

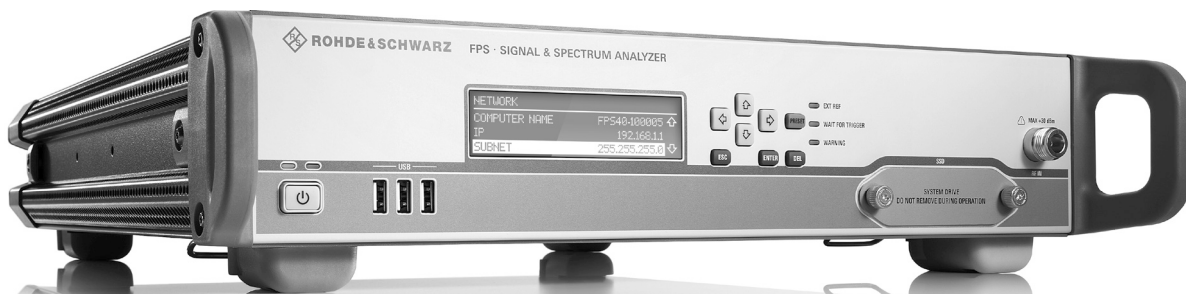
R&S®FPS

Signal and Spectrum Analyzer

Specifications



致力于电子测试、维护领域!



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Definitions

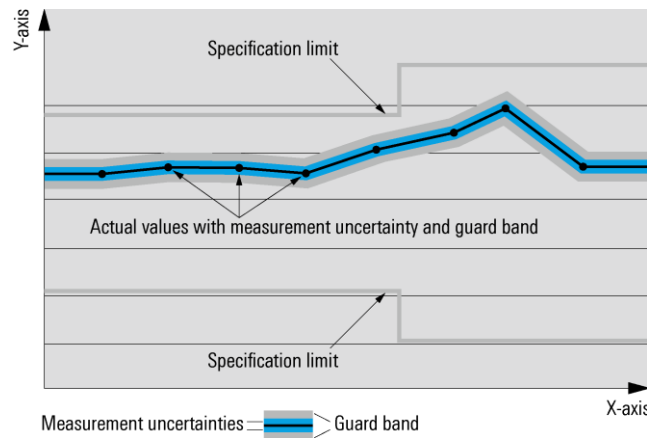
General

Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as $<$, \leq , $>$, \geq , \pm , or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



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 indicated as follows: "parameter: value".

