

R&S® R-Line Compact Test Chamber

Precise measurements
of radiated emissions of
wireless terminals
800 MHz to 18 GHz



75 Years of
Driving
Innovation



ROHDE & SCHWARZ

R&S®R-Line Compact Test Chamber At a glance

The R&S®R-Line compact test chamber is used to eliminate emission problems and optimize the overall RF performance of wireless terminals already in the initial phases of development. This helps to avoid costly and time-consuming modifications to a large number of prototypes at a later stage, thus optimizing time to market and return on investment.

The decisive advantage of the R&S®R-Line is that it offers measurement accuracy as high as that of an anechoic chamber ten times larger. The R&S®R-Line fits into any lab and thus reduces investments for infrastructure and instrumentation.

Turnkey solutions combining the R&S®R-Line with a test system from Rohde&Schwarz ensure fast and smooth measurements in the lab and provide optimized capabilities for determining an EUT's RF performance and radiated emission characteristics in the microwave range.

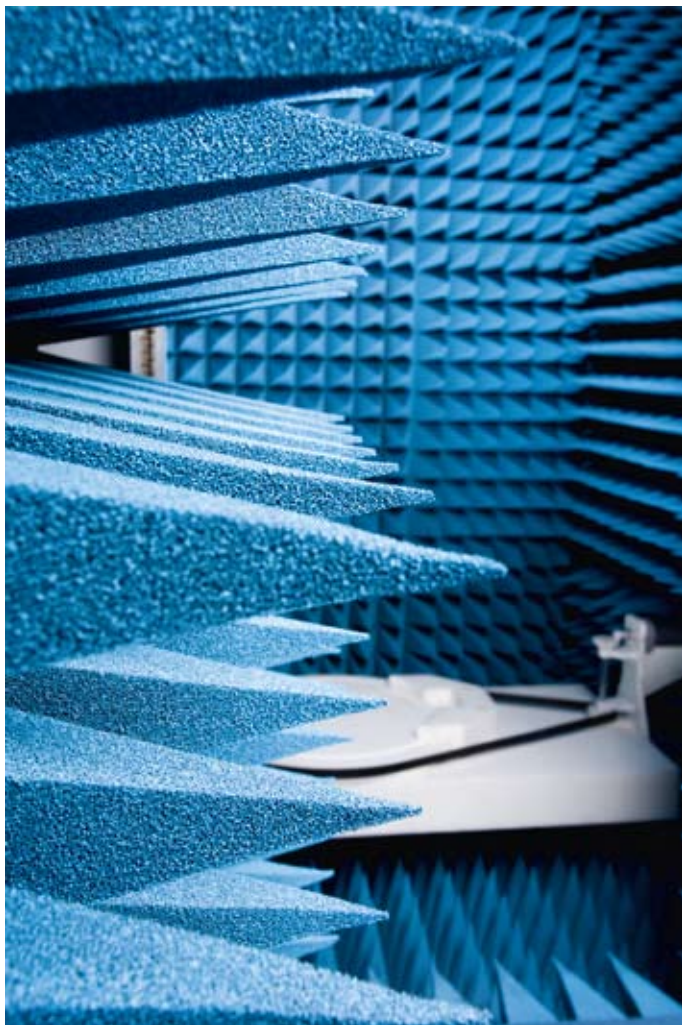
- Measurement of RF performance and radiated emissions at an early stage
- Measurement accuracy as high as in an anechoic chamber at significantly reduced investments in equipment and infrastructure
- Compact and versatile
- Efficient through automated measurements and the use of turnkey solutions



R&S®R-Line Compact Test Chamber

Benefits and key features

The compact R&S®R-Line offers extremely high measurement accuracy due to its elaborate design, with the turntable, absorbers, and measurement geometry perfectly matched to one another



Reduced time to market through early verification of radiated emissions

- ▮ Measurement accuracy as high as in an anechoic chamber
 - ▮ Meets site VSWR (SVSWR) in line with CISPR 16-1-4:2007
 - ▮ Frequency range 800 MHz to 18 GHz
- ▷ [page 4](#)

Efficient operation through measurements in the lab

- ▮ Compact and versatile
 - ▮ Readily available verification tool
 - ▮ Significantly lower investment than for anechoic chamber
- ▷ [page 5](#)

Optimum utilization of resources through comprehensive, automated test sequences for measuring radiated performance

Automated measurements using turnkey solutions combining the R&S®R-Line with test systems from Rohde&Schwarz

