产品手册

仪器型号：R&S罗德与施瓦茨信号与频谱分析仪FPS

西安安泰测试科技有限公司

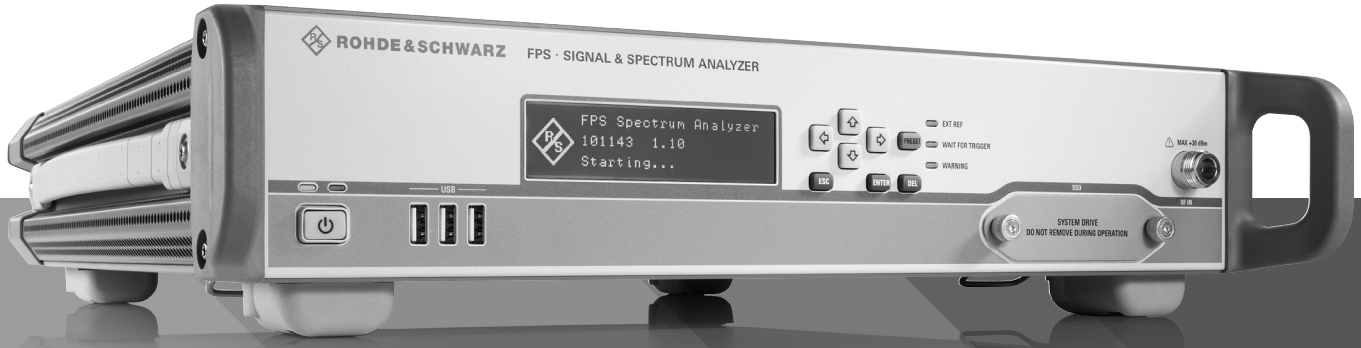
仪器维修|租赁|销售|测试

地址:西安市高新区纬二十六路 369 号　　电话：400-876-5512

网址: www.agitekservice.com　　座机：029-88827159

R&S®FPS
SIGNAL AND SPECTRUM ANALYZER

Specifications



Specifications
Version 09.02

ROHDE&SCHWARZ
Make ideas real

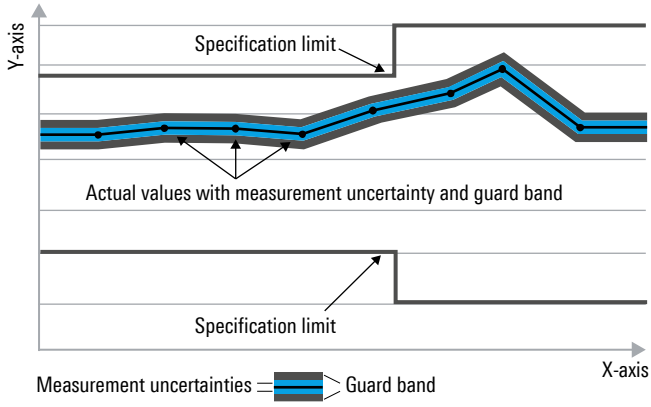
CONTENTS

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 <, ≤, >, ≥, ±, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



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

Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are designated with the format “parameter: value”.

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

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

Specifications

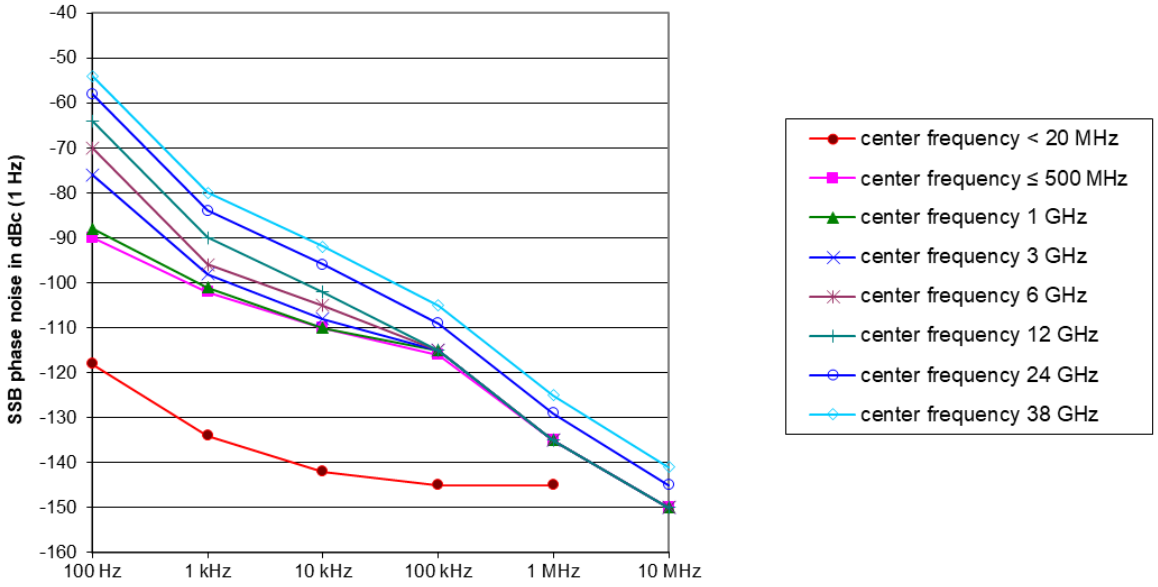
Frequency

Frequency range	R&S®FPS4	
	DC coupled	10 Hz to 4 GHz
	AC coupled	1 MHz to 4 GHz
	R&S®FPS7	
	DC coupled	10 Hz to 7 GHz
	AC coupled	1 MHz to 7 GHz
	R&S®FPS13	
	DC coupled	10 Hz to 13.6 GHz
	AC coupled	10 MHz to 13.6 GHz
	R&S®FPS30	
	DC coupled	10 Hz to 30 GHz
	AC coupled	10 MHz to 30 GHz
	R&S®FPS40	
	DC coupled	10 Hz to 40 GHz
	AC coupled	10 MHz to 40 GHz
Frequency resolution		0.01 Hz

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

Frequency readout		
Marker resolution		1 Hz
Uncertainty		±(marker frequency × reference uncertainty + 10 % × resolution bandwidth + ½ (span / (sweep points –1)) + 1 Hz)
Number of sweep (trace) points	default value	1001
	range	101 to 100001
Marker tuning frequency step size	marker step size = sweep points	span / (sweep points – 1)
	marker step size = standard	span / (default sweep points – 1)
Frequency counter resolution		0.001 Hz
Count accuracy		±(frequency × reference uncertainty + ½ (last digit))
Display range for frequency axis		0 Hz, 10 Hz to max. frequency
Resolution		0.1 Hz
Maximum span deviation		±0.1 %

Spectral purity		
SSB phase noise	frequency = 500 MHz, carrier offset	
	100 Hz	< –84 dBc (1 Hz)
	1 kHz	< –101 dBc (1 Hz)
	10 kHz	< –106 dBc (1 Hz)
	100 kHz	< –115 dBc (1 Hz)
	1 MHz	< –134 dBc (1 Hz)
	10 MHz	–150 dBc (1 Hz) (nom.)
Residual FM	frequency = 500 MHz, RBW = 1 kHz, sweep time = 100 ms	< 3 Hz (nom.)



