R&S®FSW
Signal and Spectrum Analyzer
Specifications

ROHDE&SCHWARZ

Test&Measurement

Data Sheet | 19.00

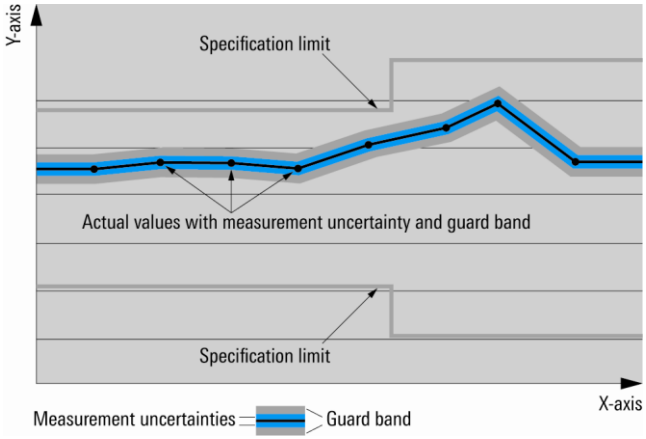
CONTENTS

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.

Specifications

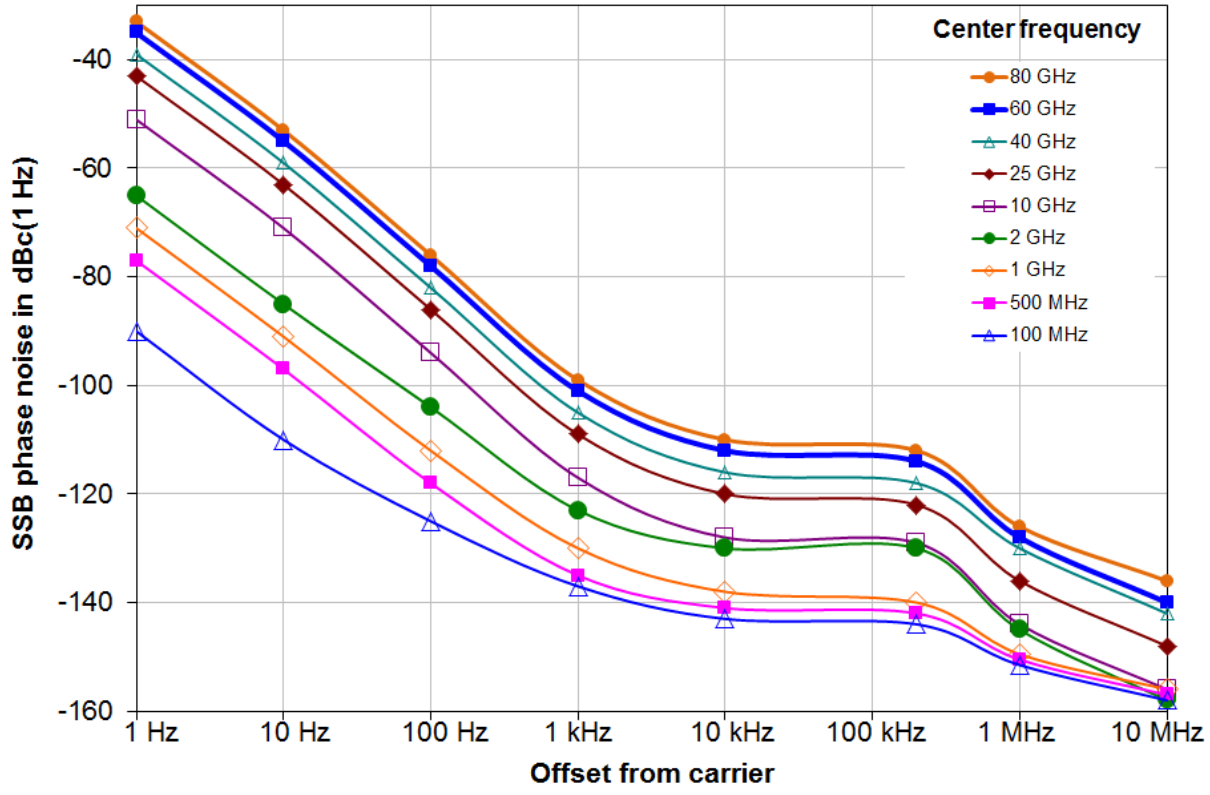
Frequency

Frequency range	R&S®FSW8	
	DC coupled	2 Hz to 8 GHz
	AC coupled	10 MHz to 8 GHz
	R&S®FSW13	
	DC coupled	2 Hz to 13.6 GHz
	AC coupled	10 MHz to 13.6 GHz
	R&S®FSW26	
	DC coupled	2 Hz to 26.5 GHz
	AC coupled	10 MHz to 26.5 GHz
	R&S®FSW43	
	DC coupled	2 Hz to 43.5 GHz
	AC coupled	10 MHz to 43.5 GHz
	R&S®FSW50	
	DC coupled	2 Hz to 50 GHz
	AC coupled	10 MHz to 50 GHz
	R&S®FSW67	
	DC coupled	2 Hz to 67 GHz
	AC coupled	10 MHz to 67 GHz
	R&S®FSW85	
	DC coupled	2 Hz to 85 GHz
	AC coupled	10 MHz to 85 GHz
	max. supported center frequency, YIG preselector = off	86 GHz
Frequency resolution		0.01 Hz

Reference frequency, internal		
Accuracy		±(time since last adjustment × aging rate + temperature drift + calibration accuracy)
Aging per year	standard	$\pm 1 \times 10^{-7}$
	with R&S®FSW-B4 OCXO precision frequency reference option	$\pm 3 \times 10^{-8}$
Temperature drift (0 °C to +50 °C)	standard	$\pm 1 \times 10^{-7}$
	with R&S®FSW-B4 OCXO precision frequency reference option	$\pm 1 \times 10^{-9}$
Achievable initial calibration accuracy	standard	$\pm 1 \times 10^{-8}$
	with R&S®FSW-B4 OCXO precision frequency reference option	$\pm 5 \times 10^{-9}$

Frequency readout		
Marker resolution		1 Hz
Uncertainty		±(marker frequency × reference accuracy + 10 % × resolution bandwidth + ½ (span/(sweep points – 1)) + 1 Hz)
Number of sweep (trace) points	default value	1001
	range	101 to 100001
Marker tuning frequency step size	marker step size = sweep points	span/(sweep points – 1)
	marker step size = standard	span/(default sweep points – 1)
Frequency counter resolution		0.001 Hz
Count accuracy		±(frequency × reference accuracy + ½ (last digit))
Display range for frequency axis		0 Hz, 10 Hz to max. frequency
Resolution		0.1 Hz
Max. span deviation		±0.1 %

Spectral purity		
SSB phase noise	frequency = 1000 MHz, carrier offset	
	10 Hz, without R&S®FSW-B4 option	–80 dBc (1 Hz) (nom.)
	10 Hz, with R&S®FSW-B4 option	–90 dBc (1 Hz) (nom.)
	100 Hz	–106 dBc (1 Hz), typ. –112 dBc (1 Hz)
	1 kHz	< –125 dBc (1 Hz), typ. –130 dBc (1 Hz)
	10 kHz	< –134 dBc (1 Hz), typ. –138 dBc (1 Hz)
	100 kHz	< –136 dBc (1 Hz), typ. –140 dBc (1 Hz)
	1 MHz	< –145 dBc (1 Hz), typ. –149 dBc (1 Hz)
	10 MHz	–156 dBc (1 Hz) (nom.)
Residual FM	frequency = 1000 MHz, RBW = 1 kHz, sweep time = 100 ms	< 0.1 Hz (nom.)



Typical phase noise at different center frequencies (with the R&S®FSW-B4 option for offsets ≤ 10 Hz).

Sweep time

Sweep time range	span = 0 Hz	1 µs to 16000 s
	span ≥ 10 Hz	3 µs to 16000 s [1]
Sweep time accuracy	span = 0 Hz	±0.1 % (nom.)
	span ≥ 10 Hz	±3 % (nom.)

[1] The selected sweep time is the net data acquisition time (without the extra time needed for hardware settling or FFT processing).

Resolution bandwidths

Sweep filters and FFT filters		
Resolution bandwidths (–3 dB)		1 Hz to 10 MHz in 1/2/3/5 sequence, 3.9 kHz, 6.25 kHz additionally
	with R&S®FSW-B8 option	20 MHz, 50 MHz, 80 MHz additionally [2]
Bandwidth uncertainty		< 3 % (nom.)
Shape factor 60 dB:3 dB		< 5 (nom.)

Channel filters		
Bandwidths (–3 dB)	standard (RRC = root raised cosine)	100 Hz, 200 Hz, 300 Hz, 500 Hz
		1/1.5/2/2.4/2.7/3/3.4/4/4.5/5/6/8.5/9/10/ 12.5/14/15/16/18 (RRC)/20/21/ 24.3 (RRC)/25/30/50/100/150/192/200/ 300/500 kHz
		1/1.228/1.28 (RRC)/1.5/2/3/3.84 (RRC)/ 4.096 (RRC)/5/10 MHz
	with R&S®FSW-B8 option	20 MHz, 28 MHz, 40 MHz, 80 MHz additionally
Bandwidth accuracy		< 2 % (nom.)
Shape factor 60 dB:3 dB		< 2 (nom.)

EMI filters (with R&S®FSW-K54 only)		
Bandwidths (–6 dB)		10 Hz, 100 Hz, 200 Hz, 1 kHz, 9 kHz, 10 kHz, 100 kHz, 120 kHz, 1 MHz
Bandwidth uncertainty		< 3 % (nom.)
Shape factor 60 dB:3 dB		< 6 (nom.)

Video bandwidths	standard	1 Hz to 10 MHz in 1/2/3/5 sequence
	with R&S®FSW-B8 option	20 MHz, 50 MHz, 80 MHz additionally

Max. signal analysis bandwidth	equalized	
	standard	10 MHz (nom.) [3]
	with R&S®FSW-B28 option	28 MHz (nom.) [3]
	with R&S®FSW-B40 option	40 MHz (nom.) [3]
	with R&S®FSW-B80 option	80 MHz (nom.) [3]
	with R&S®FSW-B160 option	160 MHz (nom.) [3]
	with R&S®FSW-B320 option	320 MHz (nom.) [3]
	with R&S®FSW-B512 option	512 MHz (nom.) [3]
	with R&S®FSW-B2000 option	2 GHz (nom.) [4]

[2] The additional resolution bandwidths are available for span ≥ 0 Hz for instruments starting from the following serial numbers: R&S®FSW8: 101580, R&S®FSW13: 101279, R&S®FSW26: 102000, R&S®FSW43: 100744, R&S®FSW50: 101024, R&S®FSW67: 101150. For instruments with lower serial numbers, the additional resolution bandwidths are available for span = 0 Hz only.

[3] YIG preselector off for f ≥ 8 GHz.

[4] The R&S®FSW-B2000 option can be combined with the base unit or any other analysis bandwidth option. For detailed specifications, see section "R&S®FSW-B2000 2 GHz analysis bandwidth".

Level

Level display		
Display range		displayed noise floor up to +30 dBm
Logarithmic level axis		1 dB to 200 dB, in steps of 1/2/5
Linear level axis		10 % of reference level per level division, 10 divisions or logarithmic scaling
Number of traces		6
Trace detector		max. peak, min. peak, auto peak (normal), sample, RMS, average
	with R&S®FSW-K54	quasi-peak additionally
Trace functions		clear/write, max. hold, min. hold, average, view
Setting range of reference level		–130 dBm to (–10 dBm + RF attenuation – RF preamplifier gain), in steps of 0.01 dB
Units of level axis	logarithmic level display	dBm, dBµV, dBmV, dBµA, dBpW
	linear level display	µV, mV, µA, mA, pW, nW

Max. input level		
DC voltage	AC coupled	
	R&S®FSW8 to R&S®FSW67	50 V
	R&S®FSW85	25 V
	DC coupled	0 V
CW RF power	RF attenuation = 0 dB	20 dBm (= 0.1 W)
	RF attenuation ≥ 10 dB	
	without R&S®FSW-B25 option or with R&S®FSW-B25 option installed and mechanical attenuation ≥ 10 dB	30 dBm (= 1 W)
Pulse spectral density	RF attenuation = 0 dB, RF preamplifier off	97 dB µV/MHz
Max. pulse voltage	without R&S®FSW-B25 option or electronic attenuation off	
	RF attenuation ≥ 10 dB	150 V
	with R&S®FSW-B25 option installed, electronic attenuation on	
	mechanical attenuation = 0 dB	25 V
	mechanical attenuation ≥ 10 dB	75 V
Max. pulse energy, pulse duration τ = 10 µs	without R&S®FSW-B25 option or electronic attenuation off	
	RF attenuation ≥ 10 dB	1 mWs
	with R&S®FSW-B25 option installed, electronic attenuation on	
	mechanical attenuation ≥ 10 dB	1 mWs

Intermodulation		
1 dB compression of input mixer (two-tone)	RF attenuation = 0 dB, RF preamplifier off	
	$f_{in} \leq 3$ GHz	+15 dBm (nom.)
	3 GHz < $f_{in} \leq 8$ GHz	+10 dBm (nom.)
	$f_{in} > 8$ GHz	+7 dBm (nom.)
	with R&S®FSW-B24 option, RF attenuation = 0 dB, RF preamplifier on	
	$f_{in} \leq 3$ GHz	–13 dBm (nom.)
	3 GHz < $f_{in} \leq 8$ GHz	–20 dBm (nom.)
	$f_{in} > 8$ GHz	–23 dBm (nom.)

