

# High-power and multicarrier tests with Base-Station Test System TS8510



FIG 1 Test System TS8510 for GSM base stations with high-power extension Photo 43 253

TS8510 was designed by Rohde & Schwarz for manufacturers of GSM mobile-radio base stations and enables complex testing including type approval [1; 2]. Type-approval tests are the prerequisite for setting up new base stations in networks and are performed in compliance with BAPT 222 ZV 6 (Germany) and MPT 1378 (Britain) on the basis of GSM specifications 11.21 and 11.23. They also extend to high-power base stations operating

with a large number of carriers. It was with a view to the latter base stations that Rohde & Schwarz extended the capabilities of TS8510, especially for transmitter and receiver tests requiring simultaneous activation of all carriers available in a base station at maximum output power as stipulated by GSM specification 11.21.

The basic TS8510 system is designed for maximum input power of 25 W and up to four carriers. The **system with high-power extension** (FIG 1) now offers maximum sum power of 200 W for up to eight carriers (25 W per

carrier) or maximum power of 64 W for one carrier. The high-power system extension combines GSM900/1800 or GSM900/1900 and thus covers all GSM bands.

The **extension**, accommodated in a **third rack**, comprises GSM-band-specific notch filters for suppression of the fourth and all further carriers in transmitter and receiver tests, other GSM-band-specific notch filters for suppression of additional carriers in the measurement of intermodulation in the receive band, low-intermodulation attenuators for matching the base-station power to the maximum permissible input power of the basic system, as well as low-intermodulation attenuator cables for defined reduction of maximum power in transmitter tests. These components are activated by operator instructions according to the test case (FIG 2).

The **user interface** of the software allows convenient test configuration, simple determination of test parameters and control of test runs. A power-check test was implemented with the high-power extension, which performs a thermal measurement of RF power on the system interface at the start of each test run, aborts the test run in the presence of impermissible levels and switches off the base station.

The **path compensation** incorporated in the basic TS8510 system, which ensures that the stimuli and measurement accuracy stipulated in GSM documents is adhered to, was extended to match the components contained in the high-power rack. This entails a considerable increase in correction data and greater complexity of correction-data generation and online data correction, so these data were split up according to the test case concerned and a fast

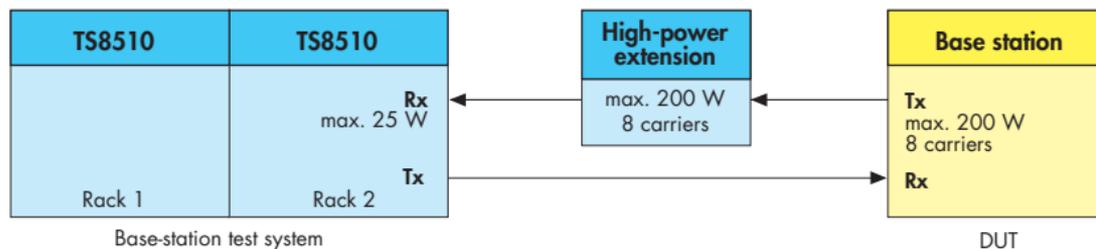


FIG 2 Configuration of Test System TS8510 with high-power extension

storage and loading facility for compensation data was added to the system.

Bearing in mind that base stations are heading for a further increase in the number of carriers and higher carrier power, Test System TS8510 and its high-power extension were designed for flexibility. Thus the  $A_{bis}$  interface, base-station configuration and signal-

ling can easily be extended for straightforward adaptation to future requirements.

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## REFERENCES

- [1] Tiwald, W.: Type-approval tests on GSM/PCN base stations with Test System TS8510. News from Rohde & Schwarz (1993) No. 143, p 28
- [2] Manert, M.; Tiwald, W.: BER measurements with Base-Station Test System TS8510. News from Rohde & Schwarz (1996) No. 150, pp 34–36