R&S®FSV3000 SIGNAL AND SPECTRUM ANALYZER

Specifications

dataTec

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Specifications
Version 12.00

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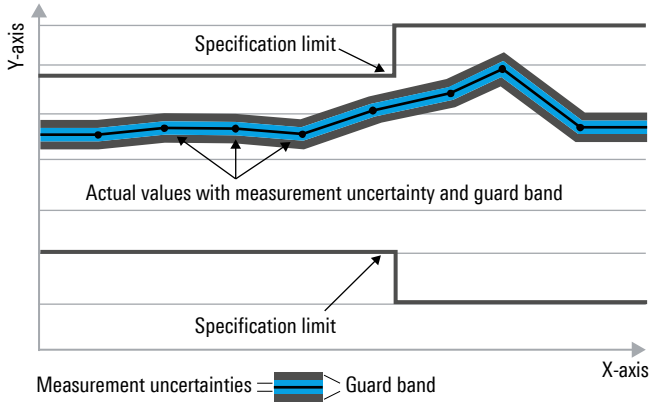
Definitions

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.



Non-traceable specifications with limits (n. trc.)
Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

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 designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Specifications

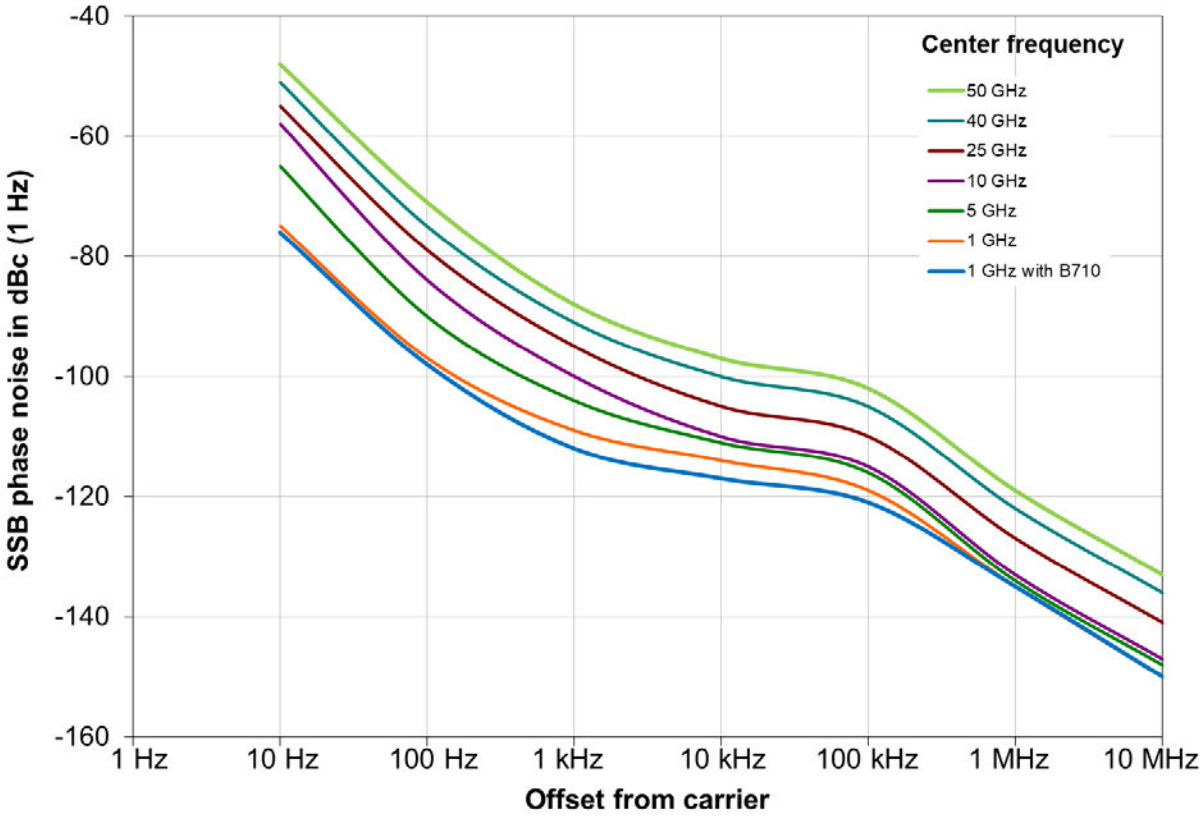
Frequency

Frequency range	R&S®FSV3004	
	DC coupled	10 Hz to 4 GHz
	AC coupled	10 MHz to 4 GHz
	R&S®FSV3007	
	DC coupled	10 Hz to 7.5 GHz
	AC coupled	10 MHz to 7.5 GHz
	R&S®FSV3013	
	DC coupled	10 Hz to 13.6 GHz
	AC coupled	10 MHz to 13.6 GHz
	R&S®FSV3030	
	DC coupled	10 Hz to 30 GHz
	AC coupled	10 MHz to 30 GHz
	R&S®FSV3044	
	DC coupled	10 Hz to 44 GHz
	AC coupled	10 MHz to 44 GHz
	R&S®FSV3050	
	DC coupled	10 Hz to 50 GHz
	AC coupled	10 MHz to 50 GHz
Frequency resolution		0.01 Hz

Reference frequency, internal		
Accuracy		(time since last adjustment × aging rate) + temperature drift + calibration accuracy
Aging per year	standard	1×10^{-6}
	with R&S®FSV3-B4 OCXO reference frequency option	1×10^{-7}
Temperature drift (0 °C to +50 °C)	standard	1×10^{-6}
	with R&S®FSV3-B4 OCXO reference frequency option	1×10^{-8}
Achievable initial calibration accuracy	standard	5×10^{-7}
	with R&S®FSV3-B4 OCXO reference frequency option	5×10^{-8}

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
	range with active EMI measurements (requires R&S®FSV3-K54 option)	101 to 200001
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 to max. frequency
Resolution		0.1 Hz

Spectral purity		
SSB phase noise (1 Hz), without R&S®FSV3-B710 option	frequency = 1 GHz, carrier offset	
	100 Hz	< –91 dBc
	1 kHz	< –101 dBc
	10 kHz	< –107 dBc
	100 kHz	< –115 dBc
	1 MHz	< –135 dBc
	10 MHz	–150 dBc (nom.)
SSB phase noise (1 Hz), with R&S®FSV3-B710 option	frequency = 1 GHz, carrier offset	
	100 Hz	< –93 dBc
	1 kHz	< –109 dBc
	10 kHz	< –114 dBc
	100 kHz	< –119 dBc
	1 MHz	< –135 dBc
	10 MHz	–150 dBc (nom.)
Residual FM	frequency = 1000 MHz, demodulation bandwidth = 25 kHz, AF highpass filter 50 Hz, AF lowpass filter 3 kHz	< 0.5 Hz (RMS) (nom.)



Typical phase noise at different center frequencies

Sweep time

Sweep time range	span = 0 Hz	1 µs to 16000 s
	span ≥ 10 Hz, swept	1.01 ms to 16000 s [1]
	span ≥ 10 Hz, FFT	0.7 µs to 16000 s [2]
Sweep time accuracy	span = 0 Hz	±0.1 % (nom.)
	span ≥ 10 Hz, swept	±3 % (nom.)

Resolution bandwidths

Sweep filters and FFT filters		
Resolution bandwidths (–3 dB)	standard	1 Hz to 10 MHz in 1/2/3/5 sequence, additionally: 51 kHz, 150 kHz, 250 kHz, 400 kHz, 450 kHz, 6 MHz, 8 MHz
	with R&S®FSV3-B8E option [3]	20 MHz, 28 MHz, 30 MHz, 40 MHz additionally
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®FSV3-B8E option	20 MHz, 28 MHz, 40 MHz additionally
Bandwidth uncertainty		< 2 % (nom.)
Shape factor 60 dB:3 dB		< 2 (nom.)

Video bandwidths		1 Hz to 10 MHz in 1/2/3/5 sequence

Signal analysis bandwidths

Maximum signal analysis bandwidth	f ≤ 7.5 GHz	
	standard	28 MHz (nom.)
	with R&S®FSV3-B40 option	40 MHz (nom.)
	with R&S®FSV3-B200 option	200 MHz (nom.)
	f > 7.5 GHz, with R&S®FSV3-B11 option and YIG preselector off	
	standard	28 MHz (nom.)
	with R&S®FSV3-B40 option	40 MHz (nom.)
	with R&S®FSV3-B200 option	200 MHz (nom.)

[1] The selected sweep time is the net data acquisition time (without the extra time needed for hardware settling or FFT processing).
[2] Time for data acquisition for FFT calculation.
[3] Gaussian shape for RBW ≤ 28 MHz.

