up to 40 GHz

Spectrum Analyzer R&S®FSP

The medium-class standard

Features

◆ 21 cm TFT colour display
◆ 1 Hz to 10 MHz RBW
◆ RMS detector for fast and reproducible measurements on digitally modulated signals
◆ Measurement routines for TOI, ACPR, OBW, amplitude statistics, multicarrier ACP
◆ EMI bandwidths and quasi-peak detector

Speed

◆ 2.5 ms minimum sweep time in frequency domain
◆ 1 µs sweep time in time domain
◆ Up to 55 GPIB measurements/s in frequency domain (including trace transfer)
◆ Up to 80 GPIB measurements/s in time domain (including trace transfer)
◆ Fast ACP measurement routine in time domain

Performance

◆ Total measurement uncertainty: 0.5 dB
◆ Displayed average noise level: −155 dBm (1 Hz)
◆ Phase noise: −113 dBc (1 Hz) at 10 kHz
◆ Dynamic range of RMS detector: 100 dB
◆ Synthesized frequency setting

ROHDE&SCHWARZ

The standard in the medium class …

Features

The Spectrum Analyzers R&S®FSP are outstanding for their innovative measurements and a host of standard functions.

Instead of a wide choice of options, the R&S®FSP offers as standard all the functions and interfaces expected from a state-of-the-art spectrum analyzer:

◆ Largest colour display in its class
◆ Resolution bandwidths from 1 Hz to 10 MHz
◆ Highly selective digital filters and FFT
◆ Quasi-peak detector and EMI bandwidths
◆ ACP and multicarrier ACP measurements
◆ Convenient documentation of results as a hardcopy or file in PC-compatible formats
◆ Interfaces: GPIB, Centronics, RS-232-C, LAN (option), USB
◆ Automatic test routines for measuring TOI, OBW, phase noise and ACP(R)
◆ Split screen with separate settings and up to 3 traces per screen
◆ Editable limit lines including PASS/FAIL indication
◆ Fast measurements in the time do-main: minimum sweep time 1 μs
◆ Gated sweep for measurements on TDMA signals

In addition, the R&S®FSP features the following unique attributes as standard:

◆ RMS detector for fast and reproducible power measurements on digitally modulated signals in frequency and time domain
◆ Statistical measurement functions for determining crest factor and CCDF (complementary cumulative distribution function)

Featuring such a wealth of functions, the R&S®FSP offers state-of-the-art spectrum analysis at an extremely attractive price/performance ratio.

Speed

Time is a finite resource – so high measurement speed is indispensable for competitiveness and cost-effective testing.

Here, too, the new R&S®FSP offers characteristics that make it top of the class:

◆ Up to 55 measurements/s on GPIB interface including trace transfer of 501 binary data
◆ 80 measurements/s on GPIB interface in zero span mode including trace transfer of 501 binary data
◆ Minimum sweep time of 2.5 ms

Performance

- 1 µs time domain measurements
- Unique fast ACP mode for high-speed ACPR measurements in time domain using the standard-compliant test filters
- List mode for fast, selective power measurements

With 100 measurements/s in manual operation and digital filters with a sweep time 2.5 times faster than comparable analog filters, the R&S®FSP will also prove beneficial in the day-to-day tasks of product development.

Modern communication systems should provide optimum spectral efficiency at high data rates. For the 3rd generation of CDMA mobile radio systems currently under development, this is achieved through functions such as among other things, by high-precision power control.

The R&S®FSP is the ideal partner in development and production, featuring low uncertainty in level measurement, as well as excellent RF characteristics:

- 0.5 dB total measurement uncertainty allows higher tolerances for the DUT, thus increasing production yield
- 0.07 dB linearity uncertainty (1 σ) is ideal for precise measurements, for example of gain control and ACPR
- RMS detector with >100 dB dynamic range measures power fast and accurately irrespective of the signal shape – almost like a thermal power sensor
- The displayed average noise level of typ. −155 dBm (1 Hz) is attained without the use of preamplifiers and thus without any reduction in dynamic range
- Typ. −145 dBc (1 Hz) phase noise at 10 MHz offset offers optimum conditions for ACPR measurements on WCDMA systems

Resolution bandwidths of up to 100 kHz are fully digital and provide – in addition to high selectivity – an ideal basis for accurate (adjacent-) channel power measurements owing to a maximum bandwidth deviation of 3%.

… now even faster

High-end characteristics …

Rohde & Schwarz ASICs

Top-class performance as offered by the R&S®FSP essentially depends on the extensive use of digital signal processing and large-scale integration of components.

For these demanding tasks, Rohde & Schwarz has developed ASICs tailored to the requirements of signal analysis. Key functions such as

◆ RMS detection
◆ Digital IF filtering
◆ Logarithmation
◆ CCDF measurement

are "cast in silicon" and are thus faster than conventional solutions.

Logarithmic amplifier

The R&S®FSP comes equipped with digital resolution filters between 10 Hz and 100 kHz featuring high selectivity and very low bandwidth deviation. The filters have an extremely low logarithmic level deviation of <0.2 dB in the range 0 dB to −70 dB. As they are implemented as ASIC functions, their great precision is attained without any reduction in measurement speed.

furnishes 10^6 single values in only 250 ms, thus enabling extremely accurate statistical analysis even of rarely occurring signal peaks.

This analysis function, which is becoming more and more important, has been implemented for the first time in the Spectrum Analyzer R&S®FSP as a fast and cost-effective solution based on ASICs.
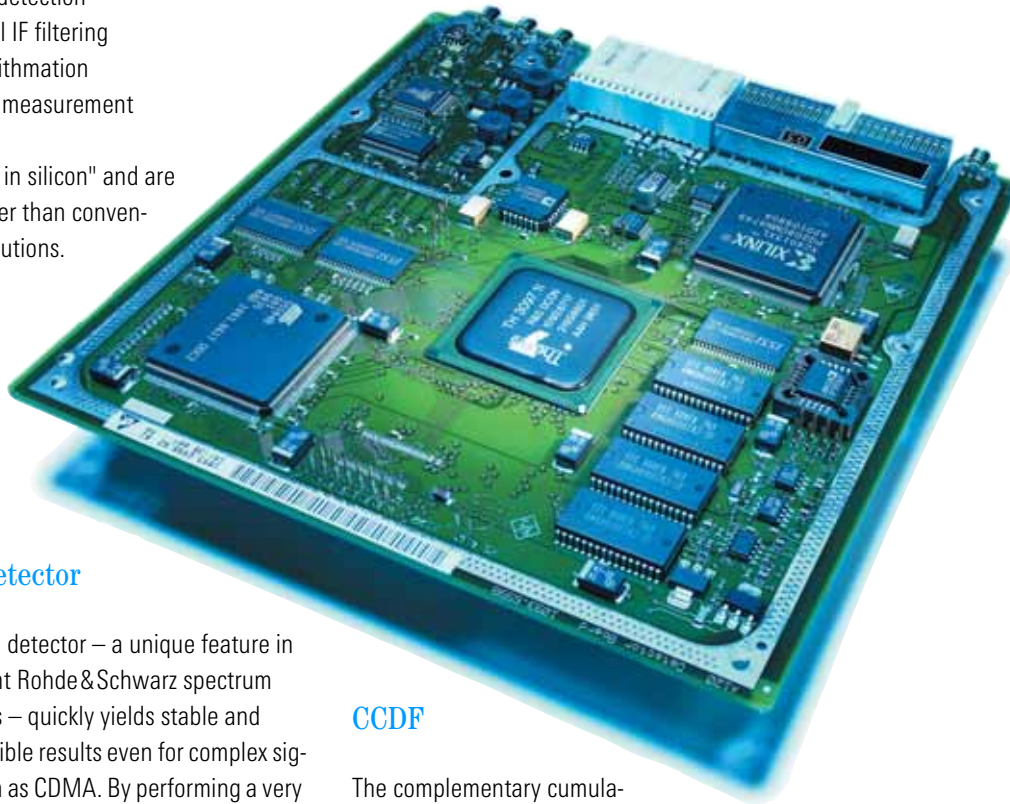
RMS detector