Third-order intercept point (TOI)	R&S®FSW8, R&S®FSW13, R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67, RF attenuation = 0 dB, level 2 × –15 dBm, ∆f > 5 × RBW, RF preamplifier off	
	f_{in} < 10 MHz	28 dBm (nom.)
	10 MHz ≤ f_{in} < 1 GHz	> 25 dBm, typ. 30 dBm
	1 GHz ≤ f_{in} < 3 GHz	> 20 dBm, typ. 25 dBm [5]
	3 GHz ≤ f_{in} < 8 GHz	> 17 dBm, typ. 20 dBm
	R&S®FSW85, RF attenuation = 0 dB, level 2 × –15 dBm, ∆f > 5 × RBW, RF preamplifier off	
	f_{in} < 100 MHz	22 dBm (nom.)
	100 MHz ≤ f_{in} < 1 GHz	> 22 dBm, typ. 30 dBm
	1 GHz ≤ f_{in} < 3 GHz	> 20 dBm, typ. 25 dBm [5]
	3 GHz ≤ f_{in} < 8 GHz	> 17 dBm, typ. 20 dBm
	R&S®FSW13, R&S®FSW26, RF attenuation = 0 dB, level 2 × –15 dBm, ∆f > 5 × RBW, YIG preselector on, RF preamplifier off	
	8 GHz ≤ f_{in} < 10 GHz	> 14 dBm, typ. 17 dBm
	10 GHz ≤ f_{in} < 12 GHz	> 16 dBm, typ. 20 dBm
	12 GHz ≤ f_{in} < 17 GHz	> 18 dBm, typ. 23 dBm
	17 GHz ≤ f_{in} < 19 GHz	> 16 dBm, typ. 20 dBm
	19 GHz ≤ f_{in} ≤ 26.5 GHz	> 18 dBm, typ. 23 dBm
	R&S®FSW43, R&S®FSW50, R&S®FSW67, R&S®FSW85, RF attenuation = 0 dB, level 2 × –20 dBm, ∆f > 5 × RBW, YIG preselector on, RF preamplifier off	
	8 GHz ≤ f_{in} ≤ 13.6 GHz	> 8 dBm, typ. 11 dBm
	13.6 GHz ≤ f_{in} ≤ 40 GHz	> 10 dBm, typ. 15 dBm
	f_{in} > 40 GHz	12 dBm (nom.)
	R&S®FSW8, R&S®FSW13, R&S®FSW26 with R&S®FSW-B24 option, RF attenuation = 0 dB, level 2 × –50 dBm, ∆f > 5 × RBW, YIG preselector on, RF preamplifier on	
	10 MHz ≤ f_{in} < 1 GHz	–10 dBm (nom.)
	1 GHz ≤ f_{in} < 8 GHz	–13 dBm (nom.)
	8 GHz ≤ f_{in} ≤ 26.5 GHz	–15 dBm (nom.)
	R&S®FSW43, R&S®FSW50, R&S®FSW67 with R&S®FSW-B24 option, RF attenuation = 0 dB, level 2 × –55 dBm, ∆f > 5 × RBW, YIG preselector on, RF preamplifier on	
	10 MHz ≤ f_{in} < 1 GHz	–5 dBm (nom.)
	1 GHz ≤ f_{in} < 4 GHz	–10 dBm (nom.)
	f_{in} > 4 GHz	–20 dBm (nom.)
Second-harmonic intercept point (SHI)	R&S®FSW8, R&S®FSW13, R&S®FSW26, RF attenuation = 0 dB, level = –5 dBm, YIG preselector on, RF preamplifier off	
	1 MHz < f_{in} ≤ 350 MHz	> 50 dBm, typ. 62 dBm
	350 MHz < f_{in} ≤ 500 MHz	> 70 dBm, typ. 80 dBm
	500 MHz < f_{in} < 1.5 GHz [6]	> 47 dBm, typ. 52 dBm
	500 MHz < f_{in} < 1.5 GHz [7]	> 62 dBm, typ. 70 dBm
	1.5 GHz ≤ f_{in} ≤ 4 GHz	> 62 dBm, typ. 70 dBm
	4 GHz < f_{in} ≤ 13.5 GHz	65 dBm (nom.)
	R&S®FSW43, R&S®FSW50, R&S®FSW67, R&S®FSW85, RF attenuation = 0 dB, level = –5 dBm, YIG preselector on, RF preamplifier off	
	1 MHz < f_{in} ≤ 500 MHz	> 45 dBm, typ. 55 dBm
	500 MHz < f_{in} < 1.5 GHz [6]	> 47 dBm, typ. 56 dBm
	500 MHz < f_{in} < 1.5 GHz [7]	> 52 dBm, typ. 60 dBm
	1.5 GHz ≤ f_{in} ≤ 4 GHz	> 62 dBm, typ. 70 dBm
	4 GHz < f_{in} ≤ 42.5 GHz	65 dBm (nom.)
	R&S®FSW8, R&S®FSW13, R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67, with R&S®FSW-B24 option, RF attenuation = 0 dB, level = –50 dBm, YIG preselector on, RF preamplifier on	
	50 MHz < f_{in} ≤ 21.75 GHz	10 dBm (nom.)

[5] With R&S®FSW-B13 highpass filter option, highpass off. With highpass on, the TOI degrades by 5 dB (nom.).

[6] Without R&S®FSW-B13 highpass filter option or highpass off.

[7] With R&S®FSW-B13 highpass filter option, highpass on.

Sensitivity

All noise level data in this section not marked as typical (typ.) or nominal (nom.) are specified values whose compliance is ensured by testing.

Displayed average noise level of the R&S®FSW8		
RF preamplifier off	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm, typ. –120 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm, typ. –130 dBm
	1 kHz < f < 9 kHz	–135 dBm, typ. –147 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, without R&S®FSW-B25 electronic attenuator option	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz < f ≤ 1 GHz	–150 dBm, typ. –154 dBm
	1 GHz < f < 3 GHz [6]	–152 dBm, typ. –156 dBm
	1 GHz < f < 3 GHz [7]	–155 dBm, typ. –160 dBm
	3 GHz ≤ f ≤ 8 GHz	–152 dBm, typ. –156 dBm
	add 1 dB to the above values if the R&S®FSW-B25 option is installed	
RF preamplifier = 30 dB	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, with R&S®FSW-B24 option, without R&S®FSW-B25 electronic attenuator option	
	10 MHz < f ≤ 50 MHz	–154 dBm (nom.)
	50 MHz < f ≤ 150 MHz	–163 dBm, typ. –166 dBm
	150 MHz < f ≤ 8 GHz	–166 dBm, typ. –169 dBm
	add 1 dB to the above values if the R&S®FSW-B25 option is installed	
Improvement with noise cancellation	for noise-like signals	13 dB (nom.)

Displayed average noise level of the R&S®FSW13, R&S®FSW26, without R&S®FSW-B24 option		
	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm, typ. –120 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm, typ. –130 dBm
	1 kHz < f < 9 kHz	–135 dBm, typ. –147 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on, without R&S®FSW-B25 electronic attenuator option	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm, typ. –154 dBm
	1 GHz < f < 3 GHz [6]	–151 dBm, typ. –156 dBm
	1 GHz < f < 3 GHz [7]	–154 dBm, typ. –159 dBm
	3 GHz ≤ f < 8 GHz	–151 dBm, typ. –156 dBm
	8 GHz ≤ f < 13.6 GHz	–150 dBm, typ. –155 dBm
	13.6 GHz ≤ f < 18 GHz	–149 dBm, typ. –153 dBm
	18 GHz ≤ f < 25 GHz	–147 dBm, typ. –150 dBm
	25 GHz ≤ f < 26.5 GHz	–143 dBm, typ. –146 dBm
	add 1 dB to the above values for frequencies < 8 GHz, 2 dB for frequencies ≥ 8 GHz, if R&S®FSW-B25 option is installed	
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off, without R&S®FSW-B25 electronic attenuator option	
	8 GHz ≤ f < 13.6 GHz	–150 dBm, typ. –155 dBm
	13.6 GHz ≤ f < 25 GHz	–149 dBm, typ. –153 dBm
	25 GHz ≤ f < 26.5 GHz	–147 dBm, typ. –150 dBm
	add 2 dB to the above values if the R&S®FSW-B25 option is installed	
Improvement with noise cancellation	for noise-like signals	13 dB (nom.)

Displayed average noise level of the R&S®FSW13, R&S®FSW26, with R&S®FSW-B24 option		
RF preamplifier off	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm, typ. –120 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm, typ. –130 dBm
	1 kHz < f < 9 kHz	–135 dBm, typ. –147 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on, without R&S®FSW-B25 electronic attenuator option	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm, typ. –154 dBm
	1 GHz < f < 3 GHz [6]	–151 dBm, typ. –156 dBm
	1 GHz < f < 3 GHz [7]	–154 dBm, typ. –159 dBm
	3 GHz ≤ f < 8 GHz	–151 dBm, typ. –156 dBm
	8 GHz ≤ f < 13.6 GHz	–149 dBm, typ. –154 dBm
	13.6 GHz ≤ f < 18 GHz	–148 dBm, typ. –152 dBm
	18 GHz ≤ f < 25 GHz	–145 dBm, typ. –149 dBm
	25 GHz ≤ f < 26.5 GHz	–141 dBm, typ. –145 dBm
	add 1 dB to the above values for frequencies < 8 GHz, 2 dB for frequencies ≥ 8 GHz, if R&S®FSW-B25 option is installed	
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off, without R&S®FSW-B25 electronic attenuator option	
	8 GHz ≤ f < 13.6 GHz	–149 dBm, typ. –154 dBm
	13.6 GHz ≤ f < 25 GHz	–148 dBm, typ. –152 dBm
	25 GHz ≤ f < 26.5 GHz	–145 dBm, typ. –149 dBm
	add 2 dB to the above values if the R&S®FSW-B25 option is installed	
RF preamplifier = 30 dB	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector on, without R&S®FSW-B25 electronic attenuator option	
	10 MHz < f ≤ 50 MHz	–154 dBm (nom.)
	50 MHz < f ≤ 150 MHz	–163 dBm, typ. –166 dBm
	150 MHz < f ≤ 8 GHz	–166 dBm, typ. –169 dBm
	8 GHz < f ≤ 13.6 GHz	–164 dBm, typ. –168 dBm
	13.6 GHz < f ≤ 22 GHz	–162 dBm, typ. –166 dBm
	22 GHz < f ≤ 26.5 GHz	–157 dBm, typ. –161 dBm
	add 1 dB to the above values for frequencies < 8 GHz, 2 dB for frequencies ≥ 8 GHz, if R&S®FSW-B25 option is installed	
Improvement with noise cancellation	for noise-like signals	13 dB (nom.)

Displayed average noise level of the R&S®FSW43 without R&S®FSW-B24 option		
	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm, typ. –120 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm, typ. –130 dBm
	1 kHz < f < 9 kHz	–135 dBm, typ. –147 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm, typ. –154 dBm
	1 GHz < f < 3 GHz [6]	–151 dBm, typ. –156 dBm
	1 GHz < f < 3 GHz [7]	–154 dBm, typ. –159 dBm
	3 GHz ≤ f < 8 GHz	–151 dBm, typ. –156 dBm
	8 GHz ≤ f < 13.6 GHz	–150 dBm, typ. –154 dBm
	13.6 GHz ≤ f < 18 GHz	–149 dBm, typ. –153 dBm
	18 GHz ≤ f < 25 GHz	–147 dBm, typ. –151 dBm
	25 GHz ≤ f ≤ 34 GHz	–143 dBm, typ. –147 dBm
	34 GHz < f ≤ 40 GHz	–140 dBm, typ. –144 dBm
	40 GHz < f ≤ 43.5 GHz	–138 dBm, typ. –142 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off	
	8 GHz ≤ f < 13.6 GHz	–152 dBm, typ. –157 dBm
	13.6 GHz ≤ f < 18 GHz	–151 dBm, typ. –156 dBm
	18 GHz ≤ f < 25 GHz	–149 dBm, typ. –154 dBm
	25 GHz ≤ f ≤ 34 GHz	–147 dBm, typ. –151 dBm
	34 GHz < f ≤ 40 GHz	–144 dBm, typ. –148 dBm
	40 GHz < f ≤ 43.5 GHz	–142 dBm, typ. –146 dBm
Improvement with noise cancellation	for noise-like signals	13 dB (nom.)

Displayed average noise level of the R&S®FSW43 with R&S®FSW-B24 option		
RF preamplifier off	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm, typ. –120 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm, typ. –130 dBm
	1 kHz < f < 9 kHz	–135 dBm, typ. –147 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm, typ. –154 dBm
	1 GHz < f < 3 GHz [6]	–150 dBm, typ. –155 dBm
	1 GHz < f < 3 GHz [7]	–153 dBm, typ. –158 dBm
	3 GHz ≤ f < 8 GHz	–150 dBm, typ. –155 dBm
	8 GHz ≤ f < 13.6 GHz	–148 dBm, typ. –152 dBm
	13.6 GHz ≤ f < 18 GHz	–147 dBm, typ. –151 dBm
	18 GHz ≤ f < 25 GHz	–145 dBm, typ. –149 dBm
	25 GHz ≤ f ≤ 34 GHz	–140 dBm, typ. –144 dBm
	34 GHz < f ≤ 40 GHz	–137 dBm, typ. –141 dBm
	40 GHz < f ≤ 43.5 GHz	–135 dBm, typ. –140 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off	
	8 GHz ≤ f < 13.6 GHz	–150 dBm, typ. –155 dBm
	13.6 GHz ≤ f < 18 GHz	–149 dBm, typ. –154 dBm
	18 GHz ≤ f < 25 GHz	–147 dBm, typ. –152 dBm
	25 GHz ≤ f ≤ 34 GHz	–144 dBm, typ. –149 dBm
	34 GHz < f ≤ 40 GHz	–141 dBm, typ. –145 dBm
	40 GHz < f ≤ 43.5 GHz	–139 dBm, typ. –144 dBm
RF preamplifier = 30 dB	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector on	
	100 kHz < f ≤ 1 MHz	–160 dBm, typ. –163 dBm
	1 MHz < f ≤ 3 GHz	–165 dBm, typ. –169 dBm
	3 GHz < f ≤ 8 GHz	–162 dBm, typ. –166 dBm
	8 GHz < f ≤ 18 GHz	–162 dBm, typ. –167 dBm
	18 GHz < f ≤ 26.5 GHz	–161 dBm, typ. –166 dBm
	26.5 GHz < f ≤ 40 GHz	–160 dBm, typ. –164 dBm
	40 GHz < f ≤ 43.5 GHz	–157 dBm, typ. –162 dBm
Improvement with noise cancellation	for noise-like signals	13 dB (nom.)

Displayed average noise level of the R&S®FSW50 without R&S®FSW-B24 option		
	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm, typ. –120 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm, typ. –130 dBm
	1 kHz < f < 9 kHz	–135 dBm, typ. –147 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm, typ. –154 dBm
	1 GHz < f < 3 GHz [6]	–151 dBm, typ. –156 dBm
	1 GHz < f < 3 GHz [7]	–154 dBm, typ. –159 dBm
	3 GHz ≤ f < 8 GHz	–151 dBm, typ. –156 dBm
	8 GHz ≤ f < 13.6 GHz	–150 dBm, typ. –154 dBm
	13.6 GHz ≤ f < 18 GHz	–149 dBm, typ. –153 dBm
	18 GHz ≤ f < 25 GHz	–147 dBm, typ. –151 dBm
	25 GHz ≤ f ≤ 34 GHz	–143 dBm, typ. –147 dBm
	34 GHz < f ≤ 40 GHz	–140 dBm, typ. –144 dBm
	40 GHz < f ≤ 43.5 GHz	–138 dBm, typ. –142 dBm
	43.5 GHz < f ≤ 47 GHz	–136 dBm, typ. –140 dBm
	47 GHz < f ≤ 49 GHz	–134 dBm, typ. –138 dBm
	49 GHz < f ≤ 50 GHz	–132 dBm, typ. –136 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off	
	8 GHz ≤ f < 13.6 GHz	–152 dBm, typ. –157 dBm
	13.6 GHz ≤ f < 18 GHz	–151 dBm, typ. –156 dBm
	18 GHz ≤ f < 25 GHz	–149 dBm, typ. –154 dBm
	25 GHz ≤ f ≤ 34 GHz	–147 dBm, typ. –151 dBm
	34 GHz < f ≤ 40 GHz	–144 dBm, typ. –148 dBm
	40 GHz < f ≤ 43.5 GHz	–142 dBm, typ. –146 dBm
	43.5 GHz < f ≤ 47 GHz	–140 dBm, typ. –144 dBm
	47 GHz < f ≤ 49 GHz	–138 dBm, typ. –142 dBm
	49 GHz < f ≤ 50 GHz	–136 dBm, typ. –140 dBm
Improvement with noise cancellation	for noise-like signals	13 dB (nom.)

