

R&S® FSVA3000 SIGNAL AND SPECTRUM ANALYZER

Specifications



Data Sheet
Version 10.01

ROHDE & SCHWARZ

Make ideas real



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Definitions

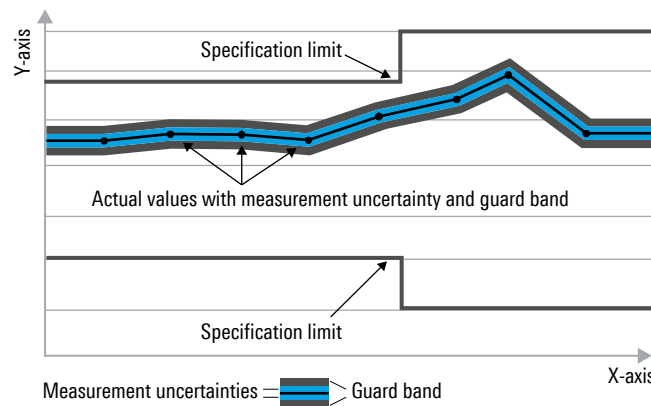
General

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 $<$, $\leq$, $>$, $\geq$, $\pm$, 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/3GPP2 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		
Without R&S®FSV3-B710 option	R&S®FSVA3004	
	DC coupled	10 Hz to 4 GHz
	AC coupled	10 MHz to 4 GHz
	R&S®FSVA3007	
	DC coupled	10 Hz to 7.5 GHz
	AC coupled	10 MHz to 7.5 GHz
	R&S®FSVA3013	
	DC coupled	10 Hz to 13.6 GHz
	AC coupled	10 MHz to 13.6 GHz
	R&S®FSVA3030	
	DC coupled	10 Hz to 30 GHz
	AC coupled	10 MHz to 30 GHz
	R&S®FSVA3044	
	DC coupled	10 Hz to 44 GHz
	AC coupled	10 MHz to 44 GHz
	R&S®FSVA3050	
	DC coupled	10 Hz to 50 GHz/54 GHz ¹
	AC coupled	10 MHz to 50 GHz/54 GHz ¹
With R&S®FSV3-B710 option	R&S®FSVA3004	
	DC coupled	2 Hz to 4 GHz
	AC coupled	10 MHz to 4 GHz
	R&S®FSVA3007	
	DC coupled	2 Hz to 7.5 GHz
	AC coupled	10 MHz to 7.5 GHz
	R&S®FSVA3013	
	DC coupled	2 Hz to 13.6 GHz
	AC coupled	10 MHz to 13.6 GHz
	R&S®FSVA3030	
	DC coupled	2 Hz to 30 GHz
	AC coupled	10 MHz to 30 GHz
	R&S®FSVA3044	
	DC coupled	2 Hz to 44 GHz
	AC coupled	10 MHz to 44 GHz
	R&S®FSVA3050	
	DC coupled	2 Hz to 50 GHz/54 GHz ¹
	AC coupled	10 MHz to 50 GHz/54 GHz ¹
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}

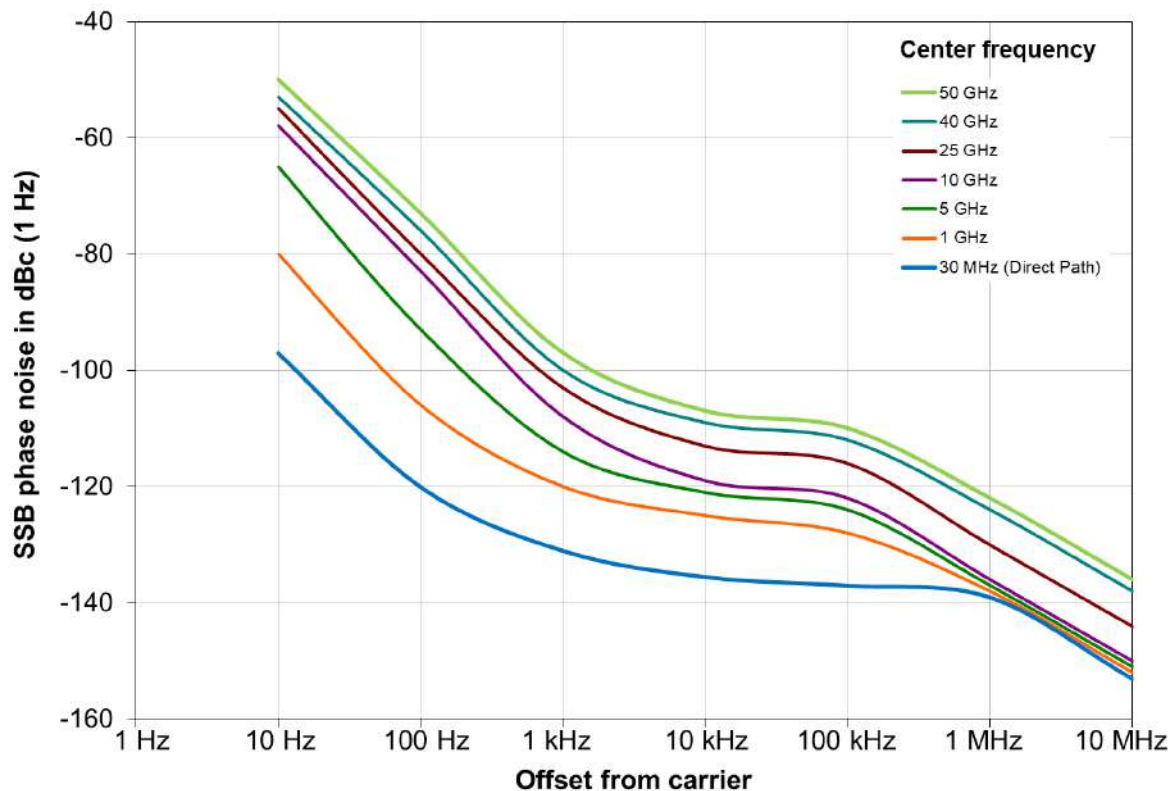
Frequency readout		
Marker resolution		1 Hz
Uncertainty		$\pm(\text{marker frequency} \times \text{reference accuracy} + 10 \% \times \text{resolution bandwidth} + \frac{1}{2} (\text{span} / (\text{sweep points} - 1)) + 1 \text{ Hz})$
Number of sweep (trace) points	default value	1001
	range	101 to 100001

¹ Up to 54 GHz with R&S®FSV3-B54G frequency extension option installed. RF preselection (YIG preselector) is active for $f \leq 50$ GHz.

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		$\pm(\text{frequency} \times \text{reference accuracy} + \frac{1}{2} \text{ (last digit)})$
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	< –95 dBc
	1 kHz	< –115 dBc
	10 kHz	< –120 dBc
	100 kHz	< –125 dBc
	1 MHz	< –137 dBc
	10 MHz	–152 dBc (nom.)
SSB phase noise (1 Hz), with R&S®FSV3-B710 option	frequency = 1 GHz, carrier offset	
	100 Hz	< –100 dBc
	1 kHz	< –122 dBc
	10 kHz	< –127 dBc
	100 kHz	< –127 dBc
	1 MHz	–140 dBc (nom.)
	10 MHz	–152 dBc (nom.)
	frequency = 10.5 GHz, carrier offset	
	100 Hz	–85 dBc (nom.)
	1 kHz	–110 dBc (nom.)
	10 kHz	–124 dBc (nom.)
	100 kHz	–126 dBc (nom.)
	1 MHz	–140 dBc (nom.)
	10 MHz	–152 dBc (nom.)
Residual FM	frequency = 1000 MHz, demodulation bandwidth = 25 kHz, AF highpass filter 50 Hz, AF lowpass filter 3 kHz	
	< 0.1 Hz (RMS) (nom.)	



