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Test & Measurement

- sales
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Complimentary Reference Material

This PDF has been made available as a complimentary service for you to assist in evaluating this model for your testing requirements.

TMG offers a wide range of test equipment solutions, from renting short to long term, buying refurbished and purchasing new. Financing options, such as Financial Rental, and Leasing are also available on application.

TMG will assist if you are unsure whether this model will suit your requirements.

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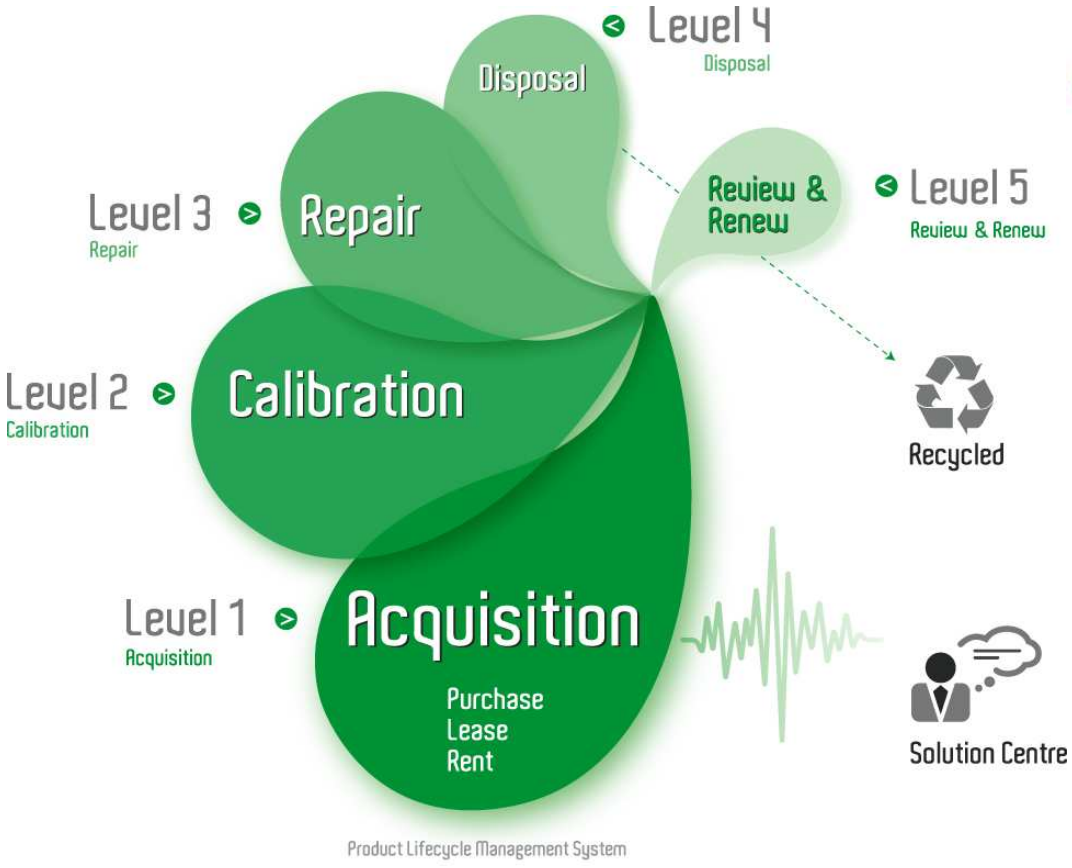


Version 03.00

January 2007

R&S®FSQ Signal Analyzer

Signal analysis with the dynamic range of a high-end spectrum analyzer and a demodulation bandwidth of up to 120 MHz

- Up to 3.6 GHz, 8 GHz, 26.5 GHz and 40 GHz
- 28 MHz I/Q demodulation bandwidth
- Optional 120 MHz I/Q demodulation bandwidth
- 16 Msample I and Q memory, extendable up to 705 Msample
- I/Q data extraction, e.g. for MCPA adjustment
- Spectrum and code domain power measurements for
  - 3GPP FDD/HSDPA
  - CDMA2000®
  - CDMA2000® 1xEV-DV
  - CDMA2000® 1xEV-DO
  - TD-SCDMA
- Spectrum and modulation measurements for
  - GSM/EDGE
  - Bluetooth®
  - WLAN
  - WiMAX
- General vector signal analysis
- Dynamic range of a high-end spectrum analyzer
  - TOI: typ. +25 dBm
  - 1 dB compression: +13 dBm
  - 84 dB ACLR/3GPP with noise correction
- Versatile resolution filters: Gaussian, FFT, channel, RRC
- Full choice of detectors
- Baseband input

LXI conformant

ROHDE&SCHWARZ

Future-proof performance and bandwidth

Spectrum and signal analysis in a single instrument

Future transmission methods in mobile radio and related fields call for wider transmission bandwidths to handle increasing data throughput. Even today, multiple carriers of a GSM or 3GPP base station are often boosted in common power output stages. This reduces the technical effort and costs on the one hand, but increases the bandwidth to be transmitted on the other. In both cases, analysis bandwidths exceeding those provided by present-day spectrum analyzers are required in development and production, while at the same time the dynamic range must satisfy stringent requirements.

The R&S®FSQ combines the outstanding spectrum analyzer features and functions of the R&S®FSU with a demodulation and analysis bandwidth that has been enhanced to 120 MHz. The R&S®FSQ is thus ideal for applications in the development and production of the following:

- Wireless LAN (WLAN)
- 3GPP and GSM-MCPA
- WiMAX

The R&S®FSQ additionally supports measurements on 2G, 2.5G and 3G mobile radio systems when using application firmware such as:

- R&S®FS-K5, GSM/EDGE
- R&S®FS-K72/-K73, 3GPP FDD
- R&S®FS-K74, HSDPA
- R&S®FS-K82/-K83/-K84/-K85, CDMA2000®
- R&S®FS-K76/-K77, TD-SCDMA

The optional I/Q demodulation bandwidth extension to 120 MHz makes the R&S® FSQ fit for future methods requiring high bandwidths.

The operating concept of the R&S®FSQ is identical with that of the R&S®FSU and R&S®FSP Spectrum Analyzers, including the GPIB/IEC commands. These instruments thus offer a uniform platform for a variety of applications.

The R&S®FSQ family

R&S®FSQ3	20 Hz to 3.6 GHz
R&S®FSQ8	20 Hz to 8 GHz
R&S®FSQ26	20 Hz to 26 GHz
R&S®FSQ40	20 Hz to 40 GHz

R&S®FSQ – world champion in spectrum analysis

The R&S®FSQ has the same outstanding RF features as the R&S®FSU Spectrum Analyzer:

- 84 dB ACLR for 3GPP with noise correction
- 77 dB ACLR for 3GPP multicarrier signals (4 adjacent carriers)
- TOI >+20 dBm, typ. +25 dBm
- 1 dB compression +13 dBm
- Displayed average noise level (DANL) –158 dBm (1 Hz bandwidth)
- Phase noise –160 dBc (1 Hz) at 10 MHz carrier offset
- Phase noise –133 dBc (1 Hz) at 10 kHz carrier offset

In addition to broadband demodulation capabilities, the R&S®FSQ provides the dynamic range that is required for multicarrier measurements or the measurement of spurious emissions at base transceiver stations (BTS).