Level

Level display		
Display range		displayed noise floor up to +30 dBm
Logarithmic level axis		1 dB to 200 dB
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
Trace functions		clear/write, max. hold, min. hold, average, view, spectrogram
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

Maximum input level [4]		
DC voltage	AC coupled	50 V
	DC coupled	0 V
CW RF power	RF attenuation = 0 dB	
	RF preamplifier = off	20 dBm (= 0.1 W)
	with R&S®FSV3-B24 option, RF preamplifier = on	13 dBm (= 0.02 W)
	RF attenuation ≥ 10 dB	
	RF preamplifier = off	30 dBm (= 1 W)
	with R&S®FSV3-B24 option, RF preamplifier = on	23 dBm (= 0.2 W)
Maximum pulse power, pulse duration τ = 3 µs	RF attenuation ≥ 10 dB	100 W
Maximum pulse voltage	RF attenuation ≥ 10 dB	50 V

Intermodulation		
1 dB compression of input mixer	RF attenuation = 0 dB, RF preamplifier = off	
	f ≤ 7.5 GHz	+10 dBm (nom.)
	f > 7.5 GHz	+5 dBm (nom.)
	with R&S®FSV3-B24 option, RF preamplifier = 30 dB, RF attenuation = 0 dB	
	f ≤ 7.5 GHz	–20 dBm (nom.)
	f > 7.5 GHz	–23 dBm (nom.)
Third order intercept point (TOI)	RF attenuation = 0 dB, RF preamplifier = off, YIG preselector on for f > 7.5 GHz, level = –15 dBm (both), Δf > 5 × RBW or 10 kHz, whichever is larger	
	R&S®FSV3004, R&S®FSV3007	
	10 MHz ≤ f_{in} < 100 MHz	> 12 dBm, typ. 15 dBm
	100 MHz ≤ f_{in} ≤ 7.5 GHz	> 15 dBm, typ. 18 dBm
	R&S®FSV3013, R&S®FSV3030, R&S®FSV3044, R&S®FSV3050, YIG preselector on for f > 7.5 GHz	
	10 MHz ≤ f_{in} ≤ 30 GHz	> 15 dBm, typ. 18 dBm
	30 GHz < f_{in} ≤ 44 GHz	> 12 dBm, typ. 15 dBm
	44 GHz < f_{in} ≤ 50 GHz	> 10 dBm, typ. 13 dBm
	with R&S®FSV3-B24 option, RF attenuation = 0 dB, RF preamplifier = 30 dB, YIG preselector on for f > 7.5 GHz, level = –45 dBm (both), Δf > 5 × RBW or 10 kHz, whichever is larger	
	10 MHz ≤ f_{in} ≤ 43.5 GHz	–20 dBm (nom.)
	R&S®FSV3050 with R&S®FSV3-B24 option model .49	
	43.5 GHz < f_{in} ≤ 50 GHz	–20 dBm (nom.)
	R&S®FSV3050 with R&S®FSV3-B24 option model .50	
	43.5 GHz < f_{in} ≤ 50 GHz	–20 dBm (nom.)

[4] Maximum input level while instrument is in operation.

Second harmonic intercept (SHI)	RF attenuation = 0 dB, RF preamplifier = off, YIG preselector on for f_{in} > 3.75 GHz, level = –10 dBm	
	100 MHz < f_{in} ≤ 1.75 GHz	45 dBm (nom.)
	1.75 GHz < f_{in} ≤ 22 GHz	80 dBm (nom.)
	R&S®FSV3050	
	22 GHz < f_{in} ≤ 25 GHz	80 dBm (nom.)
	with R&S®FSV3-B24 option, RF preamplifier = 30 dB, RF attenuation = 0 dB, YIG preselector on for f_{in} > 3.75 GHz, level = –40 dBm	
	100 MHz < f_{in} ≤ 21.75 GHz	10 dBm (nom.)
	R&S®FSV3050 with R&S®FSV3-B24 option model .49	
	21.75 GHz < f_{in} ≤ 25 GHz	5 dBm (nom.)
	R&S®FSV3050 with R&S®FSV3-B24 option model .50	
	21.75 GHz < f_{in} ≤ 25 GHz	10 dBm (nom.)

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 without R&S®FSV3-B24 preamplifier option		
	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +20 °C to +30 °C	
	10 Hz	–90 dBm (nom.)
	20 Hz	–100 dBm, typ. –110 dBm
	100 Hz	–110 dBm, typ. –120 dBm
	1 kHz	–120 dBm, typ. –130 dBm
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +20 °C to +30 °C	
	R&S®FSV3004, R&S®FSV3007	
	9 kHz ≤ f < 100 kHz	–135 dBm, typ. –140 dBm
	100 kHz ≤ f < 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz ≤ f ≤ 7.5 GHz	–148 dBm, typ. –151 dBm
	R&S®FSV3013	
	9 kHz ≤ f < 100 kHz	–135 dBm, typ. –140 dBm
	100 kHz ≤ f < 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz ≤ f < 6 GHz	–148 dBm, typ. –151 dBm
	6 GHz ≤ f ≤ 13.6 GHz	–145 dBm, typ. –147 dBm
	R&S®FSV3030, R&S®FSV3044, R&S®FSV3050	
	9 kHz ≤ f < 100 kHz	–135 dBm, typ. –140 dBm
	100 kHz ≤ f < 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz ≤ f < 1 GHz	–151 dBm, typ. –154 dBm
	1 GHz ≤ f < 3 GHz	–149 dBm, typ. –152 dBm
	3 GHz ≤ f < 6 GHz	–147 dBm, typ. –150 dBm
	6 GHz ≤ f ≤ 7.5 GHz	–145 dBm, typ. –147 dBm
	7.5 GHz < f ≤ 15 GHz	–148 dBm, typ. –151 dBm
	15 GHz < f ≤ 26.5 GHz	–145 dBm, typ. –148 dBm
	26.5 GHz < f ≤ 34 GHz	–143 dBm, typ. –146 dBm
	34 GHz < f ≤ 44 GHz	–136 dBm, typ. –139 dBm
	44 GHz < f ≤ 50 GHz	–133 dBm, typ. –137 dBm
Improvement with noise cancellation	for noise-like signals	
	10 MHz < f ≤ 43.5 GHz	13 dB (nom.)
	f > 43.5 GHz	0 dB (nom.)

Displayed average noise level with R&S®FSV3-B24 preamplifier option		
RF preamplifier = off	RF attenuation = 0 dB, termination = 50 Ω, normalized to 1 Hz RBW, trace average, average mode = log, sample detector, +20 °C to +30 °C	
	10 Hz	–90 dBm (nom.)
	20 Hz	–100 dBm, typ. –110 dBm
	100 Hz	–110 dBm, typ. –120 dBm
	1 kHz	–120 dBm, typ. –130 dBm
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +20 °C to +30 °C	
	R&S®FSV3004, R&S®FSV3007	
	9 kHz ≤ f < 100 kHz	–135 dBm, typ. –140 dBm
	100 kHz ≤ f < 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz ≤ f < 3 GHz	–148 dBm, typ. –154 dBm
	3 GHz ≤ f < 6 GHz	–147 dBm, typ. –150 dBm
	6 GHz ≤ f ≤ 7.5 GHz	–146 dBm, typ. –148 dBm
	R&S®FSV3013	
	9 kHz ≤ f < 100 kHz	–135 dBm, typ. –140 dBm
	100 kHz ≤ f < 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz ≤ f < 3 GHz	–148 dBm, typ. –154 dBm
	3 GHz ≤ f < 6 GHz	–145 dBm, typ. –148 dBm
	6 GHz ≤ f ≤ 7.5 GHz	–142 dBm, typ. –144 dBm
	7.5 GHz < f ≤ 13.6 GHz	–145 dBm, typ. –148 dBm
	R&S®FSV3030, R&S®FSV3044, R&S®FSV3050	
	9 kHz ≤ f < 100 kHz	–135 dBm, typ. –140 dBm
	100 kHz ≤ f < 1 MHz	–145 dBm, typ. –150 dBm
	1 MHz ≤ f < 1 GHz	–150 dBm, typ. –153 dBm
	1 GHz ≤ f < 3 GHz	–148 dBm, typ. –151 dBm
	3 GHz ≤ f < 6 GHz	–145 dBm, typ. –148 dBm
	6 GHz ≤ f ≤ 7.5 GHz	–142 dBm, typ. –144 dBm
	R&S®FSV3030	
	7.5 GHz < f ≤ 15 GHz	–145 dBm, typ. –148 dBm
	15 GHz < f ≤ 26.5 GHz	–142 dBm, typ. –145 dBm
	26.5 GHz < f ≤ 30 GHz	–141 dBm, typ. –144 dBm
	R&S®FSV3044, R&S®FSV3050	
	7.5 GHz < f ≤ 15 GHz	–146 dBm, typ. –149 dBm
	15 GHz < f ≤ 26.5 GHz	–144 dBm, typ. –147 dBm
	26.5 GHz < f ≤ 34 GHz	–143 dBm, typ. –146 dBm
	34 GHz < f ≤ 40 GHz	–136 dBm, typ. –139 dBm
	40 GHz < f ≤ 44 GHz	–133 dBm, typ. –136 dBm
	44 GHz < f ≤ 50 GHz	–130 dBm, typ. –133 dBm
RF preamplifier = 30 dB	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +20 °C to +30 °C, YIG preselector on	
	R&S®FSV3004, R&S®FSV3007, R&S®FSV3013, R&S®FSV3030	
	10 MHz ≤ f < 50 MHz	–158 dBm, typ. –162 dBm
	50 MHz ≤ f < 3 GHz	–162 dBm, typ. –165 dBm
	3 GHz ≤ f ≤ 13.6 GHz	–161 dBm, typ. –164 dBm
	13.6 GHz < f ≤ 22 GHz	–160 dBm, typ. –163 dBm
	22 GHz < f ≤ 26.5 GHz	–157 dBm, typ. –160 dBm
	26.5 GHz < f ≤ 30 GHz	–155 dBm, typ. –158 dBm
	R&S®FSV3044 [5]	
	10 MHz ≤ f < 3 GHz	–164 dBm
	3 GHz ≤ f ≤ 7.5 GHz	–161 dBm
	7.5 GHz < f ≤ 26.5 GHz	–160 dBm
	26.5 GHz < f ≤ 34 GHz	–157 dBm
	34 GHz < f ≤ 40 GHz	–155 dBm
	40 GHz < f ≤ 43.5 GHz	–149 dBm
	R&S®FSV3050 with R&S®FSV3-B24 option model .49	
	10 MHz ≤ f < 2.5 GHz	–164 dBm
	2.5 GHz ≤ f ≤ 7.5 GHz	–161 dBm
	7.5 GHz < f ≤ 26.5 GHz	–160 dBm
	26.5 GHz < f ≤ 40 GHz	–158 dBm
	40 GHz < f ≤ 43.5 GHz	–149 dBm
	43.5 GHz < f ≤ 50 GHz	–139 dBm

[5] The frequency range of the RF preamplifier for the R&S®FSV3044 is limited to 43.5 GHz.

