Conditions in production place heavy demands on a signal source. High setting speeds ensuring maximum throughput without any detrimental effect on signal quality have top priority. The R&S®SMATE 200 A meets these requirements. It offers special additional details that make it particularly attractive.

Vector Signal Generator R&S®SMATE 200 A

The rugged specialist for everyday use in production

Sturdy and fast

The new Vector Signal Generator R&S®SMATE 200 A (FIG 1) is ideally suited to meet production requirements. The R&S®SMATE 200 A differs distinctly from the high-end Vector Signal Generator R&S®SMU 200 A but is based on its hardware. The most obvious difference is the modified housing: The R&S®SMATE 200 A has no display or control keys. All connectors are at the rear.

But there are also special features inside: the R&S®SMATE 200 A offers an extremely short setting time of <2 ms for frequency and level changes (FIG 2). This increases the throughput in production and thus saves production costs by reducing test times. If even shorter setting times are required, it is advisable to use the List mode, since frequency and level values can be stored beforehand. The R&S®SMATE 200 A then attains setting times of <400 µs for frequency

In addition to the R&S®SMATE 200 A, Rohde & Schwarz has launched another innovative generator: the R&S®SMJ 100 A, which is described on page 30. An overview of all members of the generator family is provided on page 33.

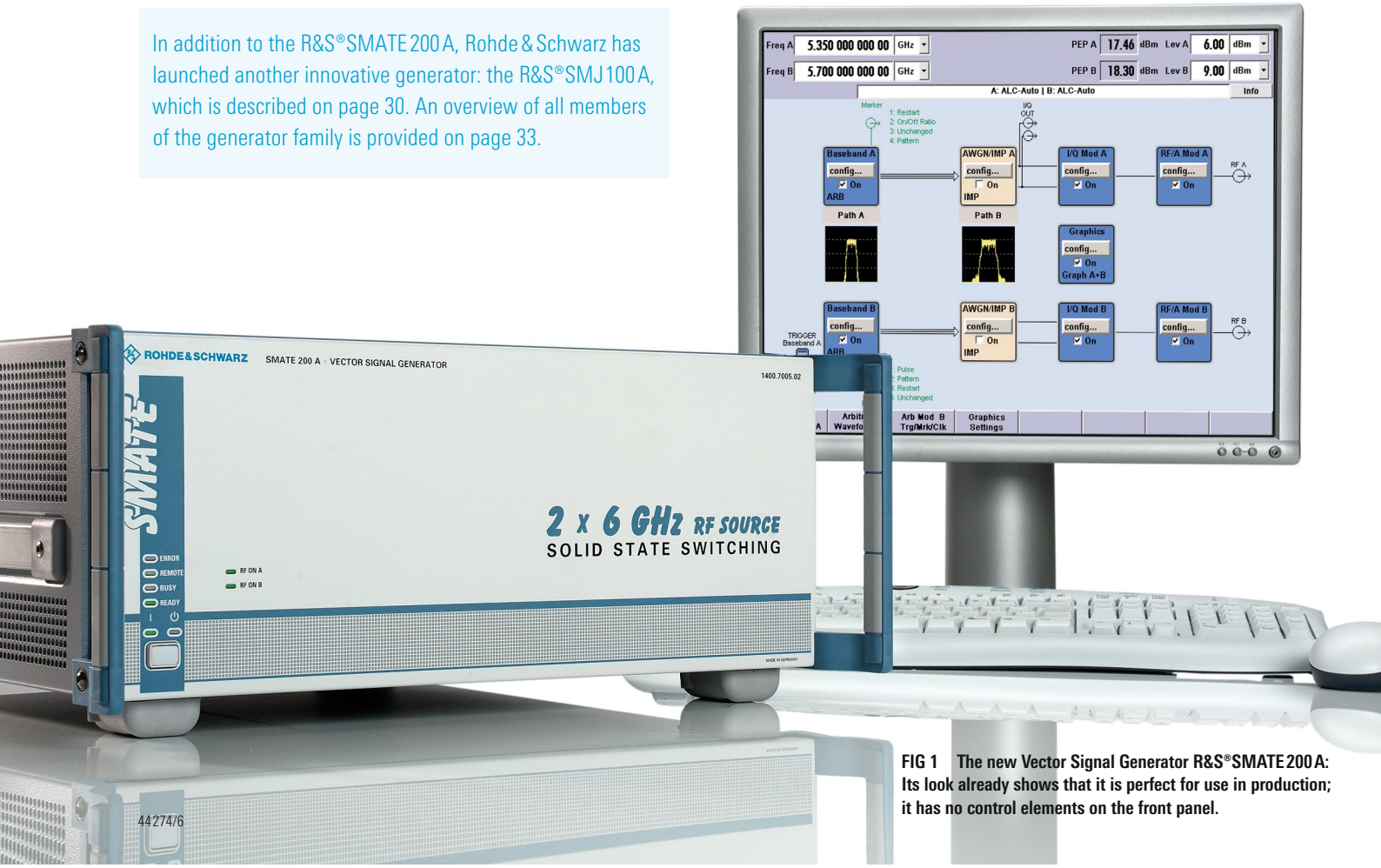

FIG 1 The new Vector Signal Generator R&S®SMATE 200 A: Its look already shows that it is perfect for use in production; it has no control elements on the front panel.

changes. The List mode becomes flexible owing to the Fast Hop mode: Up to 10 000 entries can arbitrarily be addressed via a serial bus.

Tailored to meet production requirements

In addition to short setting times, the new generator also offers a variety of other advantages that make it ideal for use in production. Space requirement is often a decisive factor. The R&S®SMATE 200 A has a two-path concept that allows up to two independent signal sources in a cabinet of only four height units. Options for extending the frequency range up to 3 GHz or 6 GHz can be used as required. The R&S®SMATE 200 A offers up to two RF sources, and up to two baseband generators can be added. External baseband sources are thus obsolete owing to the flexibility of the baseband generators and the large memory depth of the internal arbitrary waveform generator – yet another advantage to save space and thus costs.

But the baseband generator has even further potential: setting times can occur not only in the RF section but also when you switch over between digital signals. Production often calls for precalculated waveforms that must be switched over quite quickly. The R&S®SMATE 200 A can store a variety of different signals and switch over between them within only typ. 5 µs.