Typical phase noise at different center frequencies (without R&S®FSV3-B710 option)

Sweep time

Sweep time range	span = 0 Hz	1 μ s to 16000 s
	span $\geq$ 10 Hz, swept	1.01 ms to 16000 s ²
	span $\geq$ 10 Hz, FFT	0.7 μ s to 16000 s ³
Sweep time accuracy	span = 0 Hz	± 0.1 % (nom.)
	span $\geq$ 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, 6 and 8 MHz additionally
	with R&S®FSV3-B8E option ⁴	20 MHz, 28 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
	with R&S®FSV3-B8E option	1, 1.228, 1.28 (RRC), 1.5, 2, 3, 3.84 (RRC), 4.096 (RRC), 5, 10 MHz 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
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Signal analysis bandwidths

Maximum signal analysis bandwidth	$f \leq 7.5$ GHz	
	standard	28 MHz (nom.)
	with R&S®FSV3-B40 option	40 MHz (nom.)
	with R&S®FSV3-B200 option	200 MHz (nom.)
	with R&S®FSV3-B400/ R&S®FSV3-B600/R&S®FSV3-B1000 option	400 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.)
	with R&S®FSV3-B400 option	400 MHz (nom.)
	with R&S®FSV3-B600 option	600 MHz (nom.)
	with R&S®FSV3-B1000 option	1000 MHz (nom.)

² The selected sweep time is the net data acquisition time (without the extra time needed for hardware settling or FFT processing).

³ Time for data acquisition for FFT calculation.

⁴ Gaussian shape for RBW $\leq$ 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, dB μ V, dBmV, dB μ A, dBpW
	linear level display	μ V, mV, μ A, mA, pW, nW

Maximum input level ⁵		
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 $\geq$ 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 $\tau = 3 \mu$ s	RF attenuation $\geq$ 10 dB	100 W
Maximum pulse voltage	RF attenuation $\geq$ 10 dB	50 V

Intermodulation		
1 dB compression of input mixer	RF attenuation = 0 dB, RF preamplifier = off	
	$f \leq 7.5$ 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	
	$f \leq 7.5$ 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), $\Delta f > 5 \times$ RBW or 10 kHz, whichever is larger	
	R&S®FSVA3004, R&S®FSVA3007	
	$10 \text{ MHz} \leq f_{in} < 3.6 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$3.6 \text{ GHz} \leq f_{in} \leq 7.5 \text{ GHz}$	> 16 dBm, typ. 19 dBm
	R&S®FSVA3013, R&S®FSVA3030, YIG preselector on for $f > 7.5$ GHz	
	$10 \text{ MHz} \leq f_{in} \leq 16 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$16 \text{ GHz} < f_{in} < 20 \text{ GHz}$	> 15 dBm, typ. 18 dBm
	$20 \text{ GHz} \leq f_{in} \leq 26.5 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$26.5 \text{ GHz} < f_{in} \leq 30 \text{ GHz}$	> 15 dBm, typ. 21 dBm
	R&S®FSVA3044, R&S®FSVA3050, YIG preselector on for $f > 7.5$ GHz	
	$10 \text{ MHz} \leq f_{in} < 3.6 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$3.6 \text{ GHz} \leq f_{in} \leq 7.5 \text{ GHz}$	> 16 dBm, typ. 19 dBm
	$7.5 \text{ GHz} < f_{in} \leq 40 \text{ GHz}$	> 15 dBm, typ. 21 dBm
	$40 \text{ GHz} < f_{in} \leq 44 \text{ GHz}$	> 12 dBm, typ. 20 dBm
	$44 \text{ GHz} < f_{in} \leq 50 \text{ GHz}$	> 10 dBm, typ. 16 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), $\Delta f > 5 \times$ RBW or 10 kHz, whichever is larger	
	$10 \text{ MHz} \leq f_{in} \leq 43.5 \text{ GHz}$	–20 dBm (nom.)
	R&S®FSVA3050 with R&S®FSV3-B24 option model .49	
	$43.5 \text{ GHz} < f_{in} \leq 50 \text{ GHz}$	–20 dBm (nom.)
	R&S®FSVA3050 with R&S®FSV3-B24 option model .50	
	$43.5 \text{ GHz} < f_{in} \leq 50 \text{ GHz}$	–20 dBm (nom.)

⁵ 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 < $f_{in} \leq 1.75$ GHz	45 dBm (nom.)
	1.75 GHz < $f_{in} \leq 22$ GHz	80 dBm (nom.)
	R&S®FSVA3050	
	22 GHz < $f_{in} \leq 25$ 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 < $f_{in} \leq 21.75$ GHz	10 dBm (nom.)
	R&S®FSVA3050 with R&S®FSV3-B24 option model .49	
	21.75 GHz < $f_{in} \leq 25$ GHz	5 dBm (nom.)
	R&S®FSVA3050 with R&S®FSV3-B24 option model .50	
	21.75 GHz < $f_{in} \leq 25$ 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.

Sensitivity without R&S®FSV3-B710 option

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 , log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +20 °C to +30 °C	
	R&S®FSVA3004, R&S®FSVA3007	
	9 kHz $\leq f < 100$ kHz	–140 dBm, typ. –146 dBm
	100 kHz $\leq f < 1$ MHz	–145 dBm, typ. –150 dBm
	1 MHz $\leq f < 1$ GHz	–152 dBm, typ. –155 dBm
	1 GHz $\leq f < 3$ GHz	–151 dBm, typ. –153 dBm
	3 GHz $\leq f < 6$ GHz	–150 dBm, typ. –152 dBm
	6 GHz $\leq f \leq 7.5$ GHz	–149 dBm, typ. –151 dBm
	R&S®FSVA3013, R&S®FSVA3030	
	9 kHz $\leq f < 100$ kHz	–140 dBm, typ. –146 dBm
	100 kHz $\leq f < 1$ MHz	–145 dBm, typ. –150 dBm
	1 MHz $\leq f < 1$ GHz	–151 dBm, typ. –154 dBm
	1 GHz $\leq f < 3$ GHz	–149 dBm, typ. –152 dBm
	3 GHz $\leq f < 6$ GHz	–147 dBm, typ. –150 dBm
	6 GHz $\leq f \leq 7.5$ GHz	–145 dBm, typ. –147 dBm
	7.5 GHz $< f \leq 15$ GHz	–148 dBm, typ. –151 dBm
	15 GHz $< f \leq 26.5$ GHz	–145 dBm, typ. –148 dBm
	26.5 GHz $< f \leq 30$ GHz	–144 dBm, typ. –147 dBm
	R&S®FSVA3044, R&S®FSVA3050	
	9 kHz $\leq f < 100$ kHz	–140 dBm, typ. –146 dBm
	100 kHz $\leq f < 1$ MHz	–145 dBm, typ. –150 dBm
	1 MHz $\leq f < 1$ GHz	–151 dBm, typ. –154 dBm
	1 GHz $\leq f < 3$ GHz	–149 dBm, typ. –152 dBm
	3 GHz $\leq f < 6$ GHz	–147 dBm, typ. –150 dBm
	6 GHz $\leq f \leq 7.5$ GHz	–145 dBm, typ. –147 dBm
	7.5 GHz $< f \leq 15$ GHz	–148 dBm, typ. –151 dBm
	15 GHz $< f \leq 34$ GHz	–145 dBm, typ. –148 dBm
	34 GHz $< f \leq 40$ GHz	–139 dBm, typ. –142 dBm
	40 GHz $< f \leq 44$ GHz	–136 dBm, typ. –139 dBm
	44 GHz $< f \leq 50$ GHz	–133 dBm, typ. –137 dBm
	50 GHz $< f \leq 54$ GHz ¹	–131 dBm, typ. –134 dBm
Improvement with noise cancellation	for noise-like signals	
	10 MHz $< f \leq 43.5$ 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, log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +20 °C to +30 °C

