

# R&S® FSU Spectrum Analyzer Specifications



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# Specifications

Specifications apply under the following conditions: 30 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to, and all internal automatic adjustments performed.

Data without tolerances: typical values only. Data designated "nominal" applies to design parameters and is not tested.

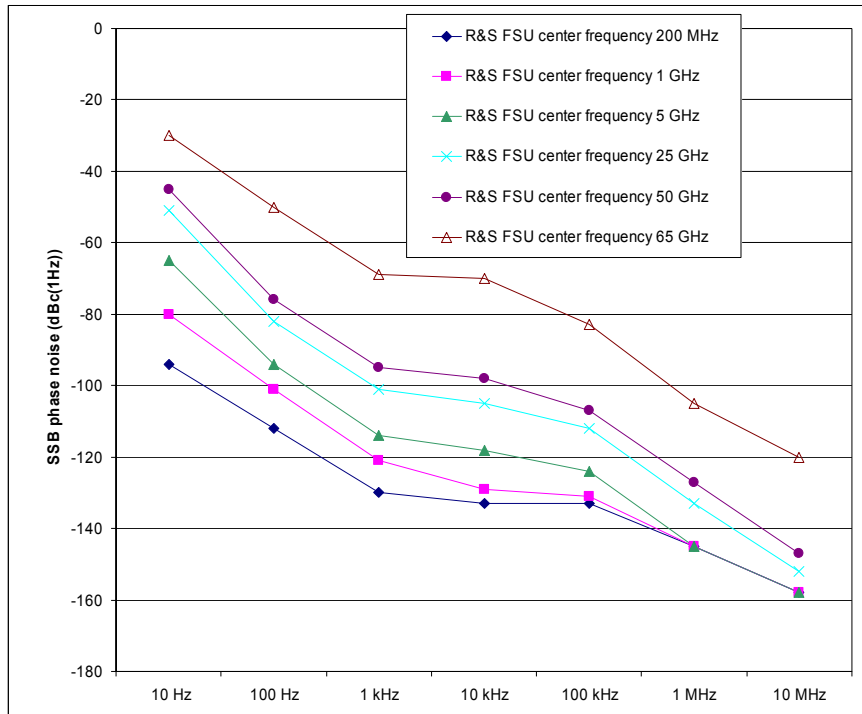
## Frequency

Frequency range	R&S®FSU3:	DC coupled	20 Hz to 3.6 GHz
		AC coupled	1 MHz to 3.6 GHz
	R&S®FSU8:	DC coupled	20 Hz to 8 GHz
		AC coupled	1 MHz to 8 GHz
	R&S®FSU26:	DC coupled	20 Hz to 26.5 GHz
		AC coupled	10 MHz to 26.5 GHz
	R&S®FSU43:	DC coupled	20 Hz to 43 GHz
	R&S®FSU46:	DC coupled	20 Hz to 46 GHz
	R&S®FSU50:	DC coupled	20 Hz to 50 GHz
	R&S®FSU67:	DC coupled	20 Hz to 67 GHz
Frequency resolution			0.01 Hz

Reference frequency, internal, nominal	standard OCXO	
Aging per day	after 30 days of continuous operation	$1 \times 10^{-9}$
Aging per year	after 30 days of continuous operation	$1 \times 10^{-7}$
Temperature drift	+5 °C to +45 °C	$8 \times 10^{-8}$
Total error	per year	$1.8 \times 10^{-7}$
Reference frequency, internal, nominal	R&S®FSU-B4 option	
Aging per day	after 30 days of continuous operation	$2 \times 10^{-10}$
Aging per year	after 30 days of continuous operation	$3 \times 10^{-8}$
Temperature drift	+5 °C to +45 °C	$1 \times 10^{-9}$
Total error	per year	$5 \times 10^{-8}$
External reference frequency	1 MHz to 20 MHz, 1 Hz steps	

Frequency display		with marker or frequency counter
Marker resolution		1 Hz
Uncertainty		$\pm(\text{marker frequency} \times \text{reference uncertainty} + 10 \% \times \text{resolution bandwidth} + \frac{1}{2}(\text{span}/(\text{sweep points} - 1)) + 1 \text{ Hz})$
Marker tuning frequency stepsize	default	span/624
	marker stepsize = sweep points	span/(sweep points - 1)
Frequency counter resolution	selectable	0.1 Hz to 10 kHz
Count accuracy	S/N > 25 dB	$\pm(\text{frequency} \times \text{reference error} + \frac{1}{2}(\text{last digit}))$
Display range for frequency axis		0 Hz, 10 Hz to max. frequency
Resolution		0.1 Hz
Max. span deviation		1 %

Spectral purity, SSB phase noise (1 Hz)	f = 640 MHz	
Residual FM	RBW 10 kHz, RMS	< 1 Hz, nominal
Carrier offset	10 Hz	< -73 dBc, nominal
	10 Hz with R&S®FSU-B4 option fitted	< -86 dBc, nominal
	100 Hz	< -98 dBc, typ. -104 dBc
	1 kHz	< -116 dBc, typ. -124 dBc
	10 kHz	< -128 dBc, typ. -133 dBc
	100 kHz	< -128 dBc, typ. -133 dBc
	1 MHz	< -140 dBc, typ. -146 dBc
	10 MHz	typ. -160 dBc



## Sweep

Sweep time	time sweep, span = 0 Hz	1 $\mu$ s to 16000 s in 5 % steps
	frequency sweep, span $\geq$ 10 Hz	2.5 ms to 16000 s in steps $\leq$ 10 %
Max. deviation of sweep time		3 %
Measurement in time domain		with marker and cursor lines (resolution 31.25 ns)

## Resolution bandwidths

Sweep filters		
3 dB bandwidths	all models except R&S <sup>®</sup> FSU43, R&S <sup>®</sup> FSU50, model .49 and R&S <sup>®</sup> FSU67, model .66	10 Hz to 20 MHz in 1/2/3/5 sequence, 50 MHz
	R&S <sup>®</sup> FSU43, R&S <sup>®</sup> FSU50, model .49 and R&S <sup>®</sup> FSU67, model .66	10 Hz to 10 MHz in 1/2/3/5 sequence
Bandwidth uncertainty	10 Hz to 100 kHz (digital)	< 3 %
	200 kHz to 5 MHz (analog)	< 10 %
	10 MHz	-30 % to +10 %
	20 MHz	-20 % to +20 %
	50 MHz, f $\leq$ 3.6 GHz	-20 % to +20 %
	50 MHz, f > 3.6 GHz	-30 % to +100 %
Shape factor 60 dB:3 dB	$\leq$ 100 kHz	< 6
	200 kHz to 2 MHz	< 12
	3 MHz to 10 MHz	< 7
	20 MHz, 50 MHz	< 6, nominal

FFT filters		
3 dB bandwidths		1 Hz to 30 kHz in 1/2/3/5 sequence
Bandwidth uncertainty		< 5 %, nominal
Shape factor 60 dB:3 dB		< 3, nominal

EMI filters		
6 dB bandwidths		10/100/200 Hz, 1/9/10/100/120 kHz, 1 MHz
Bandwidth uncertainty	$\leq$ 120 kHz (digital)	< 3 %, nominal
	1 MHz (analog)	< 10 %, nominal
Shape factor 60 dB:3 dB	$\leq$ 120 kHz	< 6, nominal
	1 MHz	< 12, nominal

<b>Channel filters</b>		
Bandwidths		100/200/300/500 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 1/1.2288/1.28 (RRC)/1.5/2/3/3.84 (RRC)/ 4.096 (RRC)/5 MHz
Shape factor 60 dB:3 dB		< 2, nominal
Bandwidth uncertainty		< 2 %, nominal
<b>Video bandwidths</b>		
		1 Hz to 10 MHz in 1/2/3/5 sequence

