

R&S®SMB100A RF and Microwave Signal Generator

Versatile, compact
solution for signal
generation up to 40 GHz



R&S®SMB100A

RF and Microwave Signal Generator

At a glance

The compact, versatile R&S®SMB100A RF and microwave signal generator with a frequency range up to 40 GHz provides outstanding spectral purity and high output power. In addition, it features easy operation, comprehensive functionality and low cost of ownership.

The R&S®SMB100A provides RF and microwave characteristics that are exceptional in its class, making it an excellent general-purpose instrument. These outstanding characteristics plus its compact size and low weight make the instrument ideal for a wide range of applications. The R&S®SMB100A is optimally suited for use in development, production and service, or, to put it even simpler: wherever an analog RF or microwave signal is required.

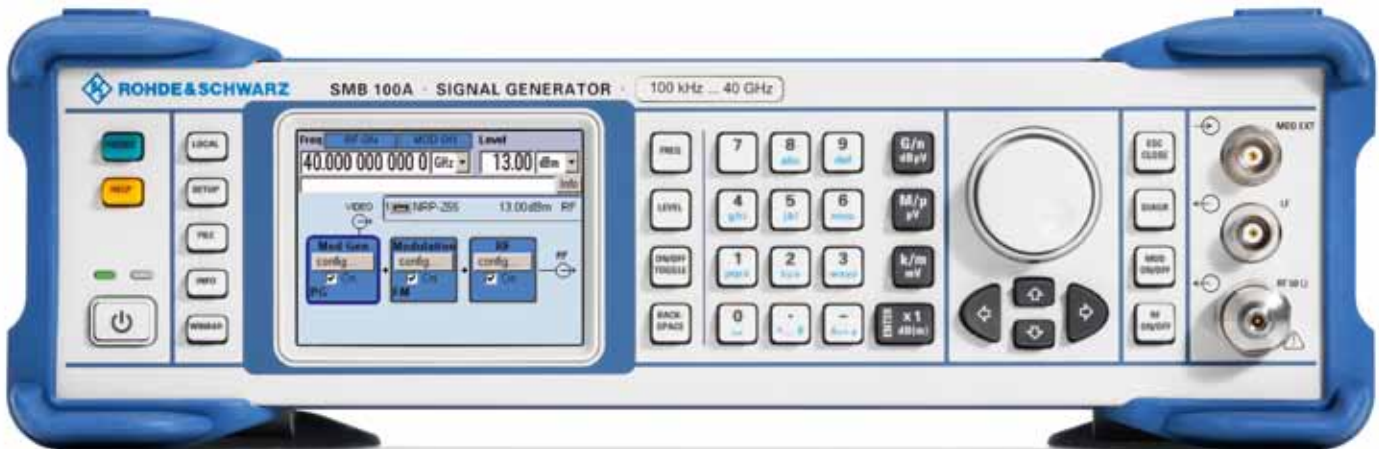
Its wide frequency range covers a large number of challenging applications. The R&S®SMB100A is the perfect choice for applications in the important ISM bands up to 5.7 GHz as well as for EMC applications because of its lower frequency limit of 9 kHz. Furthermore, the R&S®SMB100A can be ideally used for measuring the blocking characteristic up to a CW frequency of 12.75 GHz, as specified in various telecommunications standards. When it comes to frequently changing level settings, this is the first time that a wear-free electronic step attenuator is used in this frequency range.

Two frequency options up to 20 GHz and 40 GHz are available to cover the microwave range. These options are suitable for tests on radar systems and antennas in the X and K bands, for example.

In addition to pure CW signals, the R&S®SMB100A also provides the most common analog AM and FM/φM modulation modes as standard. Moreover, the R&S®SMB100A can be equipped with an excellent pulse generator and pulse modulator that makes it possible to generate user-programmable pulse scenarios, also referred to as pulse trains.

Key facts

- Wide frequency range from 9 kHz to 6 GHz or from 100 kHz to 40 GHz
- Excellent signal characteristics with low SSB phase noise of typ. -128 dBc (at 1 GHz, 20 kHz offset)
- High output power of typ. up to $+27$ dBm
- All important analog modulations with AM, FM/φM and pulse modulation supported
- Compact size with only two height units and low weight



R&S®SMB100A

RF and Microwave Signal Generator

Benefits and key features

All-purpose signal source

- ▮ Wide frequency range from 9 kHz to 1.1/2.2/3.2/6 GHz or from 100 kHz to 12.75/20/40 GHz covering the main frequency bands for RF and microwave applications
- ▮ All important analog modulations with AM, FM/φM and pulse modulation supported
- ▮ Support of R&S®NRP-Zxx power sensors
- ▮ Reverse power protection for high operational reliability included as standard in the models up to 6 GHz (optionally available for the 12.75 GHz model)
- ▮ Intuitive user interface with graphical display of signal flow for easy operation
- ▮ Remote control via LAN, USB and GPIB including emulation modes for legacy instruments
- ▮ Low weight and compact design for a wide range of applications, including mobile applications

▷ [page 5](#)

Best signal quality in the mid-range

- ▮ Very low SSB phase noise of typ. -128 dBc at 1 GHz and typ. -108 dBc at 10 GHz carrier frequency (20 kHz carrier offset, 1 Hz measurement bandwidth)
- ▮ Innovative DDS-based synthesizer concept

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High output power and wide level range

- ▮ High power over a wide frequency range
- ▮ Low level range down to -120 dBm (for instruments equipped with step attenuator) with no compromise in quality
- ▮ High harmonics suppression of < -30 dBc even at high output power

▷ [page 10](#)

Ideal for production

- ▮ Wear-free electronic attenuator up to 12.75 GHz ensuring long life even in the case of heavy use in production
- ▮ High level accuracy and repeatability for high production yield
- ▮ Short frequency and level setting times which can be further reduced in List mode
- ▮ Low power consumption

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Testing of FM stereo and RDS receivers

- ▮ Optional stereo/RDS coder for the 1.1/2.2/3.2/6 GHz models
- ▮ Automatic synchronization of measurement results with the R&S®UPV or R&S®UPP audio analyzer
- ▮ Up to five different RDS sequences with up to 64 000 characters each
- ▮ Internal LF generator delivering sinusoidal signals at fixed or swept LF frequencies

▷ [page 14](#)

Ready for aerospace and defense applications

- ▮ Optional pulse modulator with typ. > 90 dB ON/OFF ratio and rise/fall time of typ. < 5 ns and pulse generator with minimum pulse width of 10 ns for radar system testing
- ▮ Flexible generation of pulse trains for simulating complex pulse scenarios (optional)
- ▮ Wide temperature range of 0°C to +55°C and high permissible operating altitude of 4600 m for use even under extreme conditions
- ▮ Sanitizing of user data for secured areas
- ▮ High-quality shielding

▷ [page 16](#)

Flexible service concept

- ▮ Servicing on-site or at a Rohde&Schwarz service center
- ▮ Built-in selftest of modules to support troubleshooting
- ▮ Complete calibration recommended only every three years

▷ [page 18](#)

Hardware and software option concept for the R&S®SMB100A. The table provides an overview of the frequency ranges as well as of functionalities and options.

