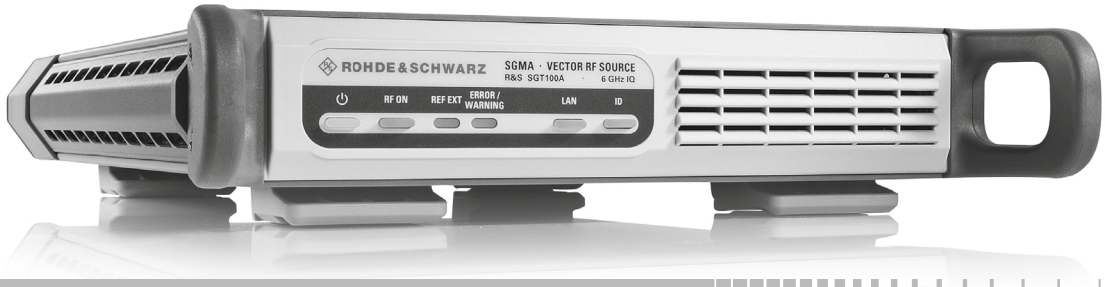
R&S®SGT100A
SGMA Vector RF Source
Specifications



ROHDE&SCHWARZ

Test & Measurement

Data Sheet | 01.00

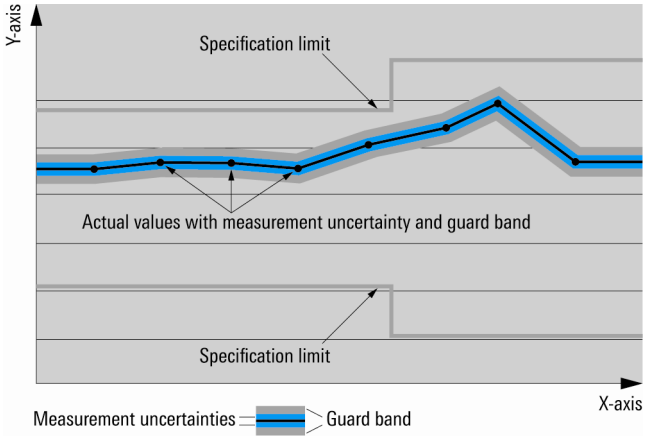
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits
Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are indicated as follows: “parameter: value”.

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

Key features

Dedicated ATE digital source

- I/Q-modulated RF source in the frequency range from 80 MHz to 3 GHz or 6 GHz
- Very fast frequency and level setting times via PCIe interface
- Maximum level of +22 dBm (typ.).
- Wear-free electronic attenuator
- Integrated ARB with up to 1 Gsample memory depth and 160 MHz RF bandwidth
- External software (R&S®SGMA GUI) for remote control of multiple instruments
- Field-upgradeable

Space-saving operation due to small dimensions

- Smallest signal generator in its class: 1 height unit, ½ × 19"
- Lightweight

High performance at an attractive price

- Low SSB phase noise of typ. –133 dBc (measured, 20 kHz carrier offset, f = 1 GHz, 1 Hz measurement bandwidth)
- Wideband noise of < –145 dBc
- Nonharmonics of < –76 dBc (> 10 kHz carrier offset, f ≤ 1500 MHz)
- Very high level accuracy and repeatability
- Optional pulse modulation capability and internal pulse generator
- Optional high-stability reference oscillator
- Optional coherent LO input/output

Minimized total cost of ownership

- Attractive initial cost
- Long calibration interval of 3 years
- Simplified error diagnostics through built-in selftests

Specifications

RF performance

Frequency

Frequency range	CW	1 MHz to 3 GHz
	I/Q	80 MHz to 3 GHz
	with option R&S®SGT-KB106	
	CW	1 MHz to 6 GHz
	I/Q	80 MHz to 6 GHz
Resolution of setting		0.001 Hz
Resolution of synthesis	f = 1 GHz	0.174 µHz (nom.)
Setting time	to within $< 2 \times 10^{-7}$ for f > 500 MHz or < 100 Hz for f ≤ 500 MHz	
	with PCIe remote control	< 500 µs
Resolution of phase offset setting		0.1°

Reference frequency

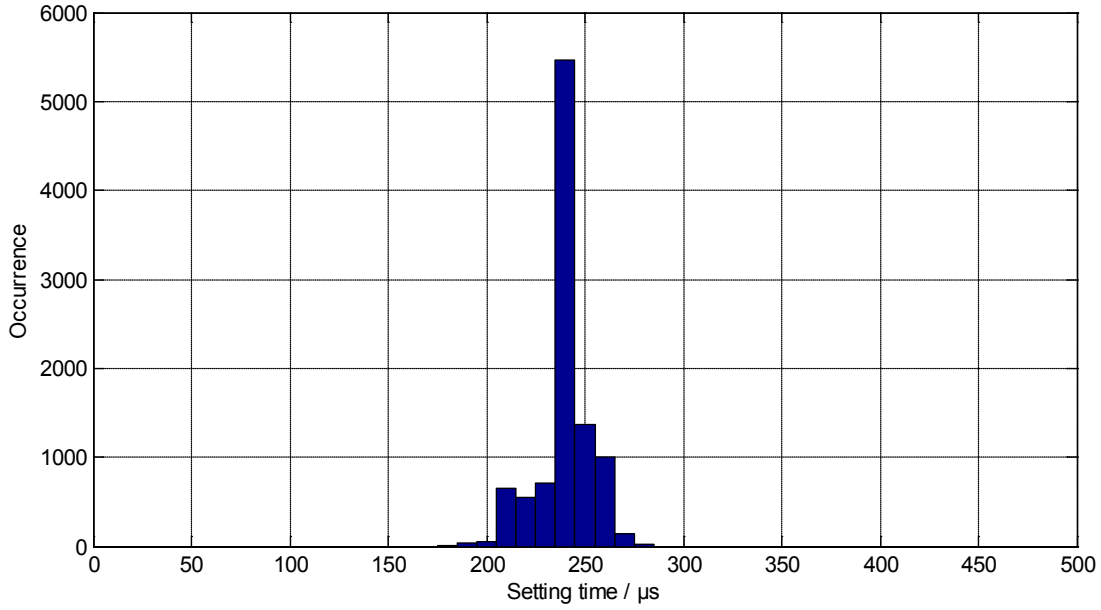
Frequency error	at time of calibration in production	$< 1 \times 10^{-7}$
	with the R&S®SGT-B1 option	$< 1 \times 10^{-8}$
Aging (after 30 days of uninterrupted operation)		$< 1 \times 10^{-6}$/year
	with the R&S®SGT-B1 option	$< 1 \times 10^{-9}$/day, $< 1 \times 10^{-7}$/year
Temperature effect (0 °C to +50 °C)		$< 2 \times 10^{-6}$
	with the R&S®SGT-B1 option	$< 1 \times 10^{-7}$
Warm-up time	to nominal thermostat temperature (with R&S®SGT-B1 option only)	≤ 10 min
Reference frequency output		
Connector type	REF/LO OUT on rear panel	SMA female
Output frequency	sine wave	
	instrument set to internal reference	10 MHz, 1000 MHz
	instrument set to external reference	applied external reference input frequency or 1000 MHz
Output level		+6 dBm to +12 dBm, 9 dBm (typ.)
Source impedance		50 Ω (nom.)
Reference frequency input		
Connector type	REF/LO IN on rear panel	SMA female
Input frequency		10 MHz, 100 MHz, 1000 MHz
Frequency locking range		$\pm 10 \times 10^{-6}$
Input level range		0 dBm to +16 dBm
Input impedance		50 Ω (nom.)