## Level

Display range		displayed noise floor to +30 dBm
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<b>Maximum input level</b>		
DC voltage	RF input AC coupled	50 V
	RF input DC coupled	0 V
CW RF power	RF attenuation 0 dB	20 dBm (= 0.1 W)
	RF attenuation $\geq 10$ dB	30 dBm (= 1 W)
Pulse spectral density		97 dB $\mu$ V/MHz
Max. pulse voltage	RF attenuation $\geq 10$ dB	150 V
Max. pulse energy	RF attenuation $\geq 10$ dB, 10 $\mu$ s	1 mWs

<b>Intermodulation</b>		
1 dB compression of input mixer	0 dB RF attenuation	
	$\leq 3.6$ GHz	+13 dBm, nominal
	> 3.6 GHz	
	R&S®FSU8	+10 dBm, nominal
	R&S®FSU26/43/46/50/67	+7 dBm, nominal
Third-order intercept point (TOI)	level $2 \times -10$ dBm, $\Delta f > 5 \times$ RBW or 10 kHz, whichever is larger	
	R&S®FSU3	
	10 MHz $\leq f_{in} < 300$ MHz	> 17 dBm, typ. 20 dBm
	300 MHz $\leq f_{in} \leq 3.6$ GHz	> 19 dBm, typ. 25 dBm
	R&S®FSU8	
	10 MHz $\leq f_{in} < 300$ MHz	> 17 dBm, typ. 20 dBm
	300 MHz $\leq f_{in} \leq 3.6$ GHz	> 20 dBm, typ. 25 dBm
	3.6 GHz $\leq f_{in} \leq 8$ GHz	> 18 dBm, typ. 23 dBm
	R&S®FSU26/43/46/50/67	
	10 MHz $\leq f_{in} < 300$ MHz	> 17 dBm, typ. 20 dBm
	300 MHz $\leq f_{in} < 3.6$ GHz	> 22 dBm, typ. 27 dBm
	3.6 GHz $\leq f_{in} < 26.5$ GHz	> 12 dBm, typ. 15 dBm
	R&S®FSU43/46	
	26.5 GHz $\leq f_{in} \leq 40$ GHz	> 12 dBm, typ. 15 dBm
	$f_{in} > 40$ GHz	> 12 dBm, nominal
	R&S®FSU50	
	26.5 GHz $\leq f_{in} < 28$ GHz	> 8 dBm, typ. 11 dBm
	28 GHz $\leq f_{in} \leq 40$ GHz	> 12 dBm, typ. 15 dBm
	$f_{in} > 40$ GHz	> 12 dBm, nominal
	R&S®FSU67	
26.5 GHz $\leq f_{in} < 28$ GHz	> 8 dBm, typ. 11 dBm	
28 GHz $\leq f_{in} \leq 40$ GHz	> 12 dBm, typ. 15 dBm	
40 GHz $< f_{in} \leq 50$ GHz	> 12 dBm, nominal	
$f_{in} > 50$ GHz	> 9 dBm, nominal	

Second harmonic intercept (SHI)	$f_{in} < 100 \text{ MHz}$	> 35 dBm
	$100 \text{ MHz} < f_{in} \leq 400 \text{ MHz}$	> 45 dBm, typ. 55 dBm
	$400 \text{ MHz} < f_{in} \leq 500 \text{ MHz}$	> 52 dBm, typ. 60 dBm
	$500 \text{ MHz} < f_{in} \leq 1 \text{ GHz}$	> 45 dBm, typ. 55 dBm
	$1 \text{ GHz} < f_{in} \leq 1.8 \text{ GHz}$	> 35 dBm
	R&S®FSU8/26/43/46/50	
	$f_{in} > 1.8 \text{ GHz}$	> 80 dBm, nominal
	R&S®FSU67	
	$1.8 \text{ GHz} < f_{in} \leq 4.0 \text{ GHz}$	> 65 dBm, nominal
$f_{in} > 4.0 \text{ GHz}$	> 75 dBm, nominal	

Displayed average noise level	0 dB RF attenuation, termination 50 $\Omega$ , log. scaling, normalized to 1 Hz RBW $f < 10 \text{ kHz}$ : 10 Hz FFT filter, trace average, sweep count = 20 $f \geq 10 \text{ kHz}$ : RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time 50 ms, sample detector, trace average, sweep count = 20, mean marker	
	20 Hz	< -90 dBm
	100 Hz	< -110 dBm
	1 kHz	< -120 dBm
	10 kHz	< -130 dBm
	100 kHz	< -130 dBm
	1 MHz	< -140 dBm
	10 MHz	< -153 dBm
	R&S®FSU3	
	$20 \text{ MHz} \leq f < 2.0 \text{ GHz}$	< -155 dBm, typ. -158 dBm
	$2.0 \text{ GHz} \leq f \leq 3.0 \text{ GHz}$	< -153 dBm, typ. -157 dBm
	$3.0 \text{ GHz} \leq f \leq 3.6 \text{ GHz}$	< -152 dBm, typ. -156 dBm
	R&S®FSU8	
	$20 \text{ MHz} \leq f < 2.0 \text{ GHz}$	< -155 dBm, typ. -158 dBm
	$2.0 \text{ GHz} \leq f < 3.0 \text{ GHz}$	< -153 dBm, typ. -155 dBm
	$3.0 \text{ GHz} \leq f < 7 \text{ GHz}$	< -152 dBm, typ. -154 dBm
	$7 \text{ GHz} \leq f \leq 8 \text{ GHz}$	< -150 dBm, typ. -152 dBm
	R&S®FSU26	
	$20 \text{ MHz} \leq f < 2 \text{ GHz}$	< -152 dBm, typ. -156 dBm
	$2 \text{ GHz} \leq f < 3.6 \text{ GHz}$	< -150 dBm, typ. -153 dBm
	$3.6 \text{ GHz} \leq f < 8 \text{ GHz}$	< -152 dBm, typ. -156 dBm
	$8 \text{ GHz} \leq f < 13 \text{ GHz}$	< -150 dBm, typ. -153 dBm
	$13 \text{ GHz} \leq f < 18 \text{ GHz}$	< -148 dBm, typ. -151 dBm
	$18 \text{ GHz} \leq f < 22 \text{ GHz}$	< -147 dBm, typ. -150 dBm
	$22 \text{ GHz} \leq f \leq 26.5 \text{ GHz}$	< -145 dBm, typ. -148 dBm
	R&S®FSU43	
	$20 \text{ MHz} \leq f < 2 \text{ GHz}$	< -152 dBm, typ. -156 dBm
	$2 \text{ GHz} \leq f < 13 \text{ GHz}$	< -150 dBm, typ. -153 dBm
	$13 \text{ GHz} \leq f < 18 \text{ GHz}$	< -148 dBm, typ. -151 dBm
	$18 \text{ GHz} \leq f < 22 \text{ GHz}$	< -147 dBm, typ. -150 dBm
	$22 \text{ GHz} \leq f < 26.5 \text{ GHz}$	< -145 dBm, typ. -148 dBm
	$26.5 \text{ GHz} \leq f < 40 \text{ GHz}$	< -138 dBm, typ. -141 dBm
	$40 \text{ GHz} \leq f \leq 43 \text{ GHz}$	< -133 dBm, typ. -138 dBm

