

ROHDE & SCHWARZ

FSL18

The Rohde & Schwarz FSL18 is a compact and lightweight 18 GHz spectrum analyzer from the FSL series. Combining the capabilities of a high-end laboratory instrument with the portability of a battery-powered field unit, the FSL18 is optimized for development, service, and production environments. It supports microwave applications up to 18 GHz, including radar testing, microwave links, and satellite surveillance, offering an exceptionally wide I/Q demodulation bandwidth of up to 28 MHz and outstanding level accuracy.

SPECIFICATIONS

General

Interfaces	LAN (10/100 Base-T), USB 2.0 Host (2 ports), USB 2.0 Device (1 port), GPIB (optional via FSL-B10)
Display	6.4-inch color TFT LCD, VGA resolution (640 x 480 pixels)
Warm-Up Time	20 min

Physical

Power Supply	100 V to 240 V AC (50 Hz to 60 Hz / 400 Hz), 12 V to 20 V DC, or optional internal battery pack
Operating Temperature	0 to 50 °C
Dimensions (W×H×D)	408 × 158.1 × 365.8 mm
Weight	8.0 kg kg

Frequency and Amplitude Performance

Frequency Range	9 kHz to 18 GHz
Frequency Resolution	1 Hz
Aging Rate per Year	1×10^{-6}
Aging Rate per Year (with OCXO Option)	1×10^{-7} (with FSL-B4 option)
Temperature Stability	1×10^{-5}
Temperature Stability (with OCXO Option)	1×10^{-7} (with FSL-B4 option)
Frequency Span Range	0 Hz, 10 Hz to 18 GHz
SSB Phase Noise at 10 kHz Offset	<-98 dBc (1 Hz), typ. -103 dBc (1 Hz) at 500 MHz carrier
SSB Phase Noise at 100 kHz Offset	<-98 dBc (1 Hz), typ. -104 dBc (1 Hz) at 500 MHz carrier
SSB Phase Noise at 1 MHz Offset	<-115 dBc (1 Hz), typ. -125 dBc (1 Hz) at 500 MHz carrier
Maximum Safe RF Input Level (Damage Level)	+30 dBm (1 W) continuous RF power
Maximum DC Input Voltage	50 V
1 dB Gain Compression Point	+5 dBm (nominal, at 0 dB RF attenuation)
Third-Order Intermodulation Distortion (TOI) at 300 MHz	typ. +18 dBm
Third-Order Intermodulation Distortion (TOI) at 3 GHz	typ. +13 dBm
DANL at 1 GHz (RBW 10 Hz, Preamp Off)	<-137 dBm, typ. -140 dBm
DANL at 1 GHz (RBW 10 Hz, Preamp On)	<-152 dBm, typ. -156 dBm (with FSL-B22 option)
DANL at 18 GHz (RBW 10 Hz, Preamp Off)	<-122 dBm, typ. -128 dBm
Absolute Amplitude Accuracy	<0.3 dB (at 65.13 MHz)
Frequency Response (Flatness) 9 kHz to 3 GHz	<0.5 dB
Frequency Response (Flatness) 3 GHz to 18 GHz	<2.5 dB
Total Measurement Uncertainty (up to 3 GHz)	<0.5 dB
Attenuator Range	0 dB to 50 dB
Attenuator Step Size	5 dB

Bandwidth and Sweep Characteristics

Resolution Bandwidth (RBW) Range	10 Hz to 10 MHz
Resolution Bandwidth (RBW) Step Shape	1 to 3 sequence (standard 3 dB bandwidths)
FFT Filter Bandwidths	1 Hz to 30 kHz
Channel Filter Bandwidths	100 Hz to 5 MHz
Video Bandwidth (VBW) Range	1 Hz to 10 MHz
Analysis Bandwidth (Real-Time/Demodulation)	28 MHz standard
Sweep Time Range (Span > 0 Hz)	2.5 ms to 16000 s
Sweep Time Range (Zero Span)	1 μ s to 16000 s
Sweep Points Range	101 to 32001