Displayed average noise level with R&S®FSV3-B24 preamplifier option		
	R&S®FSV3050 with R&S®FSV3-B24 option model .50	
	10 MHz ≤ f < 2.5 GHz	–164 dBm
	2.5 GHz ≤ f ≤ 7.5 GHz	–161 dBm
	7.5 GHz < f ≤ 26.5 GHz	–160 dBm
	26.5 GHz < f ≤ 40 GHz	–158 dBm
	40 GHz < f ≤ 44 GHz	–154 dBm
	44 GHz < f ≤ 50 GHz	–151 dBm
Improvement with noise cancellation	for noise-like signals	
	with R&S®FSV3-B24 option models .07/.13/.30/.44/.49	
	10 MHz < f ≤ 43.5 GHz	13 dB (nom.)
	f > 43.5 GHz	0 dB (nom.)
	R&S®FSV3-B24 option model .50	
	10 MHz < f ≤ 50 GHz	13 dB (nom.)

Spurious responses

Image response	YIG preselector on for f > 7.5 GHz, mixer level ≤ –10 dBm [6], sweep optimization: auto or dynamic	
	20 MHz ≤ f ≤ 7.5 GHz	
	f_{in} – 2 × 8796 MHz (first IF)	< –80 dBc (nom.)
	f_{in} – 2 × 732 MHz (second IF)	< –80 dBc
	f_{in} – 2 × 92 MHz (third IF)	< –80 dBc
	7.5 GHz < f ≤ 30 GHz	
	f_{in} ± 2 × 732 MHz (first IF)	< –80 dBc
	f_{in} – 2 × 92 MHz (second IF)	< –80 dBc
	30 GHz < f ≤ 46 GHz	
	f_{in} ± 2 × 732 MHz (first IF)	< –70 dBc
	f_{in} – 2 × 92 MHz (second IF)	< –80 dBc
	46 GHz < f ≤ 50 GHz	
	f_{in} – 2 × 6948 MHz (first IF)	< –70 dBc (nom.)
	f_{in} – 2 × 732 MHz (second IF)	< –70 dBc (nom.)
	f_{in} – 2 × 6948 + 2 × 732 MHz	< –80 dBc (nom.)
	f_{in} = external interfering signal frequency	
Intermediate frequency response	f_{in} = first IF (8796 MHz)	< –80 dBc
	f_{in} = second IF (732 MHz)	< –80 dBc
	f_{in} = third IF (92 MHz)	< –80 dBc
	f_{in} = external interfering signal frequency	
Residual spurious response	RF attenuation = 0 dB	
	f ≤ 1 MHz	< –90 dBm
	1 MHz < f ≤ 7.5 GHz	< –103 dBm
	7.5 GHz < f ≤ 50 GHz	< –100 dBm
	f = receive frequency	
Local oscillator related spurious	f < 15 GHz	
	1 kHz ≤ carrier offset ≤ 10 MHz	< –70 dBc
	carrier offset > 10 MHz	< –80 dBc
	15 GHz ≤ f ≤ 30 GHz	
	1 kHz ≤ carrier offset ≤ 10 MHz	< –64 dBc
	carrier offset > 10 MHz	< –74 dBc
	30 GHz < f ≤ 50 GHz	
	1 kHz ≤ carrier offset ≤ 10 MHz	< –58 dBc
	carrier offset > 10 MHz	< –68 dBc
	f = receive frequency	
Vibrational environmental stimuli	max. 0.21 g (RMS)	< –60 dBc + 20 log (f_{in}/GHz) (nom.)

[6] 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	
	+20 °C to +30 °C	< 0.2 dB (σ = 0.07 dB)
	0 °C to +50 °C	< 0.35 dB (σ = 0.12 dB)
Frequency response referenced to 64 MHz	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier = off, electronic attenuator off, +20 °C to +30 °C	
	9 kHz ≤ f < 10 MHz	< 0.5 dB (σ = 0.17 dB)
	10 MHz ≤ f < 3.6 GHz	< 0.3 dB (σ = 0.10 dB)
	3.6 GHz ≤ f ≤ 7.5 GHz	< 0.5 dB (σ = 0.17 dB)
	7.5 GHz < f ≤ 13.6 GHz, span < 1 GHz	< 1.5 dB (σ = 0.5 dB)
	13.6 GHz < f ≤ 30 GHz, span < 1 GHz	< 2.0 dB (σ = 0.66 dB)
	30 GHz < f ≤ 43.5 GHz, span < 1 GHz	< 2.5 dB (σ = 0.83 dB)
	43.5 GHz < f ≤ 50 GHz, span < 1 GHz	< 3.5 dB (σ = 1.16 dB)
	any setting of RF attenuation, RF preamplifier = off, 0 °C to +50 °C	
	9 kHz ≤ f < 3.6 GHz	< 1.0 dB (σ = 0.33 dB)
	3.6 GHz ≤ f ≤ 7.5 GHz	< 1.5 dB (σ = 0.5 dB)
	7.5 GHz < f ≤ 13.6 GHz	< 2.5 dB (σ = 0.83 dB)
	13.6 GHz < f ≤ 30 GHz	< 3.0 dB (σ = 1.0 dB)
	30 GHz < f ≤ 43.5 GHz	< 3.5 dB (σ = 1.17 dB)
	43.5 GHz < f ≤ 50 GHz	< 4 dB (nom.)
	RF attenuation ≤ 10 dB, RF preamplifier = on [5], 0 °C to +50 °C	
	10 MHz ≤ f < 3.6 GHz	< 1.0 dB (σ = 0.33 dB)
	3.6 GHz ≤ f ≤ 7.5 GHz	< 1.5 dB (σ = 0.5 dB)
	7.5 GHz < f ≤ 13.6 GHz	< 3.0 dB (σ = 1.0 dB)
	13.6 GHz < f ≤ 30 GHz	< 3.5 dB (σ = 1.17 dB)
	30 GHz < f ≤ 43.5 GHz	< 4.0 dB (σ = 1.17 dB)
	43.5 GHz < f ≤ 50 GHz	< 4.5 dB (nom.)
	DC coupling, RF preamplifier = off, 0 °C to +50 °C	
	10 Hz ≤ f < 20 Hz	< 1.5 dB (nom.)
	20 Hz ≤ f < 9 kHz	< 1.0 dB (σ = 0.33 dB)
Attenuator switching uncertainty	f = 64 MHz, 0 dB to 70 dB, referenced to RF attenuation = 10 dB	< 0.2 dB (σ = 0.07 dB)
Uncertainty of reference level setting		0 dB [7]
Bandwidth switching uncertainty at center frequency	referenced to RBW = 10 kHz	< 0.1 dB (σ = 0.04 dB)

Nonlinearity of displayed level		
Logarithmic level display	S/N > 16 dB, 0 dB ≤ level ≤ –70 dB	< 0.12 dB (σ = 0.04 dB)
Linear level display	S/N > 16 dB, 0 dB to –70 dB	5 % of reference level

Total measurement uncertainty	signal level 0 dB to –70 dB below reference level, S/N > 20 dB, sweep time auto, sweep type = sweep, RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier = off, span/RBW < 100, 95 % confidence level, +20 °C to +30 °C	
	9 kHz ≤ f < 10 MHz	0.39 dB
	10 MHz ≤ f < 3.6 GHz	0.29 dB
	3.6 GHz ≤ f ≤ 7.5 GHz	0.39 dB
	7.5 GHz < f ≤ 13.6 GHz	1.00 dB
	13.6 GHz < f ≤ 30 GHz	1.32 dB
	30 GHz < f ≤ 43.5 GHz	1.65 dB
	43.5 GHz < f ≤ 50 GHz	1.97 dB