Fit for tough production requirements

Instruments in continuous use in production have to meet the most stringent requirements. The new generator together with its electronic attenuator meets these requirements: It is wear-free and does not require any special maintenance.

Moreover, the R&S®SMATE 200 A offers an optimized cooling concept: This is of vital importance in racks, since the ambient temperature is often higher than in labs. Low temperature in the instrument means less stress on the components and thus a longer life and, last but not least, very short downtimes for the test system.

Signal quality without concessions

Despite all these special characteristics, the R&S®SMATE 200 A makes no concessions with regard to signal quality. Signal quality is identical to that of the R&S®SMU 200 A high-end generator. As far as the SSB phase noise is concerned, the new generator offers typ. –135 dBc (1 Hz measurement bandwidth, carrier frequency 1 GHz, 20 kHz offset) even in the standard version. With the Low Phase Noise option, this value can be improved by yet another 5 dB to typ. –140 dBc (FIG 3). Such excellent data is required for testing chips, for example.

Another important factor for use in production is the available level, in order to compensate for losses occurring in the test setup. Even in its basic version, the R&S®SMATE 200 A offers output levels of +13 dBm (FIG 4). The generator has a High-Power Output option to compensate for higher losses or to provide modules with higher levels. This option increases the output level by 6 dB to obtain +19 dBm. However, not only is

Condensed data of the R&S®SMATE 200 A

Frequency		
Frequency range		100 kHz to 3 GHz / 6 GHz
Setting time		<2 ms
Setting time in List mode		<400 µs
Level		
Range		–144 dBm to +13 dBm (PEP) [+16 dBm in overrange]
Range with High-Power Output option		–144 dBm to +19 dBm (PEP) [+26 dBm in overrange]
Setting time		<2 ms for f ≤ 3 GHz <4 ms for f ≥ 3 GHz
Spectral purity (at f = 1 GHz)		
Nonharmonics	carrier offset >10 kHz	<–80 dBc
	carrier offset >850kHz	<–86 dBc
SSB phase noise (carrier offset 20 kHz, 1 Hz measurement bandwidth)		typ. –135 dBc, typ. –140 dBc (with Low Phase Noise option)
Broadband noise (carrier offset >5 MHz, 1 Hz measurement bandwidth)		typ. –153 dBc (CW) typ. –149 dBc (I/Q modulation)
ACLR performance		
3GPP FDD test model 1, 64 DPCH		typ. 70 dB
I/Q bandwidth (RF)		
Internal		80 MHz
External		200 MHz
Arbitrary waveform generator		
Memory depth		16 Msamples / 64 Msamples
Interfaces		IEEE 488.2, LAN (Gigabit Ethernet), 2 × USB, 1 × USB slave, VGA

the level's maximum value important in production, but also its repeatability, i.e. the aim is to ensure the same conditions versus time. The high level repeatability of the R&S®SMATE 200 A allows lower tolerances during the tests and thus increases the production yield.

