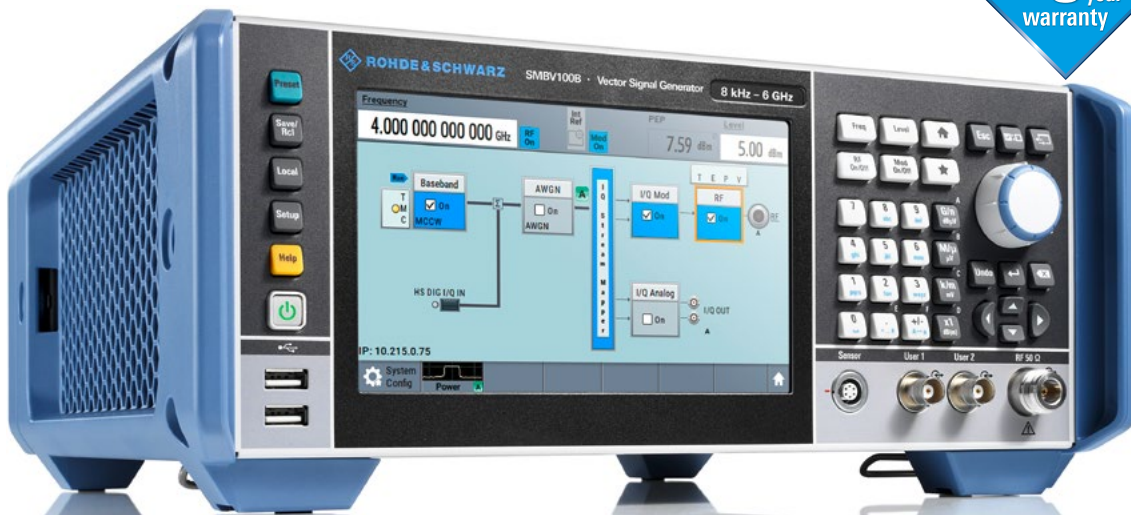


R&S® SMBV100B

Vector Signal Generator

Perfect combination of
performance and usability

3
year
warranty



R&S®SMBV100B Vector Signal Generator At a glance

The state-of-the-art R&S®SMBV100B vector signal generator sets new standards in its class. Ultra high output power, fully calibrated wideband signal generation and intuitive touchscreen operation make the R&S®SMBV100B ideal for all kinds of applications.

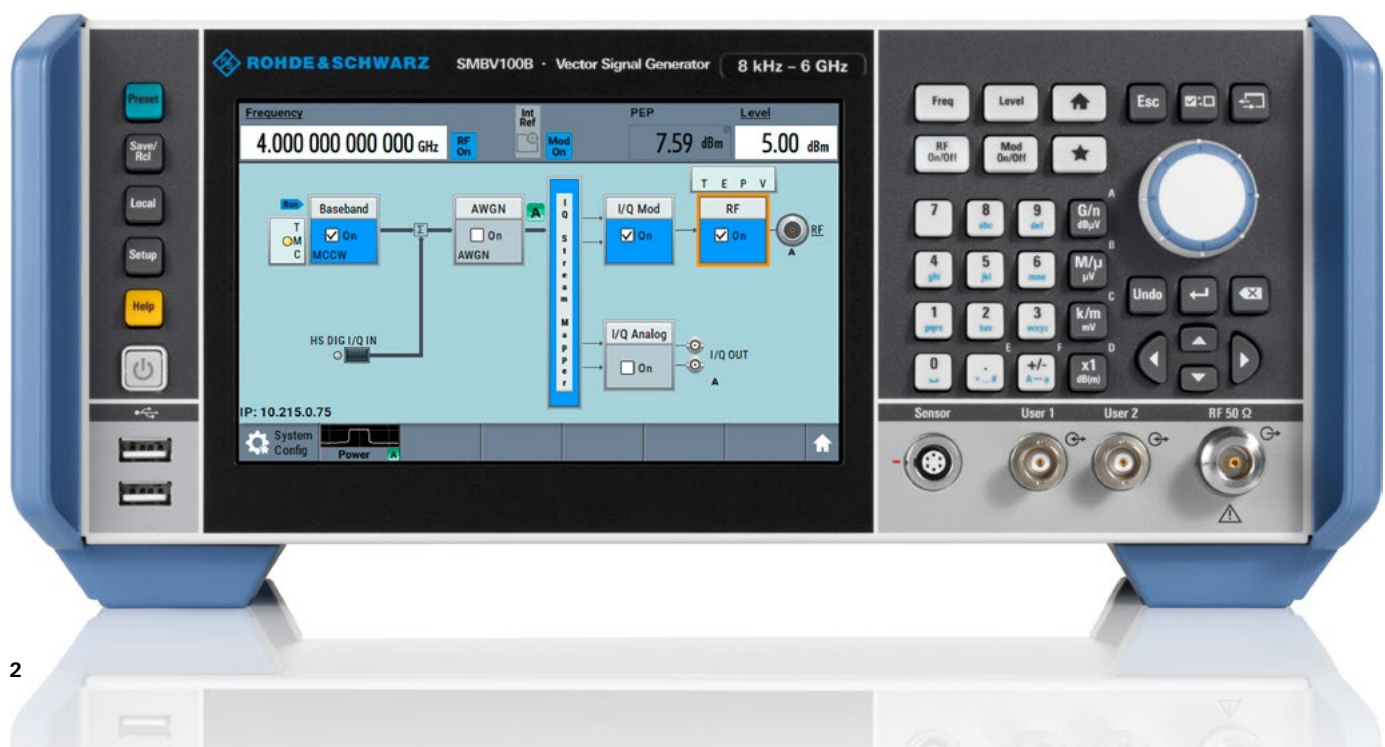
The R&S®SMBV100B vector signal generator combines superior performance characteristics such as high output power, wide modulation bandwidth and excellent signal quality. With a frequency range from 8 kHz to 6 GHz, the instrument covers all important RF bands for digital wireless communications. The wide RF modulation bandwidth of up to 500 MHz satisfies the challenging requirements of fourth and fifth generation communications standards. In A&D applications, the wide bandwidth allows the generation of complex pulsed signals.

In many test setups, such as for RF component verification, it is important to provide signals at high power levels. The R&S®SMBV100B offers best-in-class signal quality up to very high power levels. No extra amplifier is needed, which simplifies the test setup.

The R&S®SMBV100B has an intuitive touchscreen GUI and is therefore very ergonomic and practical to use. The customizable instrument is also prepared to meet future requirements. Options can be added via software keycodes, making it easy to enhance the instrument with additional functionality, e.g. by extending frequency, bandwidth and output power.

Key facts

- Frequency range from 8 kHz to 3 GHz or 6 GHz
- Ultra high output power up to +34 dBm
- 500 MHz modulation bandwidth with perfect accuracy
- Excellent EVM and ACPR results up to high power levels
- Internal signal generation for all major digital communication standards
- Fully-fledged GNSS simulator for GPS, Glonass and Galileo
- Convenient operation via 7" touchscreen



R&S®SMBV100B Vector Signal Generator

Benefits and key features

Perfect for signal quality

- New realtime, user-defined frequency response correction to compensate for the effect of test fixtures
- Very low single-sideband (SSB) phase noise:
< -134 dBc (meas.) at 1 GHz and 20 kHz offset
- Wide modulation bandwidth with perfect accuracy:
modulation frequency response of < 0.3 dB (meas.)
across 500 MHz bandwidth
- Excellent EVM and ACPR up to high power levels

▷ [page 4](#)

Perfect for output power

- Ultra high output power:
up to +34 dBm at 1 GHz
- Excellent level accuracy for CW and modulated signals:
level linearity of < 0.2 dB (meas.)

