# R&S®FPC
# Spectrum Analyzer
# Specifications


ROHDE&SCHWARZ

Data Sheet | Version 05.00

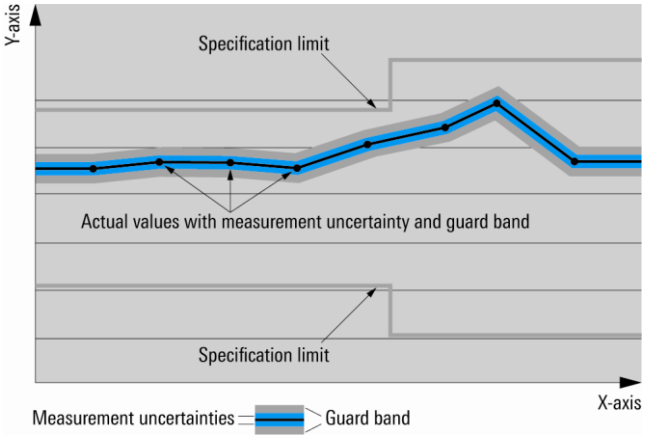
# CONTENTS

# 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 <, ≤, >, ≥, ±, 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.

In line with the 3GPP/3GPP2 standard, chip rates are specified in Mcps (million chips per second), whereas bit rates and symbol rates are specified in Mbps (million bits per second), kbps (thousand bits per second) or ksps (thousand symbols per second), and sample rates are specified in Msample/s (million samples per second). Mcps, kbps, ksps and Msample/s are not SI units.

# Specifications

## Frequency

| | | |
|---|---|---|
| Frequency range | R&S®FPC1000/R&S®FPC1500 | 5 kHz to 1 GHz |
| | with R&S®FPC-B2 option installed | 5 kHz to 2 GHz |
| | with R&S®FPC-B2 and R&S®FPC-B3 option installed | 5 kHz to 3 GHz |
| Frequency resolution | | 1 Hz |

| **Reference frequency, internal** | | |
|---|---|---|
| Aging per year | | $1 \times 10^{-6}$ |
| Temperature drift | 0 °C to +30 °C | $1 \times 10^{-6}$ |
| | +30 °C to +50 °C | $3 \times 10^{-6}$ |
| Achievable initial calibration accuracy | | $5 \times 10^{-7}$ |
| Total reference uncertainty | | (time since last adjustment × aging rate) + temperature drift + calibration accuracy |

| **Frequency readout** | | |
|---|---|---|
| Marker resolution | | 0.1 Hz |
| Uncertainty | | ±(marker frequency × reference uncertainty + 10 % × resolution bandwidth + ½ (span / (sweep points – 1)) + 1 Hz) |
| Number of sweep (trace) points | | 1183 |
| Marker tuning frequency step size | | span/1182 |
| Frequency counter resolution | | 0.1 Hz |
| Count uncertainty | SNR > 25 dB | ±(frequency × reference uncertainty + ½ (last digit)) |
| Frequency span | | 0 Hz, 10 Hz to 1 GHz |
| | with R&S®FPC-B2 option installed | 0 Hz, 10 Hz to 2 GHz |
| | with R&S®FPC-B2 and R&S®FPC-B3 option installed | 0 Hz, 10 Hz to 3 GHz |
| Span uncertainty | | 1 % (nom.) |

| **Spectral purity SSB phase noise** | | f = 500 MHz |
|---|---|---|
| Carrier offset | 30 kHz | < –88 dBc (1 Hz), –92 dBc (1 Hz) (typ.) |
| | 100 kHz | < –98 dBc (1 Hz), –103 dBc (1 Hz) (typ.) |
| | 1 MHz | < –120 dBc (1 Hz), –125 dBc (1 Hz) (typ.) |