Displayed average noise level of the R&S®FSW50 with R&S®FSW-B24 option		
RF preamplifier off	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm
	1 kHz < f < 9 kHz	–135 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm
	1 GHz < f < 3 GHz [6]	–150 dBm
	1 GHz < f < 3 GHz [7]	–153 dBm
	3 GHz ≤ f < 8 GHz	–150 dBm
	8 GHz ≤ f < 13.6 GHz	–148 dBm
	13.6 GHz ≤ f < 18 GHz	–147 dBm
	18 GHz ≤ f < 25 GHz	–145 dBm
	25 GHz ≤ f ≤ 34 GHz	–140 dBm
	34 GHz < f ≤ 40 GHz	–137 dBm
	40 GHz < f ≤ 43.5 GHz	–135 dBm
	43.5 GHz < f ≤ 47 GHz	–133 dBm
	47 GHz < f ≤ 49 GHz	–131 dBm
	49 GHz < f ≤ 50 GHz	–129 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off	
	8 GHz ≤ f < 13.6 GHz	–150 dBm
	13.6 GHz ≤ f < 18 GHz	–149 dBm
	18 GHz ≤ f < 25 GHz	–147 dBm
	25 GHz ≤ f ≤ 34 GHz	–144 dBm
	34 GHz < f ≤ 40 GHz	–141 dBm
	40 GHz < f ≤ 43.5 GHz	–139 dBm
	43.5 GHz < f ≤ 47 GHz	–137 dBm
	47 GHz < f ≤ 49 GHz	–135 dBm
	49 GHz < f ≤ 50 GHz	–133 dBm
RF preamplifier = 30 dB	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector on	
	100 kHz < f ≤ 1 MHz	–160 dBm
	1 MHz < f ≤ 3 GHz	–165 dBm
	3 GHz < f ≤ 8 GHz	–162 dBm
	8 GHz < f ≤ 18 GHz	–162 dBm
	18 GHz < f ≤ 26.5 GHz	–161 dBm
	26.5 GHz < f ≤ 40 GHz	–160 dBm
	R&S®FSW-B24 option, model .49	
	40 GHz < f ≤ 43 GHz	–157 dBm
	43 GHz < f ≤ 50 GHz	–149 dBm
	R&S®FSW-B24 option, model .51	
	40 GHz < f ≤ 43.5 GHz	–157 dBm
	43.5 GHz < f ≤ 47 GHz	–155 dBm
	47 GHz < f ≤ 50 GHz	–153 dBm
Improvement with noise cancellation	for noise-like signals	
	R&S®FSW-B24 option, model .49	
	100 kHz < f ≤ 43 GHz	13 dB (nom.)
	43 GHz < f ≤ 50 GHz	0 dB (nom.)
	R&S®FSW-B24 option, model .51	
	100 kHz < f ≤ 50 GHz	13 dB (nom.)

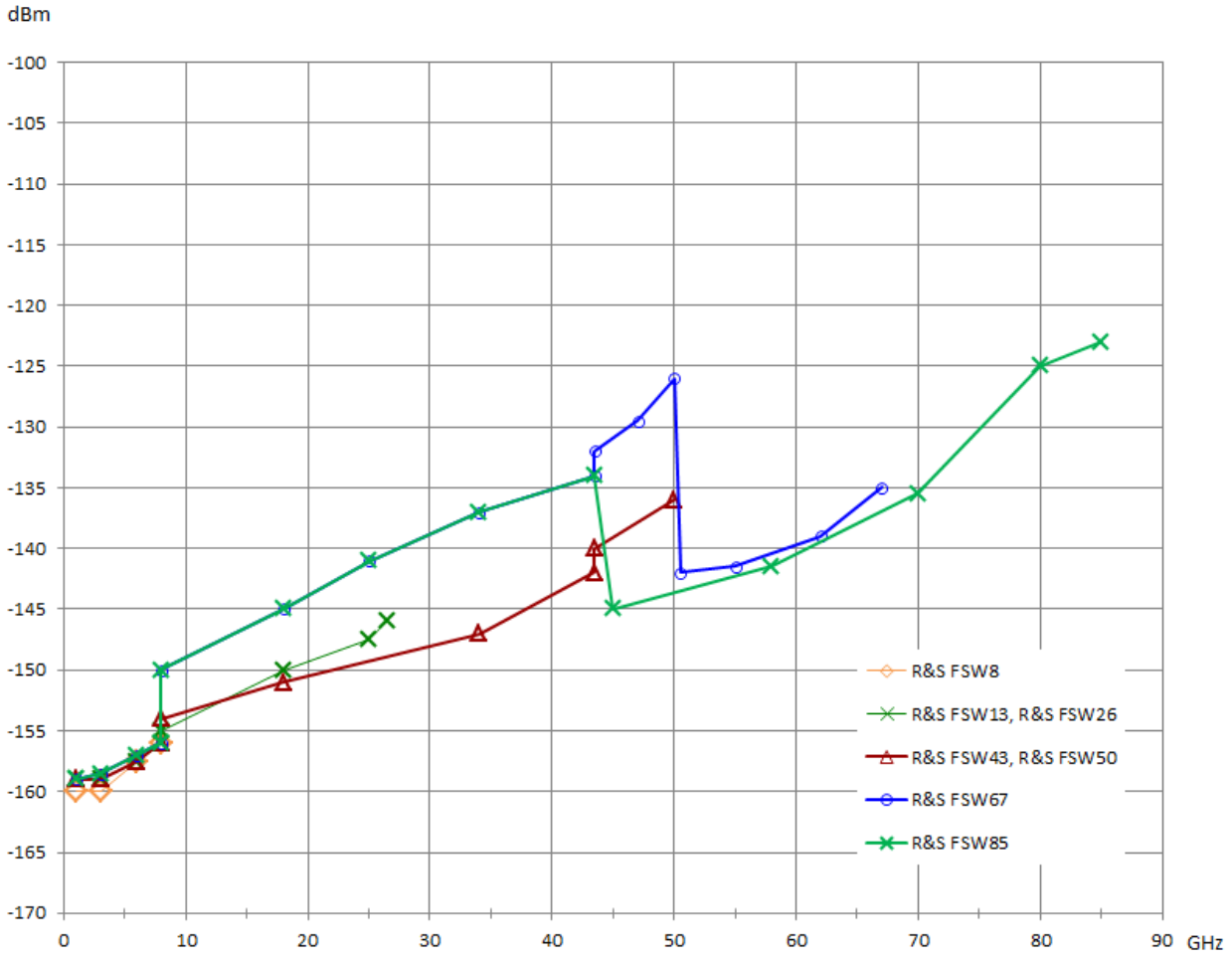
Displayed average noise level of the R&S®FSW67 without R&S®FSW-B24 option [8]		
	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm, typ. –120 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm, typ. –130 dBm
	1 kHz < f < 9 kHz	–135 dBm, typ. –147 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm, typ. –154 dBm
	1 GHz < f < 3 GHz [6]	–151 dBm, typ. –156 dBm
	1 GHz < f < 3 GHz [7]	–154 dBm, typ. –159 dBm
	3 GHz ≤ f < 8 GHz	–151 dBm, typ. –156 dBm
	8 GHz ≤ f < 13.6 GHz	–146 dBm, typ. –150 dBm
	13.6 GHz ≤ f < 18 GHz	–144 dBm, typ. –148 dBm
	18 GHz ≤ f < 23 GHz	–141 dBm, typ. –145 dBm
	23 GHz ≤ f < 30 GHz	–137 dBm, typ. –141 dBm
	30 GHz ≤ f ≤ 34 GHz	–135 dBm, typ. –139 dBm
	34 GHz < f ≤ 43.5 GHz	–131 dBm, typ. –135 dBm
	43.5 GHz < f ≤ 47 GHz	–127 dBm, typ. –131 dBm
	47 GHz < f ≤ 49 GHz	–124 dBm, typ. –128 dBm
	49 GHz < f ≤ 50 GHz	–122 dBm, typ. –126 dBm
	50 GHz < f ≤ 55 GHz	–141 dBm, typ. –143 dBm
	55 GHz < f ≤ 62 GHz	–137 dBm, typ. –139 dBm
	62 GHz < f ≤ 67 GHz	–133 dBm, typ. –135 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off	
	8 GHz ≤ f < 13.6 GHz	–148 dBm, typ. –152 dBm
	13.6 GHz ≤ f < 18 GHz	–146 dBm, typ. –150 dBm
	18 GHz ≤ f < 23 GHz	–143 dBm, typ. –147 dBm
	23 GHz ≤ f < 30 GHz	–139 dBm, typ. –142 dBm
	30 GHz ≤ f ≤ 34 GHz	–137 dBm, typ. –140 dBm
	34 GHz < f ≤ 43.5 GHz	–133 dBm, typ. –136 dBm
	43.5 GHz < f ≤ 47 GHz	–129 dBm, typ. –132 dBm
	47 GHz < f ≤ 49 GHz	–126 dBm, typ. –129 dBm
	49 GHz < f ≤ 50 GHz	–125 dBm, typ. –128 dBm
	50 GHz < f ≤ 55 GHz	–141 dBm, typ. –142 dBm
	55 GHz < f ≤ 62 GHz	–137 dBm, typ. –139 dBm
	62 GHz < f ≤ 67 GHz	–133 dBm, typ. –135 dBm
Improvement with noise cancellation	for noise-like signals	
	2 Hz < f ≤ 43 GHz	13 dB (nom.)
	43 GHz < f ≤ 67 GHz	8 dB (nom.)

[8] Specifications apply to R&S®FSW67 with serial number ≥ 104000 and to R&S®FSW67 with serial number < 104000 and upgrade kit R&S®FSW-U67.

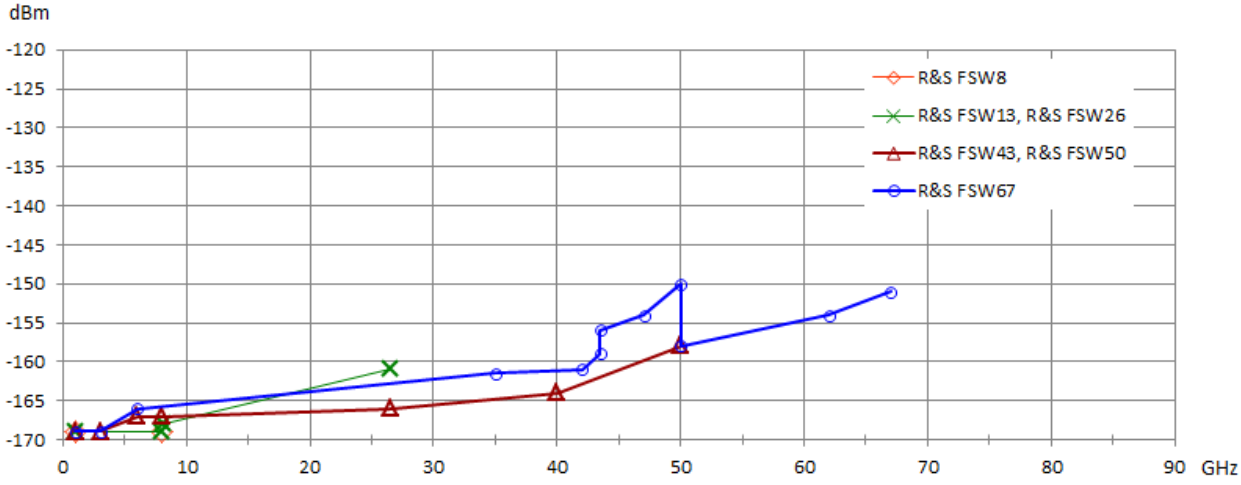
Displayed average noise level of the R&S®FSW67 with R&S®FSW-B24 option [8]		
RF preamplifier off	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–110 dBm
	100 Hz < f ≤ 1 kHz	–120 dBm
	1 kHz < f < 9 kHz	–135 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on	
	9 kHz ≤ f ≤ 1 MHz	–145 dBm
	1 MHz < f ≤ 1 GHz	–149 dBm
	1 GHz < f < 3 GHz [6]	–150 dBm
	1 GHz < f < 3 GHz [7]	–153 dBm
	3 GHz ≤ f < 8 GHz	–150 dBm
	8 GHz ≤ f < 13.6 GHz	–144 dBm
	13.6 GHz ≤ f < 18 GHz	–142 dBm
	18 GHz ≤ f < 23 GHz	–139 dBm
	23 GHz ≤ f < 30 GHz	–135 dBm
	30 GHz ≤ f ≤ 34 GHz	–132 dBm
	34 GHz < f ≤ 43.5 GHz	–128 dBm
	43.5 GHz < f ≤ 47 GHz	–124 dBm
	47 GHz < f ≤ 49 GHz	–121 dBm
	49 GHz < f ≤ 50 GHz	–119 dBm
	50 GHz < f ≤ 55 GHz	–138 dBm
	55 GHz < f ≤ 62 GHz	–134 dBm
	62 GHz < f ≤ 67 GHz	–130 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off	
	8 GHz ≤ f < 13.6 GHz	–146 dBm
	13.6 GHz ≤ f < 18 GHz	–144 dBm
	18 GHz ≤ f < 23 GHz	–141 dBm
	23 GHz ≤ f < 30 GHz	–137 dBm
	30 GHz ≤ f ≤ 34 GHz	–134 dBm
	34 GHz < f ≤ 43.5 GHz	–130 dBm
	43.5 GHz < f ≤ 47 GHz	–126 dBm
	47 GHz < f ≤ 49 GHz	–123 dBm
	49 GHz < f ≤ 50 GHz	–122 dBm
	50 GHz < f ≤ 55 GHz	–138 dBm
	55 GHz < f ≤ 62 GHz	–134 dBm
	62 GHz < f ≤ 67 GHz	–130 dBm

RF preamplifier = 30 dB	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector on	
	100 kHz < f ≤ 1 MHz	–160 dBm
	1 MHz < f ≤ 3 GHz	–165 dBm
	3 GHz < f ≤ 8 GHz	–162 dBm
	8 GHz < f ≤ 18 GHz	–161 dBm
	18 GHz < f ≤ 26.5 GHz	–160 dBm
	26.5 GHz < f ≤ 35 GHz	–159 dBm
	35 GHz < f ≤ 42 GHz	–157 dBm
	R&S®FSW-B24 option, model .66	
	42 GHz < f ≤ 43 GHz	–150 dBm
	43 GHz < f ≤ 47 GHz	–146 dBm
	47 GHz < f ≤ 50 GHz	–144 dBm
	50 GHz < f ≤ 54 GHz	–148 dBm
	54 GHz < f ≤ 56 GHz	–146 dBm
	56 GHz < f ≤ 62 GHz	–144 dBm
	62 GHz < f ≤ 65 GHz	–142 dBm
	65 GHz < f ≤ 67 GHz	–140 dBm
	R&S®FSW-B24 option, model .67	
	42 GHz < f ≤ 47 GHz	–150 dBm
	47 GHz < f ≤ 50 GHz	–146 dBm
	50 GHz < f ≤ 52 GHz	–154 dBm
	52 GHz < f ≤ 54 GHz	–152 dBm
	54 GHz < f ≤ 62 GHz	–150 dBm
	62 GHz < f ≤ 67 GHz	–147 dBm
Improvement with noise cancellation	for noise-like signals	
	R&S®FSW-B24 option, model .66	
	100 kHz < f ≤ 43 GHz	13 dB (nom.)
	43 GHz < f ≤ 67 GHz	0 dB (nom.)
	R&S®FSW-B24 option, model .67	
	100 kHz < f ≤ 67 GHz	13 dB (nom.)

Displayed average noise level of the R&S®FSW85		
	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +5 °C to +40 °C	
	2 Hz ≤ f ≤ 100 Hz	–105 dBm, typ. –115 dBm
	100 Hz < f ≤ 1 kHz	–110 dBm, typ. –120 dBm
	1 kHz < f < 9 kHz	–125 dBm, typ. –137 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, f ≥ 8 GHz: YIG preselector on	
	9 kHz ≤ f ≤ 1 MHz	–135 dBm, typ. –140 dBm
	1 MHz < f ≤ 1 GHz	–145 dBm, typ. –150 dBm
	1 GHz < f < 3 GHz [6]	–151 dBm, typ. –156 dBm
	1 GHz < f < 3 GHz [7]	–154 dBm, typ. –159 dBm
	3 GHz ≤ f < 8 GHz	–151 dBm, typ. –156 dBm
	8 GHz ≤ f < 13.6 GHz	–146 dBm, typ. –150 dBm
	13.6 GHz ≤ f < 18 GHz	–144 dBm, typ. –148 dBm
	18 GHz ≤ f < 23 GHz	–141 dBm, typ. –145 dBm
	23 GHz ≤ f < 30 GHz	–137 dBm, typ. –141 dBm
	30 GHz ≤ f ≤ 34 GHz	–135 dBm, typ. –139 dBm
	34 GHz < f ≤ 44 GHz	–129 dBm, typ. –133 dBm
	44 GHz < f ≤ 58 GHz	–137 dBm, typ. –141 dBm
	58 GHz < f ≤ 70 GHz	–132 dBm, typ. –136 dBm
	70 GHz < f ≤ 75 GHz	–127 dBm, typ. –130 dBm
	75 GHz < f ≤ 80 GHz	–122 dBm, typ. –125 dBm
	80 GHz < f ≤ 85 GHz	–120 dBm, typ. –123 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +5 °C to +40 °C, YIG preselector off	
	8 GHz ≤ f < 13.6 GHz	–148 dBm, typ. –152 dBm
	13.6 GHz ≤ f < 18 GHz	–146 dBm, typ. –150 dBm
	18 GHz ≤ f < 23 GHz	–143 dBm, typ. –147 dBm
	23 GHz ≤ f < 30 GHz	–139 dBm, typ. –142 dBm
	30 GHz ≤ f ≤ 34 GHz	–137 dBm, typ. –140 dBm
	34 GHz < f ≤ 44 GHz	–131 dBm, typ. –134 dBm
	44 GHz < f ≤ 58 GHz	–141 dBm, typ. –143 dBm
	58 GHz < f ≤ 70 GHz	–135 dBm, typ. –138 dBm
	70 GHz < f ≤ 78 GHz	–130 dBm, typ. –133 dBm
	78 GHz < f ≤ 85 GHz	–125 dBm, typ. –128 dBm
Improvement with noise cancellation	for noise-like signals	13 dB (nom.)