The RMS detector – a unique feature in all current Rohde & Schwarz spectrum analyzers – quickly yields stable and reproducible results even for complex signals such as CDMA. By performing a very large number of linear single measurements, followed by power integration, the detector avoids the measurement error inherent in conventional analyzers that arises from the averaging of the log video signal. The RMS detector of the R&S®FSP measures all modern communication signals with unparalleled accuracy and speed.

CCDF

The complementary cumulative distribution function (CCDF) describes the probability of a signal power exceeding a specific (usually the average) power. CCDF analysis is indispensable for determining the optimal transmitting power for CDMA signals, assuming that clipping over known, short intervals is tolerable. The R&S®FSP with its dedicated CCDF measurement routine

The platform

Excellent specifications such as those of the R&S®FSP require a high-grade and service-friendly platform. All the modules are optimally shielded and easy to exchange, and are accommodated in a lightweight but stable frame. A powerful low-noise fan in conjunction with low power consumption of 70 VA to 150 VA (depending on model) makes for high reliability.

A 2-year calibration interval (excluding the reference frequency) is offered with the R&S®FSP.

Fit for the future

Owing to its modular design, the R&S®FSP is optimally equipped to handle all present and future tasks. The design takes into account both hardware and firmware extensions to safeguard your investment far into the future. Thus, you can also rely on your R&S®FSP to meet all requirements that will arise in the years to come.

Ergonomics and design

The R&S®FSP sets the ergonomic standard in this class of analyzers. The 21 cm (8.4″) colour display is the largest and most brilliant in its category. Vertical and horizontal rows of softkeys allow even complex measurement tasks to be performed easily. Parameters such as frequency and amplitude are entered by means of dedicated hardkeys and unit keys.

… through innovative solutions

Innovative solutions …

Optimum dynamic range

Featuring the lowest displayed average noise level in its class (DANL <−145 dBm at 10 Hz RBW), the R&S®FSP measures even small signals accurately without using preamplifiers that reduce dynamic range. Together with the high intercept point, this yields an intermodulation-free range of typ. 100 dB – yet another record among medium-class analyzers.


## Ultra-low measurement uncertainty

In the vital frequency range below 3 GHz, the R&S®FSP is outstanding for its ultra-low measurement uncertainty. The total measurement uncertainty is less than 0.5 dB. Due to this excellent value, the use of power meters in routine lab applications very often becomes superfluous and may greater tolerances are possible for DUTs.

RMS detector

The unique RMS detector measures modern, noise-like communication signals with optimal repeatability and stability. As there are neither correction factors nor the typical errors caused by averaging of logarithmic trace data, the correct average power is displayed with high stability for all signal types – almost like in measurements with a thermal power meter.
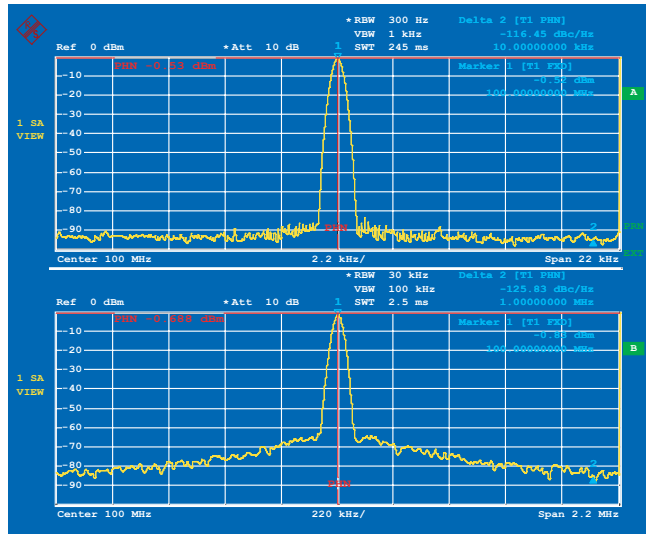
Noise figure measurements