Typical phase noise at different center frequencies

Sweep time

Range	span = 0 Hz	1 µs to 16000 s
	span ≥ 10 Hz, swept	1 ms to 16000 s [1]
	span ≥ 10 Hz, FFT	7 µs to 16000 s [2]
Sweep time accuracy	span = 0 Hz	±0.1 % (nom.)
	span ≥ 10 Hz, swept	±3 % (nom.)

[1] Net sweep time without additional hardware settling time.

[2] Time for data acquisition for FFT calculation.

Resolution bandwidths

Sweep filters and FFT filters		
Resolution bandwidths (–3 dB)	span ≥ 10 Hz, sweep filters	1 Hz to 10 MHz, in 1/2/3/5 sequence
	span ≥ 10 Hz, FFT filters	1 Hz to 3 MHz, in 1/2/3/5 sequence
	all models except R&S®FPS40, span = 0 Hz	20 MHz, 28 MHz additionally
	all models except R&S®FPS40, with R&S®FPS-B40 option, span = 0 Hz, f ≤ 7 GHz	40 MHz additionally
Bandwidth uncertainty		< 3 % (nom.)
Shape factor 60 dB:3 dB		< 5 (nom.)

Channel filters		
Bandwidths (–3 dB)	standard (RRC: root raised cosine)	100 Hz, 200 Hz, 300 Hz, 500 Hz
		1/1.5/2/2.4/2.7/3/3.4/4/4.5/5/6/8.5/9/10/ 12.5/14/15/16/18 (RRC)/20/21/ 24.3 (RRC)/25/30/50/100/150/192/200/ 300/500 kHz
		1/1.228/1.28 (RRC)/1.5/2/3/ 3.84 (RRC)/4.096 (RRC)/5/10 MHz
	all models except R&S®FPS40	20 MHz, 28 MHz additionally
	all models except R&S®FPS40, with R&S®FPS-B40 option, f ≤ 7 GHz	40 MHz additionally
Bandwidth accuracy		< 2 % (nom.)
Shape factor 60 dB:3 dB		< 2 (nom.)

Video bandwidths	standard	1 Hz to 10 MHz in 1/2/3/5 sequence
	all models except R&S®FPS40	20 MHz, 28 MHz additionally
	all models except R&S®FPS40, with R&S®FPS-B40 option, f ≤ 7 GHz	40 MHz additionally

Signal analysis bandwidth (equalized)	f ≤ 7 GHz	
	all models	28 MHz (nom.)
	with R&S®FPS-B40 option	40 MHz (nom.)
	with R&S®FPS-B160 option	160 MHz (nom.)
	f > 7 GHz, with R&S®FPS-B11 installed, YIG preselector = off	
	all models	28 MHz
	with R&S®FPS-B40 option	40 MHz
	with R&S®FPS-B160 option	160 MHz

Level

Display range		displayed noise floor up to +30 dBm

Maximum input level		
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®FPS-B22 option, RF preamplifier = on	13 dBm (= 0.02 W)
	RF attenuation ≥ 10 dB	
	RF preamplifier = off	30 dBm (= 1 W)
	with R&S®FPS-B22 option, RF preamplifier = on	23 dBm (= 0.2 W)
Pulse spectral density	RF attenuation = 0 dB, RF preamplifier = off	97 dBµV/MHz
Maximum pulse voltage	RF attenuation ≥ 10 dB	150 V
Maximum pulse energy	RF attenuation ≥ 10 dB, 10 µs	1 mWs

Intermodulation		
1 dB compression of input mixer	RF attenuation = 0 dB, RF preamplifier = off	
	f ≤ 7 GHz	+3 dBm (nom.)
	f > 7 GHz	+5 dBm (nom.)
	with R&S®FPS-B22 or R&S®FPS-B24 option, RF preamplifier = on, RF attenuation = 0 dB	
	f ≤ 7 GHz	–12 dBm (nom.)
	f > 7 GHz	–25 dBm (nom.)
Third order intercept point (TOI)	RF attenuation = 0 dB, level = 2 × –15 dBm, ∆f > 5 × RBW or 10 kHz, whichever is larger, RF preamplifier = off	
	10 MHz ≤ f_{in} < 100 MHz	> 12 dBm, 15 dBm (typ.)
	100 MHz ≤ f_{in} < 3.6 GHz	> 13 dBm, 16 dBm (typ.)
	3.6 GHz ≤ f_{in} ≤ 40 GHz	> 15 dBm, 18 dBm (typ.)
	with R&S®FPS-B22 or R&S®FPS-B24 options, RF preamplifier = on, RF attenuation = 0 dB, level = 2 × –45 dBm, ∆f > 5 × RBW or 10 kHz, whichever is larger	
	10 MHz ≤ f_{in} < 100 MHz	–3 dBm (nom.)
	100 MHz ≤ f_{in} < 3.6 GHz	–2 dBm (nom.)
	3.6 GHz ≤ f_{in} < 7 GHz	0 dBm (nom.)
	7 GHz ≤ f_{in} ≤ 40 GHz	–10 dBm (nom.)
Second harmonic intercept (SHI)	RF attenuation = 0 dB, level = –10 dBm, RF preamplifier = off	
	100 MHz < f_{in} ≤ 3.5 GHz	45 dBm (typ.)
	3.5 GHz < f_{in} ≤ 20 GHz	
	standard	80 dBm (typ.)
	with R&S®FPS-B24 option	75 dBm (typ.)
	with R&S®FPS-B22 or R&S®FPS-B24 option, RF preamplifier = on, RF attenuation = 0 dB, level = –40 dBm	
	100 MHz < f_{in} ≤ 3.5 GHz	25 dBm (nom.)
	3.5 GHz < f_{in} ≤ 20 GHz	10 dBm (nom.)