Typical displayed average noise level of the R&S®FSW models [8] for f > 1 GHz without R&S®FSW-B24 RF preamplifier option.



Typical displayed average noise level of the R&S®FSW models [8] for f > 1 GHz with R&S®FSW-B24 [9] RF preamplifier option, preamplifier gain = 30 dB [8].

[9] For frequencies > 43 GHz, the curve shown for the R&S®FSW50 applies to the R&S®FSW-B24 option model .51, the curve shown for the R&S®FSW67 applies to the R&S®FSW-B24 option model .67.

Spurious responses

Spurious responses	YIG preselector on for f ≥ 8 GHz, mixer level ≤ –10 dBm [10], sweep optimization: auto or dynamic	
Image response	f_{in} – 2 × 8997 MHz (1st IF)	< –90 dBc
	f_{in} – 2 × 1317 MHz (2nd IF)	< –90 dBc
	f_{in} – 2 × 37 MHz (3rd IF)	< –90 dBc
Intermediate frequency response	1st IF (8997 MHz)	< –90 dBc
	2nd IF (1317 MHz)	< –90 dBc
	3rd IF (37 MHz)	< –90 dBc
Residual spurious response	RF attenuation = 0 dB	
	f ≤ 1 MHz	< –90 dBm
	1 MHz < f ≤ 8900 MHz	< –110 dBm
	8900 MHz < f ≤ 26.5 GHz	< –100 dBm
	26.5 GHz < f ≤ 85 GHz	< –100 dBm
	f = receive frequency	
Local oscillator related spurious	f_{in} < 1 GHz	
	10 Hz ≤ offset from carrier < 200 Hz	< –90 dBc
	offset from carrier > 200 Hz	< –100 dBc
	f_{in} ≥ 1 GHz	
	10 Hz ≤ offset from carrier < 200 Hz	< –90 dBc + 20 log (f_{in}/GHz)
	offset from carrier > 200 Hz	
	f ≤ 50 GHz	< –100 dBc + 20 log (f_{in}/GHz)
	f > 50 GHz, RBW ≤ 10 kHz	< –100 dBc + 20 log (f_{in}/GHz)
	f > 50 GHz, RBW > 10 kHz	< –80 dBc + 20 log (f_{in}/GHz)
	f = receive frequency	
Vibrational environmental stimuli	max. 0.21 g RMS	< –60 dBc + 20 log (f_{in}/GHz) (nom.)

[10] Mixer level = signal level – RF attenuation + preamplifier gain.

Level measurement uncertainty

Absolute level uncertainty at 64 MHz	RBW = 10 kHz, level = –10 dBm, reference level = –10 dBm, RF attenuation = 10 dB	
	without R&S®FSW-B25 option or electronic attenuator off	< 0.2 dB (σ = 0.07 dB)
	with R&S®FSW-B25 option, electronic attenuator on	< 0.4 dB (σ = 0.14 dB)
Frequency response, referenced to 64 MHz, YIG preselector on	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, +20 °C to +30 °C, electronic attenuator off	
	2 Hz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 10 MHz	< 0.45 dB (σ = 0.17 dB)
	10 MHz ≤ f < 3.6 GHz [11]	< 0.3 dB (σ = 0.10 dB)
	10 MHz ≤ f < 3.6 GHz [12]	< 0.5 dB (σ = 0.17 dB)
	3.6 GHz ≤ f ≤ 8 GHz	< 0.5 dB (σ = 0.17 dB)
	8 GHz < f < 22 GHz, span < 1 GHz	< 1.5 dB (σ = 0.50 dB)
	22 GHz ≤ f ≤ 26.5 GHz, span < 1 GHz	< 2 dB (σ = 0.67 dB)
	26.5 GHz < f ≤ 50 GHz, span < 1 GHz	< 2.5 dB (σ = 0.83 dB)
	50 GHz < f ≤ 67 GHz, span < 1 GHz	< 3.0 dB (σ = 1.0 dB)
	67 GHz < f ≤ 85 GHz, span < 1 GHz	< 3.5 dB (σ = 1.17 dB)
	any RF attenuation or electronic attenuator on, +15 °C to +40 °C	
	2 Hz ≤ f < 9 kHz	< 1 dB (nom.)
	9 kHz ≤ f < 3.6 GHz	< 0.6 dB (σ = 0.20 dB)
	3.6 GHz ≤ f ≤ 8 GHz	< 0.8 dB (σ = 0.27 dB)
	8 GHz < f < 22 GHz, span < 1 GHz	< 2 dB (σ = 0.67 dB)
	22 GHz ≤ f ≤ 26.5 GHz, span < 1 GHz	< 2.5 dB (σ = 0.83 dB)
	26.5 GHz < f ≤ 50 GHz, span < 1 GHz	< 3 dB (σ = 1.0 dB)
	50 GHz < f ≤ 67 GHz, span < 1 GHz	< 3.5 dB (σ = 1.17 dB)
	67 GHz < f ≤ 85 GHz, span < 1 GHz	< 4.0 dB (σ = 1.33 dB)
	RF attenuation ≤ 20 dB, RF preamplifier on, +20 °C to +30 °C	
	10 MHz ≤ f < 3.6 GHz	< 0.6 dB (σ = 0.2 dB)
	3.6 GHz ≤ f ≤ 8 GHz	< 0.8 dB (σ = 0.27 dB)
	8 GHz < f < 22 GHz, span < 1 GHz	< 2 dB (σ = 0.67 dB)
	22 GHz ≤ f ≤ 26.5 GHz, span < 1 GHz	< 2.5 dB (σ = 0.83 dB)
	26.5 GHz < f ≤ 50 GHz, span < 1 GHz	< 3 dB (σ = 1.0 dB)
	50 GHz < f ≤ 67 GHz, span < 1 GHz	< 3.5 dB (σ = 1.17 dB)
Frequency response, referenced to 64 MHz, YIG preselector off	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, +20 °C to +30 °C, electronic attenuator off	
	f < 8 GHz	same values as with preselector on
	8 GHz ≤ f < 22 GHz	< 1.5 dB (σ = 0.5 dB)
	22 GHz ≤ f ≤ 26.5 GHz	< 2 dB (σ = 0.6 dB)
	26.5 GHz < f ≤ 67 GHz, span < 1 GHz	< 2.5 dB (σ = 0.83 dB)
	67 GHz < f ≤ 85 GHz, span < 1 GHz	< 3 dB (σ = 1.0 dB)
	any RF attenuation or electronic attenuator on, +15 °C to +40 °C	
	f < 8 GHz	same values as with preselector on
	8 GHz ≤ f < 22 GHz	< 2 dB (σ = 0.6 dB)
	22 GHz ≤ f ≤ 26.5 GHz	< 2.5 dB (σ = 0.75 dB)
	26.5 GHz < f ≤ 67 GHz, span < 1 GHz	< 3 dB (σ = 1.0 dB)
	67 GHz < f ≤ 85 GHz, span < 1 GHz	< 3.5 dB (σ = 1.17 dB)
	RF attenuation ≤ 20 dB, RF preamplifier on, +20 °C to +30 °C	
	f < 8 GHz	same values as with preselector on
	8 GHz ≤ f < 22 GHz	< 2 dB (σ = 0.6 dB)
	22 GHz ≤ f ≤ 26.5 GHz	< 2.5 dB (σ = 0.75 dB)
	26.5 GHz < f ≤ 67 GHz, span < 1 GHz	< 3 dB (σ = 1.0 dB)
Attenuator switching uncertainty	f = 64 MHz, 0 dB to 70 dB, referenced to 10 dB attenuation	< 0.2 dB (σ = 0.07 dB)
Uncertainty of reference level setting	input mixer level ≤ –15 dBm	0 dB [13]
	input mixer level > –15 dBm	< 0.1 dB (nom.)
Bandwidth switching uncertainty	referenced to RBW = 10 kHz	< 0.1 dB (σ = 0.04 dB) [14]

[11] With R&S®FSW8, R&S®FSW13, R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67.

[12] With R&S®FSW85.

[13] The reference level setting affects only the graphical representation of the measurement result on the display, not the measurement itself. The reference level setting causes no additional uncertainty in measurement results.

[14] Nominal values for RBW = 3.9 kHz and RBW = 6.25 kHz.

Nonlinearity of displayed level		
Logarithmic level display	S/N > 16 dB, 0 dB ≤ level ≤ –70 dB	< 0.1 dB (σ = 0.04 dB)
	S/N > 16 dB, –70 dB < level ≤ –90 dB	< 0.2 dB (σ = 0.08 dB)
Linear level display	S/N > 16 dB, 0 dB to –70 dB	< 5 % of reference level (nom.)

Total measurement uncertainty		
YIG preselector on	signal level = 0 dB to –70 dB below reference level, S/N > 20 dB, sweep time = auto, RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, span/RBW < 100, 95 % confidence level, +20 °C to +30 °C	
	9 kHz ≤ f ≤ 10 MHz	±0.37 dB
	10 MHz < f ≤ 3.6 GHz	±0.27 dB
	3.6 GHz < f ≤ 8 GHz	±0.37 dB
	8 GHz < f ≤ 22 GHz	±1.4 dB
	22 GHz < f ≤ 26.5 GHz	±1.7 dB
	26.5 GHz < f ≤ 50 GHz	±2.5 dB
	50 GHz < f ≤ 67 GHz	±2.8 dB
	67 GHz < f ≤ 85 GHz	±3.1 dB
YIG preselector off	signal level = 0 dB to –70 dB below reference level, S/N > 20 dB, sweep time = auto, RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, span/RBW < 100, 95 % confidence level, +20 °C to +30 °C	
	8 GHz ≤ f ≤ 22 GHz	±1.0 dB
	22 GHz < f ≤ 26.5 GHz	±1.2 dB
	26.5 GHz < f ≤ 67 GHz	±1.7 dB
	67 GHz < f ≤ 85 GHz	±2.0 dB

Adjacent channel power dynamic range

Adjacent channel leakage ratio (ACLR)	3GPP WCDMA, single carrier, 1 DPCH, carrier frequency = 2 GHz	
	noise cancellation off [15]	
	1st adjacent channel	–76 dB (nom.)
	2nd adjacent channel	–82 dB (nom.)
	noise cancellation on	
	1st adjacent channel	–88 dB (nom.)
	2nd adjacent channel	–90 dB (nom.)

Optimum mixer level	3GPP WCDMA, single carrier, 1 DPCH, carrier frequency = 2 GHz	
	noise cancellation off	
	1st adjacent channel	–5 dBm (nom.)
	2nd adjacent channel	0 dBm (nom.)
	noise cancellation on	
	1st adjacent channel	–12 dBm (nom.)
	2nd adjacent channel	–5 dBm (nom.)

Measurement speed [16]

Local measurement and display update rate	1001 sweep points	1.25 ms (800/s) (meas.)
Remote measurement, 1000 sweep averages [17]	1001 sweep points	1.0 ms (1000/s) (meas.)
Remote measurement and LAN transfer [17]		5 ms (200/s) (meas.)
Marker peak search [17]		1.7 ms (meas.)
Center frequency tune and transfer [17]	f ≤ 8 GHz	15 ms (meas.)
	f > 8 GHz	65 ms (meas.)

[15] Noise cancellation off represents the raw performance of the R&S®FSW without numeric compensation for its inherent noise.

[16] Sweep points set to 1001 points (= default), sweep optimization set to “speed”.

[17] Measured with PC equipped with Intel® Core™ i7 CPU 2.8 GHz and Gbit LAN interface.

Trigger functions

Trigger		
Trigger source	spectrum analysis	free run, video, external, IF power, RF power
	I/Q analyzer or modulation analysis	I/Q trigger additionally [18]
Trigger offset	span ≥ 10 Hz	5 ns to 20 s
	span = 0 Hz	(–sweep time) to 20 s
Min. trigger offset resolution	span > 0 Hz	5 ns
	span = 0 Hz, trigger offset > 0	5 ns
	span = 0 Hz, trigger offset < 0	sweep time/number of sweep points
Max. deviation of trigger offset		5 ns
IF power trigger		
Sensitivity	min. signal power	
	spectrum analysis	–60 dBm + RF attenuation – RF preamplifier gain (nom.)
	I/Q analyzer or modulation analysis	
	set analysis bandwidth ≤ 80 MHz	–60 dBm + RF attenuation – RF preamplifier gain (nom.)
	set analysis bandwidth > 80 MHz	–30 dBm + RF attenuation – RF preamplifier gain (nom.)
	max. signal power	–10 dBm + RF attenuation – RF preamplifier gain (nom.)
IF power trigger bandwidth	RBW > 500 kHz	20 MHz (nom.) [19]
	RBW ≤ 500 kHz, FFT	20 MHz (nom.)
	RBW ≤ 500 kHz, swept	6 MHz (nom.)
RF power trigger		
Sensitivity	min. signal power	–30 dBm + RF attenuation – RF preamplifier gain (nom.)
	max. signal power	+10 dBm + RF attenuation – RF preamplifier gain (nom.)
RF power trigger frequency range	f ≤ 8 GHz	8 GHz (nom.)
	f > 8 GHz	center frequency ± 250 MHz (nom.) [20]
Gated sweep		
Gate source		video, external, IF power, RF power
Gate delay		5 ns to 20 s, min. resolution 5 ns
Gate length		5 ns to 20 s, min. resolution 5 ns
Max. deviation of gate length		±5 ns

Audio demodulator

Demodulation		
AF demodulation types		AM and FM
Audio output		loudspeaker and phone jack
Marker stop time in spectrum mode		100 ms to 60 s

[18] Not available for analysis bandwidth > 80 MHz if R&S®FSW-B512 is installed.

[19] Sweep optimization = auto.

[20] YIG preselector off for f ≥ 8 GHz.

I/Q data

The specifications in this section apply to the base unit and the R&S®FSW-B28/-B40/-B80/-B160/-B320/-B512 options.
For specifications of the R&S®FSW-B2000 option, see section "R&S®FSW-B2000 2 GHz analysis bandwidth".