Model overview							
Frequency range	9 kHz to 1.1 GHz	9 kHz to 2.2 GHz	9 kHz to 3.2 GHz	9 kHz to 6 GHz	100 kHz to 12.75 GHz	100 kHz to 20 GHz	100 kHz to 40 GHz
With electronic step attenuator	●	●	●	●	○	–	–
Without electronic step attenuator	–	–	–	–	○	–	–
With mechanical step attenuator	–	–	–	–	–	○	○
Without mechanical step attenuator	–	–	–	–	–	○	○
High power	●	●	●	●	●	○	○
OCXO reference oscillator ¹⁾	○	○	○	○	○	○	○
OCXO reference oscillator, high performance ¹⁾	○	○	○	○	○	○	○
Reverse power protection	●	●	●	●	○	–	–
Stereo/RDS coder	○	○	○	○	–	–	–
Pulse modulator	○	○	○	○	○	○	○
Pulse generator	○	○	○	○	○	○	○
Pulse train	○	○	○	○	○	○	○

- Standard
- Optional
- Not available

¹⁾ Only one of the following options can be installed: R&S®SMB-B1 (OCXO reference oscillator) or R&S®SMB-B1H (OCXO reference oscillator, high performance).

All-purpose signal source

Wide frequency range from 9 kHz to 6 GHz or from 100 kHz to 40 GHz

The signal generator's wide frequency range, high output power and a wide variety of modulations make it a flexible signal source for a broad scope of applications. Its minimum frequency of 9 kHz permits applications in EMC measurements. Its frequency option up to 12.75 GHz covers ISM bands as well as all important mobile radio bands. In addition, the frequency options up to 20 GHz and 40 GHz cover numerous microwave applications that require high spectral purity and high output power.

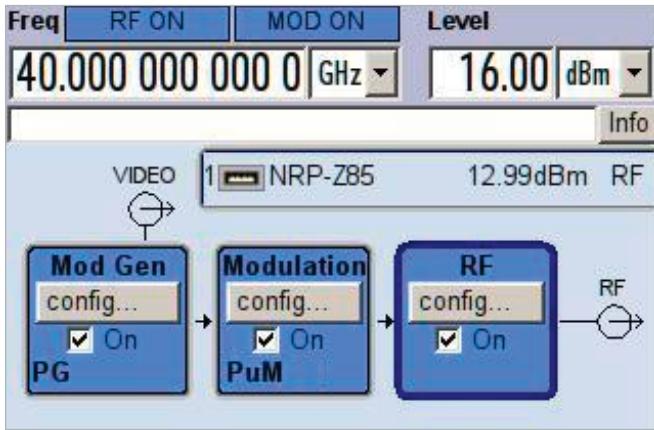
All important analog modulations with AM, FM/φM and pulse modulation supported

The R&S®SMB100A handles the important analog AM, FM/φM modulation modes and pulse modulation with excellent characteristics. In AM and FM/φM modulation, the RF carrier is modulated with the internal LF generator or also with external signals. The two different sources of modulation can be internally added to generate two-tone-modulated signals. Due to its digital modulation processing, the R&S®SMB100A implements the modulation modes with high accuracy and minimum distortion.

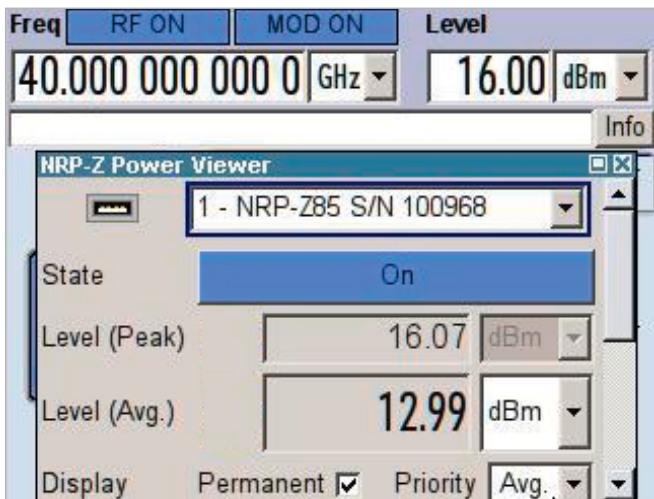
Wide frequency range, high output power and a variety of modulations make the R&S®SMB100A a flexible signal source for a broad scope of applications.



Pulse-modulated signal measured with the R&S®NRP-Z85 wideband power sensor.



Details of the measurement with the R&S®NRP-Z85 wideband power sensor (peak and average).



Support of R&S®NRP-Zxx power sensors

The R&S®SMB100A supports a wide variety of R&S®NRP-Zxx USB power sensors. The R&S®NRP-Z92 is a power sensor that ideally complements the frequency and level range of the generator up to 6 GHz. Equipped with such a power sensor, the R&S®SMB100A fully automatically performs external level correction or precisely measures the power in the test setup. The R&S®NRP-Z55 power sensor can be used with the 12.75 GHz, 20 GHz or 40 GHz frequency option of the R&S®SMB100A for the same purpose.

Reverse power protection for high operational reliability

The standard reverse power protection for instruments up to 6 GHz protects the R&S®SMB100A from high external voltages and high power at the RF output. This feature shields the RF output against unwanted high reverse power and ensures a high degree of operational reliability. The R&S®SMB-B30 reverse power protection is available for the R&S®SMB-B112/R&S®SMB-B112L 12.75 GHz frequency options.



The R&S®SMB100A with connected R&S®NRP-Z92 power sensor performs automatic level correction.

Intuitive user interface

Intuitive operation via the graphical user interface and the integrated help system facilitate the optimum use of the R&S®SMB100A for the application at hand. To support graphical operation, a mouse can be connected via USB.

Remote control via LAN, USB and GPIB including emulation modes

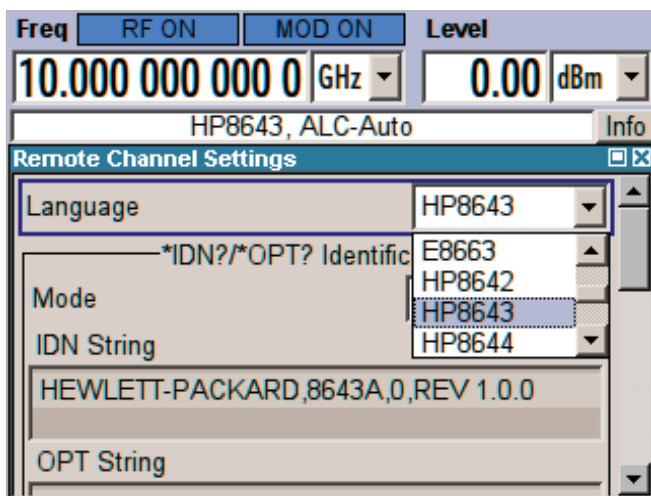
The R&S®SMB100A is also ideally equipped with regard to the remote control interface. In addition to conventional GPIB, it also supports LAN and USB as standard. This is especially advantageous in environments such as service labs where there is often no GPIB.

Signal generators are often used in automated test environments. Replacing them, e.g. due to malfunctions or standard replacement procedures, requires special care. The replacement part and the replaced part must be compatible at least in terms of electrical features and remote control features. Legacy instruments often use a proprietary remote control language. Direct replacement therefore requires language emulation capability in the software of the replacement part. To meet these requirements, the R&S®SMB100A signal generator comes with a language emulation feature. By selecting the desired language emulation, the signal generator acts as the original replaced instrument. The language list already includes a large number of emulated instruments and will be updated on a regular basis.

Low weight and compact design

The R&S®SMB100A has a compact size of only two height units and ¾ 19" width. This form factor plus its low weight of max. 5.6 kg for the 6 GHz model and 6.9 kg for the 40 GHz model make it ideal for mobile use. It easily fits in any lab and service center, where space is often at a premium.

The emulation mode can be set in the remote setup menu of the R&S®SMB100A.