Functionality

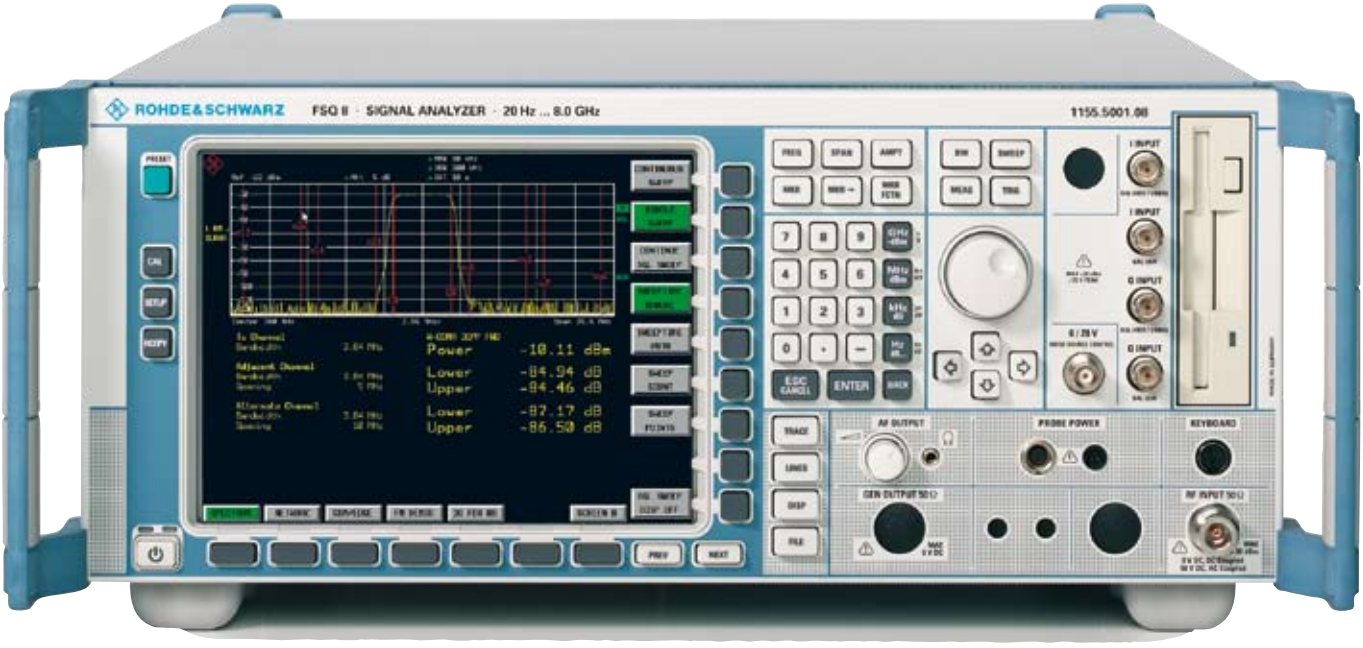
With its wide range of functions, the R&S®FSQ is practically unparalleled on the spectrum analyzer market. Even the base unit comes standard with all important functions.

Highly selective digital filters from 10 Hz to 100 kHz
Fast FFT filters from 1 Hz to 30 kHz
Channel filters from 100 Hz to 5 MHz
RRC filters
1 Hz to 50 MHz resolution bandwidth (RBW)
QP detector and EMI bandwidths 200 Hz, 9 kHz, 120 kHz
2.5 ms sweep time in frequency domain
1 µs sweep time in time domain
Number of measurement points/trace selectable between 155 and 30001
Time-selective spectrum analysis with gating function
GPIB interface, IEEE 488.2
RS-232-C serial interface, 9-pin D-Sub
VGA output, 15-pin D-Sub
PC-compatible screenshots on diskette or hard disk
Up to 80 measurements/s in manual mode
Up to 50/70 measurements/s in GPIB mode
SCPI-compatible GPIB command set
R&S®FSE/R&S®FSIQ-compatible GPIB command set
Fast ACP measurement in time domain
Statistical signal analysis with CCDF function
RMS detector with 100 dB dynamic range
Transducer factor for correcting antenna or cable frequency responses
Harmonic distortion measurement function
Spurious emission measurements with up to 100001 points, in up to 20 segments
Two-year calibration interval[1)]
External reference from 1 MHz to 20 MHz in 1 Hz steps
LAN interface 100BaseT
16 Msample I and Q memory

[1)] Except reference frequency.

Condensed data

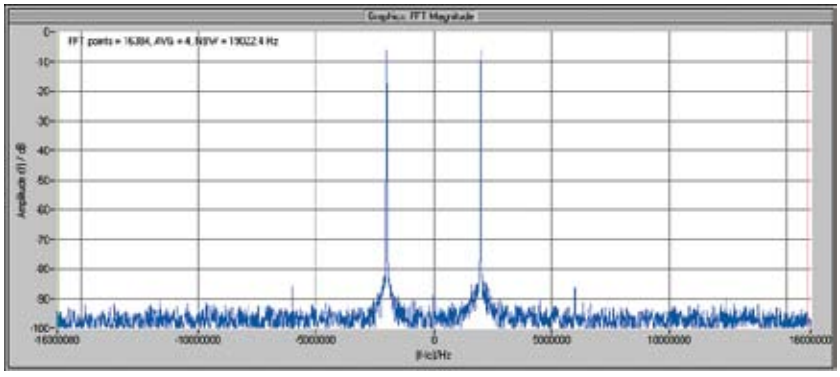
	R&S®FSQ3	R&S®FSQ8	R&S®FSQ26	R&S®FSQ40
Frequency range	20 Hz to 3.6 GHz	20 Hz to 8 GHz	20 Hz to 26.5 GHz	20 Hz to 40 GHz
Reference frequency	aging: 1×10^{-7}/year, with option R&S®FSU-B4: 2×10^{-8}			
Spectral purity				
Phase noise	typ. –133 dBc (1 Hz) at 10 kHz carrier offset			
Distortion	1 Hz			
Sweep time				
Span >10 Hz	2.5 ms to 16000 s			
Span 0 Hz (zero span)	1 µs to 16000 s			
RBW	10 Hz to 50 MHz, FFT filter: 1 Hz to 30 kHz, channel filter, EMI bandwidth			
VBW	1 Hz to 30 MHz			
Display range	DANL to +30 dBm			
DANL (1 Hz RBW)				
1 GHz	typ. –158 dBm	typ. –155 dBm	typ. –156 dBm	typ. –155 dBm
7 GHz	–	typ. –154 dBm	typ. –155 dBm	typ. –153 dBm
13 GHz	–	–	typ. –151 dBm	typ. –151 dBm
26 GHz	–	–	typ. –146 dBm	typ. –147 dBm
40 GHz	–	–	–	typ. –141 dBm
DANL with preamplifier ON (R&S®FSU-B25), 1 GHz, 1 Hz RBW	–162 dBm	–162 dBm	–162 dBm	–162 dBm
DANL with preamplifier ON (R&S®FSU-B23), 26 GHz, 1 Hz RBW	–	–	–150 dBm	–
Trace detectors	max peak, min peak, auto peak, sample, rms, average, quasi peak			
Total measurement uncertainty, f < 3.6 GHz	0.3 dB			
Display linearity	0.1 dB (0 dB to –70 dB)			