Displayed average noise level without preamplifier options, without R&S®FPS-B11 YIG preselector bypass option		
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 5 Hz, VBW = 5 Hz, zero span, sweep time = 500 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed	
	10 Hz	< –90 dBm (nom.)
	20 Hz	< –100 dBm, –110 dBm (typ.)
	100 Hz	< –110 dBm, –120 dBm (typ.)
	1 kHz	< –120 dBm, –130 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed	
	R&S®FPS4, R&S®FPS7	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –152 dBm, –155 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –150 dBm, –153 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –148 dBm, –151 dBm (typ.)
	6 GHz ≤ f ≤ 7 GHz	< –146 dBm, –149 dBm (typ.)
	R&S®FPS13, R&S®FPS30	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –151 dBm, –154 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –149 dBm, –152 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –146 dBm, –149 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –144 dBm, –147 dBm (typ.)
	7.4 GHz ≤ f < 15 GHz	< –148 dBm, –151 dBm (typ.)
	15 GHz ≤ f ≤ 30 GHz	< –144 dBm, –147 dBm (typ.)
	R&S®FPS40	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –151 dBm, –154 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –149 dBm, –152 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –146 dBm, –149 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –144 dBm, –147 dBm (typ.)
	7.4 GHz ≤ f < 15 GHz	< –145 dBm, –148 dBm (typ.)
	15 GHz ≤ f < 34 GHz	< –142 dBm, –145 dBm (typ.)
	34 GHz ≤ f ≤ 40 GHz	< –136 dBm, –139 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	

Displayed average noise level without preamplifier options, with R&S®FPS-B11 YIG preselector bypass option		
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 5 Hz, VBW = 5 Hz, zero span, sweep time = 500 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed, YIG preselector = off	
	10 Hz	< –90 dBm (nom.)
	20 Hz	< –100 dBm, –110 dBm (typ.)
	100 Hz	< –110 dBm, –120 dBm (typ.)
	1 kHz	< –120 dBm, –130 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed, YIG preselector = off	
	R&S®FPS30	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –151 dBm, –154 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –149 dBm, –152 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –146 dBm, –149 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –144 dBm, –147 dBm (typ.)
	7.4 GHz ≤ f < 15 GHz	< –147 dBm, –150 dBm (typ.)
	15 GHz ≤ f ≤ 30 GHz	< –142 dBm, –145 dBm (typ.)
	R&S®FPS40	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –151 dBm, –154 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –149 dBm, –152 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –146 dBm, –149 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –144 dBm, –147 dBm (typ.)
	7.4 GHz ≤ f < 15 GHz	< –144 dBm, –147 dBm (typ.)
	15 GHz ≤ f < 34 GHz	< –140 dBm, –143 dBm (typ.)
	34 GHz ≤ f ≤ 40 GHz	< –133 dBm, –136 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
Displayed average noise level with R&S®FPS-B22 preamplifier option		
RF preamplifier = off	without R&S®FPS-B11 YIG preselector bypass option, see section Displayed average noise level without preamplifier options, without R&S®FPS-B11 YIG preselector bypass option; with R&S®FPS-B11 YIG preselector bypass option, see section Displayed average noise level without preamplifier options, with R&S®FPS-B11 YIG preselector bypass option	
RF preamplifier = on	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed, with or without R&S®FPS-B11 YIG preselector bypass option	
	R&S®FPS4, R&S®FPS7	
	100 kHz ≤ f < 1 MHz	< –150 dBm, –155 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –162 dBm, –165 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –160 dBm, –163 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –158 dBm, –161 dBm (typ.)
	6 GHz ≤ f ≤ 7 GHz	< –156 dBm, –159 dBm (typ.)
	R&S®FPS13, R&S®FPS30, R&S®FPS40	
	100 kHz ≤ f < 1 MHz	< –145 dBm, –148 dBm (typ.)
	1 MHz ≤ f < 20 MHz	< –155 dBm, –158 dBm (typ.)
	20 MHz ≤ f < 1 GHz	< –161 dBm, –164 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –159 dBm, –162 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –156 dBm, –159 dBm (typ.)
	6 GHz ≤ f ≤ 7 GHz	< –154 dBm, –157 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	

Displayed average noise level with R&S®FPS-B24 preamplifier option, without R&S®FPS-B11 YIG preselector bypass option		
RF preamplifier = off	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 5 Hz, VBW = 5 Hz, zero span, 500 ms sweep time, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed	
	10 Hz	< –90 dBm (nom.)
	20 Hz	< –100 dBm, –110 dBm (typ.)
	100 Hz	< –110 dBm, –120 dBm (typ.)
	1 kHz	< –120 dBm, –130 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed	
	R&S®FPS13, R&S®FPS30	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –150 dBm, –153 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –147 dBm, –150 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –144 dBm, –147 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –141 dBm, –144 dBm (typ.)
	7.4 GHz ≤ f < 13.6 GHz	< –145 dBm, –148 dBm (typ.)
	13.6 GHz ≤ f < 15 GHz	< –143 dBm, –146 dBm (typ.)
	15 GHz ≤ f ≤ 30 GHz	< –141 dBm, –144 dBm (typ.)
	R&S®FPS40	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –150 dBm, –153 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –147 dBm, –150 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –144 dBm, –147 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –141 dBm, –144 dBm (typ.)
	7.4 GHz ≤ f < 13.6 GHz	< –143 dBm, –146 dBm (typ.)
	13.6 GHz ≤ f < 15 GHz	< –141 dBm, –144 dBm (typ.)
	15 GHz ≤ f < 34 GHz	< –139 dBm, –142 dBm (typ.)
	34 GHz ≤ f ≤ 40 GHz	< –132 dBm, –135 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
RF preamplifier = on	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed	
	R&S®FPS13, R&S®FPS30, R&S®FPS40	
	100 kHz ≤ f < 1 MHz	< –145 dBm, –148 dBm (typ.)
	1 MHz ≤ f < 20 MHz	< –155 dBm, –158 dBm (typ.)
	20 MHz ≤ f < 1 GHz	< –160 dBm, –163 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –157 dBm, –160 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –153 dBm, –156 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –150 dBm, –153 dBm (typ.)
	7.4 GHz ≤ f < 15 GHz	< –164 dBm, –167 dBm (typ.)
	15 GHz ≤ f < 34 GHz	< –159 dBm, –162 dBm (typ.)
	34 GHz ≤ f ≤ 40 GHz	< –154 dBm, –156 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	