Owing to its excellent display linearity, the R&S®FSP is also ideal for noise figure measurements. The optional Noise Measurement Software R&S®FS-K30 enhances the R&S®FSP to form a noise measurement system offering analyzer-specific advantages (see data sheet PD 0758.0839.32).
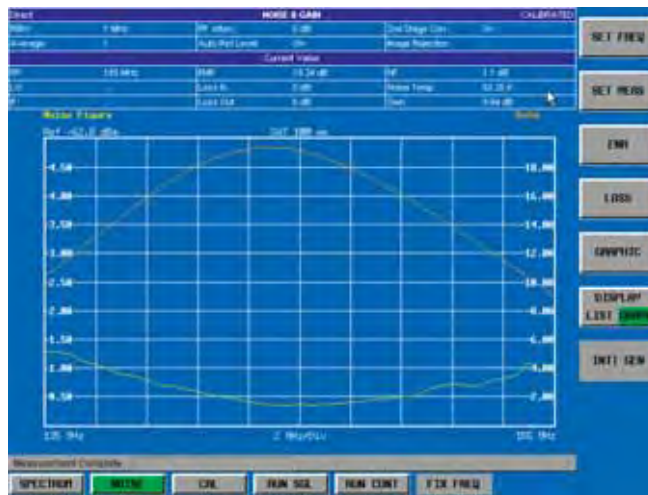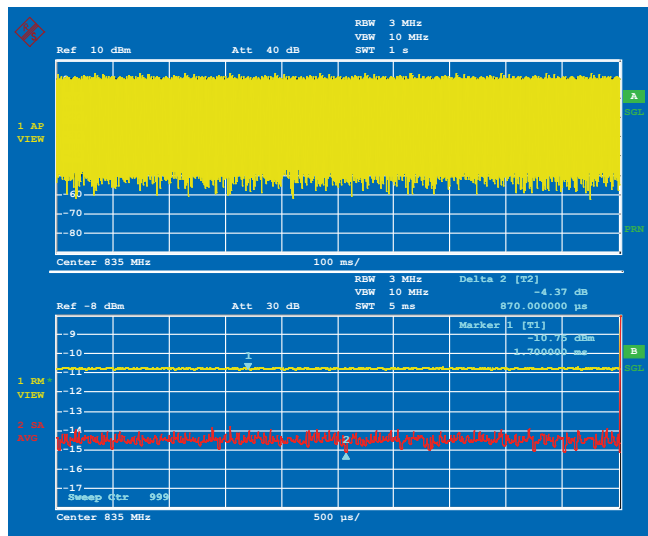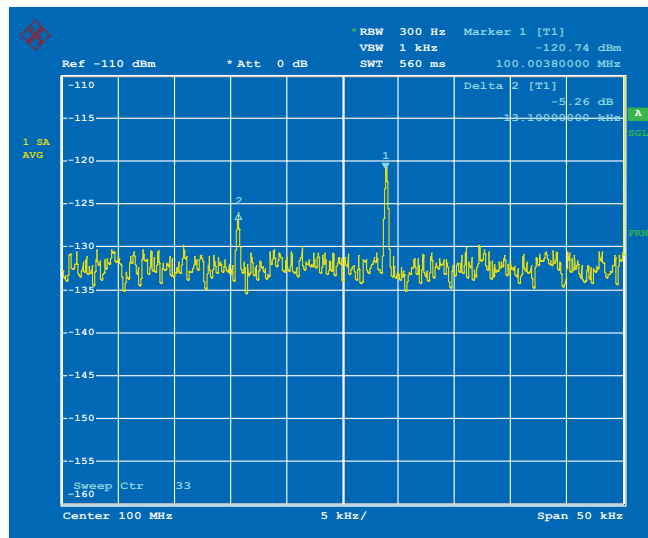
*Noise figure measurement with Noise Measurement Software R&S® FS-K30.*

Phase noise

The low phase noise of the R&S®FSP makes it suitable for demanding measurement tasks both in the vicinity of the carrier (typ. −113 dBc (1 Hz) at 10 kHz) and far from the carrier (typ. −125 dBc (1 Hz) at 1 MHz). The R&S®FSP is thus optimally equipped for performing spectral analysis and ACPR measurements on narrowband systems such as IS136 or PDC as well as on wideband systems such as IS95 or WCDMA. Phase Noise Measurement Software R&S®FS-K4 enhances the Spectrum Analyzer R&S®FSP to form a phase noise tester.

CCDF analysis

The R&S®FSP is the first spectrum analyzer to offer statistical analysis of signals by means of the complementary cumulative distribution function (CCDF) as standard and at an impressively high speed. The R&S®FSP furnishes in only 250 ms the exact CCDF characteristic, average and peak power as well as the crest factor covering 1 million measured values.
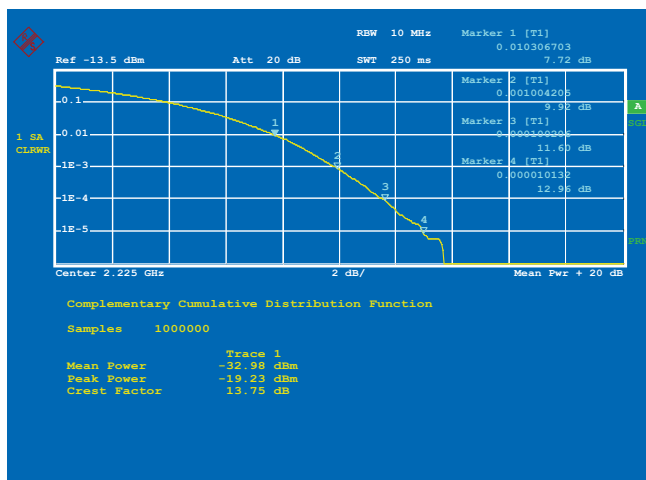
ACPR measurements

Adjacent-channel power ratio (ACPR) measurements, which many mobile radio standards stipulate for components and devices, are implemented in the R&S®FSP by means of automatic test routines. All settings, measurements and filters required for a selected standard are activated at a keystroke. In addition to a large number of preprogrammed standards, the channel width and channel spacing can be individually selected. Owing to the excellent dynamic range, lowest phase noise in its class and the RMS detector, the R&S®FSP sets the standard in the medium class also for ACPR measurements.

Phase noise measurement with the R&S®FSP.

CCDF of a WCDMA signal.

*Preprogrammed standards for ACP measurements.*

… for research & development

Innovative solutions …

High measurement speed

With 100 measurements/s in manual operation, a minimum sweep time of 2.5 ms and 1 µs zero span as standard, the R&S®FSP is ideal for time-critical applications. The highly selective, fast-sweep digital filters featuring "analog" response allow measurements on pulsed signals as well as the use of the built-in frequency counter.

The R&S®FSP comes standard with different filter types for digital resolution bandwidths up to 100 kHz such as Gaussian filter, raised root cosine (RRC) filter and steep-sided channel filters. Up to a resolution bandwidth of 30 kHz, fast Fourier transform (FFT) is available in addition. In the analyzer mode, the Gaussian filters have the advantage of high sweep speed plus excellent resolution. At high span/RBW ratios, measurements using FFT can be as much as 300 times faster than measurements with digital filters.
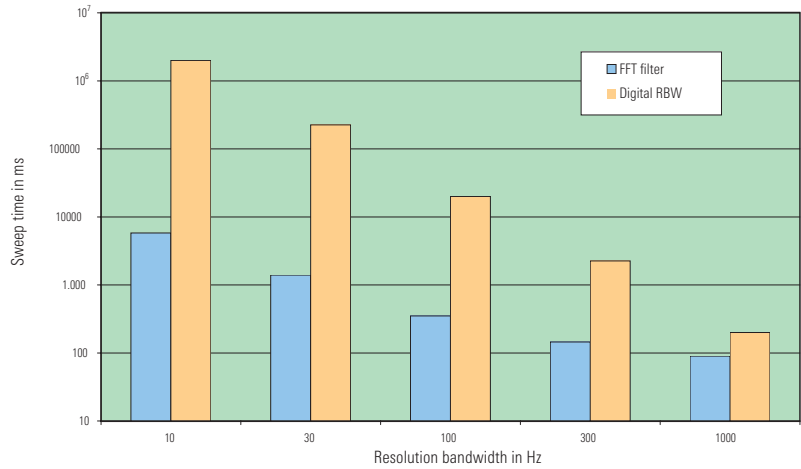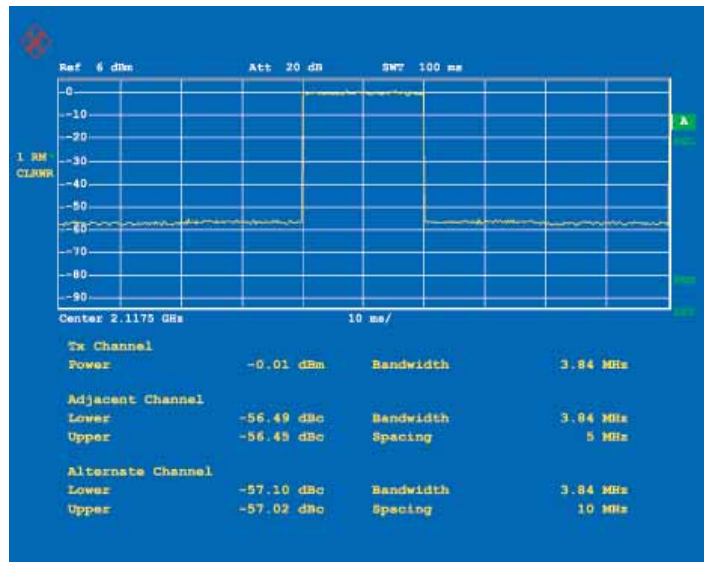