Future-proof performance and bandwidth

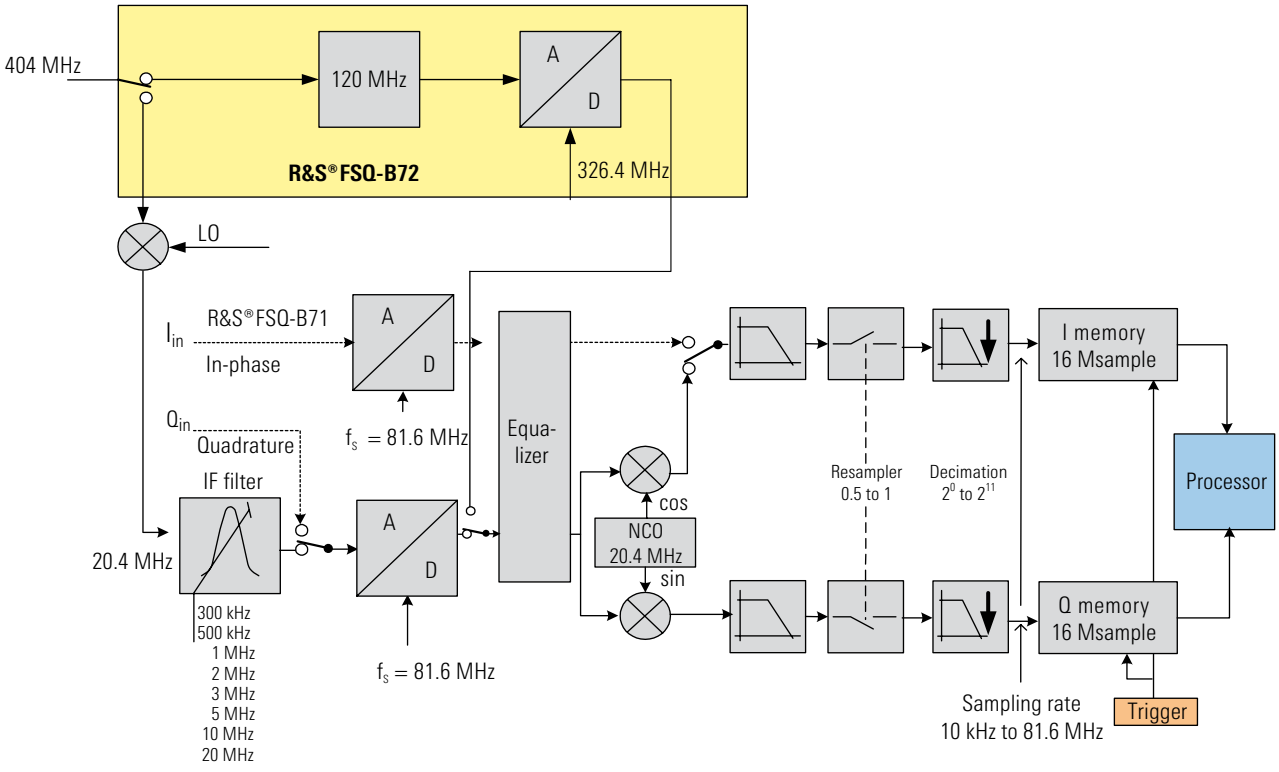
Signal analysis with up to 120 MHz bandwidth

The R&S®FSQ features a newly developed digital back end that benefits from the progress in ADC and ASIC development. Time-consuming evaluation algorithms can be implemented directly in the hardware – a prerequisite for fast measurements and high accuracy.



Intermodulation distortion of I/Q data: a distortion-free transmission range is particularly important for amplifier measurements; the illustration above shows the intermodulation characteristics of the I/Q data of a two-tone signal.

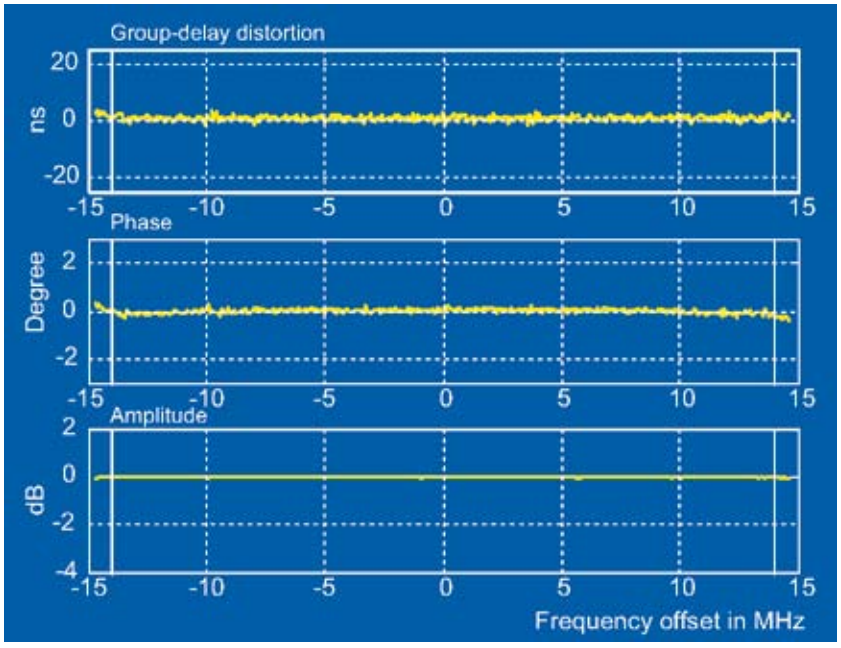
	Standard	With R&S®FSQ-B72
Demodulation bandwidth	28 MHz	120 MHz
Sampling rate, selectable	10 kHz to 81.6 MHz	81.6 MHz to 326.4 MHz
Third-order intermodulation	80 dB	typ. 68 dB



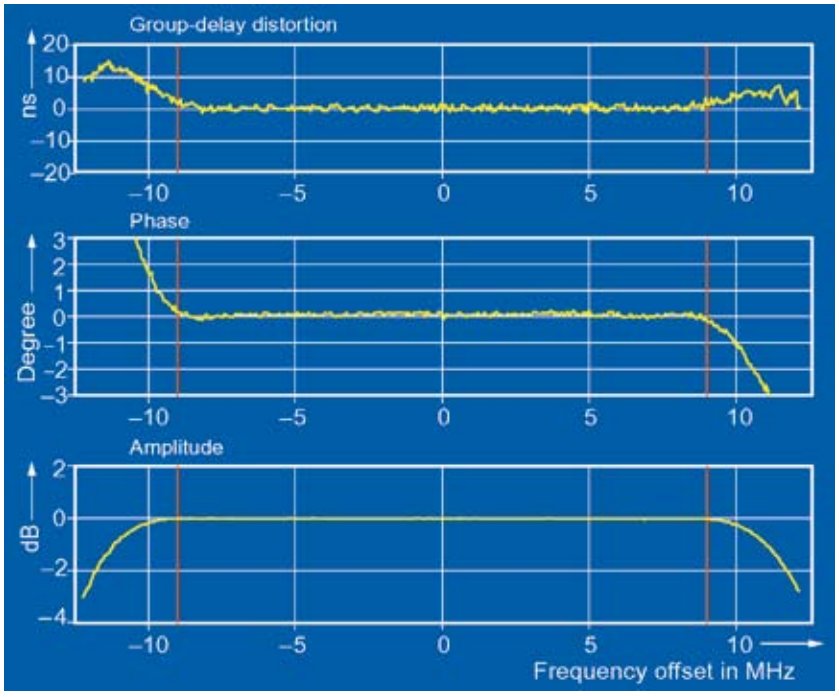
Block diagram of vector signal analysis section in the R&S®FSQ.

The R&S®FSQ determines the linear distortion in the RF and IF paths with the aid of the built-in calibration source and corrects such distortion online using a compensation filter. Moreover, the bandwidth-limiting YIG filter can be switched off in the microwave range at carrier frequencies greater than 3.6 GHz to ensure that even the smallest modulation errors can be measured with high accuracy.

The I/Q data can be transferred to a process controller via either the IEC/IEEE bus interface or the factory-installed LAN interface and then imported into programs such as MATLAB® for further analysis.



Frequency response and group-delay distortion of 50 MHz resolution filter (example).



Frequency response and group-delay distortion of 20 MHz resolution filter (example).

Shorter development cycles through versatile functions …

To handle the wide variety of measurement tasks in product development, an instrument should provide ample functionality and excellent performance in all areas of interest. The R&S®FSQ fully meets these requirements.

