

HIGH-PRECISION TEST CHAMBER FOR AUTOMOTIVE RADAR

Test, calibrate and verify high-performance automotive radar sensors with the R&S®ATS1500C CATR antenna test system and the R&S®AREG100A automotive radar echo generator



R&S®ATS1500C antenna test system

Your task

Automotive radar is one of the key technologies that is driving progress in the field of advanced driver assistance systems (ADAS) and enabling future generations of driverless vehicles. Typical 24 GHz analog radars often struggle to deliver the required resolution and accuracy. Therefore, additional sensor data from visual systems and light detection and ranging (lidar) systems are necessary. Higher-frequency radars, operating at frequencies between 76 GHz and 81 GHz with over 4 GHz of available bandwidth, offer much higher resolution and accuracy. While this reduces cost because fewer other sensing technologies are required, it also calls for a sophisticated T&M solution.

During design, production and for calibration of the final radar unit, an over-the-air radar test system with a radar target generator helps deliver accurately performing high-end radar systems.



R&S®AREG100A automotive radar echo generator

T&M solution

The R&S®ATS1500C features a highly accurate compact antenna test range (CATR) reflector, generating a quiet zone with a 30 cm diameter for testing in the frequency range from 77 GHz to 81 GHz. Its high-precision 3D tilt-tilt positioner permits testing of premium automotive radars. A carefully designed absorber layout eliminates ghost targets during target simulation.

The test system consists of the compact R&S®ATS1500C automotive radar test chamber for far-field testing in combination with the R&S®AREG100A automotive radar echo generator for precise radar target simulation at custom-defined distances. Together, they form a unique and innovative indirect far-field testing solution for reliable and reproducible verification of radar sensors throughout the R&D and validation phase in a user-friendly and extremely compact lab setup. The Rohde & Schwarz solution enabled Uhnder to precisely calibrate and verify its new, fully integrated 4D digitally modulated automotive radar-on-chip.

Application Card | Version 01.00

ROHDE & SCHWARZ

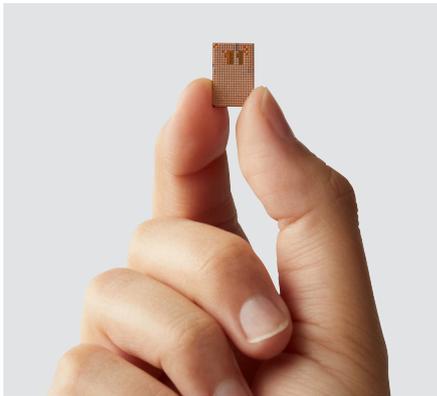
Make ideas real



UHNDER DELIVERS THE FIRST DIGITAL AUTOMOTIVE RADAR-ON-CHIP

Uhnder's radar-on-chip technology

Uhnder is delivering industry's first digital automotive radar-on-chip (RoC) using a combination of advanced CMOS and digital code modulation (DCM) technology. Uhnder's approach and technology promise to transform the automotive industry by changing the way radars work and significantly improving performance with the additional benefits of smaller size, lower power and lower cost. The RoC from Uhnder, operating between 76 GHz and 81 GHz, is unique because it integrates the radar analog frontend, the baseband, the digital frontend, the digital backend and processing on a single chip. Uhnder has succeeded in creating a MIMO radar chip with 12 transmitters and 16 receivers in a single package.



RoC from Uhnder

Uhnder's digital RoC does what lidar, current analog radar and cameras cannot: it provides a four-dimensional detection system that processes velocity, vertical angle and height, as well as horizontal angles, all at a range of 300+ meters, in any weather conditions.

While radar has always had an advantage in poor ambient conditions, a significant weakness of conventional analog radar is poor resolution. It detects an object, but cannot tell whether there is one object or two, or whether the object is elevated above the road. The digital RoC from Uhnder pioneers the high contrast resolution (HCR) technology. In addition to providing significantly improved range and angular resolution, this technology makes it possible to separate small radar reflectors from large reflectors that are in close proximity, such as a child next to a car or bus, a bicyclist riding beside moving vehicles or a pedestrian crossing the street between two cars.

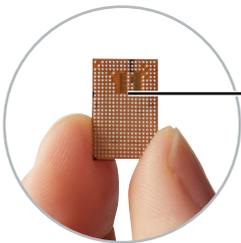
The digital RoC from Uhnder is ready for creating unprecedented high-performance sensors in large-scale deployment and production.

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Measurement setup



RoC from Uhnder



R&S®ATS1500C antenna test chamber



R&S®AREG100A automotive radar echo generator

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High-precision test chamber for automotive radar
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