R&S®FSVA3004, R&S®FSVA3007

9 kHz ≤ f < 100 kHz	–140 dBm, typ. –146 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	–150 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®FSVA3013, R&S®FSVA3030

9 kHz ≤ f < 100 kHz	–140 dBm, typ. –146 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
7.5 GHz < f ≤ 15 GHz	–145 dBm, typ. –148 dBm
15 GHz < f ≤ 30 GHz	–141 dBm, typ. –144 dBm

R&S®FSVA3044, R&S®FSVA3050

9 kHz ≤ f < 100 kHz	–140 dBm, typ. –146 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
7.5 GHz < f ≤ 15 GHz	–146 dBm, typ. –149 dBm
15 GHz < f ≤ 34 GHz	–143 dBm, typ. –146 dBm
34 GHz < f ≤ 40 GHz	–137 dBm, typ. –140 dBm
40 GHz < f ≤ 44 GHz	–133 dBm, typ. –136 dBm
44 GHz < f ≤ 50 GHz	–130 dBm, typ. –133 dBm
50 GHz < f ≤ 54 GHz ¹	–128 dBm, typ. –131 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, +20 °C to +30 °C, YIG preselector on

R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013, R&S®FSVA3030

10 MHz ≤ f < 50 MHz	–158 dBm, typ. –162 dBm
50 MHz ≤ f ≤ 7.5 GHz	–164 dBm, typ. –167 dBm
7.5 GHz < f ≤ 13.6 GHz	–162 dBm, typ. –165 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®FSVA3044 ⁶

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 ≤ 40 GHz	–158 dBm
40 GHz < f ≤ 43.5 GHz	–149 dBm

R&S®FSVA3050 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
50 GHz < f ≤ 54 GHz ¹	–134 dBm

⁶ The frequency range of the RF preamplifier for the R&S®FSVA3044 is limited to 43.5 GHz.

Improvement with noise cancellation	R&S®FSVA3050 with R&S®FSV3-B24 option model .50	
	10 MHz $\leq f < 2.5$ GHz	–164 dBm
	2.5 GHz $\leq f \leq 7.5$ GHz	–161 dBm
	7.5 GHz $< f \leq 26.5$ GHz	–160 dBm
	26.5 GHz $< f \leq 40$ GHz	–158 dBm
	40 GHz $< f \leq 44$ GHz	–154 dBm
	44 GHz $< f \leq 50$ GHz	–151 dBm
	50 GHz $< f \leq 54$ GHz ¹	–145 dBm
	for noise-like signals	
	with R&S®FSV3-B24 option models .07/.13/.30/.44/.49	
	10 MHz $< f \leq 43.5$ GHz	13 dB (nom.)
	$f > 43.5$ GHz	0 dB (nom.)
	with R&S®FSV3-B24 option model .50	
	10 MHz $< f \leq 50$ GHz/54 GHz ¹	13 dB (nom.)

Sensitivity with R&S®FSV3-B710 option

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	
	3 Hz	–90 dBm (nom.)
	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 , log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +20 °C to +30 °C	
	R&S®FSVA3004, R&S®FSVA3007	
	9 kHz $\leq f < 100$ kHz	–140 dBm
	100 kHz $\leq f < 1$ MHz	–145 dBm
	1 MHz $\leq f < 1$ GHz	–152 dBm
	1 GHz $\leq f < 3$ GHz	–153 dBm
	3 GHz $\leq f < 6$ GHz	–152 dBm
	6 GHz $\leq f \leq 7.5$ GHz	–151 dBm
	R&S®FSVA3013, R&S®FSVA3030	
	9 kHz $\leq f < 100$ kHz	–140 dBm
	100 kHz $\leq f < 1$ MHz	–145 dBm
	1 MHz $\leq f < 1$ GHz	–151 dBm
	1 GHz $\leq f < 3$ GHz	–151 dBm
	3 GHz $\leq f < 6$ GHz	–149 dBm
	6 GHz $\leq f \leq 7.5$ GHz	–147 dBm
	7.5 GHz $< f \leq 15$ GHz	–151 dBm
	15 GHz $< f \leq 26.5$ GHz	–147 dBm
	26.5 GHz $< f \leq 30$ GHz	–146 dBm
	R&S®FSVA3044, R&S®FSVA3050	
	9 kHz $\leq f < 100$ kHz	–140 dBm
	100 kHz $\leq f < 1$ MHz	–145 dBm
	1 MHz $\leq f < 1$ GHz	–151 dBm
	1 GHz $\leq f < 3$ GHz	–151 dBm
	3 GHz $\leq f < 6$ GHz	–149 dBm
	6 GHz $\leq f \leq 7.5$ GHz	–147 dBm
	7.5 GHz $< f \leq 15$ GHz	–149 dBm
	15 GHz $< f \leq 34$ GHz	–145 dBm
	34 GHz $< f \leq 40$ GHz	–142 dBm
	40 GHz $< f \leq 44$ GHz	–139 dBm
	44 GHz $< f \leq 50$ GHz	–134 dBm
	50 GHz $< f \leq 54$ GHz ¹	–132 dBm
Improvement with noise cancellation	for noise-like signals	
	10 MHz $< f \leq 43.5$ 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

3 Hz	-90 dBm (nom.)
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 , log. scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 1 Hz, +20 °C to +30 °C

R&S®FSVA3004, R&S®FSVA3007

9 kHz $\leq f < 100$ kHz	-140 dBm
100 kHz $\leq f < 1$ MHz	-145 dBm
1 MHz $\leq f < 1$ GHz	-151 dBm
1 GHz $\leq f < 3$ GHz	-152 dBm
3 GHz $\leq f < 6$ GHz	-149 dBm
6 GHz $\leq f \leq 7.5$ GHz	-148 dBm

R&S®FSVA3013, R&S®FSVA3030

9 kHz $\leq f < 100$ kHz	-140 dBm
100 kHz $\leq f < 1$ MHz	-145 dBm
1 MHz $\leq f < 1$ GHz	-150 dBm
1 GHz $\leq f < 3$ GHz	-150 dBm
3 GHz $\leq f < 6$ GHz	-147 dBm
6 GHz $\leq f \leq 7.5$ GHz	-144 dBm
7.5 GHz $< f \leq 15$ GHz	-148 dBm
15 GHz $< f \leq 30$ GHz	-144 dBm

R&S®FSVA3044, R&S®FSVA3050

9 kHz $\leq f < 100$ kHz	-140 dBm
100 kHz $\leq f < 1$ MHz	-145 dBm
1 MHz $\leq f < 1$ GHz	-150 dBm
1 GHz $\leq f < 3$ GHz	-150 dBm
3 GHz $\leq f < 6$ GHz	-147 dBm
6 GHz $\leq f \leq 7.5$ GHz	-144 dBm
7.5 GHz $< f \leq 15$ GHz	-148 dBm
15 GHz $< f \leq 34$ GHz	-143 dBm
34 GHz $< f \leq 40$ GHz	-140 dBm
40 GHz $< f \leq 44$ GHz	-136 dBm
44 GHz $< f \leq 50$ GHz	-131 dBm
50 GHz $< f \leq 54$ GHz ¹	-129 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, +20 °C to +30 °C, YIG preselector on