R&S®FSU46		
	20 MHz ≤ f < 2 GHz	< -152 dBm, typ. -156 dBm
	2 GHz ≤ f < 13 GHz	< -150 dBm, typ. -153 dBm
	13 GHz ≤ f < 18 GHz	< -148 dBm, typ. -151 dBm
	18 GHz ≤ f < 22 GHz	< -147 dBm, typ. -150 dBm
	22 GHz ≤ f < 26.5 GHz	< -145 dBm, typ. -148 dBm
	26.5 GHz ≤ f < 40 GHz	< -138 dBm, typ. -141 dBm
	40 GHz ≤ f ≤ 46 GHz	< -133 dBm, typ. -138 dBm
R&S®FSU50		
	20 MHz ≤ f < 2 GHz	< -152 dBm, typ. -156 dBm
	2 GHz ≤ f < 13 GHz	< -150 dBm, typ. -153 dBm
	13 GHz ≤ f < 18 GHz	< -148 dBm, typ. -151 dBm
	18 GHz ≤ f < 22 GHz	< -147 dBm, typ. -150 dBm
	22 GHz ≤ f < 26.5 GHz	< -145 dBm, typ. -148 dBm
	26.5 GHz ≤ f < 32 GHz	< -138 dBm, typ. -141 dBm
	32 GHz ≤ f < 46 GHz	< -133 dBm, typ. -136 dBm
	46 GHz ≤ f ≤ 50 GHz	< -128 dBm, typ. -131 dBm
R&S®FSU67		
	20 MHz ≤ f < 2 GHz	< -148 dBm, typ. -152 dBm
	2 GHz ≤ f < 13 GHz	< -144 dBm, typ. -148 dBm
	13 GHz ≤ f < 18 GHz	< -142 dBm, typ. -145 dBm
	18 GHz ≤ f < 22 GHz	< -140 dBm, typ. -144 dBm
	22 GHz ≤ f < 26.5 GHz	< -138 dBm, typ. -142 dBm
	26.5 GHz ≤ f < 40 GHz	< -136 dBm, typ. -140 dBm
	40 GHz ≤ f < 46 GHz	< -132 dBm, typ. -136 dBm
	46 GHz ≤ f < 51 GHz	< -128 dBm, typ. -132 dBm
	51 GHz ≤ f < 57 GHz	< -130 dBm, typ. -136 dBm
	57 GHz ≤ f < 65 GHz	< -126 dBm, typ. -130 dBm
	65 GHz ≤ f ≤ 67 GHz	< -120 dBm, typ. -124 dBm
	improvement with noise correction ON	max. 13 dB, nominal

Immunity to interference		
Image frequency	f ≤ 3.6 GHz	> 90 dB suppression, typ. > 110 dB
	3.6 GHz < f ≤ 40 GHz	> 70 dB suppression, typ. > 100 dB
	40 GHz < f ≤ 50 GHz	> 70 dB suppression, nominal
	f > 50 GHz	> 47 dB suppression
	f = receive frequency	
Intermediate frequency	f ≤ 3.6 GHz	> 90 dB suppression, typ. > 110 dB
	3.6 GHz < f ≤ 4.2 GHz	typ. 70 dB suppression
	4.2 GHz < f ≤ 50 GHz	> 70 dB suppression, typ. > 90 dB
	f > 50 GHz	> 47 dB suppression, typ. > 50 dB
	f = receive frequency	
Spurious response	f > 1 MHz, without input signal, 0 dB RF attenuation	< -103 dBm
Other interfering signals	Δf > 100 kHz	
	mixer level < -10 dBm, f <sub>in</sub> ≤ 2.3 GHz	< -80 dBc
	mixer level < -35 dBm, 2.3 GHz < f <sub>in</sub> < 4 GHz	< -70 dBc
	mixer level < -10 dBm	
	4 GHz ≤ f < 8 GHz	< -70 dBc
	8 GHz ≤ f < 16 GHz	< -64 dBc
	16 GHz ≤ f < 26 GHz	< -58 dBc
	26.5 GHz ≤ f < 40 GHz	< -52 dBc
	40 GHz ≤ f < 50 GHz	< -52 dBc, nominal
	50 GHz ≤ f < 64 GHz	< -47 dBc, nominal
	64 GHz ≤ f ≤ 67 GHz	< -43 dBc, nominal
f = receive frequency		

<b>Level display</b>		
Screen		(625 × 500) pixel (one diagram), max. 2 diagrams with independent settings
Logarithmic level axis		1 dB to 200 dB, in steps of 1/2/5
Linear level axis		10 % of reference level per level division, 10 divisions or logarithmic scaling
Number of traces	one measurement diagram	3
	two measurement diagrams	6
Trace detector		Max Peak, Min Peak, Auto Peak (Normal), sample, RMS, average,
	EMI detectors	Quasi Peak, CISPR-RMS, CISPR-AV
Number of measurement points	default value	625
	range	155 to 30001 in steps of about a factor of 2
Trace functions		Clear/Write, Max Hold, Min Hold, Average
Trace update rate	local measurement, display update rate, 625 points, zero span	80 per second
	remote measurement, display OFF	
	zero span/sweep time 1 ms	70 per second
	span = 10 MHz, sweep time 2.5 ms	50 per second
Setting range of reference level	logarithmic level display	-130 dBm to (+5 dBm + RF attenuation), max. 30 dBm, in steps of 0.1 dB
	linear level display	7.0 nV to 7.07 V in steps of 1 %
Units of level axis	logarithmic level display	dBm, dBμV, dBmV, dBμA, dBpW
	linear level display	μV, mV, μA, mA, pW, nW

<b>Level measurement uncertainty</b>		
Absolute level uncertainty at 128 MHz	RBW = 10 kHz, level -30 dBm, reference level -30 dBm, RF attenuation 10 dB	< 0.2 dB ( $\sigma = 0.07$ dB)
Frequency response referenced to 128 MHz	DC coupling, RF attenuation $\geq 10$ dB, +20 °C to +30 °C	
	20 Hz $\leq f < 10$ MHz	< 0.5 dB ( $\sigma = 0.17$ dB)
	10 MHz $\leq f < 3.6$ GHz	< 0.3 dB ( $\sigma = 0.1$ dB)
	3.6 GHz $\leq f < 8$ GHz, span < 1 GHz	< 1.5 dB ( $\sigma = 0.5$ dB)
	8 GHz $\leq f < 22$ GHz, span < 1 GHz	< 2 dB ( $\sigma = 0.7$ dB)
	22 GHz $\leq f < 40$ GHz, span < 1 GHz	< 2.5 dB ( $\sigma = 0.8$ dB)
	40 GHz $\leq f < 50$ GHz, span < 1 GHz	< 3 dB ( $\sigma = 1.0$ dB)
	50 GHz $\leq f \leq 67$ GHz, span < 1 GHz	< 4 dB ( $\sigma = 1.3$ dB)
	RF attenuation > 40 dB or $f \geq 3.6$ GHz, span $\geq 1$ GHz	add 0.5 dB to above values
	DC coupling, RF attenuation $\geq 10$ dB, +5 °C to +45 °C	
	20 Hz $\leq f < 3.6$ GHz	< 0.6 dB ( $\sigma = 0.2$ dB)
	3.6 GHz $\leq f < 26.5$ GHz	add 0.5 dB to above values
	26.5 GHz $\leq f < 50$ GHz	add 1.0 dB to above values
	$f \geq 50$ GHz	add 1.5 dB to above values
RF attenuation > 40 dB or $f \geq 3.6$ GHz, span $\geq 1$ GHz	add 0.5 dB to above values	
Attenuator switching uncertainty	f = 128 MHz 0 dB to 70 dB, referenced to 10 dB attenuation	< 0.2 dB ( $\sigma = 0.07$ dB)
Uncertainty of reference level setting	RF attenuation 10 dB, referenced to -10 dBm reference level setting	< 0.15 dB ( $\sigma = 0.05$ dB)

