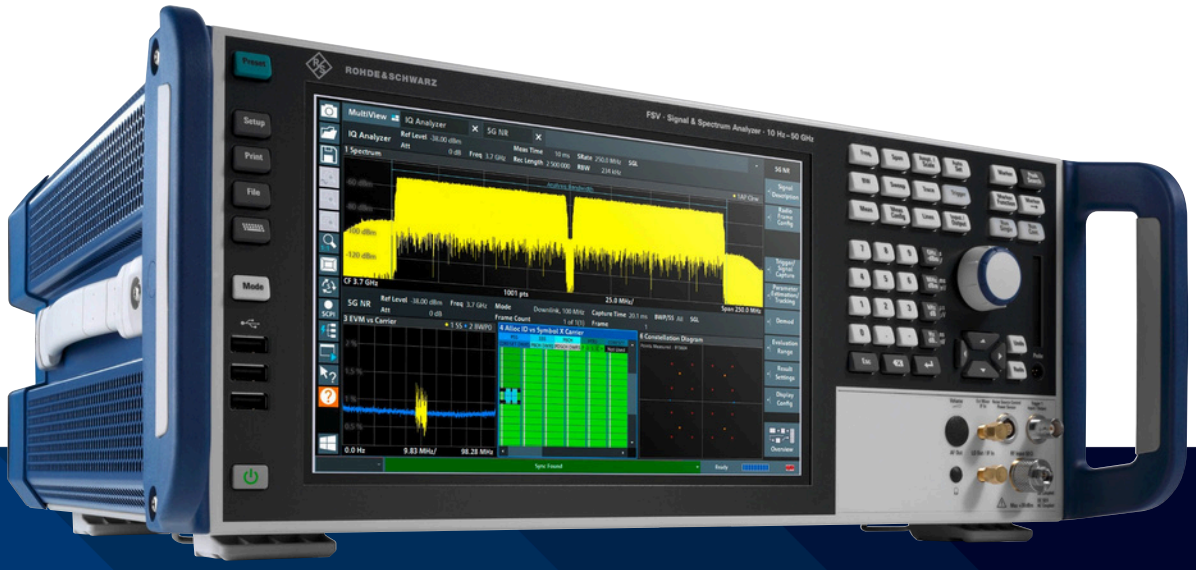
R&S®FSV3000
SIGNAL AND SPECTRUM ANALYZER

Fast setup and fast measurements



Product Brochure
Version 11.00

ROHDE&SCHWARZ
Make ideas real

AT A GLANCE

Measurements at the push of a button, capturing rare events with event based actions, and easy script programming with the SCPI recorder – setting up and performing complex measurements in no time is the strength of the R&S®FSV3000 signal and spectrum analyzer. Its fast measurement speed is a major asset, especially in automated production applications, since it yields high throughput.

The R&S®FSV3000 offers functions that make the configu ration of complex measurements fast and easy. Setting up RF parameters with touchscreen gestures is as easy as using your smartphone. The autoset feature automatically sets key parameters such as frequency, level and gating. An SCPI recorder, which translates manual operation into remote control command scripts, considerably speeds up script programming. And event based actions support you when debugging your DUT by capturing and documenting rare events.

The R&S®FSV3000 has been designed for high measure ment speed. This is a major advantage for production envi ronments in particular, which benefit from fast spectral measurements, high speed signal demodulation and rapid switching between different measurement modes.

The instrument's analysis bandwidth of up to 200 MHz enables digital modulation analysis for cellular and wire less standards, including 5G NR. With up to 200 MHz real- time analysis bandwidth, users can monitor the spectrum and trigger on shortduration signals.

Front view of the R&S®FSV3000.

KEY FACTS

- Frequency range from 10 Hz to 4/7.5/13.6/30/44/50 GHz
- Frequency range extension up to 325 GHz with external harmonic mixers from Rohde & Schwarz
- Frequency range extension up to 50 GHz for high-performance signal analysis with external frontends from Rohde & Schwarz
- Analysis bandwidth of up to 200 MHz
- Real-time bandwidth of up to 200 MHz
- SSB phase noise at 10 kHz offset (1 GHz):
  < −114 dBc (1 Hz)
- Third order intercept (TOI) at 1 GHz: +18 dBm (typ.)
- DANL at 1 GHz: −151 dBm
- DANL at 1 GHz with optional preamplifier: −165 dBm
- Ready for cloud based testing
- 10 Gbit/s LAN interface (option)
- User interface with multitouch display, SCPI recorder and event based actions
- Measurement applications for analog and digital signal analysis, including 5G NR

BENEFITS

Rear view of the R&S®FSV3000.

ADVANCED USER INTERFACE

Depending on the application,certain settings need to be configured on thesignal and spectrum analyzer. For simple spectral measurements,this might be just a few parameters. In thecase of complex automated conformance tests, lengthy programming may be required. Whatever the objective, the R&S®FSV3000 can be set up easily and quickly, providing fast access to measurement results.

Multitouch display

Basic RF measurements typically require the center fre quency, span, level and usually the resolution bandwidth to be configured. Finding the ideal settings can be difficult when measuring an unknown signal. The R&S®FSV3000 features a multitouch display and intuitive menu struc ture for exceptional ease of operation. A onefinger swipe across the screen adjusts the center frequency or the ref erence level. Twofinger gestures adjust the displayed span or level range. Settings can be configured in no time.