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

Specifications

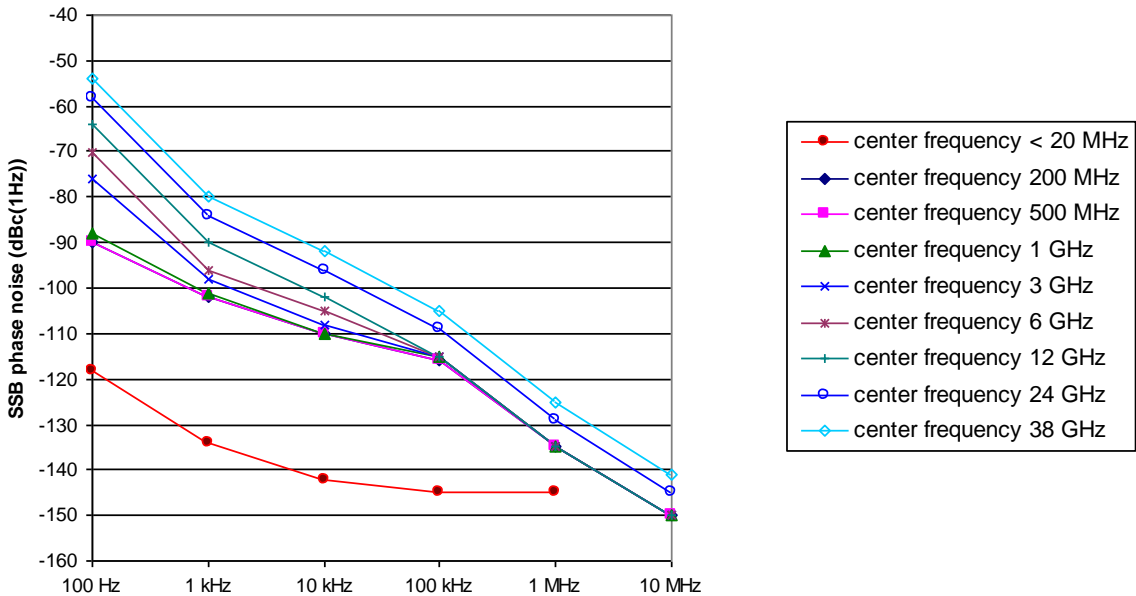
Frequency

| | | |
|-----------------------------|------------------|--------------------|
| 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 | | $\pm(\text{marker frequency} \times \text{reference uncertainty} + 10\% \times \text{resolution bandwidth} + \frac{1}{2}(\text{span} / (\text{sweep points} - 1)) + 1 \text{ Hz})$ |
| Number of sweep (trace) points | default value | 1001 |
| | range | 101 to 32001 |
| Marker tuning frequency step size | marker step size = sweep points | $\text{span} / (\text{sweep points} - 1)$ |
| | marker step size = standard | $\text{span} / (\text{default sweep size} - 1)$ |
| Frequency counter resolution | | 0.001 Hz |
| Count accuracy | | $\pm(\text{frequency} \times \text{reference uncertainty} + \frac{1}{2}(\text{last digit}))$ |
| Display range for frequency axis | | 0 Hz, 10 Hz to max. frequency |
| Resolution | | 0.1 Hz |
| Max. span deviation | | $\pm 0.1\%$ |

