

Radio equipment directive for automotive

- EN 300 328
- EN 301 893
- EN 301 908-13
- EN 301 511
- EN 302 571
- EN 303 345
- EN 303 413



ROHDE & SCHWARZ
Automotive



Your challenge

Radio spectrums have become increasingly crowded, and technologies are competing for sufficient bandwidth to operate effectively. In a car environment, for example, there are many components transmitting and receiving data communications signals in different frequency bands.

Today, car manufacturers, car systems integrators as well as car component manufacturers have to ensure that these devices operate in line with the European radio equipment directive (RED).

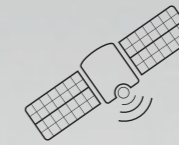
Find out more at www.rohde-schwarz.com/red



EN 303 345
AM, FM, DAB, DRM
Compliance testing in line with RED for stereo and car radio receivers



EN 300 328 & EN 301 893
Wi-Fi & Bluetooth®
Compliance testing in line with RED for equipment operating in the 2.4 GHz and 5 GHz bands



EN 303 413 Global navigation satellite systems (GNSS)

Compliance testing in line with RED for equipment operating in the 1164 MHz to 1300 MHz and 1559 MHz to 1610 MHz frequency bands



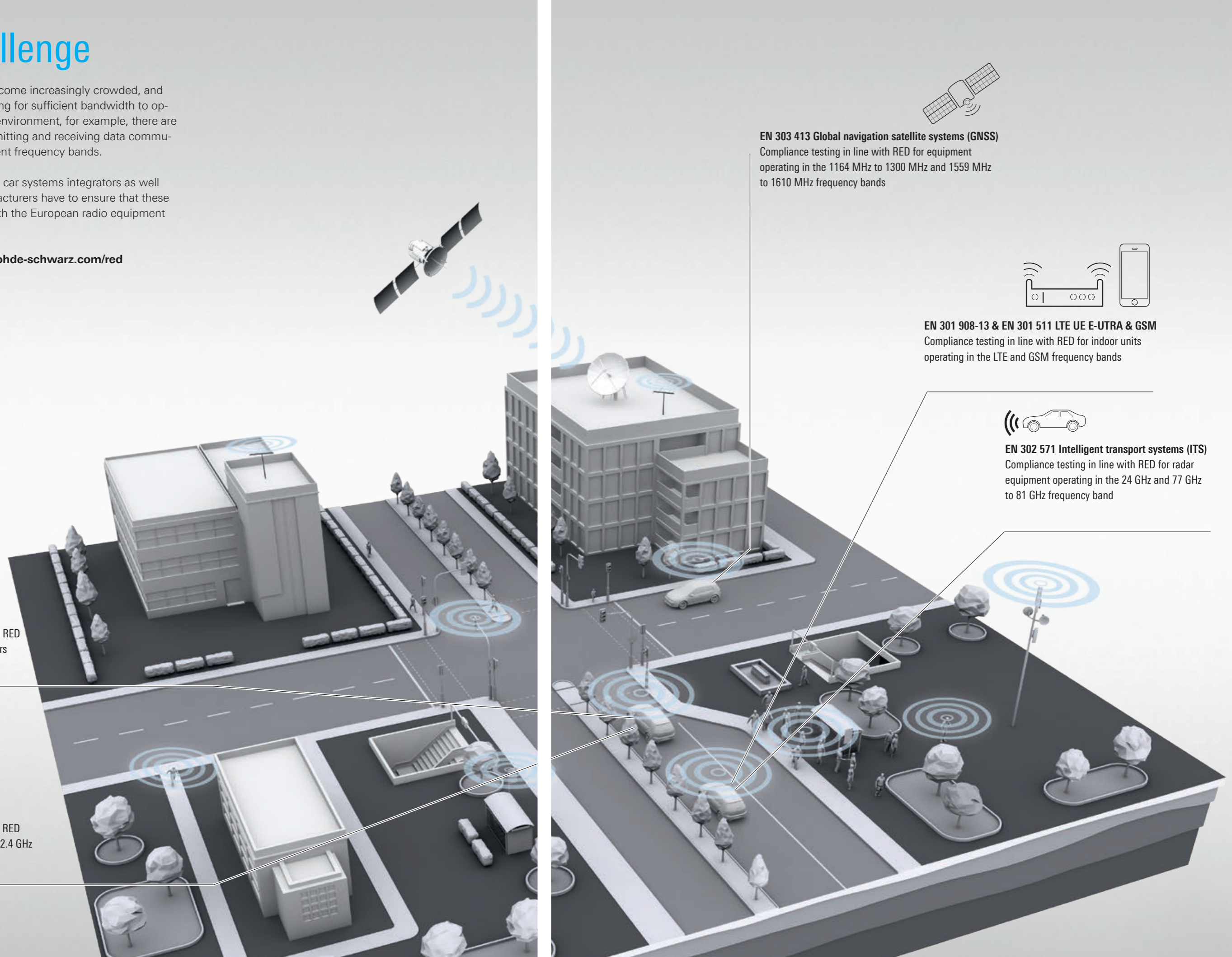
EN 301 908-13 & EN 301 511 LTE UE E-UTRA & GSM

