

# MASTERING AUTOMOTIVE RADAR EIRP MEASUREMENT FOR PEAK PERFORMANCE

Automotive radars are essential to safety systems such as collision avoidance and adaptive cruise control. The radars are a pillar of ADAS/AD systems and an important part of sensor fusion. The effective isotropic radiated power (EIRP) of automotive radar sensors is the total power emitted from radar antennas and a comprehensive measure of signal strength and coverage capability (essential to assessing automotive radar sensor performance). The AREG800A automotive radar echo generator makes for easy EIRP measurements when validating automotive radar sensors.



## Your task

Automotive radar suppliers must accurately measure EIRP in automotive radar sensors to comply with regulations, ensure sensor reliability, optimize sensor performance, maintain quality standards and establish user confidence, which are all crucial to vehicle safety and the driving experience. Standards, such as ETSI in Europe, place limits on the maximum power that radar sensors can emit to prevent interference with other electronic devices. Compliance with these limits is essential. EIRP measurements allow radar manufacturers to verify product quality and consistency in areas from R&D to production. Making sure that each radar unit emits the correct amount of power within a specified tolerance limit lets suppliers maintain high quality standards and user satisfaction.

Accurate EIRP measurements help optimize radar sensor performance. Characterizing output power and coverage lets radar suppliers fine-tune designs, improve detection range and make sure the sensors have sufficient power for detection. Precise EIRP measurements play a crucial role in the reliable and effective operation of ADAS/AD systems and overall vehicle safety.

## Rohde & Schwarz solution

Rohde & Schwarz has reliable and repeatable cutting-edge test and measurement solution for the automotive radars of today and tomorrow. The precision engineering and advanced technology make the AREG800A ideal for accurate and reliable radar testing and measurement – from early R&D to production.

A fully calibrated receive path (RX input antenna to power measurement output) is integrated into the mmWave remote frontend (output interface in the IF domain). When the AREG800A automotive radar echo generator is combined with the R&S®NRP8SN power sensor, it is an ideal test solution for accurately measuring the EIRP for automotive radar sensors. The solution can also be used to validate radar sensor compliance with specific standards (ETSI in Europe).

The R&S®NRP8SN power sensor architecture has three separate diode paths, each operated in the optimum detector range, to precisely and accurately determine the EIRP for radar sensors.

Application Card | Version 01.00

**ROHDE & SCHWARZ**

Make ideas real



## Application

The R&S®AREG8-81S mmWave remote frontend is connected to a base unit and downconverts the RF radar signal (ISM and E band) to the AREG800A IF (0.7 GHz to 5.7 GHz). The R&S®NRP8SN power sensor connects the IF output interface on the mmWave remote frontend to the AREG800A base unit. The EIRP value for the radar under test is displayed on the AREG800A GUI.

 Radar Power -25.58 dBm 2: NRP102244	<b>Radar Objects</b> Ch. ID : A2 Act. Obj.: 0	<b>Measurement Setup</b> Connected Frontends: 1 Configured Sensors: 1 Mapped Channels: 1 Parameter Preset Behavior: Off Eirp (dBm): 19.5
	<b>System Config</b> Host: AREG800A-101854 IP: 10.102.189.145 GPIB Address: 28 FW: 5.30.047.45	<b>Operation Setup</b> Mode: Static Object Reference: Origin
	<b>RF Off</b>	
	<b>Info</b>	

