Digital signals of your choice

Brief description

The B series of Signal Generator Family SMIQ for analog and digital modulation from Rohde & Schwarz is offering solutions for today and tomorrow. This series particularly takes into account future developments in the field of 3rd-generation digital mobile radio.

The SMIQ family comprises four models which differ in their upper frequency limits. These feature a hitherto unrivalled versatility regarding signal generation and signal quality and are therefore ideal for use in development and type-approval testing.

With their outstanding price/performance ratio, these signal generators are also economically attractive for applications in production. The wide frequency range from 300 kHz to 6.4 GHz covers all main radio bands including their IF ranges.

The high-grade I/Q modulator fitted as standard ensures minimum error vector magnitude and high intermodulation suppression. Using modern digital signal processor (DSP) technology, the versatile concept allows the generation of high-precision digital modulation signals with high bit rates without any limitations on modulation modes or standards.

In addition to digital modulation, the signal generators provide the full range of analog modulation modes as well as simultaneous modulation capability.

Main features

- Frequency range 300 kHz to 2.2 GHz/3.3 GHz/4.4 GHz/6.4 GHz
- Analog and digital modulation
- Versatile and broadband generation of digitally modulated signals up to 18 Msymbol/s
- Generation of TDMA, CDMA, W-CDMA and CDMA2000 standard signals to all main mobile radio standards
- Broadband I/Q modulator with outstanding vector accuracy
- Optional internal fading simulator to test specifications of mobile radio standards
- Optional internal noise generator and distortion simulator
- Optional BER measurement
- Optional arbitrary waveform generator
- Low ACP for IS-95 CDMA and W-CDMA (option)
- Low cost of ownership due to three-year calibration intervals
- Future-oriented platform concept
- Unrivalled price/performance ratio

Characteristics

Digital modulation

Any digital modulation modes (with option SMIQB20)

- Free choice of modulation mode from ASK through to 256QAM
- Any kind of baseband filtering with variable filter parameters
- Symbol rate adjustable up to 18 Msymbol/s
- Realtime coding of internal and external data
- Internal PRBS generators

Convenient burst generation for TDMA standards (with option SMIQB20/SMIQB11)

- TDMA mobile radio standards provided as standard GSM, GSM-EDGE, DECT, NADC (IS-54C/IS-136), PDC, PHS
- Versatile external synchronization capabilities
- Realtime processing of external and internal data
- Generation of TDMA frames with versatile timeslot configuration
- Continuous PRBS sequences
- Optimization of burst shaping to reduce spectra due to switching
- Realtime processing with external data for BER tests
- Slot-by-slot modulation change for TDMA
## Overview of options

### Application 1)

1. SMIQ02B/03B (SMIQ04B/06B) can be equipped with up to three (two) of the following options: SM-B5, SMIQB14, SMIQB15 or SMIQB17

<table>
<thead>
<tr>
<th>Application 1)</th>
<th>TDMA</th>
<th>CDMA IS-95</th>
<th>W-CDMA</th>
<th>CDMA2000</th>
<th>Fading</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMIQ02B/03B</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>SMIQ04B/06B</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

### Special options

**Fading simulation (options SMIQB14 and SMIQB15)**
- Fading of internal or external I/Q signals conforming to mobile radio standards
- 6-path simulation can be enhanced to 12-path simulation (2-channel fading also possible with second vector signal generator)
- Rayleigh, Rice and lognormal fading profiles can be selected independently for each path
- Selectable path attenuation and delay
- Simulation of high speeds
- Preprogrammed fading profiles for mobile radio standards GSM, NADC, IS-95 CDMA and TETRA
- Frequency range of basic unit can be fully utilized

**Noise generator and distortion simulator (option SMIQB17)**
- Simulation of amplitude and phase distortion (AM/AM and AM/\(\phi\)M characteristics)
- Distortion characteristics programmable from up to 30 input values
- Superimposed noise signals (AWGN)
- C/N ratio variable with high resolution over a wide range
- Broad noise bandwidth (10 kHz to 10 MHz)

### Analog modulation

- Broadband AM with up to 30 MHz modulation frequency
- I/O modulation with 30 MHz modulation bandwidth (3 dB), 60 MHz RF bandwidth
- Unprecedented vector accuracy and high intermodulation suppression
- Amplitude modulation