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

Trigger functions

Trigger		
Trigger source	spectrum analysis	free run, video, external, IF power, RF power, periodic time
	I/Q analysis or modulation analysis	free run, external, IF power, RF power, periodic time, I/Q power
Trigger offset	spectrum analysis	
	span ≥ 10 Hz	0 s to 30 s
	span = 0 Hz	(–sweep time) to 30 s
	I/Q analysis or modulation analysis	–16 s to 16 s, limited by maximum number of pretrigger samples
Trigger resolution	spectrum analysis, trigger source external or IF power	
	span ≥ 10 Hz	7.81 ns (nom.)
	span = 0 Hz, trigger offset ≥ 0	7.81 ns (nom.)
	span = 0 Hz, trigger offset < 0	sweep time / number of sweep points
	I/Q analysis or modulation analysis: see section I/Q data	
Maximum deviation of trigger offset		3.91 ns (nom.)
RF power trigger		
Sensitivity	minimum signal power	–40 dBm + RF attenuation – RF preamplifier gain (nom.)
	maximum signal power	0 dBm + RF attenuation – RF preamplifier gain (nom.)
RF power trigger frequency range	500 MHz ≤ f ≤ 7.5 GHz	f_{center} ± 250 MHz (nom.) [8]
	f > 7.5 GHz	f_{center} ± 250 MHz (nom.)
IF power trigger		
Sensitivity	minimum signal power	–60 dBm + RF attenuation – RF preamplifier gain (nom.)
	maximum signal power	0 dBm + RF attenuation – RF preamplifier gain (nom.)
IF power trigger bandwidth	spectrum analysis	
	RBW > 1 kHz	40 MHz (nom.)
	RBW ≤ 1 kHz	6 MHz (nom.)
	I/Q analysis or modulation analysis: see section I/Q data	
Gated sweep (FFT or sweep mode)		
Gate source		external, RF power, IF power, video
Gate delay		7.81 ns to 30 s (nom.)
Gate length		7.81 ns to 30 s (nom.)
Maximum deviation of gate length		7.81 ns (nom.)

[8] For R&S®FSV3004, R&S®FSV3007, R&S®FSV3013, R&S®FSV3030, R&S®FSV3044 with frontend model .02: –100 MHz to +150 MHz.

I/Q data

Record length	standard	max. 100 Msample I and Q
	with R&S®FSV3-B114 option	max. 800 Msample I and Q
Maximum number of pretrigger samples	standard	100 Msample I and Q
	with R&S®FSV3-B114 option	200 Msample I and Q
Word length of I/Q samples		32 bit for I and 32 bit for Q
Sampling rate	standard	100 Hz to 128 MHz
	with R&S®FSV3-B40 option	100 Hz to 128 MHz
	with R&S®FSV3-B200 option	100 Hz to 256 MHz
Maximum signal analysis bandwidth (equalized)	standard	28 MHz [9]
	with R&S®FSV3-B40 option	40 MHz [9]
	with R&S®FSV3-B200 option	200 MHz [9]

Signal analysis bandwidth ≤ 40 MHz [9]		
Amplitude flatness	(1.25 × signal analysis bandwidth) ≤ f_{center} ≤ 7.5 GHz	±0.3 dB (nom.)
	f_{center} > 7.5 GHz, YIG preselector off	±0.5 dB (nom.)
Deviation from linear phase	(1.25 × signal analysis bandwidth) ≤ f_{center} ≤ 7.5 GHz	±1° (nom.)
	f_{center} > 7.5 GHz, YIG preselector off	±2° (nom.)
Nonlinearity of displayed level		see section Nonlinearity of displayed level
Level measurement uncertainty at center frequency		see section Total measurement uncertainty
Displayed average noise level at center frequency		see section Displayed average noise level
ADC related third order intermodulation distortion	f_{center} ≥ 100 MHz, two –30 dBm tones at input mixer within analysis bandwidth	–80 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, f_{center} ≥ 100 MHz	–90 dBm (nom.)
Other spurious responses		see section Spurious responses
IF power trigger bandwidth		40 MHz (nom.)
Trigger resolution	trigger source extern or IF power	7.81 ns (nom.)

[9] For f > 7.5 GHz, R&S®FSV3-B11 option is required and YIG preselector = off must be set.

Signal analysis bandwidth 40 MHz to 200 MHz [10, 11]		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for f > 7.5 GHz	
	150 MHz ≤ f_{center} < 4 GHz	±0.5 dB (nom.) [12]
	4 GHz ≤ f_{center} ≤ 7.5 GHz	±0.7 dB (nom.) [12]
	7.5 GHz < f_{center} ≤ 26.5 GHz	±1.0 dB (nom.) [12]
	26.5 GHz < f_{center} ≤ 46 GHz	±2.0 dB (nom.) [12]
	46 GHz < f_{center} ≤ 50 GHz	±2.2 dB (nom.) [12]
Deviation from linear phase	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for f > 7.5 GHz	
	150 MHz ≤ f_{center} < 4 GHz	±2° (nom.) [13]
	4 GHz ≤ f_{center} ≤ 7.5 GHz	±2.5° (nom.) [13]
	7.5 GHz < f_{center} ≤ 26.5 GHz	±3° (nom.) [13]
	26.5 GHz < f_{center} ≤ 46 GHz	±4° (nom.) [13]
	46 GHz < f_{center} ≤ 50 GHz	±7° (nom) [13]
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 section Total measurement uncertainty
Displayed average noise level at center frequency		add 5 dB (nom.) to the values in section Displayed average noise level
ADC related third order intermodulation distortion	f_{center} ≥ 150 MHz, two –25 dBm tones at input mixer within analysis bandwidth	–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 [6], reference level = signal level, f_{center} ≥ 150 MHz	–75 dBc (nom.)
Other spurious responses		see section Spurious responses
IF power trigger bandwidth		200 MHz (nom.)
Trigger resolution	trigger source extern	3.91 ns (nom.)
	trigger source IF power	0.997 ns (nom.)

[10] The specifications in this section apply for the temperature range from +20 °C to +30 °C.

[11] To obtain the set analysis bandwidth, (f_{center} + ½ analysis bandwidth) ≤ f_{max} must be met; f_{max}: maximum frequency of the instrument.

[12] With R&S®FSV3-B24 option installed, add 0.2 dB to the specifications.

[13] With R&S®FSV3-B24 option installed, add 1° to the specifications.

Inputs and outputs

RF input		
Impedance		50 Ω
Connector	R&S®FSV3004, R&S®FSV3007, R&S®FSV3013	type N, female
	R&S®FSV3030	APC 3.5 mm male (compatible with SMA)
	R&S®FSV3044	2.92 mm male (compatible with SMA)
	R&S®FSV3050	1.85 mm male
VSWR of R&S®FSV3004, R&S®FSV3007	RF attenuation ≥ 10 dB	
	10 MHz ≤ f < 1 GHz	< 1.2, typ. 1.09 [14]
	1 GHz ≤ f < 3.6 GHz	< 1.5, typ. 1.19 [14]
	3.6 GHz ≤ f ≤ 7.5 GHz	< 2.0, typ. 1.42 [14]
	5 dB ≤ RF attenuation ≤ 9 dB	
	10 MHz ≤ f < 3.6 GHz	< 1.5, typ. 1.31 [14]
	3.6 GHz ≤ f ≤ 7.5 GHz	< 2.0, typ. 1.51 [14]
	RF attenuation ≤ 4 dB, DC coupled	
	10 MHz ≤ f < 7.5 GHz	typ. 1.87
VSWR of R&S®FSV3013, R&S®FSV3030, R&S®FSV3044, R&S®FSV3050	RF attenuation ≥ 5 dB	
	10 MHz ≤ f ≤ 3.5 GHz	< 1.5, typ. 1.3 [14]
	3.5 GHz ≤ f ≤ 18 GHz	< 2.0, typ. 1.8 [14]
	18 GHz < f ≤ 26.5 GHz	< 2.2, typ. 2.0 [14]
	26.5 GHz < f ≤ 40 GHz	< 2.5, typ. 2.2 [14]
	40 GHz < f ≤ 50 GHz	2.5 (nom.)
	RF attenuation ≤ 4 dB, DC coupled	
	10 MHz ≤ f ≤ 7.5 GHz	typ. 2.0 [14]
	7.5 GHz < f ≤ 26.5 GHz	typ. 2.5 [14]
	26.5 GHz < f ≤ 40 GHz	typ. 3.0 [14]
	40 GHz < f ≤ 50 GHz	3.0 (nom.)
Setting range of RF attenuator		0 dB to 75 dB, in 5 dB steps [15]
	with R&S®FSV3-B25 option	0 dB to 75 dB, in 1 dB steps [15]
Setting range of electronic RF attenuator	with R&S®FSV3-B25 option, f ≤ 7.5 GHz	0 dB to 25 dB, in 1 dB steps

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

Noise source control and power sensor		
Connector		7-pin LEMOSA female for R&S®FS-SNSxx smart noise sources and R&S®NRP-Zxx power sensors
	with R&S®FSV3-B28V option	BNC female for noise source control additionally
Noise source control output voltage		0 V/28 V, switchable, max. 100 mA (nom.)

USB interface	standard CPU board	
	front panel	3 ports, type A plug, version 2.0
	rear panel	2 ports, type A plug, version 2.0; 2 ports, type A plug, version 3.0
	with R&S®FSV3-B114 option	
	front panel	3 ports, type A plug, version 2.0
	rear panel	2 ports, type A plug, version 3.1 (1 × 10 Gbit/s, 1 × 5 Gbit/s)
	output current	0.5 A (nom.), version 2.0, 0.9 A (nom.), version 3.0/3.1
	maximum sum of output current via USB ports	2 A (nom.)

