

R&S® FSVA3000 SIGNAL AND SPECTRUM ANALYZER

Specifications

dataTec

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Specifications
Version 15.00

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Definitions

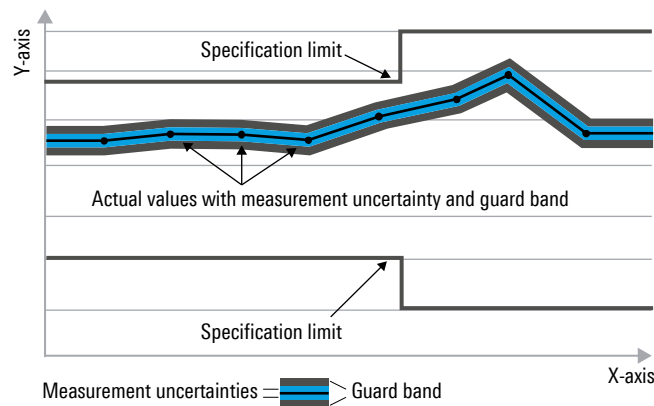
General

Product data applies under the following conditions:

- Three hours of storage at ambient temperature followed by 30 minutes of 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 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

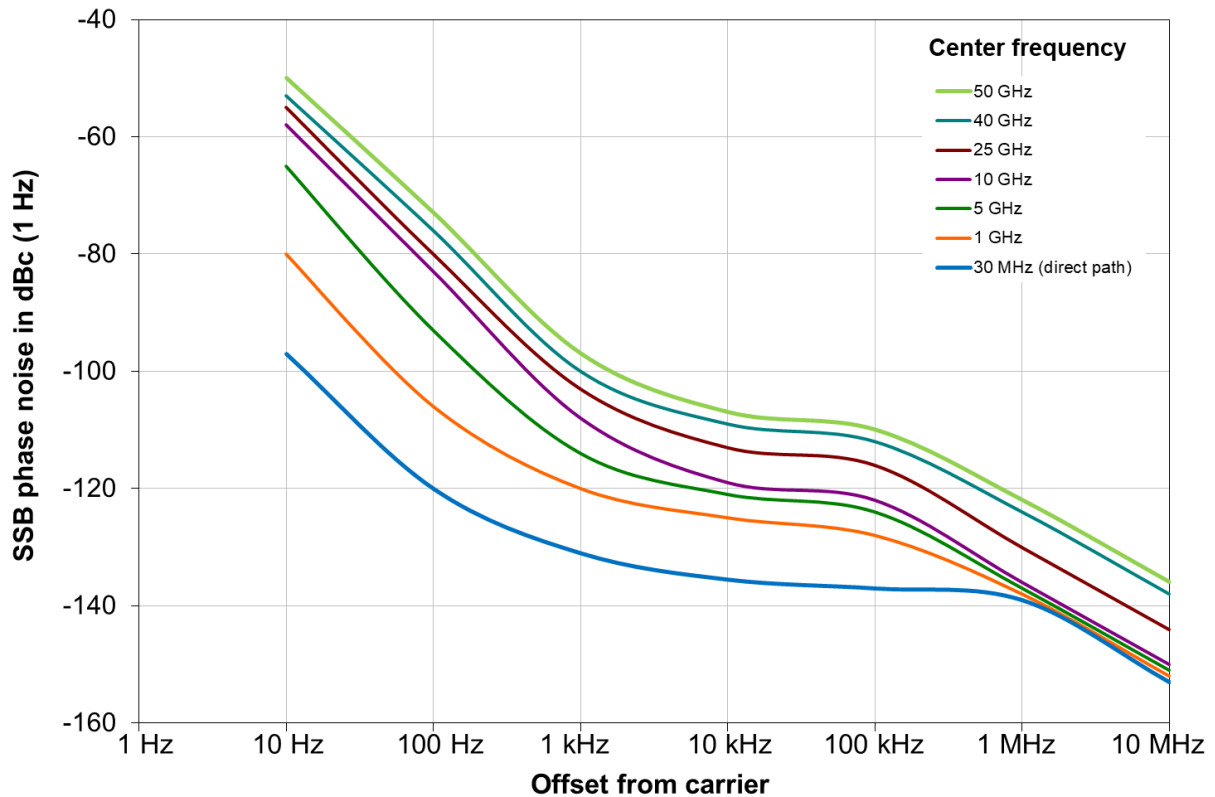
Frequency range		
Without R&S®FSV3-B710 option	R&S®FSVA3004	
	DC coupled	10 Hz to 4 GHz
	AC coupled	10 MHz to 4 GHz
	R&S®FSVA3007	
	DC coupled	10 Hz to 7.5 GHz
	AC coupled	10 MHz to 7.5 GHz
	R&S®FSVA3013	
	DC coupled	10 Hz to 13.6 GHz
	AC coupled	10 MHz to 13.6 GHz
	R&S®FSVA3030	
	DC coupled	10 Hz to 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}

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.

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
	range with active EMI measurements (R&S®FSV3-K54 required)	101 to 200001
Marker tuning frequency step size	marker step size = sweep points	$\text{span} / (\text{sweep points} - 1)$
	marker step size = standard	$\text{span} / (\text{default sweep points} - 1)$
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	\pm 0.1 % (nom.)
	span \geq 10 Hz, swept	\pm 3 % (nom.)

Resolution bandwidths

Sweep filters and FFT filters ⁴		
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 ⁵	20 MHz, 28 MHz, 30 MHz, 40 MHz additionally
Bandwidth uncertainty		< 3 % (nom.)
Shape factor 60 dB:3 dB		< 5 (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 Resolution bandwidths > 3 MHz are available in sweep mode only.