### RF characteristics

- Wide output frequency range from 300 kHz to 6.4 GHz
- High (up to 16 dBm) and precise output level (<0.5 dB)

### Fast setting time for frequency (<3 ms) and level (<2.5 ms)\(^{1)}

### Frequency hopping (500 \(\mu\)s)

### High spectral purity (typ. –130 dBc (1 Hz) at 1 GHz and 20 kHz carrier offset)

### Calibrated RF level in range from –140 dBm to –5 dBm

### RF, AF and level sweep (user-programmable)

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**Notes:**

- **SMIQ02B/03B** (SMIQ04B/06B) can be equipped with up to three (two) of the following options: SM-B5, SMIQB14, SMIQB15 or SMIQB17

- Option SMIQ02B required

- Options SMIQ02B and SMIQ04B required

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1) Without switching the mechanical attenuators.
Vector Signal Generator SMIQ

Bit error rate measurements (option SMIQB21)
- Up to 30 MHz clock rate

W-CDMA für 3GPP/FDD (Option SMIQB45)
Software option SMIQB45 supports the generation of downlink and uplink signals in line with the 3GPP standard (FDD mode). As the standardization process is not yet completed, the functionality of this option will continuously be adapted to the relevant standard modifications and expansions (for functionality see specifications).

Low ACP for IS-95 CDMA and W-CDMA (option SMIQB47)
- Specially designed for 1.2288 Mcps, 4.096 Mcps and 8.192 Mcps as well as 3.840 Mcps according to 3GPP
- Can be used with internal (option SMIQB42/43/45/48) or external CDMA/W-CDMA signals
- Typical W-CDMA adjacent-channel power ratio (5 MHz offset, 3.84 Mcps): –67 dBc (1 DPCH)
- Typical IS-95 CDMA adjacent-channel power ratio (885 kHz offset): –78 dBc (9 code channels)

Enhanced functions for W-CDMA 3GPP (FDD) digital standard (Option SMIQB48)
This option expands the functionality of option SMIQB45 W-CDMA 3GPP. It allows the generation of up to four enhanced channels that can be combined with the standard channels.
- Very long signal sequences and continuous PRBS sequences (e.g., PN9) often required for BER measurements can be implemented for the channel under test
- Use of externally precoded data or the generation of long power control profiles for the DUT
- Testing the closed-loop power control function of a mobile station
- Realistic simulation of W-CDMA scenarios
- Creation and insertion of bit errors into the data of enhanced channels
- Insertion of block errors (BLERs) into the channel-coded data
- Generation of W-CDMA signals of up to 2 minutes repetition rate

Enhanced fading functions for W-CDMA 3GPP (Option SMIQB49)
Option SMIQB49 extends the functionality of fading options SMIQB14/B15 to include W-CDMA 3GPP channel simulation. It adds three new modes to the fading simulator so that all scenarios defined in 3GPP Release 99 can be simulated:
- In fine delay mode, fading simulator resolution is increased to 1 ns with up to four paths being available
- In moving delay mode, two paths are simulated: for one path the delay remains constant, whereas for the other path the delay varies continuously
- In birth-death mode, there are two paths changing delay in steps in accordance with the 3GPP channel model

Digital standard IS-95A. Option SMIQK11 enables IS-95 functionality under WinIQSIM™.
- Up to eight complete base stations comprising 64 code channels each are available in forward link and up to 16 mobile stations in reverse link
- Channel power can be set independently for all code channels
- Adjacent-channel power can be calculated for 1. and 2. adjacent channel and output as a spectral display
- CCDF trace can be displayed

Digital standard CDMA2000 (Options SMIQK12 and SMIQB60 (ARB))
CDMA signals to the North-American standard IS-2000 can be simulated by means of software option SMIQK12 in conjunction with Arbitrary Waveform Generator SMIQB60. Option SMIQK12 enables CDMA2000 functionality under WinIQSIM™.

The modes 1X direct spread, 3X direct spread and 3X multicarrier (forward link only) are available. In forward link four base stations of max. 91 code channels can be set, in reverse link four mobile stations of max. 13 code channels each.

Arbitrary Waveform Generator SMIQB60
To further enhance the versatility of the modulation coder, a dual-channel arbitrary waveform generator (ARB) with a maximum clock rate of 40 MHz is available as an option. It can store up to 512 ksamples of externally computed I/Q values.

