RFS10F: 10 MHz Rubidium Frequency Standard

Key Features

- Rubidium Oscillator as main frequency reference
- Five sinewave outputs as standard.
- Five additional outputs available as option 01
- Very Low Phase Noise, see specifications below
- Additional five outputs at different frequency
- Many options available. See list in this brochure
- Custom built options available upon request
- 19" 2U high rack mountable case

Description

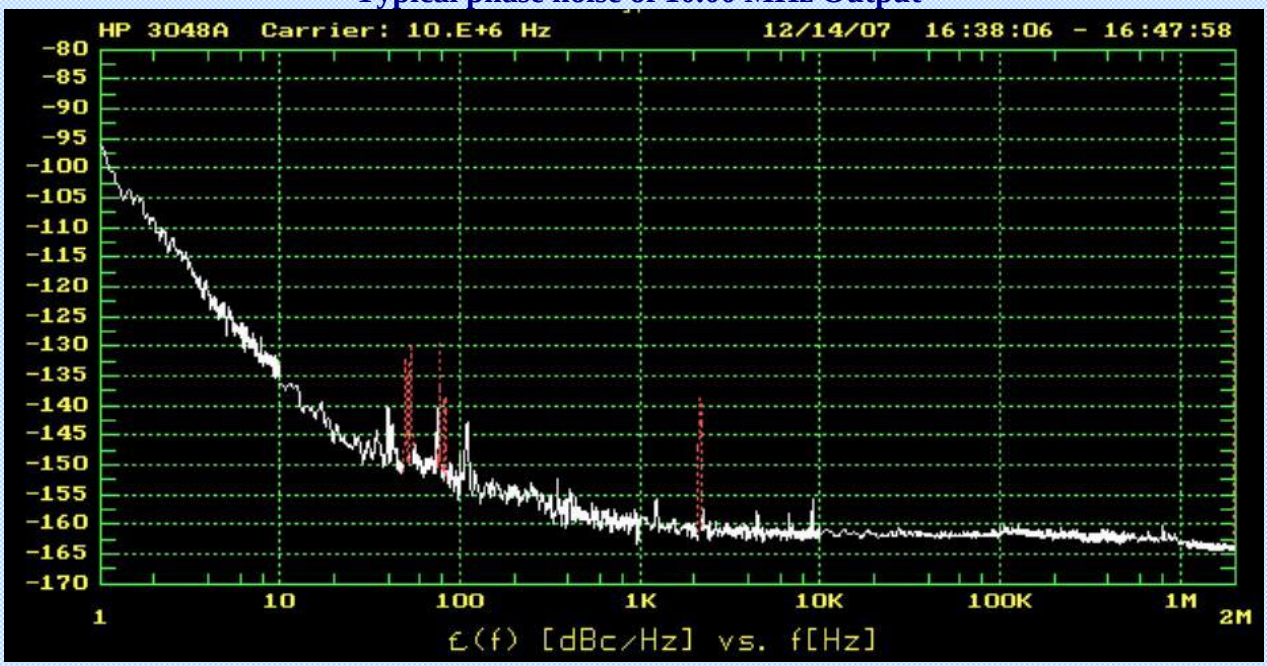
The RFS10F is a 10 MHz rubidium frequency standard with many options as described below. An optional input allows the RFS10F to be locked to a 1 pps signal such as GPS, or to other frequencies such as 5 or 10 MHz. Also the 1 pps output derived from the rubidium will align itself in time to the 1 pps input to within 150 ns.

Options

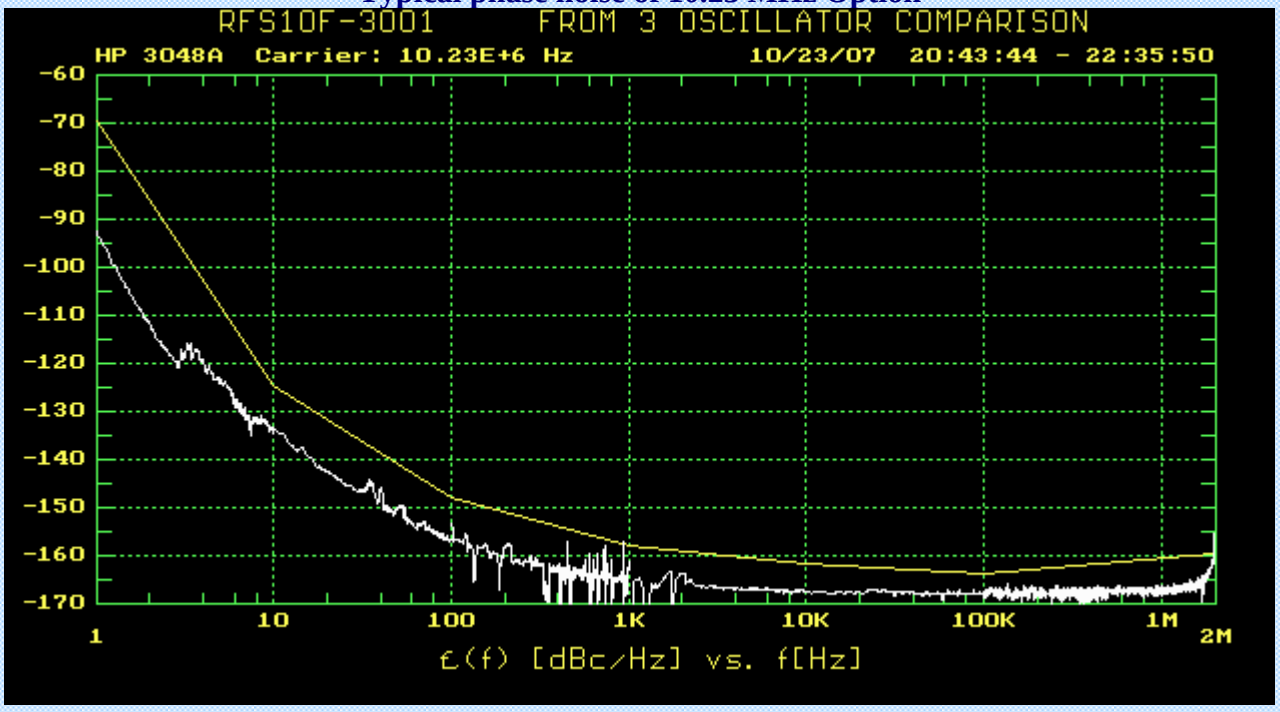
Various options are available such as:

- Very low phase noise outputs at 10.23 MHz, 13 MHz or 20 MHz. Other frequencies on request. All outputs locked to main rubidium reference.
- Squarewave Outputs. TTL, ECL, RS232, RS422, E1 levels. Any frequency from 0.1 pps to 100 MHz
- 80 MHz squarewave generator (usable to 100 MHz). Three outputs are provided, sinewave, TTL and PECL.
- Output levels to +19 dBm.
- Redundancy. Two units operate together for high reliability systems, or 2nd redundant input connector.
- External DC input. 12V, 24V, 48 V external power supply. Can be used as a backup power supply.
- Extra sinewave outputs.
- Multiplied or Divided outputs.
- Telecoms Outputs (E1 G703)

Typical phase noise of 10.00 MHz Output



Typical phase noise of 10.23 MHz Option



Specifications for the RFS10F are shown on the next page.

Specifications

Description	Specification	Remarks
Rubidium Oscillator		
Output Frequency	10 MHz sinewave	Optional change to 5 MHz
Aging (after 30 days)	$< 5 \times 10^{-11}$ /month or $< 5 \times 10^{-10}$ /year	
Accuracy at shipment	$< \pm 5 \times 10^{-11}$	
Allan Deviation	$< 2 \times 10^{-11}$ (1s), $< 2 \times 10^{-12}$ (100s),	Also $< 2 \times 10^{-11}$ (10s)
Spurious	<-120 dBc (100 kHz BW)	
Frequency Retrace	$\pm 5 \times 10^{-11}$ (72 hours on, 72 hours off)	
Settability	$< 5 \times 10^{-12}$	
Trim Range	$\pm 2 \times 10^{-9}$ (bottom panel), ± 1ppm (via RS232)	
Warm-Up Time	< 6 minutes to within 1×10^{-9}	
Temperature Coefficient	5×10^{-11} (-10 °C to +50 °C)	
Magnetic Field	$< 2 \times 10^{-10}$ for 1 Gauss field reversal	
Design Life	10 to 20 years	
10 MHz Outputs		
Number of Outputs	Five as standard, ten with option 01	Rear panel BNC connectors.
Frequency	10 MHz	
Accuracy	Same as main Rubidium Reference	
Signal Type	Sine wave	
Amplitude	0 dBm to + 12 dBm adjustable	Internally adjustable
Harmonic Distortion	- 25 dBc (-45 dBc with option 07)	
Return Loss	> 20 dB @ 10 MHz	
Phase Noise (dBc/Hz) @ offset frequency @ 10 MHz carrier frequency.	-125 @ 10Hz, -145 @ 100 Hz, -156 @ 1 kHz, -157 @ 10 kHz, -158 @ 100 kHz	See graph for typical phase noise plot
10.23 MHz Output (Option 05) or 13 MHz output (Option 05B) or 20 MHz (Option 05C)		
Connector	BNC socket on rear panel	
Number of Outputs	Five as standard	
Frequency	10.230 MHz, 13 MHz or 20 MHz	
Accuracy	Same as main Rubidium Reference	
Signal Type	Sine wave	
Amplitude	0 dBm to + 12 dBm	Internally adjustable
Harmonic Distortion	- 25 dBc (-45 dBc with option 07)	
Return Loss	> 20 dB @ 10 MHz	
Phase Noise (dBc/Hz) @ offset frequency @ 10.23 MHz carrier frequency	-125 @ 10Hz, -149 @ 100 Hz, -161 @ 1 KHz, -165 @ 10 kHz, -165 @ 100 kHz	See graph for typical phase noise plot
1 pps Output		
Connector	D sub connector – rear panel	
Frequency	1 pulse per second	
Signal Type	Pulse Output	Pulses high for 10 µs when rubidium is locked. +5V DC when rubidium not locked.
Amplitude (open circuit)	0 to 5 V, TTL Compatible	
Optional 1 pps Input		
Connector	BNC socket on rear panel	Other external input frequencies available, e.g 5 MHz, 10 MHz, 100 MHz.
Input type	1 pulse per second, TTL level.	
Miscellaneous		
Operating / Storage Temperature	-10 °C to +40 °C / -20 °C to +60°C	
AC Power Inlet with switch	IEC320 power cord	
AC Voltage Range	100 - 240 VAC	Rear Panel
Power consumption	140 W Max (warm up), 70 W (operating)	Usable 90 - 260 VAC
Width x Depth x height. / Weight	482.6 x 330 x 88 mm / 7 kg's	Warm up period is < 10 minutes at +20 °C
Consult Precision Test Systems for further details of these options. Not all options can be fitted at the same time.		

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