Record length		max. 400 Msample I and Q
Word length of I/Q samples	sampling rate > 100 MHz or number of samples > 300 Msample	18 bit
	otherwise	24 bit

Sampling rate	standard	100 Hz to 200 MHz
	with R&S®FSW-B28/-B40/-B80 options	100 Hz to 200 MHz
	with R&S®FSW-B160/-B320 options	100 Hz to 1 GHz
	with R&S®FSW-B512 option	100 Hz to 1.2 GHz
Max. signal analysis bandwidth (equalized)	standard	10 MHz (nom.)
	with R&S®FSW-B28 option	28 MHz (nom.) [20]
	with R&S®FSW-B40 option	40 MHz (nom.) [20]
	with R&S®FSW-B80 option	80 MHz (nom.) [20]
	with R&S®FSW-B160 option	160 MHz (nom.) [20]
	with R&S®FSW-B320 option	320 MHz (nom.) [20]
	with R&S®FSW-B512 option	512 MHz (nom.) [20]
Signal analysis bandwidth ≤ 80 MHz		
Amplitude flatness	(1.25 × signal analysis BW) ≤ f_{center} < 8 GHz	±0.3 dB (nom.)
	f_{center} ≥ 8 GHz, YIG preselector off	±0.5 dB (nom.)
Deviation from linear phase	(1.25 × signal analysis BW) ≤ f_{center} < 8 GHz	±1° (nom.)
	f_{center} ≥ 8 GHz, YIG preselector off	±2° (nom.)
Nonlinearity of displayed level		see section "Level measurement uncertainty – Nonlinearity of displayed level"
Level measurement uncertainty		see "Total measurement uncertainty – YIG preselector off"
Third-order intermodulation distortion		see "Third-order intercept point (TOI)"
ADC related spurious response	mixer level = –30 dBm [21]	
	analysis bandwidth < 17 MHz	–100 dBc (nom.)
	17 MHz ≤ analysis bandwidth < 80 MHz	–80 dBc (nom.)
Other spurious responses		see section "Spurious responses"

[21] Level of a tone at the input mixer (also abbreviated as mixer level) = signal level – RF attenuation + preamplifier gain.

Signal analysis bandwidth 80 MHz to 160 MHz [22]		
Amplitude flatness	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off for f ≥ 8 GHz	
	150 MHz ≤ f_{center} < 4 GHz	±0.5 dB (nom.)
	4 GHz ≤ f_{center} < 8 GHz	±0.7 dB (nom.)
	8 GHz ≤ f_{center} < 26.5 GHz	±1 dB (nom.)
	26.5 GHz ≤ f_{center} ≤ 67 GHz	±2 dB (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±2.5 dB (nom.)
Deviation from linear phase	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off for f ≥ 8 GHz	
	150 MHz ≤ f_{center} < 4 GHz	±1° (nom.)
	4 GHz ≤ f_{center} < 8 GHz	±2° (nom.)
	8 GHz ≤ f_{center} < 26.5 GHz	±2.5° (nom.)
	26.5 GHz ≤ f_{center} < 43.5 GHz	±4° (nom.)
	43.5 GHz ≤ f_{center} ≤ 67 GHz	±8° (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±8° (nom.)
Nonlinearity of displayed level	0 dB to –70 dB	< 0.15 dB (nom.)
Level measurement uncertainty at center frequency		add 0.2 dB (nom.) to the values in "Total measurement uncertainty – YIG preselector off"
Third-order intermodulation distortion	reference level = signal level + 6 dB	
	150 MHz ≤ f_{center} < 8 GHz: two –20 dBm tones at input mixer within analysis bandwidth [21], f_{center} ≥ 8 GHz: two –30 dBm tones at input mixer within analysis bandwidth [21]	–75 dBc (nom.)
Residual spurious response	RF attenuation 0 dB, f_{center} ≥ 150 MHz	–90 dBm (nom.)
ADC related spurious response	single tone within analysis bandwidth, mixer level = –10 dBm [21], reference level = signal level, f_{center} ≥ 150 MHz	–78 dBc (nom.)
Other spurious responses		see section "Spurious responses"

Signal analysis bandwidth ≤ 96 MHz within R&S®FSW-K193 DOCSIS 3.1 OFDM upstream option [23]		
Amplitude flatness	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off	
	5 MHz ≤ f ≤ 204 MHz	±0.6 dB (nom.)
Deviation from linear phase	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off	
	5 MHz ≤ f ≤ 204 MHz	±2° (nom.)
Nonlinearity of displayed level	0 dB to –70 dB	< 0.15 dB (nom.)
Level measurement uncertainty at center frequency		add 0.2 dB (nom.) to the values in "Total measurement uncertainty – YIG preselector off"
Third-order intermodulation distortion	reference level = signal level + 6 dB	
	5 MHz ≤ f ≤ 204 MHz: two –20 dBm tones at input mixer within analysis bandwidth [21],	–75 dBc (nom.)
Residual spurious response	RF attenuation 0 dB, 5 MHz ≤ f ≤ 204 MHz	–90 dBm (nom.)
ADC related spurious response	single tone within analysis bandwidth, mixer level = –10 dBm [21], reference level = signal level, 5 MHz ≤ f ≤ 204 MHz	–78 dBc (nom.)
Other spurious responses		see section "Spurious responses"

[22] The specifications for 80 MHz to 160 MHz analysis bandwidth in this section apply to the following options: R&S®FSW-B160 (order no. 1325.4850.04), R&S®FSW-B160R (order no. 1325.4850.06), R&S®FSW-B320 (order no. 1325.4867.04).

[23] The specifications in this section apply in combination with the R&S®FSW-B320 option (order no. 1325.4867.04) or R&S®FSW-B512 option (order no. 1313.4296.04).

Signal analysis bandwidth 160 MHz to 320 MHz [24]		
Amplitude flatness	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off for f ≥ 8 GHz	
	200 MHz ≤ f_{center} < 4 GHz	±0.7 dB (nom.)
	4 GHz ≤ f_{center} < 7 GHz	±1.2 dB (nom.)
	7 GHz ≤ f_{center} < 8 GHz [25]	±1.4 dB (nom.)
	8 GHz ≤ f_{center} < 22 GHz	±1.6 dB (nom.)
	22 GHz ≤ f_{center} ≤ 43.5 GHz	±2 dB (nom.)
	43.5 GHz < f_{center} ≤ 67 GHz	±2.5 dB (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±2.5 dB (nom.)
Deviation from linear phase	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off for f ≥ 8 GHz	
	200 MHz ≤ f_{center} < 4 GHz	±2.5° (nom.)
	4 GHz ≤ f_{center} < 8 GHz [25]	±4° (nom.)
	8 GHz ≤ f_{center} < 43.5 GHz	±5° (nom.)
	43.5 GHz ≤ f_{center} ≤ 67 GHz	±8° (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±8° (nom.)
Nonlinearity of displayed level	0 dB to –70 dB	< 0.15 dB (nom.)
Level measurement uncertainty at center frequency		add 0.2 dB (nom.) to the values in “Total measurement uncertainty – YIG preselector off”
Third-order intermodulation distortion	reference level = signal level + 6 dB	
	200 MHz ≤ f_{center} < 8 GHz: two –20 dBm tones at input mixer within analysis bandwidth [21], f_{center} ≥ 8 GHz: two –30 dBm tones at input mixer within analysis bandwidth [21]	–75 dBc (nom.)
Residual spurious response	RF attenuation 0 dB, f_{center} ≥ 200 MHz	–90 dBm (nom.)
ADC related spurious response	single tone within analysis bandwidth, mixer level = –10 dBm [21], reference level = signal level	
	200 MHz ≤ f_{center} ≤ 460 MHz	–70 dBc (nom.)
	f_{center} > 460 MHz	–72 dBc (nom.)
Other spurious responses		see section “Spurious responses”

[24] The specifications for 160 MHz to 320 MHz analysis bandwidth in this section apply to the R&S®FSW-B320 option (order no. 1325.4867.04).

[25] To obtain the set analysis bandwidth, (f_{center} + ½ analysis bandwidth) ≤ 8 GHz must be met.

Signal analysis bandwidth 80 MHz to 512 MHz with R&S®FSW-B512 option and R&S®FSW-B512R option		
Amplitude flatness	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off for f ≥ 8 GHz	
	analysis bandwidth ≤ 160 MHz	
	150 MHz ≤ f_{center} < 4 GHz	±0.4 dB (nom.)
	4 GHz ≤ f_{center} ≤ 8 GHz	±0.6 dB (nom.)
	analysis bandwidth ≤ 500 MHz	
	260 MHz ≤ f_{center} < 4 GHz	±0.5 dB (nom.)
	4 GHz ≤ f_{center} ≤ 8 GHz	±0.7 dB (nom.)
	analysis bandwidth ≤ 512 MHz	
	460 MHz ≤ f_{center} < 4 GHz	±0.5 dB (nom.)
	4 GHz ≤ f_{center} ≤ 8 GHz	±0.7 dB (nom.)
	any analysis bandwidth	
	8 GHz < f_{center} ≤ 26.5 GHz	±1.0 dB (nom.)
	26.5 GHz< f_{center} ≤ 43.5 GHz	±1.5 dB (nom.)
	43.5 GHz < f_{center} ≤ 67 GHz	±2 dB (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±2.5 dB (nom.)
Deviation from linear phase	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off for f ≥ 8 GHz	
	analysis bandwidth ≤ 160 MHz	
	150 MHz ≤ f_{center} < 4 GHz	±1° (nom.)
	4 GHz ≤ f_{center} ≤ 8 GHz	±2° (nom.)
	8 GHz < f_{center} ≤ 26.5 GHz	±2.5° (nom.)
	26.5 GHz < f_{center} ≤ 43.5 GHz	±4° (nom.)
	43.5 GHz < f_{center} ≤ 85 GHz	±8° (nom.)
	analysis bandwidth ≤ 500 MHz	
	260 MHz ≤ f_{center} < 4 GHz	±1.5° (nom.)
	4 GHz ≤ f_{center} ≤ 8 GHz	±2° (nom.)
	8 GHz < f_{center} ≤ 26.5 GHz	±5° (nom.)
	26.5 GHz < f_{center} ≤ 85 GHz	±8° (nom.)
	analysis bandwidth ≤ 512 MHz	
	460 MHz ≤ f_{center} < 4 GHz	±1.5° (nom.)
	4 GHz ≤ f_{center} ≤ 8 GHz	±2° (nom.)
	8 GHz < f_{center} ≤ 26.5 GHz	±5° (nom.)
	26.5 GHz < f_{center} ≤ 85 GHz	±8° (nom.)
Nonlinearity of displayed level	0 dB to –70 dB	< 0.15 dB (nom.)
Level measurement uncertainty at center frequency		add 0.2 dB (nom.) to the values in "Total measurement uncertainty – YIG preselector off"
Third-order intermodulation distortion	reference level = signal level + 6 dB	
	f_{center} ≤ 8 GHz: two –20 dBm tones at input mixer within analysis bandwidth [21]	–70 dBc (nom.)
	f_{center} > 8 GHz: two –25 dBm tones at input mixer within analysis bandwidth [21], YIG preselector off	
Residual spurious response	RF attenuation 0 dB, analysis bandwidth ≤ 160 MHz and f_{center} ≥ 150 MHz, or analysis bandwidth ≤ 512 MHz and f_{center} ≥ 650 MHz, YIG preselector off for f ≥ 8 GHz	–90 dBm (nom.)
ADC related spurious response	single tone at center frequency single tone within analysis bandwidth, mixer level = –15 dBm [21], reference level = signal level, analysis bandwidth ≤ 160 MHz and f_{center} ≥ 150 MHz, or analysis bandwidth ≤ 512 MHz and f_{center} ≥ 260 MHz, YIG preselector off for f ≥ 8 GHz	–78 dBc (nom.) –70 dBc (nom.)
Other spurious responses		see section "Spurious responses"

Inputs and outputs

RF input		
Impedance		50 Ω
Connector	R&S®FSW8, R&S®FSW13	N female
	R&S®FSW26	APC 3.5 mm male (compatible with SMA)
	R&S®FSW43	2.92 mm male (compatible with SMA)
	R&S®FSW50, R&S®FSW67	1.85 mm male (compatible with 2.4 mm)
	R&S®FSW85	1.00 mm male
VSWR of R&S®FSW8	RF attenuation ≤ 4 dB	
	10 MHz ≤ f ≤ 8 GHz	typ. 1.87 [26]
	5 dB ≤ RF attenuation ≤ 9 dB	
	10 MHz ≤ f < 1 GHz	< 1.5, typ. 1.20 [26]
	10 MHz ≤ f < 3.6 GHz	< 1.5, typ. 1.31 [26]
	3.6 GHz ≤ f ≤ 8 GHz	< 2.0, typ. 1.51 [26]
	RF attenuation ≥ 10 dB	
	10 MHz ≤ f < 1 GHz	< 1.2, typ. 1.09 [26]
	1 GHz ≤ f < 3.6 GHz	< 1.5, typ. 1.19 [26]
	3.6 GHz ≤ f ≤ 8 GHz	< 2.0, typ. 1.42 [26]
VSWR of R&S®FSW13	RF attenuation ≤ 4 dB	
	10 MHz ≤ f ≤ 13.6 GHz	typ. 1.87 [26]
	5 dB ≤ RF attenuation ≤ 9 dB	
	10 MHz ≤ f < 3.6 GHz	< 1.5, typ. 1.25 [26]
	3.6 GHz ≤ f ≤ 13.6 GHz	< 2.0, typ. 1.29 [26]
	RF attenuation ≥ 10 dB	
	10 MHz ≤ f < 1 GHz	< 1.2, typ. 1.10 [26]
	1 GHz ≤ f < 3.6 GHz	< 1.5, typ. 1.14 [26]
	3.6 GHz ≤ f ≤ 13.6 GHz	< 2.0, typ. 1.22 [26]
VSWR of R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67, R&S®FSW85	RF attenuation ≤ 4 dB	
	10 MHz ≤ f ≤ 26.5 GHz	typ. 1.87 [26, 27]
	26.5 GHz < f ≤ 40 GHz	typ. 2.0 [26]
	40 GHz < f ≤ 70 GHz	2.0 (nom.)
	70 GHz < f ≤ 85 GHz	2.4 (nom.)
	5 dB ≤ RF attenuation ≤ 9 dB	
	10 MHz ≤ f ≤ 3.5 GHz	< 1.5, typ. 1.24 [26, 27]
	3.5 GHz < f ≤ 8 GHz	< 1.8, typ. 1.26 [26]
	8 GHz < f ≤ 18 GHz	< 1.8, typ. 1.39 [26]
	18 GHz < f ≤ 26.5 GHz	< 2.0, typ. 1.43 [26]
	26.5 GHz < f ≤ 40 GHz	< 2.5, typ. 1.8 [26]
	40 GHz < f ≤ 70 GHz	2.0 (nom.)
	70 GHz < f ≤ 85 GHz	2.4 (nom.)
	RF attenuation ≥ 10 dB	
	10 MHz ≤ f ≤ 3.5 GHz	< 1.2, typ. 1.12 [26, 27]
	3.5 GHz < f ≤ 8 GHz	< 1.5, typ. 1.19 [26]
	8 GHz < f ≤ 18 GHz	< 1.5, typ. 1.25 [26]
	18 GHz < f ≤ 26.5 GHz	< 2.0, typ. 1.37 [26]
	26.5 GHz < f ≤ 40 GHz	< 2.5, typ. 1.7 [26]
	40 GHz < f ≤ 70 GHz	2.0 (nom.)
	70 GHz < f ≤ 85 GHz	2.4 (nom.)
	R&S®FSW85, input coupling AC, RF attenuation ≥ 10 dB	
	50 MHz ≤ f ≤ 3.5 GHz	< 1.5, typ. 1.19 [26]
Setting range of attenuator		0 dB to 79 dB, in 1 dB steps [28, 29]

Probe power supply		
Supply voltages		+15 V DC, –12.6 V DC and ground, max. 150 mA (nom.)

[26] Typical VSWR performance: performance expected to be met in 95 % of the cases with a confidence level of 95 %, temperature +20 °C to +30 °C, input set to “DC coupling”. These values are not warranted and are subject to modification if a significant change in the statistical behavior of production instruments is observed.

[27] R&S®FSW85: specification applies to input coupling DC.

[28] R&S®FSW8 to R&S®FSW67: Mechanical RF attenuator: 5 dB steps. Electronic IF attenuator: 1 dB steps.

[29] R&S®FSW85: Mechanical RF attenuator: 10 dB steps. Electronic IF attenuator: 1 dB steps.

Noise source control		
Connector		BNC female
Output voltage		0 V/28 V, max. 100 mA, switchable (nom.)