Displayed average noise level with R&S®FPS-B24 preamplifier option, with R&S®FPS-B11 YIG preselector bypass option		
RF preamplifier = off	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 5 Hz, VBW = 5 Hz, zero span, sweep time = 500 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed, YIG preselector = on or off	
	10 Hz	< –90 dBm (nom.)
	20 Hz	< –100 dBm, –110 dBm (typ.)
	100 Hz	< –110 dBm, –120 dBm (typ.)
	1 kHz	< –120 dBm, –130 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed, YIG preselector = on or off	
	R&S®FPS30	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –150 dBm, –153 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –147 dBm, –150 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –144 dBm, –147 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –141 dBm, –144 dBm (typ.)
	7.4 GHz ≤ f < 13.6 GHz	< –144 dBm, –147 dBm (typ.)
	13.6 GHz ≤ f < 15 GHz	< –142 dBm, –145 dBm (typ.)
	15 GHz ≤ f ≤ 30 GHz	< –139 dBm, –142 dBm (typ.)
	R&S®FPS40	
	9 kHz ≤ f < 100 kHz	< –130 dBm, –140 dBm (typ.)
	100 kHz ≤ f < 1 MHz	< –145 dBm, –150 dBm (typ.)
	1 MHz ≤ f < 1 GHz	< –150 dBm, –153 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –147 dBm, –150 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –144 dBm, –147 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –141 dBm, –144 dBm (typ.)
	7.4 GHz ≤ f < 13.6 GHz	< –142 dBm, –145 dBm (typ.)
	13.6 GHz ≤ f < 15 GHz	< –140 dBm, –143 dBm (typ.)
	15 GHz ≤ f < 34 GHz	< –137 dBm, –140 dBm (typ.)
	34 GHz ≤ f ≤ 40 GHz	< –129 dBm, –132 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
RF preamplifier = on	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed, YIG preselector = on	
	R&S®FPS30, R&S®FPS40	
	100 kHz ≤ f < 1 MHz	< –145 dBm, –148 dBm (typ.)
	1 MHz ≤ f < 20 MHz	< –155 dBm, –158 dBm (typ.)
	20 MHz ≤ f < 1 GHz	< –160 dBm, –163 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –157 dBm, –160 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –153 dBm, –156 dBm (typ.)
	6 GHz ≤ f < 7.4 GHz	< –150 dBm, –153 dBm (typ.)
	7.4 GHz ≤ f < 15 GHz	< –164 dBm, –167 dBm (typ.)
	15 GHz ≤ f < 34 GHz	< –159 dBm, –162 dBm (typ.)
	34 GHz ≤ f ≤ 40 GHz	< –153 dBm, –155 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	

RF preamplifier = on	RF attenuation = 0 dB, termination = 50 Ω, logarithmic scaling, normalized to 1 Hz RBW, RBW = 1 kHz, VBW = 3 kHz, zero span, sweep time = 50 ms, sample detector, trace average, sweep count = 20, mean marker, R&S®FPS-B160 option not installed, YIG preselector = off	
	R&S®FPS30, R&S®FPS40	
	100 kHz ≤ f < 1 MHz	< –145 dBm, –148 dBm (typ.)
	1 MHz ≤ f < 20 MHz	< –155 dBm, –158 dBm (typ.)
	20 MHz ≤ f < 1 GHz	< –160 dBm, –163 dBm (typ.)
	1 GHz ≤ f < 3.6 GHz	< –157 dBm, –160 dBm (typ.)
	3.6 GHz ≤ f < 6 GHz	< –153 dBm, –156 dBm (typ.)
	6 GHz ≤ f < 7 GHz	< –150 dBm, –153 dBm (typ.)
	7 GHz ≤ f < 7.4 GHz	< –146 dBm, –149 dBm (typ.)
	7.4 GHz ≤ f < 15 GHz	< –160 dBm, –163 dBm (typ.)
	15 GHz ≤ f < 34 GHz	< –155 dBm, –158 dBm (typ.)
	34 GHz ≤ f ≤ 40 GHz	< –148 dBm, –150 dBm (typ.)
	with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz	
Spurious responses [3]		
Image response	20 MHz ≤ f ≤ 7 GHz	
	f_{in} – 2 × 8409.9 MHz (1st IF)	< –80 dBc (typ.)
	f_{in} – 2 × 729.9 MHz (2nd IF)	< –80 dBc
	f_{in} – 2 × 89.9 MHz (3rd IF)	< –80 dBc
	7 GHz < f ≤ 30 GHz	
	f_{in} ± 2 × 729.9 MHz (1st IF)	< –80 dBc
	f_{in} – 2 × 89.9 MHz (2nd IF)	< –80 dBc
	30 GHz < f ≤ 40 GHz	
	f_{in} ± 2 × 729.9 MHz (1st IF)	< –70 dBc
	f_{in} – 2 × 89.9 MHz (2nd IF)	< –80 dBc
Intermediate frequency response	20 MHz ≤ f ≤ 7 GHz	
	1st IF (8409.9 MHz)	< –70 dBc (typ.)
	2nd IF (729.9 MHz)	< –80 dBc
	3rd IF (89.9 MHz)	< –80 dBc
	7 GHz < f ≤ 40 GHz	
	1st IF (729.9 MHz)	< –80 dBc
	2nd IF (89.9 MHz)	< –80 dBc
Residual spurious response	RF attenuation = 0 dB	
	f ≤ 1 MHz	< –90 dBm
	f > 1 MHz	< –103 dBm
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 ≤ 40 GHz	
	1 kHz ≤ carrier offset ≤ 10 MHz	< –58 dBc
	carrier offset > 10 MHz	< –68 dBc
Other interfering signals		
Subharmonic of 1st LO	20 MHz ≤ f < 7 GHz, spurious at 8410 MHz – 2 × f_{in}	< –70 dBc
Harmonic of 1st LO	mixer level < –25 dBm, spurious at f_{in}: –4205 MHz	< –70 dBc

[3] YIG preselector = on for frequencies > 7 GHz.

Level display		
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		6
Trace detector		max. peak, min. peak, auto peak (normal), sample, RMS, average
Trace functions		clear/write, max. hold, min. hold, average, view
Setting range of reference level		–130 dBm to (–10 dBm + RF attenuation – RF preamplifier gain), in steps of 0.01 dB
Units of level axis	logarithmic level display	dBm, dBµV, dBmV, dBµA, dBpW
	linear level display	µV, mV, µA, mA, pW, nW
Level measurement uncertainty		
Absolute level uncertainty at 64 MHz	RBW = 10 kHz, level = –10 dBm, reference level = –10 dBm, RF attenuation = 10 dB	
	+20 °C to +30 °C	< 0.2 dB (σ = 0.07 dB)
	0 °C to +50 °C	< 0.35 dB (σ = 0.12 dB) (nom.)
Frequency response, referenced to 64 MHz	DC coupling, RF attenuation = 10 dB, 20 dB, 30 dB, 40 dB, RF preamplifier = off, +20 °C to +30 °C	
	9 kHz ≤ f < 10 MHz	< 0.5 dB (σ = 0.17 dB)
	10 MHz ≤ f < 3.6 GHz	< 0.3 dB (σ = 0.1 dB)
	3.6 GHz ≤ f < 7 GHz	< 0.5 dB (σ = 0.17 dB)
	7 GHz ≤ f < 13.6 GHz, span < 1 GHz	< 1.5 dB (σ = 0.5 dB)
	13.6 GHz ≤ f < 30 GHz, span < 1 GHz	< 2 dB (σ = 0.66 dB)
	30 GHz ≤ f ≤ 40 GHz, span < 1 GHz	< 2.5 dB (σ = 0.83 dB)
	any setting of RF attenuation, RF preamplifier = off, +5 °C to +40 °C	
	9 kHz ≤ f < 3.6 GHz	< 1 dB (σ = 0.33 dB)
	3.6 GHz ≤ f < 7 GHz	< 1.5 dB (σ = 0.5 dB)
	7 GHz ≤ f < 13.6 GHz	< 2.5 dB (σ = 0.83 dB)
	13.6 GHz ≤ f < 30 GHz	< 3 dB (σ = 1 dB)
	30 GHz ≤ f ≤ 40 GHz	< 3.5 dB (σ = 1.33 dB)
	any setting of RF attenuation, RF preamplifier = on, +5 °C to +40 °C	
	9 kHz ≤ f < 3.6 GHz	< 1 dB (σ = 0.33 dB)
	3.6 GHz ≤ f < 7 GHz	< 1.5 dB (σ = 0.5 dB)
	7 GHz ≤ f < 13.6 GHz	< 3 dB (σ = 1 dB)
	13.6 GHz ≤ f < 30 GHz	< 3.5 dB (σ = 1.17 dB)
	30 GHz ≤ f ≤ 40 GHz	< 4 dB (σ = 1.33 dB)
	DC coupling, RF preamplifier = off, +5 °C to +40 °C	
	10 Hz ≤ f < 20 Hz	< 1.5 dB (nom.)
	20 Hz ≤ f < 9 kHz	< 1 dB (σ = 0.33 dB)
Attenuator switching uncertainty	f = 64 MHz, 0 dB to 70 dB, referenced to 10 dB attenuation	< 0.2 dB (σ = 0.07 dB)
Uncertainty of reference level setting		0 dB [4] (nom.)
Bandwidth switching uncertainty	referenced to RBW = 10 kHz	
	sweep filters	< 0.1 dB (σ = 0.04 dB)
	FFT filters	< 0.2 dB (σ = 0.07 dB)