The supplied WinIQSIM™ software allows the calculation of arbitrary modulation signals, for example COFDM, multi-carrier and noise, and downloading them
Vector Signal Generator SMIQ

into SMIQ. Together with a convenient data editor, WinIQSIM™ can calculate any kind of TDMA frame configuration, simulate impairments by superimposed interference signals, etc.

Applications

- Type-approval testing of digital base and mobile stations
- Base-station transmitter test
- Sensitivity measurements on digital receivers
- Selectivity measurements on digital receivers
- Testing of equalizers
- Tolerance tests on digital systems
- Components tests
- Development of new digital communication systems

Specifications in brief

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency</strong></td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>SMIQ02B: 300 kHz to 2.2 GHz</td>
</tr>
<tr>
<td></td>
<td>SMIQ03B: 300 kHz to 3.3 GHz</td>
</tr>
<tr>
<td></td>
<td>SMIQ04B: 300 kHz to 4.4 GHz</td>
</tr>
<tr>
<td></td>
<td>SMIQ06B: 300 kHz to 6.4 GHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 Hz</td>
</tr>
<tr>
<td>Aging (after 30 days)</td>
<td>Option SM-B1</td>
</tr>
<tr>
<td>Temperature effect</td>
<td>1 x 10⁻⁶/year</td>
</tr>
<tr>
<td></td>
<td>2 x 10⁻⁶/day</td>
</tr>
<tr>
<td></td>
<td>&lt;5 x 10⁻⁶/day</td>
</tr>
</tbody>
</table>

| Level              | SMIQ02B/03B: −144 dBm to +13 dBm (PEP) |
|                    | SMIQ04B/06B: −144 dBm to +10 dBm (PEP) |
| Overranging without guarantee of specs | up to 16 dBm |
| Resolution         | 0.1 dB or 0.01 dB |
| Total level uncertainty | >−127 dBm |
| f = 2 GHz           | ±1 dB (typ. ±0.5 dB) |
| f = 2 GHz to 4 GHz  | ±1.5 dB (typ. ±0.9 dB) |
| f = 4 GHz to 6 GHz  | ±2 dB (typ. ±1.2 dB) |
| f = 6 GHz           | ±2.5 dB |
| Frequency response at 0 dBm | <1 dB (typ. <0.3 dB) |
|                    | ±1.5 dB (typ. ±0.5 dB) |

**Spectral purity**

- Harmonics at levels ≤10 dBm: <−30 dBc
- Harmonics at levels ≤7 dBm: <−30 dBc
- Broadband noise, vector modulation: <−30 dBc
- Broadband noise, vector modulation: <−30 dBc
- Broadband noise, vector modulation: <−30 dBc
- Broadband noise, vector modulation: <−30 dBc
- Broadband noise, vector modulation: <−30 dBc

**Spurious**

- Harmonics at levels ≤10 dBm: <−30 dBc
- Broadband noise, vector modulation: <−25 dBc
- Broadband noise, vector modulation: <−25 dBc
- Broadband noise, vector modulation: <−25 dBc
- Broadband noise, vector modulation: <−25 dBc
- Broadband noise, vector modulation: <−25 dBc

**Sweep**

- RF sweep, AF sweep
- Modes: digital sweep in discrete steps
- Sweep: automatic, single shot, manual or external trigger, linear or logarithmic
Vector Signal Generator SMIQ

Data generator
Programmable memory for modulation data, envelope-control and trigger signals. The data generator can be operated only in conjunction with the optional modulation coder.

Max. symbol rate: 8.5 Msymbol/s

Operating modes:
- automatically repeating, single shot
- manually or externally triggered

Memory extension
The data generator can be extended to max. 79 Mbit by fitting up to two options SMIQB12.

Memory capacity: 32 Mbit

Digital standards
GSM / EDGE
- Option SMIQB20 and SMIQB11 according GSM standard
- Frequency: 880 to 960 MHz/1710 to 2000 MHz
- GMSK or BPSK EDGE

DECT
- Option SMIQB22
- Frequency: 1880 MHz to 1900 MHz
- Modulation: GFSK [Standard], π/4 DQPSK

NADC
- Option SMIQB11
- Frequency: 824 to 894 MHz/1880 to 2000 MHz
- Modulation: π/4 DQPSK

PDC
- Option SMIQB12
- Frequency: 810 to 870 MHz/940 to 960 MHz
- Modulation: GFSK, π/4 DQPSK

