1.2 GHz RF-Synthesizer
HM8134-3

Option HO85, high- stability oscillator with a stability of ± 5x10^{-9} per day

Internal modulation source

Internal modulation source

Frequency range from 1 Hz to 1.2 GHz

Frequency resolution 1 Hz (accuracy 0.5 ppm)

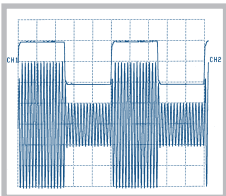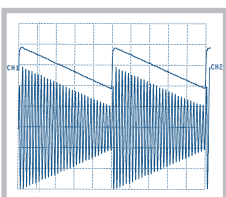**Output power from – 127 dBm to + 13 dBm**

High spectral purity

AM / FM / PM and gate modulation

RS-232   optional IEEE-488   optional USB

1.2 GHz HF Synthesizer HM8134-3
Technical description

Frequency

Range:	1 Hz to 1200 MHz
Resolution:	1 Hz
Settling time:	‹ 10 ms

10 MHz reference (internal)

Stability:	‹ 0.5 ppm
Aging:	‹ ±1 ppm/year
Output (rear panel):	TTL
Input (front panel):	Level: › 0 dBm; Frequency 10 MHz

Spectral purity (without modulation)

Harmonic:	≤ - 35 dBc
Non-harmonic:	≤ - 60 dBc (› 15 kHz from carrier)
Phase noise:	(at 20 kHz from carrier)
‹ 16 MHz:	≤ - 120 dBc/Hz
16 to 250 MHz:	≤ - 95 dBc/Hz
250 to 500 MHz:	≤ - 105 dBc/Hz
500 to 1200 MHz:	≤ - 100 dBc/Hz
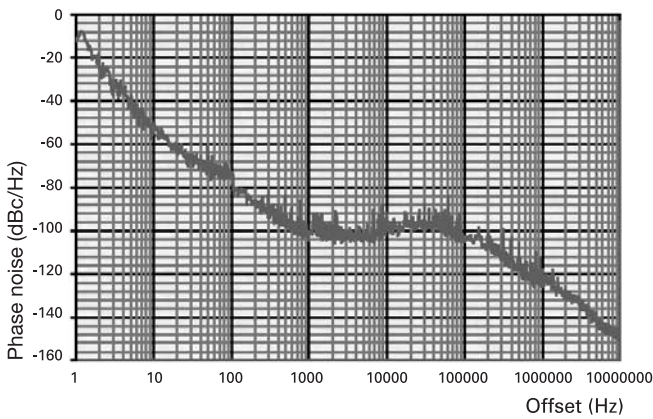
(Typical phase noise at 1 GHz)

Output level

Range:	- 127 to + 13 dBm
Resolution:	0.1 dB
Precision:	≤ ± 0.5 dB (for level › - 57 dBm)
Impedance:	50 Ω
V.S.W.R.:	≤ 1 : 1.5

Modulation sources

Internal:	10 Hz - 300 kHz sine wave,
	10 Hz - 100 kHz
	square wave, triangle, saw thooth
Resolution:	10 Hz
External:	(input on front panel)
Impedance:	10 kΩ
Input level:	2 V_{pp} for full scale
Coupling:	AC or DC
Output (on front panel):	Impedance: 1 kΩ;
	Level: 2 V_{pp}

Amplitude modulation   (Level ≤ + 7 dBm)

Source:	internal or external
Modulation depth:	0 to 100 %
Resolution:	0.1 %
Accuracy:	± 4 % of reading ± 0.5 %
	(AM-depth ≤ 80 % and f_{mod} ≤ 1 kHz)
Ext. frequency resp. (to - 1 dB):	10 Hz to 300 kHz for AC
Distortion:	‹ 2 % (AM-depth ≤ 60 %, f_{mod} ≤ 1 kHz)
	‹ 6 % (AM-depth ≤ 80 %, f_{mod}: 10 Hz to 100 kHz)

Frequency modulation

Source:	internal or external
Deviation:	± 200 Hz to 400 kHz
	(depending on frequency band)
Resolution:	100 Hz
Accuracy:	± 5 % + residual FM
Ext. frequency response: (to - 1 dB)	
DC coupling:	0 to 100 kHz
AC coupling:	10 Hz to 100 kHz
Distortion:	‹ 3 % for deviation ≥ 10 kHz

Phase modulation

Source:	internal or external
Deviation:	0 to 3.14 rad (‹ 16 MHz)
	0 to 10 rad (› 16 MHz)
Resolution:	0.01 rad
Accuracy:	± 5 % to 1 kHz + residual PM
Ext. frequency response : (to - 1 dB)	
DC coupling:	0 to 100 kHz
AC coupling:	10 Hz to 100 kHz
Analog PM:	DC up to 100 kHz
Distortion:	‹ 3 % for f_{mod} = 1 kHz and deviation = 10 rad

FSK modulation

Range:	16 to 1200 MHz
Mode:	2 FSK levels
Data source:	external
Max. rate:	10 kbit/s
Shift (F1 – F0):	0 to 10 MHz
Resolution:	100 Hz
Accuracy:	see under FM

PSK modulation

Range:	16 to 1200 MHz
Mode:	2 PSK levels
Data source:	external
Max. rate:	10 Kbit/s
Shift (Ph1 – Ph0):	0 to ± 3.14 rad (‹ 16 MHz)
	0 to ± 10 rad (› 16 MHz)
Resolution:	0.01 rad
Accuracy:	see under PM

Pulse modulation

Source:	external
Dynamic range:	› 60 dB
Rise/fall times:	‹ 200 ns
Delay:	‹ 100 ns
Max. frequency:	2.5 MHz
Input level:	TTL

Sweep mode

Range:	1 Hz to 1200 MHz
Depth:	500 Hz to 1200 MHz
Number of points:	10 to 500
Time/step:	1 ms to 1 s
Resolution:	1 ms
Operating mode:	free, single, manual
Trigger:	internal or external

Protective functions

The synthesiser is protected against reverse power applied on RF output up to 1 W for a 50 Ω source and against any DC source up to ± 7 V. The protection disconnects the output until manually rearmed by operator.

Miscellaneous

Interfaces:	RS-232, 9-pole D-sub
Configuration memories:	10
Power supply:	115/230 V ± 10 %, 50/60 Hz
Power consumption:	approx. 40 VA
Operating temperature:	+ 10 to + 40° C
Max. relative humidity:	10 to 90 % (without condensation)
Safety class:	Safety Class I (EN61010-1)
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	approx. 7 kg

Values indicated without tolerances are intended as aids to orientation and reflect the characteristics of an average device.
Reference temperature 23° C ± 2° C. Subject to change without notice.

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