Nonlinearity of displayed level		
Logarithmic level display	+5 °C to +40 °C, S/N > 16 dB	
	0 dB to –70 dB	< 0.1 dB (σ = 0.04 dB)
Linear level display	S/N > 16 dB, 0 dB to –70 dB	5 % of reference level

[4] 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.

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, YIG preselector = on, span/RBW < 100, 95 % confidence level, +20 °C to +30 °C	
	9 kHz ≤ f < 10 MHz	0.39 dB
	10 MHz ≤ f < 3.6 GHz	0.28 dB
	3.6 GHz ≤ f < 7 GHz	0.39 dB
	7 GHz ≤ f < 13.6 GHz	1 dB
	13.6 GHz ≤ f < 30 GHz	1.32 dB
	30 GHz ≤ f ≤ 40 GHz	1.65 dB

Trigger functions

Trigger		
Trigger source		free run, video, external, IF power
	signal analysis bandwidth > 40 MHz	free run, external
Trigger offset	span ≥ 10 Hz	31.25 ns to 30 s, min. resolution 31.25 ns (or 1 % of offset)
	span = 0 Hz	(–sweep time) to 30 s, min. resolution 31.25 ns (or 1 % of offset)
Maximum deviation of trigger offset		±(7.8125 ns + (0.1 % × trigger offset))
IF power trigger		
Sensitivity	min. signal power	–60 dBm + RF attenuation – RF preamplifier gain
	max. signal power	–10 dBm + RF attenuation – RF preamplifier gain
IF power trigger bandwidth	RBW > 500 kHz, swept	40 MHz (nom.)
	RBW > 20 kHz, FFT	
	RBW ≤ 500 kHz, swept	6 MHz (nom.)
	RBW ≤ 20 kHz, FFT	

Gated sweep		
Gate source		video, external, IF power
Gate delay		31.25 ns to 30 s, min. resolution 31.25 ns (or 1 % of delay)
Gate length		31.25 ns to 30 s, min. resolution 31.25 ns (or 1 % of gate length)
Maximum deviation of gate length		±(7.8125 ns + (0.1 % × gate length))

Measurement speed [5]

Power amplifier measurements, performed using R&S®FPS-K18 option, remote control via LAN		
Power servo loop + ACLR measurement	requires R&S®SGT100A	2.7 ms (meas.)
Power servo loop + ACLR measurement + harmonic measurement	requires R&S®SGT100A, carrier frequency 3.8 GHz, time to measure carrier frequency, second harmonic (7.6 GHz) and third harmonic (11.4 GHz)	13.7 ms (meas.)

[5] Measured with PC equipped with Intel® Core™ i7 CPU 2.8 GHz and Gbit LAN interface.

I/Q data

Interface		GPIB or LAN interface
Memory length		max. 200 Msample I and Q
Word length of I/Q samples	sampling rate > 64 MHz or number of samples > 100 Msample	18 bit
	otherwise	24 bit
Sampling rate	all models	100 Hz to 45 MHz
	with R&S®FPS-B40 option	100 Hz to 128 MHz
	with R&S®FPS-B160 option	100 Hz to 400 MHz
Maximum signal analysis bandwidth (equalized)	f ≤ 7 GHz	
	all models	28 MHz
	with R&S®FPS-B40 option	40 MHz
	with R&S®FPS-B160 option	160 MHz
	f > 7 GHz, with R&S®FPS-B11 installed, YIG preselector = off	
	all models	28 MHz
	with R&S®FPS-B40 option	40 MHz
	with R&S®FPS-B160 option	160 MHz
IF power trigger bandwidth	f ≤ 7 GHz	
	all models	40 MHz
	with R&S®FPS-B160 option	
	set analysis bandwidth ≤ 40 MHz	40 MHz
	set analysis bandwidth > 40 MHz	160 MHz
	f > 7 GHz, with R&S®FPS-B11 installed, YIG preselector = off	
	all models	40 MHz
	with R&S®FPS-B160 option	
	set analysis bandwidth ≤ 40 MHz	40 MHz
	set analysis bandwidth > 40 MHz	160 MHz

Signal analysis bandwidth ≤ 40 MHz [6], f ≤ 7 GHz		
Amplitude flatness		±0.3 dB (nom.)
Deviation from linear phase		±1° (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 ≥ 100 MHz two –30 dBm tones at input mixer within analysis bandwidth	–80 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, f ≥ 100 MHz	–90 dBm (nom.)
Other spurious responses		see section Spurious responses

Signal analysis bandwidth ≤ 40 MHz [6], f > 7 GHz, R&S®FPS-B11 option installed, YIG preselector = off		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off	
	7 GHz ≤ f < 13 GHz	±0.85 (nom.) [7]
	13 GHz ≤ f < 30 GHz	±0.85 (nom.) [7]
	30 GHz ≤ f ≤ 40 GHz	±0.85 (nom.) [7]
Deviation from linear phase	RF attenuation ≥ 10 dB, RF preamplifier = off	
	7 GHz ≤ f < 13 GHz	±2° (nom.) [8]
	13 GHz ≤ f < 30 GHz	±2° (nom.) [8]
	30 GHz ≤ f ≤ 40 GHz	±2° (nom.) [8]
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 ≥ 7 GHz, two –30 dBm tones at input mixer within analysis bandwidth	–80 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, f ≥ 7 GHz	–90 dBm (nom.)
Other spurious responses		see section Spurious responses

[6] Requires R&S®FPS-B40 or R&S®FPS-B160 option.