## Sweep time

| | | |
|---|---|---|
| Sweep time | span = 0 Hz | 100 µs to 100 s |
| | 10 Hz ≤ span ≤ 600 MHz | 20 ms to 1000 s |
| | span > 600 MHz | 20 ms × span/600 MHz to 1000 s |
| Uncertainty | span = 0 Hz | 1 % (nom.) |
| | span ≥ 10 Hz | 3 % (nom.) |

## Bandwidth

| **Resolution bandwidths** | | |
|---|---|---|
| Range | –3 dB bandwidth | 1 Hz to 3 MHz in 1/3 sequence |
| Bandwidth accuracy | 1 Hz ≤ RBW ≤ 300 kHz | < 5 % (nom.) |
| | 300 kHz < RBW ≤ 1 MHz | < 10 % (nom.) |
| Selectivity 60 dB:3 dB | | < 5 (nom.) (Gaussian type filters) |
| **Video filters** | | |
| Range | –3 dB bandwidth | 1 Hz to 3 MHz in 1/3 sequence |

# Level

| | | |
|---|---|---|
| Display range | | displayed noise floor to +30 dBm |
| **Maximum rated input level** | | |
| DC voltage | | 50 V |
| CW RF power | RF input | 33 dBm (= 2 W) |
| | RF output (R&S®FPC1500 only) | 23 dBm (= 0.2 W) |
| Peak RF power | RF input, duration < 3 s | 36 dBm (= 4 W) |
| | RF output, duration < 3 s (R&S®FPC1500 only) | 26 dBm (= 0.4 W) |
| Max. pulse voltage | | 150 V |
| Max. pulse energy | pulse width 10 µs | 10 mWs |
| **Intermodulation** | | |
| Third-order intercept (TOI) | intermodulation-free dynamic range, signal level 2 × –20 dBm, RF attenuation = 0 dB, RF preamplifier: off | |
| | $f_{in}$ = 1 GHz | +7 dBm (meas.) |
| | $f_{in}$ = 2.4 GHz | +10 dBm (meas.) |
| | intermodulation-free dynamic range, signal level 2 × –20 dBm, RF attenuation = 10 dB, RF preamplifier: off | |
| | $f_{in}$ = 1 GHz | +17 dBm (meas.) |
| | $f_{in}$ = 2.4 GHz | +20 dBm (meas.) |
| Second harmonic intercept (SHI) | RF attenuation = 0 dB, RF preamplifier: off, signal level = –40 dBm | |
| | $f_{in}$ = 20 MHz to 1.5 GHz | –60 dBc (nom.) |
| **Displayed average noise level** | 0 dB RF attenuation, termination 50 Ω, RBW = 100 Hz, VBW = 10 Hz, sample detector, log scaling, normalized to 1 Hz | |
| | preamplifier R&S®FPC1000/R&S®FPC1500: off | |
| | 1 MHz to 10 MHz | < –127 dBm,–135 dBm (typ.) |
| | 10 MHz to 2 GHz | < –142 dBm, –150 dBm (typ.) |
| | 2 GHz to 3 GHz | < –138 dBm, –147 dBm (typ.) |
| | preamplifier R&S®FPC1000/R&S®FPC1500: on (requires R&S®FPC-B22 option) | |
| | 1 MHz to 10 MHz | < –147 dBm, –157 dBm (typ.) |
| | 10 MHz to 2 GHz | < –158 dBm, –165 dBm (typ.) |
| | 2 GHz to 3 GHz | < –155 dBm, –163 dBm (typ.) |