R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013, R&S®FSVA3030

10 MHz $\leq f < 50$ MHz	-158 dBm
50 MHz $\leq f \leq 7.5$ GHz	-166 dBm
7.5 GHz $< f \leq 13.6$ GHz	-164 dBm
13.6 GHz $< f \leq 22$ GHz	-162 dBm
22 GHz $< f \leq 26.5$ GHz	-158 dBm
26.5 GHz $< f \leq 30$ GHz	-156 dBm

R&S®FSVA3044 ⁶

10 MHz $\leq f < 3$ GHz	-166 dBm
3 GHz $\leq f \leq 7.5$ GHz	-163 dBm
7.5 GHz $< f \leq 26.5$ GHz	-163 dBm
26.5 GHz $< f \leq 40$ GHz	-159 dBm
40 GHz $< f \leq 43.5$ GHz	-151 dBm

R&S®FSVA3050 with R&S®FSV3-B24 option model .49

10 MHz $\leq f < 2.5$ GHz	-164 dBm
2.5 GHz $\leq f \leq 7.5$ GHz	-161 dBm
7.5 GHz $< f \leq 26.5$ GHz	-161 dBm
26.5 GHz $< f \leq 40$ GHz	-159 dBm
40 GHz $< f \leq 43.5$ GHz	-149 dBm
43.5 GHz $< f \leq 50$ GHz	-139 dBm
50 GHz $< f \leq 54$ GHz ¹	-134 dBm

Displayed average noise level with R&S®FSV3-B24 preamplifier option		
	R&S®FSVA3050 with R&S®FSV3-B24 option model .50	
	10 MHz $\leq f < 2.5$ GHz	–164 dBm
	2.5 GHz $\leq f \leq 7.5$ GHz	–161 dBm
	7.5 GHz $< f \leq 26.5$ GHz	–161 dBm
	26.5 GHz $< f \leq 40$ GHz	–159 dBm
	40 GHz $< f \leq 44$ GHz	–155 dBm
	44 GHz $< f \leq 50$ GHz	–152 dBm
	50 GHz $< f \leq 54$ GHz ¹	–146 dBm
Improvement with noise cancellation	for noise-like signals	
	with R&S®FSV3-B24 option models .07/.13/.30/.44/.49	
	10 MHz $< f \leq 43.5$ GHz	13 dB (nom.)
	$f > 43.5$ GHz	0 dB (nom.)
	with R&S®FSV3-B24 option model .50	
	10 MHz $< f \leq 50$ GHz/54 GHz ¹	13 dB (nom.)

Spurious responses

Image response	YIG preselector on for $f > 7.5$ GHz, mixer level ≤ -10 dBm ⁷ , sweep optimization: auto or dynamic	
	20 MHz $\leq f \leq 7.5$ GHz	
	$f_{in} - 2 \times 8796$ MHz (first IF)	< -80 dBc (nom.)
	$f_{in} - 2 \times 732$ MHz (second IF)	< -80 dBc
	$f_{in} - 2 \times 92$ MHz (third IF)	< -80 dBc
	7.5 GHz $< f \leq 30$ GHz	
	$f_{in} \pm 2 \times 732$ MHz (first IF)	< -80 dBc
	$f_{in} - 2 \times 92$ MHz (second IF)	< -80 dBc
	30 GHz $< f \leq 46$ GHz	
	$f_{in} \pm 2 \times 732$ MHz (first IF)	< -70 dBc
	$f_{in} - 2 \times 92$ MHz (second IF)	< -80 dBc
	46 GHz $< f \leq 50$ GHz	
	$f_{in} - 2 \times 6948$ MHz (first IF)	< -70 dBc (nom.)
	$f_{in} - 2 \times 732$ MHz (second IF)	< -70 dBc (nom.)
	$f_{in} - 2 \times 6948$ MHz + 2×732 MHz	< -80 dBc (nom.)
	50 GHz $< f \leq 54$ GHz ¹	
	$f_{in} - 2 \times 732$ MHz (second IF)	< -40 dBc (nom.)
	$f_{in} - 2 \times 8412 + 2 \times 732$ MHz ⁸	< -40 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	
	$f \leq 1$ MHz	< -90 dBm
	1 MHz $< f \leq 7.5$ GHz	< -103 dBm
	7.5 GHz $< f \leq 50$ GHz	< -100 dBm
	f = receive frequency	
Local oscillator related spurious	$f < 15$ GHz	
	1 kHz $\leq$ carrier offset ≤ 10 MHz	< -70 dBc
	carrier offset > 10 MHz	< -80 dBc
	15 GHz $\leq f \leq 30$ GHz	
	1 kHz $\leq$ carrier offset ≤ 10 MHz	< -64 dBc
	carrier offset > 10 MHz	< -74 dBc
	30 GHz $< f \leq 50$ GHz	
	1 kHz $\leq$ 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 + $20 \log(f_{in}/\text{GHz})$ (nom.)

⁷ Mixer level = signal level – RF attenuation + preamplifier gain.

⁸ $f_{in} - 2 \times 8412$ MHz is the image frequency of the first IF for $f > 50$ GHz.

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 ($\sigma = 0.07$ dB)
Frequency response, referenced to 64 MHz	0 °C to +50 °C	< 0.35 dB ($\sigma = 0.12$ dB)
	RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier = off, electronic attenuator off, +20 °C to +30 °C	
	9 kHz $\leq f < 10$ MHz	< 0.5 dB ($\sigma = 0.17$ dB)
	10 MHz $\leq f < 3.6$ GHz	< 0.3 dB ($\sigma = 0.10$ dB)
	3.6 GHz $\leq f \leq 7.5$ GHz	< 0.5 dB ($\sigma = 0.17$ dB)
	7.5 GHz $< f \leq 13.6$ GHz, span < 1 GHz	< 1.5 dB ($\sigma = 0.5$ dB)
	13.6 GHz $< f \leq 30$ GHz, span < 1 GHz	< 2.0 dB ($\sigma = 0.66$ dB)
	30 GHz $< f \leq 43.5$ GHz, span < 1 GHz	< 2.5 dB ($\sigma = 0.83$ dB)
	43.5 GHz $< f \leq 50$ GHz, span < 1 GHz	< 3.5 dB ($\sigma = 1.16$ dB)
	50 GHz $< f \leq 54$ GHz ¹ , span < 1 GHz	< 3.5 dB (nom.)
	any setting of RF attenuation, RF preamplifier = off, 0 °C to +50 °C	
	9 kHz $\leq f < 3.6$ GHz	< 1.0 dB ($\sigma = 0.33$ dB)
	3.6 GHz $\leq f \leq 7.5$ GHz	< 1.5 dB ($\sigma = 0.5$ dB)
	7.5 GHz $< f \leq 13.6$ GHz	< 2.5 dB ($\sigma = 0.83$ dB)
	13.6 GHz $< f \leq 30$ GHz	< 3.0 dB ($\sigma = 1.0$ dB)
	30 GHz $< f \leq 43.5$ GHz	< 3.5 dB ($\sigma = 1.17$ dB)
	43.5 GHz $< f \leq 50$ GHz	< 4 dB (nom.)
	RF attenuation ≤ 10 dB, RF preamplifier = on ⁶ , 0 °C to +50 °C	
	10 MHz $\leq f < 3.6$ GHz	< 1.0 dB ($\sigma = 0.33$ dB)
	3.6 GHz $\leq f \leq 7.5$ GHz	< 1.5 dB ($\sigma = 0.5$ dB)
	7.5 GHz $< f \leq 13.6$ GHz	< 3.0 dB ($\sigma = 1.0$ dB)
	13.6 GHz $< f \leq 30$ GHz	< 3.5 dB ($\sigma = 1.17$ dB)
	30 GHz $< f \leq 43.5$ GHz	< 4.0 dB ($\sigma = 1.17$ dB)
	43.5 GHz $< f \leq 50$ GHz	< 4.5 dB (nom.)
	DC coupling, RF preamplifier = off, 0 °C to +50 °C	
	10 Hz $\leq f < 20$ Hz ⁹	< 1.5 dB (nom.)
	20 Hz $\leq f < 9$ kHz	< 1.0 dB ($\sigma = 0.33$ dB)
Attenuator switching uncertainty	f = 64 MHz, 0 dB to 70 dB, referenced to RF attenuation = 10 dB	< 0.2 dB ($\sigma = 0.07$ dB)
Uncertainty of reference level setting		0 dB ¹⁰
Bandwidth switching uncertainty at center frequency	referenced to RBW = 10 kHz	< 0.1 dB ($\sigma = 0.04$ dB)

