Specifications

R&S FSH3, R&S FSH6, R&S FSH18 ***Data Sheet***

Specifications are valid under the following conditions: 15 minutes warm-up time at ambient temperature, specified environmental conditions met and calibration cycle adhered to. Data without tolerances: typical values. Data designated as "nominal": design parameters, i.e. not tested.

Specification	Condition	R&S FSH3	R&S FSH6	R&S FSH18
Frequency				
Frequency range		100 kHz to 3 GHz	100 kHz to 6 GHz	10 MHz to 18 GHz
Reference frequency				
Aging		1 ppm/year		
Temperature drift	0 °C to 30 °C 30 °C to 50 °C	2 ppm in addition 2 ppm/10°C		
Frequency counter				
Resolution		1 Hz		
Frequency span		0 Hz, 100 Hz to 3 GHz	0 Hz, 100 Hz to 6 GHz	0 Hz, 100 Hz to 18 GHz
	1145.5850.13	0 Hz, 1 kHz to 3 GHz	-	-
Spectral purity SSB phase noise	f = 500 MHz, 20 to 30 °C			
30 kHz from carrier		<-85 dBc/(1 Hz)		<-85 dBc/(1 Hz)
100 kHz from carrier		< -100 dBc/(1 Hz)		< -90 dBc/(1 Hz)
1 MHz from carrier		< -120 dBc/1 Hz)		< -100 dBc/(1 Hz)
Sweep time	span = 0 Hz	1 ms to 100 s		
	span > 0 Hz	20 ms to 1000 s, min. 20 ms/600 MHz		
Bandwidths				
Resolution bandwidths (-3 dB)	1145.5850.13	1, 3, 10, 30,100, 200, 300 kHz, 1 MHz		
	1145.5850.03, .23, 1145.5850.06, .26, .18	In addition 100, 300 Hz		
Tolerance	≤ 300 kHz	± 5 %, nominal		
	1 MHz	± 10 %, nominal		

(-6 dB)	installed		
Video bandwidths		10 Hz to 1 MHz in 1, 3 steps	
Amplitude			
Display range		average noise level displayed to +20 dBm	
Maximum permissible DC voltage at RF input		50 V / 80 V [1])	50 V
Maximum power		20 dBm, 30 dBm (1 W) for max. 3 minutes	20 dBm
Intermodulation-free dynamic range	third-order IM products, 2 x -20 dBm, reference level = -10 dBm		
Carrier offset ≤ 2 MHz		60 dB (+10 dBm third-order intercept)	50 dB (nominal) (+5 dBm third-order intercept)
Carrier offset > 2 MHz		66 dB (+13 dBm third-order intercept)	50 dB (nominal) (+5 dBm third-order intercept)

[1] 80 V valid as of serial number 100900 (model 1145.5850.03) or 101600 (model 1145.5850.13); models 1145.5850.23, 1145.5850.06 and .26 all serial numbers.

	resolution bandwidth 1 kHz, video bandwidth 10 Hz, reference level ≤ -30 dBm			
10 MHz to 50 MHz		<-105 dBm, typ. -114 dBm	<-105 dBm, typ. -112 dBm	<-90 dBm, typ. -98 dBm
50 MHz to 3 GHz		<-105 dBm, typ. -114 dBm	<-105 dBm, typ. -112 dBm	<-110 dBm, typ. -118 dBm
3 GHz to 5 GHz		-	<-103 dBm, typ. -108 dBm	<-110 dBm, typ. -118 dBm
5 GHz to 6 GHz		-	<-96 dBm, typ. -102 dBm	<-110 dBm, typ. -118 dBm
6 GHz to 8 GHz		-	-	<-108 dBm, typ. -113 dBm
8 GHz to 12 GHz		-	-	<-105 dBm, typ. -113 dBm
12 GHz to 16 GHz		-	-	<-100 dBm, typ. -108 dBm
16 GHz to 18 GHz		-	-	<-90 dBm, typ. -102 dBm
With preamplifier 10 MHz to 2.5 GHz	only models 1145.5850.03[2]), 1145.5850.23, 1145.5850.06 and 1145.5850.26	<-120 dBm, typ. -125 dBm	<-120 dBm, typ. -125 dBm	-
2.5 GHz to 3 GHz		<-115 dBm, typ. -120 dBm	<-115 dBm, typ. -120 dBm	-
3 GHz to 5 GHz		-	<-115 dBm, typ. -120 dBm	-
5 GHz to 6 GHz		-	<-105 dBm, typ. -110 dBm	-

[2] As of serial number 100900 and firmware version 6.0 or higher.