▷ [page 7](#)

Perfect for use

- Convenient operation via 7" touchscreen
- Automation made easy with context-sensitive help
system and SCPI recording
- Internal realtime signal generation
- Protecting user data

▷ [page 8](#)

Perfect for upgrading

- Easy upgrading of instrument at customer premises via
software keycodes
- Time-limited licenses and waveform package for software
options

▷ [page 9](#)

R&S®LegacyPro: refresh your T&M equipment

- Replace your legacy signal generators:
emulation of generators from Rohde&Schwarz and other
vendors (e.g. R&S®SMBV100A, Keysight MXG/EXG,
Aeroflex, Anritsu)

▷ [page 10](#)

Application

- Simplify your envelope tracking system

▷ [page 10](#)

Perfect for signal quality

When developing electronic products, it is very important to choose the right test instruments.

For all key RF parameters, the R&S®SMBV100B offers outstanding specifications that clearly outperform the values of typical DUTs. This ensures that measurement results are not influenced by the signal generator. The instrument serves as a “golden reference”, providing a dependable signal for all receiver tests.

Engineers can focus on core development tasks without having to worry about the performance of their signal generator.

New realtime, user-defined frequency response correction to compensate for the effect of test fixtures

As with almost any other test instrument, the reference plane of the R&S®SMBV100B is at the RF connector. This means that the specifications for all parameters apply at this point. In most cases, however, there are also cables and other components (e.g. amplifiers) connected between the generator and the DUT. Especially when working with wide bandwidths, these test fixtures influence the modulated signal, degrading the amplitude and phase accuracy at the DUT input.

To take the influence of an external test fixture into account, the fixture can be characterized in terms of amplitude and phase, and the results can be saved to a Touchstone® .s2p file.

With the R&S®SMBVB-K544 option, this information can be used to precorrect the generator signal in realtime to compensate for the influence of the external test fixture. This new method provides the user with a test solution that delivers an extremely precise measurement signal at the DUT input, unaffected by the test setup used between the generator and the DUT.

Very low single-sideband (SSB) phase noise

SSB phase noise is a key parameter when it comes to RF generator signal quality. This parameter is not only important in CW applications such as LO substitution, it also plays a significant role in the case of digitally modulated signals as it has a direct influence on the error vector magnitude (EVM).

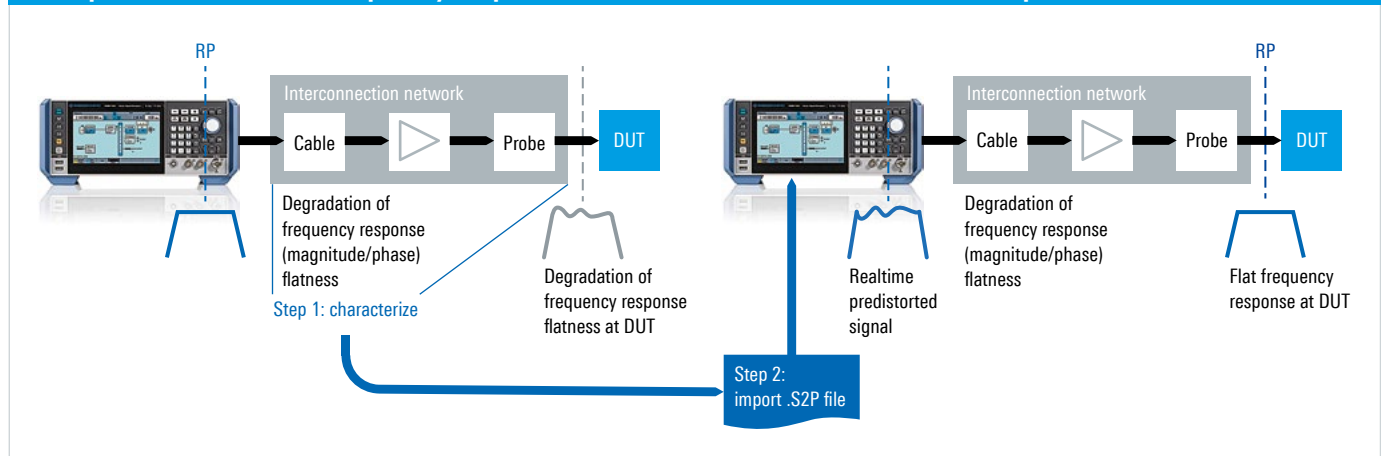
The R&S®SMBV100B exhibits very low SSB phase noise of < -134 dBc (measured) at 1 GHz and 20 kHz offset. The close-in SSB phase noise can be reduced using the R&S®SMBVB-B1 OCXO option. The option reduces the phase noise from < -37 dBc/Hz at 1 GHz and 1 Hz offset by 13 dB to < -50 dBc/Hz. Using the R&S®SMBVB-B1H high performance OCXO option, the close-in SSB phase noise can be further reduced by more than 20 dB compared with the standard instrument specifications, resulting in a value of < -65 dBc/Hz.

In addition, the R&S®SMBVB-B1 and R&S®SMBVB-B1H options significantly improve long-term stability for the reference frequency and mitigate the generator’s frequency temperature drift.

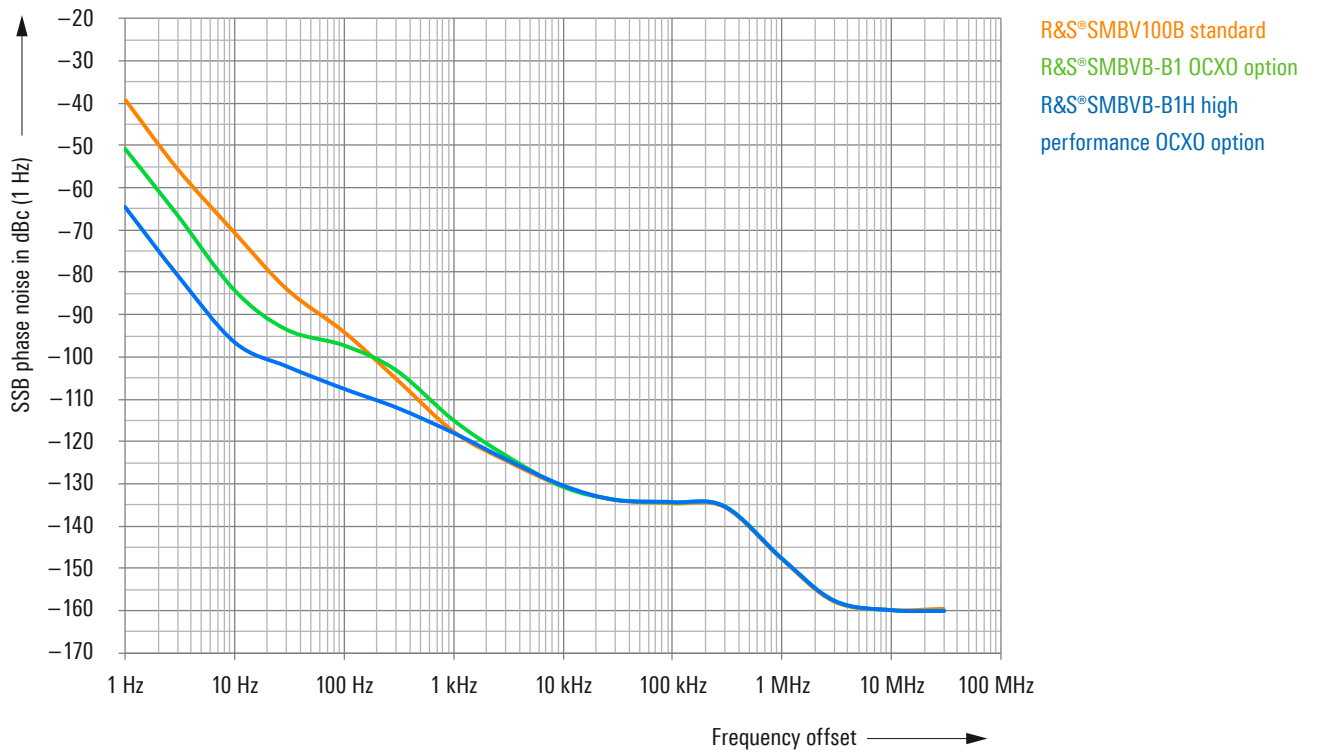
Wide modulation bandwidth with perfect accuracy