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

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

Signal analysis bandwidth from 40 MHz to 160 MHz [9], f ≤ 7 GHz		
The specifications in this section apply to a maximum frequency of 7 GHz.		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off	
	100 MHz ≤ f < 4 GHz	±0.7 dB (nom.) [10]
	4 GHz ≤ f < 6 GHz	±1.0 dB (nom.) [10]
	6 GHz ≤ f ≤ 7 GHz	±1.5 dB (nom.) [10]
Deviation from linear phase	RF attenuation ≥ 10 dB, RF preamplifier = off	
	100 MHz ≤ f < 4 GHz	±2° (nom.) [11]
	4 GHz ≤ f < 6 GHz	±2.5° (nom.) [11]
	6 GHz ≤ f ≤ 7 GHz	±3° (nom.) [11]
Nonlinearity of displayed level	0 dB to –70 dB	< 0.15 dB (nom.)
Level measurement uncertainty	at center frequency	add 0.2 dB (nom.) to the values in section Total measurement uncertainty
Displayed average noise level	at center frequency	add 5 dB (nom.) to the values in section Displayed average noise level
ADC related third order intermodulation distortion	f ≥ 100 MHz, two –30 dBm tones at input mixer within analysis bandwidth	–65 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, f ≥ 100 MHz	–90 dBm (nom.)
Image response	f ≥ 100 MHz	–65 dBc (nom.)
ADC related spurious response	f ≥ 100 MHz, mixer level = –20 dBm, reference level = signal level, single tone within analysis bandwidth	–65 dBc (nom.)
Other spurious responses		see section Spurious responses

Signal analysis bandwidth from 40 MHz to 160 MHz [9], f > 7 GHz, R&S®FPS-B11 option installed, YIG preselector = off		
The specifications in this section apply to frequencies above 7 GHz and YIG preselector off.		
Amplitude flatness	RF attenuation ≥ 10 dB, RF preamplifier = off	
	7 GHz ≤ f < 13 GHz	±1.5 dB (nom.) [10]
	13 GHz ≤ f < 30 GHz	±1.5 dB (nom.) [10]
	30 GHz ≤ f ≤ 40 GHz	±1.5 dB (nom.) [10]
Deviation from linear phase	RF attenuation ≥ 10 dB, RF preamplifier = off	
	7 GHz ≤ f < 13 GHz	±3° (nom.) [11]
	13 GHz ≤ f < 30 GHz	±3° (nom.) [11]
	30 GHz ≤ f ≤ 40 GHz	±3° (nom.) [11]
Nonlinearity of displayed level	0 dB to –70 dB	< 0.15 dB (nom.)
Level measurement uncertainty	at center frequency	add 0.2 dB (nom.) to the values in section Total measurement uncertainty
Displayed average noise level	at center frequency	add 5 dB (nom.) to the values in section Displayed average noise level
ADC related third order intermodulation distortion	two –30 dBm tones at input mixer within analysis bandwidth	–65 dBc (nom.)
Residual spurious response	RF attenuation = 0 dB, f ≥ 7 GHz	–90 dBm (nom.)
Image response		–65 dBc (nom.)
ADC related spurious response	mixer level = –20 dBm, reference level = signal level, single tone within analysis bandwidth	–65 dBc (nom.)
Other spurious responses		see section Spurious responses

[9] Requires R&S®FPS-B160 option.

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

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

Inputs and outputs

RF input		
Impedance		50 Ω
Connector	R&S®FPS4, R&S®FPS7, R&S®FPS13	N female
	R&S®FPS30	APC 3.5 mm male (compatible with SMA)
	R&S®FPS40	2.92 mm male (compatible with SMA)
VSWR	RF attenuation ≥ 10 dB	
	10 MHz ≤ f < 3.6 GHz	< 1.5, 1.3 (typ.)
	3.6 GHz ≤ f < 20 GHz	< 2, 1.8 (typ.)
	20 GHz ≤ f < 27 GHz	< 2.2, 2 (typ.)
	27 GHz ≤ f < 30 GHz	
	DC coupled	< 2.2, 2 (typ.)
	AC coupled	2.5 (typ.)
	30 GHz ≤ f ≤ 40 GHz	
	DC coupled	< 2.5, 2.2 (typ.)
	AC coupled	3 (typ.)
	RF attenuation < 10 dB, DC coupled	
	10 MHz ≤ f < 7 GHz	2 (meas.)
	7 GHz ≤ f < 30 GHz	2.5 (typ.)
	30 GHz ≤ f ≤ 40 GHz	3 (typ.)
Setting range of attenuator	standard	0 dB to 75 dB, in 5 dB steps
	with R&S®FPS-B25 option	0 dB to 75 dB, in 1 dB steps
Setting range of electronic attenuator	with R&S®FPS-B25 option, f ≤ 7 GHz	0 dB to 25 dB, in 1 dB steps
	with R&S®FPS-B25 option, f > 7 GHz	0 dB to 9 dB, in 1 dB steps
RF preamplifier gain	with R&S®FPS-B22 option	20 dB (nom.)
	with R&S®FPS-B24 option	
	f ≤ 7 GHz	20 dB (nom.)
	f > 7 GHz	30 dB (nom.)

Noise source control (R&S®FPS-B28V option)		
Connector		BNC female
Output voltage		0 V/28 V, max. 100 mA, switchable (nom.)

USB interface	front	3 ports, type A plug, version 2.0
	rear	2 ports, type A plug, version 2.0; 2 ports, type A plug, version 3.0

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

Reference input		
Connector		BNC female
Impedance		50 Ω (nom.)
Input frequency range		1 MHz ≤ f_{in} ≤ 20 MHz, in 100 kHz steps
Required level		> 0 dBm into 50 Ω (nom.)

External trigger/gate input		
Connector		BNC female
Trigger voltage		0.5 V to 3.5 V (nom.)
Input impedance		10 kΩ (nom.)

External trigger2 (switchable trigger input/trigger output)		
Connector		BNC female
Trigger input		
Trigger voltage		0.5 V to 3.3 V (nom.), min. 0 V, max. 5 V
Input impedance		10 kΩ (nom.)
Trigger output		
Trigger voltage	waiting for trigger/triggered state	TTL-compatible, 0 V/3.3 V (nom.)