Comparison of sweep times for 200 kHz span using digital filters or FFT.
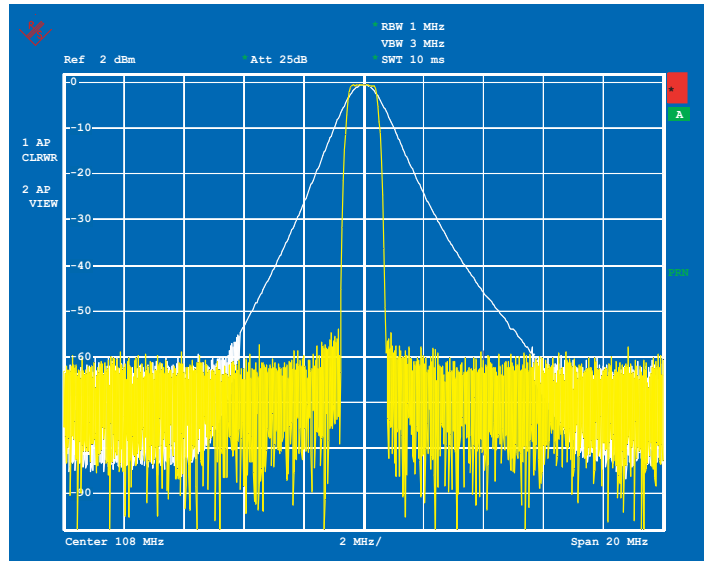
Comparison of 1 MHz channel filter and normal 1 MHz resolution filter.

Measurement of adjacent-channel power in time domain: FAST ACP.

Some mobile radio standards such as TETRA and IS136 require RRC filters for power measurement, a type of filter already included in the R&S®FSP. In addition, the R&S®FSP provides channel filters for other analog and digital methods, e.g. cdmaOne, AM/FM radio and ETS 300 113. Adjacent-channel power due to switching can also be measured using the channel filters. For the common mobile radio standards, the R&S®FSP is equipped with test routines (fast ACP) that allow the adjacent-channel power in the time domain to be determined, which reduces measurement time and increases reproducibility.

55 measurements per second on GPIB interface

The high-speed GPIB interface enables up to 55 measurements/s including trace data transfer of 501 test points with the display switched off. In the zero span mode, 80 measurements/s are possible. This characteristic makes the R&S®FSP by far the fastest spectrum analyzer on the GPIB interface. Valuable time can be saved in production, boosting throughput enormously. The R&S®FSP thus supports you in getting your products more cost-effective on the market.

0.2 dB maximum linearity uncertainty

All modern mobile radio systems achieve high spectral efficiency through precise control of transmitter output power or other means. The correct functioning of gain control, which may be as much as −70 dB depending on the system, is checked against the nominal value in a large number of individual measurements.

Featuring a maximum linearity uncertainty of only 0.2 dB and fast power measurement routines especially for digitally modulated signals, the R&S®FSP is the ideal choice wherever the reduction of the test time and the number of rejects is of primary importance.

0.5 dB total measurement uncertainty

Measurement uncertainty can be split into the part from the instrument and that introduced by the test setup. With lower uncertainty of the spectrum analyzer, greater tolerances can be allowed for the test setup. If the lower uncertainty of the analyzer is utilized to allow for higher DUT tolerances, the result will be a marked reduction of manufacturing rejects – an advantage that pays off immediately. With a total measurement uncertainty of 0.5 dB, the R&S®FSP undisputedly ranks at the top, way ahead of other medium-class analyzers.

	Sweeps/s Span 10 MHz, sweep time 2.5 ms	Sweeps/s Span 0 Hz, sweep time 100 µs
Binary IEEE 754 format	55	80

Measurement speed on GPIB interface, with transfer of trace data.
Settings: DISPLAY OFF, DEFAULT COUPLING, SINGLE TRACE, 501 POINTS.
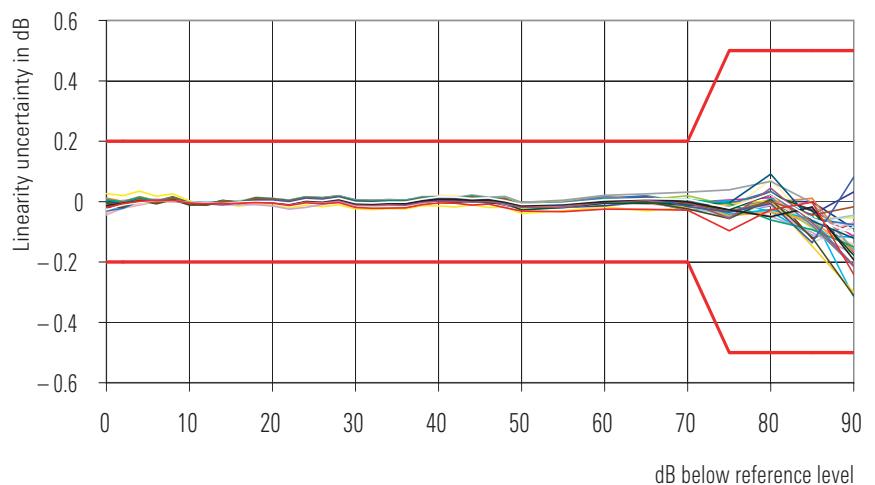
Display linearity with ≤ 100 kHz resolution bandwidth (measurement on 30 devices).