PHS
- Option SMIQB23
- Frequency: 1895.0 MHz to 1918.1 MHz
- Modulation: π/4 DQPSK

Digital standard IS-95 CDMA
According TIA standard IS-95A and J-STD-008
- Option SMIQB24
- Frequency: 824 to 894 MHz/1880 to 2000 MHz
- Modulation: GFSK, π/4 DQPSK

Digital standard W-CDMA
According 3GPP standard 3.4.0 (FDD)
- Option SMIQB45 3) according 3GPP standard 3.4.0 (FDD)
- Frequency: 1800 MHz to 2200 MHz
- Modulation: π/4 DQPSK

Digital standard W-CDMA 3GPP (FDD)
- Option SMIQB43 2) according 3GPP standard 3.4.0 (FDD)
- Frequency: 1800 MHz to 2200 MHz
- Modulation: QPSK, π/2 DQPSK

Simultaneous modulation
Any combination is possible with the following exceptions:
- Simultaneous FM and πM
- Simultaneous digital modulation and vector modulation
- Pulse modulation cannot be used together with level attenuation function LEV ATT (option SMIQB20)

Options for special applications

Fading simulation
- paths and channels with options SMIQB14 with options SMIQB14 and -B15
- Path attenuation

Options SMIQB14, SMIQB15
- 6 paths, 1 channel
- 12 paths, 1 channel or 6 + 6 paths, 2 channels with second SMIQ through simple retrofit

Path delay
- 0 dB to 50 dB
- 0 μs to 1600 μs
- 0.1 Hz to 1600 Hz

Speed range
- \(0, 0, 0 = 10^{3} M_{s} \)
- \(M_{1} = \frac{10^{3} M_{s}}{f_{1}}\)
- \(M_{m} = \frac{10^{3} M_{s}}{f_{2}}\)

Rayleigh fading, pseudo noise interval
- Power ratio: \(>-30 \text{ dB to } +30 \text{ dB}\)
- Frequency ratio
- Lognormal fading, Suzuki fading
- Standard deviation
- Correlation

Enhanced fading functions for W-CDMA 3GPP
The following data deviate from the specifications for SMIQB14/SMIQB15

Fine delay mode
- Number of paths
- Profiles
- Delay, resolution
- Moving delay mode
- Number of paths
- Delay, path 1
- Delay, path 2
- Delay variation (peak-peak)
- Variation period
- Delay step size
- Birth-death mode
- Number of paths
- Profiles
- Delay
- Delay range
- Delay grid
- Hopping dwell

Noise and distortion simulation
- Option SMIQB17
- Distortion simulator
- Distortion characteristic
- Noise generator (AWGN)
- Crest-Faktor
- C/N

Improvements
- Option SMIQB47
- Improved adjacent-channel power ratio for W-CDMA and CDMA IS-95
- Selectable baseband filters to improve ACP values

Enhanced functions for digital standard W-CDMA 3GPP (FDD)
- Option SMIQB48
- 3.4.0 to 3GPP technical specifications

Enhanced functions for digital standard W-CDMA 3GPP (FDD) version
- Option SMIQB49
- Fine delay mode
- Number of paths
- Profiles
- Delay, resolution
- Moving delay mode
- Number of paths
- Delay, path 1
- Delay, path 2
- Delay variation (peak-peak)
- Variation period
- Delay step size
- Birth-death mode
- Number of paths
- Profiles
- Delay
- Delay range
- Delay grid
- Hopping dwell

Noise and distortion simulation
- Option SMIQB17
- AM/AM and AM/FM distortion of modulation signal
- each characteristic programmable by entering up to 30 input values via IEEE/IEC bus or by entering up to five polynomial coefficients

Noise generator (AWGN)
- Gaussian, statistically indep. for I and Q

Bit error rate measurement
- Option SMIQB21
- Pseudo-random bit sequences (PRBS)
- Measurement time
- Measurement result

Improved adjacent-channel power ratio for W-CDMA and CDMA IS-95
- Selectable baseband filters to improve ACP values

Enhanced functions for digital standard W-CDMA 3GPP (FDD)
- Option SMIQB48
- 3.4.0 to 3GPP technical specifications

Options SMIQB11
- Selectable number
- 29-1, 211-1, 215-1, 216-1, 220-1, 221-1
- BER in ppm, % or decade values

Options SMIQB12
- Bit error rate measurement

Note:
1) PEP = peak envelope power.
2) Data apply to RF ± 5 MHz unless specified otherwise and for ATTENUATOR MODE NORMAL function.
3) Additional error with ALC OFF <0.3 dB.
# Vector Signal Generator SMIQ

### Enhanced Channels
Channels of W-CDMA system in SMIQ that offer enhanced functionality compared with standard channels of option SMIQB45.