<b>Display nonlinearity</b>	+20 °C to +30 °C, mixer level ≤ -10 dBm	
Logarithmic level display	RBW ≤ 100 kHz or channel filters, S/N > 20 dB	
	0 dB to -70 dB	< 0.1 dB ( $\sigma = 0.03$ dB)
	-70 dB to -90 dB	< 0.3 dB ( $\sigma = 0.1$ dB)
	200 kHz ≤ RBW ≤ 10 MHz, S/N > 16 dB	
	0 dB to -50 dB	< 0.2 dB ( $\sigma = 0.07$ dB)
	-50 dB to -70 dB	< 0.5 dB ( $\sigma = 0.17$ dB)
	RBW > 10 MHz, S/N > 16 dB	
Linear level display	0 dB to -50 dB	< 0.5 dB ( $\sigma = 0.17$ dB)
		5 % of reference level
Bandwidth switching error	referenced to RBW = 10 kHz	
	1 Hz to 100 kHz	< 0.1 dB ( $\sigma = 0.03$ dB)
	200 kHz to 3 MHz	< 0.2 dB ( $\sigma = 0.07$ dB)
	5 MHz to 50 MHz	< 0.5 dB ( $\sigma = 0.15$ dB)
	FFT filter 1 Hz to 3 kHz	< 0.2 dB ( $\sigma = 0.07$ dB)

<b>Total measurement uncertainty</b>		
	signal level 0 dB to -70 dB below reference level, S/N > 20 dB, 10 dB ≤ RF attenuation ≤ 40 dB, span/RBW < 100, 95 % confidence level, +20 °C to +30 °C, mixer level ≤ -10 dBm	
	20 Hz ≤ f < 10 MHz, RBW ≤ 100 kHz	0.4 dB
	20 Hz ≤ f < 10 MHz, RBW > 100 kHz	0.5 dB
	10 MHz ≤ f < 3.6 GHz, RBW ≤ 100 kHz	0.3 dB
	10 MHz ≤ f < 3.6 GHz, RBW > 100 kHz	0.5 dB
	3.6 GHz ≤ f < 8 GHz	1.2 dB
	8 GHz ≤ f < 22 GHz	1.5 dB
	22 GHz ≤ f < 40 GHz	1.8 dB
	40 GHz ≤ f < 50 GHz	2.2 dB
	50 GHz ≤ f < 67 GHz	2.8 dB

## I/Q data

Interface		GPIB or LAN interface
Memory length		max. 512 ksample I and Q
Sample length		24 bit, each I and Q
Sample rate	settable in steps of 0.5 (32 MHz × 2 <sup>-1</sup> , n = 0 to 11)	15.625 kHz to 32 MHz
Max. signal bandwidth	sample rate ≤ 2 MHz	0.8 × sample rate
	4 MHz	2.8 MHz
	8 MHz	4.8 MHz
	16 MHz	7 MHz
	32 MHz	9 MHz
IF pre-filter bandwidth		300 kHz to 10 MHz, 1/2/3/5 steps

## Audio demodulation

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

## Trigger functions

<b>Trigger</b>		
Trigger source		free run, video, external, IF level (mixer level 10 dBm to -50 dBm)
Trigger offset	span $\geq$ 10 Hz	125 ns to 100 s, resolution min. 125 ns (or 1 % of offset)
	span = 0 Hz	$\pm$ (125 ns to 100 s), resolution min. 125 ns, dependent on sweep time
Max. deviation of trigger offset		$\pm$ (31.25 ns + (0.1 % $\times$ trigger offset))
<b>Gated sweep</b>		
Gate source		external, IF level, video
Gate delay		1 $\mu$ s to 100 s
Gate length		125 ns to 100 s, resolution min. 125 ns or 1 % of gate length
Max. deviation of gate length		$\pm$ (31.25 ns + (0.05 % $\times$ gate length))

## Inputs and outputs (front panel)

<b>RF input</b>		
Impedance		50 $\Omega$
Connector	R&S <sup>®</sup> FSU3, R&S <sup>®</sup> FSU8	N female
	R&S <sup>®</sup> FSU26	test port adapter APC 3.5 mm/N female
	R&S <sup>®</sup> FSU43, R&S <sup>®</sup> FSU46	test port adapter 2.92 mm (K)/N female
	R&S <sup>®</sup> FSU50	test port adapter 2.4 mm/N female
	R&S <sup>®</sup> FSU67	1.85 mm/V female
VSWR	RF attenuation $\geq$ 10 dB, DC coupled	
	f < 3.6 GHz	< 1.5
	R&S <sup>®</sup> FSU8	
	3.6 GHz $\leq$ f < 8 GHz	< 2
	R&S <sup>®</sup> FSU26/43/46/50/67	
	3.6 GHz $\leq$ f < 18 GHz	< 1.8
	18 GHz $\leq$ f < 26.5 GHz	< 2.0
	26.5 GHz $\leq$ f < 40 GHz	< 2.5
	40 GHz $\leq$ f < 50 GHz	< 3, nominal
50 GHz $\leq$ f $\leq$ 67 GHz	< 3.5, nominal	
	RF attenuation < 10 dB or AC coupled	typ. 1.5
Setting range of attenuator		0 dB to 75 dB, in 5 dB steps

<b>Probe power supply</b>		
Supply voltages		+15 V DC, -12.6 V DC and ground, max. 150 mA, nominal
<b>Power supply for antennas etc</b>		
Supply voltages		5-pin connector $\pm$ 10 V and ground, max. 100 mA, nominal
<b>Power supply for noise source</b>		
Output voltage		BNC female 0 V and 28 V, switchable, nominal
<b>USB interface</b>		type A plug, version 2.0

<b>AF output</b>		
Connector		3.5 mm mini jack
Output impedance		10 $\Omega$
Open-circuit voltage		up to 1.5 V, adjustable

## Inputs and outputs (rear panel)

<b>IF 20.4 MHz</b>		BNC female
Impedance		50 $\Omega$
Bandwidth	RBW $\leq$ 30 kHz	1.67 $\times$ resolution bandwidth, min. 2.6 kHz
	RBW = 50 kHz, 100 kHz	400 kHz
	200 kHz $\leq$ RBW $\leq$ 10 MHz	equal to resolution bandwidth
Level	RBW $\leq$ 100 kHz, FFT filter, mixer level > -70 dBm	-20 dBm at reference level
	RBW = 200 kHz to 10 MHz, mixer level > -50 dBm	0 dBm at reference level
<b>IF 404.4 MHz</b>	not available with R&S <sup>®</sup> FSU43, R&S <sup>®</sup> FSU50, model .49 and R&S <sup>®</sup> FSU67, model .66, active only if RBW > 10 MHz	BNC female
Impedance		50 $\Omega$
Bandwidth	RBW > 10 MHz	equal to resolution bandwidth
Level	mixer level $\leq$ 0 dBm	typ. 10 dB below mixer level
<b>Video output</b>		BNC female
Impedance		50 $\Omega$
Output voltage	RBW $\geq$ 200 kHz, logarithmic scaling, full scale	0 V to 1 V (EMF)
<b>Reference output</b>		BNC female
Impedance		50 $\Omega$
Output frequency	internal reference	10 MHz
	external reference	same as reference input signal
Level		> 0 dBm, nominal
<b>Reference input</b>		BNC female
Impedance		50 $\Omega$
Input frequency range		1 MHz $\leq$ $f_{in}$ $\leq$ 20 MHz, in 1 Hz steps
Required level		> 0 dBm from 50 $\Omega$
<b>Sweep output</b>		BNC female
Output voltage		0 V to 5 V, proportional to displayed frequency
<b>External trigger/gate input</b>		BNC female
Trigger voltage		0.5 V to 3.5 V
Input impedance		$\geq$ 10 k $\Omega$
<b>IEC/IEEE bus control</b>		interface to IEC 625-2 (IEEE 488.2)
Command set		SCPI 1997.0 or HP8566 compatible
Connector		24-pin Amphenol female
Interface functions		SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0
<b>LAN interface</b>		10/100 BaseT, RJ45
<b>USB interface</b>	upper connector	type A plug, version 1.1
	lower connector	type A plug, version 2.0
<b>Serial interface</b>		RS-232-C (COM), 9-pin female connectors
<b>Printer interface</b>		parallel (Centronics compatible)
<b>Mouse interface</b>		PS/2 compatible
<b>Connector for external monitor (VGA)</b>		15-pin D-Sub