… for production

Innovative solutions …

Measurement routines
TOI, OBW …

The R&S®FSP offers fast routines for a
multitude of typical measurement tasks,
which make result postprocessing super-
fluous by supplying the desired data
directly:

◆ Determination of TOI
◆ Occupied bandwidth (OBW)
◆ Burst power with peak, average and
   RMS indication as well as standard
   deviation
◆ Modulation depth of AM signals
◆ Phase noise
◆ Bandwidth marker

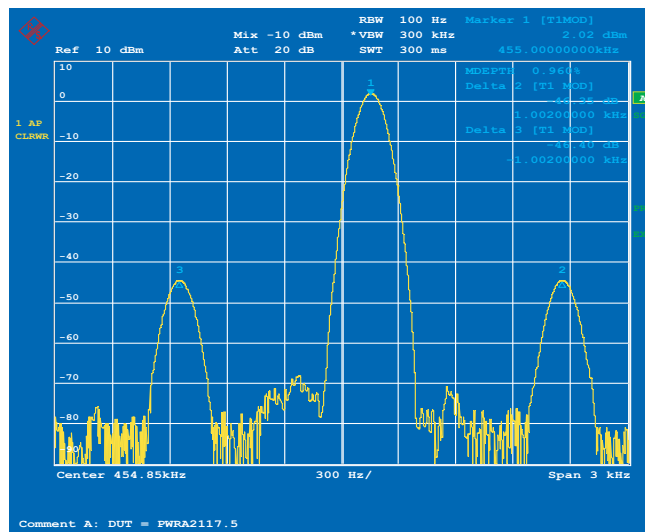Of course these functions can also be
used via the fast GPIB interface.
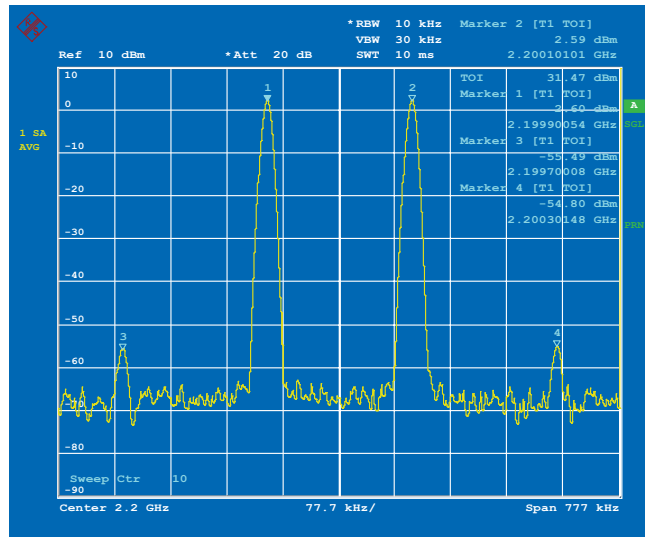
*Measurement
of TOI.*
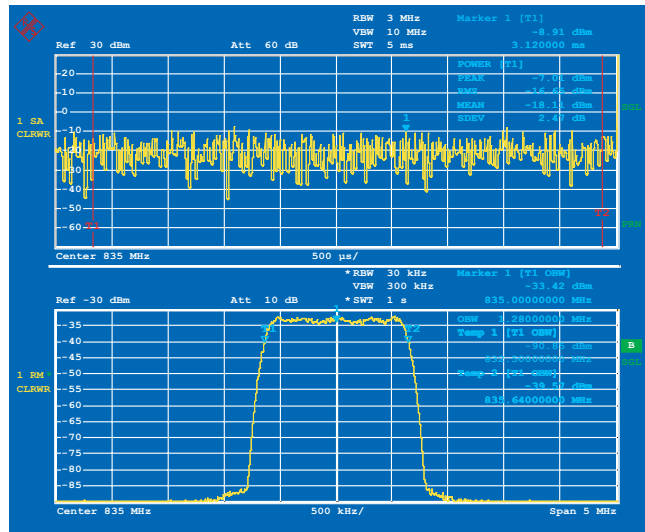
*Measurement of
burst power (top).*

*Determination of
OBW (bottom).*

*Measurement of
modulation depth
of AM signal.*

Input command

SENSE:LIST:POW
100MHz,-0dBm,10dB,10dB,NORM,1MHz,3MHz,434us,0,
200MHz,-20dBm,10dB,0dB,NORM,30kHz,100kHz,1ms,0,
300MHz,-20dBm,10dB,0dB,NORM,30kHz,100kHz,1ms,0;

Output FSP
-28.3,
-30.6,
-38.1

Remote control of the R&S® FSP via IEC/IEEE bus in list mode cuts down on measurement time.

List mode

In the List mode, the user only has to enter a few IEC/IEEE bus commands to perform measurements on up to 100 frequencies with different instrument set-ups in each case. A single command configures the list, and frequency, bandwidths, measurement time, reference level and RF attenuation can be set independently of each other. The SENSE:LIST:POWER:RESULT? query, for example, simultaneously transfers all measurement results to the process controller after the list has been processed. This feature reduces the time required for transfer via the IEC/IEEE bus. In conjunction with the very high measurement speed of the R&S® FSP, it also allows the generation of time-saving test routines in production applications.

The optional Trigger Port R&S® FSP-B28 allows idle times between the different settings to be minimized.

Electronic attenuator for high production throughput

The optional Electronic Attenuator R&S® FSP-B25 supplements the standard mechanical attenuator and provides a wear-and-tear-free setting range of 30 dB in 5 dB steps. The option does away with frequent switching of the mechanical attenuator as required for high throughput in production and so increases the availability and reliability of the measurement equipment. For example, the limit of 10^7 switching operations, which is typical of mechanical attenuators, already means a breakdown after approx. 6 months at 1.5 switching operations/s whereas the Electronic Attenuator R&S® FSP-B25 can be switched any number of times without impairing the specifications.

The integrated switchable 20 dB preamplifier allows high-sensitivity measurements in the useful frequency range from 10 MHz to 7000 MHz.

LAN interface

With the aid of the optional LAN Interface R&S® FSP-B16, the R&S® FSP can be connected to common networks such as 100Base-T so that functions such as file logging on network drives or documentation of measurement results via a network printer are available. In addition, the R&S® FSP can be remote-controlled via LAN), which is especially easy with the Windows XP Remote Desktop function. This yields a clear speed advantage over the IEC/IEEE bus, in particular for the transmission of large data blocks.

859x/8566-compatible IEC/IEEE bus command set

In many applications, existing test software is to be used in automatic test systems alongside new devices. For this reason, the R&S® FSP comes standard with an IEC/IEEE bus command set that is compatible not only with the R&S® FSEx/FSIQ family but also with the spectrum analyzers of the 859x/8566 series.