| 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.) |



Sweep time

| | | |
|---------------------|--------------------------|-----------------------------------|
| Range | span = 0 Hz | 1 μ s to 16000 s |
| | span \geq 10 Hz, swept | 1 ms to 16000 s ¹ |
| | span \geq 10 Hz, FFT | 7 μ s to 16000 s ² |
| Sweep time accuracy | span = 0 Hz | \pm 0.1 % (nom.) |
| | span \geq 10 Hz, swept | \pm 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 \geq 10 Hz, sweep filters | 1 Hz to 10 MHz in 1/2/3/5 sequence |
| | span \geq 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, $f \leq$ 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, $f \leq$ 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, $f \leq$ 7 GHz | 40 MHz additionally |
| Signal analysis bandwidth (equalized) | | |
| | $f \leq$ 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 |
| Max. 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 |
| Max. pulse voltage | RF attenuation ≥ 10 dB | 150 V |
| Max. 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, Δf > 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 option, RF preamplifier = on, RF attenuation 0 dB, level 2 × -45 dBm, Δf > 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 | |
|--|-----------------------------|
| 0 dB RF attenuation, termination 50 Ω, log. 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 | |
| 0 dB RF attenuation, termination 50 Ω, log. 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 | |
|---|---|
| | 0 dB RF attenuation, termination 50 Ω, log. 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 | |
| 0 dB RF attenuation, termination 50 Ω, log. 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 | 0 dB RF attenuation, termination 50 Ω, log. 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 | <p>0 dB RF attenuation, termination 50 Ω, log. 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</p> <table border="1"> <tr><td>10 Hz</td><td>< -90 dBm (nom.)</td></tr> <tr><td>20 Hz</td><td>< -100 dBm, -110 dBm (typ.)</td></tr> <tr><td>100 Hz</td><td>< -110 dBm, -120 dBm (typ.)</td></tr> <tr><td>1 kHz</td><td>< -120 dBm, -130 dBm (typ.)</td></tr> </table> <p>with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz</p> <p>0 dB RF attenuation, termination 50 Ω, log. 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</p> <p>R&S®FPS13, R&S®FPS30</p> <table border="1"> <tr><td>9 kHz ≤ f < 100 kHz</td><td>< -130 dBm, -140 dBm (typ.)</td></tr> <tr><td>100 kHz ≤ f < 1 MHz</td><td>< -145 dBm, -150 dBm (typ.)</td></tr> <tr><td>1 MHz ≤ f < 1 GHz</td><td>< -150 dBm, -153 dBm (typ.)</td></tr> <tr><td>1 GHz ≤ f < 3.6 GHz</td><td>< -147 dBm, -150 dBm (typ.)</td></tr> <tr><td>3.6 GHz ≤ f < 6 GHz</td><td>< -144 dBm, -147 dBm (typ.)</td></tr> <tr><td>6 GHz ≤ f < 7.4 GHz</td><td>< -141 dBm, -144 dBm (typ.)</td></tr> <tr><td>7.4 GHz ≤ f < 13.6 GHz</td><td>< -145 dBm, -148 dBm (typ.)</td></tr> <tr><td>13.6 GHz ≤ f < 15 GHz</td><td>< -143 dBm, -146 dBm (typ.)</td></tr> <tr><td>15 GHz ≤ f ≤ 30 GHz</td><td>< -141 dBm, -144 dBm (typ.)</td></tr> </table> <p>R&S®FPS40</p> <table border="1"> <tr><td>9 kHz ≤ f < 100 kHz</td><td>< -130 dBm, -140 dBm (typ.)</td></tr> <tr><td>100 kHz ≤ f < 1 MHz</td><td>< -145 dBm, -150 dBm (typ.)</td></tr> <tr><td>1 MHz ≤ f < 1 GHz</td><td>< -150 dBm, -153 dBm (typ.)</td></tr> <tr><td>1 GHz ≤ f < 3.6 GHz</td><td>< -147 dBm, -150 dBm (typ.)</td></tr> <tr><td>3.6 GHz ≤ f < 6 GHz</td><td>< -144 dBm, -147 dBm (typ.)</td></tr> <tr><td>6 GHz ≤ f < 7.4 GHz</td><td>< -141 dBm, -144 dBm (typ.)</td></tr> <tr><td>7.4 GHz ≤ f < 13.6 GHz</td><td>< -143 dBm, -146 dBm (typ.)</td></tr> <tr><td>13.6 GHz ≤ f < 15 GHz</td><td>< -141 dBm, -144 dBm (typ.)</td></tr> <tr><td>15 GHz ≤ f < 34 GHz</td><td>< -139 dBm, -142 dBm (typ.)</td></tr> <tr><td>34 GHz ≤ f ≤ 40 GHz</td><td>< -132 dBm, -135 dBm (typ.)</td></tr> </table> <p>with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz</p> | 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.) | 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.) | 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.) |
| 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.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RF preamplifier = on | <p>0 dB RF attenuation, termination 50 Ω, log. 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</p> <p>R&S®FPS13, R&S®FPS30, R&S®FPS40</p> <table border="1"> <tr><td>100 kHz ≤ f < 1 MHz</td><td>< -145 dBm, -148 dBm (typ.)</td></tr> <tr><td>1 MHz ≤ f < 20 MHz</td><td>< -155 dBm, -158 dBm (typ.)</td></tr> <tr><td>20 MHz ≤ f < 1 GHz</td><td>< -160 dBm, -163 dBm (typ.)</td></tr> <tr><td>1 GHz ≤ f < 3.6 GHz</td><td>< -157 dBm, -160 dBm (typ.)</td></tr> <tr><td>3.6 GHz ≤ f < 6 GHz</td><td>< -153 dBm, -156 dBm (typ.)</td></tr> <tr><td>6 GHz ≤ f < 7.4 GHz</td><td>< -150 dBm, -153 dBm (typ.)</td></tr> <tr><td>7.4 GHz ≤ f < 15 GHz</td><td>< -164 dBm, -167 dBm (typ.)</td></tr> <tr><td>15 GHz ≤ f < 34 GHz</td><td>< -159 dBm, -162 dBm (typ.)</td></tr> <tr><td>34 GHz ≤ f ≤ 40 GHz</td><td>< -154 dBm, -156 dBm (typ.)</td></tr> </table> <p>with R&S®FPS-B160 option installed, add 1.5 dB to the above specifications for f > 7 GHz</p> | 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.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Displayed average noise level with R&S®FPS-B24 preamplifier option, with R&S®FPS-B11 YIG preselector bypass option | |