⁵ Gaussian shape for RBW \leq 28 MHz.

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.)

EMI filters (with R&S®FSV3-K54 only)		
Bandwidths (–6 dB)		10 Hz, 100 Hz, 200 Hz, 1 kHz, 9 kHz, 10 kHz, 100 kHz, 120 kHz, 1 MHz
Bandwidth uncertainty		< 3 % (nom.)
Shape factor 60 dB:6 dB		< 4 (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 option	400 MHz (nom.)
	with R&S®FSV3-B601 option	600 MHz (nom.)
	with R&S®FSV3-B1001 option	1000 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-B601 option	600 MHz (nom.)
	with R&S®FSV3-B1001 option	1000 MHz (nom.)

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 ⁶		
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 $\tau = 3 \mu\text{s}$	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	
	$f \leq 7.5 \text{ GHz}$	+10 dBm (nom.)
	$f > 7.5 \text{ GHz}$	+5 dBm (nom.)
	with R&S®FSV3-B24 option, RF preamplifier = 30 dB, RF attenuation = 0 dB	
	$f \leq 7.5 \text{ GHz}$	-20 dBm (nom.)
	$f > 7.5 \text{ GHz}$	-23 dBm (nom.)
Third order intercept point (TOI)	RF attenuation = 0 dB, RF preamplifier = off, YIG preselector on for $f > 7.5 \text{ GHz}$, level = -15 dBm (both), $\Delta f > 5 \times \text{RBW}$ or 10 kHz, whichever is larger	
	R&S®FSVA3004, R&S®FSVA3007	
	$10 \text{ MHz} \leq f_{\text{in}} < 3.6 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$3.6 \text{ GHz} \leq f_{\text{in}} \leq 7.5 \text{ GHz}$	> 16 dBm, typ. 19 dBm
	R&S®FSVA3013, R&S®FSVA3030, YIG preselector on for $f > 7.5 \text{ GHz}$	
	$10 \text{ MHz} \leq f_{\text{in}} \leq 16 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$16 \text{ GHz} < f_{\text{in}} < 20 \text{ GHz}$	> 14 dBm, typ. 18 dBm
	$20 \text{ GHz} \leq f_{\text{in}} \leq 26.5 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$26.5 \text{ GHz} < f_{\text{in}} \leq 30 \text{ GHz}$	> 15 dBm, typ. 21 dBm
	R&S®FSVA3044, R&S®FSVA3050, YIG preselector on for $f > 7.5 \text{ GHz}$	
	$10 \text{ MHz} \leq f_{\text{in}} < 3.6 \text{ GHz}$	> 17 dBm, typ. 20 dBm
	$3.6 \text{ GHz} \leq f_{\text{in}} \leq 7.5 \text{ GHz}$	> 16 dBm, typ. 19 dBm
	$7.5 \text{ GHz} < f_{\text{in}} \leq 20 \text{ GHz}$	> 15 dBm, typ. 21 dBm
	$20 \text{ GHz} < f_{\text{in}} \leq 24 \text{ GHz}$	> 12 dBm, typ. 15 dBm
	$24 \text{ GHz} < f_{\text{in}} \leq 40 \text{ GHz}$	> 15 dBm, typ. 21 dBm
	$40 \text{ GHz} < f_{\text{in}} \leq 44 \text{ GHz}$	> 12 dBm, typ. 21 dBm
	$44 \text{ GHz} < f_{\text{in}} \leq 50 \text{ GHz}$	> 10 dBm, typ. 16 dBm
	with R&S®FSV3-B24 option, RF attenuation = 0 dB, RF preamplifier = 30 dB, YIG preselector on for $f > 7.5 \text{ GHz}$, level = -45 dBm (both), $\Delta f > 5 \times \text{RBW}$ or 10 kHz, whichever is larger	
	$10 \text{ MHz} \leq f_{\text{in}} \leq 43.5 \text{ GHz}$	-20 dBm (nom.)
	R&S®FSVA3050 with R&S®FSV3-B24 option model .49	
$43.5 \text{ GHz} < f_{\text{in}} \leq 50 \text{ GHz}$	-20 dBm (nom.)	
R&S®FSVA3050 with R&S®FSV3-B24 option model .50		
$43.5 \text{ GHz} < f_{\text{in}} \leq 50 \text{ GHz}$	-20 dBm (nom.)	
Second harmonic intercept (SHI)	RF attenuation = 0 dB, RF preamplifier = off, YIG preselector on for $f_{\text{in}} > 3.75 \text{ GHz}$, level = -10 dBm	
	$100 \text{ MHz} < f_{\text{in}} \leq 1.75 \text{ GHz}$	45 dBm (nom.)
	$1.75 \text{ GHz} < f_{\text{in}} \leq 22 \text{ GHz}$	80 dBm (nom.)
	R&S®FSVA3050	
	$22 \text{ GHz} < f_{\text{in}} \leq 25 \text{ GHz}$	80 dBm (nom.)
	with R&S®FSV3-B24 option, RF preamplifier = 30 dB, RF attenuation = 0 dB, YIG preselector on for $f_{\text{in}} > 3.75 \text{ GHz}$, level = -40 dBm	
	$100 \text{ MHz} < f_{\text{in}} \leq 21.75 \text{ GHz}$	10 dBm (nom.)
	R&S®FSVA3050 with R&S®FSV3-B24 option model .49	
	$21.75 \text{ GHz} < f_{\text{in}} \leq 25 \text{ GHz}$	5 dBm (nom.)
	R&S®FSVA3050 with R&S®FSV3-B24 option model .50	
$21.75 \text{ GHz} < f_{\text{in}} \leq 25 \text{ GHz}$	10 dBm (nom.)	

⁶ Maximum input level while instrument is in operation.