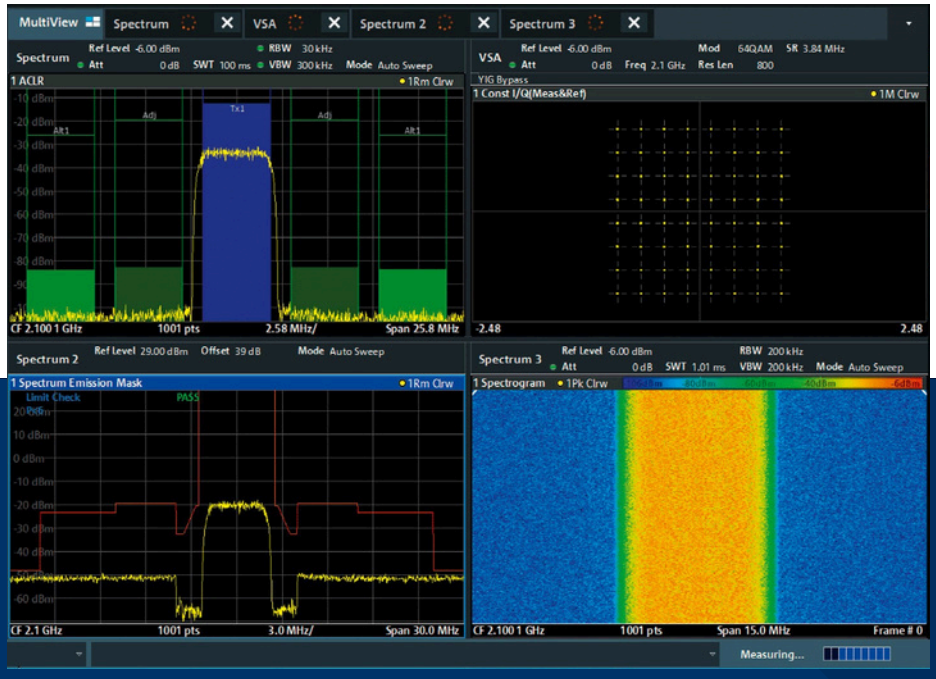
Various measurements can be displayed simultaneously in separate windows on the large 10.1" screen, making it much easier to interpret results. The MultiView function displays all active measurements on one screen. With the sequencer function, all channels are measured one after the other. The user is provided with constantly updated results, and no timeconsuming parameter adjustments are necessary.

SCPI recorder for fast automation

The R&S®FSV3000 embedded SCPI recorder accelerates the programming of executable control scripts. All manual user input is translated into SCPI commands that can be exported as plain SCPI or in the syntax of common pro gramming languages and tools such as C++, Python and MATLAB.

If manual code adaptation is required, contextsensitive online help provides comprehensive information, including SCPI commands and parameters.

MultiView displays all active measurements at the same time.



Event based actions dialog

Troubleshooting in R&D regularly requires the analysis of sporadic events, for instance failure to comply with limit lines or specified EVM values. The R&S®FSV3000 lets you define rules to perform specific actions in response to such events, for instance storing I/Q data or screenshots. A final report lists all the triggered events over an extended period.

The instrument can be set up with the straightforward GUI, eliminating the need for an external PC for remote control.

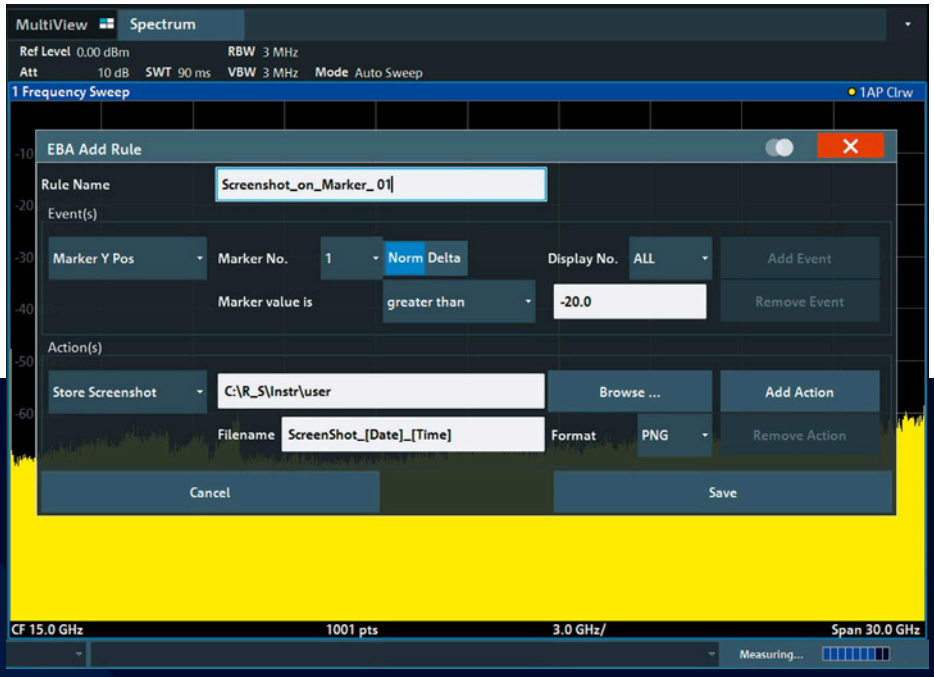
Autoset

Theautoset feature allows you to quickly configure frequently performed measurements such as occupied bandwidth, spectrum, TDP, CCDF, APD and C/N. This feature detects the parameters of an incoming signal and automatically sets the appropriate frequency, level, trigger and gating. For standard-compliant ACLR and SEM measurements, the settings are automatically configured in line with the corresponding standard.