Level

Setting characteristic AUTO: The step attenuator is switched over automatically. The output level is specified over the full range from –120 dBm to +15 dBm.

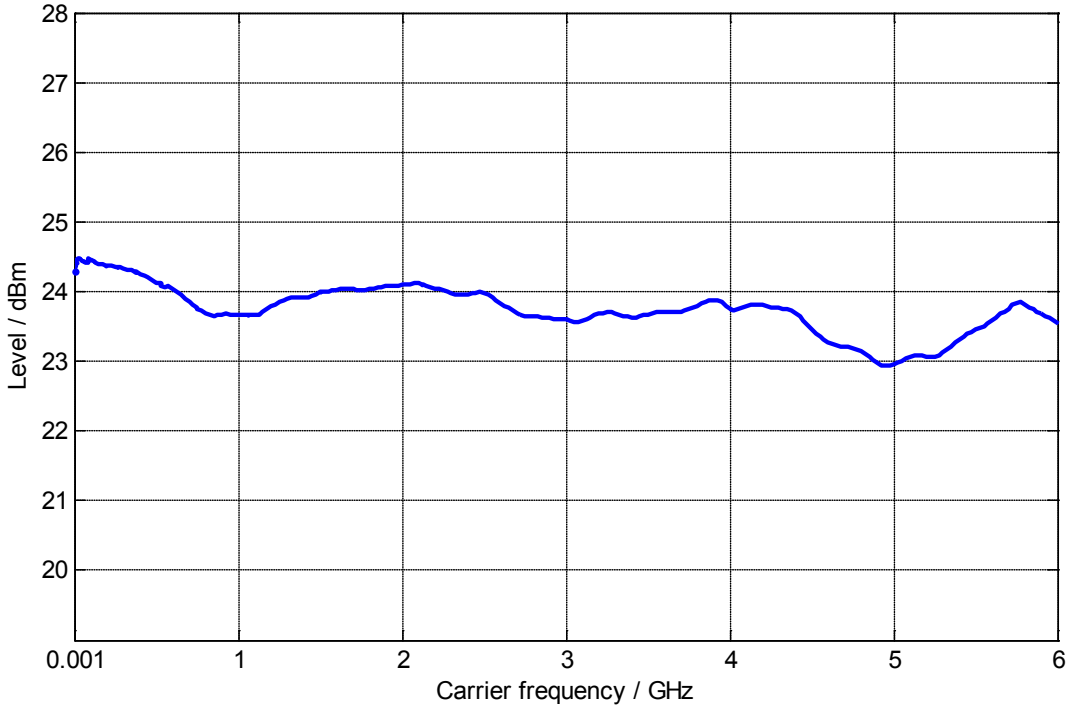
Setting characteristic UNINTERRUPTED LEVEL SETTING: The level is set without changing the step attenuator. The step attenuator is fixed to the current setting. Level changes are performed without interruption. The maximum interruption-free setting range is limited. If this range is exceeded, the spectral purity of the output signal decreases.

Setting range		–120 dBm to +25 dBm
Specified level range		–120 dBm to +15 dBm (PEP) [1]
Resolution of setting		0.01 dB
Level error	Setting Characteristic: AUTO, temperature range from +18 °C to +33 °C	
	1 MHz ≤ f ≤ 3 GHz	< 0.5 dB
	3 GHz < f ≤ 6 GHz	< 0.9 dB
Additional level error for pulse modulation	pulse width ≥ 100 ns	< 0.3 dB (meas.)
Output impedance VSWR in 50 Ω system	in full frequency range, Setting Characteristic: AUTO	< 1.8
Setting time	to < 0.1 dB deviation from final value, Setting Characteristic: AUTO, with PCIe remote control	< 500 µs
Interruption-free level setting range	Setting Characteristic: UNINTERRUPTED LEVEL SETTING	0 dB to +20 dB
Reverse power from 50 Ω	maximum permissible RF power in output	0.5 W
Maximum permissible DC voltage	at RF power connector	35 V