To satisfy the need for higher modulation bandwidths, the R&S®SMBV100B is equipped with a high performance baseband. Thanks to the generator’s intelligent internal realtime frequency response correction, an extremely high amplitude flatness of < 0.3 dB (measured) is achieved across the entire bandwidth of 500 MHz.

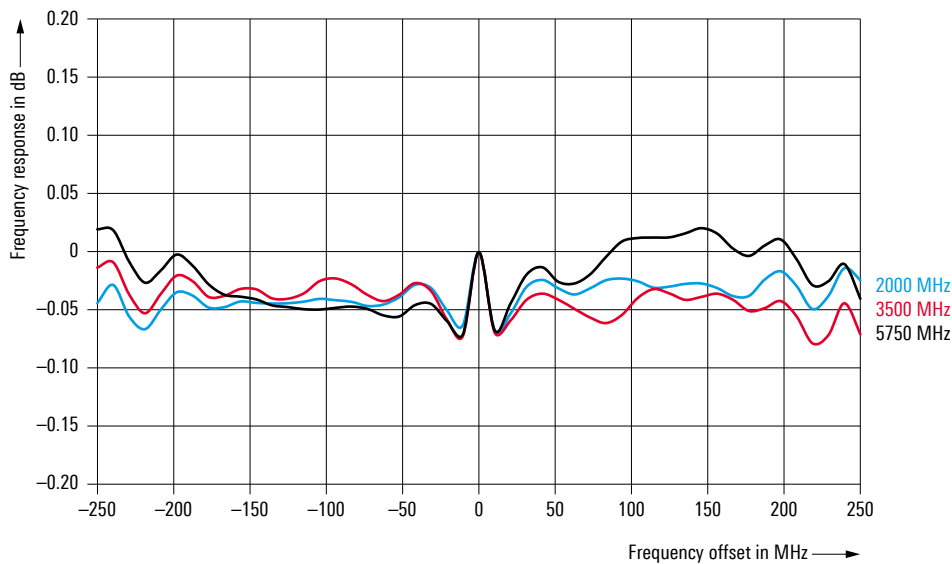
Principle of user-defined frequency response correction with R&S®SMBVB-K544 option



Single-sideband phase noise (1 GHz, 1 Hz bandwidth, measured)



Measured frequency response across maximum RF modulation bandwidth of 500 MHz at different carrier frequencies



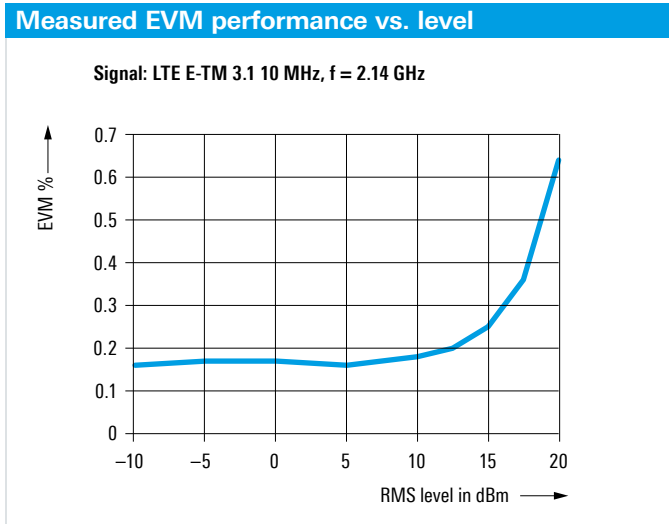
Excellent EVM and ACPR up to high power levels

A receiver's data throughput is directly influenced by the input signal quality. As a result, a good EVM value for the test signal is an important prerequisite in order to reliably assess the performance of a DUT.

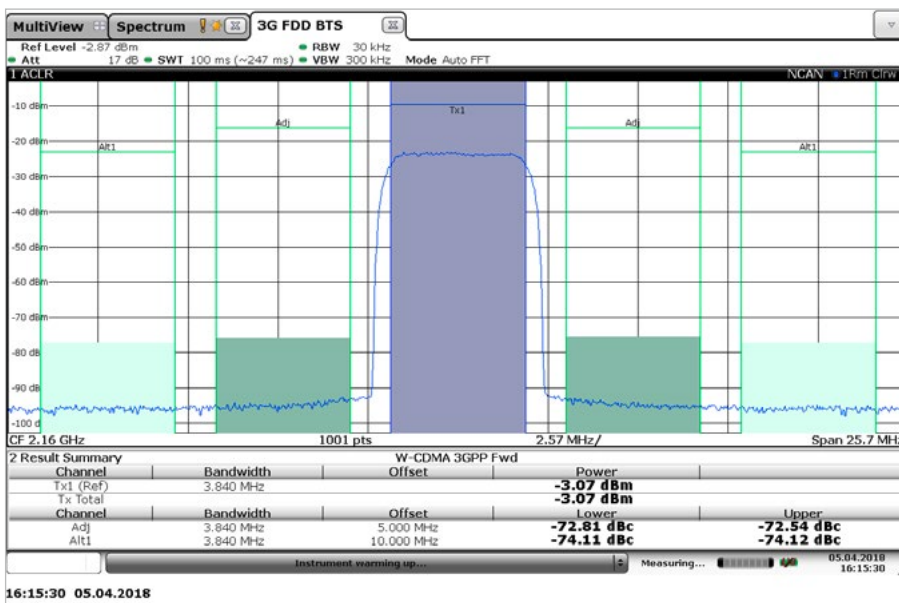
The R&S®SMBV100B combines large RF bandwidth and excellent signal quality and is therefore ideal for testing and characterizing wideband receivers and multicarrier amplifiers. With measured EVM values of less than 0.2% for LTE signals and less than 0.4% for 160 MHz 802.11ac signals, the R&S®SMBV100B offers far better EVM performance than is required for measuring a DUT.

A feature unique to the R&S®SMBV100B is its excellent EVM performance even at high output power levels. An EVM value of less than 0.4% is achieved for an LTE signal with +18 dBm (RMS) output power. The R&S®SMBV100B thus outperforms conventional signal generators in terms of EVM, while at the same time simplifying the test setup since in most cases no extra amplifier is needed.

