

ROHDE & SCHWARZ

FSU50

The Rohde & Schwarz FSU50 is a high-performance spectrum and signal analyzer designed for demanding RF and microwave measurements. Covering a frequency range from 20 Hz to 50 GHz, it offers exceptional dynamic range, extremely low phase noise, and highly accurate level measurements. It is optimized for next-generation wireless communications development, aerospace and defense, and general-purpose high-frequency testing.

SPECIFICATIONS

General

Interfaces	GPIB (IEEE 488.2), LAN (10/100 Base-T), USB 2.0, RS-232, VGA, LPT, PS/2
Display	8.4-inch color TFT LCD (SVGA, 800 x 600 pixels)

Physical

Power Supply	100 V to 240 V AC, 50 Hz to 400 Hz, typ. 150 W
Operating Temperature	5 to 40 °C
Dimensions (W×H×D)	435 mm x 192 mm x 460 mm mm
Weight	23 kg

Frequency

Frequency Range	20 Hz to 50 GHz
Internal Reference Frequency	10 MHz
Reference Frequency Aging per Year	1 x 10 ⁻⁷
Reference Frequency Aging per Year (with Option B4)	2 x 10 ⁻⁸
Frequency Span Range	0 Hz (zero span), 10 Hz to 50 GHz
Frequency Resolution	0.01 Hz
Phase Noise at 10 kHz Offset	-123 dBc/Hz (at 640 MHz carrier)
Phase Noise at 100 kHz Offset	-124 dBc/Hz (at 640 MHz carrier)
Phase Noise at 1 MHz Offset	-145 dBc/Hz (at 640 MHz carrier)

Bandwidths

Resolution Bandwidths (3 dB)	1 Hz to 10 MHz (in 1, 2, 3, 5 steps), 20 MHz, 50 MHz
FFT Filter Range	1 Hz to 30 kHz
Channel Filter Range	100 Hz to 5 MHz (39 filters)
RRC Filters	NADC, TETRA, 3GPP
EMI Filters (6 dB)	200 Hz, 9 kHz, 120 kHz, 1 MHz
Video Bandwidths	1 Hz to 10 MHz
Shape Factor (60 dB / 3 dB)	< 4.6 (analog filters)

Amplitude & Level

Maximum Safe Input Level (CW)	+30 dBm (1 W)
Maximum DC Input Voltage	0 V (DC coupled)
1 dB Compression Point	+13 dBm (at 0 dB RF attenuation)
Displayed Average Noise Level (DANL) at 1 GHz	-158 dBm (1 Hz RBW)
Displayed Average Noise Level (DANL) at 50 GHz	-130 dBm (1 Hz RBW)
Third-Order Intercept (TOI)	typ. +25 dBm (at 2 GHz)
Total Measurement Uncertainty	0.3 dB at 640 MHz
Input Attenuator Range	0 to 75 dB
Attenuator Step Size	5 dB
Input VSWR (f < 3.6 GHz)	< 1.2
Input Impedance	50 Ohm

Sweep & Acquisition

Sweep Time Range (Span > 0 Hz)	2.5 ms to 16000 s
Sweep Time Range (Zero Span)	1 microsecond to 16000 s
Sweep Time Accuracy (Zero Span)	0.1%
Number of Sweep Points	155 to 30001 (user-selectable)
Sweep Modes	Continuous, Single
Measurement Speed	Up to 70 measurements/s (via GPIB, including trace transfer)
Trigger Sources	Free Run, Video, External, Line, IF Power

Measurement & Demodulation

Detector Types	Max Peak, Min Peak, Auto Peak, Sample, RMS, Average, Quasi-Peak
Number of Traces	3
Trace Functions	Clear/Write, Max Hold, Min Hold, View, Blank, Average
Standard Measurement Routines	TOI, MC ACP(R), OBW, CCDF, APD
Demodulation Capability	AM, FM, PM

Inputs & Outputs

RF Input Connector	2.4 mm female
External Reference Input	10 MHz (BNC, female)
Reference Output	10 MHz (BNC, female)
External Trigger Input	BNC, female
VGA Monitor Port	15-pin D-Sub
LPT Parallel Port	25-pin D-Sub
Serial Port	9-pin RS-232
Keyboard/Mouse Ports	PS/2
Probe Power Supply Connector	5-pin (+15 V, -12.6 V, Ground)
GPIB Interface	IEEE 488.2 (SCPI compatible)
LAN Interface	10/100 Base-T (RJ-45)
USB Interface	USB 2.0 (Host)
IF Output Frequency	21.4 MHz

