

Simplifying receiver testing

The advanced generation capabilities of the R&S®SMW200A vector signal generator simplify receiver testing up to 20 GHz by removing the need for multiple signal generators. This single-box solution brings the real world into your lab.



Your task

Validating the performance of an RF or microwave receiver can be broken down into two tasks. First, verifying the performance with known “good” signals to determine the quality of the receiver under ideal conditions. Then, once the receiver is working in this clean environment, the signal environment can be degraded to determine how the receiver operates in a challenging, real-world environment.

To successfully determine the performance of the receiver under ideal conditions, it is important to be able to test how the receiver handles signals that are at the extremes of its operating ranges. This means testing at the highest and lowest power levels, at both ends of the operating frequency band, with the widest, fastest signals. To meet these requirements, the signal generator must have the flexibility to provide these signals, but more importantly, it must be able to provide these signals very cleanly.

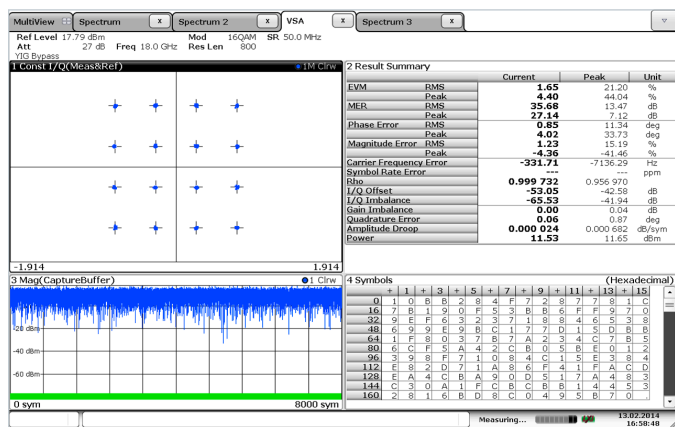
The goal is to measure and determine the performance of the receiver, not the signal generator, so the signal purity specifications of the signal generator are critical.

Testing under nonideal conditions or with more real-world signals is an obvious way to quantify how the receiver will perform when it is operational; however, it places much greater demands on the signal generator and the overall test setup. Common tests involve determining the receiver sensitivity and its ability to demodulate a low-power “wanted” signal in the presence of a high-power unwanted or interfering signal. Basically this is a check to determine if the receiver can ignore these unwanted signals and still operate correctly. Another test is to determine if the receiver can select and demodulate the required signal from a crowded spectrum. Both of these tests typically require at least two signal generators, one to produce the signal to be demodulated by the receiver and a second generator to produce the interfering signal. The use of this second generator adds complexity to the task. Not only does it require external cabling and combiners to add the signals together, but when the application calls for pulsed, time varying or hopped signals, these two signal sources need to be precisely time aligned.

T & M solution

Rohde & Schwarz offers a unique solution for receiver testing. The R&S®SMW200A vector signal generator simplifies receiver testing by offering outstanding signal purity, an integrated second RF channel and the most powerful and flexible baseband available. When combined, these features remove the need for a second external generator, which greatly reduces the complexity of the test setup, saving time and reducing measurement uncertainty.

When testing under ideal conditions, the signal purity of the signal generator is a critical factor. The cleaner the signals from the generator, the more accurate the measurements on the receiver. More accurate measurements lead to improved test margins on the device under test and ultimately a better specified final product. The R&S®SMW200A is unmatched when it comes to creating clean signals at microwave frequencies.

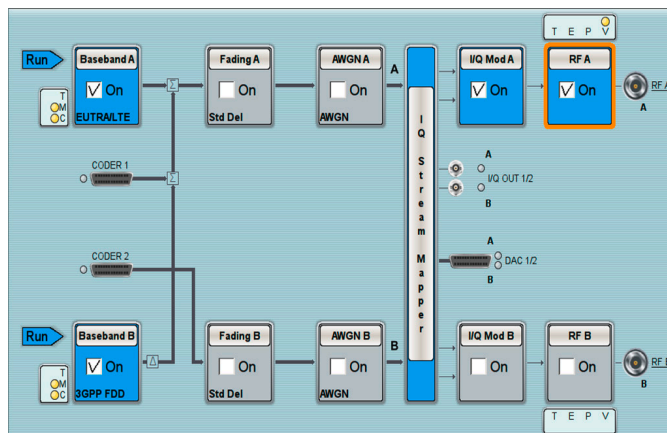


The R&S®SMW200A offers outstanding EVM performance up to 20 GHz.

With its internal modulation bandwidth of 160 MHz, the R&S®SMW200A can internally generate wideband signals at carrier frequencies up to 20 GHz that are exceptionally clean.

This high-quality signal generation performance ensures that the signal generator does not impact test results since the generated signals do not limit receiver performance. The R&S®SMW200A ensures that you are measuring the receiver's performance and not the performance of the generator.

With its flexible baseband, integrated fading hardware and second RF channel, the R&S®SMW200A brings the real world to the lab. Having a single instrument with all these capabilities inside enables you to create even the most challenging of signal environments without the need for a complex test setup with multiple signal generators. From simulating Doppler effects to generating multiple phase-coherent signals to playing back captured or custom waveforms, the R&S®SMW200A creates all these types of scenarios while reducing measurement uncertainty and improving repeatability. Setup time is reduced by doing all this from inside a single calibrated generator, with a single user interface.



The straightforward R&S®SMW200A touchscreen user interface simplifies the setup of complex signals.

Key features

- Outstanding RF and microwave performance delivers more accurate signals
- Multiple basebands simplify creation of complex signal environments
- Second output channel enables multiband and phase-coherent testing
- Internal fading allows a single signal generator to simulate fading and Doppler effects
- Multiple independent noise sources make it possible to add additive white Gaussian noise (AWGN) to wanted signals

See also

www.rohde-schwarz.com/product/SMW200A

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R&S®SMW200A Simplifying receiver testing

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