## General specifications

<b>Display</b>		21 cm LC TFT color display (8.4")
Resolution		(800 × 600) pixel (SVGA resolution)
Pixel failure rate		$< 1 \times 10^{-5}$

<b>Mass memory</b>		
Mass memory		hard disk, USB flash disk (not supplied)
Data storage		>500 instrument settings and traces
Mass memory	R&S®FSU-B20 option	hard disk replaced by a flash disk

<b>Temperature</b>		
Ranges	operating temperature range	+5° C to +40° C
	permissible temperature range	+0° C to +50° C
	storage temperature range	-40° C to +70° C
	R&S®FSU-B20 option	
	operating temperature range	0° C to +50° C
	permissible temperature range	0° C to +55° C
Climatic loading		+40° C at 95 % relative humidity, in line with EN 60068-2-30

<b>Mechanical resistance</b>		
Vibration	sinusoidal	5 Hz to 150 Hz, max. 2 g at 55 Hz; 0.5 g from 55 Hz to 150 Hz; in line with EN 60068-2-6
	random	10 Hz to 100 Hz, acceleration 1 g (RMS)
Shock		40 g shock spectrum, in line with MIL-STD-810E Method 516.4 Procedure I and MIL-PRF-28800F
	R&S®FSU-B20 option: random vibration	10 Hz to 300 Hz, acceleration 1.9 g (RMS)
Recommended calibration interval	operation with external reference	2 years
	operation with internal reference	1 year
RFI suppression		in line with EMC Directive 2004/108/EC including: IEC/EN 61326-1, IEC/EN 61326-2-1, CISPR 11/EN 55011, IEC/EN 61000-3-2, IEC/EN 61000-3-3

<b>Power supply</b>		
AC supply		100 V to 240 V, 3.1 A to 1.3 A; 50 Hz to 400 Hz, class of protection I in line with VDE 411
Power consumption	R&S®FSU3, R&S®FSU8	typ. 130 VA
	R&S®FSU26/43/46/50/67	typ. 150 VA
Safety		in line with EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1-4
Test mark		VDE, GS, CSA, CSA-NRTL
Dimensions	W × H × D	435 mm × 192 mm × 460 mm (17.13 in × 7.56 in × 18.11 in)
Weight, without options, nominal	R&S®FSU3	14.6 kg (32.2 lb)
	R&S®FSU8	15.4 kg (33.95 lb)
	R&S®FSU26	16.5 kg (36.4 lb)
	R&S®FSU43/46/50	16.8 kg (37.0 lb)
	R&S®FSU67	17.4 kg (38.3 lb)

## R&S® FSU-B9 tracking generator, R&S® FSU-B12 attenuator for tracking generator (not available for R&S® FSU67)

Unless specified otherwise, specifications not valid for frequency range from  $-3 \times \text{RBW}$  to  $+3 \times \text{RBW}$ , however at least not valid from  $-100$  kHz to  $+100$  kHz. Maximum output level  $+5$  dBm (peak modulation in the case of amplitude-modulated signals).

Frequency		
Frequency range		100 kHz to 3.6 GHz
Resolution		1 Hz
Frequency offset		
Setting range		$\pm 200$ MHz
Resolution		1 Hz

Spectral purity		
SSB phase noise	f = 500 MHz, carrier offset 10 kHz	
	normal mode	typ. $-120$ dBc (1 Hz)
	with frequency offset	typ. $-110$ dBc (1 Hz)
	with FM modulation ON	typ. $-110$ dBc (1 Hz)

Level		
Level setting range		$-30$ dBm to $+5$ dBm in steps of $0.1$ dB
	with option R&S® FSU-B12	$-100$ dBm to $+5$ dBm in steps of $0.1$ dB

Max. deviation of output level		
Absolute	f = 128 MHz, output level $-20$ dBm to $0$ dBm	$< 1$ dB ( $\sigma = 0.34$ dB)
Frequency response	referenced to level at 128 MHz, sweep time $> 100$ ms, $+5$ °C to $+45$ °C	
	output level $-20$ dBm to $0$ dBm, 100 kHz to 3.6 GHz	$< 3$ dB, typ. $1.9$ dB
	output level $-30$ dBm to $-20$ dBm, f = 100 kHz to 3.6 GHz	$3$ dB
	additional deviation with R&S® FSU-B12, 100 kHz to 3.6 GHz	$< 1$ dB

Dynamic range		
Attenuation measurement range	RBW = $1$ kHz, f $> 10$ MHz	$100$ dB
Harmonics	output level $-10$ dBm	typ. $-30$ dBc
Spurious, nonharmonics	output level $0$ dBm	typ. $-30$ dBc

Level sweep		
Level range		$0$ dBm to $-25$ dBm
Max. deviation of output level	f = 100 kHz to 2 GHz	
	output level $0$ dBm to $-5$ dBm	$< 1.5$ dB
	output level $-5$ dBm to $-15$ dBm	$< 2$ dB
	output level $-15$ to $-25$ dBm	$< 3$ dB
	f = 2 GHz to 3 GHz	$< 3$ dB
	output level $0$ dBm to $-25$ dBm	

<b>Modulation</b>		
Modulation format	external	I/Q, AM, FM
Input voltage	full scale	
	AM, FM, $V_{pp}$	1 V
	I/Q	$\sqrt{U_i^2 + U_q^2} = 0.5 \text{ V}$
<b>AM</b>	$f_{\text{Center}} > f_{\text{Mod}}$ , span = 0 Hz	
Modulation depth		0 % to 99 %
Modulation frequency response	0 Hz to 5 MHz	1 dB
	0 Hz to 30 MHz	3 dB
<b>FM</b>	$f_{\text{Center}} > f_{\text{Mod}}$ , span = 0 Hz	
Frequency deviation	full range	100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 MHz
Modulation frequency range	deviation $\leq 10$ MHz	0 Hz to 1 kHz
	deviation $\leq 1$ MHz	0 Hz to 100 kHz
Modulation frequency response	0 Hz to 100 kHz	1 dB
<b>I/Q modulation</b>	$f_{\text{Center}} > f_{\text{Mod}}$ , span = 0 Hz	
Modulation frequency response	0 Hz to 5 MHz	1 dB
	0 Hz to 30 MHz	3 dB
<b>Modulation deviation of tracking generator</b>	I/Q modulation, typical values, baseband signals generated by the R&S® AMIQ	
EVM	NADC/TETRA/PDC	
	RMS	2 %
	peak	4 %
	PHS	
	RMS	2 %
Phase error	GSM/DCS1800/PCS1900	
	RMS	1.5°
	peak	5°
Rho factor	IS-95 CDMA	0.997

<b>Inputs and outputs (front panel)</b>		
RF output		N female, 50 $\Omega$
VSWR	$100 \text{ kHz} \leq f \leq 2 \text{ GHz}$	1.2
	$2 \text{ GHz} \leq f \leq 3.6 \text{ GHz}$	1.5

<b>Inputs and outputs (rear panel)</b>		
TG I/AM IN		BNC female
Impedance		50 $\Omega$
Input voltage	$V_{pp}$	1 V
TG Q/FM IN		BNC female
Impedance		50 $\Omega$
Input voltage	$V_{pp}$	1 V