Compliance testing in line with RED for indoor units operating in the LTE and GSM frequency bands

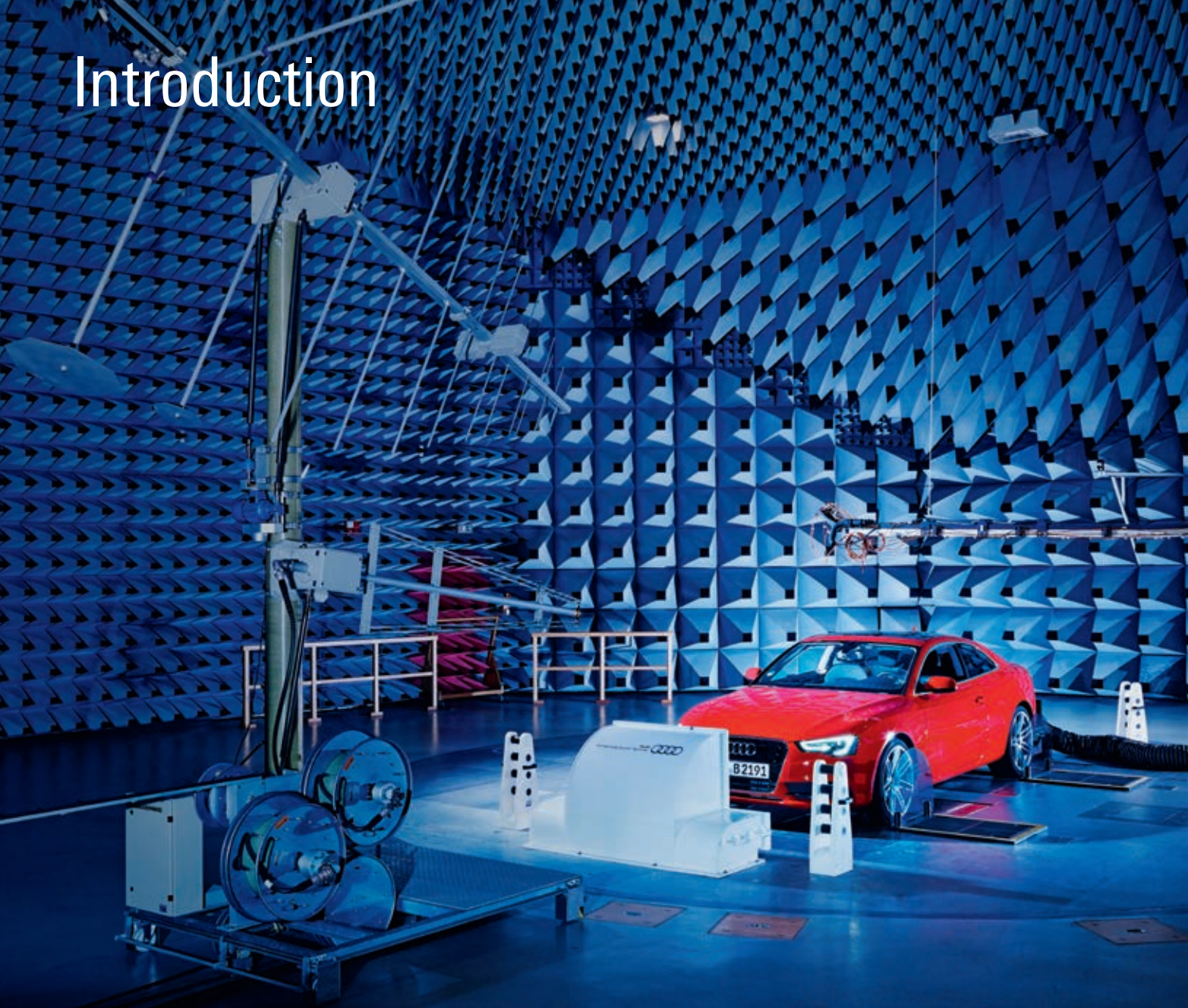


EN 302 571 Intelligent transport systems (ITS)

Compliance testing in line with RED for radar equipment operating in the 24 GHz and 77 GHz to 81 GHz frequency band



Introduction



The new radio equipment directive RED (2014/53/EU) replaces the previous directive RTTE (1999/5/EC) – better known as R&TTE.