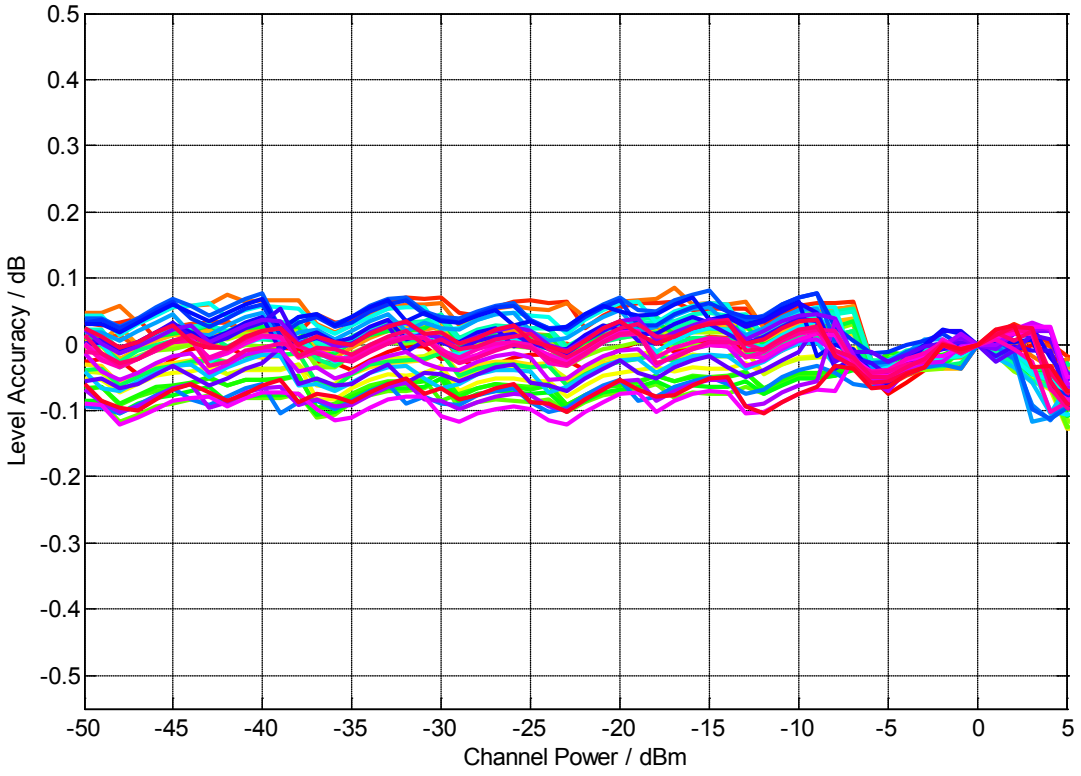


Histogram of level setting times measured via PCIe interface, I/Q modulation from internal baseband. Setting Characteristic AUTO.

[1] PEP = peak envelope power.



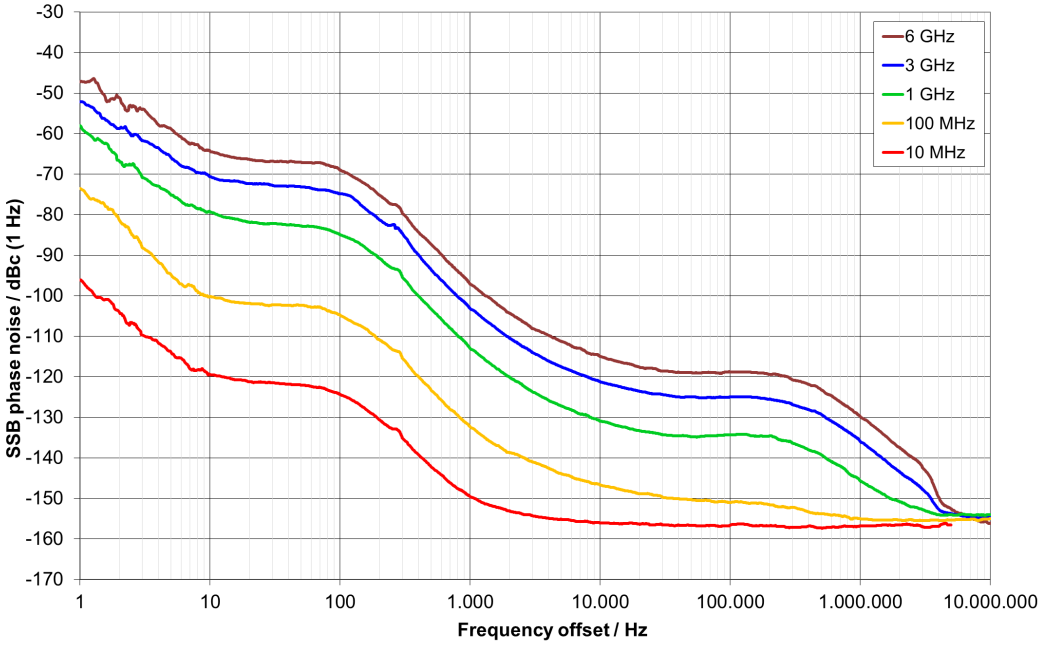
Maximum available level in CW mode, Setting Characteristic: AUTO (meas.).



Level linearity for internally generated LTE uplink signal at various test frequencies (meas.).

Spectral purity

Harmonics	level ≤ 8 dBm, CW, I/Q wideband off	< –30 dBc
Nonharmonics	level > –10 dBm, offset > 10 kHz from carrier	
	f ≤ 1500 MHz	< –76 dBc
	1500 MHz < f ≤ 3000 MHz	< –70 dBc
	3000 MHz < f ≤ 6000 MHz	< –64 dBc
Subharmonics	level > –10 dBm	
	f ≤ 3000 MHz	< –76 dBc
	3000 MHz < f ≤ 6000 MHz	< –68 dBc
Wideband noise	1 MHz ≤ f ≤ 6 GHz, carrier offset 10 MHz, level > 5 dBm, Setting Characteristic: AUTO, 1 Hz measurement bandwidth, CW	< –145 dBc
	80 MHz ≤ f ≤ 6 GHz, carrier offset 10 MHz, level > 5 dBm, Setting Characteristic: AUTO, 1 Hz measurement bandwidth, I/Q	< –135 dBc
SSB phase noise	20 kHz carrier offset, 1 Hz measurement bandwidth	
	f = 1 GHz	< –126 dBc, –133 dBc (meas.)
	f = 2 GHz	< –120 dBc, –127 dBc (meas.)
	f = 6 GHz	< –110 dBc, –117 dBc (meas.)



SSB phase noise with the R&S®SGT-B1 internal OCXO option (meas.).

Phase coherence (R&S®SGT-K90 option)

The R&S®SGT-K90 option provides phase-coherent RF outputs for two or more instruments.

LO coupling modes	This mode corresponds to internal LO operation. The REF/LO OUT connector can provide the internal LO oscillator signal to enable phase-coherent coupling on other instruments.	internal
	This mode corresponds to external LO operation at the REF/LO IN connector. The REF/LO OUT connector can provide the external LO oscillator signal to enable phase-coherent coupling on additional instruments.	external
REF/LO OUT states	The active local oscillator signal can be routed to the REF/LO OUT connector (in order to couple two or more instruments).	REF/LO/OFF
Phase drift over temperature	drift of RF signal phase difference between two LO coupled instruments R&S®SGT100A when changing ambient temperature by +1 °C, f = 6 GHz, level = +10 dBm	0.4° (meas.)

