

ROHDE & SCHWARZ

FSW50

The Rohde & Schwarz FSW50 is a high-performance signal and spectrum analyzer designed to meet the demanding requirements of microwave and millimeter-wave applications, offering a frequency coverage from 2 Hz to 50 GHz with outstanding phase noise and dynamic range.

SPECIFICATIONS

General

Interfaces	LAN (LXI), GPIB (IEC 625-2/IEEE-488), USB 2.0, USB 3.0, DVI-D, DisplayPort
Display	12.1-inch WXGA color touchscreen (1280 × 800 pixels)
Warm-Up Time	20 min (10 min with Option FSW-B4)

Physical

Power Supply	100 V to 240 V AC (±10%), 50 Hz to 60 Hz / 400 Hz
Operating Temperature	+5 °C to +45 °C °C
Dimensions (W×H×D)	462 mm × 240 mm × 504 mm mm
Weight	23.6 kg (configuration dependent) kg

Frequency Specifications

Frequency Range	2 Hz to 50 GHz
Frequency Resolution	0.01 Hz
Frequency Span Range	0 Hz (zero span), 10 Hz to 50 GHz
Internal Reference Frequency Aging Rate	$\pm 1 \times 10^{-7}$ per year
Internal Reference Frequency Aging Rate (with Option FSW-B4)	$\pm 3 \times 10^{-8}$ per year
Reference Temperature Stability	$\pm 1 \times 10^{-9}$ (+5 °C to +45 °C, with Option FSW-B4)
Phase Noise at 10 kHz Offset (1 GHz Carrier)	-140 dBc/Hz (typical)
Phase Noise at 100 kHz Offset (1 GHz Carrier)	-143 dBc/Hz (typical)
Phase Noise at 1 MHz Offset (1 GHz Carrier)	-150 dBc/Hz (typical)

Amplitude & Sensitivity Specifications

RF Input Impedance	50 Ω
RF Input Attenuator Range	0 dB to 75 dB (in 5 dB steps)
RF Input Attenuator Step Size (with Option FSW-B25)	1 dB
Maximum Safe Input Level (CW Power)	+30 dBm (1 W)
Maximum Safe Input Level (DC Voltage)	0 V

Connectivity & Interface Ports

RF Input Connector Type	2.4 mm female (ruggedized)
External Reference Input Frequency	1 MHz to 20 MHz (in 1 Hz steps)
External Reference Output	10 MHz (plus 100 MHz/640 MHz option)

Dynamic Range & Distortion

Third-Order Intercept (TOI) at 2 GHz	+25 dBm (typical)
1 dB Gain Compression Level (at 1 GHz)	+15 dBm (nominal)

Sweep & Bandwidth

Sweep Time Range (Zero Span)	1 μ s to 16000 s
Sweep Time Range (Span $\geq$ 10 Hz)	1 μ s to 16000 s
Resolution Bandwidth (RBW) Range	1 Hz to 10 MHz (up to 80 MHz with options)
Video Bandwidth (VBW) Range	1 Hz to 10 MHz
Standard Analysis Bandwidth	80 MHz (configuration dependent)
Maximum Analysis Bandwidth	8.3 GHz (with Option FSW-B8001)
RBW Selectivity (60 dB / 3 dB Shape Factor)	< 4.6 (Gaussian shape)

Measurement Capabilities & Features

Detectors	Max Peak, Min Peak, Auto Peak, Sample, RMS, Average, Quasi-Peak
Trace Functions	Clear/Write, Max Hold, Min Hold, Average, View, Blank
Number of Displayed Traces	6
Standard Measurement Suites	Channel Power, ACPR, Occupied Bandwidth, Spectrum Emission Mask, CCDF

Physical & Environmental

Display Resolution	1280 $\times$ 800 pixels
Storage Temperature Range	-40 $^{\circ}$ C to +70 $^{\circ}$ C
Operating Humidity Range	95% RH (non-condensing)
Calibration Interval	1 year

Receiver & Noise Performance

DANL at 1 GHz (no preamplifier)	-152 dBm (1 Hz) (typ. -155 dBm)
DANL at 10 GHz (no preamplifier)	-150 dBm (1 Hz) (typ. -152 dBm)
DANL at 50 GHz (no preamplifier)	-137 dBm (1 Hz) (typ. -141 dBm)
DANL at 50 GHz (with preamplifier Option FSW-B24)	-156 dBm (1 Hz) (typ. -161 dBm)

Measurement Speed & Sweep

Number of Sweep Points (Sweep)	101 to 100001
Number of Sweep Points (Transient Recorder)	2 to 400000000

Analysis Bandwidth

Analysis Bandwidth Options	up to 8.3 GHz (with Option FSW-B8000 / FSW-B8001)
Real-time Analysis Bandwidth Options	up to 800 MHz (with Option FSW-B800R)

General Data

Operating System	Windows 10
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Trigger

Trigger Sources	Free Run, Video, External, IF Power, RF Power, I/Q Power, Timer
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Connectivity

Front-Panel USB Ports	2 × USB 2.0 (Type A)
Rear-Panel USB Ports	2 × USB 3.0 (Type A), 1 × USB 2.0 (Type B)
LAN Interface	1 × RJ-45, 10/100/1000BASE-T
External Monitor Outputs	1 × DVI-D, 1 × DisplayPort
Audio Output Port	3.5 mm jack (front panel) for AM/FM demodulated audio

Inputs & Outputs

Noise Source Control Port	BNC, 28 V DC, max. 100 mA
External Mixer LO/IF Port	Option FSW-B21 (SMA female, LO: 8.0 GHz to 14.5 GHz, IF: 311.25 MHz)
Standard IF Output Frequency	311.25 MHz (BNC, 50 Ω)

Environmental & Safety

Sinusoidal Vibration Compliance	5 Hz to 55 Hz, 0.15 mm amplitude (meets EN 60068-2-6)
Random Vibration Compliance	10 Hz to 300 Hz, 1.2 g RMS (meets EN 60068-2-64)
Shock Resistance Compliance	40 g shock spectrum (meets MIL-STD-810G, Method 516.6)

TECHNOLOGY

Superheterodyne Spectrum Analyzer with Digital IF

APPLICATIONS

Microwave and millimeter-wave testing, radar analysis, 5G and satellite communication systems

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