Full choice of detectors (Fig. 1) for adaptation to a wide range of signal types:

- RMS
- Auto peak
- Max peak
- Min peak
- Sample
- Average
- Quasi peak (QPK)

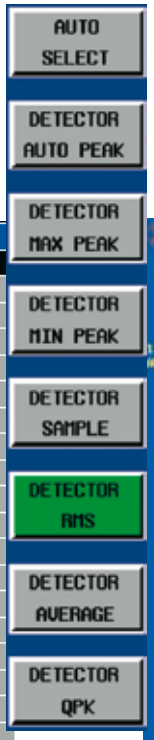
The most versatile resolution filter characteristics and largest bandwidth found in a spectrum analyzer:

- Standard resolution filters from 10 Hz to 50 MHz in steps of 1/2/3/5 sequence
- FFT filters from 1 Hz to 30 kHz
- 32 channel filters with bandwidths from 100 Hz to 5 MHz
- RRC filters for NADC, TETRA and 3GPP
- EMI filters: 200 Hz, 9 kHz, 120 kHz
- Five-pole filter in line with GSM specifications

Full range of analysis functions:

- Time domain power in conjunction with channel or RRC filters turn the R&S®FSQ into a fully-fledged channel power meter (Fig. 2)
- TOI marker (Fig. 3)
- Noise/phase-noise marker
- Versatile channel/adjacent-channel power measurement functions with wide selection of standards; user-configurable (Fig. 4)
- Split-screen mode with selectable settings (Fig. 5)
- CCDF measurement function
- Peak list marker for fast search of all peaks in the set frequency range (search for spurious)
- Multicarrier channel/adjacent channel power measurement function

1



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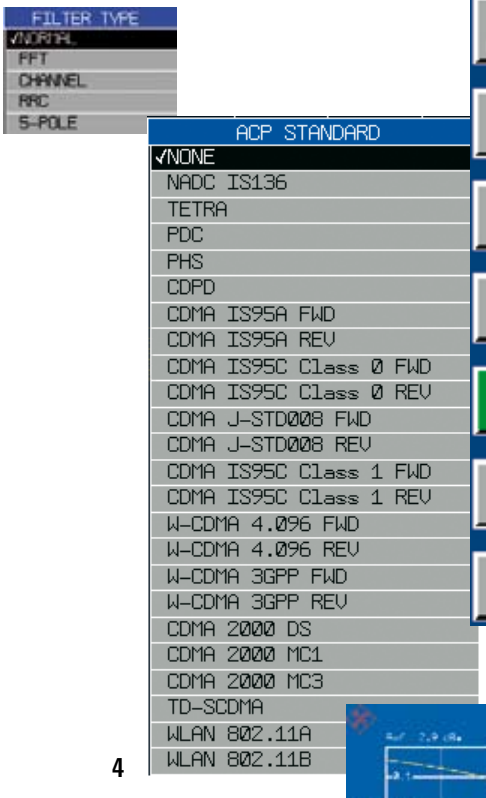

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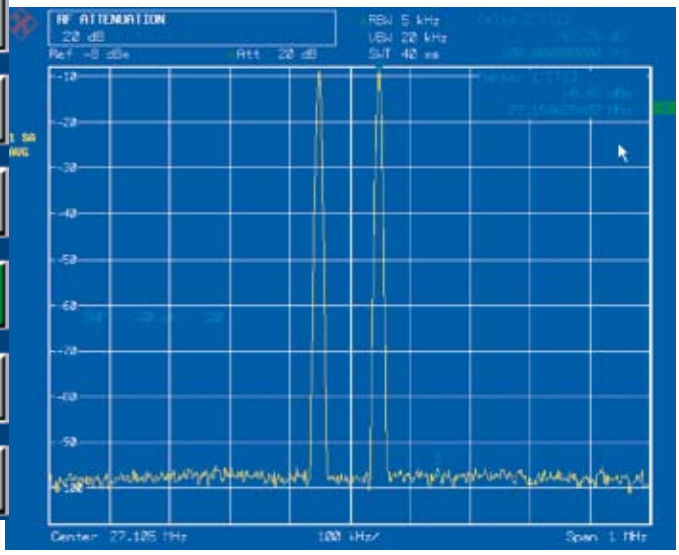

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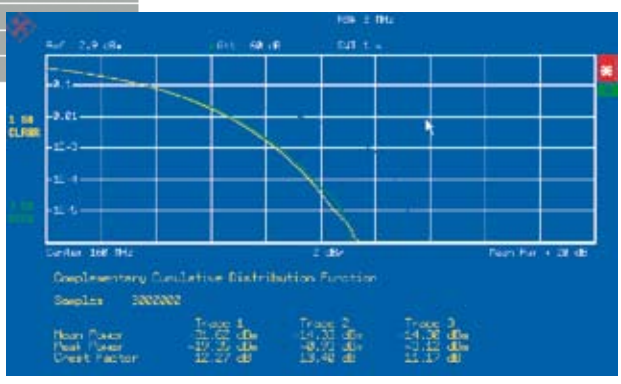


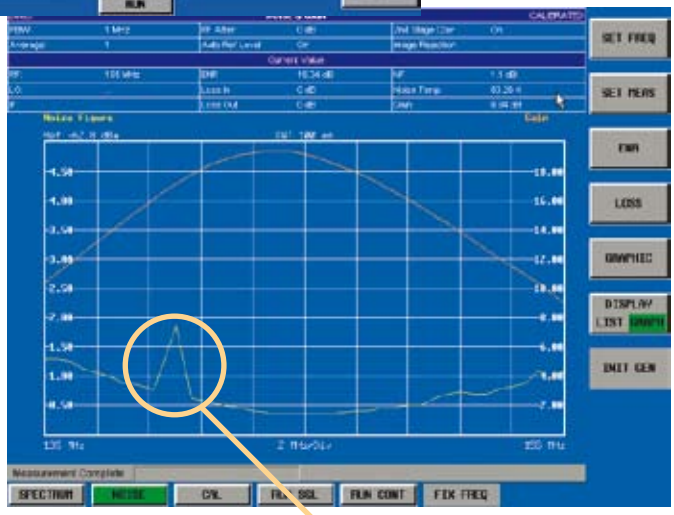
… wide dynamic range and future-proof performance

Whether in synthesizer development or front end design, additional applications expand the R&S®FSQ functionality while ease-of-use is maintained.

The R&S®FS-K40 Application Firmware for Phase Noise Measurement automates measurement over a complete offset frequency range, and determines residual FM from the phase noise characteristic. In conjunction with the extremely low phase noise of the R&S®FSQ, this eliminates in many cases the need for an extra phase noise measurement system that may even be difficult to operate.

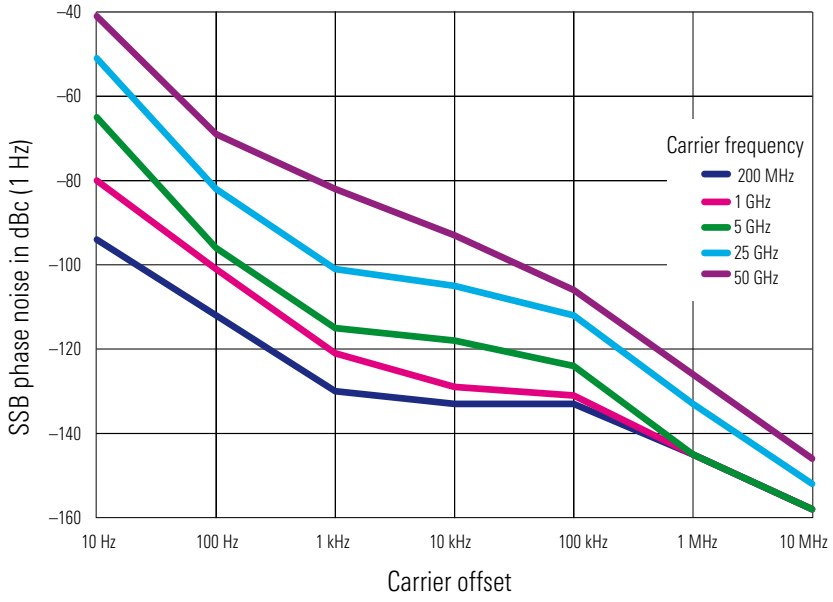
The R&S®FS-K30 Application Firmware for Noise Figure and Gain Measurements is a convenient tool for determining the noise figure of amplifiers and frequency-converting DUTs throughout the frequency range of the R&S®FSQ, thus enabling complete documentation. The high linearity and extremely accurate power measurement routines of the R&S®FSQ provide precise and reproducible results, making a separate noise figure meter unnecessary.

Phase noise measurement using the R&S®FS-K40 Application Firmware.



Noise figure measurement using the R&S®FS-K30 Application Firmware.

Fast and simple analysis of anomalies. The cause – spurious or RFI – can easily be traced with the basic analyzer function without additional measuring equipment.