## R&S® FSU-B21 LO/IF ports for external mixers (for R&S® FSU26/43/46/50/67 only)

<b>LO signal</b>		
Frequency range		7.0 GHz to 15.5 GHz
Level	+20 °C to +30 °C	+15.5 dBm ± 1 dB
	+5 °C to +40 °C	+15.5 dBm ± 3 dB

<b>IF input</b>		
IF frequency		404.4 MHz
Full scale level	2-port mixer (LO output/IF input, front panel)	-20 dBm
	3-port mixer (IF input, front panel)	-20 dBm
Level uncertainty	IF input level -30 dBm, RBW 30 kHz, two-port mixer, LO output/IF input (front panel)	
	+20 °C to +30 °C	< 1 dB
	+5 °C to +40 °C	< 3 dB
	three-port mixer, IF input (front panel)	
	+20 °C to +30 °C	< 1 dB
	+5 °C to +40 °C	< 3 dB

<b>Inputs and outputs (front panel)</b>		
LO output/IF input		SMA female, 50 Ω
IF input		SMA female, 50 Ω

## R&S® FSU-B23 RF preamplifier (for R&S® FSU26 only, requires R&S® FSU-B25 option)

Level measurement uncertainty		
Frequency response	preamplifier ON	
	3.6 GHz to 8 GHz	< 2.0 dB ( $\sigma = 0.7$ dB)
	8 GHz to 22 GHz	< 2.5 dB ( $\sigma = 0.8$ dB)
	22 GHz to 26.5 GHz	< 3.0 dB ( $\sigma = 1$ dB)
Displayed average noise level	0 dB RF attenuation, termination 50 $\Omega$ , RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time 50 ms, sample detector, log. scaling, trace average, sweep count = 20, mean marker, normalized to 1 Hz RBW	
	preamplifier OFF	
	3.6 GHz to 8 GHz	R&S® FSU26 specifications + 2 dB
	8 GHz to 26.5 GHz	R&S® FSU26 specifications + 3 dB
	preamplifier ON	
	3.6 GHz to 8 GHz	< -162 dBm, typ. -165 dBm
	8 GHz to 13 GHz	< -159 dBm, typ. -162 dBm
	13 GHz to 18 GHz	< -157 dBm, typ. -160 dBm
	18 GHz to 22 GHz	< -154 dBm, typ. -159 dBm
	22 GHz to 26.5 GHz	< -150 dBm, typ. -155 dBm
improvement with noise correction ON		max. 13 dB, nominal

## R&S® FSU-B24 preamplifier (for R&S® FSU26/43/46/50 only)

Frequency range	R&S® FSU26	100 kHz to 26.6 GHz
	R&S® FSU43	100 kHz to 43 GHz
	R&S® FSU46	100 kHz to 46 GHz
	R&S® FSU50 <sup>1</sup>	100 kHz to 50 GHz
Nominal gain		30 dB

Displayed average noise level (DANL)	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, preamplifier OFF f < 10 kHz: RBW = 10 Hz FFT filter, trace average, sweep count = 20, f ≥ 10 kHz: RBW = 1 kHz, VBW = 3 kHz, span = 0 Hz, sweep time = 50 ms, trace average, sample detector, sweep count = 20, mean marker	
	20 Hz	< -90 dBm
	100 Hz	< -110 dBm
	1 kHz	< -120 dBm
	10 kHz	< -130 dBm
	100 kHz	< -130 dBm
	1 MHz	< -140 dBm
	10 MHz	< -151 dBm
	20 MHz ≤ f < 2 GHz	< -151 dBm, typ. -154 dBm
	2 GHz ≤ f < 8 GHz	< -149 dBm, typ. -152 dBm
	8 GHz ≤ f < 13 GHz	< -147 dBm, typ. -150 dBm
	13 GHz ≤ f < 18 GHz	< -145 dBm, typ. -148 dBm
	18 GHz ≤ f < 22 GHz	< -144 dBm, typ. -147 dBm
	22 GHz ≤ f < 26.5 GHz	< -140 dBm, typ. -143 dBm
	26.5 GHz ≤ f < 32 GHz	< -135 dBm, typ. -138 dBm
	32 GHz ≤ f < 42 GHz	< -130 dBm, typ. -133 dBm
	42 GHz ≤ f ≤ 50 GHz	< -125 dBm, typ. -128 dBm
	RF attenuation = 0 dB, termination = 50 Ω, log. scaling, normalized to 1 Hz RBW, preamplifier ON RBW = 1 kHz, VBW = 3 kHz, span = 0 Hz, sweep time = 50 ms, trace average, sample detector, sweep count = 20, mean marker	
	100 kHz	< -140 dBm
	1 MHz	< -150 dBm
	10 MHz	< -163 dBm
	20 MHz ≤ f < 2 GHz	< -164 dBm, typ. -167 dBm
	2 GHz ≤ f < 3.6 GHz	< -163 dBm, typ. -166 dBm
	3.6 GHz ≤ f < 20 GHz	< -165 dBm, typ. -168 dBm
	20 GHz ≤ f < 33 GHz	< -163 dBm, typ. -166 dBm
	33 GHz ≤ f < 42 GHz	< -158 dBm, typ. -161 dBm
	42 GHz ≤ f ≤ 50 GHz	< -152 dBm, typ. -155 dBm
improvement with noise correction ON	max. 13 dB, nominal	

<sup>1</sup> Not available for R&S® FSU50, model .49.

<b>Level measurement uncertainty</b>	RBW = 10 kHz, level –30 dBm, reference level –30 dBm, RF attenuation 10 dB	
Absolute level uncertainty at 128 MHz	preamplifier OFF	< 0.2 dB ( $\sigma = 0.07$ dB)
	preamplifier ON	< 0.3 dB ( $\sigma = 0.1$ dB)
Frequency response referenced to 128 MHz	DC coupling, RF attenuation $\geq 10$ dB, preamplifier OFF, +20 °C to +30 °C	
	20 Hz $\leq f < 10$ MHz	< 0.5 dB ( $\sigma = 0.16$ dB)
	10 MHz $\leq f < 3.6$ GHz	< 0.3 dB ( $\sigma = 0.1$ dB)
	3.6 GHz $\leq f < 8$ GHz	< 1.5 dB ( $\sigma = 0.5$ dB)
	8 GHz $\leq f < 22$ GHz, span < 1 GHz	< 2.0 dB ( $\sigma = 0.7$ dB)
	22 GHz $\leq f < 40$ GHz, span < 1 GHz	< 2.5 dB ( $\sigma = 0.8$ dB)
	40 GHz $\leq f \leq 50$ GHz, span < 1 GHz	< 3.0 dB ( $\sigma = 1$ dB)
	RF attenuation > 40 dB or $f \geq 3.6$ GHz, span $\geq 1$ GHz	add 0.5 dB to above values
	DC coupling, RF attenuation $\geq 10$ dB, preamplifier OFF, +5 °C to +45 °C	
	20 Hz $\leq f < 3.6$ GHz	< 0.6 dB ( $\sigma = 0.2$ dB)
	3.6 GHz $\leq f < 26.5$ GHz	add 0.5 dB to above values
	26.5 GHz $\leq f \leq 50$ GHz	add 1.0 dB to above values
	RF attenuation > 40 dB or $f \geq 3.6$ GHz, span $\geq 1$ GHz	add 0.5 dB to above values
	DC coupling, RF attenuation $\geq 10$ dB, preamplifier ON, +20 °C to +30 °C	
	100 kHz $\leq f < 10$ MHz	< 0.8 dB ( $\sigma = 0.27$ dB)
	10 MHz $\leq f < 3.6$ GHz	< 0.6 dB ( $\sigma = 0.2$ dB)
	3.6 GHz $\leq f < 8$ GHz	< 2.0 dB ( $\sigma = 0.7$ dB)
	8 GHz $\leq f < 22$ GHz, span < 1 GHz	< 2.5 dB ( $\sigma = 0.8$ dB)
	22 GHz $\leq f < 40$ GHz, span < 1 GHz	< 3.0 dB ( $\sigma = 1$ dB)
	40 GHz $\leq f \leq 50$ GHz, span < 1 GHz	< 3.5 dB ( $\sigma = 1.2$ dB)
	RF attenuation > 40 dB or $f \geq 3.6$ GHz, span $\geq 1$ GHz	add 0.5 dB to above values
	DC coupling, RF attenuation $\geq 10$ dB, preamplifier ON, +5 °C to +45 °C	
	100 kHz $\leq f < 10$ MHz	< 1.0 dB ( $\sigma = 0.3$ dB)
10 MHz $\leq f < 3.6$ GHz	< 0.8 dB ( $\sigma = 0.27$ dB)	
3.6 GHz $\leq f < 26.5$ GHz	add 0.5 dB to above values	
26.5 GHz $\leq f \leq 50$ GHz	add 1.0 dB to above values	
RF attenuation > 40 dB or $f \geq 3.6$ GHz, span $\geq 1$ GHz	add 0.5 dB to above values	