Smart signal generator control

Many measurements require a signal generator, either to provide a simple CW signal or a modulated carrier. For such applications, the interaction between the R&S®FSV3000 and a generator such as the R&S®SMBV100B vector signal generator goes far beyond classic signal tracking. With the coupling manager, the analyzer directly controls the generator. A change in frequency or level on the analyzer results in the same change on the generator. The user interface of the generator can be displayed on the analyzer, allowing the user to operate the entire setup from a single screen. The SCPI recorder can also be coupled. Manual settings on either instrument are recorded in a single script. Advanced amplifier measurements with digital predistortion are possible. The analyzer directly provides the predistorted waveform to the generator. The hardware can be coupled via the optional 1 GHz clock reference for better phase synchronization.

In many cases, the event based actions dialog eliminates the need for an external PC.
Instead of SCPI programming, IF-THEN commands are set up via the GUI.



CLEARLY STRUCTURED, INTUITIVE GU

10.1" high-resolution multitouch display
- 1280 × 800 pixel
- Multitouch operation

Toolbar
- Quickly access frequently used functions
- Load and save configurations
- Take screenshots
- Zoom into graphs
- Configure displayed items

Zoom into graphs
- Zoom into graphs for a detailed view
- Zoom into multiple areas simultaneously
- Adapt hardware settings to zoom area

SCPI recorder
- Simplified code generation for automatic, remote controlled measurements

Event based actions
- Configure and apply IF-THEN tasks directly in the GUI
- Trigger on sporadic events for quick troubleshooting

Application starter
- Quickaccessto.exe or .com Windows programs

Three USB 2.0 ports
- for storage media
- for connecting accessories
- for power sensors with a USB connector

(additional USB 2.0/USB 3.0 ports on rear panel)

MultiView and sequencer

- Display all activemeasurements on one screen
- Measure all channels consecutively
- Receive constantly updated results

Autoset

- Automatic setting of frequency, level, trigger and gating based on the incoming signal
- Automatic selection of ACLR and SEM parameter tables in line with the corresponding standard

Start commonly used measurements

- ACLR, OBW, TOI, C/N, SEM

Removable solid-state disk

- Option

Probe power supply

- +15VDC,−12.6VDC and ground

Smart port

- For power sensors
- For smart noise sources

Settings overview

- Display andadapt all hardware-related settings on one screen

READY FOR 5G AND OTHER WIRELESS STANDARDS

TheR&S®FSV3000signal andspectrum analyzerisidealforanalyzingwirelesscommunicationssignals in R&D,systemtesting, verificationand production.

More bandwidth

Moderncommunications signals require ever more bandwidth. With 200 MHz of analysis bandwidth, the R&S®FSV3000 sets a new standard in its class. The instru ment can capture two contiguous 5G NR component car riers simultaneously. This saves measurement time and enables analysis of interactions and timing between the carriers. When the YIG filter is bypassed (YIG preselector bypass option), the 200 MHz bandwidth is available up to the maximum frequency of each analyzer model, e.g. 44 GHz. The R&S®FSV3000 features an excellent dynamic range, which is beneficial not only for spectral measurements but also for analyzing and demodulating signals with a high crest factor, such as OFDM signals or signals with a high modulation order. Excellent EVM val ues of over 1 % can be achieved for 160 MHz wide WLAN signals at 2.4 GHz and 5.8 GHz and also for 5G NR sig nals at 28 GHz. This increases the margin for the DUT, since it minimizes the error introduced by the measuring instrument.

Support of all modern wireless standards

The R&S®FSV3000provides signal analysis options for all modern wireless and cellular communications standards, i.e.:

- 3GPP 5G NR
- EUTRA/LTE/LTE-Advanced
- NBIoT downlink
- WCDMA
- GSM/EDGE/EDGE Evolution
- WLAN IEEE 802.11a/b/g/n/p/ac/ax/be
- Bluetooth® Basic Rate/Enhanced Data Rate/Low Energy

Best signal analysis performance with external frontends

5G NR signal analysis at microwave frequencies usually takes place in anechoic chambers where space is scarce. The R&S®FE50DTR and R&S®FE44S external frontends solve this challenge. Thanks to the separation of frequency upconversion and downconversion from the signal ana lyzer and generator, the small radio head can be mounted close to the antenna in order to reduce cable losses. Additionally, lower frequency base units can be used, enabling an upgrade of existing FR1 setups. The excellent radio quality of the R&S®FE50DTR and R&S®FE44S enables all relevant inband measurements to be performed in line with 3GPP and provides EVM performance up to 0.35 % for 100 MHz wide 5G NR signals at 28 GHz.

Analysis of a 5G NR signal with the R&S®FSV3-K144 (downlink) and R&S®FSV3-K145 (uplink) options.