Can be used in downlink for max. four DPCHs and in uplink for one DPCCH and max. three DPDCCHs. All DPDCCHs or DPDCCHs have the same symbol rate.

Enhanced functions at a glance:
- Sequences of up to 1642 frames
- Data lists for data fields and TPc field
- External power control
- Channel coding
- Bit error insertion
- Block error insertion
- Simulation of realistic noise scenarios
- Orthogonal channel noise simulation (OCNS)
- Additional mobile stations

### Arbitrary waveform generator Option SMIQB60
Waveform memory, interpolation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of waveform</td>
<td>1 to 524216 steps</td>
</tr>
<tr>
<td>Resolution</td>
<td>12 bit</td>
</tr>
<tr>
<td>Downloading time for 512k I/Q samples</td>
<td>4 s</td>
</tr>
<tr>
<td>Nonvolatile memory</td>
<td>22 (one waveform occupies at least one block)</td>
</tr>
<tr>
<td>Block size</td>
<td>24 from firmware version 5.30</td>
</tr>
<tr>
<td>Interpolation</td>
<td>0.375 x clock rate</td>
</tr>
</tbody>
</table>

Repetitive spectra suppression through analog filter

- >70 dB

Clock generation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clock rate</td>
<td>1 kHz to 40 MHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.1 Hz</td>
</tr>
<tr>
<td>Clock mode</td>
<td>internal or external</td>
</tr>
<tr>
<td>Signal output, channels</td>
<td>2 (I and Q)</td>
</tr>
<tr>
<td>Output level (EMF, peak)</td>
<td>0.375 x clock rate</td>
</tr>
</tbody>
</table>

**Normal mode**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnitude up to 12 MHz/10 MHz</td>
<td>&lt;1 dBtyp. 0.1 dB</td>
</tr>
<tr>
<td>Group delay up to 10 MHz</td>
<td>typ. 1 ns</td>
</tr>
<tr>
<td>I/Q imbalance</td>
<td>typ. 0.05 dB</td>
</tr>
<tr>
<td>Group delay up to 10 MHz</td>
<td>typ. 0.5 ns</td>
</tr>
</tbody>
</table>

**Manual mode**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnitude up to 12 MHz/10 MHz</td>
<td>&lt;1 dBtyp. 0.1 dB</td>
</tr>
<tr>
<td>Group delay up to 10 MHz</td>
<td>typ. 1 ns</td>
</tr>
<tr>
<td>I/Q imbalance</td>
<td>typ. 0.05 dB</td>
</tr>
<tr>
<td>Group delay up to 10 MHz</td>
<td>typ. 0.5 ns</td>
</tr>
</tbody>
</table>

**Frequency response**

- >60 dB

**Trigger modes**

- auto, retrig, armed auto, armed retrig

### General data
Memory for instrument settings

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 storable settings</td>
</tr>
</tbody>
</table>

List Mode

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency and level values can be stored in a list and set in an extremely short time; permissible level variation: 50 dB</td>
</tr>
</tbody>
</table>

Max. number of channels

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
</tr>
</tbody>
</table>

Remote control

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 625 (IEEE 488)</td>
</tr>
</tbody>
</table>

Command set

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCPI 1993.0</td>
</tr>
</tbody>
</table>

Power supply

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 V to 265 V (AC), 50 Hz to 400 Hz, autozeroing to AC supply, max. 300 VA</td>
</tr>
</tbody>
</table>

Dimensions (W x H x D)

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>435 mm x 192 mm x 460 mm</td>
</tr>
</tbody>
</table>

Weight

<table>
<thead>
<tr>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 kg when fully equipped</td>
</tr>
</tbody>
</table>

