

Concerned About Poor Sensitivity of WLAN Products?

–Resolving Noise Problems Even After Clearing EMC Regulations–

Wireless Connectivity Test Set MT8862A

Until quite recently, built-in WLAN was limited to just personal computers and mobile phones. However, many other products, including digital cameras, robotic vacuum cleaners, and household white goods, now have WLAN functions, and the growth of IoT seems likely to increase the future WLAN product range. After you've added WLAN to your products, are you concerned about customer complaints concerning poor WLAN connectivity?

Perhaps this is caused by the “Self Interference” effect.



Properly Clearing EMC Regulations ...

Every designer knows about taking care to clear EMC regulations at the product-design stage. These EMC regulations require:

- Preventing product EMI interfering with other products, and
- Preventing EMI from other products causing faulty operation of nearby products

However, as mentioned above, electrical products with built-in WLAN can also have **internal noise sources that interfere with the built-in WLAN functions**, causing the “poor connectivity” effect. This generated noise is below EMC-regulated levels.

The three main causes of disrupted WLAN communications are:



- ① **Defective Parts** — Poorly performing WLAN module, antenna, antenna coaxial cables, and connectors
- ② **External Interference** — EMI emitted from other equipment, such as microwave ovens
- ③ **Internal Electrical Noise** — Interference from product's own circuits, inverters, CPU board, LCD, etc.

From these causes, item ① should be inspected in-house first. Like-for-like tests of WLAN communications between same-company products provides an approximate evaluation. Next, item ② requires testing to discover hidden issues in customers' usage environments.

If clearing items ① and ② still does not resolve the issue, the possible cause may be item ③ **Internal Electrical Noise (Self Interference)**.

As modern products have got increasingly smaller, the physical distance between RF (wireless) boards and other circuits has become smaller, making it difficult to implement conventional countermeasures, such as shielding. Conversely, CPUs have become faster while noise from DC-DC converters and inverters has become higher frequency and more noise sources causing degraded WLAN communications increase the probable occurrence of **Self Interference**.

Necessity for WLAN Function Tests Under Customer Usage Conditions

Usually, WLAN module performance is measured with a tester after switching the module to a special test mode.

In most test cases, very little noise is generated because the current consumption is small without any processing load on the internal CPU so the power circuits are not under load, and peripheral circuits for the display, etc., are not in the normal operation state.

Since this is a completely different condition (very little internal noise) to customers' normal usage, it is difficult to either quantify or reproduce customers' claims about poor connectivity.

Anritsu's Wireless Connectivity Test Set MT8862A meets this need to inspect products under customers' actual usage conditions.



Wireless Connectivity Test Set
MT8862A

MT8862A Features

1. Easy Setup

Evaluation tests of WLAN products are easy using the MT8862A. First, connect the MT8862A and PC controller using a LAN cable. Next, connect the MT8862A and WLAN product. That's it—there is no third setup step.

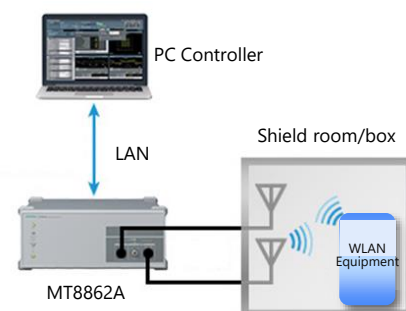
2. Evaluate Finished Product

Since the **MT8862A measures while communicating with the WLAN product**, there's **no need for evaluation firmware or connection for chip control** and even finished products can be evaluated.

In addition, both **Station and Access Point (AP)** WLAN products can be measured because **WPA/WPA2/WPA3, etc., security functions are also supported**.

3. Reproducible Measurement

With specified frequency and level accuracy, the MT8862A has **excellent measurement reproducibility** for consistent measurement results each time.



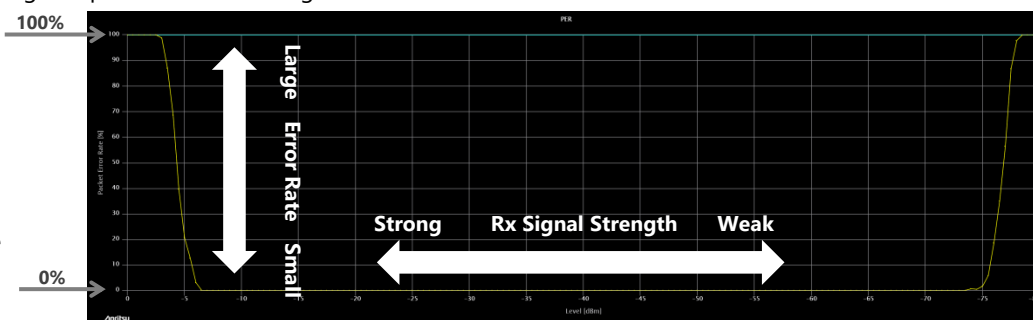
WLAN Product Wireless Performance
Evaluation Setup

What Can MT8862A Do?

The MT8862A measures all key wireless TRx performance items, including WLAN product **output Tx power, modulation frequency, Rx sensitivity**, and more. Reading changes in the Packet Error Rate (PER) from the Rx sensitivity **Bathtub curve (below)** indicates whether the design Rx performance is being achieved.

If the Bathtub curve PER does not fall smoothly to 0%, it may indicate the occurrence of self interference.

In this case, comparison with the Bathtub curve when the WLAN module is operating in stand-alone configuration can help evaluate whether the cause is self interference or another factor.



Normal Rx Sensitivity Bathtub Curve