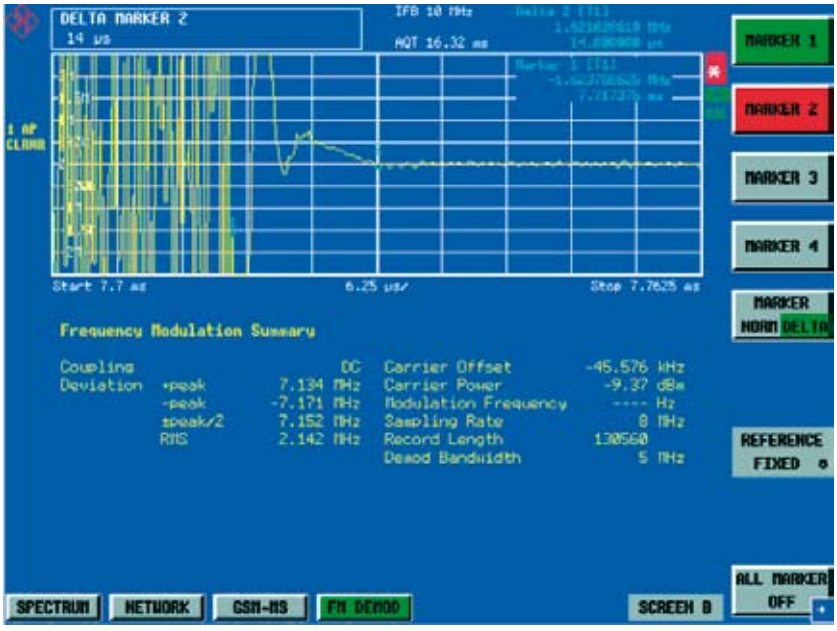


Phase noise of the R&S®FSQ at various center frequencies.

Shorter development cycles through versatile functions …

Measuring frequency deviation after settling

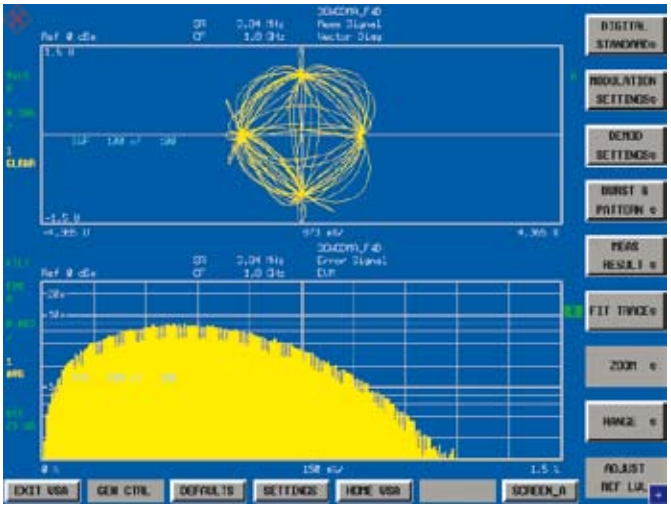
The R&S®FS-K7 option adds a measurement demodulator for analog AM, FM and φM modulation, allowing not only the frequency deviation but also the frequency settling of oscillators to be determined, for example. Analyzing the demodulated signal is possible with FFT. In addition, THD and SINAD are also measured.



Software options and function expansions for general applications

R&S®FS-K7	AM/FM/φM measurement demodulator for determining modulation frequency, THD, SINAD and spectrum (FFT) of the demodulated signal
R&S®FS-K9	Power sensor measurements (supports R&S®NRP-Z11/-Z21 with R&S®NRP-Z4 USB adapter)
R&S®FS-K30	Noise figure and gain measurements (application firmware), functions similar to R&S®FS-K3, but remote-controllable
R&S®FS-K40	Phase noise figure measurements
R&S®FSQ-K70	Universal vector signal analysis, FSK, MSK, BPSK, up to 256QAM, symbol rates up to 25 Msymbol/s (up to 81.6 Msymbol/s with R&S®FSQ-B72)

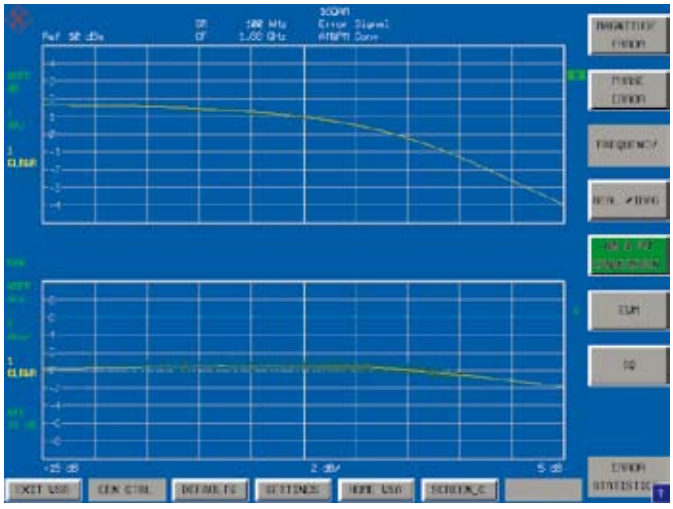
… wide dynamic range and future-proof performance



Convenient analysis with vector diagram. The upper screen (A) shows the complete constellation diagram, the lower screen (B) the probability distribution of the error vector magnitude (EVM).

Universal analysis of digital radio signals

The optional R&S®FSQ-K70 Vector Signal Analyzer upgrades the high-quality R&S®FSQ Signal Analyzers, adding universal demodulation and analysis capability down to bit stream level for digital radio signals.



AM/φM and AM/AM distortion example with a 16QAM signal. The picture shows the AM/AM and AM/φM conversion curve of the same signal.

For all major mobile radio communications standards:

- GSM and EDGE
- WCDMA-QPSK
- CDMA2000®-QPSK
- Bluetooth®
- TETRA
- PDC
- PHS
- DECT
- NADC
- APCO25

For all common digital modulation modes:

- BPSK, QPSK, OQPSK
- π/4 DQPSK
- 8PSK, D8PSK, 3π/8 8PSK
- (G)MSK
- 2, 4, (G)FSK
- 16, 32, 64, 128, 256 (D)QAM
- 2FSK, 4FSK
- 8VSB

Optimum representation of results:

- In-phase and quadrature signals versus time
- Magnitude and phase versus time
- Eye diagram
- Vector diagram
- Constellation diagram
- Table with modulation errors
- Demodulated bit stream
- Spectral evaluation
- Statistical evaluation of modulation parameters
- Amplifier distortion measurements

25 MHz symbol rate

- With R&S®FSQ-B72 up to 81.6 MHz symbol rate

28 MHz I/Q demodulation bandwidth

- Extendable up to 120 MHz

CDMA2000® is a registered trademark of the Telecommunications Industry Association (TIA -USA).