### Ordering information

#### Vector Signal Generator

- 300 kHz to 2.2 GHz
  - SMIQ02B
  - 1125.5555.02

- 300 kHz to 3.3 GHz
  - SMIQ03B
  - 1125.5555.03

- 300 kHz to 4.4 GHz
  - SMIQ04B
  - 1125.5555.04

- 300 kHz to 6.4 GHz
  - SMIQ06B
  - 1125.5555.06

#### Accessories supplied

- power cable, operating manual

### Options

- Reference Oscillator OCXO
  - SM-B1
  - 1006.7699.02

- FM/Am Modulator
  - SM-B5
  - 1006.8498.02

- Data Generator
  - SMIQB11
  - 1085.4502.04

- Memory Extension, 32 Mbit
  - SMIQB12
  - 1085.2800.04

- Fading Simulator, 6 paths
  - SMIQB14
  - 1085.4002.02

- Second Fading Simulator for 12 paths or 2 channels
  - SMIQB15
  - 1085.4402.02

- Noise Generator and Distortion Simulator
  - SMIQB17
  - 1104.9000.02

- RF and AF Rear Connectors
  - SMIQB19
  - 1085.2997.02

- Modulation Cooler
  - SMIQB20
  - 1125.5190.02

- BER Measurement
  - SMIQB21
  - 1125.5490.02

- Digital Standard IS-95 CDMA
  - SMIQB42
  - 1104.7936.02

- Digital Standard W-CDMA acc. to NTT DoCoMo 1.0
  - SMIQB43
  - 1104.8032.02

- ARIB 0.8 standard
  - Digital Standard W-CDMA according to 3GPP (FDD)
    - SMIQB45
    - 1104.8232.02

- Low ACP for IS-95 CDMA and W-CDMA
  - SMIQB47
  - 1125.5090.02

- Modification Kit for Low ACP (factory-fitted only)
  - SMIQB47
  - 1125.5149.02

- Extended Functions for W-CDMA (3GPP)
  - SMIQB48
  - 1105.0587.02

- Extended Fading Functions for W-CDMA (3GPP)
  - SMIQB49
  - 1105.1083.02

- Arbitrary Waveform Generator incl. WinIQSIM™
  - SMIQB60
  - 1136.4390.02

- TETRA T1 Simulator
  - SMIQB61
  - 1126.4390.02

- Digital Standard IS-95 CDMA (software for SMIQB60)
  - SMIQB61
  - 1105.0287.02

- Digital Standard CDMA2000 (software for SMIQB60)
  - SMIQB62
  - 1105.0435.02

- Dig. Standard W-CMA/TDD mode (3GPP) for option SMIQB60
  - SMIQB63
  - 1105.1231.02

- Digital Standard TD-SCDMA (software for SMIQB60)
  - SMIQB64
  - 1105.1338.02

- OFDM Signal Generation, HIPER LAN/2
  - SMIQB65
  - 1105.1513.02

- Additional hint: SMIQ02B/03B (SMIQ04B/06B) can be equipped with up to three (two) of the following options: SM-B5, SMIQB14, SMIQB16, SMIQB17

#### Application software

- Generation of data and control lists
  - SMIQ-K1 (*)

- Bluetooth signals for SMIQ
  - SMIQ-K3 (*)

- User mappings and user filters for SMIQ
  - User Mod (*)

*) available on www.rohde-schwarz.com

### Extras

- 19" Adapter
  - ZZA-94
  - 0396.4905.00

- Service Kit
  - SM-23
  - 1085.2500.02

- BNC Adapter for rear panel
  - D type connector PAR DATA
  - SMIQ-Z5 (SMIQ-Z6)
  - 1104.8555.02

- 90° Power Splitter
  - SMIQ-Z9 (SMIQ-Z10)
  - 1104.9680.02

- Trolley for Transit Case
  - ZZK-1
  - 1014.0510.00

- Transit Case
  - ZZK-344
  - 1013.9366.00

- Service Manual SMIQ
  - 1085.2445.24

### Instrument upgrades

- SMIQ02B to SMIQ03B
  - SMIQ03B
  - 1125.5855.03

- SMIQ03B to SMIQ04B
  - SMIQ04B
  - 1125.5855.04

- SMIQ04B to SMIQ06B
  - SMIQ06B
  - 1125.5855.06

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1) Spectral components exceeding max. IQ bandwidth will be suppressed.
2) Cannot be fitted together with Digital Standard W-CDMA 3GPP (option SMIQB45).
3) Cannot be fitted together with Digital Standard W-CDMA NTT DoCoMo (option SMIQB43).
4) Ratio of discrete and distributed component.
5) Contrast of LCD lower at higher temperature.