



◀ The wide range of spectrum analyzers from Rohde & Schwarz includes instruments for every need. The portfolio is continuously being enhanced to keep pace with technical innovations.



FIG 1 ▶ The R&S®FSL18 spectrum analyzer from Rohde & Schwarz is just as handy and compact as the R&S®FSL3 and R&S®FSL6 from the same family.

R&S®FSL18 Spectrum Analyzer

Portable spectrum analyzer for applications in the microwave range

Mobile spectrum analysis up to 18 GHz together with the capability to analyze wideband communications standards make the new R&S®FSL18

unique.

Growing demand: spectrum analysis in the microwave range

With its wide frequency range from 9 kHz to 18 GHz, the R&S®FSL 18 (FIG 1) allows you to perform spectrum and modulation measurements on microwave systems. This includes not only measurements on radar systems and microwave link systems but also production tests on microwave components such as mixers and amplifiers. Owing to the high I/Q demodulation bandwidth and the comprehensive software selection of the R&S®FSL family, the new spectrum analyzer is the only instrument in its class to support the WLAN, WiMAX and WCDMA standards. FIG 2 gives you an overview of the R&S®FSL family.

General-purpose spectrum analyzer ...

You can use the R&S®FSL 18 for a variety of applications. The analyzer has a number of excellent features that are unique in its price range and make it ideal for many applications in development, production, installation and service.

Excellent demodulation characteristics

With the largest I/Q demodulation bandwidth in its class (28 MHz), the R&S®FSL 18 covers the signal bandwidths up to wideband technologies such as WiMAX. The R&S®FSL 18 is thus perfect for modulation measurements – no matter whether in the production of WLAN chipsets or during the maintenance and installation of WiMAX networks. Moreover, the wide frequency range allows you to perform measurements up to the 5th harmonic of 3G mobile radio transmitters.

FIG 2 The R&S®FSL family: an overview.

Model	Frequency range	Frequency range of tracking generator	Output power of tracking generator	Demodulation bandwidth
R&S®FSL3, model .03	9 kHz to 3 GHz	–	–	20 MHz
R&S®FSL3, model .13	9 kHz to 3 GHz	1 MHz to 3 GHz	–20 dBm to 0 dBm	20 MHz
R&S®FSL6, model .06	9 kHz to 6 GHz	–	–	20 MHz
R&S®FSL6, model .16	9 kHz to 6 GHz	1 MHz to 6 GHz	–20 dBm to 0 dBm	20 MHz
R&S®FSL18, model .18	9 kHz to 18 GHz (overrange 20 GHz)	–	–	28 MHz

Precise power measurements

Another unrivaled characteristic in its class is the low overall measurement uncertainty, which yields accurate and reliable results even in the microwave range (for details, see box “Condensed data of the R&S®FSL18” on page 35).

Extensive scope of functions

Its extensive scope of functions, which is normally provided only by high-end spectrum analyzers, make the R&S®FSL18 truly impressive. Integrated routines – e.g. for adjacent-channel power (ACP), 3rd order intercept (TOI) or occupied bandwidth (OBW) – make measurements easy and quickly provide results. Depending on the application, you can also expand the analyzer using the numerous tailor-made firmware options from Rohde & Schwarz, e.g. the R&S®FSL-K91 option for performing measurements on WLAN signals. This option offers a user interface tailored to the application and user-specific measurement results such as modulation quality (EVM, flatness, constellation diagram), spectrum mask and adjacent-channel power. In addition to WLAN,

WiMAX, Bluetooth® and WCDMA applications, the R&S®FSL18 – together with the R&S®FSL-K7 option – can also be used as an analog modulation analyzer for amplitude-, frequency- and phase-modulated signals. For a complete list of options offered, see the product brochure and the data sheet.

Pulsed signal measurements

The R&S®FSL18 offers resolution bandwidths from 1 Hz to 10 MHz (20 MHz zero span). Owing to its wide bandwidth, it can analyze pulsed signals both in the frequency and time domain (FIGs 3 and 4).