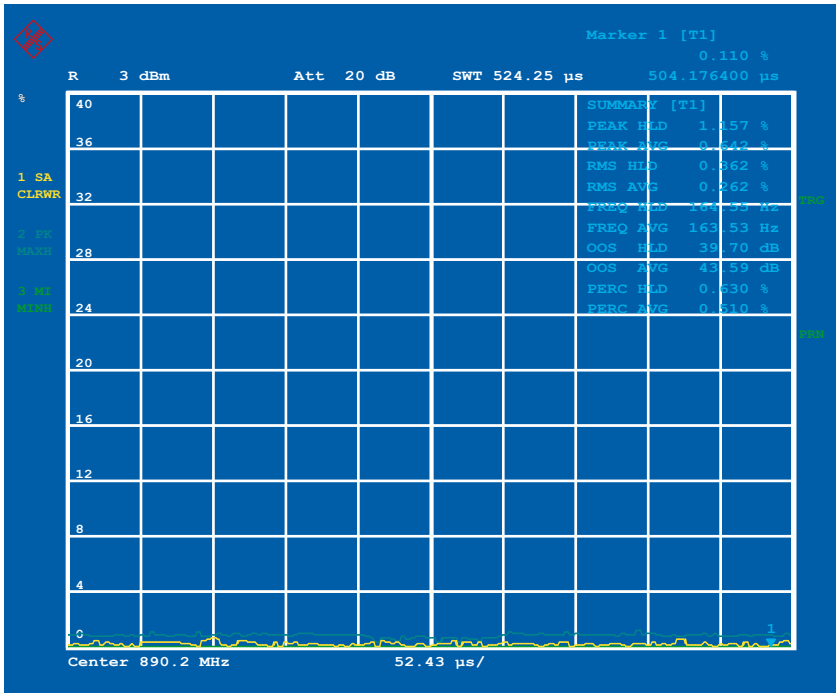
From GSM to UMTS …

From GSM to UMTS – ready for 3G mobile radio

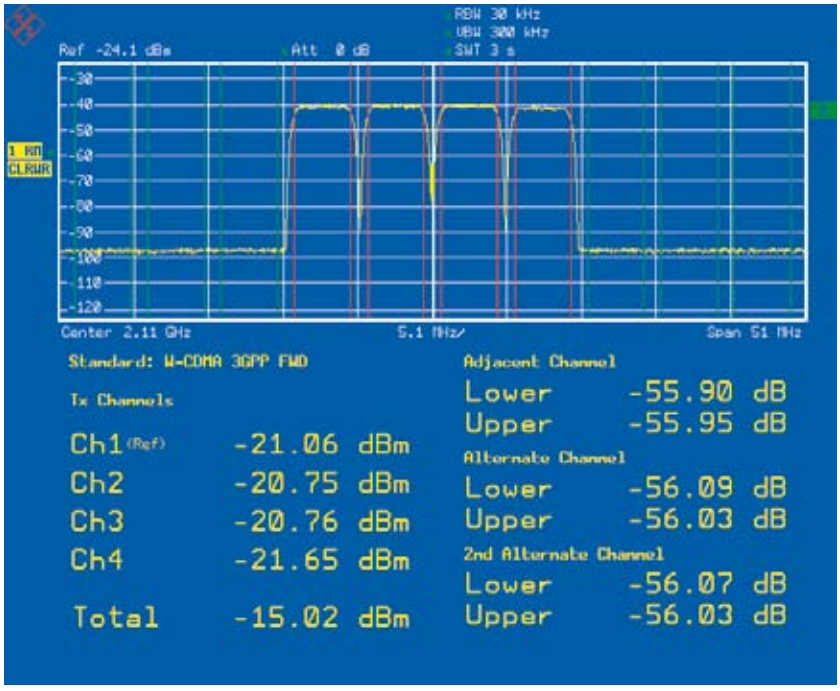
The above features plus its wide dynamic range make the R&S®FSQ an ideal tool in base station development and testing. This is enhanced by the excellent features that are provided by the R&S®FSQ as standard, such as <0.3 dB total measurement uncertainty, gated sweep function and IF power trigger.

Even in its basic version, the R&S®FSQ provides the functionality and characteristics needed to develop, verify and manufacture 3G mobile radio systems:

- RMS detector, provided as standard in Rohde & Schwarz analyzers for many years and allowing accurate power measurements independently of the waveform. 3GPP specifications stipulate RMS power measurements for most tests
- ACP measurement function for 3GPP with 3.84 MHz bandwidth RRC filter for standard-conforming adjacent-channel power measurements with a dynamic range limit of 77.5 dB, or 84 dB with noise correction (one carrier)
- Dedicated CCDF measurement function that determines the probability of instantaneous signal power exceeding average power. The CCDF measurement is indispensable in determining the optimum transmit power for CDMA signals, assuming that clipping at known, short intervals is tolerable



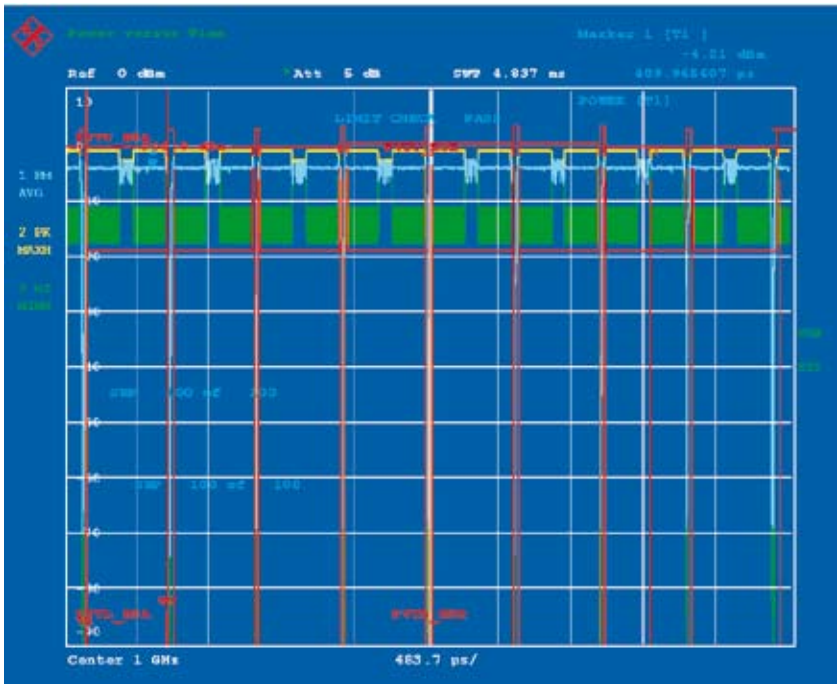
Measurement of modulation accuracy on EDGE burst.



ACP measurement with 4 channels.

In conjunction with R&S®FS-K5 GSM/EDGE Application Firmware, the R&S®FSQ provides complete functionality for RF and modulation measurements in GSM systems. EDGE (generation 2.5), is already included in the R&S®FS-K5 option.

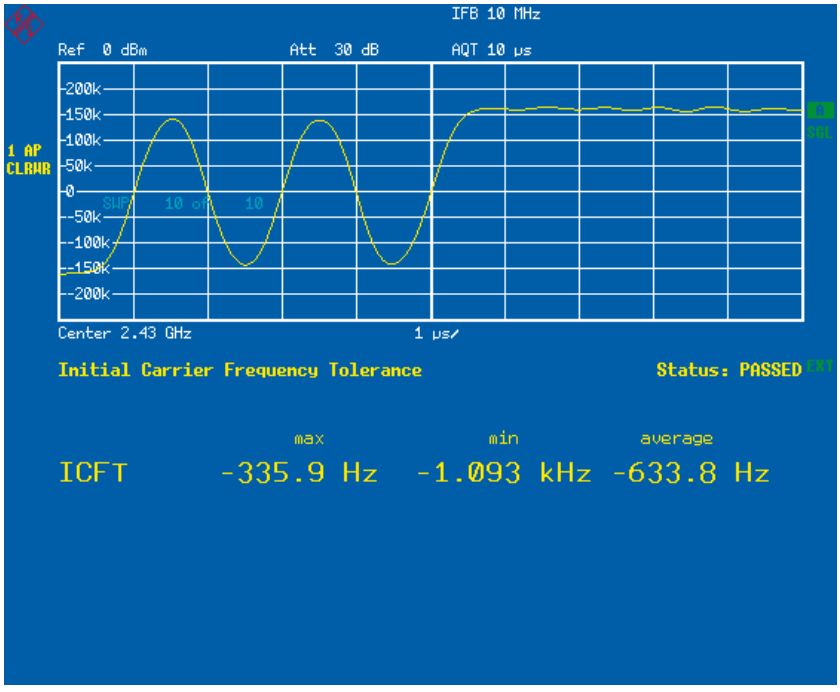
- Phase/frequency error for GSM
- Modulation accuracy for EDGE with:
  - EVM and ETSI-conforming weighting filters
  - OOS
  - 95:th percentile
  - Power versus time with synchronization to midamble
  - Spectrum due to modulation
  - Spectrum due to transients



Simultaneous measurement of power versus time of an eight-slot EDGE signal.