RED Article 3.2 places even more emphasis on the efficient use of spectrum as the essential requirement for future regulatory testing. This means that – for the first time – RED introduces regulatory performance requirements for both radio transmitters and radio receivers.

In effect since June 13, 2017, RED raises the requirements on radio equipment such as

- Broadcast digital TV and radio receivers
- Mobile phones
- Satellite receivers (including GNSS)
- Any equipment that uses WLAN, Bluetooth® or ZigBee
- Radar equipment

As the market leader in EMC and regulatory testing, Rohde & Schwarz is your reliable partner for expertise and the widest range of test and measurement solutions in this field.

With more than 70 subsidiaries and local representations worldwide, Rohde & Schwarz offers local expertise, reliable services and on-site support – on a global scale.

Rohde & Schwarz is ready for RED. Are you?

www.rohde-schwarz.com/red

EN 300 328, EN 301 893 EN 301 908-13

Data transmission equipment operating in the 2.4 GHz and 5 GHz ISM bands

All wideband transmission systems in the 2.4 GHz and 5 GHz bands must be tested to verify compliance with ETSI EN 300 328 and ETSI EN 301 893 respectively. Measurements are performed using the R&S®EMC32 software platform, which is the standard solution in EMC test labs. The key components in the test system are the R&S®EMC32-K97x options and the R&S®TS8997-specific R&S®OSP module, which provides power measurement, filtering and path switching. A menu-driven navigation system guides users through the multistage measurements required for the technology used and the characteristics of the device under test (DUT). The test system supports all measurements required by the standards, even for complex DUTs such as those featuring MIMO or adaptive hopping.

The R&S®TS8997 measures technologies typically used in wideband wireless devices, i.e. devices with a radiocommunications interface, in the 2.4 GHz and 5 GHz bands:

- WLAN 802.11a/b/g/n/ac
- Bluetooth®
- Wireless video transmission
- Radio remote control

Key facts

- Fast wideband power measurement that exceeds ETSI requirements
- Support for MIMO DUTs with up to four antenna ports
- Menu-driven, automatic measurements based on radio technology selected by the user
- Measurements via RF connection or antenna coupler
- Tried and tested R&S®EMC32 GUI and software structure
- Automatic switching of test paths up to 18 GHz



R&S®TS8997 regulatory test system for wireless devices.

IMT cellular networks e.g. LTE UE E-UTRA

EN 301 511

Global system for mobile communications (GSM)

The ETSI EN 301 908-13 testing requirement applies to IMT cellular networks using LTE UE for Evolved Universal Terrestrial Radio Access (E-UTRA) in frequency bands 1,3,7,8 and so on as specified in Article 3.2 of Directive 2014/53/EU. The ETSI EN 301 511 testing requirement applies to GSM and mobile station (MS) equipment in the GSM 900 and/or GSM 1800 frequency bands with a channel separation of 200 kHz as specified in Article 3.2 of Directive 2014/53/EU.

Key facts

- Full coverage for RF conformance test cases
- Test system automation for high efficiency
- Precise and reproducible measurement
- LTE and LTE-Advanced
- WCDMA (Rel. 99 to Rel. 9 incl. HSPA, R7 MIMO, (DB-) DC-HSDPA)
- GSM (Rel. 99 to Rel. 9 incl. GPRS, EDGE, VAMOS, TIGHTER)
- Data throughput and protocol testing capability

For more information, visit our website

www.rohde-schwarz.com/red



R&S®TS8980 RF Conformance test system.

EN 303 345

Broadcast sound receivers for AM, FM, DAB and DRM

The EN 303 345 testing requirement applies to radio broadcast receivers that support analog AM/FM or DAB/DRM digital modulation. Such receivers can either be equipped with an integral antenna or fitted with an external antenna input. The R&S®BTC is a single-box solution that fully covers the EN 303 345 testing requirements in Article 3.2 of Directive 2014/53/EU.

