

S-PARAMETER MEASUREMENT UNCERTAINTY ON THE R&S®ZNA

Vector network analyzers are the most accurate instruments in the microwave engineer's lab. The R&S®ZNA takes accuracy to a new level. Not only is the instrument extremely precise, but now it also calculates and displays the measurement uncertainty right on the screen as the device under test is being measured.



R&S®ZNA vector network analyzer, 4-port model.

Your task

Make an accurate S-parameter measurement of your device under test. Easily done with a vector network analyzer. But in addition to the S-parameter results, you need to provide the measurement uncertainty for the return loss and insertion loss results.

Rohde & Schwarz solution

Prior to now, calculating measurement uncertainty for your DUT's S-parameter results was something that was only possible in a metrology lab. But now, thanks to the new R&S®ZNA-K50 measurement uncertainty option, this calculation is done automatically, and the uncertainty bands are provided directly on the screen along with the measured S-parameters.

The power of the METAS VNA Tools calculation engine

METAS is the Swiss Federal Institute of Metrology located in Bern, Switzerland. For the past decade they have been providing VNA Tools (a powerful metrology grade software program developed by Michael Wollensack) to other national metrology institutes (NMI) and metrology labs around the world. Their research on S-parameter traceability has put them at the forefront of VNA measurement uncertainty science, and the worldwide adoption of VNA Tools is the direct result of this effort. With the introduction of the R&S®ZNA-K50 measurement uncertainty option, Rohde & Schwarz has partnered with METAS to bring the power of VNA Tools to the R&S®ZNA.

With the simplicity of the R&S®ZNA user interface

Rohde & Schwarz did this with a focus on making it easy to use. Simply calibrate the R&S®ZNA, using the same process that has been used for the past few decades. No extra steps are required. Then connect your DUT, and you see the measured S-parameters with an overlay of the measurement uncertainty. No extra effort is required.

Plus verification testing

Verification testing is another task that historically has only been done in a metrology lab. But now, using the powerful METAS VNA Tools calculation engine, the R&S®ZNA offers built-in verification testing that is as easy to perform as a calibration. Select the verification kit, and the R&S®ZNA will guide you through a verification test, including the creation of a test archive that contains a VNA Tools measurement journal, an uncertainty database for the measurement setup, raw measurement results, calibrated measurement results, and pass/fail indications.



Plus unlimited access to VNA Tools

Not only does the R&S®ZNA utilize the calculation engine of METAS VNA Tools, making uncertainty calculations and verification testing straightforward and easy, but the R&S®ZNA-K50 option also includes a complete installation of the METAS VNA Tools software. This means that all the capabilities offered by METAS VNA Tools are available directly on the R&S®ZNA. Your calibration and verification sweeps, along with the measurements of the DUT, are all exposed to METAS VNA Tools software via the VNA Tools project directory. Everything can be inspected, reports can be generated, results can be scrutinized. And for advanced users, you can apply your own vector correction algorithms to the raw data, and compare your results to the METAS results. There are no limitations.

Conclusion

Metrology grade uncertainty calculations, verification tests and measurement archives are now available with the R&S®ZNA-K50 option, utilizing the power of METAS VNA Tools.

The perfect complement to the exceptionally accurate R&S®ZNA is the ability to document that accuracy. And for that Rohde & Schwarz uses the leading measurement uncertainty software from the Swiss Federal Institute of Metrology: METAS VNA Tools.



Verification test built into the R&S®ZNA.



S-parameters for a 40 dB attenuator
with measurement uncertainty bands.

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 3609.8896.92 | Version 01.00 | July 2021 (ch)

S-parameter measurement uncertainty on the R&S®ZNA

Data without tolerance limits is not binding | Subject to change

© 2021 Rohde & Schwarz GmbH & Co. KG | 81671 Munich, Germany