Nonlinearity of displayed level

Logarithmic level display	S/N > 16 dB, 0 dB $\leq$ level $\leq$ –70 dB	< 0.1 dB ($\sigma = 0.033$ dB)
	S/N > 16 dB, –70 dB < level $\leq$ –80 dB	< 0.2 dB ($\sigma = 0.067$ 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 $\leq f < 10$ MHz	0.39 dB
	10 MHz $\leq f < 3.6$ GHz	0.29 dB
	3.6 GHz $\leq f \leq 7.5$ GHz	0.39 dB
	7.5 GHz $< f \leq 13.6$ GHz	1.00 dB
	13.6 GHz $< f \leq 30$ GHz	1.32 dB
	30 GHz $< f \leq 43.5$ GHz	1.65 dB
	43.5 GHz $< f \leq 50$ GHz/54 GHz ¹	1.97 dB

⁹ With R&S®FSV3-B710 option: 3 Hz $\leq f < 20$ Hz.

¹⁰ 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		7.81 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	$500 \text{ MHz} \leq f \leq 7.5 \text{ GHz}$	$f_{\text{center}} \pm 250 \text{ MHz}$ (nom.) ¹¹
	$f > 7.5 \text{ GHz}$	$f_{\text{center}} \pm 250 \text{ MHz}$ (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.)

¹¹ For R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013 with serial number < 102000 , or R&S®FSVA3030, R&S®FSVA3044 with serial number < 101000 : –100 MHz to +150 MHz.

I/Q data

Record length		max. 800 Msample I and Q ¹²
Maximum number of pretrigger samples		200 Msample I and Q ¹²
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, R&S®FSV3-B400 options	100 Hz to 512 MHz
	with R&S®FSV3-B600, R&S®FSV3-B1000 options	100 Hz to 2048 MHz
Maximum signal analysis bandwidth (equalized)	standard	28 MHz ¹³
	with R&S®FSV3-B40 option	40 MHz ¹³
	with R&S®FSV3-B200 option	200 MHz ¹³
	with R&S®FSV3-B400 option	400 MHz ¹³
	with R&S®FSV3-B600 option	600 MHz ¹³
	with R&S®FSV3-B1000 option	1000 MHz ¹³

Signal analysis bandwidth ≤ 40 MHz ¹³		
Amplitude flatness	(1.25 × signal analysis bandwidth)	±0.3 dB (nom.)
	$\leq f_{\text{center}} \leq 7.5 \text{ GHz}$	
	$f_{\text{center}} > 7.5 \text{ GHz}$, YIG preselector off	±0.5 dB (nom.)
Deviation from linear phase	(1.25 × signal analysis bandwidth)	±1° (nom.)
	$\leq f_{\text{center}} \leq 7.5 \text{ GHz}$	
	$f_{\text{center}} > 7.5 \text{ GHz}$, 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	$f_{\text{center}} \geq 100 \text{ MHz}$, two -30 dBm tones at input mixer within analysis bandwidth	-80 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, $f_{\text{center}} \geq 100 \text{ MHz}$	-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.)

¹² For signal analysis bandwidth > 400 MHz the maximum record length is between 50 % and 100 % of the given figures.

¹³ For $f > 7.5 \text{ GHz}$, R&S®FSV3-B11 option is required and YIG preselector = off must be set.

Signal analysis bandwidth 40 MHz to 200 MHz ^{13, 14, 15}		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$150 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 0.5 \text{ dB (nom.)}$ ¹⁶
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 0.7 \text{ dB (nom.)}$ ¹⁶
	$7.5 \text{ GHz} < f_{\text{center}} \leq 26.5 \text{ GHz}$	$\pm 1.0 \text{ dB (nom.)}$ ¹⁶
	$26.5 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 2.0 \text{ dB (nom.)}$ ¹⁶
Deviation from linear phase	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 2.2 \text{ dB (nom.)}$ ¹⁶
	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$150 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 2^\circ \text{ (nom.)}$ ¹⁷
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 2.5^\circ \text{ (nom.)}$ ¹⁷
	$7.5 \text{ GHz} < f_{\text{center}} \leq 26.5 \text{ GHz}$	$\pm 3^\circ \text{ (nom.)}$ ¹⁷
Nonlinearity of displayed level	$26.5 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 4^\circ \text{ (nom.)}$ ¹⁷
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 7^\circ \text{ (nom.)}$ ¹⁷
Level measurement uncertainty at center frequency	0 dB to -70 dB	$< 0.15 \text{ dB (nom.)}$
Displayed average noise level at center frequency		add 0.2 dB (nom.) to the values in section Total measurement uncertainty
ADC related third order intermodulation distortion	$f_{\text{center}} \geq 150 \text{ MHz}$, two -25 dBm tones at input mixer within analysis bandwidth	add 5 dB (nom.) to the values in section Displayed average noise level
Residual spurious response	RF attenuation = 0 dB, $f_{\text{center}} \geq 150 \text{ MHz}$	-75 dBc (nom.)
ADC related spurious response	single tone within analysis bandwidth, mixer level = -10 dBm ⁷ , reference level = signal level, $f_{\text{center}} \geq 150 \text{ MHz}$	-90 dBm (nom.)
Other spurious responses		-75 dBc (nom.)
IF power trigger bandwidth		see section Spurious responses
Trigger resolution	trigger source: extern	200 MHz (nom.)
	trigger source: IF power	3.91 ns (nom.)
		0.997 ns (nom.)

Signal analysis bandwidth 200 MHz to 400 MHz ^{13, 15, 18}		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$300 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 0.7 \text{ dB (nom.)}$ ¹⁶
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 1.2 \text{ dB (nom.)}$ ¹⁶
	$7.5 \text{ GHz} < f_{\text{center}} \leq 22 \text{ GHz}$	$\pm 1.6 \text{ dB (nom.)}$ ¹⁶
	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 2.0 \text{ dB (nom.)}$ ¹⁶
Deviation from linear phase	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 2.3 \text{ dB (nom.)}$ ¹⁶
	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$300 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 4^\circ \text{ (nom.)}$ ¹⁷
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 6^\circ \text{ (nom.)}$ ¹⁷
	$7.5 \text{ GHz} < f_{\text{center}} \leq 22 \text{ GHz}$	$\pm 4^\circ \text{ (nom.)}$ ¹⁷
Nonlinearity of displayed level	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 5^\circ \text{ (nom.)}$ ¹⁷
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 8^\circ \text{ (nom.)}$ ¹⁷
Level measurement uncertainty at center frequency	0 dB to -70 dB	$< 0.15 \text{ dB (nom.)}$
Displayed average noise level at center frequency		add 0.2 dB (nom.) to the values in section Total measurement uncertainty
ADC related third order intermodulation distortion	$f_{\text{center}} \geq 300 \text{ MHz}$, two -25 dBm tones at input mixer within analysis bandwidth	add 5 dB (nom.) to the values in section Displayed average noise level
Residual spurious response	RF attenuation = 0 dB, $f_{\text{center}} \geq 300 \text{ MHz}$	-75 dBc (nom.)
		-90 dBm (nom.)