	f > 30 MHz, RBW ≤100 kHz,S/N>10dB			
Input related spurious R&S FSH3 / FSH6	mixer level ≤-40 dBm carrier offset >1 MHz			
Receive frequency Up to 3 GHz 3 GHz to 6 GHz		-70 dBc (nominal)	-70 dBc (nominal) -64 dBc (nominal)	
Receive frequency = signal frequency – 2.0156 GHz	signal frequency 2 GHz to 3.2 GHz	55 dBc (nominal)	55 dBc (nominal)	
Input related spurious R&S FSH18	mixer level ≤-20 dBm carrier offset >1MHz			
Receive frequency: 10 MHz to 14 GHz 14 GHz to 18 GHz Receive frequency = signal frequency – 3.9 GHz signal frequency + 0.6 GHz to + 1 GHz signal frequency – 0.6 GHz to – 1 GHz	signal frequency: 10 MHz to 7.6 GHz 7.6 GHz to 18 GHz 10 MHz to 2.8 GHz 2.8 GHz to 7.6 GHz 7.6 GHz to 18 GHz signal frequency: 3.9 GHz to 18 GHz 7.4 GHz to 7.7 GHz 7.8 GHz to 8.5 GHz			-60 dBc (nominal) -50 dBc (nominal) -50 dBc (nominal) -30 dBc (nominal) -50 dBc (nominal) -40 dBc (nominal) -45 dBc(nominal) -45 dBc(nominal)
2nd harmonic Receive frequency Up to 6 GHz 6 GHz to 9 GHz	mixer level -40 dBm	-60 dBc (nominal)	-60 dBc (nominal)	-60 dBc (nominal) -50 dBc (nominal)
Level display				
Reference level		-80 to +20 dBm in steps of 1 dB		
Display range		100 dB, 50 dB, 20 dB, 10 dB, linear		

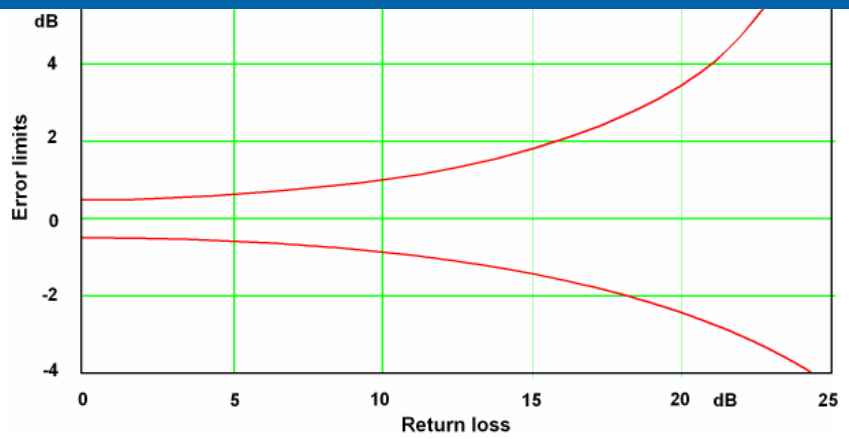
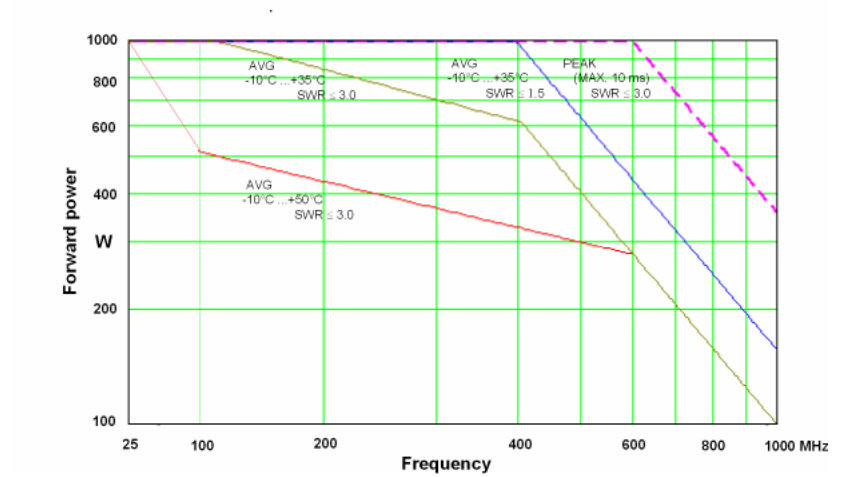
Logarithmic Linear		dBm, dBµV, dBmV with transducer also dBµV/m and dBµA/m µV, mV, V, nW, µW, mW, W with transducer also V/m, mV/m , µV/m and W/m^2	
Traces		1 trace and 1 memory trace	
Trace mathematics		A-B and B-A (trace – memory trace and memory trace – trace)	
Detectors		auto peak, maximum peak, minimum peak, sample, RMS	
	with option R&S FSH-K3 installed	in addition average and quasi-peak	
Level measurement error	at reference level down to -50 dB, 20 °C to 30 °C		
	1 MHz to 10 MHz	< 1.5 dB, typ. 0.5 dB	-
	10 MHz to 20 MHz	< 1.5 dB, typ. 0.5 dB	< 2 dB
	20 MHz to 6 GHz	< 1.5 dB, typ. 0.5 dB	< 1.5 dB
	6 GHz to 14 GHz	-	< 2.5 dB
	14 GHz to 18 GHz	-	< 3.0 dB
Markers			
Number of markers or delta markers		max. 6	
Marker functions		peak, next peak, minimum, center = marker frequency, reference level = marker level, all markers to peak	
Marker displays		normal (level), noise marker, frequency counter (count)	
Trigger		free-running, video, external	
Audio demodulation		AM (video voltage without AGC) and FM	