Thus importance was placed on maximum compatibility in order to minimize the necessity for changes.

◆ Approx. 175 commands in IEEE 488-2 format (incl. CF, AT, ST)
◆ The most important commands in IEEE 488-1 format (8566A, for exclusive use only)
◆ Selectable presets
◆ Selectable trace format

8560E to 8565E, 8566A/B, 8568A/B and 8594E are supported. The IEC/IEEE bus commands in IEEE 488-2 format can be used together with the R&S® FSP command set, making it possible to enhance and complete available software by using the innovative instrument functions of the R&S® FSP (such as list mode, channel filters) without having to redesign the test software.

… for production

Innovative solutions …

GSM/EDGE measurements

Application Firmware R&S®FS-K5 allows the user to perform the most important GSM and EDGE transmitter measurements at a keystroke:

◆ Phase/frequency error (GSM)
◆ Modulation accuracy (EDGE) including 95:th percentile and origin offset suppression
◆ Power versus time
◆ Carrier power
◆ Modulation spectrum
◆ Transient spectrum
◆ Spurious emissions
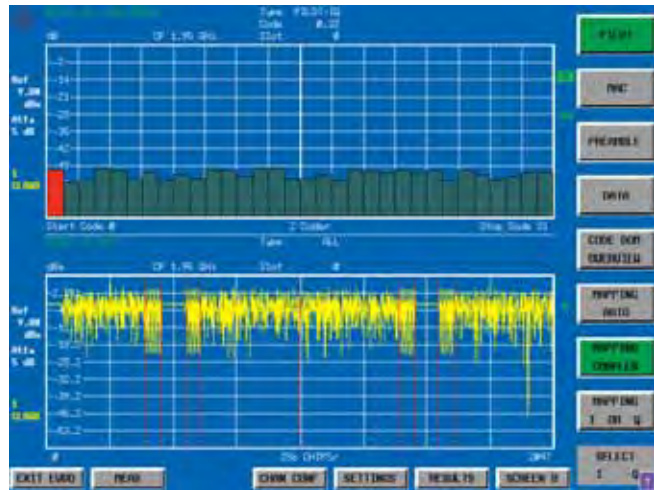
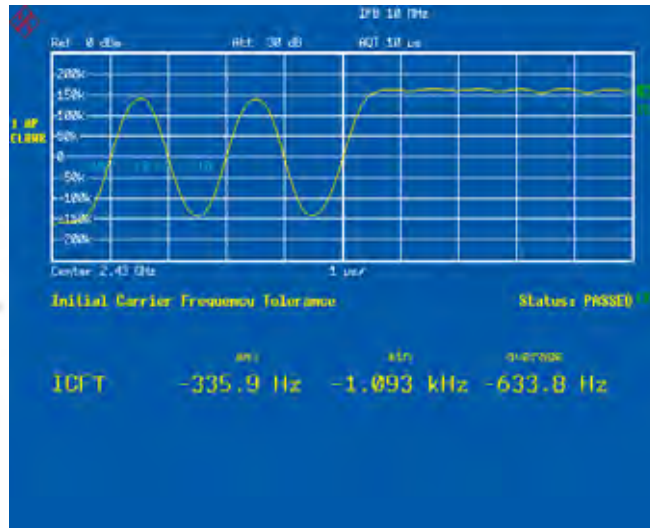*Error power and power versus chip for 1×EV-DO signal, measured with R&S®FS-K84*

| Type	Designation and/or application	Additionally required options in the R&S®FSP
R&S®FS-K4	Phase noise measurements (Windows software)	
R&S®FS-K5	Modulation and spectrum measurements on GSM/EDGE base station and mobile signals	
R&S®FS-K7	AM/FM/φM measurement demodulator for general applications	
R&S®FS-K8	*Bluetooth* transmitter measurements	
R&S®FS-K9	Power sensor measurements	supports R&S®NRP-Z11/-Z21/-Z22/-Z23/-Z24/-Z51/-Z55/-Z91 with R&S®NRP-Z4 USB adapter
R&S®FS-K72	Modulation and code domain power measurements in accordance with 3GPP TS 24.141 on base station signals (Node B)	R&S®FSP-B15 and R&S®FSP-B70
R&S®FS-K73	Modulation and code domain power measurements in accordance with 3GPP TS 25.121 on mobile station signals (UE)	R&S®FSP-B15: slot-based measurements R&S®FSP-B70: additionally required for frame-based measurements
R&S®FS-K74	HSDPA extension for R&S®FS-K72	
R&S®FS-K76	Modulation and code domain power measurements on TD-SCDMA base station signals	
R&S®FS-K77	Modulation and code domain power measurements on TD-SCDMA mobile station signals (UE)	
R&S®FS-K82	Modulation and code domain power measurements in accordance with CDMA2000®/1xEV-DV on base station signals (also for measurements on IS95/cdmaOne signals)	
R&S®FS-K83	Modulation and code domain power measurements on CDMA2000®/1xEV-DV mobile station signals (UE)	
R&S®FS-K84	Modulation and code domain power measurements on 1xEV-DO base station signals	
R&S®FS-K85	Modulation and code domain power measurements on 1xEV-DO mobile station signals (UE)	
R&S®FSP-K90	WLAN 802.11a Application Firmware	
R&S®FS-K30	Noise figure measurements (application firmware), functions similar to R&S®FS-K3, but remote-controllable	Preamplifier recommended, e.g. R&S®FSP-B25 for R&S®FSP3/7

Bluetooth® signal measurements

◆ Enhanced measurement functionality in line with *Bluetooth* RF Test Specification (*Bluetooth* SIG) Rev. 0.91
◆ Measurement functions
  – Output power
  – Adjacent channel power (ACP)
  – Modulation characteristics
  – Initial carrier frequency tolerance (ICTF)
  – Carrier frequency drift
◆ Simultaneous display of traces and all numerical measurement results
◆ Automatic limit value monitoring
◆ Ideal for use in development and production of *Bluetooth* modules

Standard 3GPP modulation and code domain power measurements

◆ Adds measurement functions in line with the 3GPP specifications for the FDD mode
◆ For BTS/Node B signals: Application Firmware R&S®FS-K72
◆ For CDMA2000®/3GPP3 base station signals: Application Firmware R&S®FS-K82/-K84
◆ For UE signals: Application Firmware R&S®FS-K73
◆ High measurement speed of 4 s/measurement
◆ Code domain power and CPICH power
◆ Code domain power and rho (CDMA2000®/3GPP2)
◆ EVM and PCDE
◆ Code domain power versus slot
◆ EVM/code channel
◆ Spectrum emission mask