The R&S®SMBV100B was designed with a focus on delivering a practically distortion-free signal in addition to good EVM performance. This is a prerequisite for achieving a good adjacent channel power ratio (ACPR). The R&S®SMBV100B attains impressive values of < -72 dB ACPR (WCDMA test model 1, 64 DPCH, measured).



Measured EVM performance vs. RMS level (R&S®SMBV100B equipped with R&S®SMBVB-K31 and R&S®SMBVB-B32 options).



Measured ACPR for 3GPP test model 1, 64 DPCH.

Perfect for output power

Many applications call for very high output powers. This means that in many cases an amplifier is required in addition to the signal generator. Here, the R&S®SMBV100B offers a better alternative. The ultra high output power option provides users with a calibrated test solution, saving space and money, all in a single box.

Ultra high output power

When equipped with the appropriate options, the R&S®SMBV100B can produce output power of up to +34 dBm at 1 GHz and up to +31 dBm at 6 GHz (measured values). In addition, the specified level increases to +25 dBm across almost the entire frequency range.

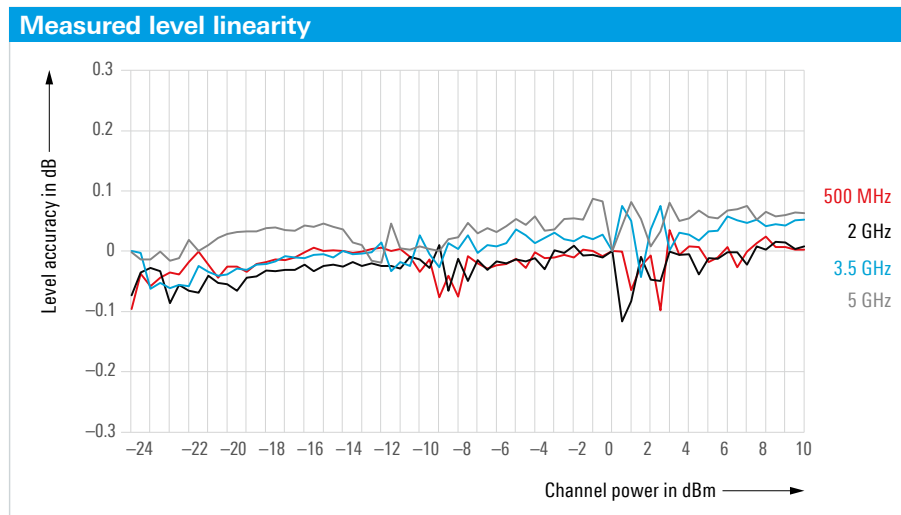
Excellent level accuracy for CW and modulated signals

To describe the nonlinear characteristics of amplifier circuits (e.g. to determine the 1 dB compression point), the signal source must exhibit very high level accuracy. In many cases, the overall system is calibrated prior to the measurements to take into account the influence of test fixtures connected between the generator and the DUT.

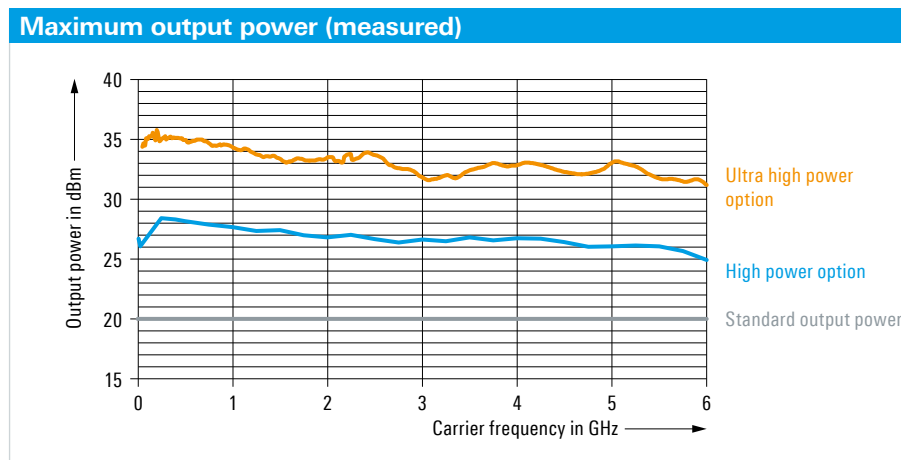
After calibration, it is critical that the generator set the level values for each test sequence repeatably and with high precision. Here, the R&S®SMBV100B delivers top performance with a measured level repeatability of < 0.09 dB.

Another critical parameter is level linearity. It is crucial for the generator to keep deviation from nominal values extremely low across a wide amplitude range. With an accuracy of < 0.2 dB (measured), the R&S®SMBV100B excels also in this respect.

The generator's very high level accuracy simplifies the calibration procedure, enabling the generator to deliver extremely precise measurements.



Measured level linearity for an internally generated LTE downlink signal at various test frequencies.



Measured output power for the base unit, with the high power option (R&S®SMBVB-K31) and with the additional ultra high power option (R&S®SMBVB-B32).

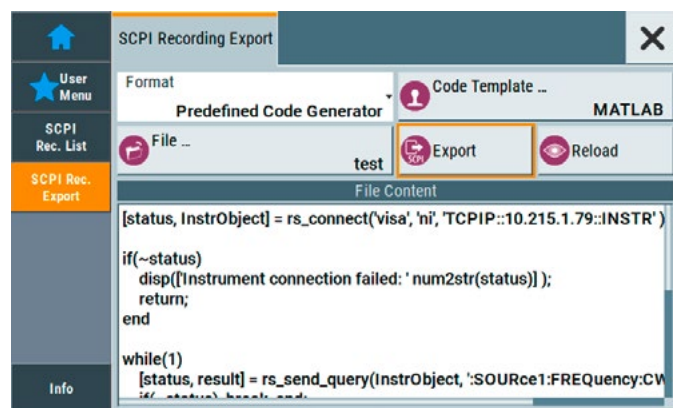
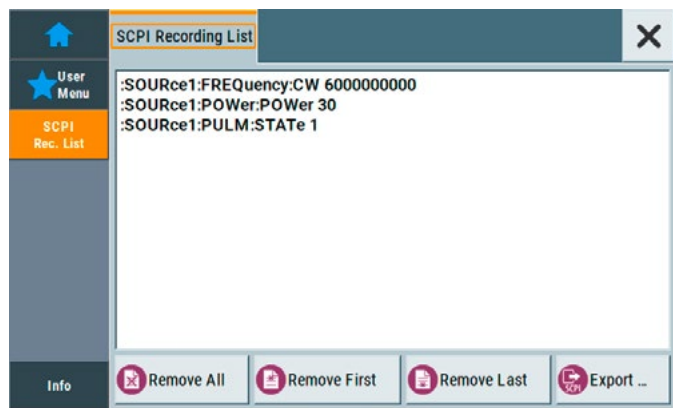
Perfect for use

Its intuitive operating concept makes the R&S®SMBV100B very ergonomic and practical to use. The customizable instrument is also prepared to meet future requirements.

Convenient operation via 7" touchscreen

The R&S®SMBV100B has a clearly structured graphical user interface with a high-resolution 7" touchscreen for efficient, intuitive operation. The functional block diagram of the R&S®SMBV100B provides a clear overview at all times. The user can immediately see the signal flow and the status of all inputs and outputs. The built-in graphics function displays the generated signals in realtime.