¹⁴ The specifications in this section apply for the R&S®FSV3-B200, R&S®FSV3-B400, R&S®FSV3-B600 and R&S®FSV3-B1000 options and for the temperature range from $+20^\circ\text{C}$ to $+30^\circ\text{C}$.

¹⁵ To obtain the set analysis bandwidth, $(f_{\text{center}} + \frac{1}{2} \text{ analysis bandwidth}) \leq f_{\text{max}}$ must be met; f_{max} : maximum frequency of the instrument.

¹⁶ With R&S®FSV3-B24 option installed, add 0.2 dB to the specifications.

¹⁷ With R&S®FSV3-B24 option installed, add 1° to the specifications.

¹⁸ The specifications in this section apply for the R&S®FSV3-B400, R&S®FSV3-B600 and R&S®FSV3-B1000 options and for the temperature range from $+20^\circ\text{C}$ to $+30^\circ\text{C}$.

ADC related spurious response	single tone within analysis bandwidth, mixer level = -10 dBm^7 , reference level = signal level	
	$300 \text{ MHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	
	analysis bandwidth $\leq 300 \text{ MHz}$	-72 dBc (nom.)
	analysis bandwidth $> 300 \text{ MHz}$	$-70 \text{ dBc (nom.)}^{19}$
	$f_{\text{center}} > 7.5 \text{ GHz}$	-72 dBc (nom.)
Other spurious responses		see section Spurious responses
IF power trigger bandwidth		400 MHz (nom.)
Trigger resolution	trigger source: extern	3.91 ns (nom.)
	trigger source: IF power	0.997 ns (nom.)

Signal analysis bandwidth 400 MHz to 1000 MHz ^{13, 15, 20}		
Amplitude flatness	RF attenuation $\geq 10 \text{ dB}$, RF preamplifier = off, YIG preselector off, $f > 7.5 \text{ GHz}$	
	$7.5 \text{ GHz} < f_{\text{center}} \leq 22 \text{ GHz}$	$\pm 1.8 \text{ dB (nom.)}^{16}$
	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 2.2 \text{ dB (nom.)}^{16}$
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}^1$	$\pm 2.5 \text{ dB (nom.)}^{16}$
Deviation from linear phase	RF attenuation $\geq 10 \text{ dB}$, RF preamplifier = off, YIG preselector off, $f > 7.5 \text{ GHz}$	
	$7.5 \text{ GHz} < f_{\text{center}} \leq 22 \text{ GHz}$	$\pm 7^\circ \text{ (nom.)}^{17}$
	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 8^\circ \text{ (nom.)}^{17}$
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}^1$	$\pm 10^\circ \text{ (nom.)}^{17}$
Nonlinearity of displayed level	0 dB to -70 dB	0.2 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	two -25 dBm tones at input mixer within analysis bandwidth	-75 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB	-90 dBm (nom.)
ADC related spurious response	single tone within analysis bandwidth, mixer level = -10 dBm^7 , reference level = signal level	$-72 \text{ dBc (nom.)}^{19}$
Other spurious responses	signal within $f_{\text{center}} \pm 500 \text{ MHz}$	see section Spurious responses
IF power trigger bandwidth		1000 MHz (nom.)
Trigger resolution	trigger source: external	3.91 ns (nom.)
	trigger source: IF power	0.977 ns (nom.), analysis bandwidth $\leq 800 \text{ MHz}$; 0.488 ns (nom.), analysis bandwidth $> 800 \text{ MHz}$

¹⁹ For R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013 with serial number ≥ 102001 , or R&S®FSVA3030, R&S®FSVA3044 with serial number ≥ 101001 .

²⁰ The specifications in this section apply for the R&S®FSV3-B600 and R&S®FSV3-B1000 options and for the temperature range from $+20^\circ \text{C}$ to $+30^\circ \text{C}$.

Inputs and outputs

RF input		
Impedance		50 Ω
Connector	R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013	type N, female
	R&S®FSVA3030	APC 3.5 mm male (compatible with SMA)
	R&S®FSVA3044	2.92 mm male (compatible with SMA)
	R&S®FSVA3050	1.85 mm male
VSWR of R&S®FSVA3004, R&S®FSVA3007	RF attenuation ≥ 10 dB	
	10 MHz $\leq f < 1$ GHz	< 1.2 , typ. 1.09 ²¹
	1 GHz $\leq f < 3.6$ GHz	< 1.5 , typ. 1.19 ²¹
	3.6 GHz $\leq f \leq 7.5$ GHz	< 2.0 , typ. 1.42 ²¹
	5 dB $\leq$ RF attenuation ≤ 9 dB	
	10 MHz $\leq f < 3.6$ GHz	< 1.5 , typ. 1.31 ²¹
	3.6 GHz $\leq f \leq 7.5$ GHz	< 2.0 , typ. 1.51 ²¹
	RF attenuation ≤ 4 dB, DC coupled	
	10 MHz $\leq f < 7.5$ GHz	typ. 1.87 ²¹
VSWR of R&S®FSVA3013, R&S®FSVA3030	RF attenuation ≥ 10 dB	
	10 MHz $\leq f < 3.5$ GHz	< 1.2 , typ. 1.12 ²¹
	3.5 GHz $\leq f \leq 18$ GHz	< 1.6 , typ. 1.22 ²¹
	18 GHz $< f \leq 26.5$ GHz	< 2.0 , typ. 1.37 ²¹
	26.5 GHz $< f \leq 30$ GHz	< 2.5 , typ. 1.70 ²¹
	5 dB $\leq$ RF attenuation ≤ 9 dB	
	10 MHz $\leq f < 3.5$ GHz	< 1.5 , typ. 1.24 ²¹
	3.5 GHz $\leq f \leq 18$ GHz	< 1.8 , typ. 1.39 ²¹
	18 GHz $< f \leq 26.5$ GHz	< 2.2 , typ. 1.43 ²¹
	26.5 GHz $< f \leq 30$ GHz	< 2.5 , typ. 1.80 ²¹
	RF attenuation ≤ 4 dB, DC coupled	
	10 MHz $\leq f \leq 7.5$ GHz	typ. 2.0 ²¹
	7.5 GHz $< f \leq 26.5$ GHz	typ. 2.5 ²¹
	26.5 GHz $< f \leq 30$ GHz	typ. 3.0 ²¹
VSWR of R&S®FSVA3044, R&S®FSVA3050	RF attenuation ≥ 5 dB	
	10 MHz $\leq f \leq 3.5$ GHz	< 1.5 , typ. 1.3 ²¹
	3.5 GHz $\leq f \leq 18$ GHz	< 2.0 , typ. 1.8 ²¹
	18 GHz $< f \leq 26.5$ GHz	< 2.2 , typ. 2.0 ²¹
	26.5 GHz $< f \leq 40$ GHz	< 2.5 , typ. 2.2 ²¹
	40 GHz $< f \leq 50$ GHz	< 2.5 (nom.)
	RF attenuation ≤ 4 dB, DC coupled	
	10 MHz $\leq f \leq 7.5$ GHz	typ. 2.0 ²¹
	7.5 GHz $< f \leq 26.5$ GHz	typ. 2.5 ²¹
	26.5 GHz $< f \leq 40$ GHz	typ. 3.0 ²¹
	40 GHz $< f \leq 50$ GHz	3.0 (nom.)
Setting range of RF attenuator		0 dB to 75 dB, in 1 dB steps ²²
Setting range of electronic RF attenuator	with R&S®FSV3-B25 option, $f \leq 7.5$ 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.)