[14] Typical VSWR performance: performance expected to be met in 95 % of the cases with a confidence level of 95 %, temperature range from +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.

[15] With R&S®FSV3-B25 option: mechanical RF attenuator with 5 dB steps and electronic attenuator with 1 dB steps. The electronic attenuator is located in the signal path behind the mechanical attenuator and the RF preamplifier (R&S®FSV3-B24 option) on the RF for f ≤ 7.5 GHz, on the IF for f > 7.5 GHz.

Reference input 1		
Connector		BNC female
Impedance		50 Ω
Input frequency range		1 MHz ≤ f_{in} ≤ 100 MHz, in 1 ppm steps
Required level		> 0 dBm, < 15 dBm into 50 Ω

Reference input 2		
Connector		SMA
Impedance		50 Ω
Input frequencies	with R&S®FSV3-K703 option	10 MHz, 100 MHz, 128 MHz, 640 MHz, 1000 MHz, 1280 MHz
Required level		> 3 dBm, < 13 dBm into 50 Ω

Reference output 1		
Connector		BNC female
Impedance		50 Ω
Output frequency	internal reference	10 MHz
	external reference	same as reference input 1 or input 2
Level		> 0 dBm (nom.)

Reference output 2		
Connector		SMA female
Impedance		50 Ω
Output frequency	with R&S®FSV3-K703 option	640 MHz
Level		10 dBm (nom.)

External trigger/gate input		
Number of ports		2 × input/output, selectable
	with R&S®FSV3-B5 option	1 × output additionally
Connector		BNC female
Trigger input voltage		0.5 V to 3.5 V (nom.)
Trigger output voltage		TTL-compatible, 0 V/5 V (nom.)
Input impedance		10 kΩ (nom.)

IEC/IEEE bus control		interface in line with IEC 625-2 (IEEE 488.2)
Command set		SCPI 1997.0
Connector	with R&S®FSV3-B5 option	24-pin Amphenol female (GPIB)
Interface functions		SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0

LAN interface	standard	10/100/1000BASE-T
	with R&S®FSV3-B6 option	10GBASE-T in addition
Connector		RJ-45

External monitor		
Connectors	standard	DVI-D
	with R&S®FSV3-B114 option	HDMI 2.0, DisplayPort Rev. 1.3

General data

Display		LCD TFT color display (10.1")
Resolution		1280 × 800 pixel (WXGA resolution)
Pixel failure rate		< 1 × 10^{-5}

Data storage		
Internal		solid-state drive ≥ 50 Gbyte (nom.)
	with R&S®FSV3-B20 option	solid-state drive ≥ 50 Gbyte (nom.)
	with R&S®FSV3-B114 option and without R&S®FSV3-B20 option	solid-state drive ≥ 120 Gbyte (nom.)
External		support of USB 2.0 and USB 3.0 compatible memory devices

Environmental conditions		
Temperature	operating temperature range	+0 °C to +50 °C
	storage temperature range	–40 °C to +70 °C
Climatic loading		+40 °C at 90 % rel. humidity, without condensation, in line with EN 60068-2-30
Maximum operating altitude	above sea level	4600 m (approx. 15100 ft)

Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 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	8 Hz to 500 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 2014/30/EU including: • IEC/EN 61326-1 [16, 17] • CISPR 11/EN 55011 [17]

Recommended calibration interval		2 years

Warranty	instrument and hardware options	3 years
	accessories	1 year

Power supply		
AC supply		100 V to 240 V, max. 3.5 A; 50 Hz to 60 Hz, 400 Hz, protection class I, in line with VDE 411
Safety		in line with EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Test mark		CE, VDE, $_{C}$CSA$_{US}$, KC

Power consumption		
Operating	R&S®FSV3004, R&S®FSV3007	120 W (nom.), max. 250 W with all options
	R&S®FSV3013, R&S®FSV3030, R&S®FSV3044	170 W (nom.), max. 300 W with all options
	R&S®FSV3050	200 W (nom.), max. 330 W with all options
Non-operating	standby (all models)	
	without R&S®FSV3-B4 option	5 W (nom.)
	with R&S®FSV3-B4 option	8 W (nom.)
	power off (all models)	0 W (nom.)

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

[17] Emission limits for class A equipment apply.

Dimensions and weight		
Dimensions (nom.)	W × H × D	462 mm × 197 mm × 417 mm (18.15 in × 7.76 in × 16.42 in)
Net weight without options (nom.)	R&S®FSV3004, R&S®FSV3007	12.2 kg (26.9 lb)
	R&S®FSV3013	13.6 kg (30 lb)
	R&S®FSV3030	13.8 kg (30.04 lb)
	R&S®FSV3044	14.6 kg (32.2 lb)
	R&S®FSV3050	15.6 kg (34.4 lb)

Options

R&S®FSV3-B3 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

AF output		
Connector		3.5 mm mini jack
Output impedance		32 Ω
Open-circuit voltage		up to 1.5 V, adjustable

R&S®FSV3-B5 and R&S®FSV3-B5E additional interfaces

IF output		
Connector		BNC female, 50 Ω
Bandwidth		equal to bandwidth setting
IF frequency		(50 kHz + ½ RBW) to (53 MHz – ½ RBW), selectable
Output level (gain versus RF input)	RF attenuation = 0 dB, RF preamplifier = off, span = 0 Hz	0 dB (nom.)

Video output		
Connector		BNC female, 50 Ω
Bandwidth		equal to bandwidth setting
Output scaling	logarithmic display scale	logarithmic
	linear 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.)
Trigger out		
Connector		BNC female
Output		TTL-compatible, 0 V/5 V

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.)

AUX control (for external generator control)		
AUX control		9-pin D-Sub female

GPIB interface (not available for R&S®FSV3-B5E)		
IEC/IEEE bus control		24-pin Amphenol female

R&S®FSV3-B10 external generator control

Supported signal generators		R&S®SGS100A, R&S®SGT100A, R&S®SMA100A, R&S®SMA100B, R&S®SMB100A, R&S®SMB100B, R&S®SMBV100A, R&S®SMBV100B, R&S®SMC100A, R&S®SMCV100B, R&S®SMF100A, R&S®SMJ100A, R&S®SMM100A, R&S®SMU200A, R&S®SMW200A
Synchronization handshake interface	standard	LAN
	with R&S®FSV3-B5/B5E option	LAN, TTL

R&S®FSV3-B21 LO/IF connections for external mixers (not available for R&S®FSV3004, R&S®FSV3007, R&S®FSV3013)

LO signal		
Frequency range		8.05 GHz to 16.4 GHz
Output level		+13 dBm to +17 dBm (nom.)
Accuracy of set LO level	+20 °C to +30 °C	±1.5 dB
	+5 °C to +40 °C	±3 dB

IF input		
Supported mixer types		3-port mixer
IF frequency	set signal analysis bandwidth	
	≤ 40 MHz	732 MHz
	> 40 MHz to 200 MHz	768 MHz
Full-scale level	compression < 1 dB	
	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 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

R&S®FSV3-B24 RF preamplifier

Frequency		
Frequency range	R&S®FSV3004	10 MHz to 4 GHz
	R&S®FSV3007	10 MHz to 7.5 GHz
	R&S®FSV3013	10 MHz to 13.6 GHz
	R&S®FSV3030	10 MHz to 30 GHz
	R&S®FSV3044	10 MHz to 43.5 GHz
	R&S®FSV3050	10 MHz to 50 GHz

Setting range		
RF preamplifier gain	R&S®FSV3004, R&S®FSV3007, R&S®FSV3013, R&S®FSV3030, R&S®FSV3044, R&S®FSV3050	15 dB/30 dB (nom.) (selectable)

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

R&S®FSV3-B25 electronic attenuator

Frequency range		10 Hz to 7.5 GHz
Setting range		0 dB to 25 dB, in 1 dB steps
Level measurement uncertainty		see base unit specification
Displayed average noise level		see base unit specification

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 7.5 GHz	40 dBm (nom.)

R&S®FSV3-B271 analog baseband inputs

Frequency		
Frequency range (equalized)	I only, Q only	DC to 200 MHz
	I + jQ	–200 MHz to 200 MHz

Spectral purity		
Phase noise	offset 1 kHz	–109 dBc (1 Hz) (nom.)
	offset 10 kHz	–114 dBc (1 Hz) (nom.)
	offset ≥ 100 kHz	–119 dBc (1 Hz) (nom.)

Inputs		
Connectors	I and Q	BNC female, 50 Ω (nom.); the I and Q inputs additionally support Rohde & Schwarz oscilloscope probes (see page 30)
	$\overline{I}$ and $\overline{Q}$	BNC female, 50 Ω (nom.)
Maximum safe input voltage	any input, sum of DC + AC	±3 V
Input voltage range (full scale)	peak voltage	±2 V, ±1 V, ±0.5 V, ±0.25 V
Maximum common mode input range		–2 V to 2 V
Input impedance	single-ended	50 Ω (nom.)
	differential	100 Ω (nom.)
	common mode at DC	150 Ω (nom.)
Input return loss	0 Hz to 80 MHz	–28 dB (nom.)
	80 MHz to 200 MHz	–24 dB (nom.)