|---|---|
| RF preamplifier = off | 0 dB RF attenuation, termination 50 Ω, log. 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 |
| | 0 dB RF attenuation, termination 50 Ω, log. 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 | 0 dB RF attenuation, termination 50 Ω, log. 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 | 0 dB RF attenuation, termination 50 Ω , log. 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 $\leq f < 1$ MHz | < -145 dBm, -148 dBm (typ.) |
| | 1 MHz $\leq f < 20$ MHz | < -155 dBm, -158 dBm (typ.) |
| | 20 MHz $\leq f < 1$ GHz | < -160 dBm, -163 dBm (typ.) |
| | 1 GHz $\leq f < 3.6$ GHz | < -157 dBm, -160 dBm (typ.) |
| | 3.6 GHz $\leq f < 6$ GHz | < -153 dBm, -156 dBm (typ.) |
| | 6 GHz $\leq f < 7$ GHz | < -150 dBm, -153 dBm (typ.) |
| | 7 GHz $\leq f < 7.4$ GHz | < -146 dBm, -149 dBm (typ.) |
| | 7.4 GHz $\leq f < 15$ GHz | < -160 dBm, -163 dBm (typ.) |
| | 15 GHz $\leq f < 34$ GHz | < -155 dBm, -158 dBm (typ.) |
| | 34 GHz $\leq f \leq 40$ 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 $\leq f \leq 7$ GHz | |
| | $f_{in} - 2 \times 8409.9$ MHz (1st IF) | < -80 dBc (typ.) |
| | $f_{in} - 2 \times 729.9$ MHz (2nd IF) | < -80 dBc |
| | $f_{in} - 2 \times 89.9$ MHz (3rd IF) | < -80 dBc |
| | 7 GHz $< f \leq 30$ GHz | |
| | $f_{in} \pm 2 \times 729.9$ MHz (1st IF) | < -80 dBc |
| | $f_{in} - 2 \times 89.9$ MHz (2nd IF) | < -80 dBc |
| | 30 GHz $< f \leq 40$ GHz | |
| | $f_{in} \pm 2 \times 729.9$ MHz (1st IF) | < -70 dBc |
| | $f_{in} - 2 \times 89.9$ MHz (2nd IF) | < -80 dBc |
| Intermediate frequency response | 20 MHz $\leq f \leq 7$ 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 $< f \leq 40$ GHz | |
| | 1st IF (729.9 MHz) | < -80 dBc |
| | 2nd IF (89.9 MHz) | < -80 dBc |
| Residual spurious response | 0 dB RF attenuation | |
| | $f \leq 1$ MHz | < -90 dBm |
| | $f > 1$ MHz | < -103 dBm |
| Local oscillator related spurious | $f < 15$ GHz | |
| | 1 kHz \leq carrier offset ≤ 10 MHz | < -70 dBc |
| | carrier offset > 10 MHz | < -80 dBc |
| | 15 GHz $\leq f < 30$ GHz | |
| | 1 kHz \leq carrier offset ≤ 10 MHz | < -64 dBc |
| | carrier offset > 10 MHz | < -74 dBc |
| | 30 GHz $\leq f \leq 40$ GHz | |
| | 1 kHz \leq carrier offset ≤ 10 MHz | < -58 dBc |
| | carrier offset > 10 MHz | < -68 dBc |
| Other interfering signals | | |
| Subharmonic of 1st LO | 20 MHz $\leq f < 7$ GHz, spurious at 8410 MHz $- 2 \times f_{in}$ | < -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, dB μ V, dBmV, dB μ A, dBpW |
| | linear level display | μ V, mV, μ A, 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 \leq f < 10 MHz | < 0.5 dB (σ = 0.17 dB) |
| | 10 MHz \leq f < 3.6 GHz | < 0.3 dB (σ = 0.1 dB) |
| | 3.6 GHz \leq f < 7 GHz | < 0.5 dB (σ = 0.17 dB) |
| | 7 GHz \leq f < 13.6 GHz, span < 1 GHz | < 1.5 dB (σ = 0.5 dB) |
| | 13.6 GHz \leq f < 30 GHz, span < 1 GHz | < 2 dB (σ = 0.66 dB) |
| | 30 GHz \leq f \leq 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 \leq f < 3.6 GHz | < 1 dB (σ = 0.33 dB) |
| | 3.6 GHz \leq f < 7 GHz | < 1.5 dB (σ = 0.5 dB) |
| | 7 GHz \leq f < 13.6 GHz | < 2.5 dB (σ = 0.83 dB) |
| | 13.6 GHz \leq f < 30 GHz | < 3 dB (σ = 1 dB) |
| | 30 GHz \leq f \leq 40 GHz | < 3.5 dB (σ = 1.33 dB) |
| | any setting of RF attenuation, RF preamplifier = on, +5 °C to +40 °C | |
| | 9 kHz \leq f < 3.6 GHz | < 1 dB (σ = 0.33 dB) |
| | 3.6 GHz \leq f < 7 GHz | < 1.5 dB (σ = 0.5 dB) |
| | 7 GHz \leq f < 13.6 GHz | < 3 dB (σ = 1 dB) |
| | 13.6 GHz \leq f < 30 GHz | < 3.5 dB (σ = 1.17 dB) |
| | 30 GHz \leq f \leq 40 GHz | < 4 dB (σ = 1.33 dB) |
| | DC coupling, RF preamplifier = off, 5 °C to +40 °C | |
| 10 Hz \leq f < 20 Hz | < 1.5 dB (nom.) | |
| 20 Hz \leq 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) |
| Max. 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) |
| Max. 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, 2 nd harmonic (7.6 GHz) and 3 rd 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 otherwise | 18 bit 24 bit |
| Sampling rate | all models with R&S®FPS-B40 option with R&S®FPS-B160 option | 100 Hz to 45 MHz 100 Hz to 128 MHz 100 Hz to 400 MHz |
| Max. signal analysis bandwidth (equalized) | $f \leq 7$ GHz all models with R&S®FPS-B40 option with R&S®FPS-B160 option $f > 7$ GHz, with R&S®FPS-B11 installed, YIG preselector = off all models with R&S®FPS-B40 option with R&S®FPS-B160 option | 28 MHz 40 MHz 160 MHz 28 MHz 40 MHz 160 MHz |
| IF power trigger bandwidth | $f \leq 7$ GHz all models with R&S®FPS-B160 option set analysis bandwidth ≤ 40 MHz set analysis bandwidth > 40 MHz $f > 7$ GHz, with R&S®FPS-B11 installed, YIG preselector = off all models with R&S®FPS-B160 option set analysis bandwidth ≤ 40 MHz set analysis bandwidth > 40 MHz | 40 MHz 40 MHz 160 MHz 40 MHz 40 MHz 160 MHz |