Best signal quality in the mid-range

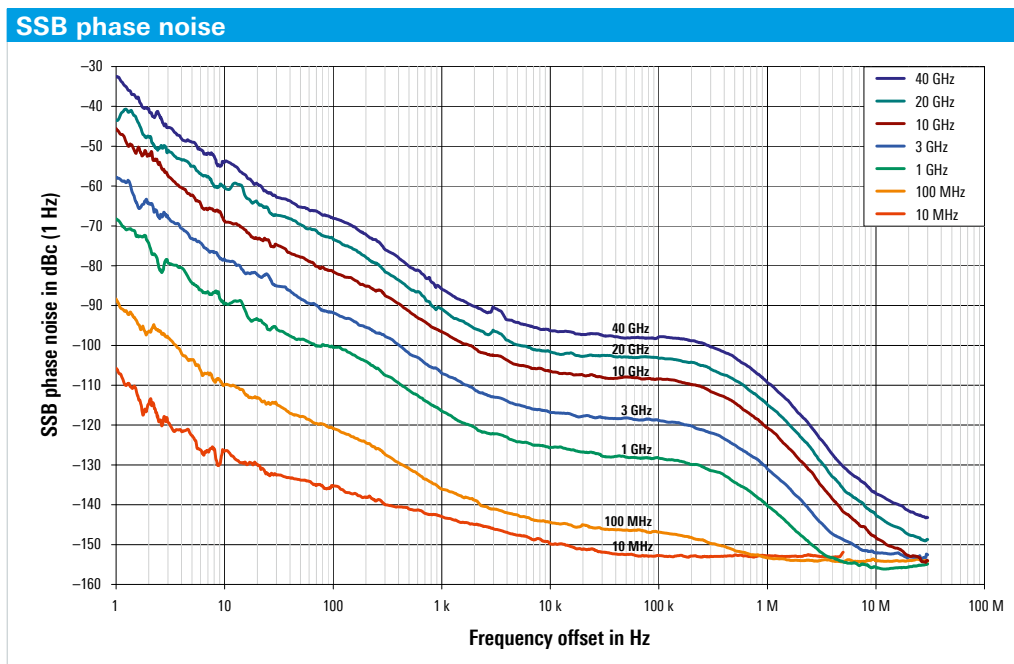
Phase noise, harmonics, nonharmonic spurious and wide-band noise are key parameters when it comes to characterizing the spectral properties of analog signal generators. Many measurements focus on more than one aspect simultaneously. For example, in blocking measurements, nonharmonics together with phase noise are essential in generating the usually unwanted RFI power in the adjacent channel.

Very low SSB phase noise

When it comes to SSB phase noise performance, the R&S®SMB100A consistently achieves excellent values over the entire frequency range from 9 kHz to 6 GHz or from 100 kHz to 40 GHz. This is due to its remarkable concept. Below 3 GHz, the R&S®SMB100A works down to 23.3475 MHz with frequency dividers. Below this value, the integrated DDS synthesizer generates the output signal directly. In contrast to conventional designs that use a mixer range below approx. 250 MHz, the innovative Rohde&Schwarz solution leads to a much better phase noise performance at low frequencies.

The R&S®SMB100A is therefore the ideal replacement in test circuits for fixed-frequency high-end crystal oscillators that are often used as a reference signal. The R&S®SMB100A combines equal or even improved signal performance with adjustable frequency and adjustable level, which is highly beneficial as it can be ideally adapted to the DUT. Moreover, the R&S®SMB100A makes it possible to define the DUT tolerance range relative to the reference by varying these parameters.

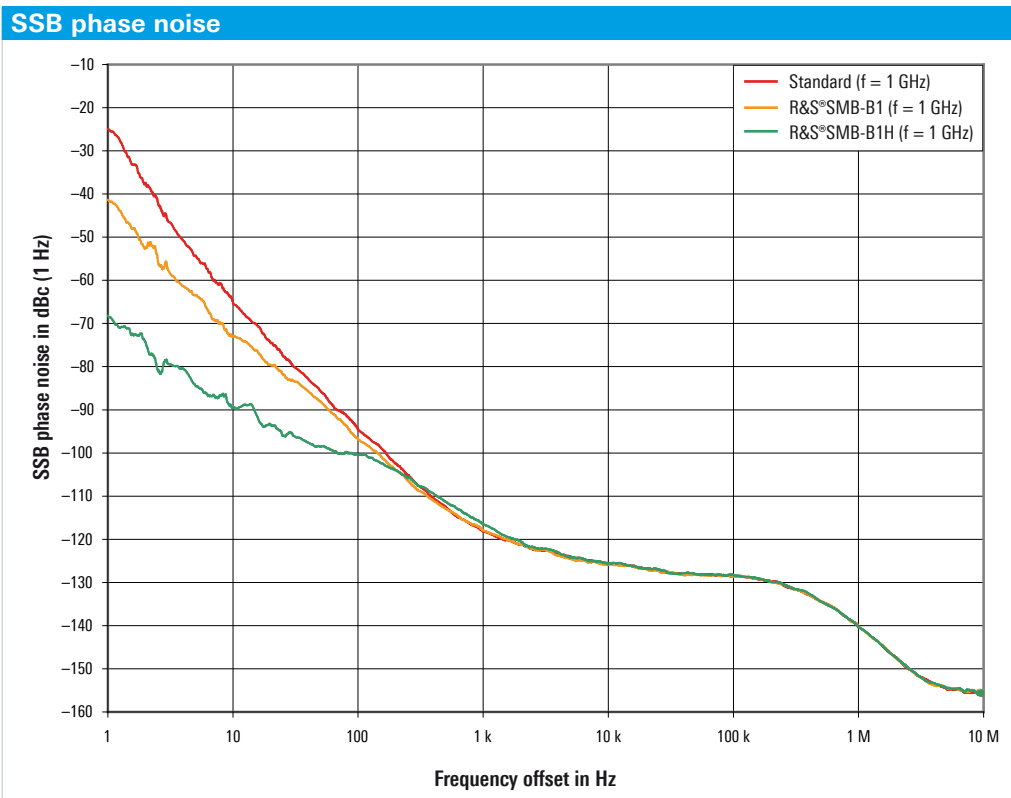
To further improve the close-in phase noise and frequency stability, two different OCXO reference oscillators are available as options. Especially the R&S®SMB-B1H offers excellent performance that is unprecedented in this class.



Measured SSB phase noise with the R&S®SMB-B1H OCXO option.

Innovative DDS-based synthesizer concept

The R&S®SMB100A superbly handles high signal-quality requirements. Due to its innovative DDS-based synthesizer concept, the R&S®SMB100A yields unsurpassed values in all parameters called for in the mid-range, thereby setting new standards.