Input of phase coherence signal		
Connector type	REF/LO IN on rear panel	SMA female
Input impedance		50 Ω (nom.)
Input level range of external local oscillator signal		7 dBm to 13 dBm
Frequency range of external local oscillator signal		80 MHz to 6 GHz
Output of phase coherence signal		
Connector type	REF/LO OUT on rear panel	SMA female
Output impedance		50 Ω (nom.)
Output level range of internal local oscillator signal		7 dBm to 13 dBm
Frequency range of internal local oscillator signal		80 MHz to 6 GHz

Simultaneous modulation

	Pulse modulation	I/Q modulation
Pulse modulation		●
I/Q modulation	●	

● = compatible

Pulse modulation (R&S®SGT-K22 option)

The R&S®SGT-K22 option provides pulse modulation capabilities. The pulse modulator can be controlled by an internal pulse generator (comes with R&S®SGT-K22) or by an external pulse signal.

Modulation source		external, internal
On/off ratio		> 80 dB
Rise/fall time	10 % to 90 % of RF amplitude	< 20 ns
External pulse modulation delay		45 ns (meas.)
Pulse repetition frequency		0 Hz to 10 MHz
Video feedthrough	level < 10 dBm	< 10 % of RF
Pulse overshoot	f ≥ 500 MHz	< 10 %

Input for external pulse modulation

Connector type	USER2 on rear panel	SMA female
Input impedance	selectable	10 kΩ or 50 Ω (nom.)
Threshold voltage		1 V (nom.)
Input damage voltage		±5 V
Input polarity	selectable	normal, inverse

Internal pulse generator

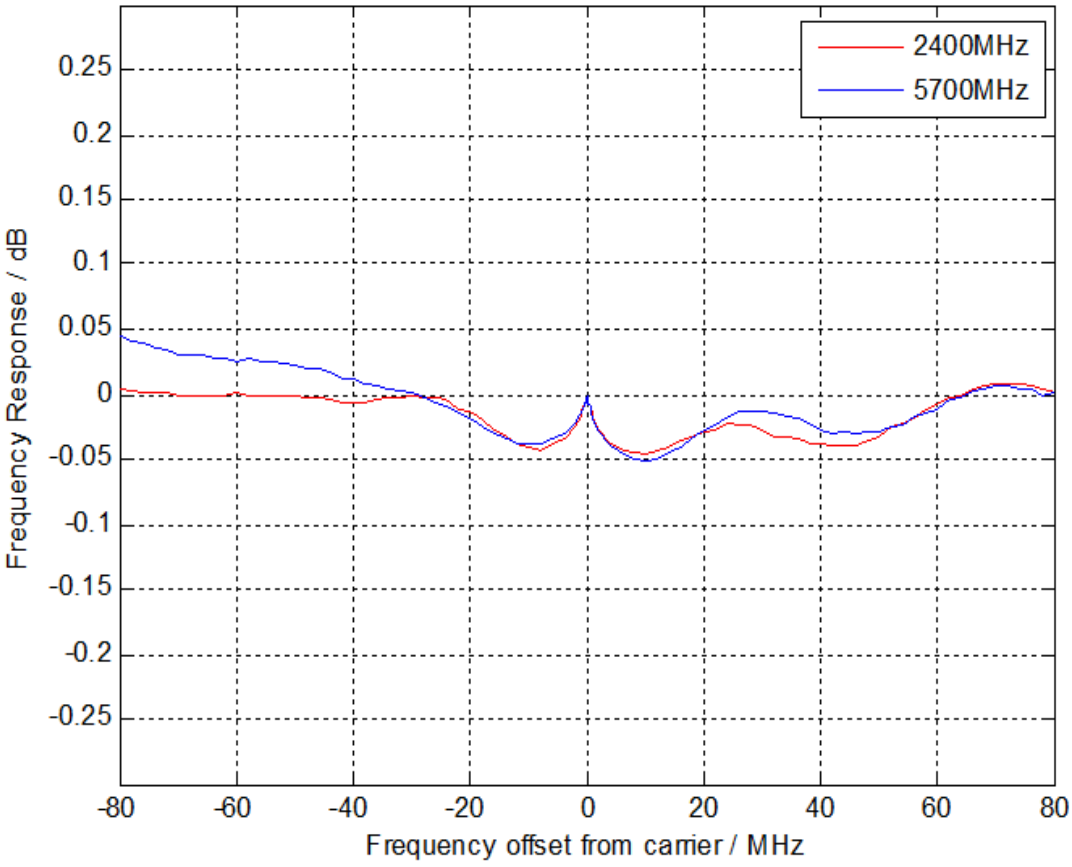
Pulse mode		single pulse, double pulse
Trigger mode	free run, internally triggered	auto
		externally triggered
		externally gated
Active trigger edge		positive or negative
Pulse period		
Setting range		100 ns to 100 s
Setting resolution		10 ns
Pulse width		
Setting range	Pulse widths of double pulses can be set independently.	20 ns to 100 s
Setting resolution		10 ns
Pulse delay		
Setting range	with external trigger	0 s to 100 s
Setting resolution	with external trigger	10 ns
Double pulse delay		
Setting range		40 ns to 100 s
Setting resolution		10 ns
External trigger delay jitter		< 20 ns
Pulse/video output	available on USER2 connector on rear panel in trigger mode auto	LVTTL signal, 3.3 V (nom.)