Power sensor		
Connector		6-pin LEMOSA female for R&S®NRP-Zxx power sensors

USB interface		7 ports, type A plug, version 2.0
		1 port, type B plug, version 2.0

AF output		
Connector		3.5 mm mini-jack
Output impedance		10 Ω (nom.)
Open-circuit voltage		up to 1.5 V, adjustable
External trigger/gate		
Number of ports		1 × input, 2 × input/output, selectable
Connector		BNC female
Trigger input voltage		0.5 V to 3.5 V (nom.)
Trigger output voltage		TTL-compatible, 0 V/5 V (nom.)
Impedance		10 kΩ (nom.)

Reference input 1 MHz to 20 MHz		
Connector		BNC female
Impedance		50 Ω (nom.)
Input frequency range		1 MHz ≤ f_{in} ≤ 20 MHz, in 1 Hz steps
Required level		> 0 dBm

Reference input 100 MHz		
Connector		SMA female
Impedance		50 Ω (nom.)
Input frequency range		100 MHz
Required level		0 dBm to 10 dBm

Reference output 10 MHz		
Connector		BNC female
Impedance		50 Ω (nom.)
Output frequency		10 MHz
Level		10 dBm (nom.)

Reference output 1 MHz to 20 MHz		
Connector		BNC female
Impedance		50 Ω (nom.)
Output frequency	internal reference	not active
	external reference	same as reference input signal
Level		same as reference input signal

Reference output 100 MHz		
Connector		SMA female
Impedance		50 Ω (nom.)
Output frequency		100 MHz
Level		6 dBm (nom.)

Reference output 640 MHz		
Connector		SMA female
Impedance		50 Ω (nom.)
Output frequency		640 MHz
Level		16 dBm (nom.)

IF/video output		
Connector		BNC female, 50 Ω (nom.)
IF out		
Bandwidth		equal to RBW setting
IF frequency		(RBW/2) to (240 MHz – RBW/2)
Output level	center frequency > 10 MHz, span = 0 Hz or I/Q analyzer on, signal at reference level and center frequency	0 dBm (nom.)
Video out		
Bandwidth		equal to VBW setting
Output scaling	log. display scale	logarithmic
	lin. display scale	linear
Output level	center frequency > 10 MHz, span = 0 Hz, signal at reference level and center frequency	1 V at 50 Ω load (nom.)

IF wide output (with R&S®FSW-B160, R&S®FSW-B320 or R&S®FSW-B512 option only)		
Connector	R&S®FSW-B160 or R&S®FSW-B320	BNC female, 50 Ω (nom.)
	R&S®FSW-B512	SMA female, 50 Ω (nom.)
IF frequency	center frequency ≥ 200 MHz	50 MHz to 550 MHz (nom.)
Max. bandwidth (6 dB)	YIG preselector off	500 MHz
Output level	RF attenuation = auto, reference level ≥ –15 dBm, signal level = reference level	–20 dBm (nom.)
Aux port		
Connector		9-pin D-Sub male
Output		TTL-compatible, 0 V/5 V (nom.), max. 15 mA (nom.)
Input		TTL-compatible, max. 5 V (nom.)

IF output 2 GHz (R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67 and R&S®FSW85 only)		
Connector		SMA female, 50 Ω (nom.)
RF frequency range	span = 0 Hz	8 GHz to the maximum frequency of the instrument model
IF frequency	center	2 GHz
Output level	RF attenuation = 0 dB, signal level = 0 dBm	
	R&S®FSW43, R&S®FSW50	–20 dBm (nom.)
	R&S®FSW67, R&S®FSW85	–30 dBm (nom.)
Amplitude flatness	within IF frequency ± 1 GHz, peak-to-peak, RF attenuation = 10 dB, RF preamplifier off, electronic attenuator off, YIG preselector off	
	R&S®FSW26	
	8 GHz ≤ f_{center} < 22 GHz	8 dB (nom.)
	f_{center} ≥ 22 GHz	10 dB (nom.)
	R&S®FSW43, R&S®FSW50	
	f_{center} ≥ 8 GHz	8 dB (nom.)
	R&S®FSW67, R&S®FSW85	
	8 GHz ≤ f_{center} < 49 GHz	8 dB (nom.)
	49 GHz ≤ f_{center} < 51 GHz	16 dB (nom.)
	51 GHz ≤ f_{center} < 57 GHz	8 dB (nom.)
	57 GHz ≤ f_{center} < 59 GHz	16 dB (nom.)
	59 GHz ≤ f_{center} < 63 GHz	10 dB (nom.)
	63 GHz ≤ f_{center} ≤ 85 GHz	16 dB (nom.)

IEC/IEEE bus control		interface in line with IEC 625-2 (IEEE 488.2)
Command set		SCPI 1997.0
Connector		24-pin Amphenol female
Interface functions		SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0

LAN interface		10/100/1000BASE-T
Connector		RJ-45

External monitor		
Connector		DVI-D, DisplayPort Rev 1.1

Synchronization input		
Connector		HDMI™

Synchronization output		
Connector		HDMI™

General data

Display		30.7 cm (12.1") WXGA color touchscreen
Resolution		1280 × 800 pixel (WXGA resolution)
Pixel failure rate		< 1 × 10^{-5}

Data storage		
Internal	standard	solid state disk ≥ 32 Gbyte
External		supports USB 2.0 compatible memory devices

Temperature		
Temperature	operating temperature range	+5 °C to +50 °C [30]
	permissible temperature range	0 °C to +55 °C [30]
	storage temperature range	–40 °C to +70 °C
Climatic loading		+40 °C at 90 % rel. humidity, in line with EN 60068-2-30, without condensation

Altitude		
Max. operating altitude	above sea level	4600 m (approx. 15100 feet)

Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz displacement: 0.15 mm constant amplitude (1.8 g at 55 Hz); 55 Hz to 150 Hz acceleration: 0.5 g constant 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		40 g shock spectrum, in line with MIL-STD-810E method no. 516.4, procedure I, MIL-PRF-28800F, class 3

EMC		in line with EMC Directive 2004/108/EC including: IEC/EN 61326-1 [31, 32] IEC/EN 61326-2-1 CISPR 11/EN 55011 [31] IEC/EN 61000-3-2 IEC/EN 61000-3-3

Recommended calibration interval		1 year

Warranty	base unit	3 years
	accessories	1 year

[30] With built–in R&S®FSW-B512R option, the upper operating and permissible temperature is limited to +45 °C.

[31] Emission limits for class B equipment apply.

[32] Immunity test requirement for industrial environment (EN 61326 table 2).

Power supply		
AC input voltage range		100 V to 240 V
AC supply frequency		50 Hz to 60 Hz/400 Hz
Max. input current		7.3 A (100 V) to 4.6 A (240 V)
Power consumption	R&S®FSW8	150 W without options, 250 W with all options (meas.) [33]
	R&S®FSW13, R&S®FSW26	175 W without options, 275 W with all options (meas.) [33]
	R&S®FSW43, R&S®FSW50	200 W without options, 300 W with all options (meas.) [33]
	R&S®FSW67	220 W without options, 320 W with all options (meas.) [33]
	R&S®FSW85	230 W without options, 330 W with all options (meas.) [33]
Safety		in line with IEC 61010-1, EN 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Test mark		VDE-GS, $_{C}$CSA$_{US}$

Dimensions and weight		
Dimensions (nom.) (W × H × D, including front handles and rear feet)	R&S®FSW8 to R&S®FSW67	462 mm × 240 mm × 504 mm (18.15 in × 9.44 in × 19.81 in)
	R&S®FSW85	462 mm × 240 mm × 610 mm (18.15 in × 9.44 in × 24.01 in)
Net weight without options (nom.)	R&S®FSW8	18.6 kg (41.01 lb)
	R&S®FSW13	20.2 kg (44.53 lb)
	R&S®FSW26	20.2 kg (44.53 lb)
	R&S®FSW43, R&S®FSW50	20.9 kg (46.07 lb)
	R&S®FSW67	23.6 kg (52.03 lb)
	R&S®FSW85	26.6 kg (58.64 lb)

[33] All options except R&S®FSW-B512R. For R&S®FSW-B512R add 130 W to the power consumption.

Options

R&S®FSW-B10 external generator control

Interface		
IEC/IEEE bus control		24-pin Amphenol female
Aux control		9-pin D-Sub female

Supported signal generators		R&S®SGS100A, R&S®SGT100A, R&S®SMA100A, R&S®SMB100A, R&S®SMBV100A, R&S®SMC100A, R&S®SME, R&S®SMF100A, R&S®SMG, R&S®SMGL, R&S®SMGU, R&S®SMH, R&S®SMHU, R&S®SMIQ, R&S®SMJ100A, R&S®SML, R&S®SMP, R&S®SMR, R&S®SMT, R&S®SMU200A, R&S®SMV03, R&S®SMW200A, R&S®SMX, R&S®SMY

R&S®FSW-B13 highpass filters

Frequency		
Frequency range	filter 1	1 GHz to 1.75 GHz
	filter 2	1.75 GHz to 3 GHz

Stopband attenuation		
500 MHz to 875 MHz	filter 1	> 20 dB (nom.)
875 MHz to 1.5 GHz	filter 2	> 20 dB (nom.)

Other specifications		
Level measurement uncertainty		see base unit specification
Displayed average noise level		
Intermodulation		
Measurement uncertainty		

R&S®FSW-B17 digital baseband interface

I/Q data IN		
Interface		LVDS
	connector	26-pin female MDR (Mini D Ribbon)
Transfer protocol		R&S®Digital I/Q Interface [34]
User data	sample rate	100 sample/s to 100 Msample/s (nom.)
	resolution	18 bit for I and 18 bit for Q
	general purpose signals	2 bit

I/Q data OUT		
Interface		LVDS
	connector	26-pin female MDR (Mini D Ribbon)
Transfer protocol		R&S®Digital I/Q Interface [34]
User data	sample rate	100 sample/s to 200 Msample/s (nom.)
	resolution	18 bit for I and 18 bit for Q
Max. I/Q bandwidth	standard	10 MHz
	with R&S®FSW-B28 option	28 MHz
	with R&S®FSW-B40 option	40 MHz
	with R&S®FSW-B80 option	80 MHz
	with R&S®FSW-B160 option	160 MHz
	with R&S®FSW-B320 option	160 MHz
	with R&S®FSW-B512 option	160 MHz

R&S®FSW-B21 LO/IF connections for external mixers (not available for R&S®FSW8, R&S®FSW13)

LO signal		
Frequency range		7.65 GHz to 17.45 GHz
Level	+20 °C to +30 °C	+15.5 dBm ± 1 dB
	+5 °C to +40 °C	+15.5 dBm ± 3 dB

IF input		
IF frequency	set signal analysis bandwidth	
	≤ 80 MHz, bandwidth-dependent	1310 MHz to 1330 MHz
	80 MHz to 160 MHz/320 MHz with R&S®FSW-B160/-B320	1530 MHz
	80 MHz to 512 MHz with R&S®FSW-B512	1580 MHz
Full-scale level	compression < 1 dB	
	2-port mixer (LO output/IF input, front panel)	–20 dBm (nom.)
	3-port mixer (IF input, front panel)	–20 dBm (nom.)
Level uncertainty at IF frequency	IF input level = reference level = –25 dBm, RBW = 30 kHz, mixer conversion loss set to 0 dB, 2-port mixer, LO output/IF input connector (front panel)	
	+20 °C to +30 °C	< 1 dB
	+5 °C to +40 °C	< 3 dB
	IF input level = reference level = –25 dBm, RBW = 30 kHz, mixer conversion loss set to 0 dB, 3-port mixer, IF input connector (front panel)	
	+20 °C to +30 °C	< 1 dB
	+5 °C to +40 °C	< 3 dB

Inputs and outputs		
LO output/IF input		SMA female, 50 Ω
IF input		SMA female, 50 Ω

[34] R&S®Digital I/Q Interface is a Rohde & Schwarz company standard for the transmission of digital I/Q data.
It is supported by a wide range of instruments (signal generators, signal analyzers and communications testers and the R&S®EX-IQ-Box).

R&S®FSW-B24 RF preamplifier

Frequency		
Frequency range	R&S®FSW8	100 kHz to 8 GHz
	R&S®FSW13	100 kHz to 13.6 GHz
	R&S®FSW26	100 kHz to 26.5 GHz
	R&S®FSW43	100 kHz to 43.5 GHz
	R&S®FSW50	100 kHz to 50 GHz
	R&S®FSW67	100 kHz to 67 GHz

Setting range		
RF preamplifier gain	R&S®FSW8, R&S®FSW13	15 dB/30 dB (nom.) (selectable)
	R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67	30 dB (nom.)

Other specifications		
Level measurement uncertainty		see base unit specification
Displayed average noise level		
Intermodulation		
Measurement uncertainty		

R&S®FSW-B25 electronic attenuator

Frequency		
Frequency range	R&S®FSW8	10 MHz to 8 GHz
	R&S®FSW13, R&S®FSW26	10 MHz to 13.6 GHz

Setting range		0 dB to 30 dB, in 1 dB steps [35]

Level measurement uncertainty		see base unit specification

Displayed average noise level	electronic attenuator on	specification of base unit degrades by 3 dB + 0.25 dB × f / 1 GHz (nom.)

Intermodulation		
Third-order intercept point (TOI)	electronic attenuator off or electronic attenuator on and RF attenuation = 0 dB	see base unit specification
	electronic attenuator on, RF attenuation = 30 dB	
	10 MHz to 500 MHz	30 dBm (nom.)
	500 MHz to 13.6 GHz	40 dBm (nom.)

[35] Electronic RF attenuator: 5 dB steps.
Electronic IF attenuator: 1 dB steps.

R&S®FSW-B71 analog baseband inputs, R&S®FSW-B71E 80 MHz analysis bandwidth for analog baseband inputs

Frequency		
Frequency range (equalized)	R&S®FSW-B71	
	I only, Q only	DC to 40 MHz
	I + jQ	–40 MHz to +40 MHz
	R&S®FSW-B71E	
	I only, Q only	DC to 80 MHz
	I + jQ	–80 MHz to +80 MHz

Spectral purity		
Phase noise	offset 1 kHz	–134 dBc (1 Hz) (nom.)
	offset 10 kHz	–138 dBc (1 Hz) (nom.)
	offset ≥ 100 kHz	–144 dBc (1 Hz) (nom.)

Inputs		
Connectors	I and Q	BNC female, 50 Ω (nom.)
	$\overline{I}$ and $\overline{Q}$ [36]	BNC female, 50 Ω (nom.)
Maximum safe input voltage	any input, sum of DC + AC	±4 V
Input voltage range (full scale)	peak voltage	±2 V, ±1 V, ±0.5 V, ±0.25 V
Max. common mode input range		–3 V to +3 V
Input impedance	single-ended	50 Ω (nom.)
	differential	100 Ω (nom.)
	common mode at DC	20 kΩ (nom.)
Input return loss	0 Hz to 40 MHz	–35 dB (nom.)
	40 MHz to 80 MHz (R&S®FSW-B71E only)	–30 dB (nom.)

Amplitude		
Absolute amplitude accuracy	f_{input} = 1 MHz, input voltage = full scale – 6 dB	±0.15 dB
Amplitude linearity	0 dB to –80 dB relative to full scale	±0.1 dB (nom.)
Frequency response		
Amplitude	relative to 1 MHz	
	0 Hz to 40 MHz	±0.15 dB
	40 MHz to 80 MHz (R&S®FSW-B71E only)	±0.25 dB
Deviation from linear phase	0 Hz to 40 MHz	±1° (nom.)
	40 MHz to 80 MHz (R&S®FSW-B71E only)	±2° (nom.)
Channel match (I/Q imbalance)		
Amplitude match accuracy	0 Hz to 20 MHz	±0.06 dB (2σ)
	20 MHz to 40 MHz	±0.1 dB (2σ)
	40 MHz to 80 MHz (R&S®FSW-B71E only)	±0.15 dB (2σ)
Phase match accuracy	0 Hz to 20 MHz	±0.3° (nom.)
	20 MHz to 40 MHz	±0.6° (nom.)
	40 MHz to 80 MHz (R&S®FSW-B71E only)	±1° (nom.)

