



“Emerging Communication Technologies Enabling the Internet of Things- IoT System Design Challenges and Testing Solutions”

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Presentation summary:

1. The challenge of radio frequency (RF) accuracy/ parametric
2. The challenge of electromagnetic interference (EMI)

1. The challenge of radio frequency (RF) accuracy/ parametric

In the world of communication technologies, RF accuracy/ parametric is one of the essential challenges in wireless system design. Specific considerations include power consumption, error vector magnitude (EVM), spectral emission mask (SEM), frequency error, constellation diagram, etc.

1.1 Solution: CMW500 wideband radio communication tester

CMW500, a test solution platform is hence established by Rohde & Schwarz (R&S) for cellular Machine Type of Communication (MTC) and LAN/PAN connectivity.

1.1.1 Features

Basically speaking, it provides an end-to-end IoT application testing from physical layer to application layer. The all-in-one platform supports all major cellular and non-cellular wireless technologies for non-signaling, signaling and protocol testing. Its operates RF transmitter and receiver validation test in real-time base station emulation mode including channel impairments. It also provides protocol tests and location based services. Its data application unit, advanced IP analysis, and impairment features also allow comprehensive e2e testing.

1.1.2 How it works

The CMW500 test solution platform identifies IoT and mobile communications devices' IP connection vulnerabilities in the early stage of development, thus closes potential security gaps in a controlled wireless environment.

Another IP connection security analysis test solution option CMW-KM052 captures, analyses, and visualises data streams as well as relevant IP connection security parameters, including certificate-based authentication details. No extra software installation is required; the solution operates with a stand-alone equipment and system, which also provides users with full channels for current and power analysis that enables analysing and optimising power consumption in an e2e environment.

2. The challenge of electromagnetic interference (EMI)

When sorting EMI problems, manufacturers often face the challenge of identifying the sources of unwanted emissions. While electromagnetic compatibility (EMC) test laboratory only provides a spectrum curve indicating the frequencies where emissions are critical or violating the limits, repetitive testing at the EMC compliance laboratory can be costly and extend production lead-time.

2.1 Solution: Radio transmitter operator (RTO) oscilloscope

The RTO oscilloscope is an EMI analysing tool with high input sensitivity, high dynamic range and a powerful fast fourier transform (FFT) implementation that can capture and analyse unwanted emissions.

In combination with HZ-15 near-field probe set, it allows developers to quickly locate and analyse even weak emissions and other EMI problems. The source of emission can be easily detected with its multiple FFT traces which provide a fast update rate and allow insights into the structure of unwanted emissions. It also favours easy configuration of masks for EMC limit testing.

The end

To learn more, please watch the presentation video at [here](#).