Measurement of initial carrier frequency tolerance of Bluetooth signal with R&S®FS-K8.
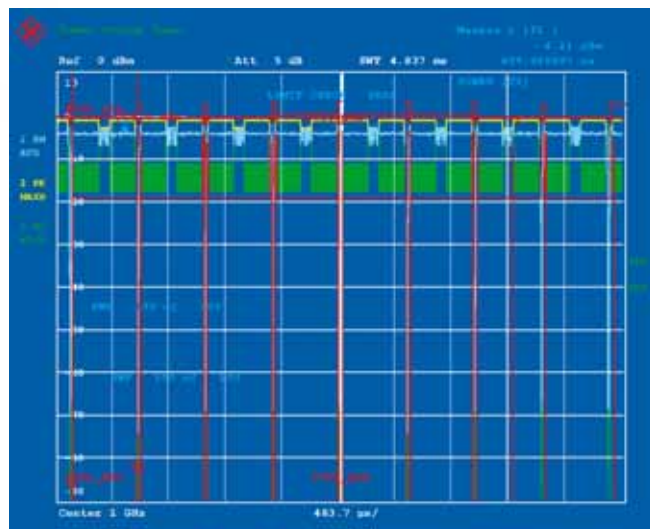
Simultaneous power versus time measurement on eight slots of EDGE signal.
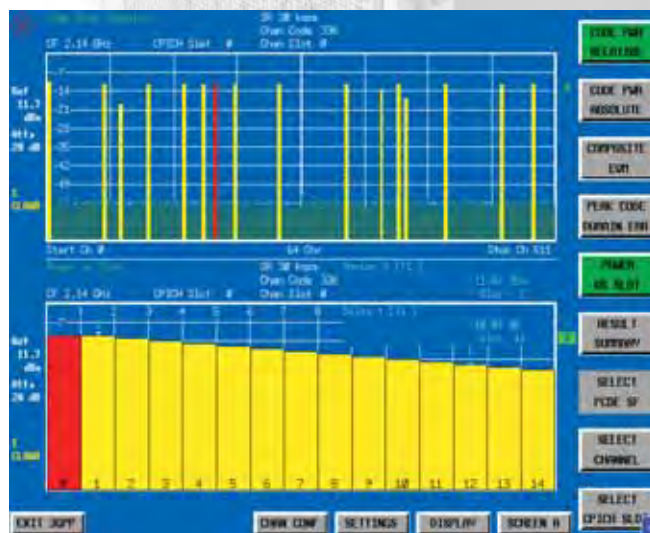
Code domain power measurement versus slot.

Innovative solutions …

Scalar network analysis in wide dynamic range and at any frequency offset

The optional Internal Tracking Generator R&S®FSP-B9 up to 3 GHz and External Generator Control R&S®FSP-B10 extend the R&S®FSP spectrum analyzers to scalar network analyzer functionality. The gain, frequency response, insertion and return loss are measured using a selective method in a wide dynamic range without any influence from the harmonics or spurious of the generator. The Internal Tracking Generator R&S®FSP-B9 can be used in all R&S®FSP models and covers the frequency range from 9 kHz to 3 GHz. A frequency offset of ±150 MHz can be set for measurements on frequency-converting modules. The tracking generator can be broadband-modulated by an external I/Q baseband signal.

The R&S®FSP-B10 option uses commercial RF signal generators as its external tracking source that can be controlled via the GPIB or a TTL bus. With this option the functionality of the internal tracking generator can be utilized:

◆ Normalization with interpolation also for reflection measurements with open and short
◆ Automatic bandwidth measurement with "n dB down" function
◆ Tolerance lines with PASS/FAIL assessment

The R&S®FSP-B6 option makes the Spectrum Analyzers R&S®FSP suitable for analog TV measurement applications and provides a settable RF level trigger for measurements on pulsed RF signals that are used in TDMA transmission systems.
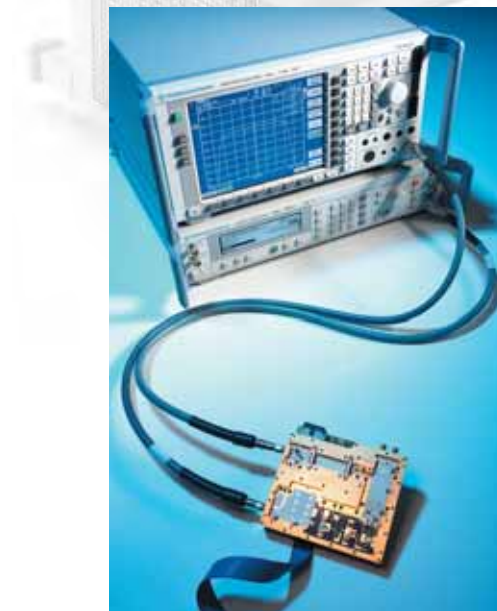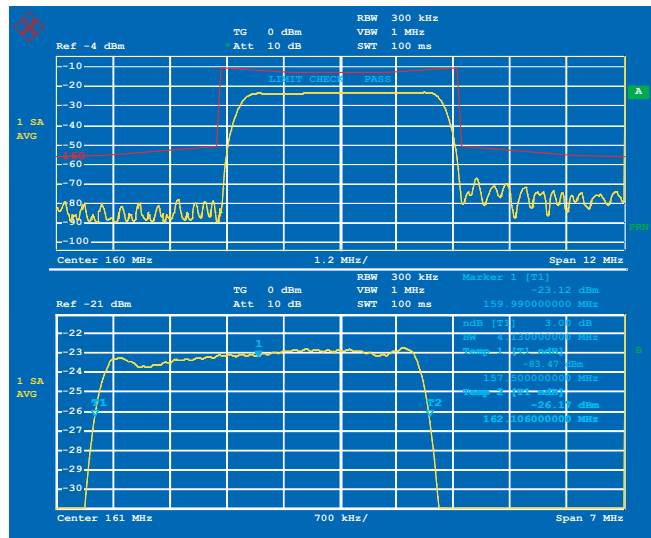
… through custom-made options

Complete measurement solutions …

Environmental compatibility

◆ Fast and easy disassembly
◆ Small number of materials
◆ Compatibility of materials
◆ Easy identification of substances through appropriate marking (plastics)
◆ Recycling of enclosure

DESIGN
AWARD
WINNER
1 9 9 8
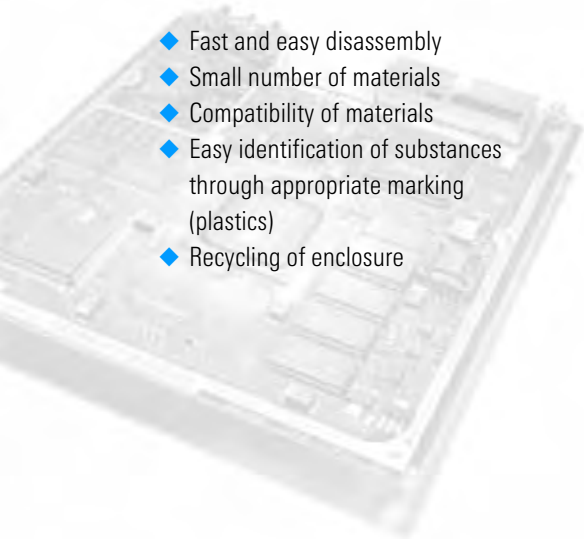
Open for the PC world …