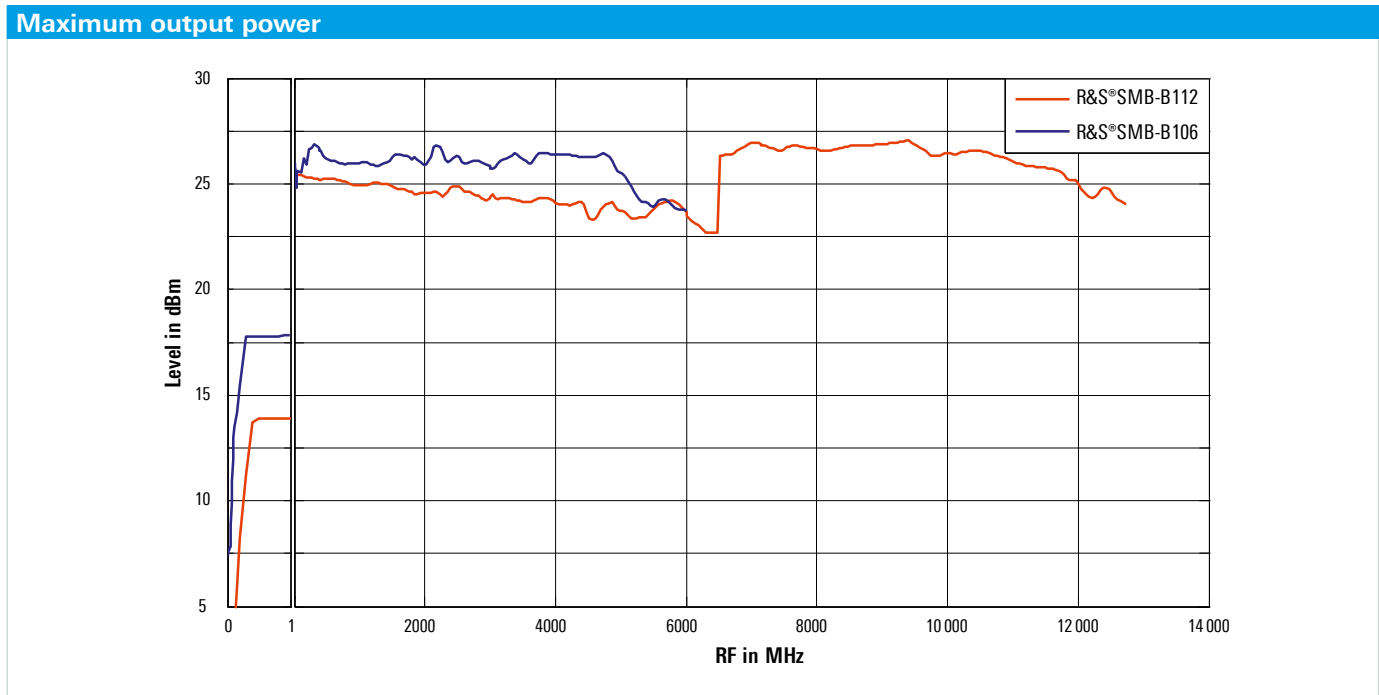
Measured SSB phase noise with standard reference, the R&S®SMB-B1 option and the R&S®SMB-B1H option.

High output power and wide level range

High power over a wide frequency range

The R&S®SMB100A combines excellent signal quality with a high output power of $> +18$ dBm as standard, which is unique in this instrument class, over a wide frequency range of 1 MHz to 12.75 GHz. The maximum available output power is up to $+27$ dBm, offering sufficient power reserve to easily compensate for level loss in a test setup. The R&S®SMB-B31 high power option for the 20 GHz model delivers a specified output power of $+19$ dBm while the R&S®SMB-B32 high power option for the 40 GHz model achieves $+16$ dBm over a wide frequency range up to 20 GHz and 40 GHz, respectively. These values are even outperformed in overrange. This usually eliminates the need for an additional external amplifier, which saves space and also drastically reduces costs for a test system. In applications, users additionally benefit from the high level accuracy that the R&S®SMB100A provides – a level accuracy that is not necessarily provided if an external amplifier is used.

Measured maximum output power versus frequency.



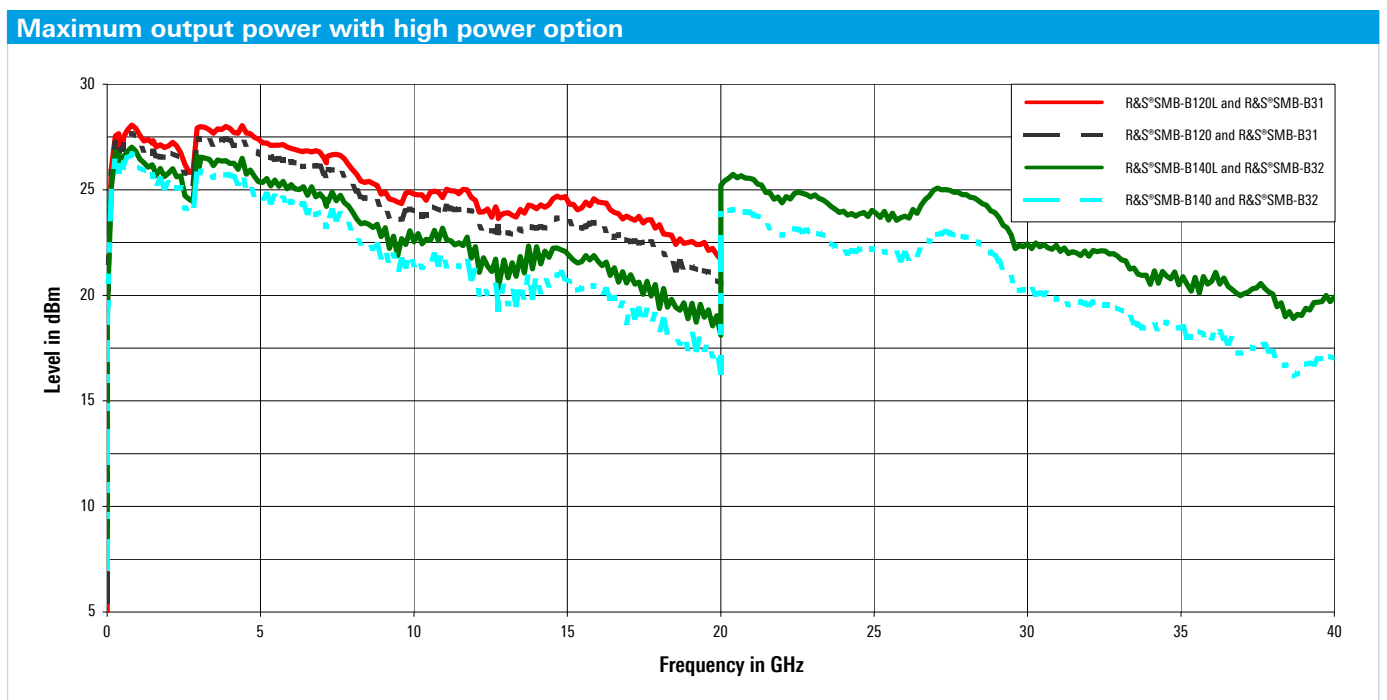
Low level range with no compromise in quality

Even in the lower level range, the R&S®SMB100A makes no compromise in quality. The RF level is specified down to -120 dBm when a step attenuator is installed. This makes the generator ideal for sensitivity measurements on receivers.

High harmonics suppression of < -30 dBc even at high output power

What is special about the R&S®SMB100A is that harmonics are still suppressed with < -30 dBc even at high output power, ideal for amplifier design applications up to 40 GHz. The nonharmonics are even suppressed by e.g. typ. < -78 dBc at 3 GHz or typ. < -66 dBc at 10 GHz.

Typical measurement of the R&S®SMB100A high-power 20 GHz and 40 GHz models, with and without optional step attenuator.