The built-in SCPI macro recorder and code generator support fast, easy generation of SCPI sequences.



Automation made easy with context-sensitive help system and SCPI recording

Context-sensitive online help offers comprehensive information. It describes each parameter and setup menu in detail, states the setting range and shows the associated remote control commands. Moreover, users can search for specific parameters in the user manual installed on the instrument.

The R&S®SMBV100B helps users quickly and correctly create remote control programs. The instrument's built-in SCPI macro recorder with code generator can automatically record all manual settings and create an executable MATLAB® script.

The R&S®SMBV100B therefore helps minimize the time required for test automation, saving development resources.

Internal realtime signal generation

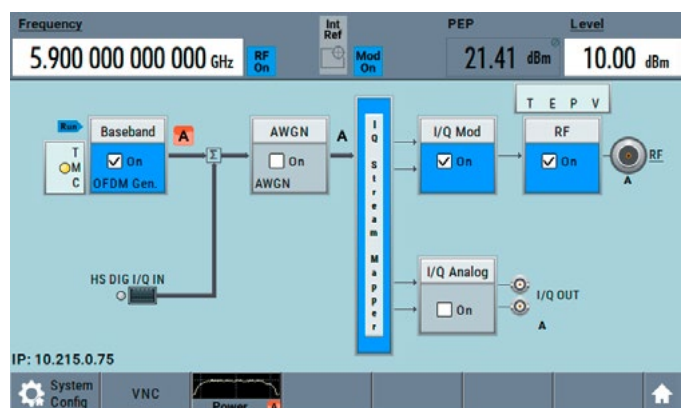
The internal baseband of the R&S®SMBV100B offers impressive realtime capabilities. Users can generate signals for all major digital communications standards right on the instrument – no external signal generation software is needed. This simplifies operation of the instrument and helps to speed up measurement tasks.

Protecting user data

To meet requirements for secured areas, the R&S®SMBV100B can be configured to prevent user data from being saved to the instrument's nonvolatile memory. An easy-to-use erasure and sanitizing procedure is also available that removes user data from the instrument. Furthermore, the R&S®SMBV100B can be equipped with a removable solid-state drive (R&S®SMBVB-B80 option). A dedicated password can be used to disable the LAN and USB ports. The display can be disabled as well.

These precautions ensure that no sensitive data will leave secured areas.

Functional block diagram of the R&S®SMBV100B.



Perfect for upgrading

The R&S®SMBV100B is a flexible platform that can be custom-tailored to specific needs at any time.

Easy upgrading of instrument at customer premises via software keycodes

As to the instrument's hardware configuration, only a few decisions need to be made. Six hardware options are available. Software options can be added at the customer premises via keycodes.

The instrument is fully calibrated at the factory. There is no downtime for servicing the instrument after an upgrade, e.g. after an extension of the frequency range, bandwidth or output power.

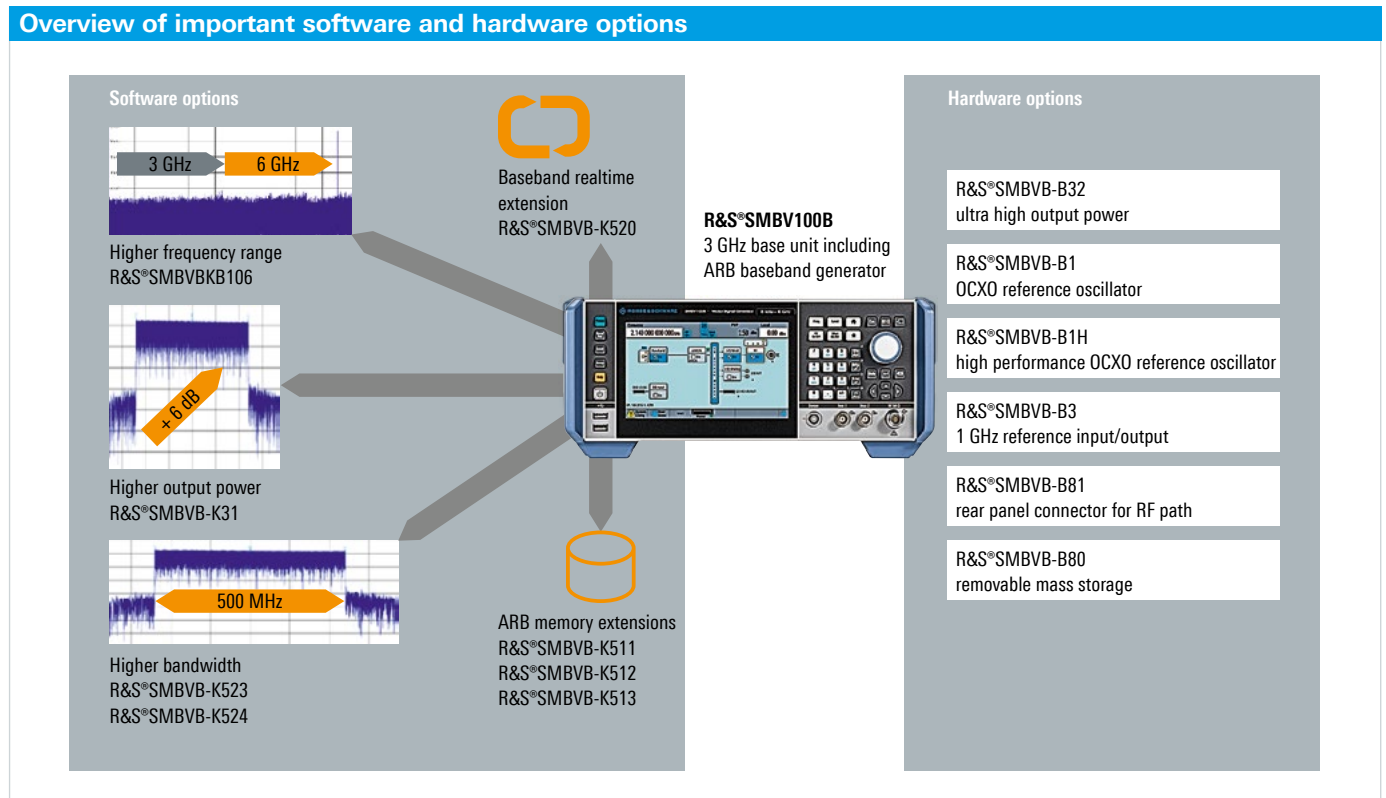
This flexibility minimizes investment risks, saves time and maximizes system uptime.

Time-limited licenses and waveform package for software options

If specific functions are not permanently needed, customers can acquire licenses for R&S®SMBV100B software options for a limited period of time (e.g. 1 month or 6 months). This alternative is offered for all of the R&S®SMBV100B software options. It allows customers to configure their R&S®SMBV100B platform as needed for the project at hand.

Characterizing DUTs often requires using test signals from a number of different standards. The waveform package is the ideal solution when it comes to inexpensively providing a signal for each standard.

A waveform package for five signals, for example, can license one WCDMA and LTE signal and three different 5G NR signals.