RF input		N female		
Input impedance		50 Ω		
VSWR	10 MHz to 3 GHz 3 GHz to 6 GHz 6 GHz to 15 GHz 15 GHz to 18 GHz	<1.5 nominal	<1.5 nominal <1.5 nominal	<1.5 nominal <1.5 nominal <2 nominal <3 nominal
Trigger/external reference input		BNC female, selectable		
Trigger voltage		TTL		
Reference frequency		10 MHz		
Required level	from 50 Ω	10 dBm		
Outputs				
AF output		3.5 mm mini jack		
Output impedance Open-circuit voltage		100 Ω adjustable up to 1.5 V		
Tracking generator	only models 145.5850.13, 1145.5850.23 und 1145.5850.26			
Frequency range		5 MHz to 3 GHz	5 MHz to 6 GHz	-
Output level	model 1145.5850.13 model 1145.5850.23 model 1145.5850.26 f < 3 GHz f > 3 GHz	-20 dBm (nominal) 0 dBm / -20 dBm, selectable	 - 10 dBm (nominal) - 20 dBm (nominal)	-
Output impedance		50 Ω, nominal		
Interfaces				
RS-232-C optical interface				
Baud rate		1200, 2400, 9600, 19200, 38400, 57600, 115200 baud		
Power sensor		7-contact female connector (type Binder 712)		

Frequency range R&S FSH-Z1		10 MHz to 8 GHz
R&S FSH-Z18		10 MHz to 18 GHz
VSWR 10 MHz to 30 MHz 30 MHz to 2.4 GHz 2.4 GHz to 8 GHz 8 GHz to 18 GHz		 < 1.15 < 1.13 < 1.20 <1.25
Maximum input power	average power peak power (<10 µs, 1% duty cycle)	400 mW (+26 dBm) 1 W (+30 dBm)
Measurement range		200 pW to 200 mW (-67 dBm to +23 dBm)
Signal weighting		average power
Effect of harmonics Effect of modulation		<0.5 % (0.02 dB) at harmonic ratio of 20 dB <1.5 % (0.07 dB) for continuous digital modulation
Absolute measurement uncertainty	sine signals, no zero offset	
10 MHz to 8 GHz 8 GHz to 18 GHz	15 °C to 35 °C 0 °C to 50 °C 15 °C to 35 °C 0 °C to 50 °C	<2.3 % (0.10 dB) <4.2 % (0.18 dB) <3.5 % (0.15 dB) <5.0 % (0.21 dB)
Zero offset after zeroing		< 110 pW
Dimensions		48 mm x 31 mm x 170 mm, connecting cable 1.5 m
Weight		< 0.3 kg

Power measurement range		30 mW to 300 W
VSWR referenced to 50 Ω		< 1.06
Power-handling capacity	depending on temperature and matching (see diagram below)	100 W to 1000 W
Insertion loss		< 0.06 dB
Directivity		> 30 dB
Average power		
Power measurement range CW, FM, PM, FSK, GMSK Modulated signals	 CF: ratio of peak envelope power to average power	 30 mW to 300 W 30 mW to 300 W / CF
Measurement uncertainty 25 MHz to 40 MHz 40 MHz to 1 GHz	sine signal, 18 °C to 28 °C, no zero offset	 4.0 % of measured value (0.17 dB) 3.2 % of measured value (0.14 dB)
Zero offset	after zeroing	± 4 mW
Range of typical meas. error with modulation FM, PM, FSK, GMSK AM (80 %) 2 CW carriers with identical power EDGE, TETRA	 *) if standard is selected on the R&S FSH	 0 % of measured value (0 dB) ± 3 % of measured value (± 0.13 dB) ± 2 % of measured value (± 0.09 dB) ± 0.5 % of measured value (± 0.02 dB) *)
Temperature coefficient 25 MHz to 40 MHz 40 MHz to 1 GHz		 0.40 %/K (0.017 dB/K) 0.25 %/K (0.011 dB/K)