R&S®FE50DTR external frontend with R&S®SMM100A vector signal generator and R&S®FSVA3000 signal and spectrum analyzer.

FAST MEASUREMENT SPEED FOR PRODUCTION

Automatedproduction of components,modulesanddevicesrequiresspectralmeasurementsas well assignaldemodulation. TheR&S®FSV3000signalandspectrumanalyzerperformsevencomplex measurements very quickly.

The R&S®FSV3000 has been designed for highspeed operation in automated test systems. It performs spectral measurements, signal demodulation and switching between different measuring modes very quickly. The instrument's synthesizer technology enables fast fre quency switching. FFT based ACLR and SEM measure- ments provide the same dynamic range as swept spec trum measurements, but are faster.

The R&S®FSV3-K147 option enables combined and auto mated ACLR, SEM and EVM measurements on 5G NR downlink signals. This feature provides significant speed advantages thanks to parallelized calculations and adapt able trigger settings. It is especially advantageous for over the-air (OTA) characterization of devices, which involves a large number of measurements.

The enhanced computing power option provides a quad core CPU and a PCIe 3.0 bus system to deliver faster clock speed, higher data transfer rates and more RAM capacity to accelerate digital signal demodulation.

Ready for cloud based testing

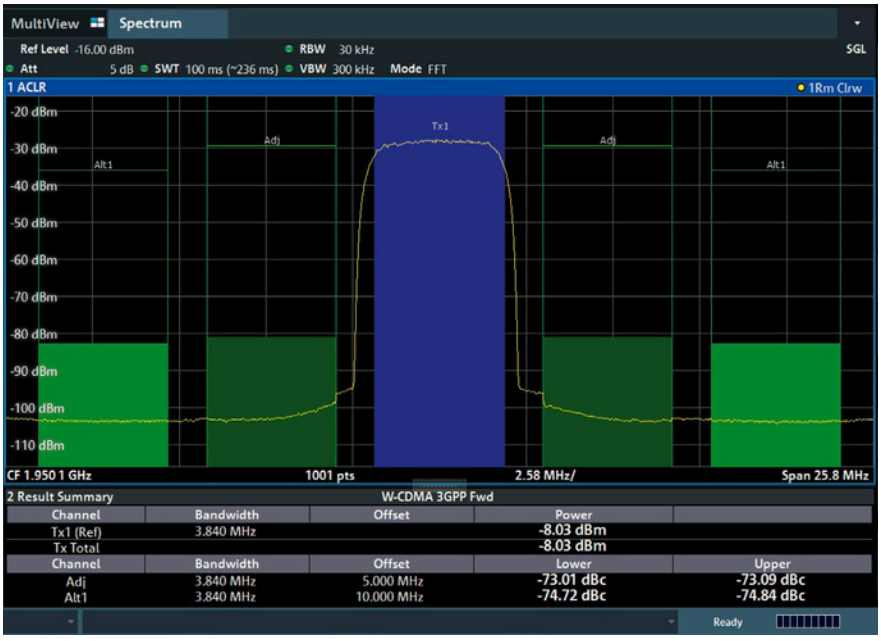
In cloud based test systems, signal analysis is performed on external CPUs. This requires the transfer of huge amounts of I/Q data. The R&S®FSV3000 interacts perfectly with cloud based processing. The instrument's architec ture enables the ultrafast transfer of I/Q measurement data. The optional 10 Gbit/s LAN interface allows I/Q data transfer even at the high sample rates required for 200 MHz analysis bandwidth.

Emulation modes for legacy instruments

Replacing legacy equipment in automated test systems can be a laborious task if all control code has to be rewritten.

The R&S®FSV3000 simplifies the replacement of obso lete instruments. Emulation modes for many legacy analyzers, including R&S®FSP, R&S®FSU/R&S®FSQ, R&S®FSV, Keysight PSA, Keysight PXA and HP 856x/ HP 8560E, enable users to keep existing code. Now there is no reason not to upgrade your legacy equipment to an R&S®FSV3000.

The R&S®FSV3000 maintains its excellent dynamic range during FFT based ACLR measurements, which are significantly faster than swept measurements.



DISCOVER THE UNSEEN WITH REAL-TIME SPECTRUM ANALYSIS

Equippedwith theR&S®FSV3-K200R 200 MHz real-time spectrum measurements option,the R&S®FSV3000 signaland spectrum analyzer displaysRF spectra seamlesslyand in real time. Short events with a duration of only 3.44 µs can be captured with 100 % probability and full level accuracy.

Unlocking comprehensive analysis capabilities

The R&S®FSV3-K200R option turns the R&S®FSV3000 into a fully fledged real-time spectrum analyzer with up to 200 MHz real-time bandwidth, depending on the installed analysis bandwidth option.

Never miss anything thanks to seamless capture

While classic swept spectrum analyzers have blind times, the R&S®FSV3-K200R real-time option displays the spectrum seamlessly with up to 200 MHz span. The supported displays are the realtime spectrum, the persistence spectrum and the spectrogram.

The spectrogram displays multiple consecutive spectra over time, with time on the vertical axis and frequency on the horizontal axis. The power level is represented by a specific color for the respective frequency/time value. This seamless spectrum display enables users, for example, to analyze existing frequency hopping algorithms or create alternative ones to prevent collisions between signals of different standards operating in the same frequency band, e.g. WLAN and Bluetooth®.