| | | |
|---|---|---|
| **Immunity to interference, nominal values** | | |
| Image frequencies | $f_{in}$ – 2 × 30.15 MHz | < –70 dBc (nom.) |
| | $f_{in}$ – 2 × 830.15 MHz | < –65 dBc (nom.) |
| | $f_{in}$ – 2 × 4042.65 MHz | –60 dBc (nom.) |
| Intermediate frequencies | 30.25 MHz, 830.25 MHz, 4042.65 MHz | < –70 dBc (nom.) |
| Other interfering signals, signal level – RF attenuation < –30 dBm | spurious at $f_{in}$ – 2021.325 MHz | < –60 dBc (nom.) |
| Other interfering signals, related to local oscillators | Δf ≥ 300 kHz (f: receive frequency) | < –60 dBc (nom.) |
| Residual spurious response | input matched with 50 Ω, without input signal, RBW ≤ 30 kHz, f ≥ 3 MHz, RF attenuation = 0 dB, Wi-Fi function disabled | < –90 dBm (nom.) |
| **Level display** | | |
| Logarithmic level axis | | 1/2/5/10/20/50/100 dB, 10 divisions |
| Linear level axis | | 0 % to 100 %, 10 divisions |
| Number of traces | | 2 |
| Trace detectors | | max. peak, min. peak, auto peak, sample, RMS |
| Trace functions | | clear/write, max. hold, min. hold, average, view |
| Setting range of reference level | | –130 dBm to +30 dBm |
| Units of level axis | | dBm, dBmV, dBµV, V, W |

| | | |
|---|---|---|
| **Level measurement uncertainty** | | |
| Absolute level uncertainty at 100 MHz | +20 °C to +30 °C | < 0.3 dB |
| Frequency response (+20 °C to +30 °C) | 100 kHz ≤ f < 10 MHz | < 1.5 dB (nom.) |
| | 10 MHz ≤ f ≤ 3 GHz | < 1 dB |
| Attenuator uncertainty | | < 0.3 dB |
| Uncertainty of reference level setting | | < 0.1 dB (nom.) |
| Display nonlinearity | SNR > 16 dB, 0 dB to –50 dB, logarithmic level display | < 0.3 dB |
| Bandwidth switching uncertainty | reference: RBW = 10 kHz | < 0.1 dB (nom.) |
| Total measurement uncertainty | 95 % confidence level, +20 °C to +30 °C, SNR > 16 dB, 0 dB to –50 dB below reference level, RF attenuation: auto | |
| | 10 MHz ≤ f ≤ 3 GHz | < 1.25 dB, 0.5 dB (typ.) |

# Trigger functions

| | | |
|---|---|---|
| **Trigger** | | |
| Trigger source | | free run, video, external, IQ power (FPC-K7 ASK/FSK only) |
| External trigger level threshold | low → high transition | 2.4 V |
| | high → low transition | 0.7 V |
| | maximum | 3.0 V |

# Tracking generator and independent source generator functions (R&S®FPC1500 only)

| | | |
|---|---|---|
| **Frequency range** | R&S®FPC1500 | 5 kHz to 1 GHz |
| | with R&S®FPC-B2 option installed | 5 kHz to 2 GHz |
| | with R&S®FPC-B2 and R&S®FPC-B3 option installed | 5 kHz to 3 GHz |
| Measurements | tracking generator mode | Generator is coupled to swept frequency of spectrum analyzer to perform transmission measurements. A frequency offset can be set. |
| | independent source mode | Generator is coupled to center frequency of spectrum analyzer or independent settable |
| Output power | 2 MHz to 3 GHz | 0 dBm to –30 dBm (nom.) |
| Frequency response | 2 MHz to 3 GHz | ±3 dB (nom.) |
| **Absolute level uncertainty at 100 MHz** | +20 °C to +30 °C, at –10 dBm output power | ±1 dB (nom.) |