Amplitude		
Absolute amplitude accuracy	f_{input} = 1 MHz, input voltage = full scale – 6 dB	±0.25 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 80 MHz	±0.15 dB
	80 MHz to 160 MHz	±0.25 dB
	160 MHz to 200 MHz	±0.35 dB
Deviation from linear phase	0 Hz to 80 MHz	±1° (nom.)
	80 MHz to 160 MHz	±1.5° (nom.)
	160 MHz to 200 MHz	±2° (nom.)
Channel match (I/Q imbalance)		
Amplitude match accuracy	0 Hz to 160 MHz	±0.10 dB (2σ)
	160 MHz to 200 MHz	±0.15 dB (2σ)
Phase match accuracy	0 Hz to 80 MHz	±0.4° (nom.)
	80 MHz to 200 MHz	±1.0° (nom.)

Dynamic range		
Crosstalk	0 Hz to 200 MHz	–80 dB (nom.)
Signal-to-noise ratio	any input range, relative to full scale	142 dBc (1 Hz) (nom.)
Displayed average noise level (RMS)	5 MHz to 200 MHz	
	range	
	±2 V peak	–128 dBm (1 Hz) (89 nV (√ 1 Hz)) (nom.)
	±1 V peak	–134 dBm (1 Hz) (45 nV (√ 1 Hz)) (nom.)
	±0.5 V peak	–140 dBm (1 Hz) (23 nV (√ 1 Hz)) (nom.)
	±0.25 V peak	–146 dBm (1 Hz) (12 nV (√ 1 Hz)) (nom.)
Residual DC (I/Q offset)	relative to full scale, 50 Ω termination	–54 dB (nom.)
Residual response	range ± 0.25 V peak	–80 dBm (nom.), –90 dBm (typ.)
Spurious response	with full scale input signal	
	0 Hz to 200 MHz	–70 dBc (nom.)
Third-order intermodulation distortion	two CW signals, voltage = full scale – 6 dB (each signal)	
	0 Hz to 80 MHz	–80 dBc (nom.)
	80 MHz to 200 MHz, differential	–80 dBc (nom.)
	80 MHz to 200 MHz, single-ended	–74 dBc (nom.)

R&S®FSV3-K980 health and utilization monitoring service (HUMS)

Interfaces	protocols and interfaces supported for data readout and display	SNMP (v1, v2c, v3)
		REST (JSON)
		SCPI
		device web
Services	information provided	device information (model, serial number, BIOS, date, time, system, HUMS and software information)
		user-defined information tags (e.g. for asset management)
		equipment information (hardware, options, software, licenses)
		system operating status
		instrument security information
		service related information (due dates etc.)
		mass storage related information
		instrument utilization data
		device history (event log)

Ordering information

Designation	Type	Order No.
Signal and spectrum analyzer, 10 Hz to 4 GHz	R&S®FSV3004	1330.5000.04
Signal and spectrum analyzer, 10 Hz to 7.5 GHz	R&S®FSV3007	1330.5000.07
Signal and spectrum analyzer, 10 Hz to 13.6 GHz	R&S®FSV3013	1330.5000.13
Signal and spectrum analyzer, 10 Hz to 30 GHz	R&S®FSV3030	1330.5000.30
Signal and spectrum analyzer, 10 Hz to 44 GHz	R&S®FSV3044	1330.5000.43
Signal and spectrum analyzer, 10 Hz to 50 GHz	R&S®FSV3050	1330.5000.50
Accessories supplied		
Power cable, quick start guide R&S®FSV3030: adapter 3.5 mm (APC3.5-compatible) female/female R&S®FSV3044: adapter 2.92 mm female/female R&S®FSV3050: adapter 1.85 mm female/female		

Options

Hardware [18]

Designation	Type	Order No.	Remarks
Side carry handles	R&S®FSV3-B1	1330.5700.02	user-retrofittable
Audio demodulator	R&S®FSV3-B3	1330.3765.02	
OCXO frequency reference	R&S®FSV3-B4	1330.3794.02	
Additional interfaces	R&S®FSV3-B5	1330.3820.02	GPIB, IF out, video out (2 × BNC), trigger out, AUX port, AUX control
Additional interfaces	R&S®FSV3-B5E	1330.3820.03	IF out, video out (2 × BNC), trigger out, AUX port, AUX control
10 Gbit/s LAN interface	R&S®FSV3-B6	1330.3913.02	for fast remote control and fast I/Q data transfer, requires R&S®FSV3-B114 option
Resolution bandwidth up to 40 MHz	R&S®FSV3-B8E	1346.4337.02	the signal analysis bandwidth is defined by the R&S®FSV3-B40/ R&S®FSV3-B200 options, not by the R&S®FSV3-B8E option; user-retrofittable, R&S®FSV3-B11 option is recommended in addition for frequencies > 7.5 GHz
External generator control	R&S®FSV3-B10	1330.3859.02	LAN based, user-retrofittable (license key), R&S®FSV3-B5 is recommended for high sweep speed
YIG preselector bypass	R&S®FSV3-B11	1330.3865.02	for R&S®FSV3013, R&S®FSV3030, R&S®FSV3044 and R&S®FSV3050, user-retrofittable (license key)
40 MHz analysis bandwidth	R&S®FSV3-B40	1330.4103.02	user-retrofittable (license key); R&S®FSV3-B11 option is recommended in addition for frequencies > 7.5 GHz
200 MHz analysis bandwidth	R&S®FSV3-B200	1330.4132.02	R&S®FSV3-B114 option required, R&S®FSV3-B11 option required in addition for frequencies > 7.5 GHz
Spare solid-state drive	R&S®FSV3-B18	1330.4003.02	requires R&S®FSV3-B20 option, user-retrofittable
Removable hard drive	R&S®FSV3-B20	1330.3971.02	at front panel

[18] The hardware options can be retrofitted in Rohde & Schwarz service centers unless otherwise noted.

Designation	Type	Order No.	Remarks
LO/IF connections, for external mixers	R&S®FSV3-B21	1330.4010.02	ex-factory only; includes two cables (length 1 m) for IF and LO ports; not available for R&S®FSV3004, R&S®FSV3007, R&S®FSV3013
RF preamplifier, for R&S®FSV3004 and R&S®FSV3007	R&S®FSV3-B24	1330.4049.07	retrofittable [19]
RF preamplifier, for R&S®FSV3013	R&S®FSV3-B24	1330.4049.13	retrofittable [19]
RF preamplifier, for R&S®FSV3030	R&S®FSV3-B24	1330.4049.30	retrofittable [19]
RF preamplifier, for R&S®FSV3044	R&S®FSV3-B24	1330.4049.44	retrofittable [19]
RF preamplifier, for R&S®FSV3050	R&S®FSV3-B24	1330.4049.49	retrofittable [19]
RF preamplifier, for R&S®FSV3050	R&S®FSV3-B24	1330.4049.50	export license required [19]
Electronic attenuator, 1 dB steps	R&S®FSV3-B25	1330.4078.02	user-retrofittable (license key)
Noise source control via BNC	R&S®FSV3-B28V	1330.6664.02	
Enhanced computing power	R&S®FSV3-B114	1330.4910.03	not retrofittable
Analog baseband inputs, 2 × 200 MHz	R&S®FSV3-B271	1330.4190.02	R&S®FSV3-B200 option required
Analog baseband inputs, 2 × 200 MHz	R&S®FSV3-B271	1330.4190.03	R&S®FSV3-B114 option required, not available in combination with R&S®FSV3-B200 option
1 GHz reference	R&S®FSV3-K703	1330.7502.02	user-retrofittable (license key)
Enhanced performance, for R&S®FSV3004	R&S®FSV3-B710	1346.4950.04	enhanced phase noise specifications, requires R&S®FSV3-B114 option, not retrofittable
Enhanced performance, for R&S®FSV3007	R&S®FSV3-B710	1346.4950.07	
Enhanced performance, for R&S®FSV3013	R&S®FSV3-B710	1346.4950.13	
Enhanced performance, for R&S®FSV3030	R&S®FSV3-B710	1346.4950.30	
Enhanced performance, for R&S®FSV3044	R&S®FSV3-B710	1346.4950.43	
Enhanced performance, for R&S®FSV3050	R&S®FSV3-B710	1346.4950.50	
Floating license smart card, with USB adapter	R&S®FSV3-FL	1345.1957.02	

[19] For retrofitting, please contact your local Rohde & Schwarz sales office.

