

# ONE POWER SENSOR SERIES FOR ALL AUTOMOTIVE RADAR NEEDS

Radar technology is essential for state-of-the-art and future vehicles on the path to full autonomous driving. Radar sensors deliver critical information about the surrounding traffic environment or monitor the interior of the vehicle. As safety-relevant parts, radar sensors must adhere to specifications and regulations.



R&S®NRP90SN and R&S®NRP90S sensors

Current developments in radar technology have enabled the production of industry-grade radar equipment at a commercial price point. Car manufacturers are increasingly using advanced driver assistance systems (ADAS) or autonomous driving (AD) features to achieve the best, most intuitive driver assistance capabilities while enhancing overall traffic safety. For this application, the automotive industry has adopted long-range and short-range E band radars. While these devices protect the vehicle from the outside, passenger safety will also get a boost from a different direction with in-cabin radar, e.g. for driver health monitoring.

## Your task

Development of advanced automotive radar sensors and radar based ADAS/AD features presents major challenges at each step of the development and validation process – from tier 2 chipset tests, to tier 1 supplier sensor production, to vehicle manufacturers' end-of-line inspection tests. Flexible, scalable, and cost-effective test concepts and environments are needed. Power sensors can fulfill these requirements, which makes them ideally suited to a wide range of tasks in automotive radar such as chipset and antenna validation during development or conformance

testing. This applies to all radar systems, whether 24 GHz ISM band sensors for blind spot detection, 60 GHz in-cabin radar, or equipment operating between 76 GHz and 81 GHz used for ADAS/AD functions. The latter has proven challenging in the past due to the lack of high-speed E band power sensors.

Since automotive radar sensors are safety-relevant, they are increasingly important for standardization authorities, particularly when it comes to their resistance to interference and adherence to emissions limits. The radio equipment directive (RED) and associated standards, such as ETSI EN 303396 and ETSI EN 303091-1/-2, established a legally binding standard for E band automotive radar sensors in Europe. The highest possible accuracy in power level measurement is crucial, especially for emissions limits, which are a focus of chipset manufacturers striving for the best radar performance.

In short – be it in analog hardware development for automotive radar sensors or in validation engineering for mass production – fast, precise and reliable power measurements are of utmost importance.

Application Card | Version 01.00

**ROHDE & SCHWARZ**

Make ideas real



## Rohde & Schwarz solution

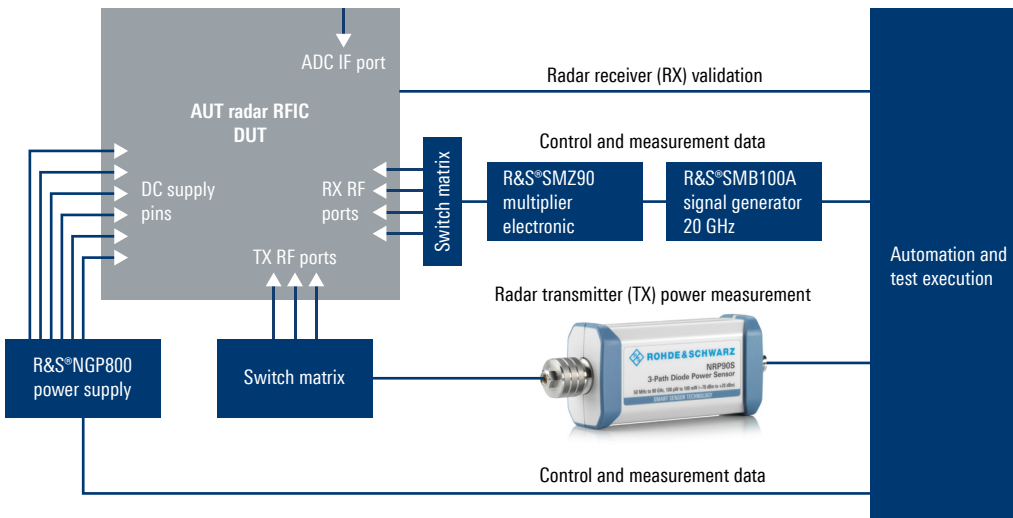
Diverse technology types, frequency bands and development stages, combined with non-RF requirements, such as digital connectivity, put extreme demands on power sensors. Automotive radar is undergoing a technology shift toward the future-proof E band, which requires a power sensor capable of reaching up to 90 GHz. R&S®NRP90S is ideally suited to this task. It is now possible for the first time to take accurate, repeatable measurements at full RF power over the entire frequency range directly in the E band.

The R&S®NRP90S and the R&S®NRP90SN are unique new first-in-class power sensors that check all the boxes. They can be used with all radar types up to E band with frequencies from 50 MHz to 90 GHz maintaining a wide dynamic range of 90 dB with -70 dBm sensitivity over the entire frequency range.

The R&S®NRP sensor series is extremely fast thanks to its three-path diode technology, which can take up to 50 000 readings/s, while accelerating test speed and reducing test time and cost. Sensor measurements are reliable with outstanding accuracy and repeatability. They also provide a high level of certainty that the correct measurement was taken the first time around.

Connecting the R&S®NRP90S or the R&S®NRP90SN sensor is quick and easy thanks to a wide range of RF connectivity options, including 1.35 mm and 1.00 mm coaxial connectors as well as waveguide adaptors. Digital connectivity for remote control includes both USB and USB/LAN models for use on PCs, power sensor base units in rack based test setups, or LAN connectivity for use with a manufacturing cloud.

## Radar conducted RF power measurement



Radar conducted RF power measurement is essential to evaluate the performance of radar ICs. As a new member of the test bench, the R&S®NRP90S power sensor is a fast and reliable radar transmitter for easy power measurements.

## ORDERING INFORMATION

Designation	Type	Order No.
<b>90 GHz three-path diode power sensors</b>		
100 pW to 100 mW, 50 MHz to 90 GHz, 1.35 mm connector	R&S®NRP90S	1424.6421.02
100 pW to 100 mW, 50 MHz to 90 GHz, 1.00 mm connector	R&S®NRP90S	1424.6421.03
100 pW to 100 mW, 50 MHz to 90 GHz, LAN version	R&S®NRP90SN	1424.6450.02
<b>Recommended extras</b>		
USB A interface cable, up to 5 m (16.4 ft)	R&S®NRP-ZKU	1419.0658.xx
USB C interface cable, up to 3 m (9.8 ft)	R&S®NRP-ZKC	1425.2442.xx
Six-pole interface cable, up to 5 m (16.4 ft)	R&S®NRP-ZK6	1419.0664.xx
Eight-pole interface cable, up to 5 m (16.4 ft)	R&S®NRP-ZK8	1424.9408.xx

Rohde & Schwarz GmbH & Co. KG  
www.rohde-schwarz.com

Rohde & Schwarz training  
www.training.rohde-schwarz.com  
Rohde & Schwarz customer support  
www.rohde-schwarz.com/support

R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG  
Trade names are trademarks of the owners  
PD 3683.8280.92 | Version 01.00 | December 2022 (ja)  
One power sensor series for all automotive radar needs  
Data without tolerance limits is not binding | Subject to change  
© 2022 Rohde & Schwarz GmbH & Co. KG | 81671 Munich, Germany