# Inputs and outputs

| | | |
|---|---|---|
| **RF input** | | |
| Impedance | | 50 Ω (nom.) |
| Connector | | N female |
| VSWR | 5 kHz ≤ f ≤ 1 GHz | < 1.5 (nom.) |
| | 1 GHz < f ≤ 3 GHz | < 2 (nom.) |
| Input attenuator | RF input only | 0 dB to 40 dB in 5 dB steps |
| **RF output (**R&S®FPC1500 only) | | |
| Impedance | | 50 Ω (nom.) |
| Connector | | N female |
| VSWR | 5 kHz ≤ f ≤ 1 GHz | < 1.5 (nom.) |
| | 1 GHz < f ≤ 3 GHz | < 2 (nom.) |
| **AF output** | | |
| AF demodulation types | | AM and FM |
| Connector | | 3.5 mm mini jack |
| Output impedance | | 32 Ω (nom.) |
| Voltage (open circuit) | | $V_{RMS}$ adjustable from 0 V to > 100 mV |
| **External reference, external trigger** | | |
| Connector | | BNC, 50 Ω |
| Mode | | ext. reference, ext. trigger |
| External reference | required level | 0 dBm |
| | frequency | 10 MHz |
| External trigger threshold | low → high transition | 2.4 V |
| | high → low transition | 0.7 V |

# General data

| | | |
|---|---|---|
| Power supply | | |
| AC supply | input specifications | 100 V to 240 V AC, 50 Hz to 60 Hz,<br>0.6 A to 0.4 A |
| Power consumption | R&S®FPC1000 | 14 W (nom.) |
| | R&S®FPC1500 | 19 W (nom.) |
| Safety | | IEC 61010-1, EN 61010-1, UL 61010-1,<br>CAN/CSA-C22.2 No. 61010.1 |
| Test mark | | VDE, GS, CSA, KC |
| Manual operation | | |
| Languages | | Chinese, English, French, German,<br>Italian, Hungarian, Japanese, Korean,<br>Portuguese, Russian, Spanish |
| Remote control | | |
| Command set | | SCPI 1997.0 |
| LAN interface | | 10/100BASE-T, RJ-45 |
| USB | | type B plug, version 2.0 |
| Display | | |
| Size | | 10.1" |
| Resolution | | 1366 × 768 pixel |
| Pixel errors | | < 2 pixel |
| Audio | | |
| Speaker | | internal |
| USB interface | | type A plug, version 2.0 |
| | number of interfaces | 2 |
| Mass memory | | |
| Mass memory | | memory stick (not supplied),<br>size ≤ 4 Gbyte, USB version 1.1 or 2.0 |
| Data storage | internal | > 256 instrument settings and traces |
| | on memory stick, ≥ 1 Gbyte | > 5000 instrument settings and traces |
| Environmental conditions | | |
| Temperature | operating temperature range | +10 °C to +40 °C |
| | storage temperature range | –20 °C to +70 °C |
| Climatic loading | relative humidity | +25 °/+40 °C at 85 % relative humidity<br>in line with EN 60068-2-30 |
| Mechanical resistance | | |
| Vibration | sinusoidal | EN 60068-2-6 |
| | random | EN 60068-2-64 |
| Shock | | 40 g shock spectrum,<br>in line with MIL-STD-810F, method 516.4<br>procedure 1, EN 60068-2-27 |
| EMC | | in line with European EMC Directive<br>2014/30/EU including<br>CISPR 11/EN 55011/group 1<br>class A (emission),<br>EN 61326 table 2 (immunity, industrial) |
| Dimensions (W × H × D) | without feet | 396 mm × 178 mm × 147 mm<br>(15.6 in × 7.0 in × 5.8 in) |
| | including feet | 396 mm × 185 mm × 156 mm<br>(15.6 in × 7.3 in × 6.1 in) |
| Weight | | 3 kg (6.6 lb) |
| Recommended calibration interval | | 1 year |

# Options

## R&S®FPC-K7 modulation analysis

The specifications below apply to the R&S®FPC1000 and R&S®FPC1500. They are based on the data sheet specifications of the R&S®FPC1000 and R&S®FPC1500, have not been checked separately and are not verified during instrument calibration.

