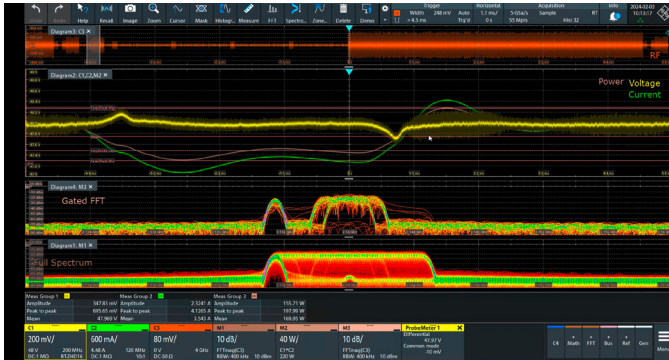


VERIFY THE ENERGY EFFICIENCY OF YOUR O-RAN RADIO UNITS

O-RAN radio units (O-RU) contribute significantly to the high power consumption of 5G networks. Making O-RUs energy efficient without sacrificing O-RAN innovations is a top priority.



Tracking fast O-RU load changes with the R&S®RTO6 oscilloscope: power ramps up (green curve) when 5G NR signal switches from SSB (low traffic load) to full allocation and TX simulating high traffic load (top graph).

Your task

5G data transmission is considered far more efficient than that of 4G. But energy consumption is expected to rise dramatically because cellular networks will have to support higher data rates.

O-RUs are the most significant factor in the total power consumption (at around 60% to 80%) of radio access networks (RAN). The overall objective is to optimize the energy efficiency of O-RAN networks without sacrificing O-RAN innovations such as cloudification and disaggregation. At the same time, energy-efficient O-RAN still has to offer a high quality of service (QoS) to network users.

Rohde & Schwarz solution

Rohde & Schwarz has partnered with VIAVI Solutions to develop a fully automated test solution to verify your O-RU energy efficiency. This solution is based on the R&S®RTO6 oscilloscope as well as VIAVI's TM500 O-RU Tester and can be supplemented by other Rohde & Schwarz products.

In the test setup, VIAVI's TM500 O-RU Tester emulates the DU, synchronizes and configures the O-RU and offers several test scripts to verify the O-RU energy efficiency under different load conditions. Rohde & Schwarz equipment can then monitor dynamic device activities versus power consumption. The R&S®RTO6 oscilloscope is the perfect tool for tracking fast load changes. It pairs seamlessly with the R&S®RT-ZC31 current probe and R&S®RT-ZHD07 high voltage differential probe. Depending on your application, you may also want to consider the R&S®RT-ZVC high dynamic power probe: it has up to eight voltage and eight current channels, which makes it ideal for debugging the power consumption of individual O-RU components. For time correlated power measurements in combination with RF signal quality analysis, try the R&S®RTO6 with the R&S®VSE software and see how well your O-RU performs in different scenarios.

The R&S®NGP power supply units are an excellent choice for powering an O-RU. They supply a stable output to the DUT and accurately measure the overall power consumption with an 8 ms time resolution. This greatly reduces setup complexity and saves space on the rack or bench. The measured data can also be logged for in-depth analysis and documentation.

Optionally, the R&S®FSVA spectrum analyzer can be added to check O-RU transmitter characteristics like error vector magnitude (EVM).

The full test setup is controlled and turnkey automated by the VIAVI O-RU Test Manager Application that executes ETSI ES 202 706-1 V1.6.1 (2021-01) cases or user-specific test scripts at the click of a button.

Application Card | Version 01.00

ROHDE & SCHWARZ
Make ideas real



O-RU test setup for energy efficiency testing

- ▶ R&S®RTO6 oscilloscope with R&S®RT-ZC31 current probe and R&S®RT-ZHD07 high voltage differential probe, optionally with R&S®RT-ZVC multichannel power probe
- ▶ R&S®NGP power supply series
- ▶ R&S®FSVA spectrum analyzer (optional)
- ▶ VIAVI TM500 O-RU Tester
- ▶ VIAVI O-RU Test Manager Application

Summary

The most economical solution for measuring O-RU power consumption is a power supply. It also provides high measurement resolution and accuracy. Another option is to use an oscilloscope with current and voltage probes, a setup that can also capture very short pulses and spikes in addition to monitoring energy dynamics under various traffic conditions. All tests can be fully automated with the VIAVI O-RU Test Manager Application. The solution supports the predefined ETSI ES 202 706-1 V1.6.1 (2021-01) cases and generates user-specific test scripts.

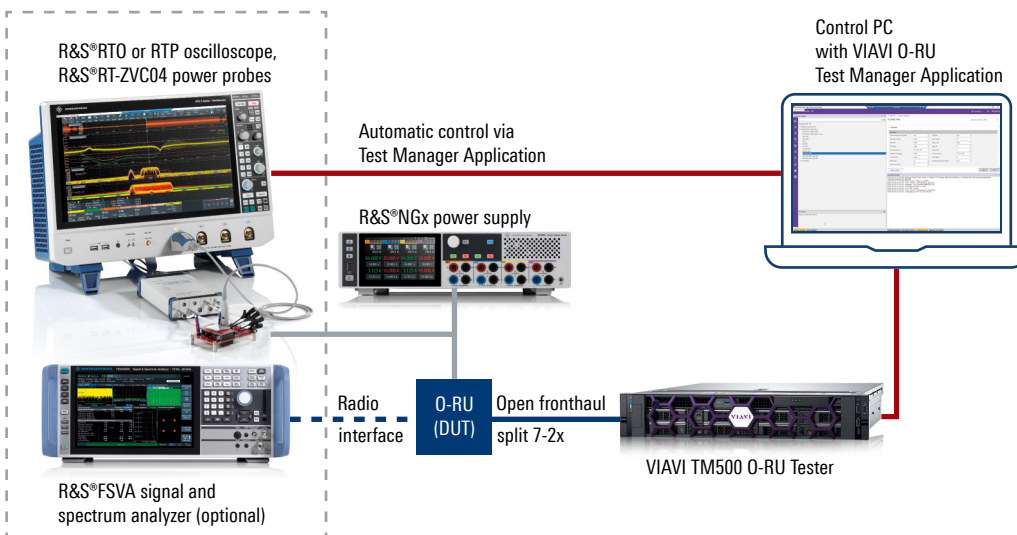
See also

www.rohde-schwarz.com/wireless/o-ran



Time correlated power measurements and RF signal quality analysis with the R&S®FSVA signal and spectrum analyzer

Test setup for fully automated O-RU power consumption measurement



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PD 3685.0634.92 | Version 01.00 | March 2024 (ja)
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