

## 1.2 GHz RF-Synthesizer HM8134-3



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

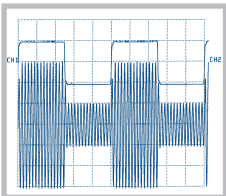
AM / FM / PM and gate modulation

See page 125 for technical specifications

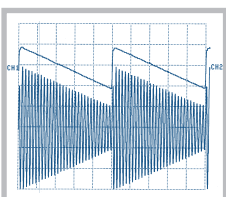
Option H085, high- stability oscillator with a stability of  $\pm 5 \times 10^{-9}$  per day



Internal modulation source



Internal modulation source



## 1.2 GHz HF Synthesizer HM8134-3

### Technical description

#### Frequency

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

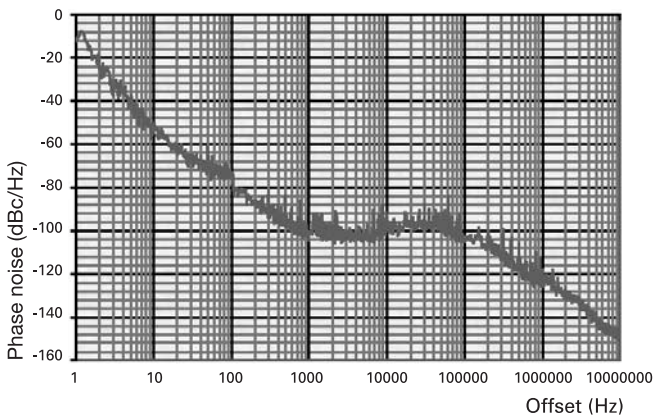
#### 10 MHz reference (internal)

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:	2V <sub>pp</sub> for full scale
Coupling:	AC or DC
Output (on front panel):	Impedance: 1 kΩ; Level: 2V <sub>pp</sub>

#### 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 <sub>mod</sub> ≤ 1 kHz]
Ext. frequency resp. (to -1 dB):	10 Hz to 300 kHz for AC < 2 % [AM-depth ≤ 60 %, f <sub>mod</sub> ≤ 1 kHz]
Distortion:	< 6 % [AM-depth ≤ 80 %, f <sub>mod</sub> : 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 <sub>mod</sub> = 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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