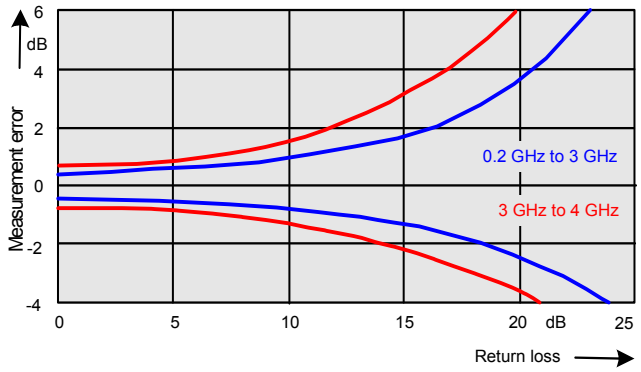
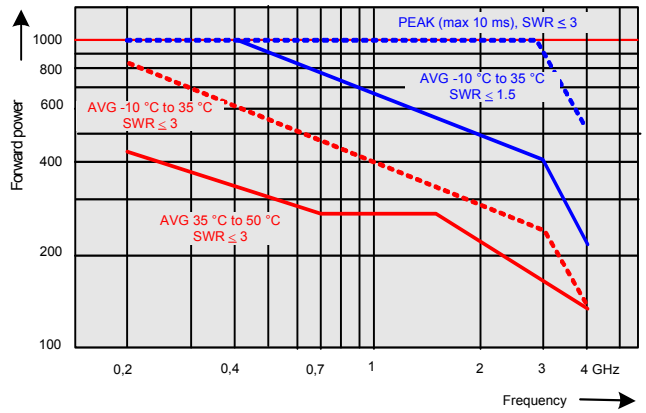
Power measurement range Video bandwidth 4 kHz 200 kHz 600 kHz		 0.4 W to 300 W 1 W to 300 W 2 W to 300 W
Measurement uncertainty	18°C to 28°C	same as for average power plus effect of peak hold circuit
Error limits of peak hold circuit for burst signals Duty cycle ≥ 0.1 and repetition rate ≥ 100 / s 20/s≤ repetition rate <100/s 0.001≤ duty cycle < 0.1	video bandwidth 4 kHz 200 kHz 600 kHz	 ± (3 % of measured value + 0.05 W) starting from a burst width of 200 µs ± (3 % of measured value + 0.20 W) starting from a burst width of 4 µs ± (7 % of measured value + 0.40 W) starting from a burst width of 2 µs plus ± (1.6 % of measured value + 0.15 W) plus ± 0.10 W
Temperature coefficient 25 MHz to 40 MHz 40 MHz to 1 GHz		 0.50 %/K (0.022 dB/K) 0.35 %/K (0.015 dB/K)
Load matching		
Matching measurement range Return loss VSWR		 0 dB to 23 dB > 1.15
Minimum forward power	specs met from 0.4 W	0.06 W

measurements		
Power-handling capacity		
Dimensions		120 mm x 95 mm x 39 mm, connecting cable 1.5 m
Weight		0.65 kg

Power measurement range		30 mW to 300 W
VSWR referenced to 50 Ω 200 MHz to 3 GHz 3 GHz to 4 GHz		 < 1.07 < 1.12
Power-handling capacity	depending on temperature and matching (see diagram below)	120 W to 1000 W
Insertion loss 200 MHz to 1.5 GHz 1.5 GHz to 4 GHz		 < 0.06 dB < 0.09 dB
Directivity 200 MHz to 3 GHz 3 GHz to 4 GHz		 > 30 dB > 26 dB
Average power		
Power measurement range CW, FM, PM, FSK, GMSK 3GPP W-CDMA, cdmaOne, cdma2000, DAB, DVB-T Other modulated signals	 CF: ratio of peak envelope power to average power	 30 mW to 300 W 30 mW to 120 W 30 mW to 300 W / CF
Measurement uncertainty 200 MHz to 300 MHz 300 MHz to 4 GHz	sine signal, 18 °C to 28 °C, no zero offset	 4.0 % of measured value (0.17 dB) 3.2 % of measured value (0.14 dB)