<b>Intermodulation</b>		
Second harmonic intercept (SHI)	$f_{in} > 1.8$ GHz	> 65 dBm, nominal

## R&S® FSU-B25 electronic attenuator and low-noise preamplifier, R&S® FSU-B85 extended specifications for low-noise preamplifier

Frequency		
Frequency range	R&S® FSU3/26/43/46/50 <sup>2</sup>	
	electronic attenuator	10 MHz to 3.6 GHz
	preamplifier	100 kHz to 3.6 GHz
	R&S® FSU8	
	electronic attenuator	10 MHz to 8 GHz
	preamplifier	100 kHz to 8 GHz

Setting range		
Electronic attenuator		0 dB to 30 dB, in 5 dB steps
Preamplifier		20 dB, switchable

Level measurement uncertainty		
Frequency response	with preamplifier or electronic attenuator	
	10 MHz to 50 MHz	< 1 dB ( $\sigma = 0.34$ dB)
	50 MHz to 3.6 GHz	< 0.6 dB ( $\sigma = 0.2$ dB)
	3.6 GHz to 8 GHz	< 2.0 dB ( $\sigma = 0.7$ dB)
Reference error	at 128 MHz, RBW $\leq$ 100 kHz, reference level $-30$ dBm, RF attenuation 10 dB	
	electronic attenuator	< 0.3 dB ( $\sigma = 0.1$ dB)
	preamplifier	< 0.3 dB ( $\sigma = 0.1$ dB)

Displayed average noise level	0 dB RF attenuation, termination 50 $\Omega$ , RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time 50 ms, sample detector, log. scaling, trace average, sweep count = 20, mean marker, normalized to 1 Hz RBW	
	preamplifier ON	
	R&S® FSU3/8/26	
	10 MHz to 2.0 GHz	< $-162$ dBm
	2.0 GHz to 3.6 GHz	< $-160$ dBm
	R&S® FSU8	
	3.6 GHz to 8 GHz	< $-157$ dBm
	R&S® FSU43/46/50	
	10 MHz to 40 MHz	< $-160$ dBm
	40 MHz to 2 GHz	< $-162$ dBm
	2 GHz to 3.6 GHz	< $-160$ dBm
	with the R&S® FSU-B25 built in, the average noise level values displayed by the base units degrade by (R&S® FSU-B25 OFF)	
	20 Hz to 3.6 GHz	1 dB
	R&S® FSU8	
	3.6 GHz to 8 GHz	2 dB
	preamplifier OFF, electronic attenuator 0 dB	
	20 Hz to 3.6 GHz	typ. 2.5 dB
	R&S® FSU8	
	3.6 GHz to 8 GHz	typ. 3.5 dB
	improvement with noise correction ON	max. 13 dB, nominal

<sup>2</sup> Not available for R&S® FSU50, model .49.

<b>Displayed average noise level with R&amp;S®FSU-B85, extended specification for low-noise preamplifier</b>	0 dB RF attenuation, termination 50 Ω, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time 50 ms, sample detector, log. scaling, trace average, sweep count = 20, mean marker, normalized to 1 Hz RBW	
	preamplifier ON	
	R&S®FSU3, R&S®FSU8	
	10 MHz to 100 MHz	< -164 dBm, typ. -166 dBm
	100 MHz to 200 MHz	< -168 dBm, typ. -170 dBm
	200 MHz to 2 GHz	< -166 dBm, typ. -168 dBm
	2 GHz to 3.6 GHz	< -165 dBm, typ. -167 dBm
	R&S®FSU8	
	3.6 GHz to 6 GHz	< -165 dBm, typ. -167 dBm
	6 GHz to 8 GHz	< -163 dBm, typ. -165 dBm
improvement with noise correction ON		max. 11 dB, nominal
<b>Intermodulation</b>		
Third-order intercept point (TOI)	electronic attenuator ON, $\Delta f > 5 \times \text{RBW}$ or 10 kHz	
	10 MHz to 300 MHz	> 17 dBm
	300 MHz to 3.6 GHz	> 20 dBm
	3.6 GHz to 8 GHz	> 18 dBm

## R&S®FSU-B27 broadband FM demodulator output

<b>Frequency deviation</b>		
Frequency deviation		≤ 5 MHz
Deviation + modulation frequency		≤ 5 MHz
FM slope	load impedance 50 Ω	280 mV/MHz ± 20 %
<b>Frequency response</b>		
	DC to 1 MHz (< 1 MHz deviation)	< 0.4 dB
	4 MHz (< 1 MHz deviation)	typ. 3 dB
Distortion	1 MHz deviation + 1 MHz modulation frequency	> 30 dBc
<b>Residual FM</b>		
Lowpass filters	LF-lowpass 100 kHz 3 dB bandwidth	< 100 Hz RMS 30 kHz, 100 kHz, 300 kHz, 1 MHz

## Ordering information

Designation	Type	Order No.
Spectrum Analyzer, 20 Hz to 3.6 GHz	R&S®FSU3	1313.9000.03
Spectrum Analyzer, 20 Hz to 8 GHz	R&S®FSU8	1313.9000.08
Spectrum Analyzer, 20 Hz to 26.5 GHz	R&S®FSU26	1313.9000.26
Spectrum Analyzer, 20 Hz to 43 GHz	R&S®FSU43	1313.9000.43
Spectrum Analyzer, 20 Hz to 46 GHz	R&S®FSU46	1313.9000.46
Spectrum Analyzer, 20 Hz to 50 GHz	R&S®FSU50 <sup>3</sup>	1313.9000.49
Spectrum Analyzer, 20 Hz to 50 GHz	R&S®FSU50	1313.9000.50
Spectrum Analyzer, 20 Hz to 67 GHz	R&S®FSU67 <sup>3</sup>	1313.9000.66
Spectrum Analyzer, 20 Hz to 67 GHz	R&S®FSU67	1313.9000.67
<b>Accessories supplied</b>		
Power cable, printed quick start guide and CD-ROM (with operating manual and service manual).		
R&S®FSU26: test port adapter with 3.5 mm female (1021.0512.00) and N female (1021.0535.00) connector.		
R&S®FSU43, R&S®FSU46: test port adapter with 2.92 mm (K) female (1036.4790.00) and N female (1036.4777.00) connector.		
R&S®FSU50: test port adapter with 2.4 mm female (1088.1627.02) and N female (1036.4777.00) connector.		

