

MIMO OTA reference test system at the Rohde & Schwarz plant in Memmingen

MIMO OTA testing has not yet been fully standardized. The CTIA in the USA and the 3GPP RAN4 working group are in the process of reviewing a range of proposals. Rohde & Schwarz has suggested to both bodies an inexpensive method of MIMO OTA testing that centers on 3D evaluation. Its feasibility has been demonstrated in the new reference test chamber at the Rohde & Schwarz plant in Memmingen. Customers are invited to have their wireless devices tested by Rohde & Schwarz so that they can compare the results with those obtained using other test methods*.

3D evaluation method indispensable for realistic test results

In real-life situations, wireless devices are operated in any orientation. Due to differences in propagation conditions, the signals received by devices may come from any direction. In order to be able to assess the devices' antenna properties in connection with multipath reception at any receive angle, 3D evaluation is essential. To simulate real-life operating conditions, it must be possible to position both transmit test antennas at any point in a spherical space around the device under test.

R&S®TS8991 MIMO OTA performance test system

The R&S®TS8991 (Figs. 2 and 3) also supports MIMO OTA testing. It requires a test chamber based on a conventional SISO OTA test chamber with one conical cut positioner. A second dual-polarized test antenna with associated positioner for the elevation supplies a second downlink signal. The test antennas can be moved independently of each other, allowing a wide angle of arrival spread for the generated signals. The DUT is attached to an azimuth positioner containing a communications antenna for the uplink.

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Fig. 1 The new MIMO OTA reference test chamber at the Rohde & Schwarz plant in Memmingen.



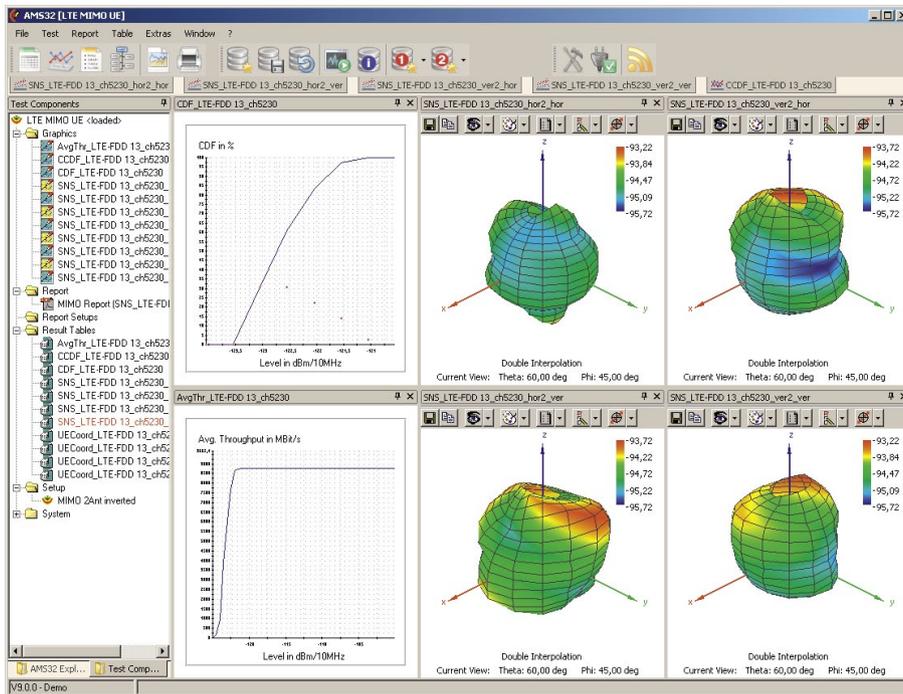


Fig. 2 Results of a MIMO OTA test using the R&S®AMS32 system software.

New reference test chamber

The Rohde&Schwarz MIMO OTA test method was originally checked and optimized in a first-generation test chamber measuring 5 m × 5 m × 5 m. Numerous test series were conducted to verify the stability of the test results and to compare different MIMO devices. Rohde&Schwarz took part in a round robin test organized by the 3GPP RAN4 working group, in which each participant was provided with five different LTE USB modems. The purpose of the test was to obtain results for identical DUTs using different MIMO OTA test methods. The results provided valuable input for the 3GPP MIMO OTA test standard.

In late 2011, Rohde&Schwarz commissioned a new reference test chamber (Fig. 1), located in a separate building. The anechoic chamber is specified for the frequency range from 400 MHz to 6 GHz, making it also suitable for tests in the field of broadcasting standards.

Summary

The new MIMO OTA reference test chamber is a permanent facility, set up to optimize the Rohde&Schwarz MIMO OTA test method. Customers are invited to have their wireless devices tested there. The results allow comparisons with other test methods proposed to the CTIA or 3GPP.

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Fig. 3 The R&S®TS8991 test system for MIMO OTA tests.

References

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- [3] Rohde&Schwarz White Paper 1SP12; Two-Channel Method for OTA Performance Measurements of MIMO-Enabled Devices; www.rohde-schwarz.com (search term: 1SP12).