I/Q modulation

I/Q modulator

Operating modes		external analog I/Q, internal baseband I/Q
RF modulation bandwidth	with external analog I/Q inputs, I/Q wideband off	
	80 MHz ≤ f ≤ 1 GHz	±5 % of carrier frequency
	1 GHz < f ≤ 6 GHz	±50 MHz
	with external analog I/Q inputs, I/Q wideband on	
	100 MHz < f ≤ 2.5 GHz	±20 % of carrier frequency
	2.5 GHz < f ≤ 6 GHz, I/Q wideband	±500 MHz
	with internal baseband I/Q, I/Q wideband on	
	100 MHz < f ≤ 400 MHz	±20 % of carrier frequency
	f > 400 MHz	±80 MHz
RF frequency response	with external analog I/Q inputs, I/Q wideband off	
	80 MHz < f ≤ 1 GHz, up to ±5 % of carrier frequency	< 3 dB (meas.)
	f > 1 GHz, up to ±50 MHz	< 3 dB (meas.)
	with external analog I/Q inputs, I/Q wideband on	
	100 MHz < f ≤ 2.5 GHz, up to ±20 % of carrier frequency	< 6 dB (meas.)
	2.5 GHz < f ≤ 6 GHz, up to ±500 MHz	< 9 dB (meas.)
	with internal baseband I/Q, I/Q wideband on, optimization mode high quality	< 1.0 dB, < 0.3 dB (meas.)
Carrier leakage	with external analog I/Q inputs, without input signal, referenced to full-scale input [2]	< –45 dBc, < –55 dBc (meas.)
Suppression of image sideband for entire instrument in modulation bandwidth	mode: internal baseband I/Q, up to 80 MHz I/Q Bandwidth	> 45 dB, 60 dB (typ.)
Error vector	measured with 16QAM, filter root cosine α = 0.5, 10 kHz symbol rate	
	f > 80 MHz, RMS	< (0.4 % + 0.2 % × f/GHz)
	f > 80 MHz, peak value	< (0.8 % + 0.4 % × f/GHz)
3GPP FDD digital standard, adjacent channel leakage ratio (ACLR)	test model 1, 64 DPCHs, level ≤ 10 dBm PEP, frequency range from 1800 MHz to 2200 MHz	
	5 MHz offset	> 67 dB, 70 dB (meas.)
	10 MHz offset	> 69 dB, 71 dB (meas.)
I/Q impairment settings (analog)	These impairments are set within the analog I/Q modulator section. They can be used in external wideband I/Q mode and internal baseband I/Q mode.	
Offset setting range		–5 % to +5 %
Offset setting resolution		0.01 %
Gain imbalance setting range		–1.0 dB to +1.0 dB
Gain imbalance setting resolution		0.001 dB
Quadrature offset setting range		–8° to +8°
Quadrature offset setting resolution		0.01°

[2] Value applies after internal readjustment.



I/Q modulation frequency response with internal baseband (meas.).

Baseband bypass mode for externally generated I/Q signals

The baseband bypass mode allows to generate modulated signals below the specified frequency range of the I/Q modulator. Externally generated signals applied to the I or Q baseband input connector can be leveled and amplified by the instrument and are provided at the RF output connector.

For the baseband bypass mode, only the data specified in this section is valid.

Level setting range		–120 dBm to +25 dBm
Specified level range		–120 dBm to +15 dBm
Frequency response	1 MHz ≤ f ≤ 80 MHz, level = 10 dBm	< 3 dB, < 1 dB (meas.)
Level error	attenuator mode AUTO, temperature range from +18 °C to +33 °C, referenced to full-scale input at I or Q connector, 1 MHz ≤ f ≤ 80 MHz	< 3 dB
Level linearity	attenuator mode FIXED, for setting range of 0 dB to +20 dB	< 2 dB, < 0.5 dB (meas.)

Analog I/Q inputs

Connector types	I, Q on rear panel	SMA female
Input impedance		50 Ω (nom.)
VSWR	up to 100 MHz	< 1.2
	100 MHz up to 500 MHz	< 1.5
Input voltage for full-scale input		$\sqrt{V_i^2 + V_q^2} = 0.5\ V$ (nom.)
Input damage voltage		±1 V

Internal baseband I/Q

D/A converter	resolution	16 bit
Aliasing filter	with amplitude, group-delay and Si correction	
	bandwidth (drop to –0.1 dB)	80 MHz (nom.)
	D/A converter interpolation spectra	
	up to 80 MHz	< –80 dBc
I/Q impairments	I offset, Q offset	
	setting range	–10 % to +10 %
	resolution	0.01 %
	gain imbalance	
	setting range	–1 dB to +1 dB
	resolution	0.001 dB
	quadrature offset	
	setting range	–10° to +10°
	resolution	0.01°

Arbitrary waveform generator (R&S®SGT-K510 option)

Waveform length		1 sample to 32 Msample in one-sample steps
	with R&S®SGT-K511 option	1 sample to 256 Msample in one-sample steps
	with R&S®SGT-K511 and R&S®SGT-K512 options	1 sample to 1 Gsample in one-sample steps
Nonvolatile memory		SSD 60 Gbyte
Sample rate		400 Hz to 75 MHz
	with R&S®SGT-K521 option	400 Hz to 150 MHz
	with R&S®SGT-K522 option	400 Hz to 200 MHz
Sample resolution	equivalent to D/A converter	16 bit
Sample clock source		internal, external
Sample frequency error	internal clock	< (5 × 10^{-14} + reference frequency error) × sample rate (nom.)
Bandwidth (RF) using the maximum sample rate		60 MHz (nom.)
	with R&S®SGT-K521 option	120 MHz (nom.)
	with R&S®SGT-K522 option	160 MHz (nom.)
Bandwidth (RF) using a reduced sample rate (drop to –0.1 dB)	The waveform is automatically interpolated to the internal sample rate of 300 MHz.	
		0.8 × sample rate (nom.)
Frequency offset setting range		–30 MHz to 30 MHz
	with R&S®SGT-K521 option	–60 MHz to 60 MHz
	with R&S®SGT-K522 option	–80 MHz to 80 MHz
Frequency offset resolution		0.01 Hz
Frequency offset error		< (5 × 10^{-10} + reference frequency error) × frequency offset (nom.)
Triggering	source	internal, external
	operating modes	auto, retrig, armed auto, armed retrig, single, next
	external trigger delay (in sample)	
	setting range	0 to (2^{16} – 1)
	resolution	0.01
	jitter	±1.67 ns (nom.)
	external trigger inhibit (in sample)	
	setting range	0 to (2^{26} – 1)
	resolution	1
	external trigger pulse width	> 20 ns (nom.)
Marker outputs	number	2
	level	LVTTL
	operating modes	unchanged, restart, pulse, pattern, ratio, trigger
	marker delay (in sample)	
	setting range	0 to (waveform length – 1)
	setting range without recalculation	0 to 2000
	resolution of setting	1