Bluetooth® signal measurement (R&S®FS-K8)

- 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 (ICFT)
  - Carrier frequency drift
- Simultaneous display of traces and all numeric measurement results
- Automatic limit value monitoring
- Ideal for use in development and production of Bluetooth® modules

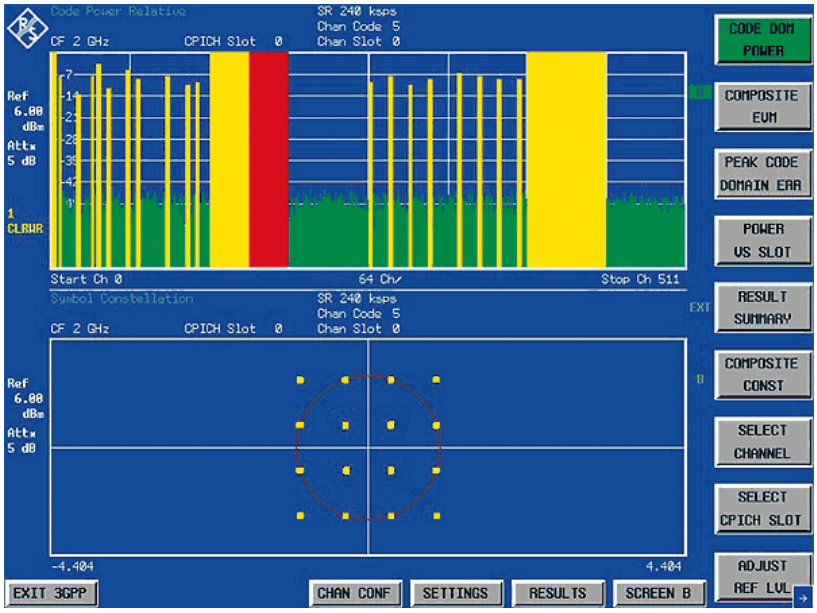


Measurement of initial carrier frequency tolerance of a Bluetooth® signal with R&S®FS-K8.

… ready for 3G mobile radio

Standard 3GPP modulation and code domain power measurements

- Additional measurement functions in line with 3GPP specifications for FDD and TDD LCR modes
- High measurement speed of 1 s/measurement for 3 GPP BTS signals
- Code domain and CPICH power
- Code domain power and rho (CDMA2000®/3GPP2)
- EVM and PCDE
- Code domain power versus slot
- EVM/code channel
- Spectrum emission mask
- Constellation (symbol, composite)

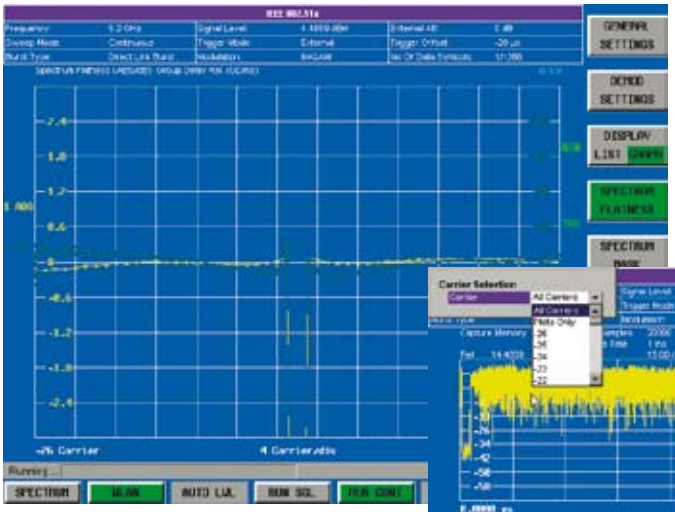


WCDMA code domain power measurement with the R&S® FSQ and R&S® FS-K72.

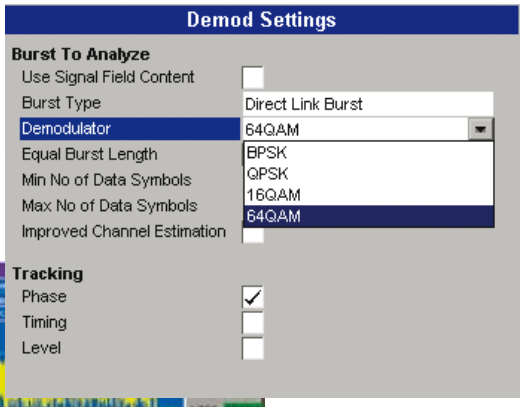
Firmware options for mobile radio applications

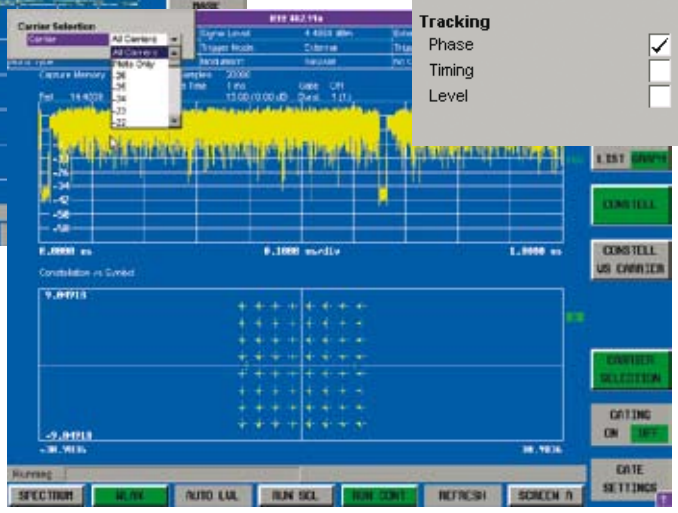
Type	Designation and/or application
R&S®FS-K5	Modulation and spectrum measurements on GSM/EDGE base station and mobile signals
R&S®FS-K8	Bluetooth® transmitter measurements
R&S®FS-K72	Modulation and code domain power measurements in line with 3GPP TS 24.141 on base station signals (node B)
R&S®FS-K73	Modulation and code domain power measurements in line with 3GPP TS 25.121 on mobile station signals (UE)
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 line with CDMA2000®/3GPP2 on base station signals (also for measurements on IS-95/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 CDMA2000®1xEV-DO mobile station signals (UE)
R&S®FS-K85	Modulation and code domain power measurements in line with CDMA2000®1xEV-DO on base station signals
R&S®FSQ-K91	Modulation and spectrum measurements on WLAN signals in line with IEEE 802.11 a/b/g/j
R&S®FSQ-K92	Modulation and spectrum measurements in line with IEEE 802.16-2005 OFDM
R&S®FSQ-K93	Modulation and spectrum measurements in line with IEEE 802.16-2005 OFDM and OFDMA

WLAN measurements



Group delay and spectrum flatness are determined via the channel estimation of the preamble or (user-selectable) for the entire burst including payload.





Constellation diagram of all or (user-selectable) individual carriers.

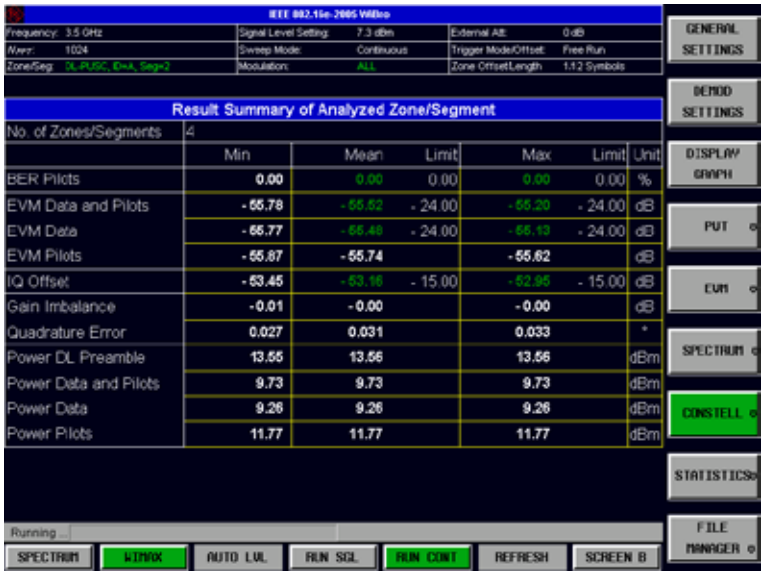
The R&S®FSQ-K91 Application Firmware provides the R&S®FSQ with modulation and spectrum measurements on WLAN signals in line with IEEE 802.11 a/b/g/j.