R&S® LegacyPro: refresh your T&M equipment

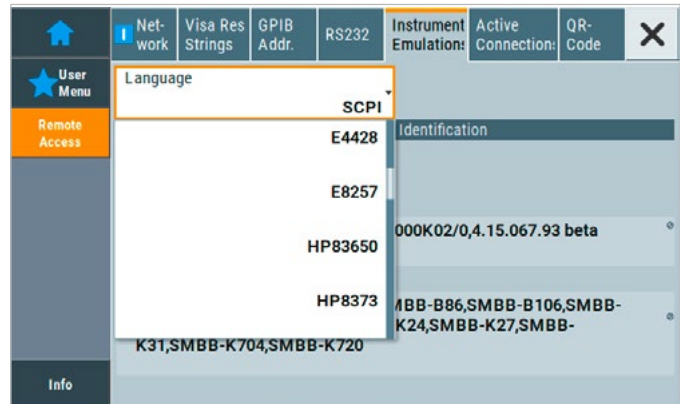


Replace your legacy signal generators

For older test systems, obsolescence is a common topic. When individual pieces of equipment become obsolete before the entire ATE system does, regular calibration and repair of obsolete equipment is an expensive, time-consuming and challenging task. Replacing obsolete test equipment with equivalent, state-of-the-art instruments should be straightforward and require minimal hardware and software changes.

The R&S®SMBV100B with R&S®LegacyPro code emulation fulfills these requirements, reducing the workload and eliminating risks. R&S®LegacyPro enables the R&S®SMBV100B to reliably emulate a wide range of legacy generators from vendors such as Keysight, Agilent, HP, Aeroflex, Anritsu and Rohde & Schwarz. As a result, the R&S®SMBV100B can be deployed in legacy ATE systems without major software changes, effectively increasing uptime, lowering the cost of ownership and extending the test system's useful life.

Enjoy plug & play replacement of your legacy signal generators with R&S®LegacyPro and the R&S®SMBV100B.



Emulation of legacy generators from Rohde & Schwarz and other vendors.

Application

Simplify your envelope tracking system

An increasing number of power amplifiers support envelope tracking (ET) in order to reduce power consumption and improve efficiency, for example in smartphones and tactical radios. Typical test setups for measuring power amplifiers comprise at least one signal generator and one spectrum analyzer. Envelope tracking requires an additional generator to deliver the envelope signal for the DC modulator.

RF and envelope signal out of one box

Equipped with the R&S®SMBVB-K540 envelope tracking option, the R&S®SMBV100B generates both the RF signal and the corresponding envelope signal. The envelope signal is generated from the baseband signal in realtime. This means that any user-specific I/Q signals and any supported wireless communications signals, such as LTE or wireless LAN, can be used.

Generating the RF signal and the envelope signal in a single instrument makes it possible to precisely adjust the delay between the two signals.

The R&S®SMBV100B adjusts the delay in picosecond steps in realtime, meeting tight requirements, for example accuracy better than 1 ns for a 20 MHz LTE signal.

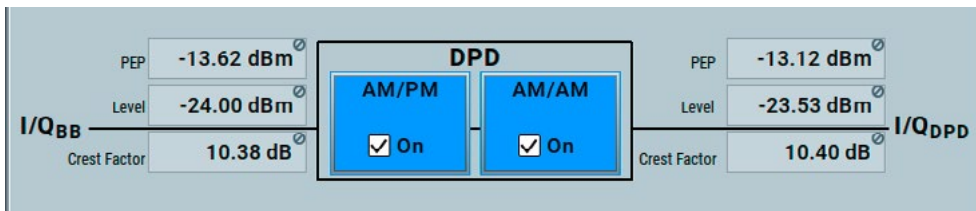
The envelope signal is shaped to optimize the power amplifier for efficiency or linearity. The R&S®SMBV100B offers various shaping methods, such as look-up table and polynomial, which are applied in realtime.

For power sweeps, the R&S®SMBV100B automatically calculates the amplitude of the envelope signal, eliminating time-consuming manual calculations. It is also possible to adjust additional parameters, such as the gain and impedance of the DC modulator.

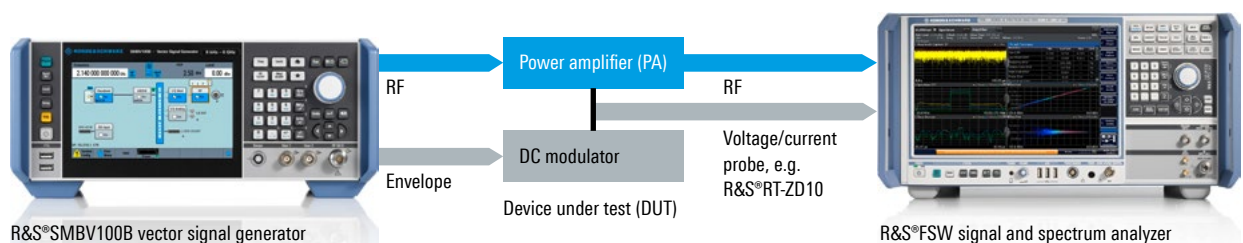
Realtime digital predistortion

With envelope tracking, the amplifier is operated close to or even in saturation, causing distortion at the amplifier output. To compensate for this effect, envelope tracking is often used in combination with digital predistortion (DPD). Equipped with the R&S®SMBVB-K541 digital predistortion option, the R&S®SMBV100B can apply realtime amplitude and phase correction to each complex I/Q sample using the values in the DPD tables. As a result, users can quickly verify the effect of predistortion, even for different power levels, without having to manually calculate the original waveform.

Digital predistortion user interface with the R&S®SMBVB-K541 option



Compact Rohde & Schwarz setup for power amplifier tests including envelope tracking



Front and rear panel view

High-resolution touchscreen with easy-to-use graphical user interface and block diagram

Context-sensitive help system

Signal monitoring with graphical result display for practically every point in the signal flow

Single-ended and differential analog I/Q outputs (R&S®SMBVB-K17 option)

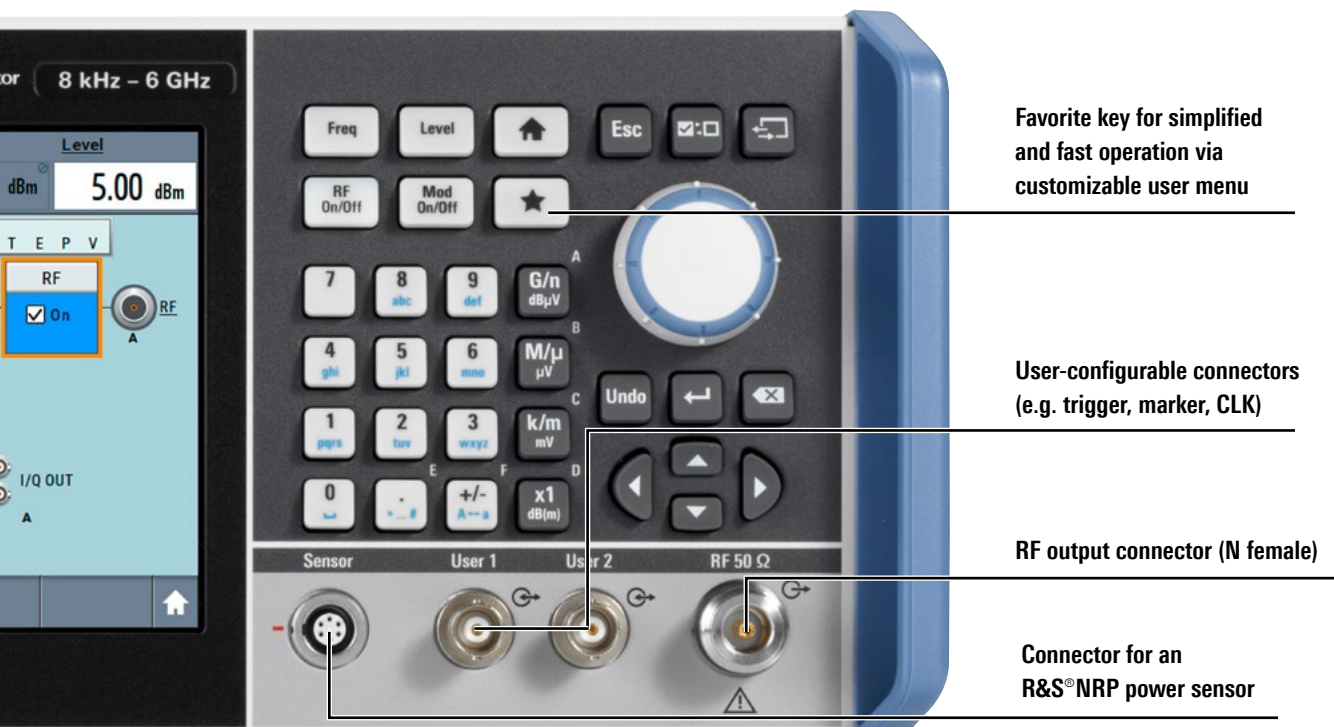
Removable solid-state drive to store sensitive information (R&S®SMBVB-B80 option)

