

RFS-M102 miniature size Rb frequency standard

Features:

- Standard frequency: 10 MHz
- Package size: 51x51x25 mm
- 1 PPS input and output available by default (1PPS output pin is user programmable)
- Rb lamp life time: up to 20 years
- Excellent temperature stability: up to $\pm 1E-10$
- Short term stability (Allan Deviation): $< 5 \times 10^{-11}$ per 1 sec
- Aging: up to $\pm 4 \times 10^{-12}$ /day and up to $\pm 5 \times 10^{-10}$ /year



ORDERING GUIDE: RFS-M102-HU 02 A-SIN-T1-10MHz-A

Frequency stability vs. Baseplate temperature		$< \pm 3E-10$	$< \pm 2E-10$	$< \pm 1E-10$
		03	02	01
HU	-10...+75°C	A	A	A
HV	-10...+80°C	A	A	A
EU	-40...+75°C	A	A	A
EW	-40...+80°C	A	A	A

A – available.

Unit may start at -10°C (-40°C) baseplate and continue operation at -10°C (-40°C) ambient temperature with total heat sinking less than 5W.

Aging		
	Per day ¹	Per year ²
A	$\pm 2E-11$	$\pm 1E-9$
B ³	$\pm 4E-12$	$\pm 5E-10$

¹ per day: average value of 7 days continuous operation at constant temperature ($< \pm 2^\circ\text{C}$) after 24 h of continuous operation.

² per year: after 30 days of continuous operation

³ compatible only with frequency stability vs. temperature option 01

Standard parameters		Spec
Parameter		Spec
Frequency, MHz		10
Output signal waveform		SIN, LVCMOS
Output power (Load 50 \pm 5 Ohm), dBm (SIN)		>7 (10 typical)
Frequency stability vs. input voltage changes @ $U_s = \pm 0.2V$		$\pm 2E-11$
Retrace (24h ON \rightarrow 6h OFF \rightarrow 2h ON) @ constant temperature		$\pm 5E-11$
Supply voltage, V ($\pm 0.2V$)		12
Power consumption at 25°C, W	– steady state:	<6
	– warm up:	<20 (<18 typical)
Warm-up time @ 25°C, min:	– to lock	<5
	– within accuracy @ $< 1 \times 10^{-9}$	<7.5
	– within accuracy @ $< 5 \times 10^{-10}$	<15
Digital frequency tuning range (via UART)		$\pm 1E-7$
Analog frequency pulling range (Option A)		$\pm 1.5E-9$
Control voltage range (Option A)		0...+5V
Harmonics, dBc (SIN only)		<-30
Spurious, dBc (SIN only)		<-60
Random vibration (no loose lock):	– frequency range, Hz	20...2000
	– acceleration, g	4
Allan Deviation (after 2h of continuous operation):	– per 1s	<5E-11 (2E-11 typical)
	– per 10s	<2E-11 (9E-12 typical)
	– per 100s	<8E-12 (3E-12 typical)
Phase noise, dBc/Hz @ offset (after 2h of continuous operation):	10 Hz	-80 (-90 typical)
	100 Hz	-115 (-120 typical)
	1 kHz	-130 (-135 typical)

Additional options	
(default)	1 PPS input
A*	Analog tuning option

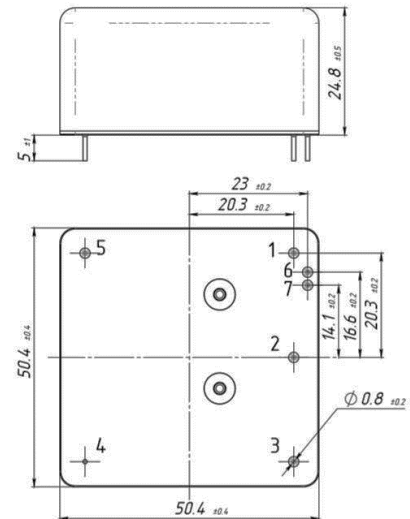
* Option factory installed only. It is not compatible with 1 PPS input default option.

Packaging type	
Type 1	T1 (7 pin case)
Type 2	T2 (8 pin case)*

*Consult factory for details

Output	
	SIN (default)
	LVCMOS

Package drawing (Type 1):



Pin	Assignment
1	1PPS input or analog EFC IN
2	1 PPS output (default)*
3	RF output
4	GROUND (SIGNAL+CASE)
5	Power supply input
6	DATA TX (UART)
7	DATA RX (UART)

* Pin #2 is fully user programmable. Please contact factory or see User Guide for details.

