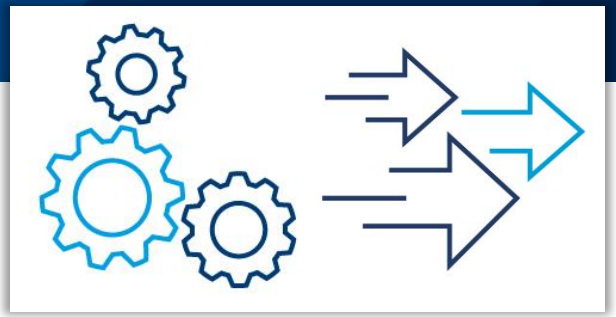
ROHDE&SCHWARZ
Make ideas real

R&S®QAR50 QUALITY AUTOMOTIVE RADOME TESTER

Best practices for normalization, verification and calibration

- The overall goal is a certain level of R&S®QAR50 performance even with various inherent uncertainties
- This is possible with normalization, verification and calibration



Normalization

Description

- Normalization ensures that environmental factors such as temperature or humidity are negated before measurements are made with the device under test (DUT).
- Normalization provides a baseline for other measurements.

Recommended interval

- Normalization ensures greater accuracy in measurements – recommended 2 h.
- Normalization should be run after any changes in environmental conditions such as rising or falling temperatures´/humidity levels for robust and reliable results.

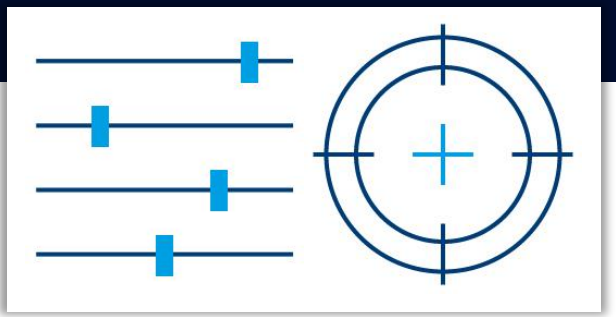
Verification

Description

- Verification ensures that the R&S®QAR50 complies with the general requirements for maximum permissible error and measuring tolerances.
- Process ensures that initial verification is performed before a measuring instrument is used and that re-verification is performed later

Recommended interval

- Verification is required when there are any doubts about the measurement results and every 6 months at least.



Calibration

Description

- Calibration is vital to any test equipment for adequate performance within set limits.
- R&S®QAR50 calibration is actually “system error calibration” comparable to calibration of a vector network analyzer.

Recommended interval

- Necessary after module replacement or if verification generates poor image quality.
- Optimally, the product must only be calibrated before leaving the factory.

For more information, visit
www.rohde-schwarz.com/product/QAR50

How to normalize the R&S®QAR50

Normalization procedure

- Reflection and transmission must be normalized separately with two separate measurements.
- Perform a through measurement to normalize transmission. Make sure the area between the clusters is free of obstacles and click normalize transmission.
- Normalizing reflection measurements requires a smooth and flat metallic plate with high reflection values (e.g. aluminum) – ideally the plate "E" from the verification kit – guide the plate between rails and press "Normalize reflection".
- The R&S®QAR50 corrects all subsequent measurements

Normalization time

~ 8 seconds for each measurement

How to verify the R&S®QAR50

Verification procedure

- Consists of consecutive measurements with A to E verification plates. The plates are made from different materials and have different the surface treatments and may have embossed patterns.
- Normalize transmission and reflection measurements as described on the left – for reflection measurements use plate E.

Verification of transmission and reflection measurements

- To verify a reflection and transmission measurement, place the glass-ceramic plate labeled "A" into the frame, initiate a measurement and remove plate from the frame.
- After each measurement, check the mean transmission loss/reflection specified by the stickers on the verification plates. The stickers show the attenuation/reflection characteristics of the plate and the maximum acceptable deviation.
- Do the same for the other two plastic plates labeled "B" (plastic) and "C" (glass-ceramic).

Verification of phase measurements

- To verify phase measurements, place the transparent plastic plate labeled "D" into the frame and initiate the measurement.
- After the measurement, check the phase results in the millimeter wave image. Phase steps should be clearly visible in the image

Handling the verification plates:
Store the verification plates in the bag they were delivered in.
Keep the verification plates clean and free of fingerprints.
Do not scratch the verification plates. Clean the plates with a lint-free duster or a damp rag.
Do not use chemicals.

How to calibrate the R&S®QAR50

Calibration procedure

- When calibrating, remove everything from the area of influence. This includes the verification kit. The R&S®QAR50 is designed to perform the calibration while remaining integrated in the production line.
- The calibration is performed with the calibration spheres on the side of the R&S®QAR50, thanks to their known properties (RCS)

Calibration time

~ 30 seconds

Market leading precision: Accredited verification set

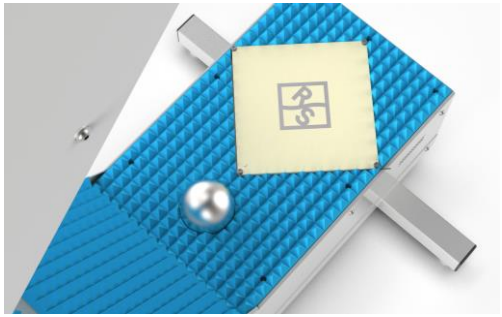
Rohde & Schwarz is the only vendor providing accredited open space measurements/characterizations

- Compliant verification set with plates for transmission loss and reflection verification.
- The R&S®QAR50-Z44 can verify the R&S®QAR50 for national and international standards.
- Ensures highest accuracy and repeatability for your measurement results.

Accessories		
Verification set	R&S®QAR50-Z44	1343.0082.02

R&S®QAR50 built-in spherical reflectors

The built-in reflector spheres enable the R&S®QAR50 to calibrate itself instantly while remaining in place, making calibration fast with no special RF or µW expertise needed.



Rohde & Schwarz GmbH & Co. KG (www.rohde-schwarz.com)
Rohde & Schwarz customer support (www.rohde-schwarz.com/support) **Rohde & Schwarz training** (www.training.rohde-schwarz.com)
R&S® is a registered trademark of Rohde & Schwarz GmbH & Co. KG | PD 5216.3350.32 | Version 01.00 | May 2022 (ai)
Trade names are trademarks of the owners | R&S®QAR50: Best practices for normalization, verification and calibration | Data without tolerance limits is not binding
Subject to change |