Range of typical measurement error with modulation		
FM, PM, FSK, GMSK		0 % of measured value (0 dB)
AM (80 %)		± 3 % of measured value (± 0.13 dB)
2 CW carriers with identical power		± 2 % of measured value (± 0.09 dB)
π/4-DQPSK		± 2 % of measured value (± 0.09 dB)
EDGE		± 0.5 % of measured value (± 0.02 dB) *)
cdmaOne, DAB		± 1 % of measured value (± 0.04 dB) *)
3GPP W-CDMA, cdma2000	*) if standard is selected on the R&S FSH	± 2 % of measured value (± 0.09 dB) *)
DVB-T		± 2 % of measured value (± 0.09 dB) *)
Temperature coefficient		
200 MHz to 300 MHz		0.40 %/K (0.017 dB/K)
300 MHz to 4 GHz		0.25 %/K (0.011 dB/K)
Max. peak envelope power		
Power measurement range		
DAB, DVB-T, cdmaOne, cdma2000, 3GPP W-CDMA		4 W to 300 W
Other signals at video bandwidth 4 kHz		0.4 W to 300 W
200 kHz		1 W to 300 W
4 MHz		2 W to 300 W

		circuit
Error limits of peak hold circuit for burst signals Duty cycle ≥ 0.1 und repetition rate ≥ 100 / s	video bandwidth 4 kHz 200 kHz 4 MHz	± (3 % of measured value + 0.05 W) starting from a burst width of 100 µs ± (3 % of measured value + 0.20 W) starting from a burst width of 4 µs ± (7 % of measured value + 0.40 W) starting from a burst width of 1 µs
20/s ≤ repetition rate <100/s		plus ± (1.6 % of measured value + 0.15 W)
0.001 ≤ duty cycle < 0.1		plus ± 0.10 W
Burst width ≥ 0.5µs		plus ± 5 % of measured value
Burst width ≥ 0.2µs		plus ± 10 % of measured value
Range of typical measure-ment error of peak hold circuit for cdmaOne, DAB	video bandwidth 4 MHz and standard selected on the R&S FSH	± (5% of measured value + 0.4 W)
DVB-T, cdma2000, 3GPP W-CDMA		± (15% of measured value + 0.4 W)
Temperature coefficient 200 MHz to 300 MHz		0.50 %/K (0.022 dB/K)
300 MHz to 4 GHz		0.35 %/K (0.015 dB/K)
Load matching		
Matching measurement range Return loss 200 MHz to 3 GHz		0 dB to 23 dB
3 GHz to 4 GHz		0 dB to 20 dB
VSWR 200 MHz to 3 GHz		> 1.15
3 GHz to 4 GHz		> 1.22
Minimum forward power	specs met from 0.2 W	0.03 W

Error limits for matching measurements		
Power-handling capacity		
Dimensions		120 mm x 95 mm x 39 mm, connecting cable 1.5 m
Weight		0.65 kg

Frequency range		10 MHz to 3 GHz	10 MHz to 3 GHz
Impedance		50 Ω	
VSWR bridge			
Directivity 10 MHz to 30 MHz 30 MHz to 1 GHz 1 GHz to 3 GHz 3 GHz to 6 GHz		 typ. 30 dB typ. 30 dB typ. 25 dB -	 typ. 16 dB > 20 dB, typ. 28 dB > 20 dB, typ. 28 dB > 16 dB, typ. 25 dB
Directivity, corrected 2 MHz to 10 MHz 10 MHz to 3 GHz 3 GHz to 6 GHz	option R&S FSH-K2	 typ. 40 dB typ. 43 dB -	 typ. 40 dB typ. 40 dB typ. 37 dB
Return loss at test port 10 MHz to 50 MHz 50 MHz to 3 GHz 3 GHz to 6 GHz		 20 dB, typ. 20 dB, typ. -	 > 12 dB, typ. 18 dB > 16 dB, typ. 22 dB > 16 dB, typ. 22 dB
Return loss at test port, corrected 2 MHz to 3 GHz 3 GHz to 6 GHz	option R&S FSH-K2	 typ. 35 dB -	 typ. 40 dB typ. 37 dB
Insertion loss Test port Bypass		 typ. 9 dB -	 typ. 9 dB typ. 4 dB

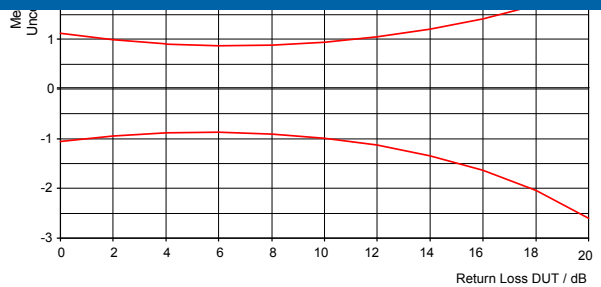
DC bias		-	
Max. input voltage		-	50 V
Max. input current		-	300 mA /600 mA *)
Type of connector		-	BNC female
Connectors			
Generator input/RF output		N male	
Test port		N female	
Control interface		7-contact connector (type Binder)	
General data			
Power consumption		-	3 mW (nominal)
Dimensions (W x H x D)		169 mm x 116 mm x 30 mm	149 mm x 144 mm x 45 mm
Weight		485 g	620 g
Calibration standards		R&S FSH-Z29 R&S FSH-Z30/-Z31	R&S FSH-Z28
Short/open		N male	
50 Ω load		N male	
Impedance		50 Ω	
Return loss DC to 3 GHz 3 GHz to 6 GHz		 > 43 dB -	 > 40 dB, typ. 46 dB > 37 dB, typ. 43 dB
Power-handling capacity		1 W	1 W

