





Signal generators

Type/designation	Frequency range	Max. output power/voltage	SSB phase noise	Nonharmonics	Modulation
HMF arbitrary function generator 	10 μ Hz to 25 MHz/50 MHz	10 V (V_{pp}) into 50 Ω load	< -115 dBc (1 Hz) (typ.)	<ul style="list-style-type: none"> -70 dBc ($f < 1$ MHz) -70 dBc + 6 dB/octave ($1 \text{ MHz} < f < 50 \text{ MHz}$) 	AM, FM, pulse, PWM, FSK
HM8134-3/HM8135 RF synthesizer 	1 Hz to 1.2 GHz/3 GHz	+13 dBm	≤ -95 dBc (1 Hz) ($f = 1$ GHz)	≤ -50 dBc (> 15 kHz from carrier)	AM, FM, ϕ M, pulse, FSK, PSK
R&S®SMC100A signal generator 	9 kHz to 1.1 GHz/3.2 GHz (depending on RF path option)	<ul style="list-style-type: none"> +13 dBm ($f = 200$ kHz to 3.2 GHz) +17 dBm (meas.) 	< -105 dBc (-111 dBc (typ.)) ($f = 1$ GHz, carrier offset = 20 kHz, 1 Hz measurement bandwidth)	< -60 dBc (-72 dBc (typ.)) (carrier offset > 10 kHz, $f \leq 1600$ MHz)	AM, FM, ϕ M, pulse
R&S®SMB100A RF and microwave signal generator 	9 kHz to 1.1/2.2/3.2/6 GHz (depending on RF path option)	<ul style="list-style-type: none"> +5 dBm ($9 \text{ kHz} \leq f < 200 \text{ kHz}$) +13 dBm ($200 \text{ kHz} \leq f < 1 \text{ MHz}$) +18 dBm ($1 \text{ MHz} \leq f < 6 \text{ GHz}$) +23 dBm (meas.) 	< -122 dBc (-128 dBc (typ.)) ($f = 1$ GHz, carrier offset = 20 kHz, 1 Hz measurement bandwidth)	< -70 dBc (< -84 dBc (typ.)) (carrier offset > 10 kHz, $23.4375 \text{ MHz} < f \leq 1500 \text{ MHz}$)	AM, FM, ϕ M, pulse

HMF Arbitrary Function Generator



The latest generation of arbitrary function generators

- Frequency range: 10 μ Hz to 25 MHz/50 MHz
- Triangle waveforms up to 10 MHz
- Output voltage: 5 mV to 10 V (V_{pp}) into 50 Ω load
- Total harmonic distortion: 0.04 % ($f < 100$ kHz)
- Waveforms: sine, square, triangle/ramp, pulse, arbitrary (incl. predefined waveforms such as white/pink noise, cardinal sine, exponential rise/fall)
- Modulation modes: AM, FM, pulse, PWM, FSK (internal and external)
- External connectors: TRIGGER (I/O), SWEEP (O), MODULATION (I)
- External reference input/output (10 MHz) via BNC connector
- Arbitrary waveform generator: 250 Msample/s, 14 bit, 256k point
- PC software (free of charge) to easily create user-defined waveforms
- Oscillographic signal display in realtime
- Front USB connector to easily save and recall waveforms and settings
- RS-232/USB dual interface for remote control
- Fanless design

Models/options

Designation	Type
25 MHz Arbitrary Function Generator	HMF2525
50 MHz Arbitrary Function Generator	HMF2550
Dual Ethernet/USB Interface	HO730
IEEE-488 (GPIB) Interface, galvanically isolated	HO740

Application	How the HAMEG HMF meets your needs
Analog circuit design	<ul style="list-style-type: none"> ■ Low-noise amplifier ■ Many predefined curves including white and pink noise ■ Up to 10 V (V_{pp}) into 50 Ω load
Mixed signal design and debugging	<ul style="list-style-type: none"> ■ Pulse mode with adjustable rise time ■ Sweep, burst mode ■ AM, FM, pulse, PWM, FSK modulation modes
Education and service	<ul style="list-style-type: none"> ■ Fast boot time ■ Easy to use ■ Fanless design

HM8134-3/HM8135 RF Synthesizer



RF synthesizers from the 8100 programmable measuring instruments series

- Frequency range: 1 Hz to 1.2 GHz/3 GHz
- Output power: -127 dBm/-135 dBm to +13 dBm
- Frequency resolution: 1 Hz
- High spectral purity, excellent sweep mode
- Modulation modes: AM, FM, pulse, phase, FSK, PSK
- Internal modulation (10 Hz to 150 kHz): sine, square, triangle, ramp
- External reference input/output (10 MHz) via BNC connector
- HM8134-3/HM8135: TCXO
(temperature stability: $\pm 0.5 \times 10^{-6}$);
HM8134-3X/HM8135-X: OCXO
(temperature stability: $\pm 1.0 \times 10^{-8}$)
- RS-232/USB dual interface, IEEE-488 (GPIB) optional

Models/options

Designation	Type
1.2 GHz RF Synthesizer	HM8134-3
1.2 GHz RF Synthesizer, with OCXO (temperature stability: $\pm 1.0 \times 10^{-8}$)	HM8134-3X
3 GHz RF Synthesizer	HM8135
3 GHz RF Synthesizer, with OCXO (temperature stability: $\pm 1.0 \times 10^{-8}$)	HM8135-X
IEEE-488 (GPIB) Interface, galvanically isolated	HO880

Application	How the HAMEG HM8134-3/HM8135 meets your needs
Analog RF circuit design	<ul style="list-style-type: none"> ■ Low-noise amplifier, high dynamic range, up to +13 dBm output power ■ Clean sine wave due to high spectral purity
RF system design	<ul style="list-style-type: none"> ■ Sweep mode ■ Several internal modulation types: sine wave, square wave, triangle, ramp up to 150 kHz ■ Internal offset correction
Education and service	<ul style="list-style-type: none"> ■ Fast boot time ■ Easy to use

R&S®SMC100A Signal Generator



Smallest size and best price/performance ratio in its class

The analog R&S®SMC100A sets new standards for attractively priced signal generators. It has the smallest size and the best price/performance ratio in its class.