| **Measurement of analog modulation signals** | | |
|---|---|---|
| Center frequency | | 10 MHz to 3 GHz |
| Demodulation bandwidth | | 2 MHz, 1 MHz, 500 kHz, 300 kHz, 200 kHz, 100 kHz, 50 kHz, 30 kHz, 20 kHz, 10 kHz (nom.) |
| Bandwidth accuracy | | < ±5 % (nom.) |
| Display | AM | carrier power, carrier frequency offset, AM modulation depth, modulation frequency, THD, SINAD |
| | FM | carrier power, carrier frequency offset, FM deviation, modulation frequency, THD, SINAD |

| **Carrier power** | | |
|---|---|---|
| Carrier power measurement accuracy | | add 0.2 dB, see section “Level measurement uncertainty” |
| Display resolution | | 0.1 dB |

| **AF (modulation frequency)** [1] | | |
|---|---|---|
| Range | AM | 20 Hz to 100 kHz (nom.) |
| | FM | 20 Hz to 200 kHz (nom.) |
| Resolution | | 1 Hz |
| Measurement uncertainty | 1 kHz ≤ AF ≤ 200 kHz | ±1 % of measured value (nom.) |
| | 20 Hz ≤ AF < 1 kHz | ±1 Hz (nom.) |
| AF filters | | |
| Lowpass | audio decimation | bypass, 1/10, 1/30, 1/100 (nom.) |
| Deemphasis | FM demodulation and demodulation bandwidth 200 kHz and 300 kHz | off, 50 µs, 75 µs (nom.) |

| **AM demodulation** [2] | | |
|---|---|---|
| Measurement range | modulation depth | 5 % to 95 % (nom.) |
| Modulation depth uncertainty | | ±4 % (nom.) |

| **FM demodulation** [3] | | |
|---|---|---|
| Measurement range | frequency deviation | 10 kHz to 400 kHz (nom.), max. 0.4 × demodulation bandwidth |
| Deviation uncertainty | | ±(0.04 × (AF + deviation)) (nom.) |

| **Modulation distortion** [1, 2, 3] | | |
|---|---|---|
| Measurement functions | | THD, SINAD |
| Measurement range | THD | –50 dB to 0 dB |
| | SINAD, AM | 0 dB to 50 dB |
| | SINAD, FM | 0 dB to 40 dB |
| Display resolution | | 0.1 dB |
| Measurement uncertainty | | 1 dB (nom.) |
| AF frequency range | | 20 Hz to 100 kHz (nom.) |

[1] Min. and max. detectable audio frequency and harmonics depend on the demodulation bandwidth and audio filter settings.

[2] Modulation frequency 1 kHz sine, AM modulation depth 50 %, carrier level 0 dBm, center frequency = 499 MHz, reference level 6 dBm, demodulation bandwidth = 20 kHz, SNR > 60 dB, audio filter: bypass.

[3] Modulation frequency 1 kHz sine, FM-deviation = 75 kHz, carrier level 0 dBm, center frequency = 499 MHz, reference level 6 dBm, demodulation BW = 300 kHz, SNR > 60 dB, audio filter = 1/10, deemphasis: off.

| **Measurement of digital modulation signals (ASK, FSK)** | | |
|---|---|---|
| Center frequency | | 10 MHz to 3 GHz |
| Demodulation bandwidth | | 400 Hz to 2 MHz<br>auto-set corresponding to signal and demodulation bandwidth requirements |
| Display | ASK diagram | eye diagram, symbols, modulation depth, modulation error |
| | ASK numerical results | carrier power, carrier frequency error, modulation depth and index, modulation error |
| | FSK diagram | eye diagram, symbols, modulation deviation, modulation error |
| | FSK numerical results | carrier power, carrier frequency error, frequency deviation, modulation error, magnitude error |

| **Demodulation parameters** | | |
|---|---|---|
| Modulation and demodulation filters | transmit filter | • root raised cosine (RRC)<br>• raised cosine (RC)<br>• Gaussian (GAUSS)<br>• unfiltered [4]<br>measurement and reference filters internally adapted to signal parameters |
| Points/symbol | | 4, 8, 16<br>internally adapted to signal parameters |
| Filter length | | internally adapted to signal parameters |
| Demodulation length | | 20 symbols to max. 1000 symbols<br>(at 4 points/symbol) |
| Data processing | | burst on/off |