In the persistence spectrum, the color depends on the number of occurrences of a level at a specific frequency in a certain past period. Events that occurred further back are slowly grayed out with an afterglow effect.

By coupling the markers between spectrogram and realtime spectrum, the spectrum of past events can be displayed.

KEY USE CASES

Aerospace and defense (A&D)

- Seamless analysis of frequency agile radar signals
- Detection of unwanted spurious emissions
- Validation of frequency agile tactical communications systems

Regulatory authorities

- Continuous monitoring of frequency bands
- Reliable detection of unwanted or unlicensed signals

EMC precompliance

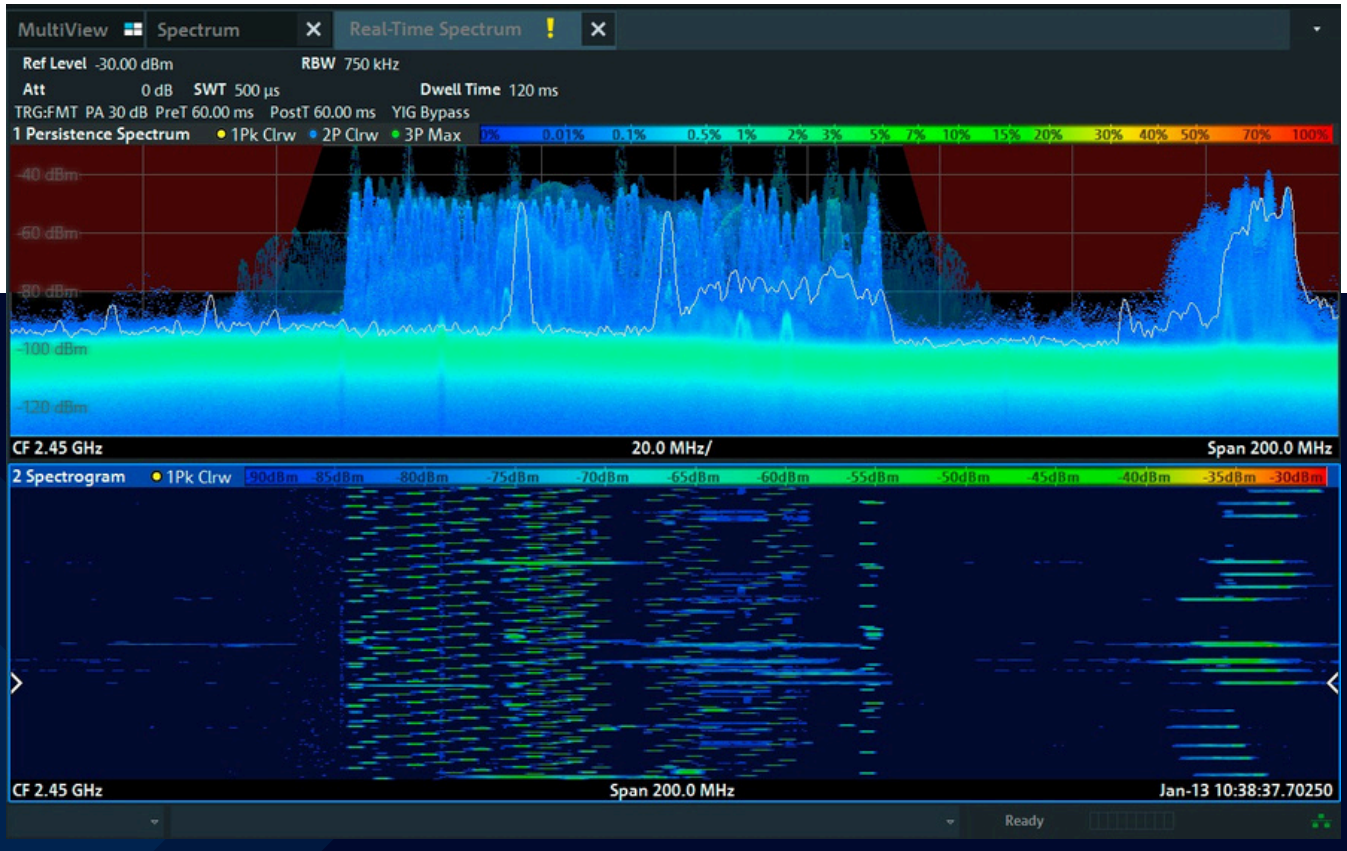
- Instantaneous identification of emission sources
- Spectral mask triggering on transmission events
- Detection of spurious emissions in real time

Detection and triggering on extremely short or frequency agile signals

TheR&S®FSV3000 canalso use frequencydependent masks to trigger on extremely short transient events that classic spectrum analyzers cannot detect. The duration of the shortest events that can be captured with 100 % prob ability and less than 3 dB level uncertainty is called the probability of intercept (POI). The R&S®FSV3-K200R fea tures a POI of less than 3.44 µs.

A userdefinable frequencydependent mask can be used to trigger on such short spectral events. This enables sig nals that occur sporadically in the spectrum to be detected reliably and investigated effectively.

Real-time spectrum of the ISM band at 2.45 GHz.