IF/video output		
Connector		BNC female
IF out		
Impedance		50 Ω (nom.)
Bandwidth		equal to RBW setting
IF frequency		32 MHz (nom.)
Output level (gain versus RF input)	RF attenuation = 0 dB, RF preamplifier off, span = 0 Hz	0 dB (nom.)
Video out		
Impedance		50 Ω (nom.)
Bandwidth		equal to VBW setting
Output scaling	logarithmic display scale	logarithmic
	linear display scale	linear
Output level	center frequency > 10 MHz, span = 0 Hz, signal at reference level and center frequency	1 V (nom.) open circuit
IEC/IEEE bus control		interface in line with IEC 625-2 (IEEE 488.2)
Command set		SCPI 1997.0
Connector		24-pin Amphenol female
Interface functions		SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0

LAN interface		10/100/1000BASE-T
Connector		RJ-45

External monitor		
Connector		DisplayPort
		DVI (digital outputs only)

External generator control		
Interface		LAN
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®SMU200A, R&S®SMW200A

General data

Data storage		
Internal		solid state module ≥ 30 Gbyte (nom.) removable
External		supports USB-2.0-compatible memory devices

Environmental conditions		
Temperature range	operating	+5 °C to +40 °C
	permissible	0 °C to +50 °C
	storage	–40 °C to +70 °C
Climatic loading		+40 °C at 90 % rel. humidity, in line with EN 60068-2-30

Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.15 mm constant amplitude (1.8 g at 55 Hz), in line with EN 60068-2-6
		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

EMC		in line with EMC Directive 2014/30/EU including: • IEC/EN 61326-1 [12, 13] • IEC/EN 61326-2-1 • CISPR 11/EN 55011 [12] • IEC/EN 61000-3-2 • IEC/EN 61000-3-3

Recommended calibration interval		2 years [14]

Power supply		
AC supply		100 V to 240 V, max. 3.5 A 50 Hz to 60 Hz/400 Hz, protection class I, in line with VDE 411
Power consumption	R&S®FPS4, R&S®FPS7	125 W (nom.), max. 160 W with all options (meas.)
	R&S®FPS13, R&S®FPS30, R&S®FPS40	165 W (nom.), max. 210 W with all options (meas.)
Safety		in line with EN 61010-1, IEC 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Test marks		CE, VDE, $_{C}$CSA$_{US}$, RCM, KCC

Dimensions and weight		
Dimensions (nom.)	W × H × D	461 mm × 107 mm × 551 mm (18.15 in × 4.21 in × 21.69 in)
Net weight without options (nom.)	R&S®FPS4, R&S®FPS7	10.1 kg (22.27 lb)
	R&S®FPS13	10.9 kg (24.03 lb)
	R&S®FPS30	11.3 kg (24.92 lb)
	R&S®FPS40	11.7 kg (25.80 lb)

[12] Emission limits for class A equipment.

[13] Immunity test requirement for controlled electromagnetic environment (EN 61326 table 3).

[14] Two years apply to instruments with serial numbers starting from:
R&S®FPS4: 100817, R&S®FPS7: 101191, R&S®FPS13: 101426, R&S®FPS30: 100961, R&S®FPS40: 100928.
To extend earlier instruments to a recommended calibration interval of 2 years, contact a Rohde & Schwarz service center.

Ordering information

Designation	Type	Order No.
Signal and spectrum analyzer, 10 Hz to 4 GHz	R&S®FPS4	1319.2008.04
Signal and spectrum analyzer, 10 Hz to 7 GHz	R&S®FPS7	1319.2008.07
Signal and spectrum analyzer, 10 Hz to 13.6 GHz	R&S®FPS13	1319.2008.13
Signal and spectrum analyzer, 10 Hz to 30 GHz	R&S®FPS30	1319.2008.30
Signal and spectrum analyzer, 10 Hz to 40 GHz	R&S®FPS40	1319.2008.40
Accessories supplied		
Power cable, quick start guide, R&S®FPS30: adapter 3.5 mm (APC3.5-compatible) female/female, R&S®FPS40: adapter 2.92 mm female/female		

Options

Designation	Type	Order No.	Retrofittable	Remarks
Hardware				
Rear RF input	R&S®FPS-B0	1321.4310.02	no	for R&S®FPS4 and R&S®FPS7
OCXO reference frequency	R&S®FPS-B4	1321.4291.02	yes	retrofit in service center
External generator control	R&S®FPS-B10	1321.4256.02	yes	pre-installed in factory
YIG preselector bypass	R&S®FPS-B11	1326.5467.30	no	for R&S®FPS30
	R&S®FPS-B11	1326.5467.40	no	for R&S®FPS40
Spare solid-state drive	R&S®FPS-B18	1321.4304.10	yes	spare SSD for instruments with Windows 10, user-retrofittable
RF preamplifier, 9 kHz to 7 GHz	R&S®FPS-B22	1321.4027.02	yes	user-retrofittable
RF preamplifier, 9 kHz to 13.6 GHz	R&S®FPS-B24	1321.4279.13	no	
RF preamplifier, 9 kHz to 30 GHz	R&S®FPS-B24	1321.4279.30	no	
RF preamplifier, 9 kHz to 40 GHz	R&S®FPS-B24	1321.4279.40	no	
Electronic attenuator, 1 dB steps	R&S®FPS-B25	1321.4033.02	yes	user-retrofittable
Noise source control 0 V/28 V	R&S®FPS-B28V	1326.5996.02	no	
40 MHz analysis bandwidth	R&S®FPS-B40	1321.4040.02	yes	user-retrofittable, for frequencies ≤ 7 GHz
160 MHz analysis bandwidth	R&S®FPS-B160	1321.4285.02	yes	for R&S®FPS4 and R&S®FPS7 retrofit in service center
160 MHz analysis bandwidth	R&S®FPS-B160	1321.4285.13	no	for R&S®FPS13 for frequencies ≤ 7 GHz
160 MHz analysis bandwidth	R&S®FPS-B160	1321.4285.40	no	for R&S®FPS30 and R&S®FPS40; for f > 7 GHz: R&S®FPS-B11 option required

Designation	Type	Order No.	Remarks
Firmware/software			
Pulse measurements	R&S®FPS-K6	1331.3169.02	
AM/FM/PM modulation analysis	R&S®FPS-K7	1321.4079.02	
GSM/EDGE/EDGE Evolution/ VAMOS measurements	R&S®FPS-K10	1321.4091.02	
Power amplifier measurements	R&S®FPS-K18	1321.4662.02	
Direct DPD measurements	R&S®FPS-K18D	1321.4956.02	
Noise figure measurements	R&S®FPS-K30	1321.4104.02	
Security write protection of solid-state drive	R&S®FPS-K33	1326.6092.02	
Phase noise measurements	R&S®FPS-K40	1321.4110.02	
Vector signal analysis	R&S®FPS-K70	1321.4127.02	
3GPP FDD (WCDMA) BS measurements (including HSDPA and HSDPA+)	R&S®FPS-K72	1321.4133.02	
3GPP FDD (WCDMA) MS measurements (including HSUPA and HSUPA+)	R&S®FPS-K73	1321.4140.02	
TD-SCDMA BS measurements	R&S®FPS-K76	1321.4379.02	
TD-SCDMA UE measurements	R&S®FPS-K77	1321.4385.02	
CDMA2000® BS measurements	R&S®FPS-K82	1321.4156.02	
CDMA2000® MS measurements	R&S®FPS-K83	1321.4162.02	
1xEV-DO BS measurements	R&S®FPS-K84	1321.4179.02	
1xEV-DO MS measurements	R&S®FPS-K85	1321.4185.02	
WLAN IEEE 802.11a/b/g measurements	R&S®FPS-K91	1321.4191.02	
WLAN IEEE 802.11n measurements	R&S®FPS-K91n	1321.4204.02	requires R&S®FPS-K91 and R&S®FPS-B40 or R&S®FPS-B160

