



1.2 GHz RF-Synthesizer HM8134-3



Frequency range from 1 Hz to 1.2 GHz

Output power from -127 dBm to +13 dBm

Frequency resolution 1 Hz (accuracy 0.5 ppm)

Input for external time base (10 MHz)

Modulation modes: AM, FM, Puls, Φ , FSK, PSK

Rapid pulse modulation: typ. 200 ns

Internal modulator 10 Hz to 150 kHz

High spectral purity

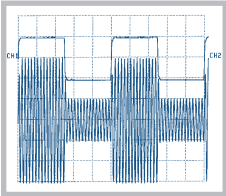
OCXO optional

RS-232 interface, optional: USB, IEEE-488

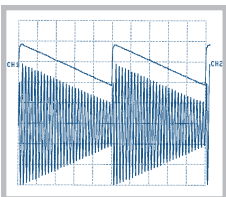
HZ42 19" Rackmount kit 2RU



Internal modulation source



Internal modulation source



1.2 GHz HF Synthesizer HM8134-3

Valid at 23 °C after a 30 minute warm-up period

Frequency

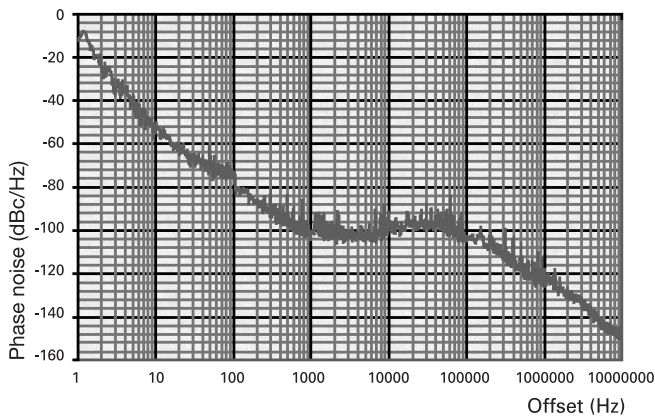
Range:	1 Hz to 1200 MHz
Resolution:	1 Hz
Settling time:	< 10 ms

Frequency Reference 10 MHz

Standard:	TCXO
Stability (0 to 50 °C):	≤ ±0.5 ppm
Aging:	≤ ±1 ppm/year
Option: OCXO (H085)	
Stability:	≤ ±1.10 ⁻⁸
Aging:	≤ ±5.10 ⁻⁹ /day
Internal reference output:	(rear panel)
Level:	TTL
External reference input:	(rear panel)
Level:	> 0 dBm

Spectral purity (without modulation)

Harmonic:	≤ -35 dBc
Non-harmonic:	≤ -55 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 1000 MHz:	≤ -100 dBc/Hz
1000 to 1200 MHz:	≤ -95 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 - 150 kHz sine wave, 10 Hz - 20 kHz square wave, triangle, saw tooth
Resolution:	10 Hz
External:	(input on front panel)
Impedance:	10 kΩ 50 pF
Input level:	2V _{rms} for full scale
Coupling:	AC or DC
Output (on front panel):	Impedance: 1 kΩ Level: 2V _{rms}

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 50 kHz for AC
Distortion:	< 2% [AM-depth ≤ 60%, f _{mod} ≤ 1 kHz] < 6% [AM-depth ≤ 80%, f _{mod} : 10 Hz to 50 kHz]

Frequency modulation

Source:	internal or external
Deviation:	± 200 Hz to 400 kHz (depending on frequency band)
Resolution:	100 Hz
Accuracy:	f _{mod} < 5 kHz: ±(3% + res. FM) f _{mod} > 5 kHz: ±(7% + res. FM)
Ext. frequency response: (to -1 dB)	
DC coupling:	0 to 150 kHz
AC coupling:	10 Hz to 150 kHz
Distortion:	< 3% for deviation ≥ 10 kHz at 1 kHz

Phase modulation

Source:	internal or external
Deviation:	< 16 MHz: 0 to 3.14 rad > 16 MHz: 0 to 10 rad
Resolution:	0.01 rad
Accuracy:	± 5% to 1 kHz + residual PM
Ext. frequency response : (to -1 dB)	
DC coupling:	0 to 150 kHz
AC coupling:	10 Hz to 150 kHz
Distortion:	< 3% for f _{mod} = 1 kHz and deviation = 10 rad

FSK modulation

Range (F0 - F1):	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

Mode:	2 PSK levels
Data source:	external
Max. rate:	10 kbit/s
Shift (Ph1 - Ph0):	< 16 MHz: 0 to ± 3.14 rad > 16 MHz: 0 to ± 10 rad
Resolution:	0.01 rad
Accuracy:	see under PM

Pulse modulation

Source:	external (rear panel)
Dynamic range:	> 60 dB
Rise/fall times:	< 200 ns
Delay:	< 100 ns
Max. frequency:	2.5 MHz
Input level:	TTL

Sweep mode

Range:	1 MHz to 1200 MHz
Depth:	500 Hz to 1199 MHz
Sweep time:	10 ms to 5 s
Trigger:	internal

Protective functions

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

Miscellaneous

Interface:	RS-232, 9-pole D-sub
Configuration memories:	10
Safety class:	Safety Class I [EN61010-1]
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)
Dimensions (W x H x D):	285 x 75 x 365 mm
Weight:	approx. 5 kg

Accessories supplied: Operator's manual, power cable

Optional accessories:

HZ33/HZ34 (17-0033-0000 /17-0034-0000)	Test Cable 50 Ω (BNC-BNC)
HZ21 (17-0021-0000)	Adapter plug
HZ42 (27-0042-0000)	19" Rackmount kit 2RU
H0870 (26-0870-0000)	USB Interface
H0880 (26-0880-0000)	IEEE-488 interface,
H0890 (26-0890-0000)	RS-232 Interface