Ideal for production

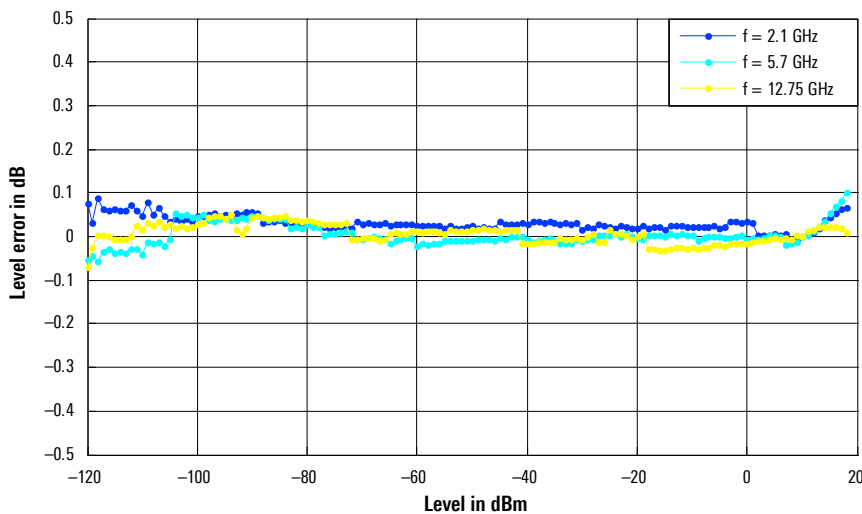
Wear-free electronic attenuator with reverse power protection

The wear-free electronic attenuator – unique in the frequency range up to 12.75 GHz – of the R&S®SMB100A functions reliably, even if the level values frequently change. As a result, high availability in the test system is ensured together with long service intervals even in the case of heavy use in production. Moreover, the reverse power protection included in the models up to 6 GHz (optionally available for the 12.75 GHz model) shields the R&S®SMB100A against high reverse power or DC voltage on the RF line.

High level accuracy and repeatability for high production yield

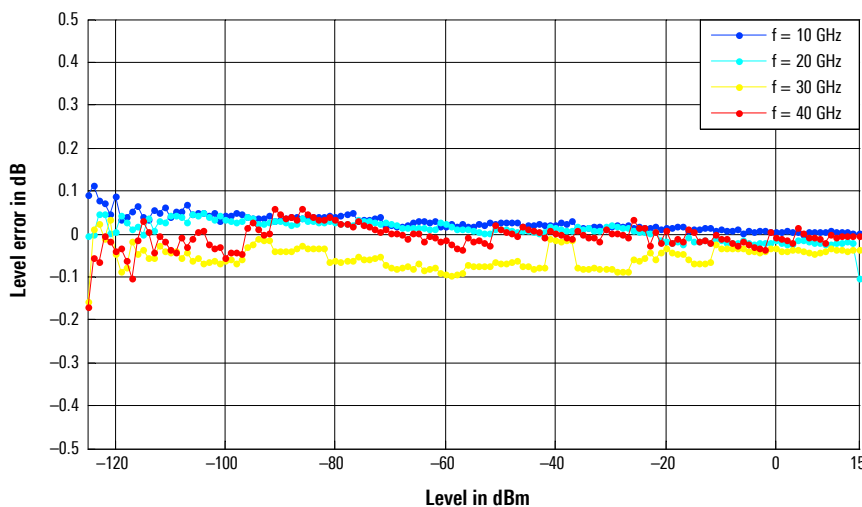
The R&S®SMB100A offers high level accuracy and repeatability, as well as a very high level sweep range over the entire range. Measurements within narrow limits can be performed with high reproducibility, boosting production yield.

Level linearity



Measured level linearity, ALC ON (with the R&S®SMB-B112 12.75 GHz frequency option).

Level linearity



Measured level linearity, ALC ON (with the R&S®SMB-B140 40 GHz frequency option and the R&S®SMB-B32 high power option).

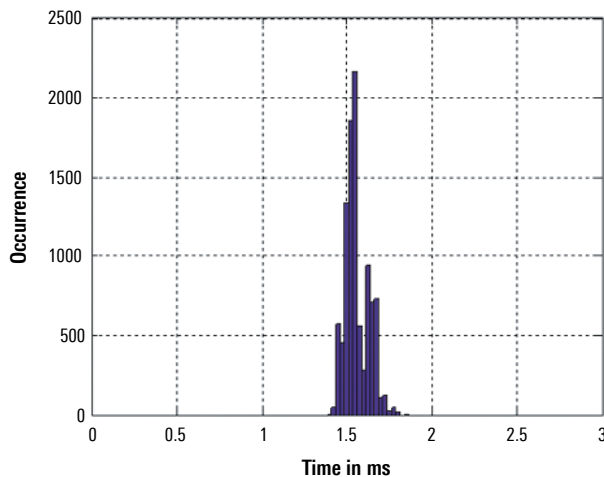
Short frequency and level setting times

Another criterion in production is the short setting time of the test instrument in order to achieve high throughput. The R&S®SMB100A meets this requirement by achieving short frequency (< 3 ms) and level (< 2.5 ms) setting times up to 40 GHz. Plus, it features the List mode as standard, which reduces the setting times to well below 1 ms. In this mode, setting parameters for the frequency and level pairs recorded in a list are precalculated and stored in order to speed up switchover.

Low power consumption

The R&S®SMB100A combines very low power consumption and effective heat dissipation. Its power consumption of only 60 W (6 GHz model) or 120 W (40 GHz model) reduces expenditures for cooling in a production line rack. The efficient design of the R&S®SMB100A also has a positive impact on the MTBF.

Frequency setting time



Measured frequency setting time statistics for remote control over 10000 settings (with the R&S®SMB-B106 frequency option).

Testing of FM stereo and RDS receivers

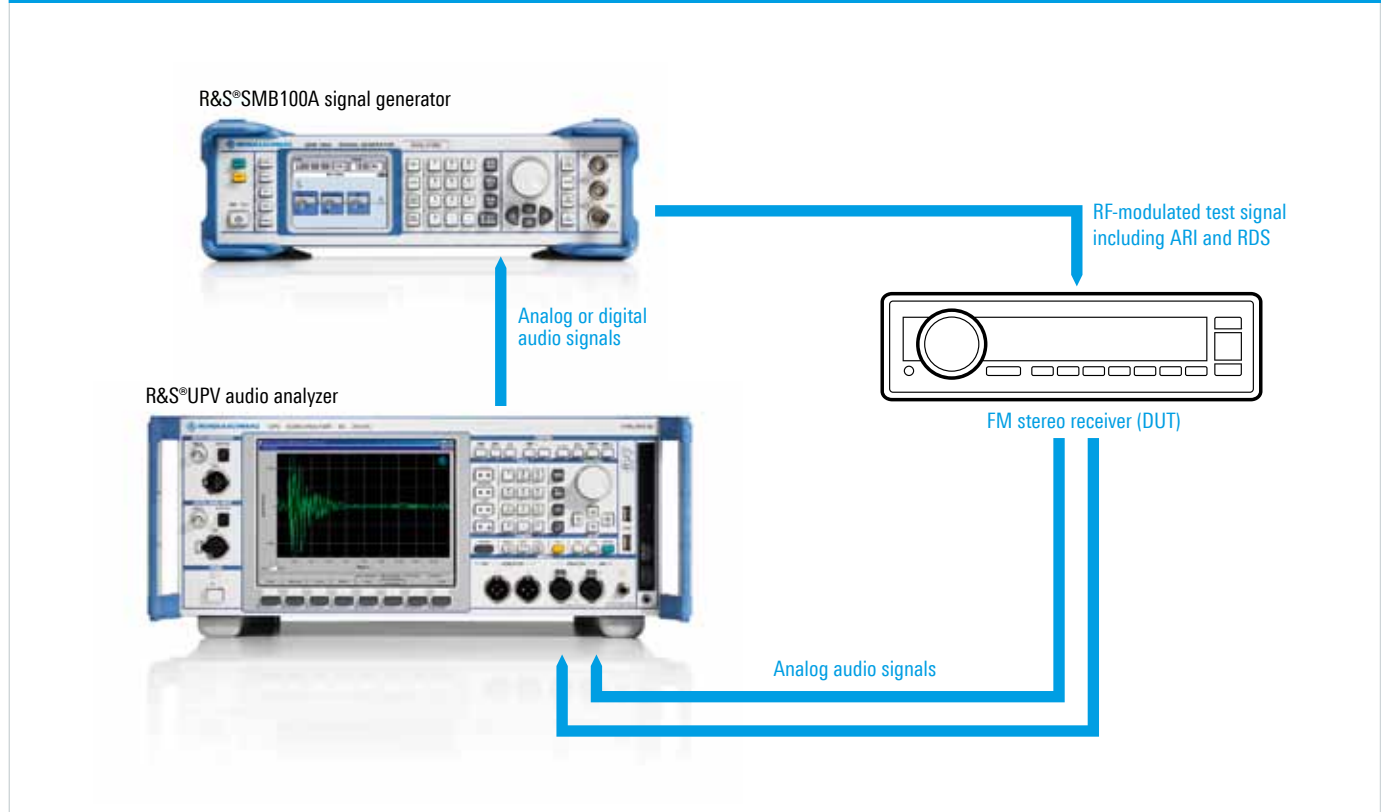
FM stereo is still the major audio broadcasting medium – especially in the automobile sector, where millions of car radios are produced every year. For testing FM stereo receivers, audio test signals are modulated onto an RF carrier and measured after demodulation by the DUT. Test signals are also needed for the radio data system (RDS) established in many countries for a long time.