Signal analysis bandwidth ≤ 40 MHz ⁶, $f \leq 7$ GHz

| | | |
|--|---|---|
| Amplitude flatness | | ± 0.3 dB (nom.) |
| Deviation from linear phase | | $\pm 1^\circ$ (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 | $f \geq 100$ MHz two -30 dBm tones at input mixer within analysis bandwidth | -80 dBc (nom.) |
| Residual spurious response | RF attenuation 0 dB, $f \geq 100$ 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 $\leq f < 13$ GHz 13 GHz $\leq f < 30$ GHz 30 GHz $\leq f \leq 40$ GHz | ± 0.85 (nom.) ⁷ ± 0.85 (nom.) ⁷ ± 0.85 (nom.) ⁷ |
| Deviation from linear phase | RF attenuation ≥ 10 dB, RF preamplifier = off 7 GHz $\leq f < 13$ GHz 13 GHz $\leq f < 30$ GHz 30 GHz $\leq f \leq 40$ GHz | $\pm 2^\circ$ (nom.) ⁸ $\pm 2^\circ$ (nom.) ⁸ $\pm 2^\circ$ (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 | $f \geq 7$ GHz two -30 dBm tones at input mixer within analysis bandwidth | -80 dBc (nom.) |
| Residual spurious response | RF attenuation 0 dB, $f \geq 7$ 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 40 MHz to 160 MHz⁹, $f \leq 7$ 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 $\leq f < 4$ GHz | ± 0.7 dB (nom.) ¹⁰ |
| | 4 GHz $\leq f < 6$ GHz | ± 1.0 dB (nom.) ¹⁰ |
| | 6 GHz $\leq f \leq 7$ GHz | ± 1.5 dB (nom.) ¹⁰ |
| Deviation from linear phase | RF attenuation ≥ 10 dB, RF preamplifier = off | |
| | 100 MHz $\leq f < 4$ GHz | $\pm 2^\circ$ (nom.) ¹¹ |
| | 4 GHz $\leq f < 6$ GHz | $\pm 2.5^\circ$ (nom.) ¹¹ |
| | 6 GHz $\leq f \leq 7$ GHz | $\pm 3^\circ$ (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 | $f \geq 100$ MHz two -30 dBm tones at input mixer within analysis bandwidth | -65 dBc (nom.) |
| Residual spurious response | RF attenuation 0 dB, $f \geq 100$ MHz | -90 dBm (nom.) |
| Image response | $f \geq 100$ MHz | -65 dBc (nom.) |
| ADC related spurious response | $f \geq 100$ 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 40 MHz to 160 MHz⁹, $f > 7$ 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 $\leq f < 13$ GHz | ± 1.5 dB (nom.) ¹⁰ |
| | 13 GHz $\leq f < 30$ GHz | ± 1.5 dB (nom.) ¹⁰ |
| | 30 GHz $\leq f \leq 40$ GHz | ± 1.5 dB (nom.) ¹⁰ |
| Deviation from linear phase | RF attenuation ≥ 10 dB, RF preamplifier = off | |
| | 7 GHz $\leq f < 13$ GHz | $\pm 3^\circ$ (nom.) ¹¹ |
| | 13 GHz $\leq f < 30$ GHz | $\pm 3^\circ$ (nom.) ¹¹ |
| | 30 GHz $\leq f \leq 40$ GHz | $\pm 3^\circ$ (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, $f \geq 7$ 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 $\leq f < 3.6$ GHz | < 1.5, 1.3 (typ.) |
| | 3.6 GHz $\leq f < 20$ GHz | < 2, 1.8 (typ.) |
| | 20 GHz $\leq f < 27$ GHz | < 2.2, 2 (typ.) |
| | 27 GHz $\leq f < 30$ GHz | |
| | DC-coupled | < 2.2, 2 (typ.) |
| | AC-coupled | 2.5 (typ.) |
| | 30 GHz $\leq f \leq 40$ GHz | |
| | DC-coupled | < 2.5, 2.2 (typ.) |
| | AC-coupled | 3 (typ.) |
| | RF attenuation < 10 dB, DC-coupled | |
| | 10 MHz $\leq f < 7$ GHz | 2 (meas.) |
| 7 GHz $\leq f < 30$ GHz | 2.5 (typ.) | |
| 30 GHz $\leq f \leq 40$ 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, $f \leq 7$ 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 | 4 ports, type A plug, version 2.0 |
| | | 1 port, type B plug, version 2.0 |