<sup>3</sup> Max. bandwidth 10 MHz.

## Options

Designation	Type	Order No.	Retrofittable	Remarks
<b>Options</b>				
OCXO, low aging/improved phase noise at 10 Hz carrier offset	R&S®FSU-B4	1144.9000.02	yes	
Tracking Generator, 100 kHz to 3.6 GHz	R&S®FSU-B9	1142.8994.02	yes	not available for R&S®FSU67
External Generator Control	R&S®FSP-B10	1129.7246.03	yes	
Output Attenuator, 0 dB to 70 dB, for R&S®FSU-B9	R&S®FSU-B12	1142.9349.02	yes	requires R&S®FSU-B9, not available for R&S®FSU67
Removable Hard Disk	R&S®FSU-B18	1303.0400.12	no	excludes R&S®FSU-B20
Second Hard Disk for R&S®FSU-B18	R&S®FSU-B19	1303.0600.02		requires R&S®FSU-B18
Extended Environmental Specifications	R&S®FSU-B20	1155.1606.11	no	
LO/IF Ports for External Mixers	R&S®FSU-B21	1157.1090.03	yes	only for R&S®FSU26/43/46/50/67
20 dB Preamplifier, 3.6 GHz to 26.5 GHz	R&S®FSU-B23	1157.0907.02	no	only for R&S®FSU26, requires R&S®FSU-B25
30 dB Preamplifier, 100 kHz to 50 GHz	R&S®FSU-B24	1157.2100.50	yes	only for R&S®FSU26/43/46/50, not available for R&S®FSU50, model .49., excludes R&S®FSU-B23, R&S®FSU-B25
Electronic Attenuator, 0 dB to 30 dB, and 20 dB Preamplifier (3.6 GHz)	R&S®FSU-B25	1144.9298.02	yes	not available for R&S®FSU50, model .49, and R&S®FSU67
Broadband FM Demodulator Output, max. dev. 5 MHz	R&S®FSU-B27	1157.2000.02	yes	
Vector Signal Analyzer	R&S®FSU-B73	1169.5696.03	no	not available for R&S®FSU67
Extended Specifications for Low-Noise Preamplifier of R&S®FSU-B25 option	R&S®FSU-B85	1303.3000.02	no	only for R&S®FSU3 and R&S®FSU8, requires R&S®FSU-B25
<b>Firmware/Software</b>				
GSM/EDGE Application Firmware	R&S®FS-K5	1141.1496.02		
FM Measurement Demodulator	R&S®FS-K7	1141.1796.02		
Bluetooth® 4 Application Firmware	R&S®FS-K8	1157.2568.02		
Power Sensor Measurements	R&S®FS-K9	1157.3006.02		
Application Firmware for Noise Figure and Gain Measurements	R&S®FS-K30	1300.6508.02		preamplifier (e.g. R&S®FSU-B25) recommended
Application Firmware for Phase Noise Measurement	R&S®FS-K40	1161.8138.02		
3GPP BTS/Node B FDD Application Firmware	R&S®FS-K72	1154.7000.02		
3GPP UE FDD Application Firmware (incl HSUPA)	R&S®FS-K73	1154.7252.02		
3GPP HSDPA BTS Application Firmware	R&S®FS-K74	1300.7156.02		requires R&S®FS-K72
3GPP TD-SCDMA BTS Application Firmware	R&S®FS-K76	1300.7291.02		
3GPP TD-SCDMA UE Application Firmware	R&S®FS-K77	1300.8100.02		
CDMA2000® 5/IS-95 (cdmaOne)/1xEV-DV BTS Application Firmware	R&S®FS-K82	1157.2316.02		
CDMA2000® 1xEV-DV MS Application Firmware	R&S®FS-K83	1157.2416.02		
CDMA2000® 1xEV-DO BTS Application Firmware (incl Rev A)	R&S®FS-K84	1157.2851.02		
CDMA2000® 1xEV-DO MS Application Firmware	R&S®FS-K85	1300.6689.02		

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## Recommended extras

Designation	Type	Order No.
Headphones		0708.9010.00
IEC/IEEE Bus Cable, length 1 m	R&S®PCK	0292.2013.10
IEC/IEEE Bus Cable, length 2 m	R&S®PCK	0292.2013.20
19" Rack Adapter	R&S®ZZA-411	1096.3283.00
Adapter for mounting on telescopic rails (only with 19" Adapter R&S®ZZA-411)	R&S®ZZA-T45	1109.3774.00
<b>Matching pads, 50 Ω/75 Ω</b>		
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
<b>SWR bridges, 50 Ω</b>		
SWR Bridge, 5 MHz to 3 GHz	R&S®ZRB2	0373.9017.5X
SWR Bridge, 40 kHz to 4 GHz	R&S®ZRC	1039.9492.5X
<b>High power attenuators</b>		
100 W, 3/6/10/20/30 dB, 1 GHz	R&S®RBU100	1073.8495.XX (XX = 03/06/10/20/30)
50 W, 3/6/10/20/30 dB, 2 GHz	R&S®RBU50	1073.8695.XX (XX = 03/06/10/20/30)
50 W, 20 dB, 6 GHz	R&S®RDL50	1035.1700.52
<b>Connectors and cables</b>		
N-type adapter for R&S®RT-Zx probes	R&S®RT-ZA9	1417.0909.02
Probe power connector, 3 pin		1065.9480.00
<b>DC blocks</b>		
DC Block, 10 kHz to 18 GHz (type N)	R&S®FSE-Z4	1084.7443.02
<b>External harmonic mixers (for R&amp;S®FSU26/43/46/50 with R&amp;S®FSU-B21 option)</b>		
Harmonic Mixer 40 GHz to 60 GHz	R&S®FS-Z60	1089.0799.02
Harmonic Mixer 50 GHz to 75 GHz	R&S®FS-Z75	1089.0847.02
Harmonic Mixer 60 GHz to 90 GHz	R&S®FS-Z90	1089.0899.02
Harmonic Mixer 75 GHz to 110 GHz	R&S®FS-Z110	1089.0947.04
<b>For R&amp;S®FSU26 only</b>		
Test port adapter N male		1021.0541.00
Test port adapter 3.5 mm male		1021.0529.00
Microwave Measurement Cable with test port adapter set N male and 3.5 mm male	R&S®FSE-Z15	1046.2002.02
<b>For R&amp;S®FSU43 and R&amp;S®FSU46 only</b>		
Test port adapter N male		1036.4783.00
Test port adapter K male		1036.4802.00
Test port adapter 2.4 mm female	R&S®FSE-Z5	1088.1627.02
<b>For R&amp;S®FSU50 only</b>		
Test port adapter N male		1036.4783.00
Test port adapter K female		1036.4790.00
Test port adapter K male		1036.4802.00

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## Regional contact

- ▮ Europe, Africa, Middle East | +49 89 4129 12345  
[customersupport@rohde-schwarz.com](mailto:customersupport@rohde-schwarz.com)
- ▮ North America | 1 888 TEST RSA (1 888 837 87 72)  
[customer.support@rsa.rohde-schwarz.com](mailto:customer.support@rsa.rohde-schwarz.com)
- ▮ Latin America | +1 410 910 79 88  
[customersupport.la@rohde-schwarz.com](mailto:customersupport.la@rohde-schwarz.com)
- ▮ Asia/Pacific | +65 65 13 04 88  
[customersupport.asia@rohde-schwarz.com](mailto:customersupport.asia@rohde-schwarz.com)
- ▮ China | +86 800 810 8228/+86 400 650 5896  
[customersupport.china@rohde-schwarz.com](mailto:customersupport.china@rohde-schwarz.com)

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