Optional stereo/RDS coder

The optional stereo/RDS coder (R&S®SMB-B5, available for instruments up to 6 GHz) meets all the above requirements. Built into the R&S®SMB100A, the solution is based on equipment that features an excellent price/performance ratio as well as top-class specifications and provides full coverage of the frequency range in question.

Typical test setup with the R&S®SMB100A and the R&S®UPV audio analyzer (the R&S®UPP can be used alternatively).

Typical test setup with the R&S®UPV audio analyzer



Automatic synchronization of measurement results

The stereo/RDS coder also works with external signals applied to its analog (left and right) or digital (S/P DIF) modulation inputs. Combining the R&S®SMB100A signal generator and the R&S®UPV or R&S®UPP audio analyzer creates a general-purpose test system for FM receivers. The great advantage is the automatic synchronization of measurement results. As in other audio measurements, the test signals are produced in the generator section of the audio analyzer, routed to the DUT through the R&S®SMB100A as a modulator, and measured in the analyzer section of the R&S®UPV or the R&S®UPP. Since generation and analysis are optimally timed, measurement times are considerably shorter than with separately operating instruments.

Up to five different RDS sequences

The R&S®SMB100A with the R&S®SMB-B5 option generates stereo multiplex signals, including ARI and RDS information, and outputs the signals on the RF. It is possible to choose between traffic announcement identification and standardized area identification A to F. The RDS traffic program or RDS traffic announcement can be switched on and off. Up to five different RDS sequences can be loaded. Due to a length of up to 64 000 characters per sequence, longer RDS applications such as radio text can be tested as well.

Flexible internal LF generator

The internal LF generator, which is suitable for general receiver tests, is part of the basic configuration of the R&S®SMB100A. It generates sinusoidal signals at fixed or swept LF frequencies, allowing basic functional tests to be carried out without an external signal.

Ready for aerospace and defense applications

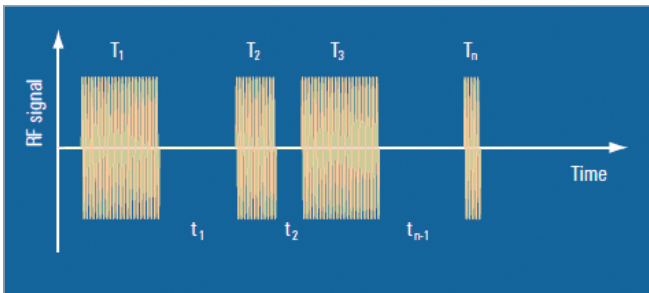
Optional high-performance pulse modulator and pulse generator

Pulsed signals are frequently required in aerospace and defense applications to test radar systems. To meet this need, the R&S®SMB100A can be equipped with an integrated pulse modulator (R&S®SMB-K21 or R&S®SMB-K22) and a pulse generator (R&S®SMB-K23) with superb characteristics such as a minimum pulse width of 10 ns for radar system testing. The pulse modulator, for example, makes it possible to perform radar tests with a high ON/OFF ratio of > 80 dB and very short rise/fall times of typ. < 5 ns. The pulse modulator is either controlled by an external pulse signal or it is supplied with single or double pulses or pulse trains as modulation signals by the internal pulse generator.

Versatile pulse trains

An optional feature of the built-in pulse generator is the possibility to generate pulse trains (R&S®SMB-K27 option), which are commonly used for radar applications. An example of a pulse train is shown in the figure on the left. In contrast to a single or double pulse, a pulse train is a combination of different pulses, which can be a periodical or non-periodical set of pulses. Pulse width and pulse pause can be set independently and separately for each pulse. This makes it possible to generate staggered pulses or to apply jitter to pulse width and pulse pause. Up to 2047 different pulses with a repetition of 1 to max. 65535 are possible. This yields very long pulse train sequences for testing.

Pulse train: combination of pulses with different pulse widths and pulse pauses.



Editing pulse train data.

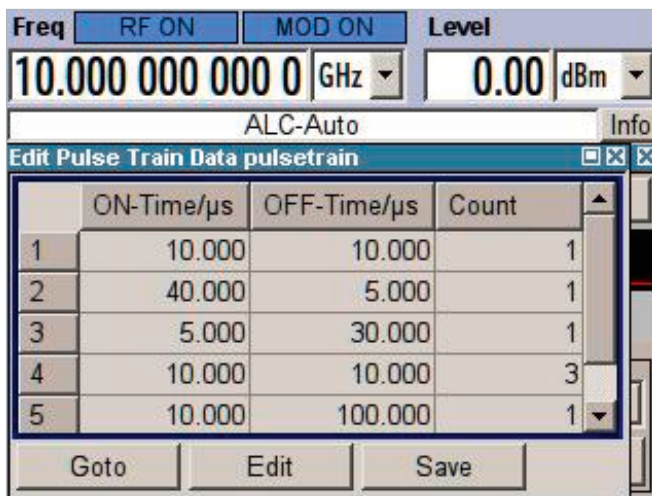
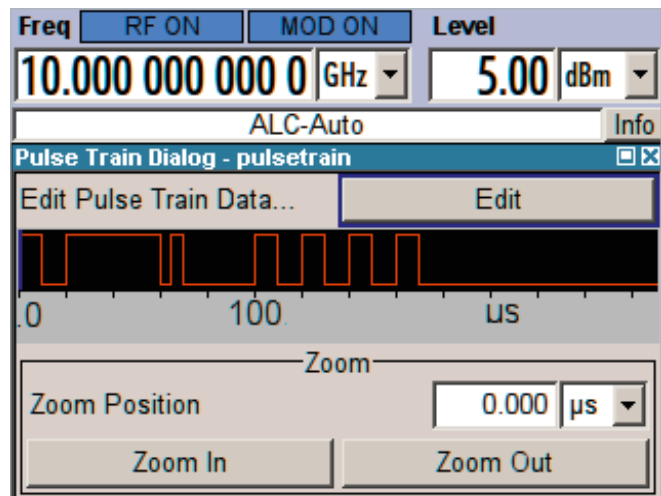


Diagram of the pulse train.



Wide temperature range and high permissible operating altitude

The R&S®SMB100A functions reliably under extreme conditions owing to its wide temperature range of 0°C to +55°C and a maximum permissible operating altitude of 4600 m above sea level.

Sanitizing of user data for secured areas

To meet requirements for secured areas, an erase and sanitize procedure has been developed that reliably erases user data from the instrument. This ensures that no sensitive data will leave the secured area. Moreover, LAN and USB ports can be disabled by means of a security password and the display can be disabled as well.