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.

For instruments with R&S®FSV3-B601 or R&S®FSV3-B1001 option applies:

- With preamplifier switched off or not installed, add 2 dB to the specified values for $f \leq 7.5$ GHz
- With preamplifier switched on, add 1 dB to the specified values for $f \leq 7.5$ GHz

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 , logarithmic 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, logarithmic 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, logarithmic 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 ⁷	
	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	-133 dBm	

⁷ The frequency range of the RF preamplifier for the R&S®FSVA3044 is limited to 43.5 GHz.

RF preamplifier = 30 dB (continued)	R&S®FSVA3050 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	-161 dBm
	44 GHz < f ≤ 50 GHz	-152 dBm
	50 GHz < f ≤ 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 ≤ 43.5 GHz	13 dB (nom.)
	f > 43.5 GHz	0 dB (nom.)
	with R&S®FSV3-B24 option model .50	
	10 MHz < f ≤ 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, logarithmic 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
	100 kHz ≤ f < 1 MHz	-145 dBm
	1 MHz ≤ f < 1 GHz	-152 dBm
	1 GHz ≤ f < 3 GHz	-153 dBm
	3 GHz ≤ f < 6 GHz	-152 dBm
	6 GHz ≤ f ≤ 7.5 GHz	-151 dBm
	R&S®FSVA3013, R&S®FSVA3030	
	9 kHz ≤ f < 100 kHz	-140 dBm
	100 kHz ≤ f < 1 MHz	-145 dBm
	1 MHz ≤ f < 1 GHz	-151 dBm
	1 GHz ≤ f < 3 GHz	-151 dBm
	3 GHz ≤ f < 6 GHz	-149 dBm
	6 GHz ≤ f ≤ 7.5 GHz	-147 dBm
	7.5 GHz < f ≤ 15 GHz	-151 dBm
	15 GHz < f ≤ 30 GHz	-145 dBm
	R&S®FSVA3044, R&S®FSVA3050	
	9 kHz ≤ f < 100 kHz	-140 dBm
	100 kHz ≤ f < 1 MHz	-145 dBm
	1 MHz ≤ f < 1 GHz	-151 dBm
	1 GHz ≤ f < 3 GHz	-151 dBm
	3 GHz ≤ f < 6 GHz	-149 dBm
	6 GHz ≤ f ≤ 7.5 GHz	-147 dBm
	7.5 GHz < f ≤ 15 GHz	-149 dBm
	15 GHz < f ≤ 34 GHz	-145 dBm
	34 GHz < f ≤ 40 GHz	-142 dBm
	40 GHz < f ≤ 44 GHz	-139 dBm
	44 GHz < f ≤ 50 GHz	-134 dBm
	50 GHz < f ≤ 54 GHz ¹	-132 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	
	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, logarithmic 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
	100 kHz ≤ f < 1 MHz	-145 dBm
	1 MHz ≤ f < 1 GHz	-151 dBm
	1 GHz ≤ f < 3 GHz	-152 dBm
	3 GHz ≤ f < 6 GHz	-149 dBm
	6 GHz ≤ f ≤ 7.5 GHz	-148 dBm
	R&S®FSVA3013, R&S®FSVA3030	
	9 kHz ≤ f < 100 kHz	-140 dBm
	100 kHz ≤ f < 1 MHz	-145 dBm
	1 MHz ≤ f < 1 GHz	-150 dBm
	1 GHz ≤ f < 3 GHz	-150 dBm
	3 GHz ≤ f < 6 GHz	-147 dBm
	6 GHz ≤ f ≤ 7.5 GHz	-144 dBm
	7.5 GHz < f ≤ 15 GHz	-148 dBm
	15 GHz < f ≤ 30 GHz	-144 dBm
	R&S®FSVA3044, R&S®FSVA3050	
	9 kHz ≤ f < 100 kHz	-140 dBm
	100 kHz ≤ f < 1 MHz	-145 dBm
	1 MHz ≤ f < 1 GHz	-150 dBm
	1 GHz ≤ f < 3 GHz	-150 dBm
	3 GHz ≤ f < 6 GHz	-147 dBm
	6 GHz ≤ f ≤ 7.5 GHz	-144 dBm
	7.5 GHz < f ≤ 15 GHz	-148 dBm
	15 GHz < f ≤ 34 GHz	-143 dBm
	34 GHz < f ≤ 40 GHz	-140 dBm
40 GHz < f ≤ 44 GHz	-136 dBm	
44 GHz < f ≤ 50 GHz	-131 dBm	
50 GHz < f ≤ 54 GHz ¹	-129 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®FSVA3004, R&S®FSVA3007, R&S®FSVA3013, R&S®FSVA3030	
	10 MHz ≤ f < 50 MHz	-158 dBm
	50 MHz ≤ f ≤ 7.5 GHz	-166 dBm
	7.5 GHz < f ≤ 13.6 GHz	-164 dBm
	13.6 GHz < f ≤ 22 GHz	-162 dBm
	22 GHz < f ≤ 26.5 GHz	-158 dBm
	26.5 GHz < f ≤ 30 GHz	-156 dBm
	R&S®FSVA3044 ⁷	
	10 MHz ≤ f < 3 GHz	-166 dBm
	3 GHz ≤ f ≤ 7.5 GHz	-163 dBm
	7.5 GHz < f ≤ 26.5 GHz	-163 dBm
	26.5 GHz < f ≤ 40 GHz	-159 dBm
	40 GHz < f ≤ 43.5 GHz	-151 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	-161 dBm
	26.5 GHz < f ≤ 40 GHz	-159 dBm
	40 GHz < f ≤ 43.5 GHz	-149 dBm
43.5 GHz < f ≤ 50 GHz	-139 dBm	
50 GHz < f ≤ 54 GHz ¹	-133 dBm	

Displayed average noise level with R&S®FSV3-B24 preamplifier option		
RF preamplifier = 30 dB (continued)	R&S®FSVA3050 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	–161 dBm
	26.5 GHz < f ≤ 40 GHz	–159 dBm
	40 GHz < f ≤ 44 GHz	–161 dBm
	44 GHz < f ≤ 50 GHz	–153 dBm
	50 GHz < f ≤ 54 GHz ¹	–147 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.)
	with R&S®FSV3-B24 option model .50	
	10 MHz < f ≤ 50 GHz/54 GHz ¹	13 dB (nom.)

