

New measurement functions in Digital Radio Tester CTS55

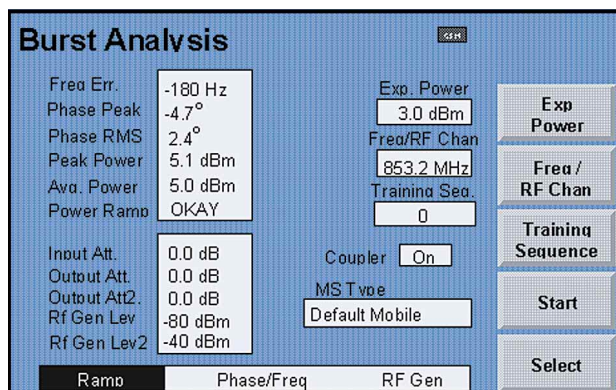


FIG 1 Result of signal analysis in module test

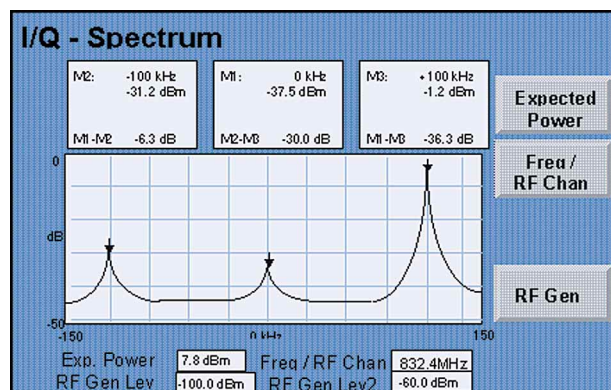


FIG 2 I/Q spectrum analysis with Digital Radio Tester CTS55

Digital Radio Tester CTS55 is a compact unit for testing GSM, DCS1800 and PCS1900 mobile phones in qualified service [1]. Rohde & Schwarz has now enhanced measurement and control functions, making this successful tester suitable for new fields of applications.

The **BER search routine** offers an interesting application. Here CTS55 performs successive bit-error-rate measurements in the course of which the signal level is continuously reduced relative to a selectable start value until the BER limit, which can also be adjusted, is reached. With this function the sensitivity of a mobile phone can be determined in an extremely easy way and with high accuracy.

Another function of modern mobile phones – the **short message service** – can also be tested conveniently with CTS55. Without explicit call setup, either a text message is sent from the tester to the mobile phone or a message received from the mobile phone. If an error occurs in transmission, eg if the text memory of the mobile is full, the tester will output a corresponding error message.

The **module test** mode (option CTS-B7) allows measurements and adjustments

of individual modules of mobile phones or operation in the service mode. For this purpose CTS55 contains an RF synthesizer that, in addition to GSM, DCS1800 and PCS1900 bands, also covers the 900 to 995 MHz and 1800 to 1990 MHz bands. The level can be adjusted at two outputs in the range -10 to -110 dBm with or without burst shaping. Available modulation modes are "dummy burst modulation" with selectable midamble (training sequence) and "unmodulated". After entry of the expected frequency, ie channel number, and power, the RF signal generator can synchronize to GSM signals (FIG 1). Measurement is triggered by pulsed signals on the received burst and by CW signals on a midamble. CTS55 then measures peak power, average power, power ramp versus time as well as frequency and phase error.

The **I/Q spectrum** measurement function allows simple checking or adjustment of an I/Q modulator module. Graphical display of the spectrum close to the carrier provides a quick overview of carrier and sideband suppression, while the delta marker functions allow qualitative assessment (FIG 2).

The **remote-control function** of CTS55 (option CTS-K6) opens up further

possibilities. The tester can be fully controlled via an RS-232-C interface for setting parameters, conducting measurements and reading out results. With few exceptions, the remote-control commands are identical to those for the GSM testers of the CMD series [2]. So automatic test routines, as used for CMD testers on repair lines in production for instance, can also be implemented with CTS55. This means an interesting variety of applications for the customer, such as automatic product-specific test routines, test-result documentation, central evaluation or statistical analyses.

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REFERENCES

- [1] Vohrer, M.: Digital Radio Tester CTS55 – All-in-one service tester for GSM, PCN and PCS mobile telephones. News from Rohde & Schwarz (1996) No. 152, pp 4–6
- [2] Mittermaier, W.: Module test with Digital Radiocommunication Tester CMD52/55. News from Rohde & Schwarz (1995) No. 149, pp 36–37

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