²¹ 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.

²² 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 $f \leq 7.5$ GHz, on the IF for $f > 7.5$ GHz.

USB interface	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 3.1
	maximum sum of output current via USB ports	2 A (nom.)

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

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

External monitor		
Connector		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		$< 1 \times 10^{-5}$
Data storage		
Internal		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
Altitude		
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	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 2014/30/EU including: • IEC/EN 61326-1²³ • CISPR 11/EN 55011²⁴
Recommended calibration interval		1 year
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
Power consumption	R&S®FSVA3004, R&S®FSVA3007	120 W (nom.), max. 250 W with all options
	R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044	170 W (nom.), max. 300 W with all options
	R&S®FSVA3050	200 W (nom.), max. 330 W with all options
Safety		in line with EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 no. 61010-1
Test mark		CE, VDE, cCSA _{US} , KC

²³ Immunity test requirement for industrial environment (EN 61326 table 2).

²⁴ 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®FSVA3004, R&S®FSVA3007	12.2 kg (26.9 lb)
	R&S®FSVA3013	13.6 kg (30 lb)
	R&S®FSVA3030	13.8 kg (30.44 lb)
	R&S®FSVA3044	14.6 kg (32.2 lb)
	R&S®FSVA3050	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	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.)
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®FSVA3004, R&S®FSVA3007, R&S®FSVA3013)

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 400 MHz	768 MHz
	> 400 MHz	1536 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®FSVA3004	10 MHz to 4 GHz
	R&S®FSVA3007	10 MHz to 7.5 GHz
	R&S®FSVA3013	10 MHz to 13.6 GHz
	R&S®FSVA3030	10 MHz to 30 GHz
	R&S®FSVA3044	10 MHz to 43.5 GHz
	R&S®FSVA3050	10 MHz to 50 GHz
	R&S®FSVA3050 with R&S®FSV3-B54G option	10 MHz to 54 GHz

Setting range		
RF preamplifier gain	R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3050	15 dB/30 dB (nom.) (selectable)
	R&S®FSVA3044	30 dB (nom.)

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-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®FSVA3004	1330.5000.05
Signal and spectrum analyzer, 10 Hz to 7.5 GHz	R&S®FSVA3007	1330.5000.08
Signal and spectrum analyzer, 10 Hz to 13.6 GHz	R&S®FSVA3013	1330.5000.14
Signal and spectrum analyzer, 10 Hz to 30 GHz	R&S®FSVA3030	1330.5000.31
Signal and spectrum analyzer, 10 Hz to 44 GHz	R&S®FSVA3044	1330.5000.44
Signal and spectrum analyzer, 10 Hz to 50 GHz	R&S®FSVA3050	1330.5000.51
Accessories supplied		
Power cable, quick start guide		
R&S®FSVA3030: adapter 3.5 mm (APC3.5-compatible) female/female		
R&S®FSVA3044: adapter 2.92 mm female/female		
R&S®FSVA3050: adapter 1.85 mm female/female		

Options

Hardware ²⁵

Designation	Type	Order No.	Remark
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	GPIO, 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
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/ R&S®FSV3-B400/ R&S®FSV3-B600/ R&S®FSV3-B1000 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®FSVA3013, R&S®FSVA3030, R&S®FSVA3044 and R&S®FSVA3050, 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-B11 option required in addition for frequencies > 7.5 GHz.
400 MHz analysis bandwidth	R&S®FSV3-B400	1330.7154.02	R&S®FSV3-B11 option required in addition for frequencies > 7.5 GHz.

²⁵ The hardware options can be retrofitted in service center unless otherwise noted.

Designation	Type	Order No.	Remark
Upgrade from 200 MHz to 400 MHz analysis bandwidth	R&S®FSV3-U400	1330.7183.02	R&S®FSV3-B200 option required, user-retrofittable (license key), recalibration by the Rohde & Schwarz service is recommended
600 MHz analysis bandwidth	R&S®FSV3-B600	1346.5004.02	R&S®FSV3-B11 required, only for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050
1 GHz analysis bandwidth	R&S®FSV3-B1000	1346.3699.02	R&S®FSV3-B11 required, only for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050
Upgrade from 600 MHz to 1 GHz analysis bandwidth	R&S®FSV3-U1006	1346.5027.02	R&S®FSV3-B600 option required, user-retrofittable (license key), recalibration by the Rohde & Schwarz service is recommended
Spare hard drive	R&S®FSV3-B18	1330.4003.02	requires R&S®FSV3-B20, user-retrofittable
Removable hard drive	R&S®FSV3-B20	1330.3971.02	at front panel
LO/IF connections, for external mixers	R&S®FSV3-B21	1330.4010.02	ex-factory only; not available for R&S®FSVA3004, R&S®FSVA3007, R&S®FSVA3013
RF preamplifier, for R&S®FSVA3004 and R&S®FSVA3007	R&S®FSV3-B24	1330.4049.07	
RF preamplifier, for R&S®FSVA3013	R&S®FSV3-B24	1330.4049.13	
RF preamplifier, for R&S®FSVA3030	R&S®FSV3-B24	1330.4049.30	
RF preamplifier, for R&S®FSVA3044	R&S®FSV3-B24	1330.4049.44	
RF preamplifier, for R&S®FSVA3050	R&S®FSV3-B24	1330.4049.49	
RF preamplifier, for R&S®FSVA3050	R&S®FSV3-B24	1330.4049.50	export license required
Electronic attenuator, 1 dB steps	R&S®FSV3-B25	1330.4078.02	user-retrofittable (license key)
Frequency extension 54 GHz	R&S®FSV3-B54G	1346.6369.02	R&S®FSV3-B11 required, only for R&S®FSVA3050
Enhanced computing power	R&S®FSV3-B114	1330.4910.04	always included
Noise source control via BNC	R&S®FSV3-B28V	1330.6664.02	
1 GHz reference	R&S®FSV3-K703	1330.7502.02	user-retrofittable (license key)
Enhanced performance, for R&S®FSVA3004	R&S®FSV3-B710	1346.4950.05	minimum frequency: 2 Hz, enhanced phase noise and sensitivity specifications; not retrofittable
Enhanced performance, for R&S®FSVA3007	R&S®FSV3-B710	1346.4950.08	
Enhanced performance for R&S®FSVA3013	R&S®FSV3-B710	1346.4950.14	
Enhanced performance, for R&S®FSVA3030	R&S®FSV3-B710	1346.4950.31	
Enhanced performance, for R&S®FSVA3044	R&S®FSV3-B710	1346.4950.44	
Enhanced performance, for R&S®FSVA3050	R&S®FSV3-B710	1346.4950.51	
Floating license smart card, with USB adapter	R&S®FSV3-FL	1345.1957.02	