- ▮ R&S®TS8991 Over The Air Performance (OTA) Test System
 - ▮ R&S®TS8996 Radiated Spurious Emissions (RSE) Test System
- ▷ [page 6](#)

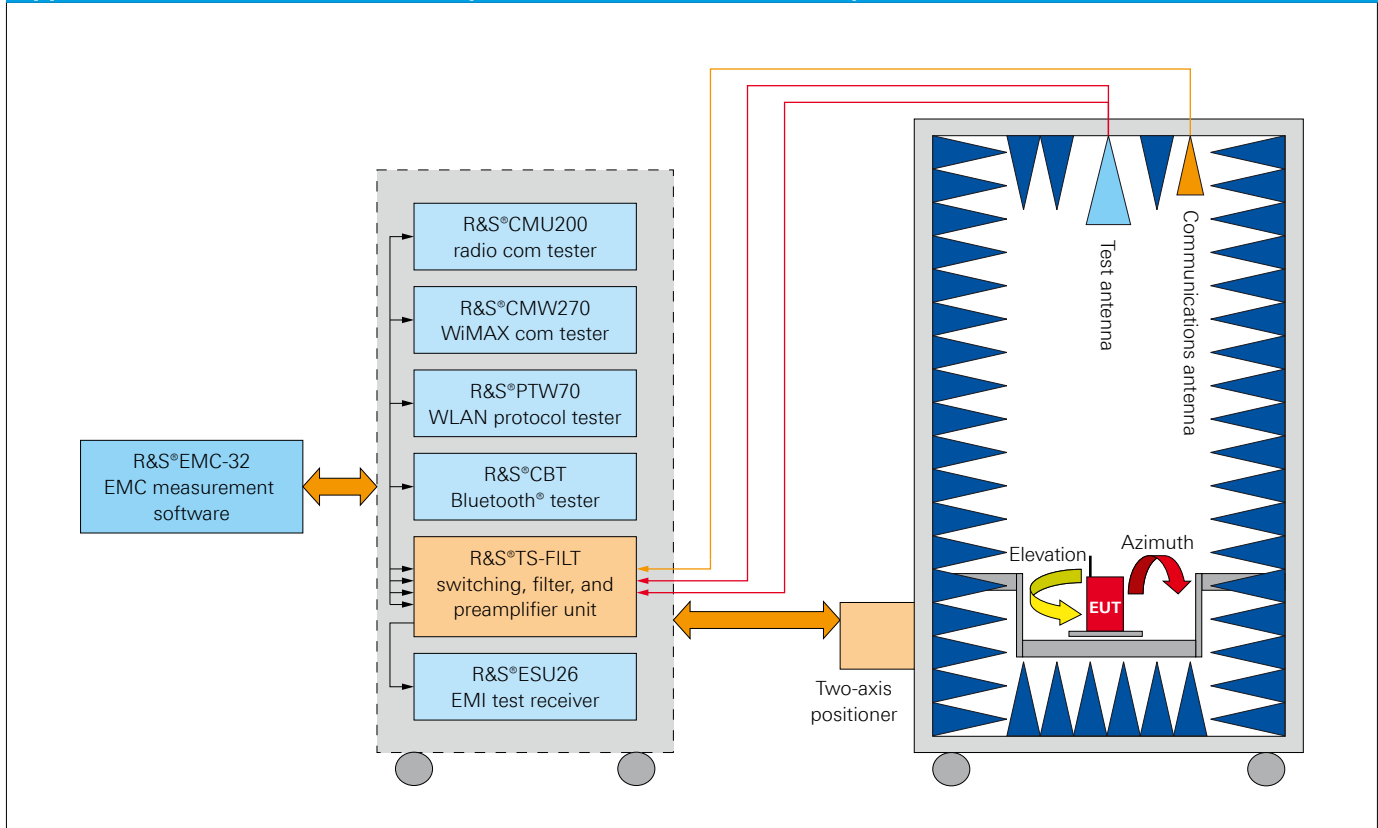
Reduced time to market through early verification of radiated emissions

Measurement accuracy as high as in an anechoic chamber

The compact system performs measurements in the critical frequency range from 800 MHz to 18 GHz with an accuracy as high as that of an anechoic chamber. The SVSWR validation requirements in line with CISPR 16-1-4:2007 are not only met but even considerably exceeded. The R&S®R-Line is thus a compact and economical solution for microwave measurements suitable for use in the R&D lab. The system identifies radiated harmonics and spurious emissions at an early stage – i.e. during development. This avoids complex and costly re-engineering during the final conformance tests. Time to market and related costs are thus reduced. Optimizing radiated spurious emissions as well as the specific absorption rate (SAR) and over-the-air performance (OTA) poses a permanent challenge. To achieve optimum results, therefore, the measurement solution should fulfill the requirements of a conformance test system.