| **Carrier power** | | |
|---|---|---|
| Carrier power measurement accuracy | | add 0.2 dB, see section “Level measurement uncertainty” |
| Carrier power range | | –30 dBm to +20 dBm (nom.) |
| Display resolution | | 0.1 dB |

| **ASK demodulation [5]** | | |
|---|---|---|
| Measurement range | symbol rate | 1 kHz to 100 kHz (nom.) |
| | modulation depth | 5 % to 95 % (nom.) |
| Modulation depth uncertainty | | ±4 % (nom.) |
| Display resolution | | 0.1 % |

| **FSK demodulation [6]** | | |
|---|---|---|
| Measurement range | symbol rate | 1 kHz to 100 kHz (nom.) |
| | frequency deviation | 1 kHz to 400 kHz (nom.) |
| | symbol rate | |
| | 1 kHz to 20 kHz | 1 ≤ beta [7] ≤ 20 |
| | > 20 kHz to 50 kHz | 1 ≤ beta ≤ 8 |
| | > 50 kHz to 100 kHz | 1 ≤ beta ≤ 4 |
| Accuracy | | ±4 % (nom.) |
| Display resolution | | 0.1 Hz |

[4] Reference signal is generated with a Gauss filter, BT = 3.

[5] ASK modulation index 50 %, symbol rate = 100 kHz, Gauss BT = 1.0, modulation signal PSBS.

[6] FSK modulation deviation 100 kHz, symbol rate = 100 kHz, Gauss BT = 1.0, modulation signal PRBS.

[7] Beta is the ratio of frequency deviation to symbol rate.

## R&S®FPC-K43 receiver mode

The specifications below apply to the R&S®FPC1000 and R&S®FPC1500. They are based on the data sheet specifications of the R&S®FPC1000 and R&S®FPC1500, have not been checked separately and are not verified during instrument calibration.

| | | |
|---|---|---|
| **Measurements** | | • fixed frequency<br>• channel scan<br>• channel scan<br>  − user defined channel list<br>• EMI precompliance<br>  − CISPR bandwidths<br>  − CISPR detectors |

| | | |
|---|---|---|
| Frequency range | | see base unit |
| Measurement modes | | fixed frequency, frequency scan, channel scan |
| Frequency scan step size | | |
| Scan step size | | 100 Hz to max. frequency |
| Max. number of steps | | 10000 |
| Channel scan | | |
| Channel spacing | | user-definable |
| Max. number of channels | | 10000 |
| Resolution bandwidths | | |
| Range | –3 dB bandwidth | 1 Hz to 3 MHz in 1/3 sequence |
| Detectors | CISPR bandwidths (–6 dB) | 200 Hz, 9 kHz, 120 kHz, 1 MHz |
| | | max. peak, average, RMS, quasi-peak |
| Level | | see base unit |

## R&S®FPC-K55 advanced measurements

| | | |
|---|---|---|
| **Measurements** | | • spectrogram<br>• channel power<br>• occupied bandwidth<br>• third-order intercept<br>• harmonic distortion<br>• TDMA power<br>• AM modulation depth |

## R&S®FPC-B200 Wi-Fi connection support

| | | |
|---|---|---|
| Interface | | wireless LAN 802.11 b/g/n, 2.4 GHz |
| Operating modes | | client mode |
| Certifications | | CE, ETSI, FCC, IC approval |

## R&S®FPC-K42 Vector network analyzer measurements (with R&S®FPC1500 only)

| | | |
|---|---|---|
| **Individual measurements** | | reflection ($S_{11}$), transmission ($S_{21}$), |
| | | 1-port cable loss |
| | | distance-to-fault |

