

**ROHDE & SCHWARZ**

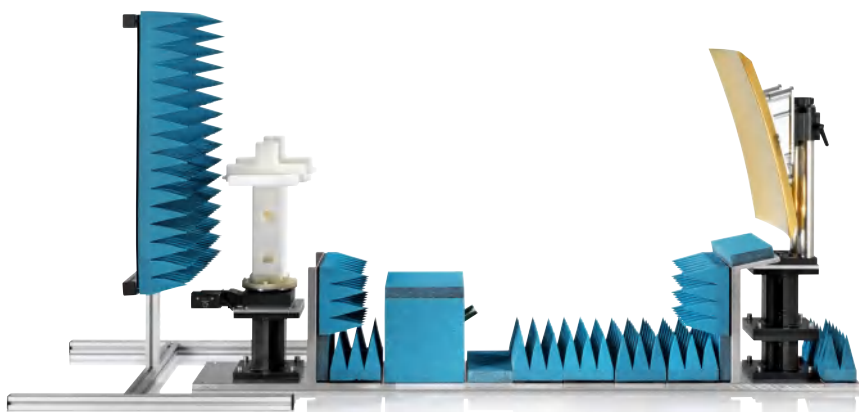
Make ideas real



# R&S®ATS800 CATR ANTENNA TEST SYSTEMS

R&S®ATS800R rack based model,  
R&S®ATS800B benchtop model

Millimeterwave and 5G NR  
antenna characterization  
on a small footprint



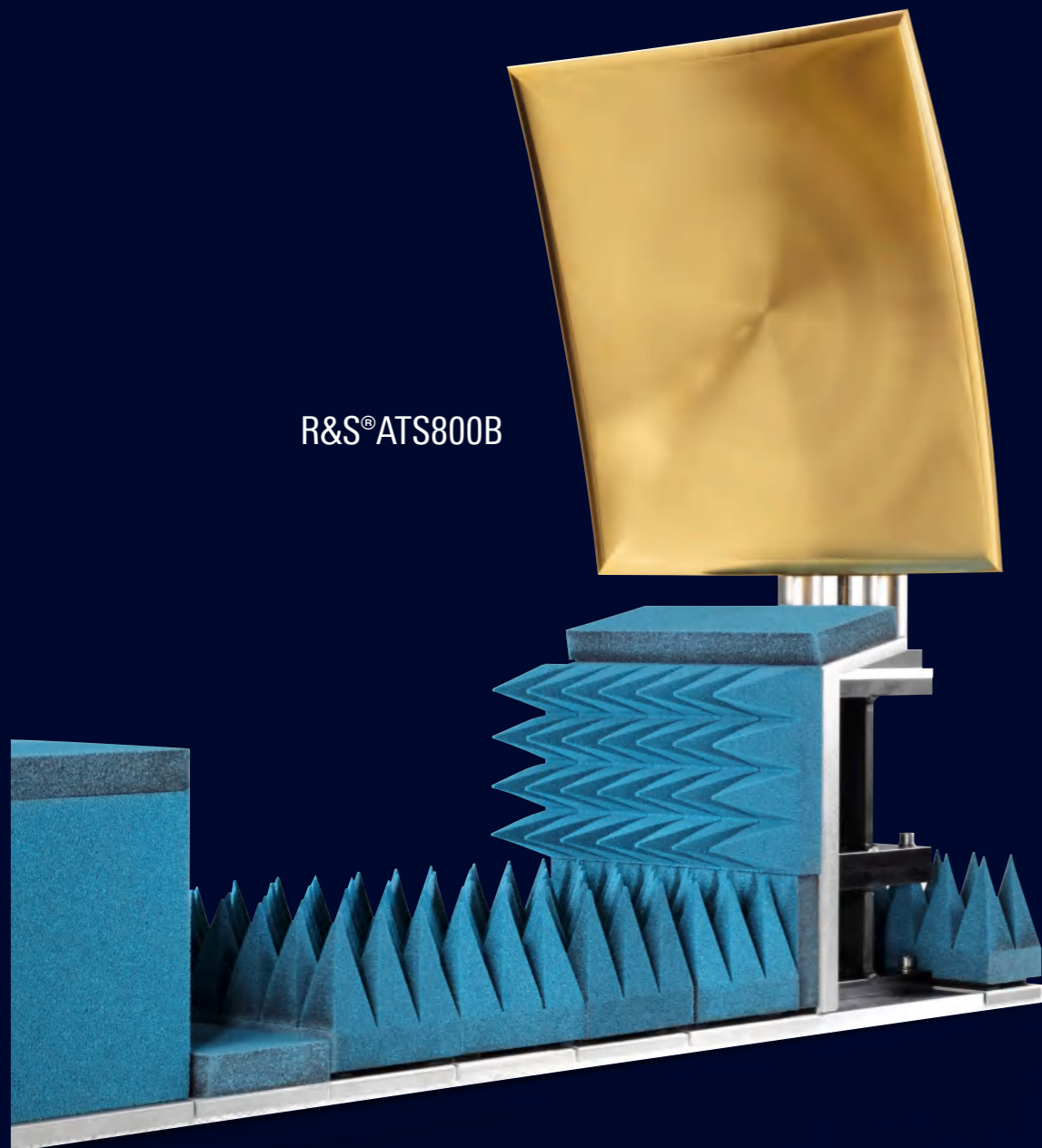
# R&S®ATS800 FAMILY

The R&S®ATS800 antenna test system family offers a very compact environment for 5G antenna, module and device characterization in the 20 GHz to 50 GHz range. It is an essential tool for R&D as well as design verification for both active and passive devices. The R&S®ATS800 comes as an accessible horizontal benchtop setup (R&S®ATS800B) or as a fully anechoic rack-integrated vertical setup (R&S®ATS800R).

