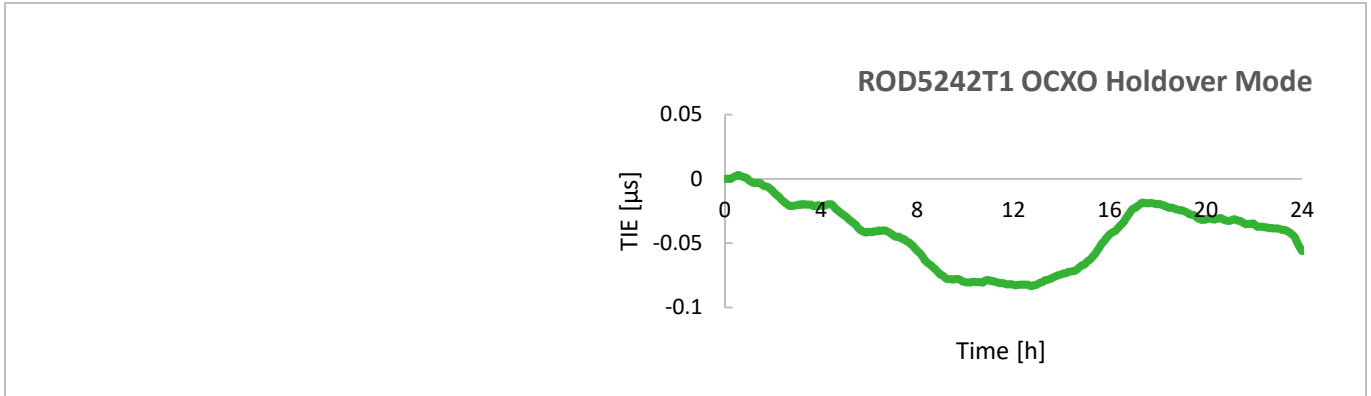
### Standards Compliance

- Stratum 2 clock performance
- ITU-T timing standards:
  - Frequency synchronisation: G.812 (except lifetime accuracy), G.813
  - Synchronous Ethernet (SyncE): G.8262, G.8262.1
  - Packet-based frequency Sync: G.8263, G.8266
  - Primary Reference Time Clock (PRTC): G.8272, G.8272.1
  - Time/phase distribution (PTP profiles): G.8273.2, G.8273.4
  - PTP telecom profiles: G.8275.1, G.8275.2

### Block diagram – Application Example



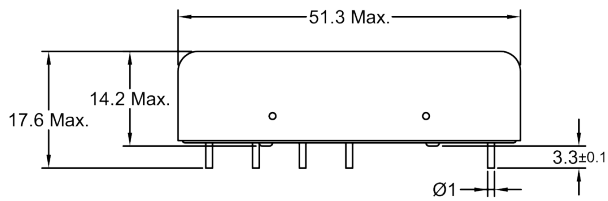
## Block diagram – Holdover Chart



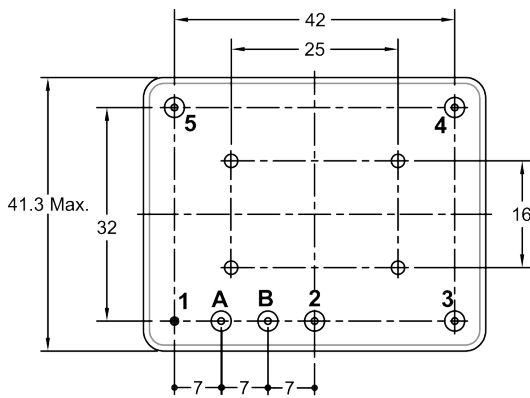
## Standard Specifications

Parameter	Min.	Typ.	Max.	Unit	Test Condition / Description
Nominal frequency (Fn)		10 - 20		MHz	Standard frequencies: 10 and 20 MHz
Operating temperature range	-40		85	°C	
Frequency stability over temperature		0.05	0.1	ppb	Peak to peak
Free-run accuracy (20 years)		±1		ppm	
Supply voltage stability		±0.5		ppb	±5% at 25°C
48-hour holdover performance		±1.5		µs	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)		±0.1 ±10 ±50		ppb/day ppb/month ppb/year	After 1 week of operation
Compensated ageing		±0.0075		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 <sub>CC</sub> )		3.3		V	±5%. Standard options 5.0 V
Power consumption			7.5 3.0	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					Sine wave option: +7dBm – 50Ω
Output voltage level high (V <sub>OH</sub> )	2.4			V	
Output voltage level low (V <sub>OL</sub> )			0.4	V	
Rise & fall time			5	ns	
Environmental					Qualification – not operational
Vibration			10	g	IEC 68-2-06 test Fc-Severity 500/10
Shock (3 directions)			50	g	IEC 68-2-27 test Ea severity 50A
Storage temperature	-55		90	°C	

## Model Outline



**FRONT VIEW**



**BOTTOM VIEW**

### PIN CONNECTIONS

Pin	Symbol	Function
1	GND	Ground
2	SCL	I <sup>2</sup> C bus – SCL
3	SDA	I <sup>2</sup> C bus – SDA
4	V <sub>CC</sub>	Supply voltage
5	F <sub>OUT</sub>	RF Output
A	PPS <sub>OUT</sub>	PPS Output
B	PPS <sub>IN</sub>	PPS Input

### NOTE

- Dimensions in mm.
- Tolerance: ±0.2 mm unless noted.