*) as of serial number 100500

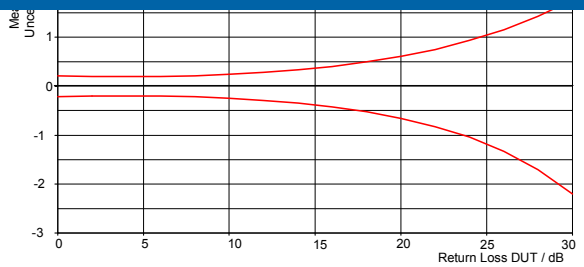
Display		301 pixels
Maximum resolution, distance to fault	maximum zoom	cable length/1023 pixels
Display range Return loss VSWR Reflection coefficient mRho		 10, 5, 2, 1 dB/div, linear 1 to 2 ,1 to 6, 1 to 10 und 1 to 20 with option R&S FSH-K2 in addition 1 to 1.2 and 1 to 1.5 0 to 1, 0 to 0.1, 0 to 0.01, 0 to 0.001 0 to 100, 0 to 100, 0 to 10, 0 to 1
Cable length	depending on cable loss	0 m to max. 1000 m
Maximum permissible spurious signal		1st mixer 1 dB compression point typ. +10 dBm IF overload at reference level typ. +8 dB

Specification	Condition	R&S FSH3	R&S FSH6
Transmission measurements (only with R&S FSH3 models 1145.5850.13, 1145.5850.23 and R&S FSH6 model 1145.5850.26)			
Frequency range		5 MHz bis 3 GHz	5 MHz bis 6 GHz
Dynamic range 10 MHz to 2.2 GHz	 scalar mode	 typ. 60 dB	 typ. 80 dB
	vector mode, option R&S FSH-K2	typ. 80 dB	typ. 90 dB
2.2 to 3 GHz	scalar mode	typ. 50 dB	typ. 70 dB
	vector mode, option R&S FSH-K2	typ. 65 dB	typ. 85 dB
3 to 5 GHz	scalar mode	-	typ. 40 dB
	vector mode, option R&S FSH-K2	-	typ. 55 dB
5 to 6 GHz	scalar mode	-	typ. 35 dB
	vector mode, option R&S FSH-K2	-	typ. 50 dB

(only with R&S FSH3 model 1145.5850.13 or 1145.5850.23, R&S FSH6 model 1145.5850.26 and R&S FSH-Z2/-Z3)			
Frequency range		10 MHz to 3 GHz	10 MHz to 3 GHz
Display range of return loss		10, 20, 50, 100 dB, selectable	
VSWR display range		1 to 2 , 1 to 6, 1 to 10 und 1 to 20, selectable, with option R&S FSH-K2 also 1 to 1.2 and 1 to 1.5	
Display range Reflection coefficient mRho		0 to 1, 0 to 0.1, 0 to 0.01, 0 to 0.001 0 to 100, 0 to 100, 0 to 10, 0 to 1	
Smith chart	only with option R&S FSH-K2		
Marker formats: Reflection		dB mag and phase lin mag and phase real and imag	
Impedance		R+jX $(R+jX)/Z_0$	
Admittance		G+jB $(G+jB)/Z_0$	
Reference impedance Z_0		10 mΩ to 10 kΩ	
Zoom function		expansion factor 2, 4, 8	
Measurement uncertainty		see diagrams	



Measurement uncertainty with scalar measurements



Measurement uncertainty with vector measurements (option R&S FSH-K2)

Specification	Condition	R&S FSH3	R&S FSH6
Phase measurements (transmission, reflection) (only with R&S FSH3 models 1145.5850.13 or 1145.5850.23, R&S FSH6 1145.5850.26 and R&S FSH-K2)			
Frequency range Reflection Transmission	with R&S FSH-Z2/-Z3	 10 MHz to 3 GHz 5 MHz to 3 GHz	 10 MHz to 6 GHz 5 MHz to 6 GHz
Display range		± 180° (wrap) 0° to 54360° (unwrap)	
Group delay measurements (only with R&S FSH3 models 1145.5850.13 or 1145.5850.23, R&S FSH6 1145.5850.26 and R&S FSH-K2)			
Frequency range Reflection Transmission	with R&S FSH-Z2/-Z3	 10 MHz to 3 GHz 5 MHz to 3 GHz	 10 MHz to 6 GHz 5 MHz to 6 GHz
Aperture increments		1 to 300	
Display range		10 ns, 20 ns, 50 ns, 100 ns, 200 ns, 500 ns, 1000 ns, selectable	