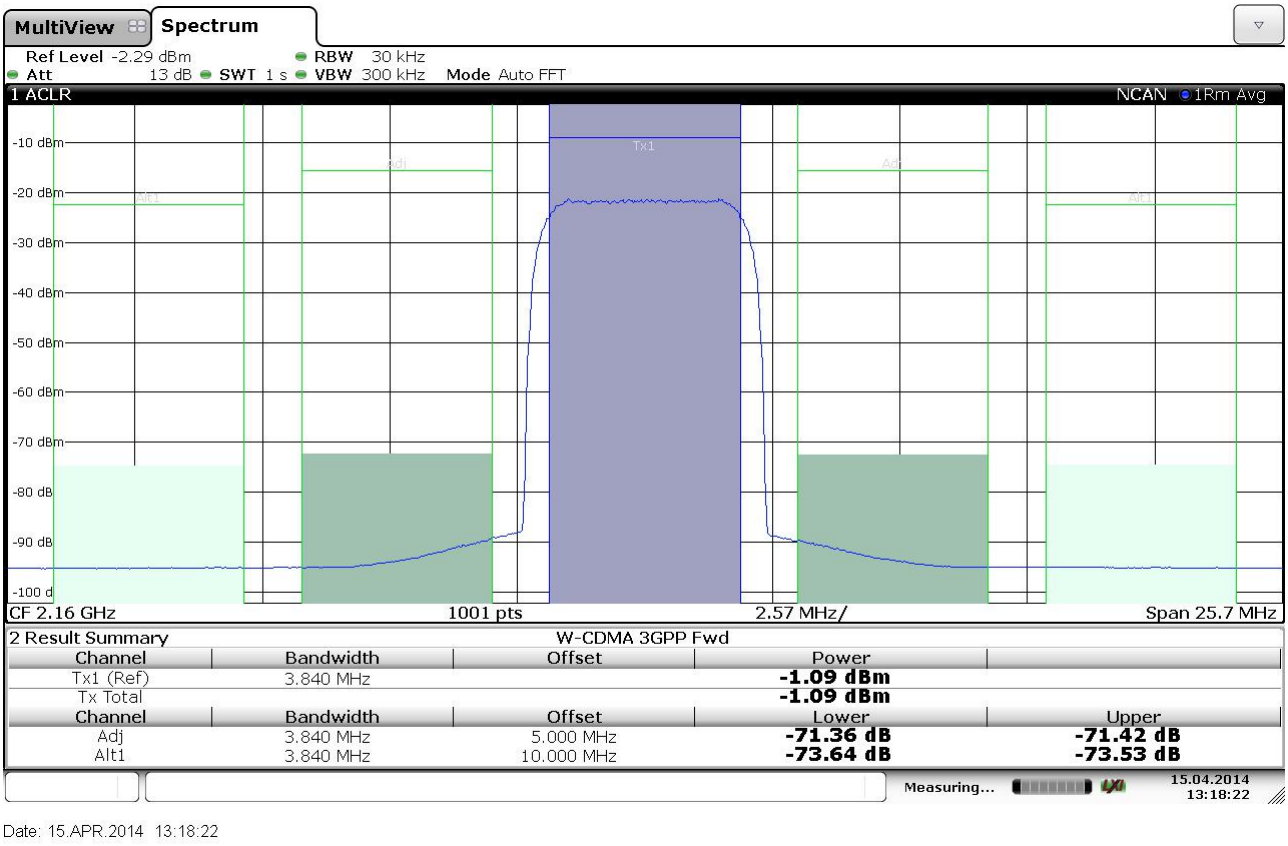
Multisegment and multicarrier arbitrary waveform mode

Multisegment waveform	number of segments	max. 100 segments
	changeover modes	GUI, remote control, external trigger
	extended trigger modes	same segment, next segment, next segment seamless, sequencer
	changeover time at 50 MHz clock rate (external trigger, without clock change)	5 µs (meas.)
	seamless changeover	output up to end of current segment, followed by changeover to next segment
	sequencer play list length	max. 1024
	sequencer segment repetitions	max. 65535
Multicarrier waveform	number of carriers	max. 32
	carrier spacing	
	setting range	depends on number of carriers and bandwidth (RF)
	resolution	0.01 Hz
	crest factor modes	maximize, minimize, off
	signal period modes	longest file, shortest file, user (max. 1 s)
	single carrier gain	
	setting range	–80 dB to 0 dB
	resolution	0.01 dB
	single carrier start phase	
	setting range	0° to 360°
	resolution	0.01°
	single carrier delay	
	setting range	0 s to 1 s
	resolution	1 ns

Operation with R&S®WinIQSIM2™:
The software supports download of I/Q data and basic control of the arbitrary waveform generator.

Modulation performance for GSM/EDGE and 3GPP FDD digital standards

GSM/EDGE	with R&S®SGT-K240 option level ≤ 13 dBm PEP, frequency range from 400 MHz to 2000 MHz	
Burst on/off ratio		100 dB (meas.)
Phase error	MSK, Gaussian filter B × T = 0.3	
	RMS	< 0.4°, 0.15° (typ.)
	peak	0.4° (meas.)
Error vector magnitude	8PSK EDGE, Gaussian linearized filter, RMS	< 0.5 %, 0.25 % (typ.)
Power density spectrum	values measured with 30 kHz resolution bandwidth, referenced to level in band center without power ramping	
	200 kHz offset	< –34 dB, –38 dB (typ.)
	400 kHz offset	< –66 dB, –70 dB (typ.)
	600 kHz offset	< –74 dB, –78 dB (typ.)
3GPP FDD	with R&S®SGT-K242 option level ≤ 0 dBm RMS, frequency range from 1800 MHz to 2200 MHz	
Error vector magnitude	1 DPCH, RMS	< 0.8 %, 0.4 % (typ.)
Adjacent channel leakage ratio (ACLR)	test model 1, 64 DPCHs	
	offset 5 MHz	> 68 dB, 71 dB (typ.)
	offset 10 MHz	> 70 dB, 73 dB (typ.)



Digital standard 3GPP FDD test model 1, 64 DPCHs ACLR (meas.).

Digital standards with R&S®WinIQSIM2™

R&S®WinIQSIM2™ requires an external PC.

The options are described in the R&S®WinIQSIM2™ data sheet (PD 5213.7460.22).