WIDE RANGE OF MEASUREMENT APPLICATIONS

GENERAL PURPOSE MEASUREMENT APPLICATIONS

Measurement application	Measurement parameters	Measurement functions
R&S®FSV3-K6 Pulse measurements	Pulse parameters: ▶ Timing: pulse width, pulse repetition interval, duty cycle, rise/fall time, settling time, timestamp, off time ▶ Frequency: carrier frequency, pulse-to-pulse frequency difference, chirp rate, frequency deviation, frequency error ▶ Power: peak power, average power, peak-to-average power ratio, pulsetopulse power ratio ▶ Phase: carrier phase, pulse-to-pulse phase difference, phase deviation, phase error ▶ Amplitude: droop, ripple, overshoot width, top/base power, average on power, average transmitted power, minimum/peak power, peaktoaverage/peak tomin power ratio, pulsetopulse power ratio	▶ Point-in-pulse measurements: frequency, amplitude, phase versus pulse, trend charts and histograms for all parameters ▶ Pulse statistics: standard deviation, average, maximum, minimum ▶ Pulse tables ▶ Userdefined measurement parameters
R&S®FSV3-K7 Modulation analysis for AM/FM/PM modulated single carriers	▶ Modulation depth (AM) ▶ Frequency deviation (FM) ▶ Phase deviation (PM) ▶ Modulation frequency ▶ THD and SINAD ▶ Carrier power	▶ AF spectrum ▶ RF spectrum ▶ AF scope display ▶ AF filters (lowpass and highpass) ▶ Weighting filters (CCITT) ▶ Squelch
R&S®FSV3-K8 Bluetooth® Basic Rate/ Enhanced Data Rate/Low Energy measurements	▶ Packet type ▶ Packet length ▶ Output power ▶ Delta frequency (Δf) ▶ Frequency drift ▶ ICFT	▶ RF spectrum ▶ RF envelope ▶ Constellation ▶ Demod waveform ▶ Symbols
R&S®FSV3-K18 Amplifier measurements R&S®FSV3-K18D R&S®FSV3-K18F Direct DPD measurements Frequency response and group delay R&S®FSV3-K18M Memory-polynomial DPD	▶ AM/AM, AM/PM, EVM ▶ Width of AM/AM and AM/PM curves ▶ Magnitude, phase and group delay versus frequency (R&S®FSV3-K18F) ▶ Polynomial coefficients (R&S®FSV3-K18) ▶ Memory-polynomial coefficients (R&S®FSV3-K18M)	▶ General amplifier measurements ▶ Polynomial based digital predistortion (R&S®FSV3-K18) ▶ Direct digital predistortion (R&S®FSV3-K18D) ▶ Memory-polynomial predistortion (R&S®FSV3-K18M) ▶ Control and synchronization of an external signal generator, e.g. the R&S®SMBV100B vector signal generator ▶ Characterization of dynamic behavior of two-port devices ▶ Real-time memory DPD (with Hammerstein model) (R&S®FSV3-K18M)
R&S®FSV3-K30 Noise figure and gain measure ments based on Yfactor method	▶ Noise figure ▶ Noise temperature ▶ Gain ▶ Yfactor	▶ Analyzer noise correction (second stage correction) ▶ Measurements on frequency-converting DUTs ▶ Control of a generator as an LO in frequency-converting measurements ▶ SSB and DSB
R&S®FSV3-K40 Phase noise measurements	▶ SSB phase noise ▶ Residual FM and residual PM ▶ Jitter	▶ 1 Hz to 10 GHz offset range ▶ Selection of resolution bandwidth and number of averages for each offset range ▶ Definable evaluation ranges for residual FM/PM ▶ Signal tracking ▶ Optional suppression of spurious emissions