Firmware ²⁶

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	
Power sensor support	R&S®FSV3-K9	1346.3676.02	
GSM/EDGE/EDGE evolution/ VAMOS measurements ²⁷	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 (digital predistortion)	R&S®FSV3-K18M	1345.1486.02	R&S®FSV3-K18 and R&S®FSV3-K18D options required
Noise figure measurements ²⁷	R&S®FSV3-K30	1330.5045.02	for legacy noise sources R&S®FSV3-B28V option is required
Phase noise measurements ²⁷	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
Vector signal analysis ²⁷	R&S®FSV3-K70	1330.5074.02	
Multi-modulation analysis ²⁷	R&S®FSV3-K70M	1346.3376.02	R&S®FSV3-K70 option required
BER PRBS measurements ²⁷	R&S®FSV3-K70P	1346.3382.02	R&S®FSV3-K70 option required
3GPP FDD (WCDMA) base station measurements (incl. HSDPA and HSDPA+) ²⁷	R&S®FSV3-K72	1330.5080.02	
3GPP FDD (WCDMA) mobile station measurements (incl. HSUPA and HSUPA+) ²⁷	R&S®FSV3-K73	1330.5097.02	
WLAN 802.11a/b/g measurements ²⁷	R&S®FSV3-K91	1330.5100.02	R&S®FSV3-K91 option required
WLAN 802.11n measurements ²⁷	R&S®FSV3-K91N	1330.5139.02	
WLAN 802.11ac measurements ²⁷	R&S®FSV3-K91AC	1330.5116.02	
WLAN 802.11ax measurements ²⁷	R&S®FSV3-K91AX	1346.3399.02	
WLAN 802.11p measurements ²⁷	R&S®FSV3-K91P	1330.5122.02	
WLAN IEEE802.11be measurements ²⁷	R&S®FSV3-K91BE	1346.4966.02	
EUTRA/LTE FDD base station measurements ²⁷	R&S®FSV3-K100	1330.5145.02	
EUTRA/LTE FDD UE measurements ²⁷	R&S®FSV3-K101	1330.5151.02	
EUTRA/LTE base station MIMO measurements ²⁷	R&S®FSV3-K102	1330.5168.02	R&S®FSV3-K100 or R&S®FSV3-K104 option required
EUTRA/LTE-Advanced uplink measurements ²⁷	R&S®FSV3-K103	1330.7231.02	R&S®FSV3-K101 or R&S®FSV3-K105 option required
EUTRA/LTE TDD base station measurements ²⁷	R&S®FSV3-K104	1330.5174.02	
EUTRA/LTE TDD uplink measurements ²⁷	R&S®FSV3-K105	1330.5180.02	
EUTRA/LTE NB-IoT downlink measurements ²⁷	R&S®FSV3-K106	1346.3418.02	

²⁶ For measurements with analysis bandwidths > 28 MHz an appropriate bandwidth option is required.²⁷ 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
5G NR Rel. 15 downlink measurements ²⁷	R&S®FSV3-K144	1330.7219.02	
5G NR Rel. 15 uplink measurements ²⁷	R&S®FSV3-K145	1330.7225.02	
5G NR combined ACLR/SEM/EVM measurements ²⁷	R&S®FSV3-K147	1346.4250.02	R&S®FSV3-K144 option required
5G NR Rel. 16 extension for uplink/downlink measurements ²⁷	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 ²⁷	R&S®FSV3-K171	1346.5362.02	R&S®FSV3-K144 option or R&S®FSV3-K145 and R&S®FSV3-K148 options required
User defined frequency correction by SnP file ²⁷	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 ^{28, 29, 30}	R&S®VSE	1345.1011.06
R&S®VSE enterprise edition ^{30, 31}	R&S®VSE	1345.1105.06
License dongles		
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, please refer to document PD 3607.1371.22 (specifications) and PD 3607.1371.12 (product brochure).

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	

²⁸ Requires R&S®FSPC.

²⁹ Not available for R&S®FSPC-FL.

³⁰ 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.

³¹ Requires R&S®FSPC or R&S®FSPC-FL.

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	R&S®ZZA-KN4	1175.3033.00
Noise sources		
Smart noise sources, for noise figure and gain measurements up to 55 GHz (requires R&S®FSV3-K30)	R&S®FS-SNS18/26/40/55	1338.8008.18, 1338.8008.26, 1338.8008.40, 1338.8008.55
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) – 1.85 mm (f)		3588.9654.00
Coaxial adapter, 2.92 mm (f) – 2.92 mm (f)		3588.8664.00
Coaxial adapter, 3.5 mm (f) – 3.5 mm (f), APC3.5-compatible		3689.9442.00
Coaxial adapter, 3.5 mm (m) – 3.5 mm (m), APC3.5-compatible		3587.7770.00
Coaxial adapter, type N (f) – 3.5 mm (m), APC3.5-compatible		3587.7806.00
Coaxial adapter, type N (f) – 3.5 mm (f), APC3.5-compatible		3587.7829.00
Coaxial cable, SMA (m) – SMA (m), length: 1 m		3586.9970.00
Connectors and cables		
Probe power connector, 3-pin		1065.9480.00
Type N adapter, for R&S®RT-Zxx oscilloscope probes	R&S®RT-ZA9	1417.0909.02
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®FSVA3030, R&S®FSVA3044 and R&S®FSVA3050 with R&S®FSV3-B21 option)		
Harmonic mixer, 40 GHz to 60 GHz	RPG FS-Z60 ³²	1048.0171.02
Harmonic mixer, 50 GHz to 75 GHz	RPG FS-Z75 ³²	3638.2240.02
Harmonic mixer, 60 GHz to 90 GHz	RPG FS-Z90 ³²	3638.2270.02
Harmonic mixer, 75 GHz to 110 GHz	RPG FS-Z110 ³²	3638.2292.02
Harmonic mixer, 90 GHz to 140 GHz	RPG FS-Z140 ³²	3622.0708.02
Harmonic mixer, 110 GHz to 170 GHz	RPG FS-Z170 ³²	3622.0714.02
Harmonic mixer, 140 GHz to 220 GHz	RPG FS-Z220 ³²	3593.3250.02
Harmonic mixer, 220 GHz to 325 GHz	RPG FS-Z325 ³²	3593.3267.02
Harmonic mixer, 325 GHz to 500 GHz	RPG FS-Z500 ³²	3593.3273.02
Waveguide to coaxial adapters		
Waveguide to coaxial adapter, WR10 – 1 mm (f)	WCA110	3626.1067.02
Waveguide to coaxial adapter, WR10 – 1 mm (m)	WCA110	3626.1067.03
Waveguide to coaxial adapter, WR12 – 1 mm (m)	WCA90	3626.1050.03
Waveguide to coaxial adapter, WR15 – 1 mm (f)	WCA75	3626.1044.02
Waveguide to coaxial adapter, WR15 – 1 mm (m)	WCA75	3626.1044.03
Waveguide to coaxial adapter, WR12 – 1 mm (f)	WCA90	3626.1050.02

³² RPG is the abbreviation of Radiometer Physics GmbH, a Rohde & Schwarz company.

Designation	Type	Order No.
Horn antennas		
Horn antenna, 110 GHz to 170 GHz	FH-SG-170	3629.2493.02
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
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

Power sensors supported by the R&S®FSV3-K9 option ³³

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 ³⁴	R&S®NRP-Z11	1138.3004.02
10 MHz to 18 GHz, 100 mW, two-path ³⁴	R&S®NRP-Z221	1417.0309.02
10 MHz to 18 GHz, 200 mW ³⁴	R&S®NRP-Z21	1137.6000.02
10 MHz to 18 GHz, 2 W ³⁴	R&S®NRP-Z22	1137.7506.02
10 MHz to 18 GHz, 15 W ³⁴	R&S®NRP-Z23	1137.8002.02
10 MHz to 18 GHz, 30 W ³⁴	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 ³⁵		
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 ³⁵		
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 ³⁴	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 ³⁵		
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

³³ For average power measurement only.

³⁴ Product discontinued.

³⁵ 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.
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
Wideband power sensors ³⁵		
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

Service options

Warranty		
Standard		3 years ³⁶
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 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 ³⁷. 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 ³⁷ 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 ³⁷ and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

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³⁶ For instrument and hardware options. For accessories 1 year applies.

³⁷ 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

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