Cellular standards
EUTRA/LTE (R&S®SGT-K255 option)
EUTRA/LTE Release 9 and enhanced features (R&S®SGT-K284 option, R&S®SGT-K255 required)
EUTRA/LTE Release 10/LTE-Advanced (R&S®SGT-K285 option, R&S®SGT-K255 required)
3GPP FDD (R&S®SGT-K242 option)
3GPP FDD/HSPA/HSPA+, enhanced BS/MS tests (R&S®SGT-K283 option, R&S®SGT-K242 required)
GSM/EDGE (R&S®SGT-K240 option)
EDGE EVOLUTION (R&S®SGT-K241 option, R&S®SGT-K240 required)
CDMA2000® (R&S®SGT-K246 option)
1xEV-DO (R&S®SGT-K247 option)
1xEV-DO Rev. B (R&S®SGT-K287 option, R&S®SGT-K247 required)
TD-SCDMA (3GPP TDD LCR) (R&S®SGT-K250 option)
TD-SCDMA (3GPP TDD LCR) enhanced BS/MS test including HSDPA (R&S®SGT-K251 option, R&S®SGT-K250 required)
TETRA Release 2 (R&S®SGT-K268 option)
Wireless connectivity standards
IEEE 802.11 a/b/g/n (R&S®SGT-K254 option)
IEEE 802.11 ac (R&S®SGT-K286 option, R&S®SGT-K254 required)
IEEE 802.16 (R&S®SGT-K249 option)
Bluetooth® EDR/low energy (R&S®SGT-K260 option)
NFC A/B/C (R&S®SGT-K289 option)
Navigation standards
GPS 1 satellite (R&S®SGT-K244 option)
Galileo 1 satellite (R&S®SGT-K266 option)
Glonass 1 satellite (R&S®SGT-K294 option)
BeiDou 1 satellite (R&S®SGT-K407 option)
Broadcast standards
DVB-H/DVB-T (R&S®SGT-K252 option)
DAB/T-DMB (R&S®SGT-K253 option)
Other standards and modulation systems
Multicarrier CW signal generation (R&S®SGT-K261 option)
Additional white Gaussian noise (AWGN) (R&S®SGT-K262 option)

Digital baseband connectivity (R&S®SGT-K18 option)

External digital I/Q signals can be fed in to the baseband section. The digital I/Q connectivity can be used for the lossless connection of the R&S®SGT100A to the digital I/Q output of other Rohde & Schwarz instruments (e.g. R&S®SMW200A vector signal generator). One R&S®SGT-K18 can be installed.

Input parameters

Input level	peak level	
	setting range	–60 dB to +3 dB referenced to full scale
	resolution	0.01 dB
	crest factor	
	setting range	0 dB to +30 dB
	resolution	0.01 dB
	The adjust level function automatically determines the peak level and crest factor of the input signal.	
Frequency offset	With the aid of the frequency offset, the center frequency of the input signal can be shifted in the baseband. The restrictions caused by the modulation bandwidth apply.	
	setting range	–80 MHz to +80 MHz
	resolution	0.01 Hz
	frequency accuracy	< 5 × 10 – 10 × frequency offset + reference frequency error
I/Q swap	I and Q signals swapped	on/off
Interface	standard	in line with Rohde & Schwarz standard for digital I/Q interface
	level	LVDS
	connector	26-pin MDR
	data rate	up to 200 MHz
I/Q sample rate	With source ‘user-defined’, the sample rate must be entered via the parameter ‘sample rate’, no I/Q data clock being necessary. With source ‘digital I/Q in’, the sample rate will be estimated on the basis of the applied I/Q data clock.	
	source	user-defined, digital I/Q in
	sample rate	400 Hz to 200 MHz, max. sample rate depending on interface data rate
	resolution (user-defined)	0.001 Hz
	frequency uncertainty (user-defined)	$< 5 \times 10^{-14}$
I/Q data	resolution	18 bit
	logic format	two’s complement
	bandwidth	0.33 × sample rate
Control signals	markers	4
	data valid	valid samples marked in data stream

Internal additive white Gaussian noise (AWGN, R&S®SGT-K62 option)

Addition of an AWGN signal of settable bandwidth and settable C/N ratio or E_b/N_0 to a wanted signal.

Noise	distribution density	Gaussian, statistical, separate for I and Q
	crest factor	> 15 dB
	periodicity	> (2^{800} – 1)/300 MHz
C/N, E_b/N_0	setting range	–30 dB to +30 dB
	resolution	0.1 dB
	uncertainty for system bandwidth = symbol rate –24 dB < C/N < 30 dB and crest factor < 12 dB	< 0.1 dB
System bandwidth	bandwidth for determining noise power	
	setting range	
	standard	1 kHz to 60 MHz
	with R&S®SGT-K521 option	1 kHz to 120 MHz
	with R&S®SGT-K522 option	1 kHz to 160 MHz
	setting resolution	100 Hz

Remote control

Systems		PCIe (single lane)
		Ethernet (TCP/IP) 10/100/1000BaseT
		USB 2.0
Command set	remote control via Ethernet, USB	SCPI 1999.5 or compatible command sets
	remote control via PCIe	Rohde & Schwarz instrument driver

Connectors

Rear panel connectors

RF 50 Ω	RF output	SMA female
REF/LO IN	reference frequency input or external LO signal input	SMA female
REF/LO OUT	reference frequency output or internal LO signal output	SMA female
I, Q	input connector for I and Q baseband signals input for I/Q vector-modulated IF signals up to 80 MHz	SMA female
DIG IQ IN	digital input connectivity in line with R&S®Digital I/Q Interface	26-pin MDR
USER1	multipurpose input/output	SMA female
USER2	pulse and multipurpose input/output	SMA female
USB IN	remote control of instrument	USB (micro USB)
LAN	remote control of instrument	RJ-45
PCI Express	remote control of instrument	single lane, according to PCI Express external cabling specification

General data

Power supply		
AC input voltage range		100 V to 240 V ± 10 %
AC supply frequency		50 Hz to 60 Hz, –5 %/+5 %
Max. input current		1.7 A
Power consumption		65 W (meas.)
Power factor correction		in line with EN 61000-3-2
Electrical safety		
Compliance		in line with IEC 61010-1, EN 61010-1, CAN/CSA-C22.2 No. 61010-1-04, UL 61010-1
Test mark		VDE-GS, $_{C}$CSA$_{US}$
EMC		
Electromagnetic compatibility		in line with EN 55011 class A, EN 61326-1 (industrial environment), EN 61326-2-1
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 150 Hz, max. 2 g at 55 Hz, const. 0.5 g at 55 Hz to 150 Hz, in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64
Shock		in line with MIL-STD-810E, method no. 516.4, procedure I, 40 g shock spectrum
Environmental conditions		
Temperature range	operating temperature range	0 °C to +50 °C, in line with EN 60068-2-1, EN 60068-2-2
	storage temperature range	–40 °C to +71 °C
Climatic resistance		+40 °C/95 % rel. humidity, in line with EN 60068-2-30
Altitude	operating	up to 4600 m
	storage	up to 4600 m
Dimensions	W × H × D	250 mm × 52.5 mm × 401 mm (9.84 in × 2.07 in × 15.79 in) 1 HU, ½ 19" rack width
Weight	when fully equipped	4.0 kg (8.82 lb)
Calibration interval		
Recommended calibration interval	40 h/week operation in the full range of the specified environmental conditions	3 years