The following broadcast radio modulation methods are considered in Europe:

- Amplitude modulation (AM) with and without amplitude modulation signal system (AMSS)
- Frequency modulation (FM) with and without radio data system (RDS)
- Digital audio broadcasting (DAB)
- Digital radio mondiale (DRM)

Key facts

- Realtime coder for AM, FM, DAB and DRM
- 2 RF output signal generators
- Integrated audio player and multimedia generator
- High spectral signal quality
- Arbitrary waveform generator
- Integrated power sensor
- Integrated module for audio analysis
- Integrated quasi-peak detector
- All-in-one-box solution

R&S®BTC – a single-box solution that fully covers the EN 303 345 testing requirements.



EN 303 413

Satellite earth stations and systems (SES) Global navigation satellite system (GNSS) receivers

Radio equipment operating in the 1164 MHz to 1300 MHz and 1559 MHz to 1610 MHz frequency bands

To achieve the goal of increased spectral efficiency, the European Commission agreed on a directive (RED 2014/53/EU Article 3.2.) that requires all GNSS receivers to ensure a certain resilience against (legal) interference from neighboring bands. This directive requires all classes of GNSS receivers (navigation devices, mobile devices, GPS-based watches, high-end measurement instruments, other devices that use GNSS, etc.) to be certified and fulfill this requirement in line with ETSI EN 303413. This is mandatory for any radio equipment operating in the 1164 MHz to 1300 MHz and the 1559 MHz to 1610 MHz frequency bands.

Key facts

- Full coverage of EN 303413 (adjacent frequency selectivity and spurious emission)
- Automation of NMEA capable devices
- Automation of Android devices
- Scalable size and portable design
- Easy-to-use GUI
- Automated calibration routine
- Re-usable for other RED tests such as EN 300328/EN 301893
- Extendable to radiated testing
- Generation of automated test reports

R&S®SMW dual-channel vector signal generator and R&S®FSV spectrum analyzer offer full compliance for GNSS testing.



EN 300 220

Coming soon remote keyless entry (RKE)

Short Range Devices (SRD) operating in the frequency ranges from 863 MHz to 876 MHz and 915 MHz to 921 MHz commonly used as transceivers for immobilizer functionality - Remote Key-less Entry (RKE)

EN 303 396, EN 302 264

EN 301 091, EN 302 858

Coming soon – automotive radar testing

To ensure the coexistence of the growing number of automotive radar sensors, updated European standards are, one by one, replacing and extending the existing regulations for automotive radar transceivers.

The four applicable ETSI standards are divided according to the radar's transmit frequencies: ETSI EN 303 396 describes the principle measurement procedures; ETSI EN 302 858 deals with radars in the 24 GHz band; ETSI EN 301 091 and ETSI EN 302 264 deal with radars operating in the 76 GHz to 77 GHz band and the 77 GHz to 81 GHz band, respectively.

Key facts

- Ready for ETSI EN 303 396, EN 302 264, EN 301 091, EN302 858
- Spurious emission measurements up to 110 GHz
- Conveniently sized chamber (1.2 m x 1.2 m x 2 m)
- Test automation for high efficiency
- Easy-to-use GUI
- Interference signal and target generation within the beam main lobe
- Optional signal analysis with up to 5 GHz bandwidth

Signal generator and analyzer up to 81 GHz covering the latest radar technologies.



Rohde & Schwarz is ready for RED. Are you?

Summary of relevant material

Check out our "ready for red" webinar series in our Automotive webinar center



www.rohde-schwarz.com/automotive-mediacenter

Interested in Radio equipment directive for sound and TV broadcast receivers?
Download our overview flyer:



www.rohde-schwarz.com/red-broadcast-receivers

Interested in Radio equipment directive in general?
Read more:



www.rohde-schwarz.com/red

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- ▮ Local und personalized
- ▮ Customized and flexibel
- ▮ Uncompromising quality
- ▮ Long-term dependability

About Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, radiomonitoring and radiolocation. Founded more than 80 years ago, this independent company has an extensive sales and service network and is present in more than 70 countries. The electronics group is among the world market leaders in its established business fields. The company is headquartered in Munich, Germany. It also has regional headquarters in Singapore and Columbia, Maryland, USA, to manage its operations in these regions.

Sustainable product design

- ▮ Environmental compatibility and eco-footprint
- ▮ Energy efficiency and low emissions
- ▮ Longevity and optimized total cost of ownership

Certified Quality Management
ISO 9001

Certified Environmental Management
ISO 14001

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