OFDM (IEEE 802.11a/g/j)	DSSS (IEEE 802.11/b)
Modulation formats	
OFDM with BPSK, QPSK, 16QAM, 64QAM	DBPSK, DQPSK, CCK, short PLCP, long PLCP
Modulation measurements	
Constellation diagram	Constellation diagram
Constellation diagram per OFDM carrier	–
I/Q offset and I/Q imbalance	I/Q offset and I/Q imbalance
Carrier and symbol frequency error	Carrier and symbol frequency error
Modulation error (EVM) per OFDM carrier or symbol	Modulation error (EVM)
Amplitude flatness and spectral flatness	–
CCDF and crest factor	CCDF and crest factor
Transmit spectrum mask	Spectrum mask (IEEE and ETSI)
FFT, also across a selected part of the signal, e.g. preamble	FFT
Payload bit information	Payload bit information header
Sample size selectable up to 50 ms	Sample size selectable up to 50 ms
Trigger	
Free run	Free run
External	External
IF power	IF power
Typical inherent errors for IEEE 802.11a measurements	**Typical inherent errors for IEEE 802.11b measurements**
EVM –45 dB	EVM 0.7 % (RF = 2.4 GHz)
Spectral flatness 0.5 dB	–

WiMAX measurements

With the R&S®FSQ-K93 Application Firmware, the R&S®FSQ Signal Analyzer can be used for spectrum and modulation measurements on signals in line with standard IEEE 802.16e-2005 also known as mobile WiMAX. Its functions cover standard-related tests and more in-depth analysis for troubleshooting WiMAX applications. All functions can be operated manually or programmed via GPIB or LAN.

- Frequency range: 20 MHz to 3.6/8/26/40 GHz
- Analysis at the RF or in the analog baseband (optional)
- Standards: IEEE 802.16e-2005, including WiBro
- Support of OFDM and OFDMA
- Modulation formats for IEEE 802.16: BPSK, QPSK, 16QAM, 64QAM



WiMAX measurement result summary.

Constellation diagram with low signal-to-noise ratio.

EVM versus carrier of a PUSC signal.

Benefit from networking

Versatile documentation and networking capabilities

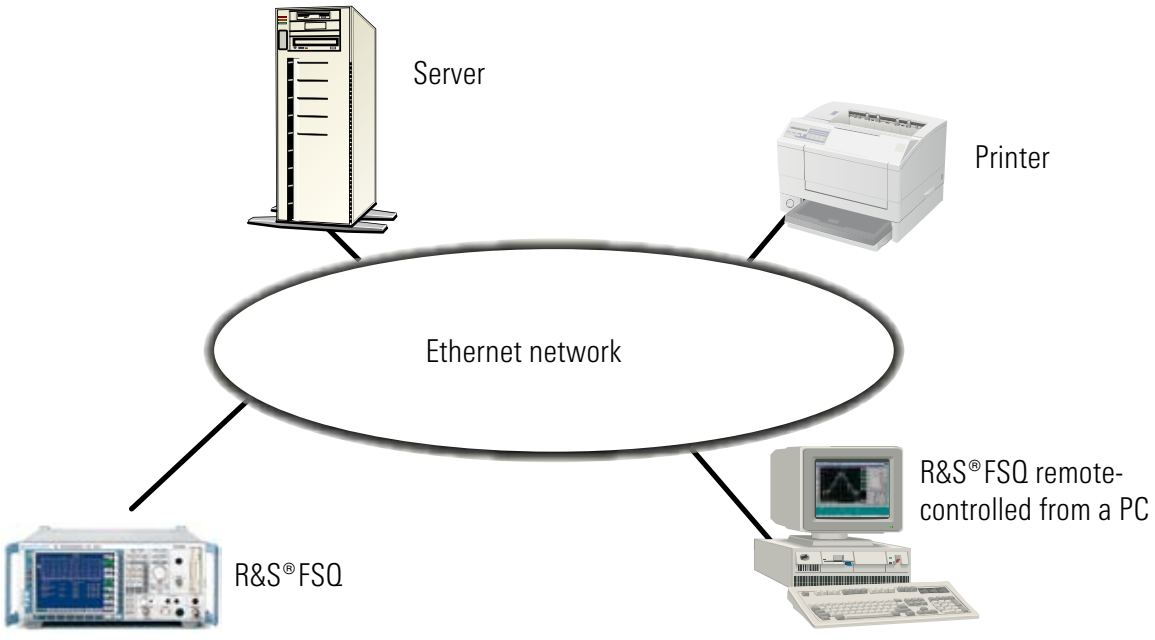
The Windows XP operating system coupled with a wide variety of interfaces makes it easy to insert measurement results into documentation. Simply save the screen contents as a BMP or WMF file and import them into your word processing system. To process trace data, save the data as an ASCII file (CSV format), which not only documents trace data but also the main instrument settings.

Advantages of networking
The standard LAN interface opens up versatile networking capabilities:

- Link to standard network (Ethernet 10/100BaseT)
- Running under Windows XP Embedded, the R&S®FSQ can be configured for network operation. Applications such as data output to a central network printer or saving results on a central server can easily be implemented. The R&S®FSQ can thus be optimally matched to your work environment
- Screen contents can be imported directly into Word or, by using an Excel macro, into your documentation programs so that you can immediately create data sheets for your products or documents for quality assurance

Remote control by Ethernet is even simpler

- The R&S®FSL, R&S®FSP, R&S®FSU and R&S®FSQ families from Rohde&Schwarz were the world's first spectrum analyzers to be officially certified as compliant with LXI class C. The LAN eXtensions for Instrumentation (LXI) standard for controlling T&M equipment combines the advantages of rack&stack instruments, offering GPIB interfaces and powerful firmware functions, with the benefits of modular, compact VXI/PXI systems



The R&S®FSQ in network operation.

Ordering information

Designation	Type	Order No.
Signal Analyzer, 20 Hz to 3.6 GHz	R&S®FSQ3	1155.5001.03
Signal Analyzer, 20 Hz to 8 GHz	R&S®FSQ8	1155.5001.08
Signal Analyzer, 20 Hz to 26.5 GHz	R&S®FSQ26	1155.5001.26
Signal Analyzer, 20 Hz to 40 GHz	R&S®FSQ40	1155.5001.40

Options

Designation	Type	Order No.
Low-Aging OXCO	R&S®FSU-B4	1144.9000.02
Tracking Generator, 100 kHz to 3.6 GHz	R&S®FSU-B9	1142.8994.02
External Generator Control	R&S®FSP-B10	1129.7246.02
Attenuator for R&S®FSU-B9 Tracking Generator	R&S®FSU-B12	1142.9349.02
Removable Hard Disk	R&S®FSQ-B18	1145.0242.05
Second Hard Disk for R&S®FSQ-B18	R&S®FSQ-B19	1145.0394.05
LO/IF Ports for External Mixers	R&S®FSU-B21	1157.1090.02
RF Preamplifier, 3.6 GHz to 26 GHz, for R&S®FSQ26	R&S®FSQ-B23	1157.0907.03
Electronic Attenuator, 0 dB to 30 dB, and 20 dB preamplifier	R&S®FSU-B25	1144.9298.02
Disable USB	R&S®FSQ-B33	1157.0336.12
Analog Baseband Inputs	R&S®FSQ-B71	1157.0113.02
I/Q Bandwidth Extension to 120 MHz	R&S®FSQ-B72	1157.0336.02
I/Q Memory Extension to 235 Msample	R&S®FSQ-B100	1169.5244.02
I/Q Memory Extension to 705 Msample, requires R&S®FSQ-B100	R&S®FSQ-B102	1169.5444.04

Certified Quality System ISO 9001 DQS REG. NO 1954 QM

Certified Environmental System ISO 14001 DQS REG. NO 1954 UM

For specifications, see PD 0758.0945.22
and www.rohde-schwarz.com
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