[36] Not available for the R&S®FSW85.

Dynamic range		
Crosstalk		–80 dB (nom.)
Signal-to-noise ratio	any input range, relative to full scale	145 dBc (1 Hz) (nom.)
Displayed average noise level (RMS)	2 MHz to 80 MHz	
	range	
	±2 V peak	–130 dBm (1 Hz) (72 nV (√ 1 Hz)) (nom.)
	±1 V peak	–136 dBm (1 Hz) (36 nV (√ 1 Hz)) (nom.)
	±0.5 V peak	–142 dBm (1 Hz) (18 nV (√ 1 Hz)) (nom.)
	±0.25 V peak	–148 dBm (1 Hz) (9 nV (√ 1 Hz)) (nom.)
Residual DC (I/Q offset)	relative to full scale	–54 dB (nom.)
Residual response	range ± 0.25 V peak	–90 dBm (nom.)
Spurious response	with full scale input signal	
	0 Hz to 40 MHz	–75 dBc (nom.)
	40 MHz to 80 MHz (R&S®FSW-B71E only)	–70 dBc (nom.)
Third-order intermodulation distortion	two CW signals, voltage = full scale – 6 dB (each signal)	
	0 Hz to 40 MHz	–80 dBc (nom.)
	40 MHz to 80 MHz (R&S®FSW-B71E only)	
	differential	–80 dBc (nom.)
	single-ended	–74 dBc (nom.)

Probes		
Probes supported on connectors I and Q	active single-ended probes	R&S®RT-ZS10E
		R&S®RT-ZS10
		R&S®RT-ZS20
		R&S®RT-ZS30
		R&S®RT-ZS60
	active differential probes	R&S®RT-ZD20
		R&S®RT-ZD30
		R&S®RT-ZD40
RF measurements using probes [37]		
Supported connector	input source RF set to baseband input I	I
Maximum input frequency		5 GHz [38]
Frequency response	see probe specification for frequency response of probe	add the probe frequency response to the R&S®FSW frequency response specified in section “Total measurement uncertainty”

[37] Feature not available for R&S®FSW67 and R&S®FSW85.

[38] Maximum frequency supported by the connector. To identify the maximum achievable input frequency when using a probe, the probe specification must be taken into account.

R&S®FSW-B2000 2 GHz analysis bandwidth (option available for all models except R&S®FSW8, R&S®FSW13)

The specifications in this section apply to I/Q data recorded using the R&S®FSW-B2000 option. "B2000" must be configured as data source in the INPUT menu. When using other input settings for I/Q data recording, i.e. in relation with the R&S®FSW-B28/ -B40/-B80/-B160/-B320/-B512 options, see section "I/Q data" in the base unit specification.

The R&S®FSW-B2000 option uses an oscilloscope as external digitizer. An R&S®RTO1044 or R&S®RTO2044 with R&S®RTO-B4 option is needed to obtain the specified performance. For ordering information, see "Oscilloscopes supported by R&S®FSW-B2000".

Frequency range	center frequency, dependent on instrument model	5.5 GHz to 26/43/50/67/86 GHz
Record length [39]	2 GHz analysis bandwidth, R&S®RTO-1044 with R&S®RTO-B104 option	
	trigger: free run, IF power	max. 200 Msample I and Q [40]
	trigger: external	max. 100 Msample I and Q [40]
	2 GHz analysis bandwidth, R&S®RTO-2044 with R&S®RTO-B110 option	
	trigger: free run, IF power	max. 500 Msample I and Q [40]
	trigger: external	max. 250 Msample I and Q [40]
Sampling rate		10 kHz to 2.5 GHz
Signal analysis bandwidth (equalized)	dependent on sampling rate, YIG preselector off	8 kHz to 2 GHz
Amplitude flatness	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off, +20 °C to +30 °C	
	analysis bandwidth ≤ 2 GHz	
	5.5 GHz ≤ f_{center} < 8 GHz	±1.5 dB
	8 GHz ≤ f_{center} < 22 GHz	±1.2 dB
	22 GHz ≤ f_{center} ≤ 26.5 GHz	±1.4 dB
	26.5 GHz < f_{center} ≤ 43.5 GHz	±1.6 dB
	43.5 GHz < f_{center} ≤ 50.0 GHz	±1.7 dB
	50.0 GHz < f_{center} ≤ 67.0 GHz	±2.0 dB
	67 GHz < f_{center} ≤ 85 GHz	±2.5 dB
Deviation from linear phase	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier off, electronic attenuator off, YIG preselector off, +20 °C to +30 °C	
	analysis bandwidth ≤ 500 MHz	
	5.5 GHz ≤ f_{center} < 13 GHz	±4° (nom.)
	13 GHz ≤ f_{center} ≤ 37 GHz	±2° (nom.)
	37 GHz < f_{center} ≤ 40 GHz	±4° (nom.)
	40.0 GHz < f_{center} ≤ 50.0 GHz	±6° (nom.)
	50.0 GHz < f_{center} ≤ 67.0 GHz	±4° (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±6° (nom.)
	analysis bandwidth ≤ 1 GHz	
	5.5 GHz ≤ f_{center} < 13 GHz	±6° (nom.)
	13 GHz ≤ f_{center} ≤ 37 GHz	±4° (nom.)
	37 GHz < f_{center} ≤ 40 GHz	±6° (nom.)
	40.0 GHz < f_{center} ≤ 50.0 GHz	±8° (nom.)
	50.0 GHz < f_{center} ≤ 67.0 GHz	±6° (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±8° (nom.)
	analysis bandwidth ≤ 2 GHz	
	R&S®FSW26	
	f_{center} ≥ 8 GHz	±8° (nom.)
	R&S®FSW43 to R&S®FSW85	
	5.5 GHz ≤ f_{center} < 13 GHz	±8° (nom.)
	13 GHz ≤ f_{center} ≤ 37 GHz	±6° (nom.)
	37 GHz < f_{center} ≤ 40 GHz	±8° (nom.)
	40.0 GHz < f_{center} ≤ 50.0 GHz	±10° (nom.)
	50.0 GHz < f_{center} ≤ 67.0 GHz	±8° (nom.)
	67 GHz < f_{center} ≤ 85 GHz	±10° (nom.)
Level measurement uncertainty at center frequency		add 1 dB (nom.) to the values in "Total measurement uncertainty – YIG preselector off"

[39] The maximum record length with the R&S®FSW-B2000 option depends on the R&S®RTO memory configuration.
The following equation indicates the relation between record length, R&S®RTO memory size and set R&S®FSW sampling rate:
Record length (rounded to Msample) = (R&S®RTO memory size per channel in Msample) * R&S®FSW sample rate/R&S®RTO sample rate.
This equation is valid for measurements with free run or IF power trigger. For use with external trigger, divide the above value by 2.
The sample rate for the R&S®RTO can be set to 10 GHz (default) or 20 GHz. At 2 GHz analysis bandwidth the R&S®FSW sample rate is 2.5 GHz.

[40] Rounded to Msample.

Ordering information

Designation	Type	Order No.
Signal and Spectrum Analyzer, 2 Hz to 8 GHz	R&S®FSW8	1312.8000.08
Signal and Spectrum Analyzer, 2 Hz to 13.6 GHz	R&S®FSW13	1312.8000.13
Signal and Spectrum Analyzer, 2 Hz to 26.5 GHz	R&S®FSW26	1312.8000.26
Signal and Spectrum Analyzer, 2 Hz to 43.5 GHz	R&S®FSW43	1312.8000.43
Signal and Spectrum Analyzer, 2 Hz to 50 GHz	R&S®FSW50	1312.8000.50
Signal and Spectrum Analyzer, 2 Hz to 67 GHz	R&S®FSW67	1312.8000.67
Signal and Spectrum Analyzer, 2 Hz to 85 GHz	R&S®FSW85	1312.8000.85
Accessories supplied		
Power cable, quick start guide and CD-ROM (with operating manual and service manual) R&S®FSW26: adapter 3.5 mm (APC3.5-compatible) female/female R&S®FSW43: adapter 2.92 mm female/female R&S®FSW50 and R&S®FSW67: adapter 1.85 mm female/female R&S®FSW85: adapter 1.0 mm female/female, torque wrench for 1.0 mm connectors with 0.23 Nm coupling torque		

Options

Designation	Type	Order No.	Retro-fittable	Remarks
OCXO Precision Frequency Reference	R&S®FSW-B4	1313.0703.02	yes	user-retrofittable
Resolution Bandwidth > 10 MHz	R&S®FSW-B8	1313.2464.26	no	for R&S®FSW8/13/26, with span = 0 Hz; the signal analysis bandwidth is defined by the R&S®FSW-B28/ -B40/-B80/-B160/-B160R/-B320/ -B512/-B512R/-B2000 options, not by the R&S®FSW-B8 option
Resolution Bandwidth > 10 MHz	R&S®FSW-B8	1313.2464.02	no	for R&S®FSW43/50/67/85, with span = 0 Hz; the signal analysis bandwidth is defined by the R&S®FSW-B28/ -B40/-B80/-B160/-B160R/-B320/ -B512/-B512R/-B2000 options, not by the R&S®FSW-B8 option; export license required
External Generator Control	R&S®FSW-B10	1313.1622.02	yes	contact service center
Highpass Filter for Harmonic Measurements	R&S®FSW-B13	1313.0761.02	yes	user-retrofittable
Digital Baseband Interface	R&S®FSW-B17	1313.0784.02	yes	user-retrofittable
Spare Solid State Drive (removable hard drive)	R&S®FSW-B18	1313.0790.02	yes	for R&S®FSW8/13/26/43/50; user-retrofittable
Spare Solid State Drive (removable hard drive)	R&S®FSW-B18	1313.0790.06	yes	for R&S®FSW67; user-retrofittable
LO/IF Connections for external mixers	R&S®FSW-B21	1313.1100.26	yes	for R&S®FSW26; contact service center
LO/IF Connections for external mixers	R&S®FSW-B21	1313.1100.43	yes	for R&S®FSW43/50/67; contact service center
LO/IF Connections for external mixers	R&S®FSW-B21	1313.1100.85	yes	for R&S®FSW85; contact service center
RF Preamplifier, 100 kHz to 13.6 GHz	R&S®FSW-B24	1313.0832.13	yes	for R&S®FSW8/13; contact service center
RF Preamplifier, 100 kHz to 26.5 GHz	R&S®FSW-B24	1313.0832.26	yes	for R&S®FSW26; contact service center
RF Preamplifier, 100 kHz to 43.5 GHz	R&S®FSW-B24	1313.0832.43	yes	for R&S®FSW43/67; no export license required; contact service center
RF Preamplifier, 100 kHz to 50 GHz	R&S®FSW-B24	1313.0832.49	yes	for R&S®FSW50; no export license required; contact service center
RF Preamplifier, 100 kHz to 50 GHz	R&S®FSW-B24	1313.0832.51	yes	for R&S®FSW50; export license required; contact service center

Designation	Type	Order No.	Retro-fittable	Remarks
RF Preamplifier, 100 kHz to 67 GHz	R&S®FSW-B24	1313.0832.66	yes	for R&S®FSW67; no export license required; contact service center
RF Preamplifier, 100 kHz to 67 GHz	R&S®FSW-B24	1313.0832.67	yes	for R&S®FSW67; export license required; contact service center
Electronic Attenuator, 1 dB steps	R&S®FSW-B25	1313.0990.02	yes	for R&S®FSW8/13/26; contact service center
USB Mass Memory Write Protection	R&S®FSW-B33	1313.3602.02	no	pre-installed in factory
28 MHz Analysis Bandwidth	R&S®FSW-B28	1313.1645.02	yes	user-retrofittable
40 MHz Analysis Bandwidth	R&S®FSW-B40	1313.0861.02	yes	user-retrofittable
80 MHz Analysis Bandwidth	R&S®FSW-B80	1313.0878.02	yes	user-retrofittable
160 MHz Analysis Bandwidth	R&S®FSW-B160	1325.4850.04	yes	contact service center
320 MHz Analysis Bandwidth	R&S®FSW-B320	1325.4867.04	yes	contact service center
512 MHz Analysis Bandwidth	R&S®FSW-B512	1313.4296.04	yes	contact service center
2 GHz Analysis Bandwidth	R&S®FSW-B2000	1325.4750.26	no	for R&S®FSW26 ex-factory; for later upgrade of R&S®FSW26 instruments use R&S®FSW-U2000
2 GHz Analysis Bandwidth	R&S®FSW-B2000	1325.4750.02	yes	for R&S®FSW43/50/67/85; contact service center
Analog Baseband Inputs, 40 MHz Analysis Bandwidth	R&S®FSW-B71	1313.1651.13	yes	for R&S®FSW8/13; contact service center
Analog Baseband Inputs, 40 MHz Analysis Bandwidth	R&S®FSW-B71	1313.1651.26	yes	for R&S®FSW26/43/50; contact service center
Analog Baseband Inputs, 40 MHz Analysis Bandwidth	R&S®FSW-B71	1313.1651.67	yes	for R&S®FSW67; contact service center
Analog Baseband Inputs, 40 MHz Analysis Bandwidth	R&S®FSW-B71	1313.1651.85	yes	for R&S®FSW85; contact service center
80 MHz Analysis Bandwidth for Analog Baseband Inputs	R&S®FSW-B71E	1313.6547.02	yes	R&S®FSW-B71 required; user-retrofittable
Real-Time Spectrum Analyzer 160 MHz, POI ≤ 15 µs	R&S®FSW-B160R	1325.4850.06	yes	contact service center; includes 160 MHz analysis bandwidth; no export license required
Real-Time Spectrum Analyzer 512 MHz POI ≤ 15 µs	R&S®FSW-B512R	1313.4296.06	yes	contact service center includes 512 MHz analysis bandwidth; export license required