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 $\leq f_{in} \leq 20$ 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 k Ω (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 k Ω (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 | log. display scale | logarithmic |
| | lin. display scale | linear |
| Output level | center frequency > 10 MHz, span 0 Hz, signal at reference level and center frequency | 1 V (nom.) open circuit |
| IEC/IEEE bus control | | |
| Command set | | interface in line with IEC 625-2 (IEEE 488.2) |
| Connector | | SCPI 1997.0 |
| Interface functions | | 24-pin Amphenol female SH1, AH1, T6, L4, SR1, RL1, PP1, DC1, DT1, C0 |
| LAN interface | | |
| Connector | | 10/100/1000BASE-T 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®SMB100A, R&S®SMBV100A, R&S®SMC100A, R&S®SMF100A, R&S®SMJ100A, R&S®SMU200A, R&S®SMW200A |

General data

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

| Environmental conditions | | |
|--------------------------|-------------------------------|---|
| Temperature | operating temperature range | +5 °C to +40 °C |
| | permissible temperature range | 0 °C to +50 °C |
| | storage temperature range | -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 | 10 Hz to 300 Hz, acceleration 1.2 g (RMS), in line with EN 60068-2-64 |
| Shock | | 40 g shock spectrum, in line with MIL-STD-810E method no. 516.4 procedure I |

| EMC | | |
|-----|--|--|
| | | in line with EMC Directive 2004/108/EC 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, class of protection 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 mark | | VDE, GS, CSA, CSA-NRTL |

| Dimensions and weight | | |
|-----------------------------------|--------------------|---|
| Dimensions (nom.) | W x H x D | 461 mm x 107 mm x 551 mm (18.15 in x 4.21 in x 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 industrial environment (EN 61326 table 2).