High-quality shielding

Sensitivity measurements on low-noise satellite receivers can only be made with RF-leakage-proof signal sources. The comprehensive shielding of the R&S®SMB100A based on sophisticated technologies ensures low RF leakage exactly for this purpose.

Rear view of the R&S®SMB100A.



Flexible service concept

Servicing on-site or at a Rohde&Schwarz service center

The R&S®SMB100A is designed for maximum reliability and easy servicing to maximize uptime in all application fields and significantly reduce cost of ownership. Customers can choose between calling on a certified Rohde&Schwarz service center as usual or servicing the instrument themselves.

Built-in selftest of modules to support troubleshooting

A built-in selftest carries out an operational check of the instrument and serves as a troubleshooting aid during servicing. The simple and straightforward architecture with very few modules cuts the time required for troubleshooting and repair to a minimum. Moreover, for all instruments up to 6 GHz, the R&S®SMB100A does not need to be recalibrated if a module has to be replaced because all replacement modules come fully adjusted. A simple function check is usually sufficient to ensure the outstanding specifications of the R&S®SMB100A. Do-it-yourself servicing can be completed in just 45 minutes on average.

Complete calibration only every three years

A complete calibration is recommended for the R&S®SMB100A only every three years and can, of course, also be performed on-site.

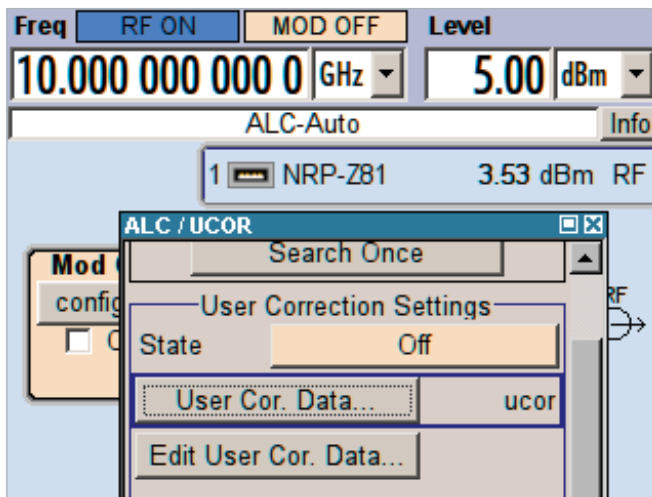
A minimum of modules in the R&S®SMB100A means high reliability and easy servicing (the photo shows the 6 GHz model).



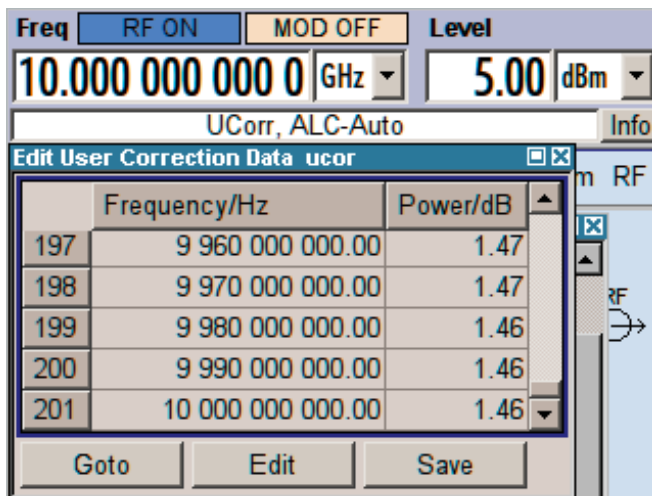
User-defined correction of external frequency responses

Test setups including cables, power amplifiers or filters always have frequency responses. The signal generator can compensate for the frequency response. The R&S®SMB100A features the User Correction function for precisely this purpose. For a known frequency response

Without frequency response correction of the RF cable, the level error (measured with the R&S®NRP-Z81 power sensor) amounts to approx. 1.5 dB at 10 GHz (nominal value: 5 dBm).



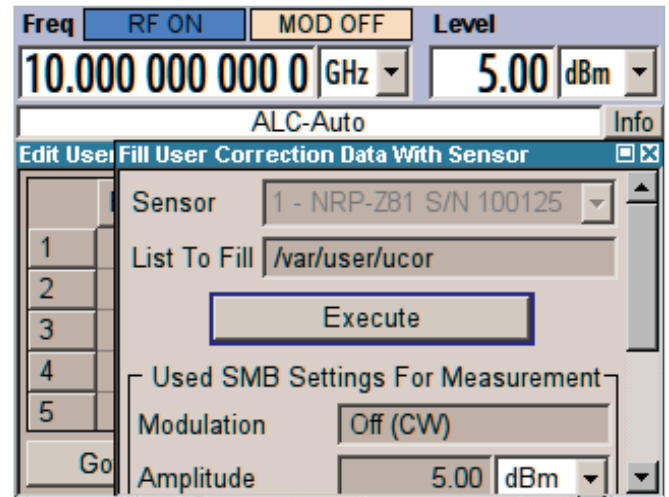
The measured level correction values are stored in a table together with the user-selected frequencies.



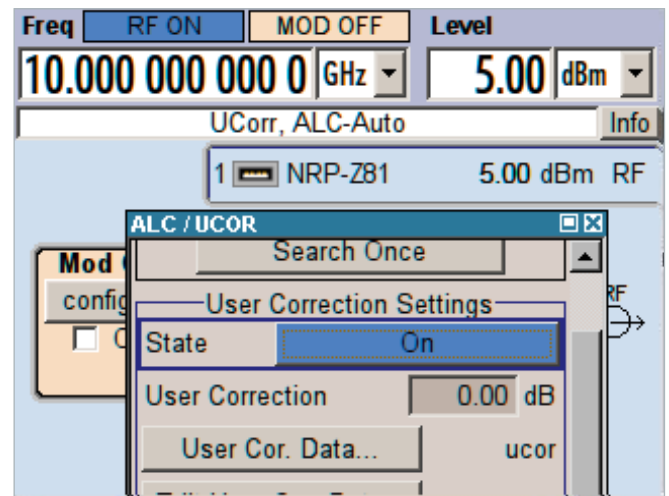
that needs to be corrected, the user can enter the level correction values as a function of the frequency. Automatic interpolation of the correction values is performed between these frequency points. To simplify this, the R&S®SMB100A can also automatically include the level correction values at the press of a button by using a directly connected R&S®NRP-Zxx power sensor.

The screenshots show the frequency response correction for an RF cable in the range from 8 GHz to 10 GHz. Without frequency response correction, the level error (measured with the R&S®NRP-Z81) amounts to approx. 1.5 dB at 10 GHz due to cable loss. After the correction values in the range from 8 GHz to 10 GHz have been automatically measured and stored with the R&S®NRP-Z81, the level error will be automatically compensated for when the User Correction function is activated.

The connected R&S®NRP-Z81 power sensor automatically measures and stores the frequency response of the RF cable.



After the User Correction table has been activated, the R&S®SMB100A adapts its output power in order to compensate for the frequency response of the RF cable.



From pre-sale to service. At your doorstep.