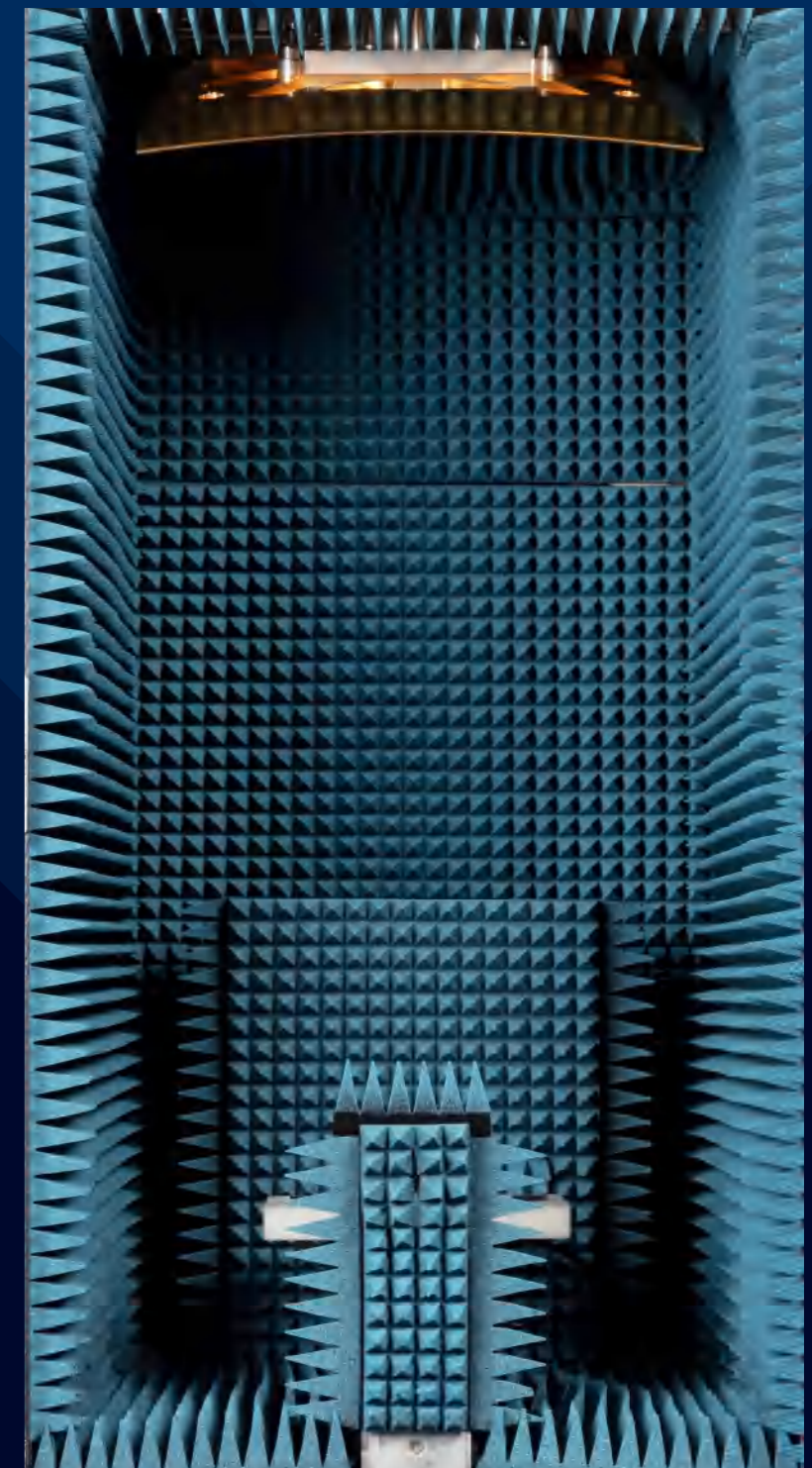
## Key facts

- ▶ Very compact far-field over-the-air (OTA) test system based on compact antenna test range (CATR) technology
- ▶ Unrivaled quiet zone size and accuracy with just a 0.8 m<sup>2</sup> footprint
- ▶ State-of-the-art reflector surface precision for high frequency support
- ▶ Unique benchtop or rack based CATR setup
- ▶ Automated high-precision positioner (optional)
- ▶ Indirect far-field method – as recommended by 3GPP for 5G OTA testing

R&S®ATS800B



R&S®ATS800R



Based on the compact antenna test range (CATR) principle, the R&S®ATS800 allows over-the-air RF measurements under far-field conditions in even the smallest lab spaces. It helps optimize the overall RF module performance in the early development phases, preventing costly and time-consuming modifications for a large number of prototypes at a later stage. OTA RF testing during development reduces costs and keeps the product launch on schedule with faster time to market.

In combination with its test equipment, Rohde&Schwarz offers a one-stop solution for lab based 5G device antenna performance testing – ensuring fast and smooth characterization in the mmWave frequency range.

In summary, the R&S®ATS800 antenna test system is a compact, convenient and accurate solution for testing 5G modules in the new 5G mmWave frequency bands.

5G is all about data, speed and reliability in high-frequency millimeterwave (mmWave) bands. The lack of conventional external RF connectors on mmWave devices makes 5G antenna characterization challenging. 5G antenna, chipset and UE manufacturers as well as mobile operators need a viable and easy to operate over-the-air (OTA) solution for research, diagnostics and debugging through type approval. Compact CATR setups are ideal for this.

# R&S®ATS800B

## BENCHTOP CATR ANTENNA TEST SYSTEM

The R&S®ATS800B is a very compact and accessible benchtop CATR for enormous flexibility in creating various test setups that provide a highly accurate 20 cm quiet zone. The open design makes it easy to use with devices of different sizes and weights. Also, oddly shaped devices are not a problem when positioning and testing. The open architecture enables great flexibility and easy setup, making it ideal for education, universities and research labs as well as RF development labs.

The R&S®ATS800B feed antenna offers a wide frequency range and is easily connected to any type of test equipment such as network analyzers as well as signal generators, signal analyzers and radiocommunications testers via RF cables supporting up to 50 GHz.