¹⁴ 2 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 please 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 |
| Spare Solid-State-Drive | R&S®FPS-B18 | 1321.4304.02 | yes | |
| YIG Preselector Bypass | R&S®FPS-B11 | 1326.5467.30 | no | for R&S®FPS30 |
| YIG Preselector Bypass | R&S®FPS-B11 | 1326.5467.40 | no | for R&S®FPS40 |
| RF Preamplifier, 9 kHz to 7 GHz | R&S®FPS-B22 | 1321.4027.02 | yes | user-retrofittable |
| Electronic Attenuator, 1 dB steps | R&S®FPS-B25 | 1321.4033.02 | 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 | |
| Noise Source Control 0/28 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. | Retrofittable | Remarks |
|--|---------------|--------------|---------------|--|
| Firmware/software | | | | |
| Pulse Measurements | R&S®FPS-K6 | 1331.3169.02 | | |
| Analog Modulation Analysis for AM, FM, φM | R&S®FPS-K7 | 1321.4079.02 | | |
| Noise Figure Measurements | R&S®FPS-K30 | 1321.4104.02 | | |
| Phase Noise Measurements | R&S®FPS-K40 | 1321.4110.02 | | |
| Security Write Protection of solid state drive | R&S®FPS-K33 | 1326.6092.02 | | |
| 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 | | |
| Vector Signal Analysis | R&S®FPS-K70 | 1321.4127.02 | | |
| 3GPP FDD (WCDMA) BS Measurements (incl. HSDPA and HSDPA+) | R&S®FPS-K72 | 1321.4133.02 | | |
| 3GPP FDD (WCDMA) MS Measurements (incl. 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 802.11a/b/g Measurements | R&S®FPS-K91 | 1321.4191.02 | | |
| WLAN 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 |
| WLAN 802.11p Measurements | R&S®FPS-K91p | 1321.4391.02 | | requires R&S®FPS-K91 |
| WLAN 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 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 |

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 (taken into account in instrument function RF INPUT 75 Ω) | 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.xx (xx = 03/06/10/20/30) |
| Attenuator, 50 W, 3/6/10/20/30 dB, 2 GHz | R&S®RBU50 | 1073.8695.xx (xx = 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 blocks | | |
| DC Block, 10 kHz to 18 GHz (type N) | R&S®FSE-Z4 | 1084.7443.02 |

Power sensors supported ¹⁵

| 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 | R&S®NRP-Z11 | 1138.3004.02 |
| 10 MHz to 18 GHz, 100 mW, two-path | R&S®NRP-Z221 | 1417.0309.02 |
| 10 MHz to 18 GHz, 200 mW | R&S®NRP-Z21 | 1137.6000.02 |
| 10 MHz to 18 GHz, 2 W | R&S®NRP-Z22 | 1137.7506.02 |
| 10 MHz to 18 GHz, 15 W | R&S®NRP-Z23 | 1137.8002.02 |
| 10 MHz to 18 GHz, 30 W | 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 | | |
| 0 Hz to 18 GHz, 100 mW | R&S®NRP-Z51 | 1138.0005.02 |
| 0 Hz to 40 GHz, 100 mW | R&S®NRP-Z55 | 1138.2008.02 |
| 0 Hz to 50 GHz, 100 mW | R&S®NRP-Z56 | 1171.8201.02 |
| 0 Hz to 67 GHz, 100 mW | R&S®NRP-Z57 | 1171.8401.02 |
| 0 Hz to 110 GHz, 100 mW | R&S®NRP-Z58 | 1173.7031.02 |
| Average power sensor | | |
| 9 kHz to 6 GHz, 200 mW | R&S®NRP-Z91 | 1168.8004.02 |
| 9 kHz to 6 GHz, 2 W | R&S®NRP-Z92 | 1171.7005.02 |
| Three-path diode power sensors | | |
| 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 |
| 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 |
| Wideband Power Sensor | | |
| 50 MHz to 18 GHz, 100 mW | R&S®NRP-Z81 | 1137.9009.02 |

Power sensor USB adapter cable ¹⁶

| Designation | Type | Order No. |
|---|------------|--------------|
| USB Adapter Cable (active), length: 2 m | R&S®NRP-Z3 | 1146.7005.02 |
| 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 |

¹⁵ For average power measurement only.

¹⁶ Required for connecting the power sensor to the R&S®FPS USB connector.

Service options

| Service options | | |
|--|---------|---|
| Extended Warranty, one year | R&S®WE1 | Please contact your local Rohde & Schwarz sales office. |
| Extended Warranty, two years | R&S®WE2 | |
| Extended Warranty with Calibration Coverage, one year | R&S®CW1 | |
| Extended Warranty with Calibration Coverage, two years | R&S®CW2 | |

Extended warranty with a term of one to four years (WE1 to WE2)

Repairs carried out during the contract term are free of charge ¹⁷. Necessary calibration and adjustments carried out during repairs are also covered. Simply contact the forwarding agent we name; your product will be picked up free of charge and returned to you in top condition a couple of days later.

Extended warranty with calibration (CW1 to 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 ¹⁷ and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

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¹⁷ Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.