		number 103500)
3GPP FDD code domain power BTS/Node B measurement (only with R&S FSH-K4 1300.7633.02)		
Frequency range		10 MHz to 3 GHz
Carrier frequency error Measurement range Measurement uncertainty	 S/N > 30 dB	(test case 6.3 in accordance with 3GPP 25.141) ±1 kHz < 50 Hz + Δf_{ref} [1)] (σ = 20 Hz)
Total power Measurement range Measurement uncertainty	S/N > 30 dB frequency > 1 MHz 20 °C to 30 °C -40 dBm < P_{total} < 20 dBm P_{REF_LEV} -30dB < P_{total} < P_{REF_LEV}+3dB	(test case 6.2.1 in accordance with 3GPP 25.141) -60 dBm < P_{total} < 20 dBm ± 1.5 dB, typ. 0.5 dB
CPICH power Measurement range Measurement uncertainty	S/N > 30 dB -40 dBm < P_{total} < 20 dBm - P_{total} -20 dBm < P_{CPICH} < P_{total}	(test case 6.2.2 in accordance with 3GPP 25.141) P_{total} -20 dB < P_{CPICH} < P_{total} ± 1.5 dB, typ. 0.5 dB
P-CCPCH power Measurement range Measurement uncertainty	S/N > 30 dB -40 dBm < P_{total} < 20 dBm P_{total} -20 dBm < P_{PCCPCH} < P_{total}	 P_{total} -40 dB < P_{PCCPCH} < P_{total} ± 1.5 dB, typ. 0.5 dB
PSCH/SSCH power Measurement range Measurement uncertainty	S/N > 30 dB -40 dBm < P_{total} < 20 dBm P_{total} -20 dBm < P_{PSCH} < P_{total}	 P_{total} -30 dB < P_{SCH} < P_{total} ± 2.5 dB, typ. 1.5 dB
Symbol EVM Measurement range Measurement uncertainty Residual EVM_{symbol}	 3% < EVM_{symbol} < 10% 10% < EVM_{symbol} < 20%	 3% < EVM_{symbol} < 25% ± 2.5% typ. ± 3.0% typ. 3% typ.

Frequency range	± 1 kHz	10 MHz to 3 GHz
Single scrambling code detection		
Calculation time		24 s
CPICH E_C / I_0		> -18 dB [2]
Multiple scrambling code detection		
Max. number of scrambling codes		8
Calculation time		57 s
CPICH E_C / I_0		> -21 dB [2]
CPICH power Measurement uncertainty	-40 dBm < P_{total} < 20 dBm	± 4.2 dB

[1] Δf_{ref} = uncertainty of reference frequency source.

[2] Probability of detection >50% with test model 1.16 in accordance with 3GPP TS 25.141 test specifications.

Resolution	320 x 240 pixels
Memory	CMOS RAM
Settings and traces	100
Environmental conditions	
Temperature	
Operating temperature range	
R&S FSH powered from internal battery	0°C to 50 °C
R&S FSH powered from AC power supply	0°C to 40 °C
Storage temperature range	-20°C to +60 °C
Battery charging mode	0 °C to 40 °C
Climatic conditions	
Relative humidity	95 % at 40 °C (IEC60068)
IP class of protection	51
Mechanical resistance	
Vibration, sinusoidal	complies with EN 60068-2-1, EN61010-1 5 Hz to 55 Hz: max. 2 g, 55 Hz to 150 Hz: 0.5 g constant, 12 minutes per axis
Vibration, random	complies with EN60068-2-64 10 Hz to 500 Hz, 1.9 g, 30 minutes per axis
Shock	complies with EN 60068-2-27 40 g shock spectrum
RFI suppression	complies with EMC directive of EU (89/336/EEC) and German EMC legislation
Immunity to radiated interference	10 V/m
Level display at 10 V/m (reference level ≤ -10 dBm)	
Input frequency	< -75 dBm (nominal)
IF	< -85 dBm (nominal)
Other frequencies	< displayed noise level