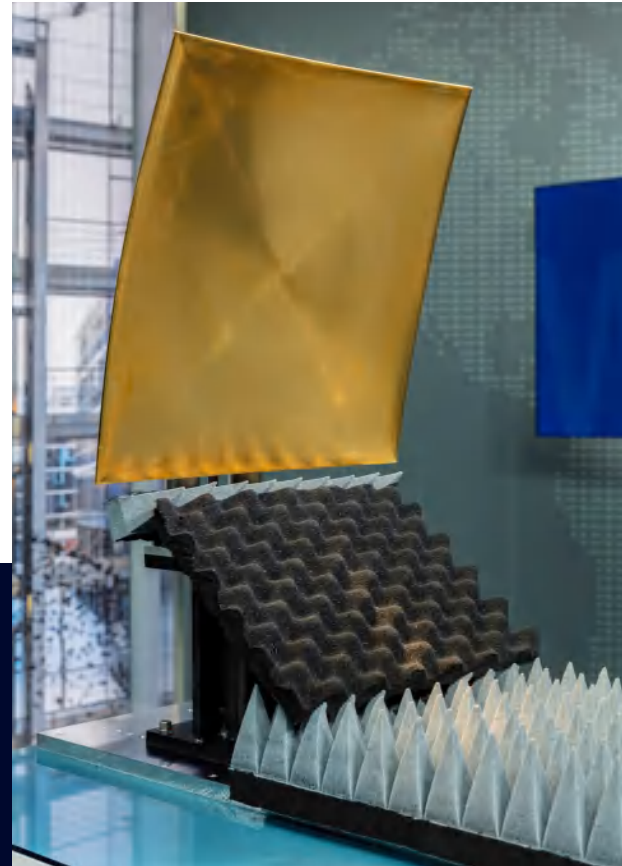
The CATR reflector is a member of the Rohde&Schwarz reflector family. It features rolled edges to prevent scattering and reflections that could contaminate the high-quality quiet zone created by the parabolic shape. The low surface roughness ensures a very high upper frequency limit. The gold-plated finishing provides stable performance over time by preventing oxidation that would increase surface roughness.

The fixture provided with the R&S®ATS800B is made of RF transparent material to ensure minimum influence on measurements. The flexible clamping feature easily accommodates different device sizes and shapes.

The optional 2D azimuth rotation stage enhances the flexibility and usability of the R&S®ATS800B and allows measurement of 2D DUT radiation patterns. A motor controller is provided for easy control via the USB or RS-232 interface with various supported application programming interfaces (API).