Measurement Capabilities and Signal Processing

Trace Detectors	Max Peak, Min Peak, Auto Peak, Sample, RMS, Average, Quasi-Peak (with FSL-K3 option)
Standard Measurement Suites	Channel Power, Occupied Bandwidth (OBW), Adjacent Channel Leakage Ratio (ACLR), Spectrum Emission Mask (SEM), C/N, C/N0
Noise Figure Measurement Option	Supported (with FSL-K30 software)
Phase Noise Measurement Option	Supported (with FSL-K40 software)

Inputs, Outputs and Interfaces

RF Input Connector Type	3.5 mm male
RF Input Impedance	50 ohms
External Reference Input Frequency	10 MHz
External Reference Input Level Range	0 dBm to +10 dBm
Internal Reference Output Frequency	10 MHz
Internal Reference Output Level	typ. 0 dBm
Trigger Input Connector	BNC female
External Monitor Output	VGA (D-Sub 15-pin)

System Architecture and Display

Internal Operating System	Windows XP Embedded
Internal Storage Type and Capacity	CompactFlash card

Power and Electrical Specifications

Power Consumption (Typical)	65 W
Power Consumption (Maximum)	85 W
Battery Operating Time	Not supported

Physical and Environmental Specifications

Storage Temperature Range	-40 °C to +70 °C
Relative Humidity Range (Non-Condensing)	95% at +40 °C

Standards, Compliance and Calibration

EMC Certifications	EN 55011 Class B, EN 61326-1
Safety Standards Met	IEC 61010-1, EN 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Recommended Calibration Cycle	1 year

Options

RF Preamplifier Option	R&S FSL-B22 (3 GHz to 18 GHz)
Reference Frequency Option	R&S FSL-B4 (OCXO)
Additional Interfaces Option	R&S FSL-B5 (adds GPIB, video output, IF output, noise source control)

Performance

DANL at 18 GHz (RBW 10 Hz, Preamp On)	<-139 dBm (typical -143 dBm, with R&S FSL-B22 option)
Reference Level Range	-130 dBm to +30 dBm
Number of Traces	4
Trace Functions	Max Hold, Min Hold, Average, Clear/Write, View, Blank
Audio Demodulation	AM, FM (via internal speaker or headphone jack)
Gated Sweep	Supported
DANL at 6 GHz (RBW 10 Hz, Preamp Off)	<-133 dBm (typ. -136 dBm)
DANL at 13 GHz (RBW 10 Hz, Preamp Off)	<-128 dBm (typ. -131 dBm)

Power Supply

DC Power Supply Option	R&S FSL-B30 (12 V to 28 V DC)
Battery Pack Option	R&S FSL-B31 (NiMH battery)
AC Power Input Voltage Range	100 V to 240 V
AC Power Input Frequency Range	50 Hz to 60 Hz / 400 Hz
DC Power Supply Input Voltage	12 V to 28 V (with option FSL-B30)

Interfaces & Connectivity

USB Interface Ports	2 × USB 2.0 host (type A), 1 × USB device (type B)
LAN Interface Type	10/100 Base-T, RJ-45

Frequency Reference

Internal Reference Frequency Uncertainty	1×10^{-6}
OCXO Warm-Up Time	10 min

Bandwidths

Video Bandwidth (VBW) Step Size	1-3-10 sequence
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Spurious Responses

Inherent Spurious Response	< -90 dBm ($f > 1$ MHz, RF attenuation 0 dB)
Intermediate Frequency Response	< -80 dBc, typ. -103 dBc ($f < 3$ GHz); < -60 dBc, typ. -80 dBc ($f \geq 3$ GHz to 18 GHz)
Image Frequency Response	< -80 dBc, typ. -103 dBc ($f < 3$ GHz); < -60 dBc, typ. -80 dBc ($f \geq 3$ GHz to 18 GHz)
LO Emission at RF Input	< -70 dBm (RF attenuation 0 dB)

Trigger

External Trigger Delay Range	100 ns to 100 s
External Trigger Delay Resolution	100 ns

TECHNOLOGY

Spectrum Analysis

APPLICATIONS

RF & Microwave Testing, Radar System Maintenance, Microwave Link Field Deployment, Wireless Demodulation Analysis

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