	100 V AC to 240 V AC, 50 Hz to 60 Hz, 400 mA
External DC voltage	15 V to 20 V
Internal battery	NiMH battery (type Fluke BP190, R&S FSH-Z32)
Battery voltage	6 V to 9 V
Operating time with fully charged battery	typ. 4 h with tracking generator off, typ. 3 h with tracking generator on, typ. 3 h for R&S FSH18
Battery charging time	4 h with instrument off
Lifetime	300 to 500 charging cycles
Power consumption	typ. 7 W
Safety	complies with EN 61010-1, UL 3111-1, CSA C22.2 No. 1010-1
Test mark	VDE, GS, CSA, CSA-NRTL
Dimensions (W x H x D)	170 mm x 120 mm x 270 mm
Weight	2.5 kg
Order No.	
Handheld Spectrum Analyzer R&S FSH3 100 kHz to 3 GHz, with preamplifier	1145.5850.03
Handheld Spectrum Analyzer R&S FSH3 100 kHz to 3 GHz, with tracking generator	1145.5850.13
Handheld Spectrum Analyzer R&S FSH3 100 kHz to 3 GHz, with tracking generator and preamplifier	1145.5850.23
Handheld Spectrum Analyzer R&S FSH6 100 kHz to 6 GHz, with preamplifier	1145.5850.06
Handheld Spectrum Analyzer R&S FSH6 100 kHz to 6 GHz, with tracking generator and preamplifier	1145.5850.26
Handheld Spectrum Analyzer R&S FSH18 10 MHz to 18 GHz	1145.5850.18

RS-232-C optical cable, headphones, Quick Start manual, CD-ROM with Control Software R&S FSH View and documentation

Options

	Designation	Order No.
Distance-to-Fault Measurement for the R&S FSH (includes 1 m cable, R&S FSH-Z2 required)	R&S FSH-B1	1145.5750.02
Remote Control via RS-232-C for the R&S FSH	R&S FSH-K1	1157.3458.02
Vector Transmission and Reflection Measurements for the R&S FSH	R&S FSH-K2	1157.3387.02
Receiver Mode for the R&S FSH	R&S FSH-K3	1157.3429.02
3GPP FDD Code Domain Power BTS/Node B Measurement for the R&S FSH3 model 23 as of serial number 103500	R&S FSH-K4	1300.7633.02

Optional accessories

	Designation	Order No.
Power Sensor for the R&S FSH, 10 MHz to 8 GHz	R&S FSH-Z1	1155.4505.02
VSWR Bridge and Power Divider for the R&S FSH, 10 MHz to 3 GHz (incl. calibration standards open, short, 50 Ω load)	R&S FSH-Z2	1145.5767.02
VSWR Bridge with DC Bias and Bypass Connector for the R&S FSH, 10 MHz to 6 GHz (incl. calibration standards open, short, 50 Ω load)	R&S FSH-Z3	1300.7756.02

	Designation	Order No.
Directional Power Sensor for the R&S FSH, 25 MHz to 1 GHz	R&S FSH-Z14	1120.6001.02
Power Sensor for the R&S FSH, 10 MHz to 18 GHz	R&S FSH-Z18	1165.1909.02
Directional Power Sensor for the R&S FSH, 200 MHz to 4 GHz	R&S FSH-Z44	1165.2305.02
Matching Pad, 50/75 Ω, 0 Hz to 2700 MHz	RAZ	0358.5714.02
Spare RF Cable (1 m), connectors N male/N female for R&S FSH-B1	R&S FSH-Z20	1145.5867.02
12 V Car Adapter for the R&S FSH	R&S FSH-Z21	1145.5873.02
Serial/Parallel Converter for the R&S FSH	R&S FSH-Z22	1145.5880.02
Carrying Bag for the R&S FSH	R&S FSH-Z25	1145.5896.02
Transit Case for the R&S FSH	R&S FSH-Z26	1300.7627.00
Spare Combined Short/Open and 50 Ω Load for VSWR and DTF calibration, DC to 6 GHz	R&S FSH-Z28	1300.7804.02
Combined Short/Open and 50 Ω Load for VSWR and DTF calibration, DC to 3 GHz	R&S FSH-Z29	1300.7504.02
Spare Short/Open Calibration Standard for R&S FSH-Z2 for VSWR calibration, DC to 3 GHz	R&S FSH-Z30	1145.5773.02
Spare 50 Ω Load Standard for R&S FSH-Z2 for VSWR and DTF calibration, DC to 3 GHz	R&S FSH-Z31	1145.5780.02
Spare Battery Pack for the R&S FSH	R&S FSH-Z32	1145.5796.02
Spare AC Power Supply for the R&S FSH	R&S FSH-Z33	1145.5809.02

	Designation	Order No.
Spare RS-232-C Optical Cable	R&S FSH-Z34	1145.5815.02
Spare CD-ROM with Control Software R&S FSH View and documentation	R&S FSH-Z35	1145.5821.02
Spare Headphones	R&S FSH-Z36	1145.5838.02
Spare USB Optical Cable	R&S FSH-Z37	1300.7733.02
Active Directional Antenna	R&S HE-200	4050.3509.02
Portable EMF Measurement System, 30 MHz to 3 GHz, for the Handheld Spectrum Analyzer R&S FSH	R&S TS-EMF	1158.9295.13
Near-Field Probe Set	R&S HZ-15	1147.2736.02
Preamplifier for the R&S HZ-15	R&S HZ-16	1147.2720.02