



Identify Noise Sources in Pre-Test to Cut EMI Compliance Risk

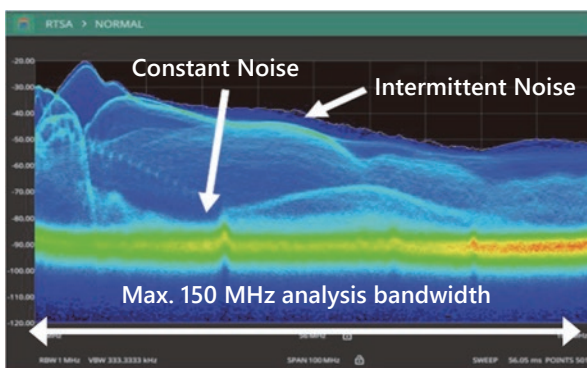
Automotive EMI Test Challenges

Pre-testing to identify noise sources and analyze their root causes is important for 5 GHz-band receivers, such as wireless LAN and V2X systems in connected cars, to accurately assess the effects of external noise and inter-device interference. Since CISPR 25 Ed. 5.0 extends the evaluation range to about 5.9 GHz, there is a growing need to establish a pre-test environment for correctly identifying noise sources in the 5 GHz band.

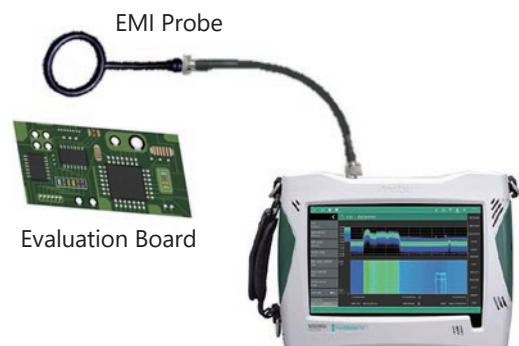
Issue: Enhancing the EMI pre-testing environment to identify 5 GHz band noise sources

Solution

Minimizing EMI compliance test risk by identifying potential noise sources



Example of noise measurement by RTSA



Real-Time Spectrum Analyzer
Field Master™ MS2080A (9 kHz to 6 GHz)
Field Master Pro™ MS2090A (9 kHz to 54 GHz)

- Simultaneous time- and frequency-axis analysis that visualizes intermittent noise events
- Handheld real-time spectrum analyzer (RTSA) combined with EMI probe (6 GHz) delivers powerful identification of local noise sources, even in confined vehicle spaces.
- RTSA for detecting weak signals (−162 dBm average noise level @ 6 GHz*)

*: With MS2090A

Streamlining In-vehicle EMI Pre-testing with a Handheld RTSA

Customer: In-vehicle equipment manufacturer (Model: MS2080A + EMI probe)

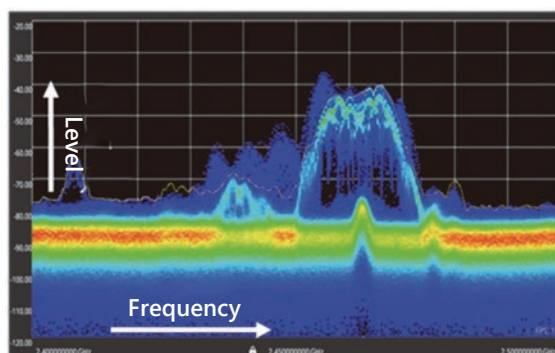
■ Challenges:

Although in-vehicle EMI was being evaluated using a benchtop RTSA, there were concerns about errors caused by the increased cable length to the antenna, as well as poor maneuverability due to the unit size. Improved operability in confined vehicle interiors was needed, along with the ability to capture broadband noise up to 6 GHz and extract latent noise with time-varying characteristics, requiring a solution that could address all these challenges.

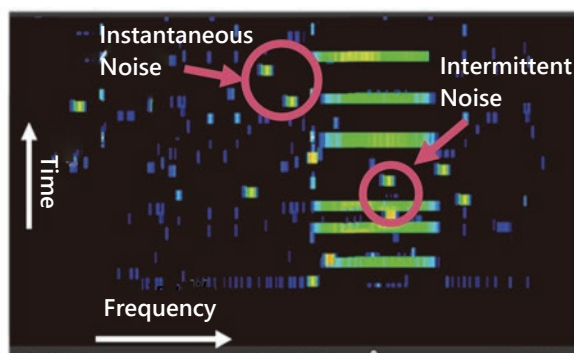
■ Solution:

Introducing the handheld RTSA MS2080A (with built-in battery) and a 6 GHz EMI probe made installation and movement in the vehicle easier. This results in improved work efficiency. Positioning the RTSA close to the antenna reduced cable-induced measurement error and improved repeatability of radiated noise measurements in confined vehicle interiors. Additionally, the spectrogram function visualizes previously overlooked time-varying noise, and the ability to capture instantaneous and intermittent noise delivers tangible improvements in both accuracy and efficiency for EMI pre-testing.

Concept images of capturing time-varying noise generated by in-vehicle EV inverters and ECUs



Measuring noise in the wireless LAN signal band using RTSA



Measuring time-variable noise using the Spectrogram function

The contents of this document may be subject to change without notice. In addition, the numerical results shown in each measurement screen example are not guaranteed values. Please refer to the catalog/data sheet for standard values.