Spurious responses

Image response	YIG preselector on for f > 7.5 GHz, mixer level ≤ –10 dBm ⁸ , sweep optimization: auto or dynamic	
	20 MHz ≤ f ≤ 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 ≤ 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 ≤ 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 ≤ 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 ≤ 54 GHz ¹	
	$f_{in} - 2 \times 732$ MHz (second IF)	< –40 dBc (nom.)
$f_{in} - 2 \times 8412 + 2 \times 732$ MHz ⁹	< –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 ≤ 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.)

⁸ Mixer level = signal level – RF attenuation + preamplifier gain.

⁹ $f_{in} - 2 \times 8412$ 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)
	0 °C to +50 °C	< 0.35 dB ($\sigma = 0.12$ 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 $\leq f < 10$ 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 ⁷ , 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 ¹⁰	< 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 ¹¹
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 \geq level \geq –70 dB	< 0.1 dB ($\sigma = 0.033$ dB)
	S/N > 16 dB, –70 dB > level \geq –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

¹⁰ With R&S®FSV3-B710 option: 3 Hz $\leq f < 20$ Hz.

¹¹ 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	$500 \text{ MHz} \leq f \leq 7.5 \text{ GHz}$	$f_{\text{center}} \pm 250 \text{ MHz}$ (nom.) ¹²
	$f > 7.5 \text{ GHz}$	$f_{\text{center}} \pm 250 \text{ MHz}$ (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.)

¹² 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 ¹³
Maximum number of pretrigger samples		200 Msample I and Q ¹³
Word length of I/Q samples		32 bit for I and 32 bit for Q
I/Q file export	supported formats	*.iq.tar, *.aid, *.iqw, *.csv, *.mat
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-B601, R&S®FSV3-B1001 options	100 Hz to 2048 MHz
Maximum signal analysis bandwidth (equalized)	standard	28 MHz ¹⁴
	with R&S®FSV3-B40 option	40 MHz ¹⁴
	with R&S®FSV3-B200 option	200 MHz ¹⁴
	with R&S®FSV3-B400 option	400 MHz ¹⁴
	with R&S®FSV3-B601 option	600 MHz ¹⁴
	with R&S®FSV3-B1001 option	1000 MHz ¹⁴

Signal analysis bandwidth ≤ 40 MHz ¹⁴		
Amplitude flatness	(1.25 × signal analysis bandwidth) ≤ $f_{\text{center}} \leq 7.5$ GHz	±0.3 dB (nom.)
	$f_{\text{center}} > 7.5$ GHz, YIG preselector off	±0.5 dB (nom.)
Deviation from linear phase	(1.25 × signal analysis bandwidth) ≤ $f_{\text{center}} \leq 7.5$ GHz	±1° (nom.)
	$f_{\text{center}} > 7.5$ 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	$f_{\text{center}} \geq 100$ MHz, two -30 dBm tones at input mixer within analysis bandwidth	-80 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, $f_{\text{center}} \geq 100$ MHz	-90 dBm (nom.)
Other spurious responses		see section Spurious responses
IF power trigger bandwidth		40 MHz (nom.)
Trigger resolution	trigger source: external	3.91 ns (nom.)
	trigger source: IF power	7.81 ns (nom.)

¹³ For signal analysis bandwidth > 400 MHz the maximum record length is between 50 % and 100 % of the given figures.

¹⁴ 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 ^{14, 15, 16}		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$150 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 0.5 \text{ dB (nom.)}$ ¹⁷
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 0.7 \text{ dB (nom.)}$ ¹⁷
	$7.5 \text{ GHz} < f_{\text{center}} \leq 26.5 \text{ GHz}$	$\pm 1.0 \text{ dB (nom.)}$ ¹⁷
	$26.5 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 2.0 \text{ dB (nom.)}$ ¹⁷
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 2.2 \text{ dB (nom.)}$ ¹⁷
Deviation from linear phase	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$150 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 2^\circ \text{ (nom.)}$ ¹⁸
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 2.5^\circ \text{ (nom.)}$ ¹⁸
	$7.5 \text{ GHz} < f_{\text{center}} \leq 26.5 \text{ GHz}$	$\pm 3^\circ \text{ (nom.)}$ ¹⁸
	$26.5 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 4^\circ \text{ (nom.)}$ ¹⁸
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 7^\circ \text{ (nom.)}$ ¹⁸
Nonlinearity of displayed level	0 dB to -70 dB	$< 0.15 \text{ dB (nom.)}$
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	$f_{\text{center}} \geq 150 \text{ MHz}$, two -25 dBm tones at input mixer within analysis bandwidth	-75 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, $f_{\text{center}} \geq 150 \text{ MHz}$	-90 dBm (nom.)
ADC related spurious response	single tone within analysis bandwidth, mixer level = -10 dBm ⁸ , reference level = signal level, $f_{\text{center}} \geq 150 \text{ MHz}$	-75 dBc (nom.)
Other spurious responses		see section Spurious responses
IF power trigger bandwidth		200 MHz (nom.)
Trigger resolution	trigger source: external	3.91 ns (nom.)
	trigger source: IF power	0.997 ns (nom.)

