Vector signal generator creates complex multichannel scenarios for highest demands

The R&S SMW200A high-performance vector signal generator from Rohde & Schwarz enables faster time-to-market, improves end-device quality, and exceeds important 2G, 3G and 4G digital standards and applications. Featuring versatile configuration options, the range of applications extends from single-path vector signal generation to multichannel MIMO receiver testing. The R&S SMW200A vector signal generator is the only product on the market that provides a baseband generator, RF generator and real-time MIMO fading simulator in a single instrument.

The vector signal generator covers the frequency range from 100 kHz to 3 GHz or 6 GHz, and features an I/Q modulation bandwidth of 160 MHz with internal baseband. Exceptional modulation and RF characteristics make it ideal for developing high-end components, modules and complete products for wideband communications systems such as LTE-Advanced and WLAN IEEE 802.11ac. The generator performs especially well in verification of 3G and 4G base stations, as well as aerospace and defense applications.

The R&S SMW200A can be equipped with an optional second RF path for frequencies up to 6 GHz and with a maximum of two baseband and four fading simulator modules, giving users two full-featured vector signal generators in a single unit. Fading scenarios, such as 2x2 MIMO, 8x2 MIMO for TD-LTE and 2x2 MIMO for LTE-Advanced carrier aggregation, can be easily simulated. Previously, this had required complex setups consisting of multiple instruments.

Higher order MIMO applications such as 3X3 MIMO for WLAN or 4X4 MIMO for LTE-FDD are easily supported by connecting a third and fourth source to the R&S SMW200A. The R&S SGS100A are highly compact RF sources that are controlled directly from the front panel of the R&S SMW200A. Overall this solution takes up considerably less space with only a total of five height units for 4x4 MIMO receiver tests and provides correctly encoded baseband signals, real-time channel simulation, AWGN generation, and phase-locked coupling of multiple RF paths, if required.

Options for every important digital communications standard are available from the start: LTE, LTE-Advanced, 3GPP FDD/HSPA/HSPA+, GSM/EDGE/EDGE Evolution, TD-SCDMA, CDMA2000/1xEV-DO and WLAN IEEE 802.11a/b/g/n/ac. The standards run directly on the R&S SMW200A without having to connect an external PC — making it possible to vary signals or specific parameters quickly and easily, as required to test multi-standard radio base stations, for example.

The R&S SMW200A ensures high accuracy in spectral and modulation measurements. The SSB phase noise is –139 dBc (typ.) at 1 GHz (20 kHz offset). In terms of modulation quality, the R&S SMW200A scores top marks with an EVM of –49 dB (meas.) for WLAN IEEE 802.11ac signals as well as a 0.05 dB (meas.) I/Q modulation frequency response over 160 MHz bandwidth.

Building upon the Rohde & Schwarz block diagram approach that allowed users to visualize the signal path graphically on the instrument, the new touchscreen functionality makes the R&S SMW200A even more intuitive. Help functions are provided for additional ease-of-use, and presets are provided for all important digital standards and fading scenarios. LTE and UMTS test case wizards simplify complex base station conformance testing in line with the 3GPP specification.

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