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FIG 1 Practical and indispensable: Antenna Coupler R&S CMU-Z10 and Shielding Cover R&S CMU-Z11.

Antenna Coupler R&S CMU-Z10 / Shielding Cover R&S CMU-Z11

Practical and indispensable accessories for testing mobile phones

Service, quality assurance, development and production are often faced with the same problem: A suitable adapter cable is not available for the telephone under test or there is no connector at all on the telephone. A universal aid in such a situation is the Antenna Coupler R&S CMU-Z10, which also protects the DUT from unwanted interference in conjunction with the Shielding Cover R&S CMU-Z11.

High-quality measurements

Although the functional principle of a coupler may seem quite simple at first glance, the case is actually the opposite: Signals are transmitted between two points by means of antennas, and a large number of requirements have to be taken into consideration because the ultimate goal is to perform high-grade measurements with the coupler. First, the coupler should absorb the power radiated by the mobile phone with minimum loss to prevent the signal-to-noise ratio from being degraded. And this should apply to telephones of all different types and standards (e.g. cdmaOne, GSM or WCDMA) since users are not prepared to change the test setup for each new DUT. Thus, the focus is on large bandwidth, low-loss adaptation and high efficiency coupled with maximum independence from the phone position on the coupler since this is necessary to ensure a high level of repeat accuracy in measurements.

Determining attenuation values

The Antenna Coupler R&S CMU-Z10 (FIG 1) is ideal for meeting all these requirements. Owing to the instrument's special design, for which a patent is pending, its coupling factor is nearly constant over a large area (FIG 2). However, a list of attenuation values for various mobile phone types cannot be predefined. It should be at the user's discretion to determine the typical values one time for the telephones under test, to store these values and to retrieve them as required.

A reliable telephone that best meets the nominal parameters is used to measure the telephone-specific attenuation values. In the uplink (transmit path of the mobile), the user requests a transmit level by means of signalling on three different channels for each band and reads the result on the radio tester connected. The difference determined between the transmit and receive level is to be set as the attenuation on the tester.

In the downlink, the procedure is the opposite. The radio tester sends a signal to the telephone and the RSSI (radio signal strength indication) sent by the mobile is read out again on the tester.

Different results are obtained with different models and designs. If the exact position in the adapter is noted down in addition to the telephone-specific attenuation values, it is easy to obtain a repeat accuracy of less than 0.5 dB.

Protecting from interference

The Shielding Cover R&S CMU-Z11, available as an option to the R&S CMU-Z10, protects the DUT from interference.

Experienced users choose the complete system because only this setup can ensure that the displayed result is truly from the DUT and is not influenced by interference. The Antenna Coupler R&S CMU-Z10 can easily be retrofitted with the Shielding Cover R&S CMU-Z11.

The combination formed by the R&S CMU-Z10 and the R&S CMU-Z11 can, of course, be used as a shielding chamber. An RF feedthrough is available for this purpose to directly connect the mobile, provided the mobile has an RF connector. A 15-pin D-SUB connector is available for reading out data or remotely controlling the telephone. It is recommended to use the supplied high-grade connecting cable for all measurements. An adapter is pre-mounted for conveniently fixing the mobile in place. If larger modules are to be measured, the base plate with adapter can be replaced by a supplied base plate without adapter.

Users who want to test the *Bluetooth* interface at the same time can install the optional *Bluetooth*™* Antenna R&S CMU-Z12 in the coupler.

Summary

Using the universal Antenna Coupler R&S CMU-Z10 and the Shielding Cover R&S CMU-Z11 can save time and money since it is not necessary to search for suitable cables and adapters and reproducible results are obtained quickly. Several test sequences and final measurements can be omitted since the shielding cover efficiently protects the DUT from interference and the power radiated by the telephone is absorbed by the coupler with minimum loss.

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* *Bluetooth* is a trademark owned by Bluetooth SIG, Inc., USA and licensed to Rohde&Schwarz.

More information and data sheet at www.rohde-schwarz.com (search term: CMU-Z10)

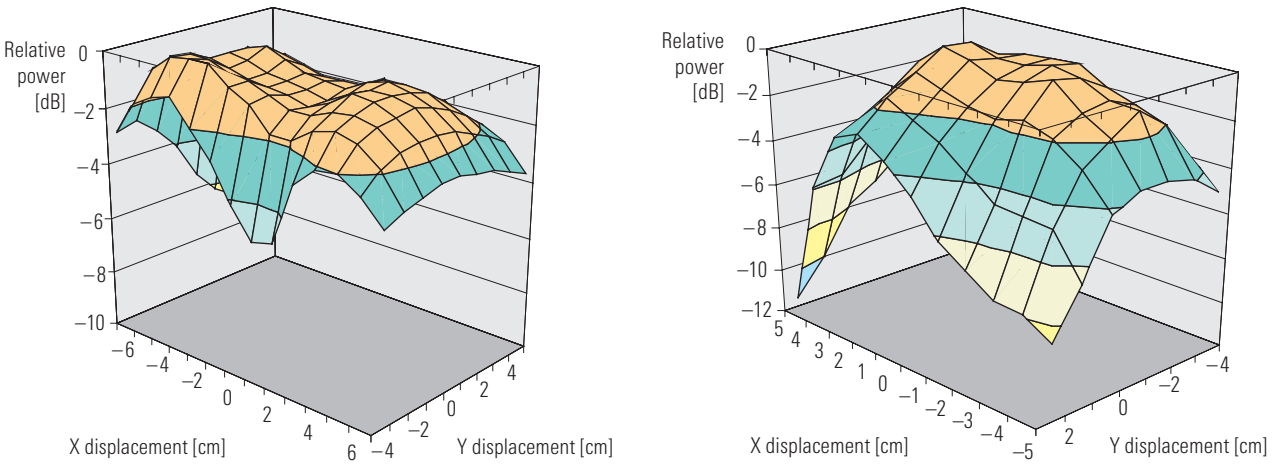

FIG 2 Power measurement with the Antenna Coupler R&S CMU-Z10 (without R&S CMU-Z11) at different positions: left GSM 900, right: GSM 1800.