Signal Generator SMY

**SMY01**: 9 kHz to 1040 MHz
**SMY02**: 9 kHz to 2080 MHz
Low-cost, ideal for receiver testing and component measurements

**Brief description**

Signal Generator SMY from Rohde & Schwarz is a cost-effective instrument for testing AM, FM and qM receivers and for component measurements. Designed exclusively for the main applications of signal generators by cutting out the unnecessaries, the SMY features an outstanding price/performance ratio. Thanks to its comprehensive basic features and excellent signal characteristics, it is an economical solution for universal use in lab, production and service environments.

**Main features**

- Level range -140 dBm to +19 dBm (25 dBm overrange with option SMY-B40), sufficient even for receivers of highest sensitivity
- High level accuracy and low RF leakage allowing accurate and undegraded sensitivity measurements
- FM-DC with high accuracy of carrier frequency for testing pagers and receivers fitted with digital squelches
- Low SSB phase noise and high spurious rejection for all in-channel and blocking measurements
- Low residual FM affording ample of margin for S/N measurements
- Modulation generator 1 Hz to 500 kHz for modulation frequency response measurements
- Stereo channel separation of 50 dB and low harmonic distortion for testing FM stereo receivers
- Non-interrupting level setting over a range of 20 dB for reproducible measurement of squelch hysteresis
- Frequency resolution 1 Hz, suitable also for narrowband DUTs
- FM-DC, deviation up to 20 MHz for VCO simulation
- FM bandwidth 2 MHz for fast FSK and telemetry applications
- AF synthesizer 1 Hz to 500 kHz, separate use as AF signal source for external applications possible, eg recording of AF frequency response
- Remote-control interface IEC625/IEEE488 for use in automatic test systems
- RF sweep
- Sequence function and SEQ input for semi-automatic use

**Characteristics**

**Cost-saving synthesis concept**

Single-loop synthesis is a concept that makes for simple and cost-effective circuit design without losing out on high frequency resolution and short setting time. The fractional N-technique uses a fractional frequency division ratio, ie a frequency resolution of 1 Hz is obtained in spite of the high reference frequency. High reliability and light weight thanks to VLSI components are further advantages of this technique.

**Uncomplicated operation**

The panel controls are ergonomically arranged. The patented, magnetically locking spinwheel is easy to turn, nevertheless the user can exactly feel each setting step. Fast tuning and programming of the step width are also possible. Frequently used settings can be stored and recalled any time. The memory saves up to 100 complete instrument setups.

**Reliability of operation, ease of maintenance**

The built-in selftest facility monitors continuously the signal generator status. If there are any malfunctions, these are immediately detected and indicated. The user thus has an effective protection against invalid measurements, should the generator ever fail. The SMY requires particularly little maintenance: aging and drift are compensated for by control loops. Due to the few reference components, which are designed for maximum stability, calibration is required at intervals of 3 years only.
Specifications in brief

**Frequency**

Range SMY01/SMY02

9 kHz to 1.04 GHz/9 kHz to 2.08 GHz

Underranging

1 Hz

Setting time (to within <1 x 10^-7 for f >65 MHz or <70 Hz for f <65 MHz)

<60 ms

**Reference frequency**

Standard option SMY-B1

1 x 10^-9/year <1 x 10^-9/day

Temperature effect (to 55°C)

2 x 10^-8 /°C x 10^-8

**Output for internal reference**

Frequency

10 MHz

Level Vpeak (EMF, sinewave)

1 V at 50 Ω

Input for external reference

5 x 10 MHz ±5 x 10^-6

Input level (V rms)

0.2 or 2 V at 200 Ω

**Spectral purity**

Spurious signals

<30 dBc for levels <10 dBm

<25 dBc for levels >10 dBm

Subharmonics

none (f <1.04 GHz: <10 dBc)

Nonharmonics at

<5 kHz from carrier

<70 dBc (f <1.04 GHz: <64 dBc)

Broadband noise with CW, carrier offset >1 MHz, bandwidth, f <65 MHz

<140 dBc

SSB phase noise at 20 kHz from carrier, 1 Hz bandwidth, CW

<114 dBc

Frequency range/resolution

100 MHz/500 MHz <132 dBc/120 dBc

1 GHz/2 GHz

<114 dBc/108 dBc

Residual FM, rms, <1 % of max. deviation, f = 1 GHz

0.3 to 3 kHz (CCITT)

<10 Hz (500 kHz to 20 kHz: <20 Hz)

Residual AM, rms (0.03 to 20 kHz)

<0.02 %

**Level**

Range

-140 to +13 dBm; -134 to +19 dBm

Overranging (without guarantee of specs)

up to +19 dBm; -140 to +25 dBm

Resolution

0.1 dB

Accuracy for levels >127 dBm

±1 dB (f <1.04 GHz: ±1.5 dB)

Frequency response at 0 dBm

1 dB, typ. 0.3 dB

Characteristic impedance

50 Ω

VSWR

<1.5 (<1.04 GHz: <1.8)

Setting time (IEC/IEEE bus)

<25 ms (<10 ms with electronic level setting)

Noninterrupting level setting

0 to 20 dB

**Overload protection**

protects the instrument against externally applied RF power and DC voltage (50 Ohm source)

Max. permissible RF power

30 W (SMY 02: 50 W)

Max. permissible DC voltage

35 V

Max. pulse load (pulse width <10 μs)

1 mWs or 150 V (peak)

**Simultaneous modulation**

any combination of AM, FM (μW) and pulse modulation

**Amplitude modulation**

Modulation depth

internal, external AC/DC

Resolution

0 to 100 %

Setting error at 1 kHz (m <80 %)

<4 % of reading ± 1 %

AM distortion at 1 kHz

m = 30 %

<1 %; 3 %

m >80 %

<2 %; 5 %

Modulation frequency response (m = 60 %)

30 Hz (DC) to 10 kHz

0.4 dB

10 Hz (DC) to 50 kHz

3 dB

Incidental QAM at (30 %), AF = 1 kHz

<0.4 rad at f = 1.04 GHz (SMY 02)

<0.1 rad at f = 1.04 GHz (SMY 01)

**Frequency modulation**

Max. deviation for carrier frequency

<65 MHz

10 MHz

65 to 130 MHz

1.25 MHz

130 to 260 MHz

2.5 MHz

260 to 520 MHz

5 MHz

520 to 1040 MHz

10 MHz

1040 to 2080 MHz

20 MHz

Resolution time

<1 %, min. 10 Hz

1) with option SMY840

2) To be retrofitted by authorized service centers only.