Physical & Environmental

Display Type	8.4-inch color TFT LCD
Display Resolution	800 x 600 pixels (SVGA)
Operating Temperature Range	+5 °C to +40 °C
Storage Temperature Range	-40 °C to +70 °C
Power Supply Voltage	100 V to 240 V AC, 50 Hz to 400 Hz

Hardware & Software Options

High Stability OCXO Option	Option FSU-B4
Tracking Generator Options	Option FSU-B9 (3.6 GHz) / Option FSU-B12 (26.5 GHz)
External Mixer Support Option	Option FSU-B21
Preamplifier Option (up to 50 GHz)	Option FSU-B24
Electronic Attenuator Option	Option FSU-B25
GSM/EDGE Measurement Application	Option FS-K5
Bluetooth Measurement Application	Option FS-K8
Noise Figure Measurement Application	Option FS-K30
Phase Noise Measurement Application	Option FS-K40
WCDMA Measurement Application	Option FS-K72

RF Performance

Input VSWR (3.6 GHz to 8 GHz)	< 1.5
Input VSWR (8 GHz to 26.5 GHz)	< 1.8
Input VSWR (26.5 GHz to 50 GHz)	< 2.0 (up to 46 GHz), < 2.5 (up to 50 GHz)
Third-Order Intercept (TOI) (3.6 GHz to 26.5 GHz)	> 17 dBm (typ. +22 dBm)
Third-Order Intercept (TOI) (26.5 GHz to 50 GHz)	> 13 dBm (typ. +18 dBm)
Second Harmonic Intercept (SHI) (f < 1.8 GHz)	> 45 dBm (typ. +55 dBm)
Absolute Level Uncertainty (at 128 MHz)	< 0.15 dB
Logarithmic Display Range	1 dB to 150 dB

Reference Frequency

Reference Input Frequency Range	1 MHz to 20 MHz (in 1 MHz steps)
Reference Input Level	-10 dBm to +15 dBm
Reference Output Level	> 0 dBm (typ. +10 dBm into 50 ohms)
Warm-up Time	20 minutes
Warm-up Time (with Option B4)	5 minutes

I/Q Demodulation

I/Q Demodulation Bandwidth	28 MHz
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Options

Option B73 YIG Filter Bypass Range	3.6 GHz to 50 GHz
Preamplifier Option B24 Gain	30 dB (nominal)
Preamplifier Option B24 Frequency Range	100 kHz to 50 GHz

Environmental & Compliance

Vibration (Sinusoidal)	5 Hz to 55 Hz (0.15 mm amplitude), 55 Hz to 150 Hz (0.5 g), conforms to IEC 60068-2-6
Vibration (Random)	10 Hz to 300 Hz (1.2 g RMS), conforms to IEC 60068-2-64
Shock Resistance	40 g shock spectrum, conforms to MIL-STD-810D
EMC Standard	EN 55011 Class B, EN 61326
Safety Standard	EN 61010-1, UL 3111-1, CAN/CSA-C22.2 No. 1010.1

Power Supply & Electrical

AC Input Frequency	47 Hz to 440 Hz
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Environmental

Max Operating Altitude	4600 m
Max Storage Altitude	12000 m
Operating Relative Humidity	95% at +40 °C (non-condensing)

RF Input

LO Emission at RF Input	<-90 dBm (attenuation = 0 dB, f < 3.6 GHz)
1 dB Compression Point (f < 3.6 GHz)	13 dBm (attenuation = 0 dB)
1 dB Compression Point (3.6 GHz to 50 GHz)	10 dBm (attenuation = 0 dB)

Performance

ADC Resolution	14 bit
ADC Sampling Rate	32 MHz
Reference Frequency Temperature Drift	1 × 10 ⁻⁶ (0 °C to 50 °C)
Reference Frequency Temperature Drift with Option B4	1 × 10 ⁻⁹ (0 °C to 50 °C)
3GPP ACLR Dynamic Range	77 dB (typical)

TECHNOLOGY

Spectrum Analysis

APPLICATIONS

RF & Microwave Testing, Aerospace and Defense, Wireless Communications Design

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