Measurement application	Measurement parameters	Measurement functions
R&S®FSV3-K54 EMI measurements	EMI diagnostics and precompliance measurements in line with commercial and military standards: ▶ Disturbance voltage ▶ Disturbance power ▶ Radiated disturbance	▶ EMI detectors and resolution bandwidths in line with CISPR 16-1-1, MIL-STD-461 and DO-160 ▶ Limit line library as specified in the latest EMI standards ▶ Test automation and reporting for fast and repeatable measurements ▶ Transducer factors for antennas, cables, LISNs, etc. ▶ Support of R&S®ELEKTRA EMC test software
R&S®FSV3-K60 Transient measurements R&S®FSV3-K60C Transient chirp measurements R&S®FSV3-K60H Transient hop measurements	▶ Frequency hopping signals: dwell time, settling time, switching time, frequency deviation, power, phase deviation, power ripple ▶ Chirp signals: frequency deviation, chirp begin, chirp length, chirp rate, chirp state deviation, phase deviation, power, power ripple	▶ Spectrogram and spectrogram sections, tabular display, frequency, frequency error, phase and amplitude versus time, FFT spectrum ▶ Pan and zoom functions to select analysis region using touch gestures; supported in spectrogram, frequency and time domain trace displays ▶ Phase noise ▶ Frequency and phase deviation spectrograms ▶ Trend charts and histograms for all parameters ▶ Chirp and hop statistics: standard deviation, average, maximum and minimum ▶ Userdefined measurement parameters
R&S®FSV3-K60P Transient phase noise measurements R&S®FSV3-K70 Vector signal analysis R&S®FSV3-K70M Multi-modulation analysis R&S®FSV3-K70P BER PRBS measurements	Analysis of digitally modulated single carriers down to bit level: ▶ EVM ▶ MER ▶ Phase error ▶ Magnitude error ▶ Carrier frequency error ▶ Symbol rate error ▶ I/Q skew ▶ Rho ▶ I/Q offset, I/Q imbalance, quadrature error ▶ Amplitude droop ▶ Power ▶ Bit error rate of known data streams ▶ Bit error rate of bit streams generated with PRBS shift registers (R&S®FSV3-K70P) ▶ Analysis of vector modulated signals with multiple modulations, e.g. DVB-S2(X) (R&S®FSV3-K70M)	▶ Eye diagram ▶ Constellation diagram ▶ Vector diagram ▶ Histogram ▶ Equalizer ▶ Multiple modulation formats, e.g.: – 2FSK to 64FSK – MSK, GMSK, DMSK – Multiple PSKs (e.g. BPSK, QPSK, 8PSK, 3π/8-8PSK) – 16QAM to 1024QAM – 16APSK (DVB-S2), 32APSK (DVB-S2), 2ASK, 4ASK – Userdefinable constellations
R&S®FSV3-K96 OFDM signal analysis	Analysis of custom OFDM signals: ▶ EVM (pilots, data, pilots anddata) ▶ EVM versus carrier versus symbol ▶ Frequency error ▶ Sampling clock error ▶ I/Q offset ▶ Gain imbalance ▶ Quadrature error ▶ Power versus time ▶ Power spectrum ▶ Power versus carrier versus symbol ▶ Channel flatness ▶ Group delay ▶ Impulse response ▶ Bitstream ▶	▶ Constellation diagram ▶ CCDF ▶ Channel estimation and compensation using phase, timing and level tracking ▶ Configuration file wizard ▶ Free configuration of pilot and data carriers and modulation schemes

WIDE RANGE OF MEASUREMENT APPLICATIONS

MEASUREMENT APPLICATIONS FOR WIRELESS COMMUNICATIONS SYSTEMS

Measurement application	Power	Modulation quality	Spectrum measurements	Miscellaneous	Special features
R&S®FSV3-K10 GSM/EDGE/ EDGE Evolution	▶ Power measurement in time domain, including carrier power	▶EVM ▶Phase/frequency error ▶Origin offset suppression ▶ Constellation diagram	▶ Modulation spectrum ▶ Transient spectrum		▶Single burst and multiburst ▶Automatic detection of modulation format
R&S®FSV3-K72/-K73 3GPP FDD (WCDMA)	▶ Code domain power ▶ Code domain power versus time ▶ CCDF	▶EVM ▶Peak code domain error ▶Constellation diagram ▶I/Q offset ▶Residual code domain error ▶I/Q imbalance ▶Gain imbalance ▶Center frequency error (chip rate error)	▶Spectrum mask ▶ACLR ▶Power measurement	▶ Channel table with channels used on base station ▶Timing offset ▶Power versus time	▶ Automatic detection of active channels and decoding of useful information ▶ Automatic detection of encryption code ▶ Automatic detection of HSDPA modulation format ▶ Support of compressed mode signals ▶ Support of HSPA and HSPA+ (HSDPA+ and HSUPA+)
R&S®FSV3-K91 WLAN IEEE 802.11a/b/g R&S®FSV3-K91P WLAN IEEE 802.11p R&S®FSV3-K91N WLAN IEEE 802.11n R&S®FSV3-K91AC WLAN IEEE 802.11ac R&S®FSV3-K91AX WLAN IEEE 802.11ax	▶Power versus time ▶Burst power ▶Crest factor	▶EVM (pilot, data) ▶EVM versus carrier ▶EVM versus symbol ▶Constellation diagram ▶I/Q offset ▶I/Q imbalance ▶Gain imbalance ▶Center frequency error ▶Symbol clock error ▶Group delay	▶Spectrum mask ▶ACLR ▶Power measurement ▶Spectrum flatness	▶Bit stream ▶Signal field ▶Constellation versus carrier	▶Automatic detection of burst type ▶Automatic detection of MCS index ▶Automatic detection of bandwidth ▶Automatic detection of guard interval ▶Estimation of payload length from burst ▶IEEE 802.11ax PPDU formats: HE SU PPDU, HE MU PPDU, HE trigger based PPDU, HE extended range SU PPDU ▶ IEEE 802.11be PPDU formats: EHT MU PPDU (compressed, noncompressed), EHT trigger based PPDU
R&S®FSV3-K100/ -K101/-K104/-K105 R&S®FSV3-K91BE EUTRA/LTE TDD and FDD WLAN IEEE 802.11be uplink and downlink measurements	▶ Power measurement in time and frequency domains ▶ CCDF	▶EVM ▶Constellation diagram ▶I/Q offset ▶Gain imbalance ▶Quadrature error ▶Center frequency error (symbol clock error)	▶Spectrum mask ▶ACLR ▶Power measurement ▶Spectrum flatness	▶Bit stream ▶Allocation summary list ▶ Averaging over multiple measurements	Automatic detection of modulation format, cyclic prefix length and cell ID