The high measurement accuracy is obtained through an optimized measurement geometry and absorber layout combined with a positioner made of low-permittivity material throughout.

Application: R&S®TS8996 Radiated Spurious Emissions (RSE) Test System with R&S®R-Line



Efficient operation through measurements in the lab

Compact and versatile ...

... at the development engineer's workstation

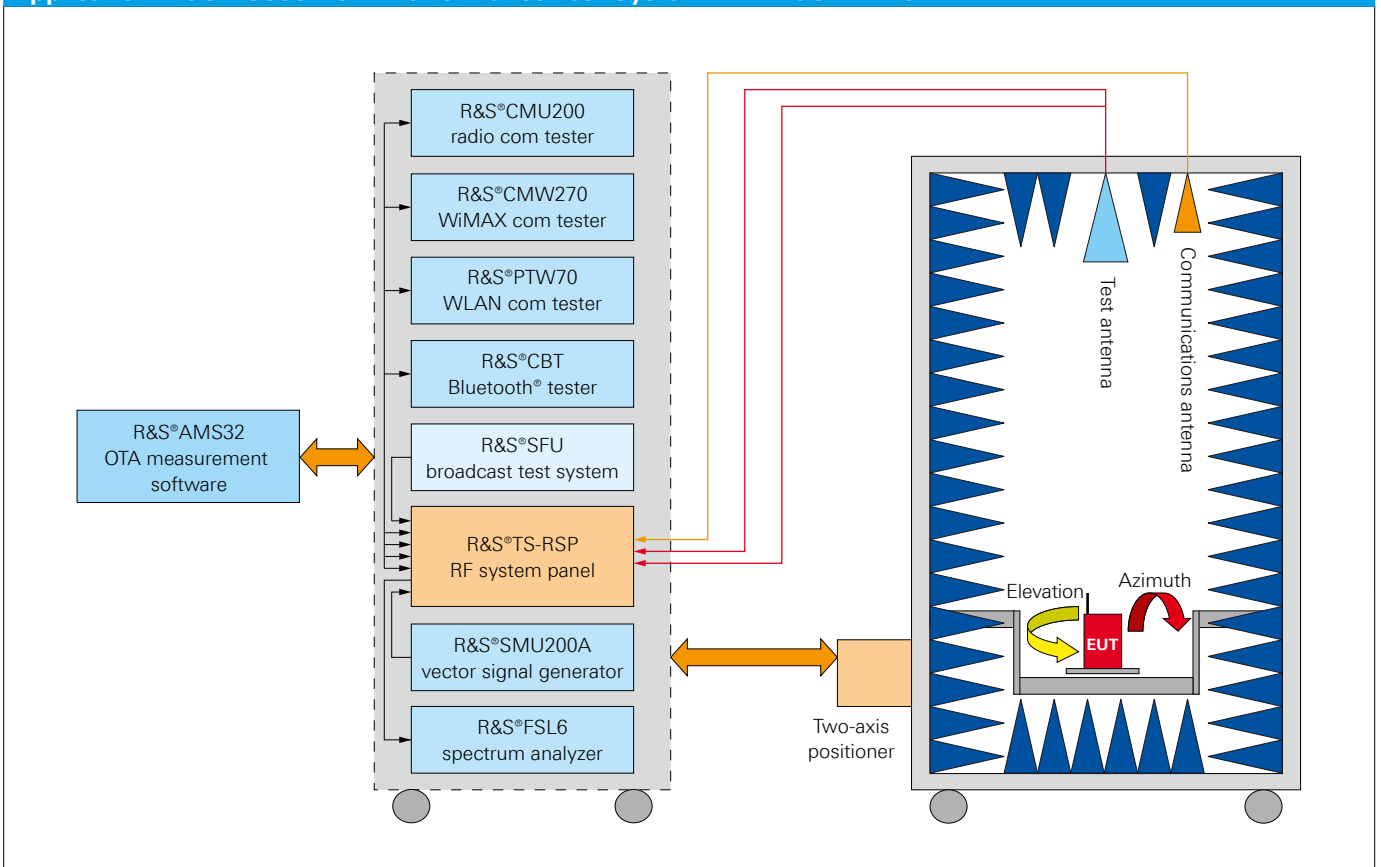
Requiring a floor space of only 2.5 m², the R&S®R-Line fits into any R&D lab. Thus, no long distances have to be covered, and there is no need for the complex infrastructure of an anechoic chamber. The test chamber can quickly and easily be set up wherever it is needed. This makes for highly flexible and efficient test procedures.

