

ROHDE & SCHWARZ

SMP02

The Rohde & Schwarz SMP02 is a high-precision microwave signal generator covering the frequency range from 10 MHz to 20 GHz. Known for its ultra-low phase noise, superior frequency switching times, and versatile sweep capabilities, the SMP02 is designed for demanding radar, communication equipment, EMC, and R&D measurements. Its modular concept supports optional high-performance pulse modulation, phase modulation, and built-in attenuators, making it a highly adaptable instrument for diverse testing environments.

SPECIFICATIONS

Frequency

Minimum Frequency	2 GHz (10 MHz with Option SMP-B11) Hz
Maximum Frequency	20 GHz Hz
Frequency Resolution	0.1 Hz
Frequency Switching Time	<15 ms
External Reference Input Frequency	10 MHz

Output

Maximum Output Power	+13 dBm dBm
Output Power Range	-20 dBm to +13 dBm (without attenuator); -140 dBm to +10 dBm (with Option SMP-B15)
Phase Noise	<-105 dBc/Hz (at 10 kHz offset, 10 GHz carrier)

Modulation

Modulation	AM, FM, Phase Modulation (Option SMP-B20), Pulse Modulation
Sweep Modes	Digital RF, AF (LF), and level sweep; linear or logarithmic

General

Reference Oscillator	10 MHz standard (High-Stability Oven Quartz Option SMP-B1 available)
Interfaces	GPIO (IEEE-488.2)
Display	Backlit LCD
Setup Memory Locations	Storage of 50 complete instrument configurations

Physical

Power Supply	100 V to 240 V AC, 47 Hz to 440 Hz
Dimensions (W×H×D)	435 mm × 147 mm × 570 mm mm
Weight	21 kg kg

Level (Amplitude)

Level Resolution	0.1 dB
Level Uncertainty	< ±0.9 dB (at 0 dBm, 10 MHz to 20 GHz)
Output Impedance	50 Ω

Spectral Purity

Harmonics (f < 2 GHz)	<-30 dBc
Non-harmonics	<-60 dBc (at > 10 kHz offset)
SSB Phase Noise at 10 GHz (10 kHz offset, standard)	<-105 dBc/Hz
SSB Phase Noise at 20 GHz (10 kHz offset)	<-99 dBc/Hz

Analog Modulation

Amplitude Modulation Depth Range	0% to 90%
Amplitude Modulation Distortion	< 3% (at 30% depth, 1 kHz modulation)

Pulse Modulation

Pulse Modulation On/Off Ratio	> 80 dB
Pulse Rise and Fall Times	< 10 ns (typically < 5 ns)

Connectors & Interfaces

RF Output Connector Type	PC 3.5 female
External Reference Input/Output Connectors	BNC female
External Modulation Input Connectors	BNC female

Physical & Environmental

Operating Temperature Range	0 °C to +55 °C
Storage Temperature Range	-40 °C to +70 °C
Relative Humidity Limits	Up to 95% (non-condensing)

Power Requirements

Power Consumption	Approx. 120 W (up to 220 VA)
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Hardware Options

Option SMP-B1	High-Stability Oven Quartz Reference
Option SMP-B15	RF Attenuator (for SMP02)
Option SMP-B18	Option SMP-B18 = RF Attenuator (for SMP22)
Option SMP-B19	Option SMP-B19 = Pulse Modulator (for SMP22)
Option SMP-B20	Option SMP-B20 = Pulse Generator (for SMP22)

RF Output

VSWR (f < 2 GHz)	< 1.5
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Options

Option SMP-B2	Internal Pulse Generator
Option SMP-B3	Pulse Modulator
Option SMP-B11	Frequency Extension 10 MHz to 2 GHz

Power Supply

AC Input Voltage Range	90 V to 265 V (nominal 100 V to 240 V)
AC Input Frequency Range	47 Hz to 440 Hz

Internal Pulse Generator (Option SMP-B2)

Pulse Period Range	1 μ s to 85 s
Pulse Width Range	100 ns to 85 s

Amplitude Modulation

External AM 3-dB Bandwidth	DC to 50 kHz (DC-coupled), 10 Hz to 50 kHz (AC-coupled)
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Interfaces & Control

GPIO Command Language	SCPI
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Frequency Modulation

Frequency Modulation 3-dB Bandwidth	DC to 5 MHz (FM DC), 10 Hz to 5 MHz (FM AC)
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Phase Modulation

Phase Modulation 3-dB Bandwidth	DC to 100 kHz
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Internal Modulation Source

Internal Modulation Source Frequency Resolution	0.1 Hz
Internal Modulation Source Output Voltage Range	1 mV to 1 V (into 50 Ω)

Physical & General

Rack Height Units	4 U
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TECHNOLOGY

RF & Microwave Synthesized Signal Generation

APPLICATIONS

Radar and communication systems testing, EMC testing, production, R&D, and material testing

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