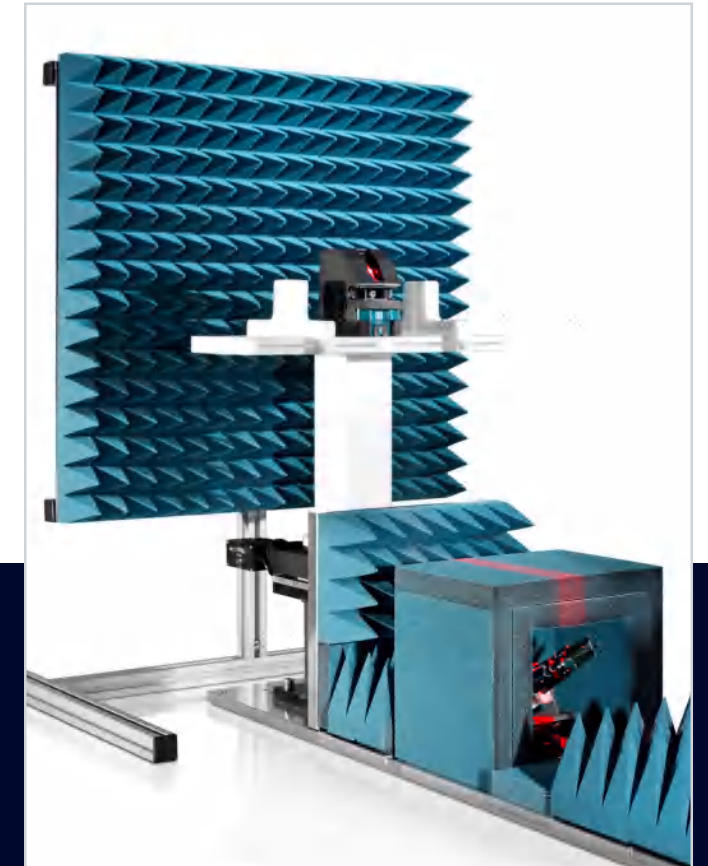
Feed antenna



Reflector



DUT fixture



Positioner

# R&S®ATS800R

## RACK BASED CATR ANTENNA TEST SYSTEM

The R&S®ATS800R rack based CATR setup uses many of the components from the R&S®ATS800B benchtop setup and arranges them for more industrial environments.

The same gold-plated parabolic CATR reflector with rolled edges is used, but installed under the ceiling of the compact anechoic chamber. This further decreases the system footprint and prevents accidental contact with the reflector.

The feed antenna is also the same as in the benchtop setup and is moved to the backwall of the anechoic chamber for the same illumination of the reflector while keeping it less prone to contact and better protected.

The DUT is placed on the bottom of the anechoic chamber and can be tested with ease. The device fixture allows flexible DUT mounting inside the 20 cm high quality quiet zone. This can be done with the pin holes or threaded holes that also match the mechanical interface for Rohde&Schwarz calibration antennas.

A metal door with high-quality absorbers completes the setup. The entire anechoic chamber is placed in a rack for the convenient storage of both the CATR test environment and testing equipment for assessing the DUT. This further reduces the test setup footprint and enables far-field OTA testing with limited lab space. Optional rack wheels make the setup even more convenient and flexible.

The optional remote radio head (RRH) holder on the back of the chamber reduces the necessary cable length and the critical cable loss at mmWave frequencies. This enables close integration with the R&S®CMP200 and R&S®CMX500 radiocommunications testers and their remote radio heads. The R&S®ATS800R is the ideal OTA environment for RF pre-conformance testing, FR2 application testing and data performance testing in combination with the R&S®CMX500.

The R&S®AMS32-ATS calibration and QZ verification for CATR systems software tool in conjunction with a network analyzer (e.g. R&S®ZNA) enable convenient initial alignment of the reflector and can also perform RF path loss calibration for the R&S®ATS800R.

# 3D POSITIONER AND EXTREME TEMPERATURE TEST SOLUTION

## Optional 3D positioner

A 3D azimuth over elevation positioner is available as an optional extension to the R&S®ATS800R. It replaces the DUT fixture and enables a full 3D assessment of the DUT rather than only testing in a fixed stable position. The 3D positioner can independently rotate a smartphone or tablet device by 360° along both axes. While moving, the encoders provide an accurate position at the control interface of the positioner for trouble-free and accurate operation. To test passive antennas that need an RF connection, additional rotary joints and feed cables are also available for full spherical testing.

The 3D positioner and optional rotary joints can be added to any installed R&S®ATS800R.

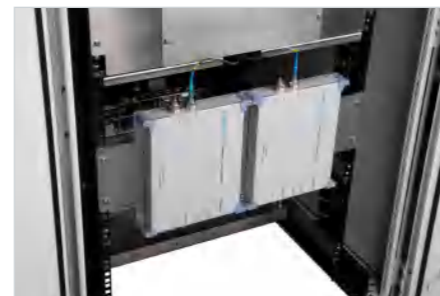
## Climate option for tests under extreme temperature conditions

The extreme temperature test option comes with an isolated yet RF transparent enclosure to analyze temperature effects on the DUT. The DUT is placed inside the enclosure which can be heated or cooled with an external heat pump to provide hot or cold airstreams into the enclosure. Thickly insulated, temperature-resistant hoses enable testing in a wide temperature range. The dome shaped lid is made from RF transparent material that tightly encloses the DUT and has little to no influence on the RF radiation. The enclosure sizes allow also bigger devices to be accommodated comfortably inside the extreme temperature test option.