Firmware [20]

Designation	Type	Order No.	Remark
Pulse measurements	R&S®FSV3-K6	1346.3330.02	
AM/FM/PM modulation analysis	R&S®FSV3-K7	1330.5022.02	
Bluetooth® BR/EDR/LE measurements [21]	R&S®FSV3-K8	1346.5679.02	
Power sensor support	R&S®FSV3-K9	1346.3676.02	
GSM/EDGE/EDGE Evolution/ VAMOS measurements [21]	R&S®FSV3-K10	1330.5039.02	
Amplifier measurements	R&S®FSV3-K18	1346.3347.02	
Direct DPD measurements	R&S®FSV3-K18D	1346.3353.02	R&S®FSV3-K18 option required
Frequency response and group delay measurements	R&S®FSV3-K18F	1346.4408.02	R&S®FSV3-K18 option required
Memory-polynomial DPD	R&S®FSV3-K18M	1345.1486.02	R&S®FSV3-K18 and R&S®FSV3-K18D options required
Noise figure measurements [21]	R&S®FSV3-K30	1330.5045.02	for legacy noise sources R&S®FSV3-B28V option is required
Phase noise measurements [21]	R&S®FSV3-K40	1330.5051.02	
EMI measurements	R&S®FSV3-K54	1330.5068.02	
CISPR calibration, for R&S®FSV3-K54	R&S®FSV3-K54C	1346.3624.02	R&S®FSV3-K54 option required; retrofit requires instrument calibration by the Rohde & Schwarz service
Transient measurements	R&S®FSV3-K60	1346.4350.02	
Transient chirp measurements	R&S®FSV3-K60C	1346.4366.02	R&S®FSV3-K60 option required
Transient hop measurements	R&S®FSV3-K60H	1346.4372.02	R&S®FSV3-K60 option required
Transient phase noise measurements	R&S®FSV3-K60P	1346.6298.02	
Vector signal analysis [21]	R&S®FSV3-K70	1330.5074.02	
Multi-modulation analysis [21]	R&S®FSV3-K70M	1346.3376.02	R&S®FSV3-K70 option required
BER PRBS measurements [21]	R&S®FSV3-K70P	1346.3382.02	R&S®FSV3-K70 option required
3GPP FDD (WCDMA) base station measurements (incl. HSDPA and HSDPA+) [21]	R&S®FSV3-K72	1330.5080.02	
3GPP FDD (WCDMA) mobile station measurements (incl. HSUPA and HSUPA+) [21]	R&S®FSV3-K73	1330.5097.02	
WLAN 802.11a/b/g measurements [21]	R&S®FSV3-K91	1330.5100.02	
WLAN 802.11n measurements [21]	R&S®FSV3-K91N	1330.5139.02	R&S®FSV3-K91 option required
WLAN 802.11ac measurements [21]	R&S®FSV3-K91AC	1330.5116.02	
WLAN 802.11ax measurements [21]	R&S®FSV3-K91AX	1346.3399.02	
WLAN 802.11p measurements [21]	R&S®FSV3-K91P	1330.5122.02	
WLAN 802.11be measurements [21]	R&S®FSV3-K91BE	1346.4966.02	
OFDM signal analysis	R&S®FSV3-K96	1346.6469.02	
EUTRA/LTE FDD base station measurements [21]	R&S®FSV3-K100	1330.5145.02	
EUTRA/LTE FDD UE measurements [21]	R&S®FSV3-K101	1330.5151.02	
EUTRA/LTE base station MIMO measurements [21]	R&S®FSV3-K102	1330.5168.02	R&S®FSV3-K100 or R&S®FSV3-K104 option required
EUTRA/LTE-Advanced uplink measurements [21]	R&S®FSV3-K103	1330.7231.02	R&S®FSV3-K101 or R&S®FSV3-K105 option required
EUTRA/LTE TDD base station measurements [21]	R&S®FSV3-K104	1330.5174.02	

[20] For measurements with analysis bandwidths > 28 MHz an appropriate bandwidth option is required.

[21] Also available as floating license. Order number is xxxx.xxxx.51 instead of xxxx.xxxx.02 and requires R&S®FSV3-FL hardware option.

Designation	Type	Order No.	Remark
EUTRA/LTE TDD uplink measurements [21]	R&S®FSV3-K105	1330.5180.02	
EUTRA/LTE NB-IoT downlink measurements [21]	R&S®FSV3-K106	1346.3418.02	
5G NR Rel. 15 downlink measurements [21]	R&S®FSV3-K144	1330.7219.02	
5G NR Rel. 15 uplink measurements [21]	R&S®FSV3-K145	1330.7225.02	
5G NR combined ACLR/SEM/EVM measurements [21]	R&S®FSV3-K147	1346.4250.02	R&S®FSV3-K144 option required
5G NR Rel. 16 extension for uplink/downlink measurements [21]	R&S®FSV3-K148	1346.4914.02	R&S®FSV3-K144 or R&S®FSV3-K145 option required
5G NR Rel. 17 extension for uplink/downlink measurements [21]	R&S®FSV3-K171	1346.5362.02	R&S®FSV3-K144 option or R&S®FSV3-K145 and R&S®FSV3-K148 options required
O-RAN measurements [21]	R&S®FSV3-K175	1346.6452.02	
User defined frequency correction by SnP file [21]	R&S®FSV3-K544	1346.3630.02	corrects frequency response (amplitude and phase) of measurement setup
External frontend control	R&S®FSV3-K553	1346.4889.02	
Health and utilization monitoring service (HUMS)	R&S®FSV3-K980	1346.4943.02	
Local VSE enabler	R&S®FSV3-VSE	1345.2247.02	

PC software

Designation	Type	Order No
R&S®VSE basic edition [22, 23, 24]	R&S®VSE	1345.1011.06
R&S®VSE enterprise edition [24, 25]	R&S®VSE	1345.1105.06
License dongle		
License dongle	R&S®FSPC	1310.0002.03
Floating license dongle	R&S®FSPC-FL	1310.0002.04
Service option		
R&S®VSE software maintenance	R&S®VSE-SWM	1320.7622.81

For further information on the R&S®VSE vector signal explorer software, see specifications (PD 3607.1371.22) and product brochure (PD 3607.1371.12).

Instrument security

Designation	Type	Order No.	Remark
USB mass memory write protection	R&S®FSV3-B33	1330.4861.02	preinstallation ex-factory, for later retrofit see instrument security manuals
Security write protection of solid-state drive	R&S®FSV3-K33	1346.3360.02	

[22] Requires R&S®FSPC.
[23] Not available for R&S®FSPC-FL.
[24] To obtain the floating license of the product, R&S®FSPC-FL is needed and order number xxxx.xxxx.51 must be used instead of xxxx.xxxx.06.
[25] Requires R&S®FSPC or R&S®FSPC-FL.

Upgrades

Designation	Type	Order No.	Remark
RF preamplifier 7.5 GHz upgrade	R&S®FSV3-U24C	1346.6581.07	
RF preamplifier 13.6 GHz upgrade	R&S®FSV3-U24C	1346.6581.13	retrofittable [26]
RF preamplifier 30 GHz upgrade	R&S®FSV3-U24C	1346.6581.30	retrofittable [26]
RF preamplifier 44 GHz upgrade	R&S®FSV3-U24C	1346.6581.44	retrofittable [26]
RF preamplifier 50 GHz upgrade	R&S®FSV3-U24C	1346.6581.49	retrofittable [26]
RF preamplifier 50 GHz upgrade	R&S®FSV3-U24C	1346.6581.50	export license required [26]
RF preamplifier 13.6 GHz upgrade	R&S®FSV3-U24N	1346.6575.13	retrofittable [26]
RF preamplifier 30 GHz upgrade	R&S®FSV3-U24N	1346.6575.30	retrofittable [26]
RF preamplifier 44 GHz upgrade	R&S®FSV3-U24N	1346.6575.44	retrofittable [26]
RF preamplifier 50 GHz upgrade	R&S®FSV3-U24N	1346.6575.49	retrofittable [26]
RF preamplifier 50 GHz upgrade	R&S®FSV3-U24N	1346.6575.50	export license required [26]

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, 4 HU, 1/1, dark blue	R&S®ZZA-KN4B	1703.1346.00
Noise sources		
Smart noise sources, for noise figure and gain measurements up to 110 GHz (requires R&S®FSV3-K30)	R&S®FS-SNS18/26/40/55/67/90/110	1338.8008.18, 1338.8008.26, 1338.8008.40, 1338.8008.55, 1338.8008.67, 1338.8008.90, 1338.8008.11
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		
1000 W, 40 dB, 400 (1000) MHz	R&S®RBS1000	0207.4010.55
100 W, 3/6/10/20/30 dB, 2 GHz	R&S®RBU100	1073.8495.03, 1073.8495.06, 1073.8495.10, 1073.8495.20, 1073.8495.30
50 W, 3/6/10/20/30 dB, 2 GHz	R&S®RBU50	1073.8695.03, 1073.8695.06, 1073.8695.10, 1073.8695.20, 1073.8695.30
50 W, 20 dB, 6 GHz	R&S®RDL50	1035.1700.52
RF adapters and cables		
Coaxial adapter, 1.85 mm (f) to 1.85 mm (f)		3588.9654.00
Coaxial adapter, 1.85 mm (f) to 2.92 mm (f)		3628.4728.02
Coaxial adapter, 2.92 mm (f) to 2.92 mm (f)		3588.8664.00
Coaxial adapter, 3.5 mm (f) to 3.5 mm (f), APC3.5-compatible		3689.9442.00
Coaxial adapter, 3.5 mm (m) to 3.5 mm (m), APC3.5-compatible		3587.7770.00
Coaxial adapter, type N (f) to 3.5 mm (m), APC3.5-compatible		3587.7806.00
Coaxial adapter, type N (f) to 3.5 mm (f), APC3.5-compatible		3587.7829.00
Coaxial cable, SMA (m) to SMA (m), length: 1 m		3586.9970.00

[26] For retrofitting, contact your local Rohde & Schwarz sales office.