... in installation and service

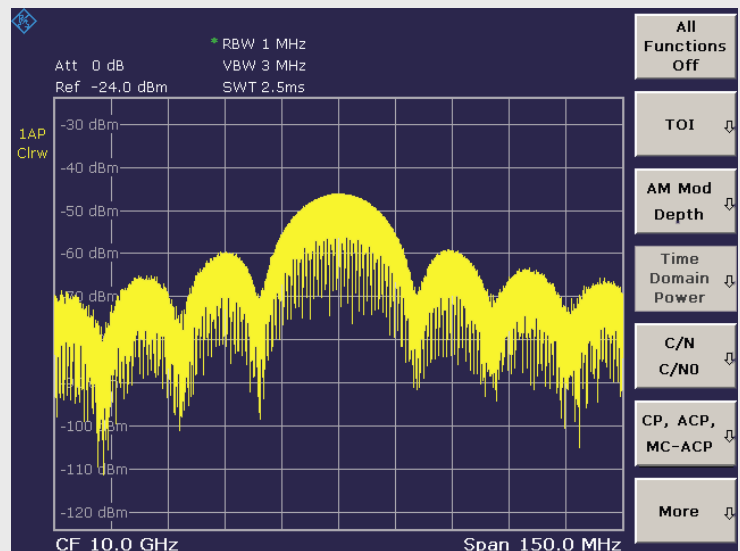
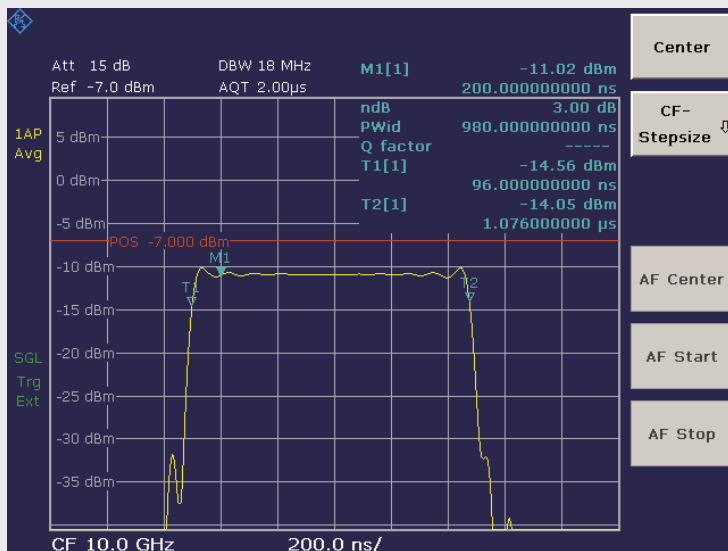
Low weight (<8 kg), small size and optional DC/battery operation make the R&S®FSL18 ideal for mobile field applications where an AC supply is not always available. Transmitter measurements for civil and military applications – from WiMAX and SatCom to radar – are no problem at all.

Another special feature of this spectrum analyzer is the fact that you can directly add a power sensor from the R&S®NRP-Z series. The R&S®FSL-K9 option and a connected power sensor allow very precise measurements of the DUT power – an enormous advantage for applications where level accuracy is crucial. The R&S®FSL18 can thus replace a power meter. This is particularly important in mobile applications.

... in production

With its extensive scope of functions, the spectrum analyzer is also a cost-efficient solution for applications in production. Production experts will appreciate its high measurement speed in addition to its level accuracy: high throughput is obtained with 80 sweeps/s in zero span (including all data transfers). Moreover, measurements with up to 300 analyzer settings can be performed by a single remote-control command in the frequency list mode. Power measurements in the time domain using channel filters and a fast frequency counter with a res-

FIGs 3 and 4 Typical applications of the R&S®FSL18 include measurements in the microwave range, e.g. measurement of the pulse width using the n-dB-down marker or measurement of the envelope spectrum of pulsed signals.



olution of 0.1 Hz at a measurement time of <50 ms are also part of the concept.

The R&S®FSL 18 also excels with its connectors since they help ensure fast remote control via GPIB and LAN (FIG 5). USB ports for connecting additional components such as keyboard and mouse, USB stick or power sensors are also available.

... in development

Impressive technical features and a wide scope of functions make the R&S®FSL 18 an analyzer with an attractive price/performance ratio. It can be used as a universal measurement tool at any workplace in addition to high-performance spectrum analyzers. The range of measurements offered, the user interface and remote-control commands conform to those of high-end spectrum analyzers from Rohde & Schwarz. Therefore, existing measurement solutions can be easily and quickly transferred to the R&S®FSL 18. This eliminates having to port them to various platforms. And

you do not have to be specially trained for the different T&M solutions. The R&S®FSL 18 is also ideal for research and education at institutes and universities.

Summary

The R&S®FSL 18 is a versatile and powerful spectrum analyzer up to 18 GHz. It can perform measurements on radar systems and microwave link systems. Plus,

it is the right tool in production applications for microwave components such as amplifiers or in the installation and maintenance of WiMAX networks. This versatility and the analyzer's attractive price/performance ratio make it an indispensable do-it-all tool.

Dorothea von Droste

Condensed data of the R&S®FSL 18

Frequency range	9 kHz to 18 GHz (20 GHz overrange)
Resolution bandwidths	1 Hz to 10 MHz (20 MHz zero span)
Video bandwidths	1 Hz to 10 MHz
I/Q demodulation bandwidth	28 MHz
Phase noise	<-98 dBc/Hz, 10 kHz carrier offset, 500 MHz <-115 dBc/Hz, 1 MHz carrier offset, 500 MHz
DANL (1 Hz RBW)	<-140 dBm (1 GHz) <-130 dBm (18 GHz)
TOI	<-152 dBm (1 GHz, preamplifier)
1 dB compression point	10 dBm, typ. 13 dBm
Level measurement uncertainty	+5 dBm <0.5 dB for $f < 3$ GHz, <0.8 dB for $f < 6$ GHz, <1.2 dB for $f < 18$ GHz

FIG 5 The plug & play concept of the R&S®FSL 18 allows you to retrofit hardware options on site without recalibration. This saves time and money and thus enhances the scope of functions for future applications.



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More information, brochure and data sheet at
www.rohde-schwarz.com
 (search term: FSL)