Signal analysis bandwidth 200 MHz to 400 MHz ^{14, 16, 19}		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$300 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 0.7 \text{ dB (nom.)}$ ¹⁷
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 1.2 \text{ dB (nom.)}$ ¹⁷
	$7.5 \text{ GHz} < f_{\text{center}} \leq 22 \text{ GHz}$	$\pm 1.6 \text{ dB (nom.)}$ ¹⁷
	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 2.0 \text{ dB (nom.)}$ ¹⁷
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 2.3 \text{ dB (nom.)}$ ¹⁷
Deviation from linear phase	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector off for $f > 7.5$ GHz	
	$300 \text{ MHz} \leq f_{\text{center}} < 4 \text{ GHz}$	$\pm 4^\circ \text{ (nom.)}$ ¹⁸
	$4 \text{ GHz} \leq f_{\text{center}} \leq 7.5 \text{ GHz}$	$\pm 6^\circ \text{ (nom.)}$ ¹⁸
	$7.5 \text{ GHz} < f_{\text{center}} \leq 22 \text{ GHz}$	$\pm 4^\circ \text{ (nom.)}$ ¹⁸
	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 5^\circ \text{ (nom.)}$ ¹⁸
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 8^\circ \text{ (nom.)}$ ¹⁸
Nonlinearity of displayed level	0 dB to -70 dB	$< 0.15 \text{ dB (nom.)}$
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	$f_{\text{center}} \geq 300 \text{ MHz}$, two -25 dBm tones at input mixer within analysis bandwidth	-75 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, $f_{\text{center}} \geq 300 \text{ MHz}$	-90 dBm (nom.)

¹⁵ The specifications in this section apply for the R&S®FSV3-B200, R&S®FSV3-B400, R&S®FSV3-B601 and R&S®FSV3-B1001 options in the temperature range from $+20$ °C to $+30$ °C.

¹⁶ 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.

¹⁷ With R&S®FSV3-B24 option installed, add 0.2 dB to the specifications.

¹⁸ With R&S®FSV3-B24 option installed, add 1° to the specifications.

¹⁹ The specifications in this section apply for the R&S®FSV3-B400, R&S®FSV3-B601 and R&S®FSV3-B1001 options in the temperature range from $+20$ °C to $+30$ °C.

ADC related spurious response	single tone within analysis bandwidth, mixer level = -10 dB ⁸ , 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 dBc (nom.)
	$f_{\text{center}} > 7.5 \text{ GHz}$	-72 dBc (nom.)
Other spurious responses		see section Spurious responses
IF power trigger bandwidth		400 MHz (nom.)
Trigger resolution	trigger source: external	3.91 ns (nom.)
	trigger source: IF power	0.997 ns (nom.)

Signal analysis bandwidth 400 MHz to 1000 MHz with R&S®FSV3-B601 or R&S®FSV3-B1001 option ^{14, 16, 20}		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector = off for $f > 7.5 \text{ GHz}$	
	$600 \text{ MHz} \leq f_{\text{center}} \leq 22 \text{ GHz}$	± 1.8 dB (nom.) ¹⁷
	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	± 2.2 dB (nom.) ¹⁷
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	± 2.5 dB (nom.) ¹⁷
Deviation from linear phase	RF attenuation ≥ 10 dB, RF preamplifier = off, YIG preselector = off for $f > 7.5 \text{ GHz}$	
	$600 \text{ MHz} \leq f_{\text{center}} \leq 22 \text{ GHz}$	$\pm 7^\circ$ (nom.) ¹⁸
	$22 \text{ GHz} < f_{\text{center}} \leq 46 \text{ GHz}$	$\pm 8^\circ$ (nom.) ¹⁸
	$46 \text{ GHz} < f_{\text{center}} \leq 54 \text{ GHz}$ ¹	$\pm 10^\circ$ (nom.) ¹⁸
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	$f_{\text{center}} \leq 7.5 \text{ GHz}$: -80 dBm (nom.), -90 dBm (typ.) $f_{\text{center}} > 7.5 \text{ GHz}$: -90 dBm (nom.)
ADC related spurious response	single tone within analysis bandwidth, mixer level = -10 dB ⁸ , reference level = signal level	-72 dBc (nom.)
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	
	analysis bandwidth $\leq 800 \text{ MHz}$	0.977 ns (nom.)
	analysis bandwidth $> 800 \text{ MHz}$	0.488 ns (nom.)

²⁰ The specifications in this section apply for the R&S®FSV3-B601 and R&S®FSV3-B1001 options in the temperature range from $+20$ °C to $+30$ °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, DC coupled	< 1.2 , typ. 1.12 ²¹
	10 MHz $\leq f < 3.5$ GHz, AC coupled	< 1.3 , typ. 1.15 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	10/100/1000BASE-T
	with R&S®FSV3-B6 option	10GBASE-T in addition
Connector		RJ-45

External monitor		
Connectors		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.)
	with R&S®FSV3-B20 option	solid-state drive ≥ 50 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: <ul style="list-style-type: none"> • IEC/EN 61326-1²³ • CISPR 11/EN 55011²⁴
Recommended calibration interval		2 years
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 marks		CE, VDE, cCSA _{US} , KC
Power consumption		
Operating	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
	standby (all models)	
Non-operating	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.)