Remote control via GPIB, USB or LAN

Input for external pulse modulation signal (R&S®SMBVB-K22 option)

Flexible reference input/output from 1 MHz to 100 MHz (R&S®SMBVB-K704 option)



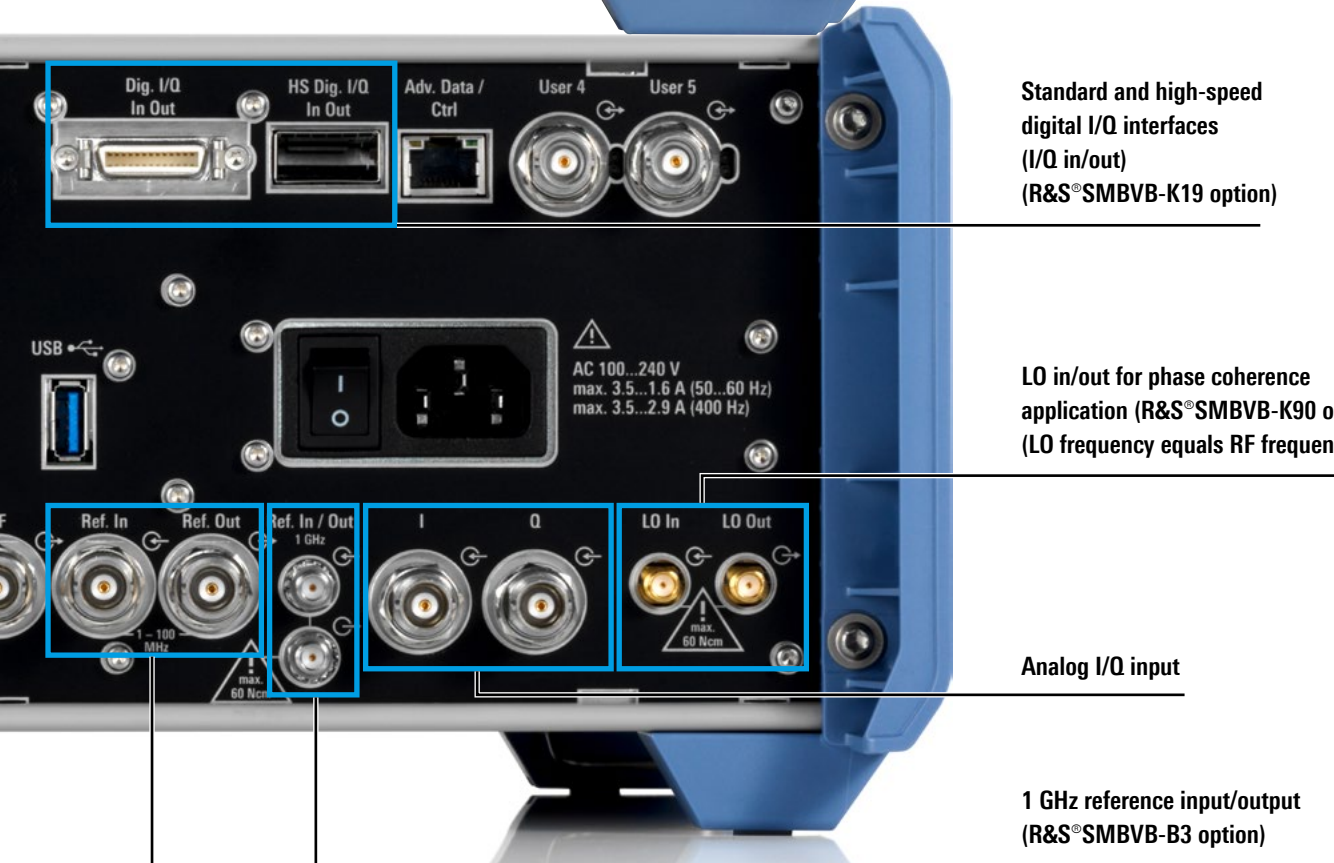


Favorite key for simplified and fast operation via customizable user menu

User-configurable connectors (e.g. trigger, marker, CLK)

RF output connector (N female)

Connector for an R&S[®] NRP power sensor



Standard and high-speed digital I/Q interfaces (I/Q in/out) (R&S[®] SMBVB-K19 option)

LO in/out for phase coherence application (R&S[®] SMBVB-K90 option) (LO frequency equals RF frequency)