Automotive radar EIRP measurement

## Summary

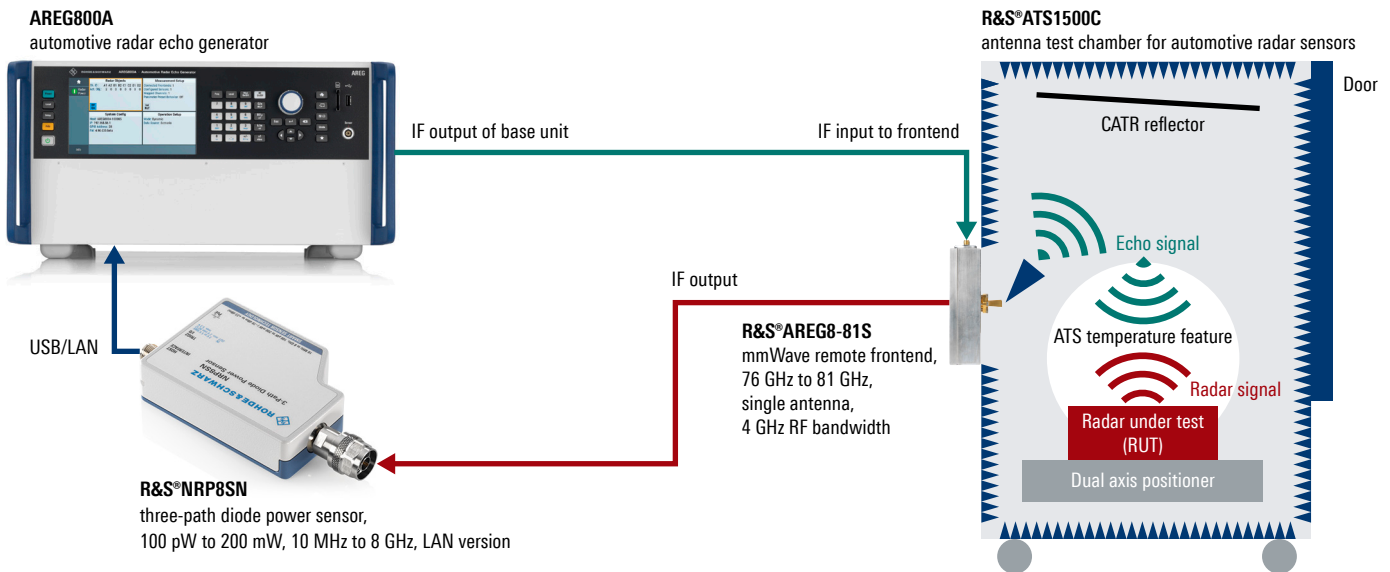
Benefit from the extensive Rohde&Schwarz portfolio of reliable automotive radar testing solutions:

- ▶ Accurate measurement of EIRP for radar sensors in all automotive radar bands (ISM and E band) from R&D to production
- ▶ The EIRP value for the radar under test is displayed on the AREG800A GUI
- ▶ Cost-efficient since R&S®NRP8SN power sensors are accurate enough to measure the EIRP in the E band
- ▶ Footprint optimized with separable RF frontend for integration in shielded chambers
- ▶ Standalone commercial-off-the-shelf solution
- ▶ No synchronization with radar under test required
- ▶ Fast execution minimizes test cycle times

## See also

[www.rohde-schwarz.com/product/areg800a](http://www.rohde-schwarz.com/product/areg800a)

## EIRP measurement setup



## Ordering information

Designation	Type	Order No.
Automotive radar echo generator	AREG800A	1437.4400.02
Three-path diode power sensor, 100 pW to 200 mW, 10 MHz to 8 GHz, LAN version	R&S®NRP8SN	1419.0012.02
Antenna test chamber for automotive radar sensors	R&S®ATS1500C	1537.9777.02
mmWave remote frontend, 76 GHz to 81 GHz, single antenna, 4 GHz RF bandwidth	R&S®AREG8-81S	1437.8734K02

## Rohde & Schwarz GmbH & Co. KG

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

### 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)

R&S® is a registered trademark of Rohde&Schwarz GmbH & Co. KG

Trade names are trademarks of the owners

PD 3673.0511.92 | Version 01.00 | August 2024 (jr)

Mastering automotive radar EIRP measurement for peak performance

Data without tolerance limits is not binding | Subject to change

© 2024 Rohde & Schwarz | 81671 Munich, Germany