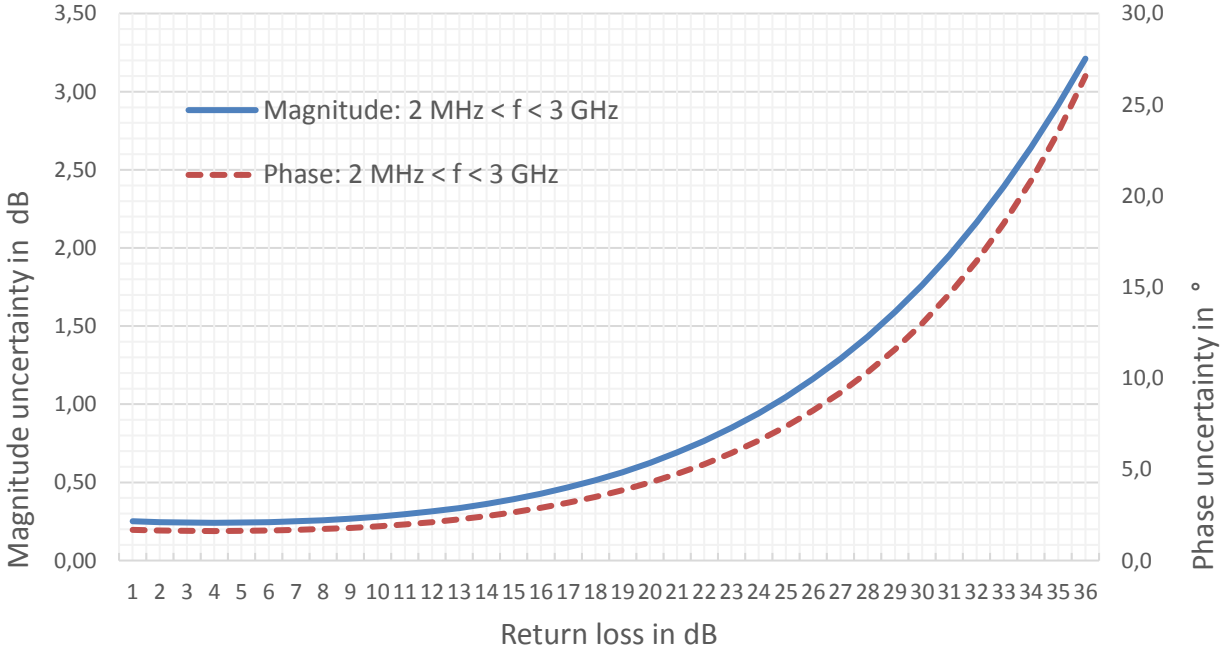
| | | |
|---|---|---|
| **Measurement setup** | | |
| Frequency range | R&S®FPC1500 | 2 MHz to 1 GHz |
| | with R&S®FPC-B2 option installed | 2 MHz to 2 GHz |
| | with R&S®FPC-B2 and R&S®FPC-B3 option installed | 2 MHz to 3 GHz |
| Port output power | | –10 dBm (nom.) |
| Data points | selectable | 101 to 2501 |
| Measurement bandwidth | | 100 Hz to 100 kHz in 1/3 sequence |
| Trace modes | | clear/write, average |

| **Transmission measurement $S_{21}$** | | |
|---|---|---|
| Result formats | | magnitude |
| Magnitude | | |
| Range | | 1/2/5/10/20/50/100/120/150 dB, linear 100 % |
| Resolution | | 0.1 dB |
| Dynamic range | | 80 dB (nom.) |

| **Reflection measurement $S_{11}$** | | |
|---|---|---|
| Result formats | | magnitude, VSWR, distance-to-fault, Smith chart, phase |
| Magnitude | | |
| Range | | 1/2/5/10/20/50/100/120/150 dB, linear 100 % |
| Resolution | | 0.1 dB |
| VSWR | | |
| Range | selectable | 1 to 1.5, 2, 6, 11, 21 or 71 |
| Measurement speed | | 0.3 ms per point |
| Corrected directivity with R&S®ZN-Z103 | 2 MHz ≤ f ≤ 3 GHz | > 42 dB (nom.) |
| Corrected test port match with R&S®ZN-Z103 | 2 MHz ≤ f ≤ 3 GHz | > 36 dB (nom.) |
| Measurement uncertainty with R&S®ZN-Z103 | | see figure “Uncertainty of reflection measurement” |
| **1-port cable loss measurement** | | |
| Result format | | magnitude |
| Range | selectable | 1/2/5/10/20/50/100/120/150 dB |
| Resolution | | 0.1 dB |