Analog I/Q input

1 GHz reference input/output (R&S[®] SMBVB-B3 option)

Specifications in brief

Specifications in brief		
Frequency range	R&S®SMBVB-B103	
	CW mode	8 kHz to 3 GHz
	I/Q mode	1 MHz to 3 GHz
	R&S®SMBVB-B103 and R&S®SMBVBKB106	
	CW mode	8 kHz to 6 GHz
	I/Q mode	1 MHz to 6 GHz
Level range	peak envelope power (PEP)	
R&S®SMBVB-B103/KB106	standard	
	1 MHz < f ≤ 6 GHz	-127 dBm to +18 dBm
	with R&S®SMBVB-K31 option	
	1 MHz < f ≤ 4 GHz	-127 dBm to +21 dBm
	4 GHz < f ≤ 6 GHz	-127 dBm to +20 dBm
	with R&S®SMBVB-K31 and R&S®SMBVB-B32 options	
	10 MHz < f ≤ 6 GHz	-127 dBm to +25 dBm
Spectral purity		
SSB phase noise	f = 1 GHz, 20 kHz offset, 1 Hz measurement bandwidth	< -126 dBc, -132 dBc (typ.)
Harmonics	1 MHz < f ≤ 6 GHz, level ≤ 13 dBm	< -30 dBc
Nonharmonics	f = 1 GHz, level > +10 dBm, offset > 10 kHz	< -76 dBc
Analog modulation	supported analog modulation modes	
	with R&S®SMBVB-K720 option	AM, FM, φM
	with R&S®SMBVB-K22 option	pulse modulation
I/Q modulation		
RF modulation bandwidth	with internal baseband I/Q, I/Q wideband on	
	1 MHz < f ≤ 1000 MHz	±25% of carrier frequency
	f > 1000 MHz	±250 MHz
	with external I/Q inputs, I/Q wideband on	
	1 MHz ≤ f ≤ 4 GHz	±25% of carrier frequency
	f > 4 GHz	±1 GHz
Modulation frequency response in specified RF modulation bandwidth	with internal baseband I/Q, I/Q wideband on, optimization mode: high quality	< 1.0 dB, < 0.3 dB (meas.)
I/Q baseband generator		
Signal bandwidth	standard	120 MHz
	with R&S®SMBVB-K523 option	240 MHz
	with R&S®SMBVB-K523 and R&S®SMBVB-K524 options	500 MHz
ARB memory depth	standard	64 Msample
	with R&S®SMBVB-K511 option	512 Msample
	with R&S®SMBVB-K511 and R&S®SMBVB-K512 options	1 Gsample
	with R&S®SMBVB-K511, R&S®SMBVB-K512 and R&S®SMBVB-K513 options	2 Gsample
Digital standards	the options are described in the Digital Standards data sheet (PD 5213.9434.22)	5G NR, Cellular IoT, LTE Release 8-14, 3GPP FDD HSPA/HSPA+, GSM, WLAN IEEE 802.11a/b/g/n/j/p/ac/ax, AWGN and more
External R&S®Pulse Sequencer software or R&S®Pulse Sequencer (DFS) software	the options are described in the Pulse Sequencer options data sheet (PD 3607.1388.22)	pulse sequencing, enhanced pulse sequencing, direction finding, DFS signal generation
GNSS and Avionics	the options are described in the GNSS and Avionics data sheet (PD 3607.6896.22)	GPS, Galileo, Glonass, BeiDou, GBAS, ILS, VOR, DME

For data sheet, see PD 3607.8201.22 and www.rohde-schwarz.com

Always up to date

The firmware can be updated using a USB storage device or the LAN port. Free firmware updates are available for download from the Internet at www.rohde-schwarz.com.

Ordering information

Designation	Type	Order No.
R&S®SMBVB-Bxxx = hardware option		
R&S®SMBVB-Kxxx = software/keycode option		
Base unit		
Vector Signal Generator, including ARB baseband generator (64 Msample, 120 MHz RF bandwidth), power cable and Quick Start Guide	R&S®SMBV100B	1423.1003.02
Frequency options		
8 kHz to 3 GHz (mandatory)	R&S®SMBVB-B103	1423.6270.02
Frequency Extension to 6 GHz	R&S®SMBVBKB106	1423.6370.02
RF options		
OCXO Reference Oscillator	R&S®SMBVB-B1	1423.6470.02
High Performance OCXO Reference Oscillator	R&S®SMBVB-B1H	1423.6570.02
1 GHz Reference Input/Output	R&S®SMBVB-B3	1423.7260.02
Flexible Reference Input from 1 MHz to 100 MHz	R&S®SMBVB-K704	1423.7618.02
High Output Power	R&S®SMBVB-K31	1423.6670.02
Ultra High Output Power	R&S®SMBVB-B32	1423.6711.02
Phase Coherence	R&S®SMBVB-K90	1423.7076.02
Pulse Modulator	R&S®SMBVB-K22	1423.7560.02
Pulse Generator	R&S®SMBVB-K23	1423.7576.02
Multifunction Generator	R&S®SMBVB-K24	1423.7582.02
AM/FM/φM	R&S®SMBVB-K720	1423.7599.02
Baseband		
Differential Analog I/Q Outputs	R&S®SMBVB-K17	1423.7624.02
ARB Memory Extension to 512 Msample	R&S®SMBVB-K511	1423.7653.02
ARB Memory Extension to 1 Gsample	R&S®SMBVB-K512	1423.7660.02
ARB Memory Extension to 2 Gsample	R&S®SMBVB-K513	1423.8589.02
Baseband Realtime Extension	R&S®SMBVB-K520	1423.7676.02
Baseband Extension to 240 MHz RF bandwidth	R&S®SMBVB-K523	1423.7682.02
Baseband Extension to 500 MHz RF bandwidth	R&S®SMBVB-K524	1423.7699.02
Baseband enhancements		
Additive White Gaussian Noise (AWGN)	R&S®SMBVB-K62	1423.7876.02
Bit Error Rate Tester	R&S®SMBVB-K80	1423.7647.02
Envelope Tracking	R&S®SMBVB-K540	1423.7701.02
AM/AM, AM/φM Predistortion	R&S®SMBVB-K541	1423.7718.02
User-Defined Frequency Response Correction	R&S®SMBVB-K544	1423.8150.02
Digital standards		
GSM/EDGE	R&S®SMBVB-K40	1423.7724.02
EDGE Evolution	R&S®SMBVB-K41	1423.7730.02
3GPP FDD	R&S®SMBVB-K42	1423.7747.02
CDMA2000®	R&S®SMBVB-K46	1423.7760.02
1xEV-DO	R&S®SMBVB-K47	1423.7776.02
TD-SCDMA	R&S®SMBVB-K50	1423.7782.02
TD-SCDMA Enhanced BS/MS Tests	R&S®SMBVB-K51	1423.7799.02
IEEE 802.11 (a/b/g/n/j/p)	R&S®SMBVB-K54	1423.7824.02
EUTRA/LTE	R&S®SMBVB-K55	1423.7830.02
Bluetooth® EDR	R&S®SMBVB-K60	1423.7853.02
Multicarrier CW Signal Generation	R&S®SMBVB-K61	1423.7860.02
3GPP FDD HSPA/HSPA+, Enhanced BS/MS Tests	R&S®SMBVB-K83	1423.7899.02
EUTRA/LTE Release 9 and Enhanced Features	R&S®SMBVB-K84	1423.7901.02
EUTRA/LTE Release 10 (LTE-Advanced)	R&S®SMBVB-K85	1423.7918.02
IEEE802.11ac	R&S®SMBVB-K86	1423.7924.02
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Bluetooth® EDR	R&S®SMBVB-K260	1423.8295.02
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EUTRA/LTE Release 10 (LTE-Advanced)	R&S®SMBVB-K285	1423.8350.02
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Verizon 5GTF Signals	R&S®SMBVB-K418	1423.8543.02
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5 Waveforms	R&S®SMBVB-K200	1423.8714.72
50 Waveforms	R&S®SMBVB-K200	1423.8714.75
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BeiDou	R&S®SMBVB-K107	1423.7999.02
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GNSS Test Suite	R&S®SMBVB-K362	1423.8672.02

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Other options		
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Rear Panel Connector for RF Path	R&S®SMBVB-B81	1423.7360.02
Recommended extras		
19" Rack Adapter	R&S®ZZA-KNA33	1177.8090.00
USB Serial Adapter for RS-232 remote control	R&S®TS-USB1	6124.2531.00
Documentation of Calibration Values	R&S®DCV-2	0240.2193.18
R&S®SMBV100B Accredited Calibration (ISO 17025, ISO 9000)	R&S®SMBVB-ACA	1423.8620.02

Warranty		
Base unit	3 years	
All other items	1 year	
Options		
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Extended Warranty, two years	R&S®WE2	
Extended Warranty with Calibration Coverage, one year	R&S®CW1	
Extended Warranty with Calibration Coverage, two years	R&S®CW2	
Extended Warranty with Accredited Calibration Coverage, one year	R&S®AW1	
Extended Warranty with Accredited Calibration Coverage, two years	R&S®AW2	

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