... with respect to the measurement task

The R&S®R-Line provides in-development support of radiated spurious emission measurements as well as inband measurements covering effective isotropical radiated power (EIRP) and the three-dimensional radiation and reception characteristics (free-space OTA performance). The corresponding test systems – R&S®TS8996 for RSE and R&S®TS8991 for OTA measurements – are adapted to the measurement task by adding the required modules to each system and/or combining the two systems.

The RSE and OTA measurement software can be configured in a variety of ways. For example, a network message can be sent at the end of the test, or critical frequencies can automatically be identified and retested, or interactive test sequences can be provided.

Application: R&S®TS8991 OTA Performance Test System with R&S®R-Line



Optimum utilization of resources through fully automatic measurements of radiated performance

Automated measurements ...

... through the use of an RF-transparent two-axis positioner

Measurements in all spatial directions can be performed fully automatically without any interaction on the part of the operator. Such measurements are necessary for determining the radiation characteristics as well as radiated spurious emissions.

... by using a Rohde & Schwarz test system

The Rohde & Schwarz test systems support fully automatic measurements even across several bands and channels of a radio service. Automatic control covers the R&S®R-Line and the complete measurement sequence, as well as continuous and reliable communication with the EUT. Test configurations and results can be re-used later during conformance measurements by means of the R&S®TS8991 and R&S®TS8996 test systems and an anechoic chamber. This yields an efficient and consistent test procedure.

Two-axis positioner made of RF-transparent material throughout



Specifications and Ordering information

General data		
Environmental conditions		
Operating temperature range		+0°C to +35°C
Storage temperature range		-10°C to +45°C
Relative humidity	without condensation	90% at +25°C
Power supply	208 V to 230 V/50 Hz to 60 Hz	max. 350 VA
Environmental test		
Electromagnetic compatibility		in line with EN 55011 class B, EN 55022:1987, class B
Safety class		in line with EN 60204-1
Mechanical data		
Dimensions (W × H × D)	including four movable and lockable castors	1690 mm × 1560 mm × 2130 mm 66.535 in × 61.417 in × 83.858 in
Weight		400 kg 881.85 lb
Door size (W × H)		500 mm × 1000 mm 19.685 in × 39.37 in
Size of EUT (W × H × D)		max. 200 mm × 200 mm × 200 mm max. 7.874 in × 7.874 in × 7.874 in
Weight of EUT		max. 2 kg max. 4.41 lb
Positioning speed of turntable		azimuth: 4.5 rpm to 13 rpm elevation: 0.1 rpm to 0.5 rpm
Distance between test antenna and center of EUT		1.02 m 40.157 in
Interfaces		Data
IEC/IEEE bus	in line with IEC 625-2 (IEEE 488.2)	for control of positioner
Test antenna	2 × SMA (female)	
Communications antenna	1 × N (female)	
RF feedthroughs	2 × N (female) 2 × SMA (female)	for calibration or connecting the EUT

RF specifications		
Measurement range		
Frequency range		800 MHz to 18 GHz
Polarization		horizontal and vertical, through cross-polarized antenna
RF power		max. 3 W
Communications antenna		800 MHz to 6 GHz, circularly polarized
Field uniformity	meets CISPR 16-1-4:2007	site VSWR <4 dB
	max. EUT volume for uniform field volume (W × H × D)	200 mm × 200 mm × 200 mm max. 7.874 in × 7.874 in × 7.874 in

System requirements

For the positioner, a PC with a Windows XP operating system and an IEC/IEEE bus interface is required. Ideally, the R&S®EMC32 or the R&S®AMS32 measurement software is used for controlling the positioner.

Designation	Type	Order No.
Compact Test Chamber Spurious and RF measurements	R&S®R-Line	1511.0508.02
System components		
RSE Test System	R&S®TS8996	1119.4544.02
OTA Performance Test System	R&S®TS8991	1119.4309.02

Service you can rely on

- | In 70 countries
- | Person-to-person
- | Customized and flexible
- | Quality with a warranty
- | No hidden terms

About Rohde & Schwarz

Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

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Certified Quality System

ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System

ISO 14001
DQS REG. NO 1954 UM

More information at
www.rohde-schwarz.com
(search term: R-Line)

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