Designation	Type	Order No.
Connectors and cables		
Probe power connector, 3-pin		1065.9480.00
Type N adapter, for R&S®RT-Zxx oscilloscope probes (for R&S®FSV3004/3007/3013)	R&S®RT-ZA9	1417.0909.02
Type 3.5 mm (f) adapter, for R&S®RT-Zxx oscilloscope probes (for R&S®FSV3030 and R&S®FSV3044). Not suitable for R&S®FSV3050. Hint: access to “Trigger 1 in/out” and “Noise source control and power sensor” ports can be limited.	R&S®RT-ZA51	1803.5365.02
Cable for connecting high speed digital baseband interfaces of Rohde & Schwarz instruments	R&S®DIGIQ-HS	3641.2948.03
D-Sub BNC cable, 9 pole		1103.9735.00
D-Sub cable, 2 × 9 pole		1103.9729.00
DC block		
DC block, 10 kHz to 18 GHz (type N)	R&S®FSE-Z4	1084.7443.03
External harmonic mixers (for R&S®FSV3030, R&S®FSV3044 and R&S®FSV3050 with R&S®FSV3-B21 option)		
Harmonic mixer, 40 GHz to 60 GHz	RPG FS-Z60 [27]	1048.0171.02
Harmonic mixer, 50 GHz to 75 GHz	RPG FS-Z75 [27]	3638.2240.02
Harmonic mixer, 60 GHz to 90 GHz	RPG FS-Z90 [27]	3638.2270.02
Harmonic mixer, 75 GHz to 110 GHz	RPG FS-Z110 [27]	3638.2292.02
Harmonic mixer, 90 GHz to 140 GHz	RPG FS-Z140 [27]	3622.0708.02
Harmonic mixer, 110 GHz to 170 GHz	RPG FS-Z170 [27]	3622.0714.02
Harmonic mixer, 140 GHz to 220 GHz	RPG FS-Z220 [27]	3593.3250.02
Harmonic mixer, 220 GHz to 325 GHz	RPG FS-Z325 [27]	3593.3267.02
Waveguide to coaxial adapters		
Waveguide to coaxial adapter, WR10 to 1 mm (f)	WCA110	3626.1067.02
Waveguide to coaxial adapter, WR10 to 1 mm (m)	WCA110	3626.1067.03
Waveguide to coaxial adapter, WR12 to 1 mm (m)	WCA90	3626.1050.03
Waveguide to coaxial adapter, WR15 to 1 mm (f)	WCA75	3626.1044.02
Waveguide to coaxial adapter, WR15 to 1 mm (m)	WCA75	3626.1044.03
Waveguide to coaxial adapter, WR12 to 1 mm (f)	WCA90	3626.1050.02
Horn antennas		
Horn antenna, 26 GHz to 40 GHz	FH-SG-40	3629.2393.02
Horn antenna, 50 GHz to 75 GHz	FH-SG-75	3629.2458.02
Horn antenna, 60 GHz to 90 GHz	FH-SG-90	3629.2464.02
Horn antenna, 110 GHz to 170 GHz	FH-SG-170	3629.2493.02
Tools		
Torque wrench, for type N connectors, 1.5 Nm coupling torque (for R&S®FSV3004/3007/3013)	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®FSV3030/3044)	R&S®ZN-ZTW	1328.8534.35

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

Power sensors supported by the R&S®FSV3-K9 option [28]

Designation	Type	Order No.
Universal power sensors		
10 MHz to 8 GHz, 100 mW, two-path	R&S®NRP-Z211	1417.0409.02
10 MHz to 8 GHz, 200 mW [29]	R&S®NRP-Z11	1138.3004.02
10 MHz to 18 GHz, 100 mW, two-path [29]	R&S®NRP-Z221	1417.0309.02
10 MHz to 18 GHz, 200 mW [29]	R&S®NRP-Z21	1137.6000.02
10 MHz to 18 GHz, 2 W [29]	R&S®NRP-Z22	1137.7506.02
10 MHz to 18 GHz, 15 W [29]	R&S®NRP-Z23	1137.8002.02
10 MHz to 18 GHz, 30 W [29]	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 [30]		
0 Hz to 18 GHz, 100 mW	R&S®NRP18T	1424.6115.02
0 Hz to 18 GHz, 100 mW, LAN version	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, LAN version	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, LAN version	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, LAN version	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, LAN version	R&S®NRP67TN	1424.6209.02
0 Hz to 90 GHz, 100 mW	R&S®NRP90T	1424.6473.02
0 Hz to 90 GHz, 100 mW, LAN version	R&S®NRP90TN	1424.6480.02
0 Hz to 110 GHz, 100 mW	R&S®NRP110T	1424.6215.02
Thermal waveguide power sensors		
50 GHz to 75 GHz, 100 mW	R&S®NRP75TWG	1700.2529.02
60 GHz to 90 GHz, 100 mW	R&S®NRP90TWG	1700.2312.02
75 GHz to 110 GHz, 100 mW	R&S®NRP110TWG	1173.8709.02
Average power sensors [30]		
8 kHz to 6 GHz, 200 mW	R&S®NRP6A	1424.6796.02
8 kHz to 6 GHz, 200 mW, LAN version	R&S®NRP6AN	1424.6809.02
9 kHz to 6 GHz, 200 mW [29]	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, LAN version	R&S®NRP18AN	1424.6821.02
Three path diode power sensors [30]		
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
1 nW to 2 W, 10 MHz to 18 GHz	R&S®NRP18S-10	1424.6721.02
10 nW to 15 W, 10 MHz to 18 GHz	R&S®NRP18S-20	1424.6738.02
30 nW to 30 W, 10 MHz to 18 GHz	R&S®NRP18S-25	1424.6744.02
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 200 mW, 10 MHz to 33 GHz, LAN version, TVAC-compliant	R&S®NRP33SN-V	1419.0129.02
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
100 pW to 100 mW, 50 MHz to 50 GHz	R&S®NRP50S	1419.0087.02
100 pW to 100 mW, 50 MHz to 50 GHz, LAN version	R&S®NRP50SN	1419.0093.02
100 pW to 100 mW, 50 MHz to 67 GHz	R&S®NRP67S	1424.6396.02
100 pW to 100 mW, 50 MHz to 67 GHz, LAN version	R&S®NRP67SN	1424.6409.02
100 pW to 200 mW, 50 MHz to 67 GHz, LAN version, TVAC-compliant	R&S®NRP67SN-V	1424.6415.02

[28] For average power measurement only.

[29] Product discontinued.

[30] In addition to RF power measurements the R&S®NRP-Z8x, R&S®NRPxxT/TN, R&S®NRPxxA/AN and R&S®NRPxxS/SN power sensors can be used as wideband RF power trigger sources.

Designation	Type	Order No.
Wideband power sensors [30]		
50 MHz to 40 GHz, 100 mW (2.92 mm) [29]	R&S®NRP-Z41	1171.8801.02
50 MHz to 18 GHz, 100 mW	R&S®NRP-Z81	1137.9009.02
50 MHz to 40 GHz, 100 mW (2.92 mm)	R&S®NRP-Z85	1411.7501.02
50 MHz to 40 GHz, 100 mW (2.40 mm)	R&S®NRP-Z86	1417.0109.40
50 MHz to 44 GHz, 100 mW (2.40 mm)	R&S®NRP-Z86	1417.0109.44

Probes supported by R&S®FSV3-B271 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
1.0 GHz, active, differential, 1 MΩ, 0.6 pF, micro button	R&S®RT-ZD10	1410.4715.02
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
1.5 GHz modular probe amplifier, differential, 400 kΩ, multimode, incl. R&S®ProbeMeter; micro button	R&S®RT-ZM15	1800.4700.02
3 GHz modular probe amplifier, differential, 400 kΩ, multimode, incl. R&S®ProbeMeter; micro button	R&S®RT-ZM30	1419.3005.02
6 GHz modular probe amplifier, differential, 400 kΩ, multimode, incl. R&S®ProbeMeter; micro button	R&S®RT-ZM60	1419.3105.02
9 GHz modular probe amplifier, differential, 400 kΩ, multimode, incl. R&S®ProbeMeter; micro button	R&S®RT-ZM90	1419.4301.02
Extras for modular probes		
Tip cable, solder in, extended temperature, length: 15 cm, multimode compatible	R&S®RT-ZMA11	1419.4318.02
Tip cable, square pin, for 1.27 mm pin header, length: 15 cm, multimode compatible	R&S®RT-ZMA12	1419.4324.02
Tip cable, quick connect, for solder in resistor connection, length: 15 cm, multimode compatible	R&S®RT-ZMA15	1419.4224.02
Browser module, variable span from 0.5 mm to 8 mm, spring-loaded, incl. spring loaded resistor tips (2 pairs)	R&S®RT-ZMA30	1419.4353.02
SMA module, 2.92 mm/3.5 mm/SMA, differential, 100 Ω, DC termination, multimode compatible; incl. lead 11 cm (4.3 in)	R&S®RT-ZMA40	1419.4201.02
Extended temperature kit, 1 m matched cable pair, multimode compatible, incl. R&S®RT-ZMA11	R&S®RT-ZMA50	1419.4218.02

Service options

Warranty		
Standard		3 years [31]
Extended warranty, one year	R&S®WE1	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 accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	
DAkkS calibration (ISO 17025, ISO 9000)	R&S®FSV3000ACA	

Extended warranty with a term of one and two years (WE1 and WE2)
Repairs carried out during the contract term are free of charge [32]. 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 [32] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 and AW2)
Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs [32] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

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[31] For instrument and hardware options. For accessories 1 year applies.

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

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