The temperature test enclosure can be added to any installed R&S®ATS800R but cannot be combined with the 3D positioner.



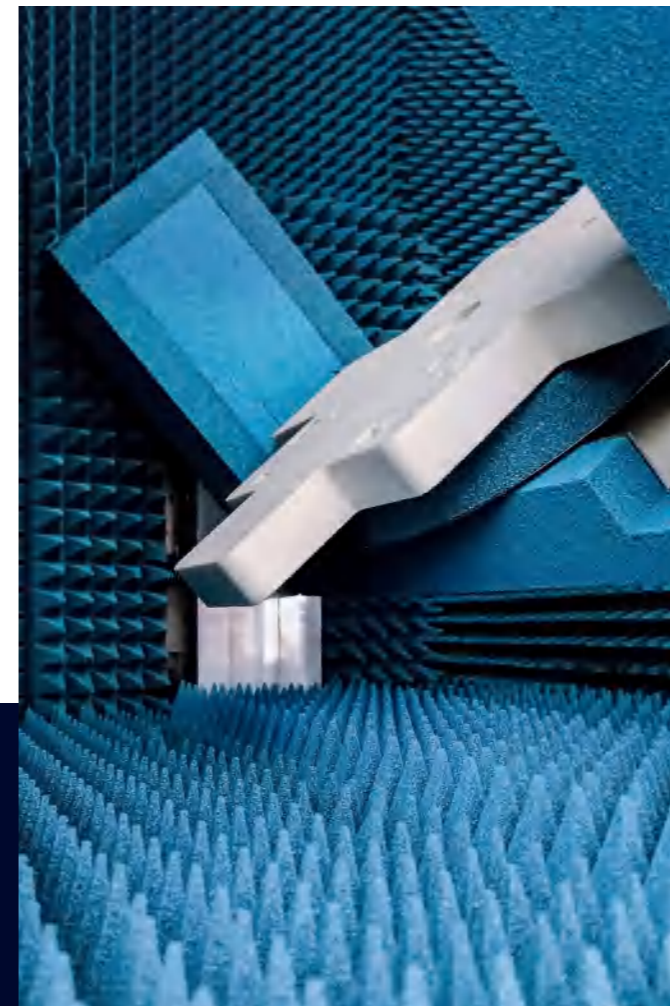
Complete setup



RRH mount



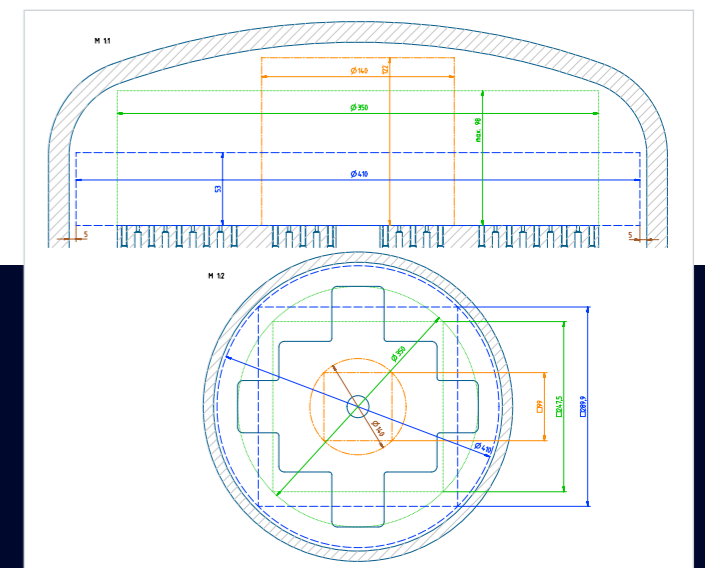
Feed antenna



Optional 3D positioner



Climate option



## Rohde & Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

### Service that adds value

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

### Rohde & Schwarz training

[www.training.rohde-schwarz.com](http://www.training.rohde-schwarz.com)

### Rohde & Schwarz customer support

[www.rohde-schwarz.com/support](http://www.rohde-schwarz.com/support)

