

ROHDE & SCHWARZ

SMR40

The Rohde & Schwarz SMR40 is a high-performance microwave signal generator covering the frequency range of 10 MHz to 40 GHz. Designed for both laboratory and production environments, the SMR40 provides excellent spectral purity, fast switching times, and highly precise output levels. It can be easily upgraded from a standard CW generator with pulse modulation to a fully-featured AM/FM signal generator or vector-modulated upconverter, supporting a wide range of radar, EMC, and communication testing applications.

SPECIFICATIONS

Frequency

Minimum Frequency	10 MHz Hz
Maximum Frequency	40 GHz Hz
Frequency Resolution	1 kHz (0.1 Hz with option SMR-B9)

Output

Maximum Output Power	+9 dBm dBm
Output Power Range	-20 dBm to +9 dBm (extendable to -130 dBm with optional step attenuator SMR-B17)
Phase Noise	<-103 dBc/Hz (typical -109 dBc/Hz) at 10 kHz offset, 10 GHz carrier

Modulation

Modulation	Pulse (standard); AM, FM, Phase modulation (optional SMR-B5)
Sweep Modes	Digital frequency sweep, Level sweep (standard); Analog ramp sweep (optional SMR-B4)

General

Reference Oscillator	10 MHz standard TCXO (OCXO optional SMR-B1)
Interfaces	GPIO (IEEE 488.2)
Display	Monochrome LCD with backlight
Instrument Setup Memory	50 complete instrument settings

Physical

Power Supply	90 V to 265 V AC, 47 Hz to 440 Hz
Dimensions (W×H×D)	427 mm × 88 mm × 450 mm mm

Frequency Specifications

Frequency Switching Speed	< 10 ms
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Reference Oscillator

Aging Rate (Standard TCXO)	< 1 x 10 ⁻⁶ per year
Aging Rate (Optional OCXO SMR-B1)	< 5 x 10 ⁻¹⁰ per day
External Reference Input Frequency	10 MHz

Amplitude Specifications

Level Uncertainty (at 10 GHz)	< 0.9 dB
Output Impedance	50 ohms
Output VSWR	< 2.0 (for frequencies > 2 GHz)

Spectral Purity

Harmonics	<-30 dBc (for frequencies > 2 GHz)
Subharmonics (f > 20 GHz)	<-50 dBc

Analog Modulation

Pulse Modulation On/Off Ratio	> 80 dB
Pulse Modulation Rise/Fall Time	< 10 ns (typical 5 ns)
Pulse Modulation Minimum Pulse Width	50 ns
AM Depth Range (Option SMR-B5)	0% to 90%
Phase Modulation Max Deviation	100 rad (at 10 GHz carrier)

Sweep and Operating Modes

Number of Sweep Points	2 to 65535
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System Connectivity and Interfaces

RF Output Connector Type	2.92 mm female (K-type)
Remote Control Language	SCPI

Physical and Environmental Specifications

Operating Temperature Range	0 °C to +55 °C
Storage Temperature Range	-40 °C to +70 °C
Rack Unit (RU) Height	2 HU

Power Requirements

Power Consumption	150 W (typical)
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Compliance and Standards

Recommended Calibration Cycle	3 years
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Hardware and Software Options

Option SMR-B1	OCXO Reference Oscillator
Option SMR-B4	Option SMR-B11
Option SMR-B5	AM/FM/Phase Modulation/Log AM Modulator
Option SMR-B9	High Frequency Resolution (0.1 Hz)
Option SMR-B11	Option SMR-B14
Option SMR-B17	Step Attenuator (for SMR40)
Option SMR-B23	IF Upconverter (up to 40 GHz)

LF Generator (Option SMR-B5)

LF Generator Frequency Range (Sine)	0.1 Hz to 10 MHz
LF Generator Frequency Range (Other Waveforms)	0.1 Hz to 1 MHz (square, triangle, sawtooth)
LF Generator Waveforms	sine, square, triangle, sawtooth
LF Generator Frequency Resolution	0.1 Hz

Pulse Generator (Option SMR-B14)

Pulse Generator Period Range	100 ns to 85 s
Pulse Generator Pulse Width Range	10 ns to 1 s
Pulse Generator Resolution	10 ns
Pulse Generator Operating Modes	single pulse, double pulse, delayed pulse, external trigger, external gate

Reference Frequency

Internal Reference Output Frequency	10 MHz
Internal Reference Output Level	approx. 1 V (rms) into 50 Ω

Analog Ramp Sweep (Option SMR-B11)

Analog Ramp Sweep Sweep Time Range	10 ms to 100 s
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Sweep

Sweep Trigger Modes	auto, single, external, manual
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RF Attenuator (Option SMR-B23)

Attenuator Range	0 dB to 110 dB (with Option SMR-B17)
Attenuator Step Size	10 dB (with Option SMR-B17)

Phase Noise

SSB Phase Noise at 10 GHz (10 kHz offset)	<-83 dBc/Hz (typical -89 dBc/Hz)
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Rear Panel Connectors (Option SMR-B19)

Option SMR-B19 Description	Moves RF output and all modulation inputs/outputs to the rear panel
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Options

Option SMR-B12 Description	High Output Power for SMR27, SMR30, and SMR40
Option SMR-B14 Description	Pulse Generator

LF Generator

LF Generator Output Amplitude Range	10 mV to 1 V (into 50 ohm), 10 mV to 2 V (open circuit)
LF Generator Output Impedance	50 ohm

TECHNOLOGY

Synthesized Microwave Signal Generation

APPLICATIONS

Radar testing, scalar network analysis, EMC testing, microwave component characterization, vector signal upconversion

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