

ROHDE & SCHWARZ

FSL

The Rohde & Schwarz FSL is a compact, lightweight spectrum analyzer designed for general-purpose RF development, production, and field service. Operating across various frequency models (up to 3 GHz, 6 GHz, and 18/20 GHz), it uniquely integrates a standard 28 MHz signal analysis bandwidth and optional battery operation, making it a highly versatile instrument in its class.

SPECIFICATIONS

General

Interfaces	2 × USB 2.0 Host (Type A), 1 × USB 2.0 Device (Type B), LAN (RJ-45, 10/100 Base-T), VGA (D-Sub 15-pin), GPIB (optional via FSL-B10)
Display	6.4" TFT color LCD, 640 × 480 pixels (VGA)

Physical

Power Supply	100 V to 240 V AC (50 Hz to 60 Hz / 400 Hz), 12 V to 28 V DC (optional via FSL-B30)
Operating Temperature	0 °C to +50 °C °C
Dimensions (W×H×D)	408 mm × 158 mm × 344 mm mm
Weight	7.0 kg (without options) kg

Frequency

Frequency Range	9 kHz to 3 GHz (FSL3) / 6 GHz (FSL6) / 18 GHz (FSL18, overrange to 20 GHz)
Reference Frequency Accuracy	1 × 10 ⁻⁶ (standard), 1 × 10 ⁻⁷ (with option FSL-B4)
Aging per Year	1 × 10 ⁻⁶ (standard), 1 × 10 ⁻⁷ (with option FSL-B4)
Temperature Drift	1 × 10 ⁻⁶ (standard, 0 °C to 50 °C), 1 × 10 ⁻⁷ (with option FSL-B4)
Frequency Resolution	1 Hz
Span Range	0 Hz, 10 Hz to 3 / 6 / 18 GHz
SSB Phase Noise (10 kHz offset)	<-98 dBc (1 Hz), typ. -103 dBc (1 Hz) at 1 GHz carrier
SSB Phase Noise (100 kHz offset)	<-98 dBc (1 Hz), typ. -105 dBc (1 Hz) at 1 GHz carrier
SSB Phase Noise (1 MHz offset)	<-115 dBc (1 Hz), typ. -120 dBc (1 Hz) at 1 GHz carrier

Bandwidth

Resolution Bandwidth (RBW) Range	10 Hz to 10 MHz (1 Hz to 10 MHz with option FSL-B7)
Resolution Bandwidth (RBW) Steps	1, 3, 10 sequence
Resolution Filter Shape Factor (60 dB / 3 dB)	<5
Video Bandwidth (VBW) Range	1 Hz to 10 MHz
Video Bandwidth (VBW) Steps	1, 3, 10 sequence
FFT Filter Bandwidth Range	10 Hz to 30 kHz (1 Hz to 30 kHz with option FSL-B7)

Amplitude

Maximum Safe Input Level (CW)	+30 dBm (1 W)
Maximum Input DC Voltage	50 V
1 dB Compression Point	+5 dBm (nominal, at 0 dB RF attenuation)
Displayed Average Noise Level (DANL) (without Preamp)	typ. -140 dBm/Hz at 1 GHz
Displayed Average Noise Level (DANL) (with Preamp)	typ. -152 dBm/Hz at 1 GHz (with option FSL-B22)
Frequency Response (Flatness)	<0.5 dB (<3 GHz), <0.8 dB (<6 GHz)
Input Attenuator Range	0 dB to 50 dB
Input Attenuator Steps	5 dB
Second Harmonic Intercept (SHI)	+40 dBm (typ. at 1 GHz)
Third-Order Intercept (TOI)	typ. +12 dBm (at 1 GHz)
Amplitude Measurement Range	DANL to +30 dBm

Sweep and Trigger

Sweep Time Range (Span > 0 Hz)	2.5 ms to 16000 s
Sweep Time Range (Zero Span)	1 μ s to 16000 s
Sweep Time Accuracy	0.1% (nominal)
Number of Sweep Points	501 (standard), up to 32001 (user-selectable)
Sweep Modes	Continuous, Single
Trigger Sources	Free Run, Video, External
Trigger Delay Range	1 μ s to 100 s