Measurement application	Power	Modulation quality	Spectrum measurements	Miscellaneous	Special features
R&S®FSV3-K102 EUTRA/LTE MIMO		▶ R&S®FSV3K100 and -K104 modulation quality measurements for each individual MIMO path			▶MIMO time alignment for R&S®FSV3-K100/-K104 ▶Interband carrier aggregation time alignment
R&S®FSV3-K103 EUTRA/LTE-Advanced uplink measurements			▶Multicarrier ACLR for FDD and TDD ▶SEM for contiguously aggregated component carriers		
R&S®FSV3-K106 EUTRA/LTE NB-IoT downlink measurements	▶ Power measurement in time and frequency domains	▶EVM ▶Constellation diagram ▶Frequency error ▶Sampling error	▶ Spectrum flatness, ACLR, SEM	▶ Allocation summary list	▶Standalone, guard band and inband operation ▶Automatic detection of cell ID
R&S®FSV3-K144 5G NR Rel. 15 down link measurements R&S®FSV3-K145 5G NR Rel. 15 uplink measurements R&S®FSV3-K147 5G NR combined ACLR/SEM/EVM measurements R&S®FSV3-K148 5G NR Rel. 16 extension for uplink/downlink measurements R&S®FSV3-K171 5G NR Rel. 17 extension for uplink/downlink measurements R&S®FSV3-K175 Extension for ORAN measurements	▶ Power versus time	▶EVM ▶EVM xPDSCH ▶Constellation diagram ▶I/Q offset ▶I/Q imbalance ▶Gain imbalance ▶Center frequency error	▶ Multicarrier ACLR, SEM	▶Allocation summary list ▶Channel table with channels used on base station	▶Automatic detection of cell ID ▶Support of multiple bandwidth parts
R&S®FSV3-K544 Frequency response correction				▶ SnP file in Touchstone file format	▶ Corrects frequency response (amplitude and phase) of the measurement setup

SPECIFICATIONS IN BRIEF

Specifications in brief		
Frequency		
Frequency range	R&S®FSV3004	10 Hz to 4 GHz
	R&S®FSV3007	10 Hz to 7.5 GHz
	R&S®FSV3013	10 Hz to 13.6 GHz
	R&S®FSV3030	10 Hz to 30 GHz
	R&S®FSV3044	10 Hz to 44 GHz
	R&S®FSV3050	10 Hz to 50 GHz
Aging of frequency reference		1 × 10−6 per year
	with R&S®FSV3-B4 option	1 × 10−7 per year
Bandwidth	standard filter	1 Hz to 10 MHz
Resolution bandwidth	RRC filter	18 kHz (NADC), 24.3 kHz (TETRA), 3.84 MHz (3GPP), 4.096 MHz
	channel filter	100 Hz to 5 MHz
	video filter	1 Hz to 10 MHz
I/Q demodulation bandwidth	standard	28 MHz
	with R&S®FSV3-B40 option	40 MHz
	with R&S®FSV3-B200 option	200 MHz
I/Q demodulation bandwidth via analog baseband inputs	with R&S®FSV3-B271 option	I only, Q only: DC to 200 MHz; I + jQ: −200 MHz to +200 MHz
Phase noise (with R&S®FSV3-B710 option)	1 GHz carrier	
	1 kHz offset	< −109 dBc (1 Hz) <
	10 kHz offset	−114 dBc (1 Hz) < −
	100 kHz offset	119 dBc (1 Hz) < −
	1 MHz offset	135 dBc (1 Hz) −151
Displayed average noise level (DANL)	1 GHz	dBm (typ.) −165 dBm
DANL with preamplifier (R&S®FSV3-B24 option)	50 MHz ⩽ f < 3 GHz	(typ.)
Intermodulation		
Third order intercept (TOI)	1 GHz	> 15 dBm, 18 dBm (typ.)
Total measurement uncertainty	2 GHz	0.29 dB

RELATED DOCUMENTS

Title of document	PD No.
R&S®FSV3000 Signal and Spectrum Analyzer − Specifications	5216.1334.22
R&S®VSE Vector Signal Explorer Software − Product Brochure	3607.1371.12
R&S®FSSNS Smart Noise Sources − Product Brochure	5216.2718.12
EMI Measurement Application for Signal and Spectrum Analyzers − R&S®FSW-K54, R&S®FSV3-K54, R&S®FPL1-K54, R&S®FSV-K54 − Product Brochure	3608.3949.12
R&S®FE50DTR External Frontend 36 GHz to 50 GHz − Product Brochure	3609.5551.12
R&S®FE44S External Frontend 24 GHz to 44 GHz − Product Brochure	3609.5545.12

Service at Rohde & Schwarz

YOU'RE IN GREAT HANDS

	SERVICE PLANS	ON DEMAND
Calibration	Up to five years 1)	Pay per calibration
Warranty and repair	Up to five years 1)	Standard price repair

1) For extended periods, contact your Rohde&Schwarz sales office.
On-site services available on request.

Instrument management made easy

The R&S®InstrumentManager makes it easy to register and manage your instruments. It lets you schedule calibration dates and book services.

Find out more about our service portfolio under:

Your local Rohde & Schwarz expert will help find the best solution for you.
Contact your local Rohde & Schwarz sales office for more information: www.sales.rohde-schwarz.com