Key facts

- Frequency range: 9 kHz to 1.1 GHz or 3.2 GHz
- Maximum output level: > +17 dBm (typ.)
- Low SSB phase noise: -111 dBc (typ.) (f = 1 GHz, 20 kHz carrier offset, 1 Hz measurement bandwidth)
- Wear-free electronic attenuator with integrated overvoltage protection
- AM/FM/φM/pulse modulation provided as standard
- Signal generator with the best price/performance ratio in its class
- Signal generator with the smallest size in its class (½ 19", 2 HU)
- Low total cost of ownership

Models/options

Designation	Type
Signal Generator	R&S®SMC100A
RF Path, 9 kHz to 1.1 GHz	R&S®SMC-B101
RF Path, 9 kHz to 3.2 GHz	R&S®SMC-B103
OCXO Reference Oscillator	R&S®SMC-B1
GPIO/IEEE-488 Interface	R&S®SMC-K4

Application	How the R&S®SMC100A meets your needs
Service and maintenance of RF components and modules	<ul style="list-style-type: none"> ■ Good SSB phase noise and wideband noise ■ Analog modulation modes included in instrument ■ Perfect for simple measurements such as gain, intermodulation and distortion measurements
RF tests in education	<ul style="list-style-type: none"> ■ Cost-efficient instrument ■ Easy to operate ■ Good performance for RF experiments
Field use	<ul style="list-style-type: none"> ■ Small size and low weight ■ R&S®NRP-Zxx power sensors can be connected (no need for an additional power meter)
A&D development/service/maintenance	<ul style="list-style-type: none"> ■ Sanitizing procedure for internal memory ■ Support for self-maintainers
Simple production applications	<ul style="list-style-type: none"> ■ Short frequency and level setting times ■ Low total cost of ownership (TCO)

R&S®SMB100A RF and Microwave Signal Generator



Key facts

- Wide frequency range: 9 kHz to 6 GHz
- Excellent signal characteristics with low SSB phase noise of -128 dBc (typ.) (at 1 GHz, 20 kHz offset)
- High output power of up to $+27$ dBm
- Wear-free electronic attenuator up to 6 GHz
- Short setting times for frequency (< 3 ms) and level (< 2.5 ms) via remote control and < 1 ms in list mode
- All important analog modulation modes with AM, FM/PM and pulse modulation supported
- Optional pulse modulator with > 90 dB (typ.) on/off ratio (up to 11 GHz) and rise/fall time of < 5 ns (typ.); pulse generator with minimum pulse width of 10 ns
- Compact size with only 2 HU and low weight

Versatile, compact solution for signal generation

The analog R&S®SMB100A signal generator delivers excellent signal characteristics and high flexibility at low cost of ownership – the key criteria for a signal source.

Models/options

Designation	Type
RF and Microwave Signal Generator	R&S®SMB100A
RF Path, 9 kHz to 1.1 GHz	R&S®SMB-B101
RF Path, 9 kHz to 2.2 GHz	R&S®SMB-B102
RF Path, 9 kHz to 3.2 GHz	R&S®SMB-B103
RF Path, 9 kHz to 6 GHz	R&S®SMB-B106
For higher frequencies, please contact your local Rohde & Schwarz partner.	

Application	How the R&S®SMB100A meets your needs
Blocking/receiver tests	Can serve as a high-quality generator of transmitter or interference signals up to 6 GHz (as specified in 3GPP TS25.141, for example)
Production testing	Compared with mechanical attenuators, the electronic attenuator eliminates wear caused by continuous switching; the modular design enables on-site instrument servicing and ensures fast level switching
Development of RF ICs	85 dB (typ.) suppression of unwanted and nonpredictable spurs and low wideband noise of -148 dBc (typ.) meet most development needs
Car radio tests	Optional FM stereo coder with RDS signal generation capabilities (available for R&S®SMB-B101/-B102/-B103/-B106), can be used together with the R&S®UPV or R&S®UPP audio analyzer
EMC applications	Wide frequency range from 9 kHz to 6 GHz for wide coverage with only one source, for simplified EMC test setups
Test system integration	Multiple choices for remote interfaces: LAN, USB and GPIB
LO	LO substitution in various applications
General purpose	Test of components, R&D, laboratory equipment

Options		
Designation	Type	Comments
OCXO Reference Oscillator	R&S®SMB-B1	only one of the R&S®SMB-B1 or R&S®SMB-B1H options can be installed
OCXO Reference Oscillator, high performance	R&S®SMB-B1H	
Stereo/RDS Coder	R&S®SMB-B5	only available with an R&S®SMB-B101/-B102/-B103/-B106 frequency option
Pulse Modulator for R&S®SMB-B101/-B102/-B103/-B106	R&S®SMB-K22	requires the R&S®SMB-K23 option; only available for instruments with serial number > 102400
Pulse Generator	R&S®SMB-K23	
Pulse Train	R&S®SMB-K27	