Measurement and Demodulation

Marker Functions	Peak Search, Next Peak, Marker to Trace, Marker Demodulation (AM/FM), Noise Marker, Frequency Counter
Detector Types	Max Peak, Min Peak, Auto Peak, Sample, RMS, Average, Quasi-Peak (with option FSL-K3)
Trace Functions	Clear/Write, Max Hold, Min Hold, Average, View
Standard Analysis Functions	Channel Power (CP), Adjacent Channel Leakage Ratio (ACLR), Occupied Bandwidth (OBW), Spectrum Emission Mask (SEM), C/N, TOI
Analog Demodulation Types	AM, FM (audio via built-in speaker or headphone jack)
Digital Demodulation Options	WCDMA/3GPP, WLAN 802.11a/b/g/n, WiMAX, Bluetooth (option-dependent)
Signal Analysis (Demodulation) Bandwidth	28 MHz

Inputs and Outputs

RF Input Connector	N female
RF Input Impedance	50 Ω (standard), 75 Ω (with option RAM/RAZ matching pad)
External Reference Input (Frequency/Level)	10 MHz / -10 dBm to +10 dBm
External Reference Output	10 MHz / typ. 0 dBm

Tracking Generator

Tracking Generator Frequency Range	9 kHz to 3 GHz / 6 GHz (option FSL-B9 dependent)
Tracking Generator Output Level Range	-20 dBm to 0 dBm
Tracking Generator Output Level Resolution	0.1 dB
Tracking Generator Flatness	± 1 dB (nominal)
Tracking Generator Impedance	50 Ω

Display and User Interface

Language Support	English, German, French, Spanish, Russian, Chinese, Japanese, Korean
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Physical and Power

Power Consumption	typ. 45 W, max. 65 W
Battery Operation Option	NiMH battery pack (option FSL-B31)
Weight (with Battery Option)	approx. 8.4 kg (including FSL-B30 and FSL-B31 options)

Environmental and Compliance

Storage Temperature Range	-40 °C to +70 °C
Relative Humidity Range	95% at +40 °C (non-condensing)
Electromagnetic Compatibility (EMC)	Meets EN 55011 Class B, EN 61326-1
Safety Certifications	EN 61010-1, UL 61010-1, CAN/CSA-C22.2 No. 61010-1
Mechanical Shock and Vibration Compliance	Meets MIL-PRF-28800F Class 3

System & Software

Operating System	Windows XP Embedded
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Frequency Stability

OCXO Reference Frequency Aging (Option FSL-B4)	1 x 10 ⁻⁷ per year
OCXO Reference Frequency Temperature Drift (Option FSL-B4)	1 x 10 ⁻⁷ (0°C to +50°C)

Preamplifier Option

RF Preamplifier Gain (Option FSL-B22)	15 dB (nominal)
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Optional Interfaces

Noise Source Control Output (Option FSL-B5)	28 V, max. 100 mA (BNC connector)
IF Output (Option FSL-B5)	20.4 MHz (BNC connector)
GPIO Interface (Option FSL-B10)	IEEE 488 (GPIO) interface, 24-pin

Measurement Options

Supported Power Sensors (Option FSL-K9 / FSL-B5)	R&S NRP-Z11/Z21/Z22/Z23/Z24/Z51/Z55/Z81/Z91
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Connectivity

LAN Port	10/100 Base-T (RJ-45)
USB Ports	2 × USB 2.0 Type-A (1 front, 1 rear), 1 × USB 2.0 Type-B (rear)
External Display Output	VGA (15-pin D-Sub)
Audio Output Connector	3.5 mm mini jack (headphone/speaker)

General Specs

Warm-Up Time	20 min
Recommended Calibration Interval	1 year

Environmental

Maximum Operating Altitude	3000 m
Maximum Storage Altitude	4600 m

TECHNOLOGY

Heterodyne Spectrum Analyzer

APPLICATIONS

RF testing, wireless standard demodulation, service, and production

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