Designation	Type	Order No.	Remarks
WLAN IEEE 802.11p measurements	R&S®FPS-K91p	1321.4391.02	requires R&S®FPS-K91
WLAN IEEE 802.11ac measurements	R&S®FPS-K91ac	1321.4210.02	requires R&S®FPS-K91 and R&S®FPS-B160
EUTRA/LTE FDD downlink measurements	R&S®FPS-K100	1321.4227.02	
EUTRA/LTE FDD uplink measurements	R&S®FPS-K101	1321.4340.02	
EUTRA/LTE downlink MIMO measurements	R&S®FPS-K102	1321.4333.02	requires R&S®FPS-K100 or R&S®FPS-K104
EUTRA/LTE uplink MIMO measurements	R&S®FPS-K103	1321.4356.02	requires R&S®FPS-K101 or R&S®FPS-K105
EUTRA/LTE TDD downlink measurements	R&S®FPS-K104	1321.4233.02	
EUTRA/LTE TDD uplink measurements	R&S®FPS-K105	1321.4362.02	
EUTRA/LTE NB-IoT downlink measurements	R&S®FPS-K106	1331.3246.02	
VERIZON 5GTF	R&S®FPS-K118	1321.4962.02	requires R&S®FPS-B160
5G NR downlink measurements	R&S®FPS-K144	1321.4979.02	requires R&S®FPS-B160 [15]
5G NR Rel. 16 downlink/uplink measurements	R&S®FPS-K148	1331.3298.02	requires R&S®FPS-K144

Upgrade

Designation	Type	Order No.	Retrofittable	Remarks
Upgrade to Windows 10 IoT (SSD) for R&S®FPS	R&S®FPS-U10	1328.3661.02	yes	retrofit in service center, for details contact your local Rohde & Schwarz service center

Recommended extras

Designation	Type	Order No.
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-KN2	1175.3010.00
19" rack adapter, pre-installed, ex-factory	R&S®FPS-B478	1321.4262.02
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 (instrument function RF INPUT 75 Ω taken into account)	R&S®RAZ	0358.5714.02
SWR bridges, 50 Ω		
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
High-power attenuators		
Attenuator, 100 W, 3/6/10/20/30 dB, 1 GHz	R&S®RBU100	1073.8495.03/.06/.10/.20/.30
Attenuator, 50 W, 3/6/10/20/30 dB, 2 GHz	R&S®RBU50	1073.8695.03/.06/.10/.20/.30
Attenuator, 50 W, 20 dB, 6 GHz	R&S®RDL50	1035.1700.52
Connectors and cables		
N-type adapter for R&S®RT-Zx oscilloscope probes	R&S®RT-ZA9	1417.0909.02
Probe power connector, 3-pin		1065.9480.00
LVDS cable, for connecting digital baseband interfaces	R&S®SMU-Z6	1415.0201.02
DC block		
DC block, 10 kHz to 18 GHz (type N)	R&S®FSE-Z4	1084.7443.02

[15] R&S®FPS-B160 option is mandatory for R&S®FPS-K144 to support 5G NR carrier bandwidth configurations > 40 MHz.
R&S®FPS-B11 option is required additionally for 5G NR analysis at frequencies > 7 GHz.

Power sensors supported [16]

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 [17]	R&S®NRP-Z11	1138.3004.02
10 MHz to 18 GHz, 100 mW, two-path [17]	R&S®NRP-Z221	1417.0309.02
10 MHz to 18 GHz, 200 mW [17]	R&S®NRP-Z21	1137.6000.02
10 MHz to 18 GHz, 2 W [17]	R&S®NRP-Z22	1137.7506.02
10 MHz to 18 GHz, 15 W [17]	R&S®NRP-Z23	1137.8002.02
10 MHz to 18 GHz, 30 W [17]	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 [18]		
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 [18]		
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 [17]	R&S®NRP-Z91	1168.8004.02
8 kHz to 18 GHz, 200 mW	R&S®NRP18A	1424.6815.02
8 kHz to 18 GHz, 200 mW, LAN version	R&S®NRP18AN	1424.6821.02
Three path diode power sensors [18]		
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
Wideband power sensors [18]		
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

[16] For average power measurement only.

[17] Product discontinued.

[18] 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.

Power sensor USB adapter cable [19]

Designation	Type	Order No.
USB adapter cable (passive), length: 2 m	R&S®NRP-Z4	1146.8001.02
USB adapter cable (passive), length: 0.5 m	R&S®NRP-Z4	1146.8001.04
USB adapter cable (passive), length: 0.15 m	R&S®NRP-Z4	1146.8001.06

Service options

Warranty		
Base unit		3 years
All other items [20]		1 year
Service options		
Extended warranty, one year	R&S®WE1	Contact your local Rohde & Schwarz sales office.
Extended warranty, two years	R&S®WE2	
Extended warranty with calibration coverage, one year	R&S®CW1	
Extended warranty with calibration coverage, two years	R&S®CW2	
Extended warranty with accredited calibration coverage, one year	R&S®AW1	
Extended warranty with accredited calibration coverage, two years	R&S®AW2	

Extended warranty with a term of one and two years (WE1 and WE2)
Repairs carried out during the contract term are free of charge [21]. Necessary calibration and adjustments carried out during repairs are also covered.

Extended warranty with calibration coverage (CW1 and CW2)
Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs [21] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

Extended warranty with accredited calibration (AW1 and AW2)
Enhance your extended warranty by adding accredited calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated under accreditation, inspected and maintained during the term of the contract. It includes all repairs [21] and accredited calibration at the recommended intervals as well as any accredited calibration carried out during repairs or option upgrades.

[19] Required for connecting the power sensor to the R&S®FPS USB connector.

[20] For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

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

Service at Rohde&Schwarz
You're in great hands

- Worldwide
- Local and personalized
- Customized and flexible
- Uncompromising quality
- Long-term dependability

Rohde&Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test&measurement, technology systems and networks&cybersecurity. Founded 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

Sustainable product design

- Environmental compatibility and eco-footprint
- Energy efficiency and low emissions
- Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

Rohde&Schwarz training
www.training.rohde-schwarz.com

Rohde&Schwarz customer support
www.rohde-schwarz.com/support

PD 3606.9433.22 | Version 09.02 | May 2024 (ch)
R&S®FPS Signal and Spectrum Analyzer
Data without tolerance limits is not binding | Subject to change

3606943322