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 x H x D	462 mm x 197 mm x 417 mm (18.15 in x 7.76 in x 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	logarithmic display scale linear display scale	logarithmic 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®FSVA3044, R&S®FSVA3050	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	-127 dBc (1 Hz) (nom.)
	offset 10 kHz	-131 dBc (1 Hz) (nom.)
	offset ≥ 100 kHz	-137 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 34)
	T and \bar{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	$f_{\text{input}} = 1 \text{ MHz}$, 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 ($\sqrt{1}$ Hz)) (nom.)
	±1 V peak	-134 dBm (1 Hz) (45 nV ($\sqrt{1}$ Hz)) (nom.)
	±0.5 V peak	-140 dBm (1 Hz) (23 nV ($\sqrt{1}$ Hz)) (nom.)
	±0.25 V peak	-146 dBm (1 Hz) (12 nV ($\sqrt{1}$ 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®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		
<ul style="list-style-type: none"> 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-retrofitable
Audio demodulator	R&S®FSV3-B3	1330.3765.02	
OEXO 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/-B200/-B400/-B601/-B1001 options, not by the R&S®FSV3-B8E option; user-retrofitable; 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-retrofitable (license key), R&S®FSV3-B5 is recommended for high sweep speed
YIG preselector bypass	R&S®FSV3-B11	1330.3865.02	required for signal analysis at center frequencies > 7.5 GHz with R&S®FSV3-B40/-B200/-B400/-B601/-B1001 options; for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050; user-retrofitable (license key)

²⁵ The hardware options can be retrofitted in Rohde & Schwarz service centers unless otherwise noted.

Designation	Type	Order No.	Remark
40 MHz analysis bandwidth	R&S®FSV3-B40	1330.4103.02	user-retrofitable (license key) ²⁶
200 MHz analysis bandwidth	R&S®FSV3-B200	1330.4132.02	R&S®FSV3-B11 option is recommended in addition for signal analysis at frequencies > 7.5 GHz
400 MHz analysis bandwidth	R&S®FSV3-B400	1330.7154.02	
600 MHz analysis bandwidth	R&S®FSV3-B601	1346.5762.02	for R&S®FSVA3004, R&S®FSVA3007
		1346.5762.12	for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050 ²⁶
1 GHz analysis bandwidth	R&S®FSV3-B1001	1346.5779.02	for R&S®FSVA3004, R&S®FSVA3007
		1346.5779.12	for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050 ²⁶
Spare solid-state drive	R&S®FSV3-B18	1330.4003.21	includes Windows IoT Enterprise LTSC 2021 license; R&S®FSV3-B20 option required; user-retrofitable
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	includes two cables (length: 1 m) for the IF and LO ports; for R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050
RF preamplifier, for R&S®FSVA3004 and R&S®FSVA3007	R&S®FSV3-B24	1330.4049.07	retrofitable ²⁷
RF preamplifier, for R&S®FSVA3013	R&S®FSV3-B24	1330.4049.13	retrofitable Fehler! Textmarke nicht definiert.
RF preamplifier, for R&S®FSVA3030	R&S®FSV3-B24	1330.4049.30	retrofitable Fehler! Textmarke nicht definiert.
RF preamplifier, for R&S®FSVA3044	R&S®FSV3-B24	1330.4049.44	retrofitable Fehler! Textmarke nicht definiert.
RF preamplifier, for R&S®FSVA3050	R&S®FSV3-B24	1330.4049.49	retrofitable Fehler! Textmarke nicht definiert.
RF preamplifier, for R&S®FSVA3050	R&S®FSV3-B24	1330.4049.50	export license required Fehler! Textmarke nicht definiert.
Electronic attenuator, 1 dB steps	R&S®FSV3-B25	1330.4078.02	user-retrofitable (license key)
Noise source control via BNC	R&S®FSV3-B28V	1330.6664.02	
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	mandatory
Analog baseband inputs, 2 x 200 MHz	R&S®FSV3-B271	1330.4190.02	R&S®FSV3-B200/-B400/-B601 or -B1001 option required; supports I/Q analyzer mode and R&S®FSV3-K91, R&S®FSV3-K144, R&S®FSV3-K145 options
Analog baseband inputs, 2 x 200 MHz	R&S®FSV3-B271	1330.4190.03	not available in combination with R&S®FSV3-B200/-B400/-B601 or -B1001 option; supports I/Q analyzer mode and R&S®FSV3-K91, R&S®FSV3-K144, R&S®FSV3-K145 options

²⁶ R&S®FSV3-B11 option is recommended in addition for signal analysis at frequencies > 7.5 GHz.

²⁷ For retrofitting, please contact your local Rohde & Schwarz sales office.

Designation	Type	Order No.	Remark
1 GHz reference	R&S®FSV3-K703	1330.7502.02	user-retrofitable (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 retrofitable
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 ²⁸

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 ²⁹	R&S®FSV3-K8	1346.5679.02	
Power sensor support	R&S®FSV3-K9	1346.3676.02	
GSM/EDGE/EDGE evolution/ VAMOS measurements ²⁹	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 ²⁹	R&S®FSV3-K30	1330.5045.02	for legacy noise sources R&S®FSV3-B28V option is required
Phase noise measurements ²⁹	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	R&S®FSV3-K60 and (R&S®FSV3-K60C or R&S®FSV3-K60H) options required
Vector signal analysis ²⁹	R&S®FSV3-K70	1330.5074.02	
Multi-modulation analysis ²⁹	R&S®FSV3-K70M	1346.3376.02	R&S®FSV3-K70 option required
BER PRBS measurements ²⁹	R&S®FSV3-K70P	1346.3382.02	R&S®FSV3-K70 option required
3GPP FDD (WCDMA) base station measurements (incl. HSDPA and HSDPA+) ²⁹	R&S®FSV3-K72	1330.5080.02	
3GPP FDD (WCDMA) mobile station measurements (incl. HSUPA and HSUPA+) ²⁹	R&S®FSV3-K73	1330.5097.02	

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

²⁹ Also available as floating license. Order number is xxxx.xxxx.51 instead of xxxx.xxxx.02 and R&S®FSV3-FL hardware option is required.