◆ PC-compatible screenshots, no conversion software needed
◆ Windows printer support
◆ USB interface for connecting PC peripherals
◆ LabWindows driver
◆ LabView driver
◆ SCPI-compatible
◆ R&S® FSE/FSIQ-compatible GPIB command set
◆ Customized training
◆ Solution-oriented consulting
◆ Application notes
◆ 2-year calibration cycle

… and much more

… no guessing games

Specifications in brief of the R&S®FSP family

	R&S®FSP3	R&S®FSP7	R&S®FSP13	R&S®FSP30	R&S®FSP40
Frequency range	9 kHz to 3 GHz	9 kHz to 7 GHz	9 kHz to 13 GHz	9 kHz to 30 GHz	9 kHz to 40 GHz
Frequency resolution	aging 1×10^{-6}/year, with option R&S®FSP-B4: 1×10^{-7}				
Spectral purity					
Phase noise	typ. −113 dBc (1 Hz) in 10 Hz carrier offset				
Residual FM	typ. 3 Hz				
Sweep time					
Span >10 Hz	2.5 ms to 16000 s				
Span 0 Hz (zero span)	1 µs to 16000 s				
Resolution bandwidths	10 Hz to 10 MHz, FFT filter: 1 Hz to 30 kHz, channel filter, EMI bandwidths				
Video bandwidths	1 Hz to 10 MHz				
Display range	DANL up to +30 dBm				
Displayed average noise level					
1 GHz	typ. −145 dBm	typ. −145 dBm	typ. −145 dBm	typ. −145 dBm	typ. −145 dBm
7 GHz	–	typ. −143 dBm	typ. −145 dBm	typ. −145 dBm	typ. −145 dBm
13 GHz	–	–	typ. −138 dBm	typ. −138 dBm	typ. −138 dBm
30 GHz	–	–	–	typ. −123 dBm	typ. −128 dBm
40 GHz	–	–	–	–	typ. −120 dBm
Displayed average noise level with optional on (option R&S®FSP-B25 electronic attenuator on)	−152 dBm	−152 dBm	–	–	–
Total measurement uncertainty, f < 3 GHz	0.5 dB				
Linear level display	0.2 dB (0 dB to −70 dB)				

Ordering information

Order designation	Type	Order No.
Spectrum Analyzer 9 kHz to 3 GHz	R&S®FSP3	1164.4391.03
Spectrum Analyzer 9 kHz to 7 GHz	R&S®FSP7	1164.4391.07
Spectrum Analyzer 9 kHz to 13.6 GHz	R&S®FSP13	1164.4391.13
Spectrum Analyzer 9 kHz to 30 GHz	R&S®FSP30	1164.4391.30
Spectrum Analyzer 9 kHz to 40 GHz	R&S®FSP40	1164.4391.40
Accessories supplied		
Power cable, compact manual, CD-ROM with operating manual and service manual. R&S®FSP30: test port adapter 3.5 mm female (1021.0512.00) and N female (1021.0535.00) R&S®FSP40: test port adapter K female (1036.4770.00) and N female (1036.4777.00)		

Related data sheets

Title	Order No.
TV Trigger/RF Power Trigger R&S®FSP-B6	PD 0757.6433
Phase Noise Measurement Software R&S®FSE-K4	PD 0757.4201
GSM/EDGE Application Firmware R&S®FS-K5 for R&S®FSP	PD 0757.6185
FM Measurement Demodulator R&S®FS-K7	PD 0757.6685
Bluetooth Application Firmware R&S®FS-K8	PD 0757.7730
Application Firmware for Noise Figure and Gain Measurements R&S®FS-K30 for R&S®FSP/FSU/FSQ	PD 0758.0839.32
WCDMA 3GPP Application Firmware R&S®FS-K72/-K73	PD 0757.7246
CDMA2000® Base Station Test Application Firmware 1xEV-DO Base Station Test Application Firmware R&S®FS-K82/-K84	PD 0757.7675
WLAN 802.11a Application Firmware R&S®FSP-K90	PD 0758.0916.22
R&S®FSP Specifications	PD 0757.8565

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The Spectrum Analyzers R&S®FSP …

◆ Unparalleled range of functions
◆ Highest measurement speed
◆ Maximum precision

With the R&S®FSP family, the well-known advantages of the Rohde&Schwarz high-end analyzers have been systematically integrated into the medium-class analyzers. The R&S®FSP sets the standard for the medium-class regarding the vital criteria of functionality, measurement speed and accuracy. The use of innovative techniques such as a highly integrated front-end and fully digital signal processing in the back-end, together with ASICs developed by Rohde & Schwarz, has resulted in a product that features top-class specifications and high reliability.

… the medium-class standard

A wealth of functions …

Function/Option	Standard	Option
Highly selective digital filters from 10 Hz to 100 kHz	●	
Fast FFT filters from 1 Hz to 30 kHz	●	
Channel filter 100 Hz to 5 MHz	●	
QP detector & EMI bandwidths 200 Hz, 9 kHz, 120 kHz	●	
2.5 ms sweep time in frequency domain	●	
1 µs sweep time in time domain	●	
Time-selective spectrum analysis with gating	●	
GPIB interface, IEEE 488.2	●	
USB interface	●	
RS-232-C serial interface, 9-pin D-sub	●	
VGA output, 15-pin D-sub	●	
PC-compatible screenshots on floppy disk or hard disk	●	
Measurement speed manually up to 100 measurements/s	●	
Measurement speed GPIB up to 80 measurements/s	●	
SCPI-compatible GPIB command set	●	
R&S®FSE/FSIQ-compatible GPIB command set	●	
856XA/B-compatible command set	●	
Fast ACP measurements in time domain	●	
CCDF measurement functions	●	
RMS detector with 100 dB dynamic range	●	
2-year calibration interval[1]	●	
Cabinet for portable use	–	B1
AM/FM audio demodulator	–	B3
OCXO reference frequency	–	B4
TV trigger/RF power trigger	–	B6
Tracking generator	–	B9
External generator control	–	B10
Pulse calibrator	–	B15
LAN interface	–	B16
Extended environmental specification	–	B20
LO/IF ports for external mixers	–	B21
Electronic attenuator	–	B25
Trigger port	–	B28
Frequency range extension 20 Hz	–	B29
DC power supply	–	B30
Battery pack/spare battery pack	–	B31/B32
Demodulation hardware memory extension	–	B70

[1] Except reference frequency.

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