The Rohde & Schwarz network in over 70 countries ensures optimum on-site support by highly qualified experts. The user risks are reduced to a minimum at all stages of the project:

- ▮ Solution finding/purchase
- ▮ Technical start-up/application development/integration
- ▮ Training
- ▮ Operation/calibration/repair



Specifications in brief

Specifications in brief		
Frequency		
Frequency range	R&S®SMB-B101	9 kHz to 1.1 GHz
	R&S®SMB-B102	9 kHz to 2.2 GHz
	R&S®SMB-B103	9 kHz to 3.2 GHz
	R&S®SMB-B106	9 kHz to 6 GHz
	R&S®SMB-B112/-B112L	100 kHz to 12.75 GHz
	R&S®SMB-B120/-B120L	100 kHz to 20 GHz
	R&S®SMB-B140/-B140L	100 kHz to 40 GHz
Setting time	SCPI mode	< 3 ms
	List mode	< 1 ms
Level		
Maximum output power	R&S®SMB-B101/-B102/-B103/-B106/-B112/-B112L 1 MHz < f ≤ 12.75 GHz	> +18 dBm
	R&S®SMB-B120 with R&S®SMB-B31 50 MHz < f ≤ 20 GHz	> +16 dBm
	R&S®SMB-B120L with R&S®SMB-B31 100 MHz < f ≤ 20 GHz	> +19 dBm
	R&S®SMB-B140 with R&S®SMB-B32 50 MHz < f ≤ 40 GHz	> +13 dBm
	R&S®SMB-B140L with R&S®SMB-B32 50 MHz < f ≤ 40 GHz	> +16 dBm
Minimum specified output power	R&S®SMB-B101/-B102/-B103/-B106 R&S®SMB-B112/-B120/-B140	-120 dBm
	R&S®SMB-B112L	-5 dBm
	R&S®SMB-B120L/-B140L	0 dBm
Setting time (without switching of the mechanical attenuator)	SCPI mode	< 2.5 ms
	List mode	< 1 ms
Spectral purity		
SSB phase noise	f = 1 GHz, carrier offset = 20 kHz, 1 Hz measurement bandwidth	< -122 dBc, typ. -128 dBc
	f = 10 GHz, carrier offset = 20 kHz, 1 Hz measurement bandwidth	< -102 dBc, typ. -108 dBc
Supported modulation modes		
AM		standard
AM depth		0% to 100%
FM/φM		standard
Maximum FM deviation	f = 10 GHz	32 MHz
Maximum φM deviation	f = 10 GHz	320 rad
Pulse	R&S®SMB-K21/-K22 pulse modulator	
Rise/fall time		< 20 ns, typ. < 5 ns
ON/OFF ratio		> 80 dB
Minimum pulse width of pulse generator output		10 ns
Connectivity		
Remote control		GPIO IEEE-488.2 Ethernet (TCP/IP), USB
Peripherals		USB

Ordering information

Designation	Type	Order No.
Base unit		
RF and Microwave Signal Generator ¹⁾	R&S®SMB100A	1406.6000.02
Accessories supplied		
Power cable, Quick Start Guide and CD-ROM (with operating and service manual)		
Options		
RF Path/Frequency Option		
9 kHz to 1.1 GHz	R&S®SMB-B101	1407.2509.02
9 kHz to 2.2 GHz	R&S®SMB-B102	1407.2609.02
9 kHz to 3.2 GHz	R&S®SMB-B103	1407.2709.02
9 kHz to 6 GHz	R&S®SMB-B106	1407.2909.02
100 kHz to 12.75 GHz, with electronic step attenuator	R&S®SMB-B112	1407.2109.02
100 kHz to 12.75 GHz, without step attenuator	R&S®SMB-B112L	1407.2150.02
100 kHz to 20 GHz, with mechanical step attenuator	R&S®SMB-B120	1407.2209.02
100 kHz to 20 GHz, without step attenuator	R&S®SMB-B120L	1407.2250.02
100 kHz to 40 GHz, with mechanical step attenuator	R&S®SMB-B140	1407.2309.02
100 kHz to 40 GHz, without step attenuator	R&S®SMB-B140L	1407.2350.02
OCXO Reference Oscillator ²⁾	R&S®SMB-B1	1407.3005.02
OCXO Reference Oscillator, High Performance ²⁾	R&S®SMB-B1H	1407.3070.02
Stereo/RDS Coder ³⁾	R&S®SMB-B5	1407.3205.02
Reverse Power Protection, 100 kHz to 12.75 GHz ⁴⁾	R&S®SMB-B30	1407.1160.02
High Power Option		
10 MHz to 20 GHz (only available with R&S®SMB-B120/-B120L)	R&S®SMB-B31	1407.1260.02
10 MHz to 40 GHz (only available with R&S®SMB-B140/-B140L)	R&S®SMB-B32	1407.1360.02
Pulse Modulator for R&S®SMB-B112/-B112L/-B120/-B120L/-B140/-B140L	R&S®SMB-K21	1407.3811.02
Pulse Modulator for R&S®SMB-B101/-B102/-B103/-B106	R&S®SMB-K22	1407.3770.02
Pulse Generator	R&S®SMB-K23	1407.3786.02
Pulse Train ⁵⁾	R&S®SMB-K27	1407.3828.02

¹⁾ The base unit must be ordered together with an R&S®SMB-B101/-B102/-B103/-B106/-B112/-B112L/-B120/-B120L/-B140 or R&S®SMB-B140L frequency option.

²⁾ Only one of the options R&S®SMB-B1 or R&S®SMB-B1H can be installed.

³⁾ Only available with an R&S®SMB-B101/-B102/-B103 or R&S®SMB-B106 frequency option.

⁴⁾ Only available with an R&S®SMB-B112 or R&S®SMB-B112L frequency option.

⁵⁾ Requires the R&S®SMB-K23 option; only available for instruments with serial number > 102400.

Designation	Type	Order No.
Recommended extras		
19" Rack Adapter	R&S®ZZA-S234	1109.4493.00
Power Sensor, 9 kHz to 6 GHz, incl. USB adapter cable	R&S®NRP-Z92	1171.7005.42
Power Sensor, DC to 40 GHz, for levels up to 20 dBm	R&S®NRP-Z55	1138.2008.02
Power Sensor, 10 MHz to 18 GHz	R&S®NRP-Z22	1137.7506.02
USB Adapter for R&S®NRP-Zxx power sensors	R&S®NRP-Z4	1146.8001.02
Keyboard with USB Interface (US character set)	R&S®PSL-Z2	1157.6870.04
Mouse with USB Interface, optical	R&S®PSL-Z10	1157.7060.03
USB Serial Adapter for RS-232-C remote control	R&S®TS-USB1	6124.2531.00
Adapters for instruments with an R&S®SMB-B112/-B112L/-B120 or R&S®SMB-B120L frequency option		
Test port adapter, PC 3.5 mm female		1021.0512.00
Test port adapter, PC 3.5 mm male		1021.0529.00
Test port adapter, N female		1021.0535.00
Test port adapter, N male		1021.0541.00
Adapters for instruments with an R&S®SMB-B140 or R&S®SMB-B140L frequency option		
Test port adapter, 2.4 mm female		1088.1627.02
Test port adapter, 2.92 mm female		1036.4790.00
Test port adapter, 2.92 mm male		1036.4802.00
Test port adapter, N female		1036.4777.00
Test port adapter, N male		1036.4783.00

Service options		
Two-Year Calibration Service	R&S®CO2SMB100A	Please contact your local Rohde & Schwarz sales office.
Three-Year Calibration Service	R&S®CO3SMB100A	
Five-Year Calibration Service	R&S®CO5SMB100A	
One-Year Repair Service following the warranty period	R&S®RO2SMB100A	
Two-Year Repair Service following the warranty period	R&S®RO3SMB100A	
Four-Year Repair Service following the warranty period	R&S®RO5SMB100A	
Documentation of Calibration Values	R&S®DCV-2	0240.2193.18
DKD (ISO 17025) Calibration including ISO 9000 calibration (can only be ordered with the instrument)	R&S®SMB-DKD	1161.3607.02

For data sheet, see PD 5213.8396.22 and www.rohde-schwarz.com

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PD 5213.8396.12 | Version 04.00 | July 2011 | R&S®SMB100A
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