Designation	Type	Order No.	Remark
WLAN 802.11a/b/g measurements ²⁹	R&S®FSV3-K91	1330.5100.02	
WLAN 802.11n measurements ²⁹	R&S®FSV3-K91N	1330.5139.02	R&S®FSV3-K91 option required
WLAN 802.11ac measurements ²⁹	R&S®FSV3-K91AC	1330.5116.02	
WLAN 802.11ax measurements ²⁹	R&S®FSV3-K91AX	1346.3399.02	
WLAN 802.11p measurements ²⁹	R&S®FSV3-K91P	1330.5122.02	
WLAN 802.11be measurements ²⁹	R&S®FSV3-K91BE	1346.4966.02	
OFDM signal analysis	R&S®FSV3-K96	1346.6469.02	
EUTRA/LTE FDD base station measurements ²⁹	R&S®FSV3-K100	1330.5145.02	
EUTRA/LTE FDD UE measurements ²⁹	R&S®FSV3-K101	1330.5151.02	
EUTRA/LTE base station MIMO measurements ²⁹	R&S®FSV3-K102	1330.5168.02	R&S®FSV3-K100 or R&S®FSV3-K104 option required
EUTRA/LTE-Advanced uplink measurements ²⁹	R&S®FSV3-K103	1330.7231.02	R&S®FSV3-K101 or R&S®FSV3-K105 option required
EUTRA/LTE TDD base station measurements ²⁹	R&S®FSV3-K104	1330.5174.02	
EUTRA/LTE TDD uplink measurements ²⁹	R&S®FSV3-K105	1330.5180.02	
EUTRA/LTE NB-IoT downlink measurements ²⁹	R&S®FSV3-K106	1346.3418.02	
5G NR Rel. 15 downlink measurements ²⁹	R&S®FSV3-K144	1330.7219.02	
5G NR Rel. 15 uplink measurements ²⁹	R&S®FSV3-K145	1330.7225.02	
5G NR combined ACLR/SEM/EVM measurements ²⁹	R&S®FSV3-K147	1346.4250.02	R&S®FSV3-K144 option required
5G NR combined multicarrier ACLR/SEM/EVM measurements ²⁹	R&S®FSV3-K147C	1346.6498.02	R&S®FSV3-K147 option required
5G NR Rel. 16 extension for uplink/downlink measurements ²⁹	R&S®FSV3-K148	1346.4914.02	R&S®FSV3-K144 or R&S®FSV3-K145 option required
5G NR Rel. 17/18 extension for uplink/downlink measurements ²⁹	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 ²⁹	R&S®FSV3-K175	1346.6452.02	
200 MHz real-time spectrum measurements ²⁹	R&S®FSV3-K200R	1346.6552.02	R&S®FSV3-B114 option model .03 or higher required; the maximum real-time bandwidth (span) is limited by the analysis bandwidth
User defined frequency correction by SnP file ²⁹	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	
I/Q noise cancellation	R&S®FSV3-K575	1346.6769.02	supports I/Q analyzer mode and R&S®FSV3-K91, R&S®FSV3-K144, R&S®FSV3-K145 options
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 ^{30, 31, 32}	R&S®VSE	1345.1011.06
R&S®VSE enterprise edition ^{32, 33}	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, 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	

³⁰ R&S®FSPC required.

³¹ Not available for R&S®FSPC-FL.

³² 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.

³³ R&S®FSPC or R&S®FSPC-FL required.

Upgrades

Designation	Type	Order No.	Remark
200 MHz to 400 MHz analysis bandwidth upgrade	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 to 1 GHz analysis bandwidth upgrade	R&S®FSV3-U1006	1346.5027.02	R&S®FSV3-B600/-B601 option required, user-retrofittable (license key), recalibration by the Rohde & Schwarz service is recommended
R&S®FSV3-B601 upgrade	R&S®FSV3-U601	1346.6675.02	for R&S®FSVA3004 and R&S®FSVA3007
		1346.6675.12	R&S®FSV3-B11 recommended; for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050
R&S®FSV3-B1001 upgrade	R&S®FSV3-U1001	1346.6681.02	for R&S®FSVA3004 and R&S®FSVA3007
		1346.6681.12	R&S®FSV3-B11 recommended; for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050
R&S®FSV3-B600 to B601 upgrade	R&S®FSV3-U601	1346.6675.13	for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050 (installed R&S®FSV3-B600 option required)
R&S®FSV3-B1000 to B1001 upgrade	R&S®FSV3-U1001	1346.6681.13	for R&S®FSVA3013, R&S®FSVA3030, R&S®FSVA3044, R&S®FSVA3050 (installed R&S®FSV3-B1000 option required)
LO/IF connections for external mixers upgrade ³⁴	R&S®FSV3-U21	1356.3291.xy	
RF preamplifier 7.5 GHz upgrade ³⁴	R&S®FSV3-U24C	1346.6581.07	
RF preamplifier 13.6 GHz upgrade ³⁴	R&S®FSV3-U24C	1346.6581.13	
RF preamplifier 30 GHz upgrade ³⁴	R&S®FSV3-U24C	1346.6581.30	
RF preamplifier 44 GHz upgrade ³⁴	R&S®FSV3-U24C	1346.6581.44	
RF preamplifier 50 GHz upgrade ³⁴	R&S®FSV3-U24C	1346.6581.49	
RF preamplifier 50 GHz upgrade ³⁴	R&S®FSV3-U24C	1346.6581.50	export license required
RF preamplifier 13.6 GHz upgrade ³⁴	R&S®FSV3-U24N	1346.6575.13	
RF preamplifier 30 GHz upgrade ³⁴	R&S®FSV3-U24N	1346.6575.30	
RF preamplifier 44 GHz upgrade ³⁴	R&S®FSV3-U24N	1346.6575.44	
RF preamplifier 50 GHz upgrade ³⁴	R&S®FSV3-U24N	1346.6575.49	
RF preamplifier 50 GHz upgrade ³⁴	R&S®FSV3-U24N	1346.6575.50	export license required
Upgrade to Windows IoT Enterprise LTSC 2021 ³⁴	R&S®FSV3-U10	1346.6698.21	

³⁴ For retrofitting, contact your local Rohde & Schwarz sales office.