Firmware

Designation	Type	Order No.	Retro-fittable	Remarks
Pulse Measurements	R&S®FSW-K6	1313.1322.02		
Time Side Lobe Measurement	R&S®FSW-K6S	1325.3738.02		R&S®FSW-K6 option required
Analog Modulation Analysis for AM/FM/φM	R&S®FSW-K7	1313.1339.02		
GSM/EDGE/EDGE Evolution/ VAMOS Measurements	R&S®FSW-K10	1313.1368.02		
VOR/ILS Measurements	R&S®FSW-K15	1331.4388.02		contact service center
Multicarrier Group Delay Measurements	R&S®FSW-K17	1313.4150.02		
Amplifier Measurements	R&S®FSW-K18	1325.2170.02		
Noise Figure Measurements	R&S®FSW-K30	1313.1380.02		
Security Write Protection of solid state drive	R&S®FSW-K33	1322.7936.02		
Phase Noise Measurements	R&S®FSW-K40	1313.1397.02		
Spurious Measurements	R&S®FSW-K50	1325.2893.02		
EMI Measurements	R&S®FSW-K54	1313.1400.02		
CISPR Calibration for R&S®FSW-K54	R&S®FSW-K54CAL	1331.5932.02		in line with ISO 17025 and ISO 9000; R&S®FSW-K54 option required
Transient Measurement Application	R&S®FSW-K60	1313.7495.02		
Transient Hop Measurement	R&S®FSW-K60H	1322.9916.02		R&S®FSW-K60 option required
Transient Chirp Measurement	R&S®FSW-K60C	1322.9745.02		R&S®FSW-K60 option required
Vector Signal Analysis	R&S®FSW-K70	1313.1416.02		
3GPP FDD (WCDMA) BS Measurements (incl. HSDPA and HSDPA+)	R&S®FSW-K72	1313.1422.02		
3GPP FDD (WCDMA) MS Measurements (incl. HSUPA and HSUPA+)	R&S®FSW-K73	1313.1439.02		
TD-SCDMA BS Measurements	R&S®FSW-K76	1313.1445.02		
TD-SCDMA UE Measurements	R&S®FSW-K77	1313.1451.02		
CDMA2000® BS Measurements	R&S®FSW-K82	1313.1468.02		
CDMA2000® MS Measurements	R&S®FSW-K83	1313.1474.02		
1xEV-DO BS Measurements	R&S®FSW-K84	1313.1480.02		
1xEV-DO MS Measurements	R&S®FSW-K85	1313.1497.02		
WLAN 802.11a/b/g Measurements	R&S®FSW-K91	1313.1500.02		To support signal analysis bandwidths > 10 MHz, one of the R&S®FSW-B28/-B40/-B80/-B160/ -B320/-B512 options is needed.
WLAN 802.11n Measurements	R&S®FSW-K91N	1313.1516.02		R&S®FSW-K91 required; to support signal analysis bandwidths > 10 MHz, one of the R&S®FSW-B28/-B40/-B80/ -B160/-B320/-B512 options is needed.
WLAN 802.11ac Measurements	R&S®FSW-K91AC	1313.4209.02		
WLAN 802.11p Measurements	R&S®FSW-K91P	1321.5646.02		
WLAN 802.11ad Measurements	R&S®FSW-K95	1313.1639.02		R&S®FSW-B2000 option required
EUTRA/LTE FDD BS Measurements	R&S®FSW-K100	1313.1545.02		To support signal analysis bandwidths > 10 MHz, one of the R&S®FSW-B28/-B40/-B80/ -B160/-B320/-B512 options is needed.
EUTRA/LTE FDD UE Measurements	R&S®FSW-K101	1313.1551.02		
EUTRA/LTE BS MIMO Measurements	R&S®FSW-K102	1313.1568.02		
EUTRA/LTE UL Advanced UL Measurements	R&S®FSW-K103	1313.2478.02		
EUTRA/LTE TDD BS Measurements	R&S®FSW-K104	1313.1574.02		
EUTRA/LTE TDD Uplink Measurements	R&S®FSW-K105	1313.1580.02		
DOCSIS 3.1 OFDM Downstream	R&S®FSW-K192	1325.4138.02		R&S®FSW-B320 option required
DOCSIS 3.1 OFDMA Upstream	R&S®FSW-K193	1325.4144.02		R&S®FSW-B320 option required
160 MHz Real-Time Measurement Application, POI > 15 µs	R&S®FSW-K160RE	1313.7766.02		one of the R&S®FSW-B160/-B320 options is required; not available for R&S®FSW-B512; no export license required

PC software

Designation	Type	Order No.	Retro-fittable	Remarks
OFDM Vector Signal Analysis Software	R&S®FS-K96	1310.0202.02		spectrum analyzer required
OFDM Vector Signal Analysis Software	R&S®FS-K96PC	1310.0219.02		usable with or without spectrum analyzer
EUTRA/LTE FDD Downlink PC Software	R&S®FS-K100PC	1309.9916.02		
EUTRA/LTE Uplink FDD PC Software	R&S®FS-K101PC	1309.9922.02		
EUTRA/LTE Downlink MIMO PC Software (incl. LTE-Advanced)	R&S®FS-K102PC	1309.9939.02		
EUTRA/LTE Uplink MIMO PC Software (incl. LTE-Advanced)	R&S®FS-K103PC	1309.9945.02		
EUTRA/LTE TDD Downlink PC Software	R&S®FS-K104PC	1309.9951.02		
EUTRA/LTE TDD Uplink PC Software	R&S®FS-K105PC	1309.9968.02		
Distortion Analysis PC Software	R&S®FS-K130PC	1310.0090.02		

Upgrades

Designation	Type	Order No.	Retro-fittable	Remarks
LO/IF Connections for external mixers	R&S®FSW-U21	1313.6318.26	yes	for R&S®FSW26; contact service center
LO/IF Connections for external mixers	R&S®FSW-U21	1313.6318.27	yes	for R&S®FSW26 with -B2000 option; contact service center
R&S®FSW67 extended dynamic range for frequencies > 50 GHz	R&S®FSW-U67	1331.5755.02	yes	for R&S®FSW67 with serial number < 104000 only; contact service center
Analysis Bandwidth Upgrade from 28 MHz to 40 MHz	R&S®FSW-U40	1313.5205.02	yes	user-retrofittable; R&S®FSW-B28 required
Analysis Bandwidth Upgrade from 40 MHz to 80 MHz	R&S®FSW-U80	1313.5211.02	yes	user-retrofittable; R&S®FSW-B40 or R&S®FSW-U40 required
Analysis Bandwidth Upgrade from 80 MHz to 160 MHz	R&S®FSW-U160	1325.5357.04	yes	contact service center; R&S®FSW-B80 or R&S®FSW-U80 required
Analysis Bandwidth Upgrade from 160 MHz to 320 MHz	R&S®FSW-U320	1313.7189.02	yes	user-retrofittable; R&S®FSW-B160 or R&S®FSW-U160 or R&S®FSW-B160R or R&S®FSW-U160R required
Real-Time Spectrum Analyzer, 160 MHz, POI ≤ 15 µs	R&S®FSW-U160R	1325.5357.06	yes	contact service center; R&S®FSW-B80 or R&S®FSW-U80 required; includes analysis bandwidth upgrade from 80 MHz to 160 MHz; no export license required
Upgrade Real-Time Spectrum Analyzer 512 MHz POI ≤ 15 µs	R&S®FSW-U512R	1321.6320.06	yes	contact service center includes 512 MHz analysis bandwidth; R&S®FSW-B80 or R&S®FSW-U80 required export license required
Upgrade to 2 GHz Signal Analysis Bandwidth	R&S®FSW-U2000	1325.5405.26	yes	for R&S®FSW26; contact service center
Upgrade to 2 GHz Signal Analysis Bandwidth	R&S®FSW-U2000	1325.5405.50	yes	for R&S®FSW50 with serial number < 103080; contact service center
Upgrade to 2 GHz Signal Analysis Bandwidth	R&S®FSW-U2000	1325.5405.68	yes	for R&S®FSW67 with serial number < 104000 includes R&S®FSW-U67 contact service center

Recommended extras

Designation	Type	Order No.
Headphones		0708.9010.00
IEC/IEEE Bus Cable, length: 1 m	R&S®PCK	0292.2013.10
IEC/IEEE Bus Cable, length: 2 m	R&S®PCK	0292.2013.20
19" Rack Adapter	R&S®ZZA-KN5	1175.3040.00
Matching pads, 50/75 Ω		
L Section, matching at both ends	R&S®RAM	0358.5414.02
Series Resistor, 25 Ω, matching at one end (taken into account in instrument function RF INPUT 75 Ω)	R&S®RAZ	0358.5714.02
High-power attenuators		
100 W, 3/6/10/20/30 dB, 1 GHz	R&S®RBU100	1073.8495.xx (xx = 03/06/10/20/30)
50 W, 3/6/10/20/30 dB, 2 GHz	R&S®RBU50	1073.8695.xx (xx = 03/06/10/20/30)
50 W, 20 dB, 6 GHz	R&S®RDL50	1035.1700.52
Connectors and cables		
Probe power connector, 3-pin		1065.9480.00
N-Type Adapter for R&S®RT-Zxx oscilloscope probes	R&S®RT-ZA9	1417.0909.02
Cable for connecting digital baseband interfaces of Rohde & Schwarz instruments (accessory for R&S®FSW-B17)	R&S®SMU-Z6	1415.0201.02
DC blocks		
DC Block, 10 kHz to 18 GHz (N type)	R&S®FSE-Z4	1084.7443.02
External harmonic mixers (for R&S®FSW26, R&S®FSW43, R&S®FSW50, R&S®FSW67 and R&S®FSW85 with R&S®FSW-B21 option)		
Harmonic Mixer, 40 GHz to 60 GHz	R&S®FS-Z60	1089.0799.02
Harmonic Mixer, 50 GHz to 75 GHz	R&S®FS-Z75	1048.0271.02
Harmonic Mixer, 60 GHz to 90 GHz	R&S®FS-Z90	1048.0371.02
Harmonic Mixer, 75 GHz to 110 GHz	R&S®FS-Z110	1048.0471.02
Harmonic Mixer, 90 GHz to 140 GHz	RPG FS-Z140 [41]	3622.0708.02
Harmonic Mixer, 110 GHz to 170 GHz	RPG FS-Z170 [41]	3622.0714.02
Harmonic Mixer, 140 GHz to 220 GHz	RPG FS-Z220 [41]	3593.3250.02
Harmonic Mixer, 220 GHz to 325 GHz	RPG FS-Z325 [41]	3593.3267.02
Harmonic Mixer, 325 GHz to 500 GHz	RPG FS-Z500 [41]	3593.3273.02
Tools		
Torque Wrench for type N connectors, 1.5 Nm coupling torque (for R&S®FSW8/13)	R&S®ZN-ZTW	1328.8534.71
Torque Wrench for 3.5/2.92/2.4/1.85 mm connectors, 0.9 Nm coupling torque (for R&S®FSW26/43/50/67)	R&S®ZN-ZTW	1328.8534.35
Torque Wrench for 1.0 mm connectors, 0.23 Nm coupling torque (for R&S®FSW85)	R&S®ZN-ZTW	1328.8534.11

[41] RPG is the abbreviation of Radiometer Physics GmbH, a Rohde & Schwarz company.

Power sensors supported [42]

Designation	Type	Order No.
Universal power sensors		
10 MHz to 8 GHz, 100 mW, 2-path	R&S®NRP-Z211	1417.0409.02
10 MHz to 8 GHz, 200 mW	R&S®NRP-Z11	1138.3004.02
10 MHz to 18 GHz, 100 mW, 2-path	R&S®NRP-Z221	1417.0309.02
10 MHz to 18 GHz, 200 mW	R&S®NRP-Z21	1137.6000.02
10 MHz to 18 GHz, 2 W	R&S®NRP-Z22	1137.7506.02
10 MHz to 18 GHz, 15 W	R&S®NRP-Z23	1137.8002.02
10 MHz to 18 GHz, 30 W	R&S®NRP-Z24	1137.8502.02
Power sensor modules with power splitter		
DC to 18 GHz, 500 mW	R&S®NRP-Z27	1169.4102.02
DC to 26.5 GHz, 500 mW	R&S®NRP-Z37	1169.3206.02
Thermal power sensors		
0 Hz to 18 GHz, 100 mW	R&S®NRP18T	1424.6115.02
0 Hz to 18 GHz, 100 mW	R&S®NRP18TN	1424.6121.02
0 Hz to 33 GHz, 100 mW	R&S®NRP33T	1424.6138.02
0 Hz to 33 GHz, 100 mW	R&S®NRP33TN	1424.6144.02
0 Hz to 40 GHz, 100 mW	R&S®NRP40T	1424.6150.02
0 Hz to 40 GHz, 100 mW	R&S®NRP40TN	1424.6167.02
0 Hz to 50 GHz, 100 mW	R&S®NRP50T	1424.6173.02
0 Hz to 50 GHz, 100 mW	R&S®NRP50TN	1424.6180.02
0 Hz to 67 GHz, 100 mW	R&S®NRP67T	1424.6196.02
0 Hz to 67 GHz, 100 mW	R&S®NRP67TN	1424.6209.02
0 Hz to 110 GHz, 100 mW	R&S®NRP110T	1424.6215.02
Average power sensors		
8 kHz to 6 GHz, 200 mW	R&S®NRP6A	1424.6796.02
8 kHz to 6 GHz, 200 mW	R&S®NRP6AN	1424.6809.02
9 kHz to 6 GHz, 200 mW	R&S®NRP-Z91	1168.8004.02
8 kHz to 18 GHz, 200 mW	R&S®NRP18A	1424.6815.02
8 kHz to 18 GHz, 200 mW	R&S®NRP18AN	1424.6821.02
Three path diode power sensors		
100 pW to 200 mW, 10 MHz to 8 GHz	R&S®NRP8S	1419.0006.02
100 pW to 200 mW, 10 MHz to 8 GHz, LAN version	R&S®NRP8SN	1419.0012.02
100 pW to 200 mW, 10 MHz to 18 GHz	R&S®NRP18S	1419.0029.02
100 pW to 200 mW, 10 MHz to 18 GHz, LAN version	R&S®NRP18SN	1419.0035.02
100 pW to 200 mW, 10 MHz to 33 GHz	R&S®NRP33S	1419.0064.02
100 pW to 200 mW, 10 MHz to 33 GHz, LAN version	R&S®NRP33SN	1419.0070.02
100 pW to 100 mW, 50 MHz to 40 GHz	R&S®NRP40S	1419.0041.02
100 pW to 100 mW, 50 MHz to 40 GHz, LAN version	R&S®NRP40SN	1419.0058.02
Wideband power sensors		
50 MHz to 18 GHz, 100 mW	R&S®NRP-Z81	1137.9009.02

Probes supported by R&S®FSW-B71/-B71E option

Designation	Type	Order No.
1.0 GHz, active, 1 MΩ, 0.8 pF	R&S®RT-ZS10E	1418.7007.02
1.0 GHz, active, 1 MΩ, 0.8 pF, micro button	R&S®RT-ZS10	1410.4080.02
1.5 GHz, active, 1 MΩ, 0.8 pF, micro button	R&S®RT-ZS20	1410.3502.02
3.0 GHz, active, 1 MΩ, 0.8 pF, micro button	R&S®RT-ZS30	1410.4309.02
6.0 GHz, active, 1 MΩ, 0.3 pF, micro button	R&S®RT-ZS60	1418.7307.02
1.5 GHz, active, differential, 1 MΩ, 0.6 pF, micro button	R&S®RT-ZD20	1410.4409.02
3.0 GHz, active, differential, 1 MΩ, 0.6 pF, micro button	R&S®RT-ZD30	1410.4609.02
4.5 GHz, active, differential, 1 MΩ, 0.4 pF, micro button	R&S®RT-ZD40	1410.5205.02

[42] For average power measurement only.

Oscilloscopes supported by R&S®FSW-B2000 option

Designation	Type	Order No.
Digital Oscilloscope, 4 GHz, 20 Gsample/s, 20/80 Msample, 4 channels	R&S®RTO1044	1316.1000.44
OCXO 10 MHz	R&S®RTO-B4	1304.8305.02
Memory Upgrade, 50 Msample per channel	R&S®RTO-B101	1304.8428.02
Memory Upgrade, 100 Msample per channel	R&S®RTO-B102	1304.8434.02
Memory Upgrade, 200 Msample per channel	R&S®RTO-B103	1304.8440.02
Memory Upgrade, 400 Msample per channel	R&S®RTO-B104	1304.8457.02

Designation	Type	Order No.
Digital Oscilloscope, 4 GHz, 20 Gsample/s, 20/80 Msample, 4 channels	R&S®RTO2044	1329.7002.44
OCXO 10 MHz	R&S®RTO-B4	1304.8305.02
Memory Upgrade, 100 Msample per channel	R&S®RTO-B101	1329.7060.02
Memory Upgrade, 200 Msample per channel	R&S®RTO-B102	1329.7077.02
Memory Upgrade, 400 Msample per channel	R&S®RTO-B104	1329.7083.02
Memory Upgrade, 1 Gsample per channel	R&S®RTO-B110	1329.7090.04

Service options

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 with Calibration Coverage, one year	R&S®CW1	
Extended Warranty with Calibration Coverage, two years	R&S®CW2	

Extended warranty with a term of one and two years (WE1 and WE2)
Repairs carried out during the contract term are free of charge [43]. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration coverage (CW1 and CW2)
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 [43] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

For product brochure, see PD 5214.5984.12 and www.rohde-schwarz.com

[43] 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 offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, radiomonitoring and radiolocation. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

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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R&S®FSW Signal and Spectrum Analyzer
Data without tolerance limits is not binding | Subject to change

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