Ordering information

Designation	Type	Order No.
SGMA Vector RF Source, 1 MHz to 3 GHz RF, baseband hardware included	R&S®SGT100A	1419.4501.02
Including power cable, Quick Start Guide and CD-ROM (with operating and service manual)		
RF options		
Frequency extension to 6 GHz	R&S®SGT-KB106	1419.5708.02
Reference Oscillator OCXO	R&S®SGT-B1	1419.5608.02
Pulse Modulation	R&S®SGT-K22	1419.6279.02
Phase Coherent Input/Output	R&S®SGT-K90	1419.6333.02
Baseband options		
Digital baseband connectivity	R&S®SGT-K18	1419.6240.02
ARB baseband generator, 32 MS, 60 MHz RF bandwidth	R&S®SGT-K510	1419.7500.02
ARB memory extension to 256 Msample	R&S®SGT-K511	1419.6362.02
ARB memory extension to 1 GSample	R&S®SGT-K512	1419.6391.02
ARB bandwidth extension to 120 MHz RF Bandwidth	R&S®SGT-K521	1419.6427.02
ARB bandwidth extension to 160 MHz RF Bandwidth	R&S®SGT-K522	1419.6456.02
Noise generation		
Additive White Gaussian Noise (AWGN)	R&S®SGT-K62	1419.6304.02
Digital modulation systems using R&S®WinIQSIM2™ [3]		
GSM/EDGE	R&S®SGT-K240	1419.5950.02
EDGE Evolution	R&S®SGT-K241	1419.6004.02
3GPP FDD	R&S®SGT-K242	1419.6056.02
GPS	R&S®SGT-K244	1419.6104.02
CDMA2000® incl. 1x EV-DV	R&S®SGT-K246	1419.6156.02
1xEV-DO Rev. A	R&S®SGT-K247	1419.6204.02
IEEE 802.16	R&S®SGT-K249	1419.6504.02
TD-SCDMA	R&S®SGT-K250	1419.6556.02
TD-SCDMA Enhanced BS/MS Tests	R&S®SGT-K251	1419.6604.02
DVB-H	R&S®SGT-K252	1419.6656.02
DAB/T-DMB	R&S®SGT-K253	1419.6704.02
IEEE 802.11a/b/g/n	R&S®SGT-K254	1419.6756.02
EUTRA/LTE	R&S®SGT-K255	1419.6804.02
Bluetooth® EDR	R&S®SGT-K260	1419.6856.02
Multicarrier CW Signal Generation	R&S®SGT-K261	1419.6904.02
Additive White Gaussian Noise (AWGN)	R&S®SGT-K262	1419.6956.02
Galileo	R&S®SGT-K266	1419.7000.02
TETRA Release 2	R&S®SGT-K268	1419.7052.02
3GPP FDD HSPA/HSPA+	R&S®SGT-K283	1419.7100.02
EUTRA/LTE Rel.9, enhanced features	R&S®SGT-K284	1419.7152.02
EUTRA/LTE Release 10 (LTE Adanced)	R&S®SGT-K285	1419.7200.02
IEEE 802.11ac	R&S®SGT-K286	1419.7252.02
1xEV-DO Rev. B	R&S®SGT-K287	1419.7300.02
NFC A/B/F	R&S®SGT-K289	1419.7352.02
Glonass	R&S®SGT-K294	1419.7400.02
BeiDou	R&S®SGT-K407	1419.7452.02
Waveform package for signals from R&S®WinIQSIM2™ [3]		
1 Waveform	R&S®SGT-K200 var. 71	1419.5850.71
5 Waveforms	R&S®SGT-K200 var. 72	1419.5850.72
50 Waveforms	R&S®SGT-K200 var. 75	1419.5850.75
Recommended extras		
Documentation of Calibration Values	R&S®DCV-2	0240.2193.18
Hardcopy manuals (in English)		1176.8674.02
19" Rack Adapter, suitable for installation of two R&S®SGMA instruments (for two 1 HU instruments next to each other	R&S®ZZA-KN20	1175.3191.00
19" Rack Adapter (for one instrument and spacing module)	R&S®ZZA-KN21	1175.3204.00

[3] R&S®WinIQSIM2™ requires an external PC.

Service options		
Extended Warranty, one year	R&S®WE1	Please contact your local Rohde & Schwarz sales office.
Extended Warranty, two years	R&S®WE2	
Extended Warranty, three years	R&S®WE3	
Extended Warranty, four years	R&S®WE4	
Extended Warranty with Calibration Coverage, one year	R&S®CW1	
Extended Warranty with Calibration Coverage, two years	R&S®CW2	
Extended Warranty with Calibration Coverage, three years	R&S®CW3	
Extended Warranty with Calibration Coverage, four years	R&S®CW4	

Extended warranty with a term of one to four years (WE1 to WE4)
Repairs carried out during the contract term are free of charge [4]. Necessary calibration and adjustments carried out during repairs are also covered. Simply contact the forwarding agent we name; your product will be picked up free of charge and returned to you in top condition a couple of days later.

Extended warranty with calibration (CW1 to CW4)
Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs [4] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

For product brochure, see PD 3607.0217.12 and www.rohde-schwarz.com

[4] Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

Service that adds value

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde&Schwarz

The Rohde&Schwarz electronics group is a leading supplier of solutions in the fields of test and measurement, broadcasting, secure communications, and radiomonitoring and radiolocation. Founded more than 80 years ago, this independent global company has an extensive sales network and is present in more than 70 countries.
The company is headquartered in Munich, Germany.

Sustainable product design

- Environmental compatibility and eco-footprint
- Energy efficiency and low emissions
- Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

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