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 (R&S®FSV3-K30 required)	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
Connectors and cables		
Probe power connector, 3-pin		1065.9480.00
Type N adapter, for R&S®RT-Zxx oscilloscope probes (for R&S®FSVA3004/3007/3013)	R&S®RT-ZA9	1417.0909.02
Type 3.5mm (f) adapter, for R&S®RT-Zxx oscilloscope probes (for R&S®FSVA3030 and R&S®FSVA3044). Not suitable for R&S®FSVA3050. Hint: access to "Trigger 1 in/out" and "Noise source control and power sensor" ports might 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 x 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 ³⁵	1048.0171.02
Harmonic mixer, 50 GHz to 75 GHz	RPG FS-Z75 ³⁵	3638.2240.02
Harmonic mixer, 60 GHz to 90 GHz	RPG FS-Z90 ³⁵	3638.2270.02
Harmonic mixer, 75 GHz to 110 GHz	RPG FS-Z110 ³⁵	3638.2292.02
Harmonic mixer, 90 GHz to 140 GHz	RPG FS-Z140 ³⁵	3622.0708.02
Harmonic mixer, 110 GHz to 170 GHz	RPG FS-Z170 ³⁵	3622.0714.02
Harmonic mixer, 140 GHz to 220 GHz	RPG FS-Z220 ³⁵	3593.3250.02
Harmonic mixer, 220 GHz to 325 GHz	RPG FS-Z325 ³⁵	3593.3267.02

³⁵ RPG is the abbreviation of Radiometer Physics GmbH, a Rohde & Schwarz company.

Designation	Type	Order No.
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®FSVA3004/3007/3013)	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®FSVA3030/3044)	R&S®ZN-ZTW	1328.8534.35

Power sensors supported by the R&S®FSV3-K9 option ³⁶

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 ³⁷	R&S®NRP-Z11	1138.3004.02
10 MHz to 18 GHz, 100 mW, two-path ³⁷	R&S®NRP-Z221	1417.0309.02
10 MHz to 18 GHz, 200 mW ³⁷	R&S®NRP-Z21	1137.6000.02
10 MHz to 18 GHz, 2 W ³⁷	R&S®NRP-Z22	1137.7506.02
10 MHz to 18 GHz, 15 W ³⁷	R&S®NRP-Z23	1137.8002.02
10 MHz to 18 GHz, 30 W ³⁷	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 ³⁸		
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 ³⁸		
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 ³⁷	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

³⁶ For average power measurement only.

³⁷ Product discontinued.

³⁸ 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.
Three path diode power sensors ³⁸		
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
100 pW to 100 mW, 50 MHz to 90 GHz	R&S®NRP90S	1424.6421.02
100 pW to 100 mW, 50 MHz to 90 GHz, LAN version	R&S®NRP90SN	1424.6421.03
Wideband power sensors ³⁸		
50 MHz to 40 GHz, 100 mW (2.92 mm) ³⁷	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, multimode for differential, single-ended and common mode, 1.2 m cable, 400 kΩ differential, 200 kΩ single ended, R&S®ProbeMeter, micro button	R&S®RT-ZM15	1800.4700.02
3 GHz modular probe amplifier, multimode for differential, single-ended and common mode, 1.2 m cable, 400 kΩ differential, 200 kΩ single ended, R&S®ProbeMeter, micro button	R&S®RT-ZM30	1419.3005.02
6 GHz modular probe amplifier, multimode for differential, single-ended and common mode, 1.2 m cable, 400 kΩ differential, 200 kΩ single ended, R&S®ProbeMeter, micro button	R&S®RT-ZM60	1419.3105.02
9 GHz modular probe amplifier, multimode for differential, single-ended and common mode, 1.2 m cable, 400 kΩ differential, 200 kΩ single-ended, R&S®ProbeMeter, micro button	R&S®RT-ZM90	1419.3205.02
13 GHz modular probe amplifier, multimode for differential, single-ended and common mode, 1.2 m cable, 400 kΩ differential, 200 kΩ single-ended, R&S®ProbeMeter, micro button	R&S®RT-ZM130	1800.4500.02
16 GHz modular probe amplifier, multimode for differential, single-ended and common mode, 1.2 m cable, 400 kΩ differential, 200 kΩ single-ended, R&S®ProbeMeter, micro button	R&S®RT-ZM160	1800.4600.02

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

External frontends supported by R&S®FSV3-B553 option

Designation	Type	Order No.
External frontend from 24 GHz to 44 GHz	R&S®FE44S	1338.7001.02
External frontend from 36 GHz to 50 GHz	R&S®FE50DTR	1347.4099.02

Warranty and service

Warranty		
Base unit		1 year
All other items		1 year
Service options		
	Service plans	On demand
Calibration	up to five years ³⁹	pay per calibration
Warranty and repair	up to five years ³⁹	standard price repair
Contact your Rohde & Schwarz sales office for further details.		

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³⁹ For extended periods, contact your Rohde & Schwarz sales office.

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