Summary

The family concept of the generators offered by Rohde & Schwarz is paying off: In addition to the R&S®SMU 200 A high-end generator for laboratory use, the R&S®SMATE 200 A is now offered for use in production. This is a decisive factor for the user, since the same performance in development and production is ensured.

The new Vector Signal Generator R&S®SMATE 200 A combines the advantages of the R&S®SMU 200 A regarding signal quality and two-path concept with special functions like Fast Hop bus and very low setting time. Its hardware design underlines that it is ideal for production applications.

But that's not all: Another member of the family is introduced on the next page – the R&S®SMJ 100 A. This generator has a strictly single-path concept and is interesting mainly for users looking for an excellent vector signal generator without special features such as a two-path concept or fading.

Markus Lörner

FIG 2 The frequency setting time of the R&S®SMATE 200 A is typ. 1.2 ms.

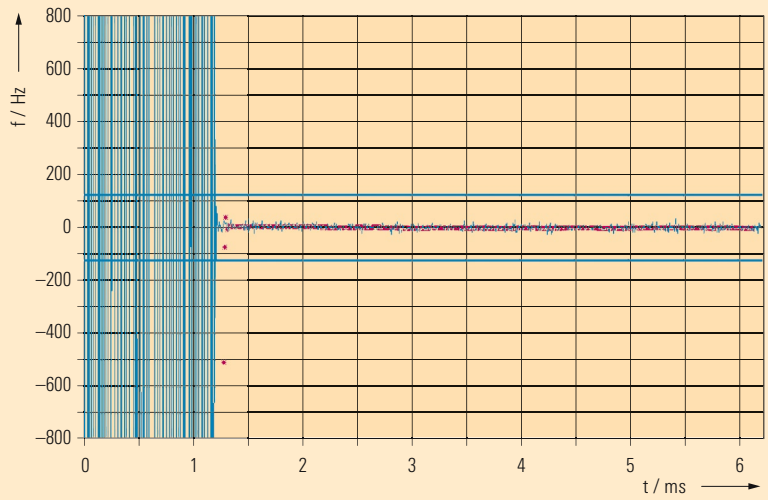

FIG 3 Excellent SSB phase noise with Low Phase Noise option: typical traces for different frequency bands.

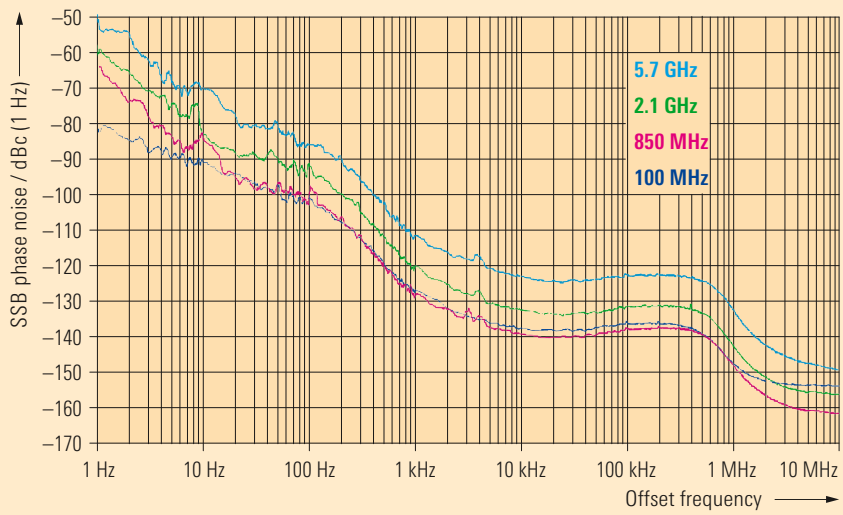

FIG 4 High output levels over the complete frequency range.