| **Distance-to-fault analysis** | | |
|---|---|---|
| Result formats | | return loss, VSWR with average and maximum indication |
| Return loss | | |
| Range | | 1/2/5/10/20/50/100/120/150 dB, linear 100 % |
| Resolution | | 0.1 dB |
| VSWR | | |
| Range | selectable | 1 to 1.5, 2, 6, 11, 21 or 71 |
| Fault resolution in meters | | (1.5 × $10^8$ × velocity factor/span) |
| Maximum cable length | depending on cable loss | 1500 m (nom.) |

| **Immunity to interference** | | |
|---|---|---|
| Maximum permissible spurious signal | measurement = reflection ($S_{11}$)/1 – port cable loss/distance-to-fault analysis | |
| | | +17 dBm (nom.) |




*Uncertainty of reflection measurements with the R&S®ZN-Z103 calibration unit; temperature: +18 °C to +25 °C, RBW: 10 Hz, power: –10 dBm.*

# Ordering information

| Designation | Type | Order No. |
|---|---|---|
| Spectrum Analyzer, 5 kHz to 1 GHz | R&S®FPC1000 | 1328.6660.02 |
| Spectrum Analyzer with Tracking Generator, 5 kHz to 1 GHz | R&S®FPC1500 | 1328.6660.03 |
| **Accessories supplied:** power cable, USB cable for connection to PC | | |

## Options

| Designation | Type | Order No. |
|---|---|---|
| Spectrum Analyzer Frequency Upgrade to 2 GHz | R&S®FPC-B2 | 1328.6677.02 |
| Spectrum Analyzer Frequency Upgrade to 3 GHz (requires R&S®FPC-B2) | R&S®FPC-B3 | 1328.6683.02 |
| Spectrum Analyzer Preamplifier | R&S®FPC-B22 | 1328.6690.02 |
| Modulation Analysis for AM, FM, ASK, FSK | R&S®FPC-K7 | 1328.6748.02 |
| Receiver Mode | R&S®FPC-K43 | 1328.6754.02 |
| Advanced Measurements | R&S®FPC-K55 | 1328.6760.02 |
| Wi-Fi Support | R&S®FPC-B200 | 1328.6990.02 |
| Vector Network Analyzer Measurements (only for R&S®FPC1500) | R&S®FPC-K42 | 1328.7396.02 |

## Accessories

| Designation | Type | Order No. |
|---|---|---|
| 19" Rackmount Kit | R&S®ZZA-FPC1 | 1328.7080.02 |
| Soft Carrying Bag | R&S®RTM-Z3 | 1305.0289.02 |
| Carrying Case | R&S®RTB-Z3 | 1333.1734.02 |
| Combined Open/Short/50 Ω Load Calibration Standard, DC to 4 GHz | R&S®FSH-Z29 | 1300.7510.03 |
| 1-Port Calibration Unit (male) | R&S®ZN-Z103 | 1321.1828.02 |
| Teaching Kit | R&S®FPC-Z10 | 1328.7338.02 |

## Service options

| **Warranty** | | |
|---|---|---|
| Base unit | | 3 years |
| All other items [8] | | 1 year |
| 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 and two years (WE1 and WE2)**
Repairs carried out during the contract term are free of charge [9]. 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 [9] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

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

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

**Service that adds value**

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

**Rohde&Schwarz**

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, 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

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PD 5214.7112.22 | Version 05.00 | February 2019 (ja)
R&S®FPC Spectrum Analyzer


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5214.7112.22 05.00 PDP 1 en