

Achieve Accurate and Optimized EVM Measurements

Keysight WLAN EVM measurement solution

Introduction

Wireless local area network (WLAN) technology continues to evolve by integrating the latest technologies to meet the requirements of new applications and the need for higher data rates. The goal is clear: to continuously improve spectrum utilization, throughput, and user experience.

While in the early development stage, the next-generation 802.11 standard — 802.11be, or Extremely High Throughput, WLAN — holds great promise. The Institute of Electrical and Electronics Engineers (IEEE) is defining many new features that will significantly increase throughput and provide support for real-time applications. These features include 320 MHz transmission bandwidth, use of 4096-QAM modulation, and multiple-input / multiple-output enhancements with more spatial streams. Similar to 802.11ax, 802.11be will also operate in 2.4, 5, and 6 GHz frequency bands. New WLAN devices must be backward compatible and coexist with legacy IEEE 802.11 devices operating in the same band.

Use Case Summary

Error vector magnitude (EVM) measurements provide powerful insight into the performance of communication transmitters and receivers. EVM and related measurement displays are sensitive to flaws that affect a signal's magnitude and phase trajectory for any digital modulation format. EVM quantifies the performance of transmitters, receivers, and software-defined radios. It also indicates waveform distortion, representing a device's phase, amplitude, and noise characteristics. Moreover, the IEEE defines the maximum permitted transmitter constellation error as part of the standard. The maximum allowed depends on the data rate or constellation size because a higher-order constellation requires a tighter modulation accuracy. Engineers must rely on high-performance solutions to enable easier testing and evaluation and demonstrate that their wireless devices meet regulations.

Solution Overview

The Keysight EVM measurement solution ensures that your designs achieve advanced EVM measurements and meet the latest standards. It quickly performs pass / fail tests of your WLAN transmitter with the lowest EVM floor. The **Keysight N9042B UXA signal analyzer** delivers up to 11 GHz of analysis bandwidth with the industry's widest dynamic range and best residual EVM. Its ready-to-use **measurement applications** and **vector signal analysis software** will help you test the true performance of your WLAN device.

Learn more at: [EVM: The Heart of Everything Wireless](#)

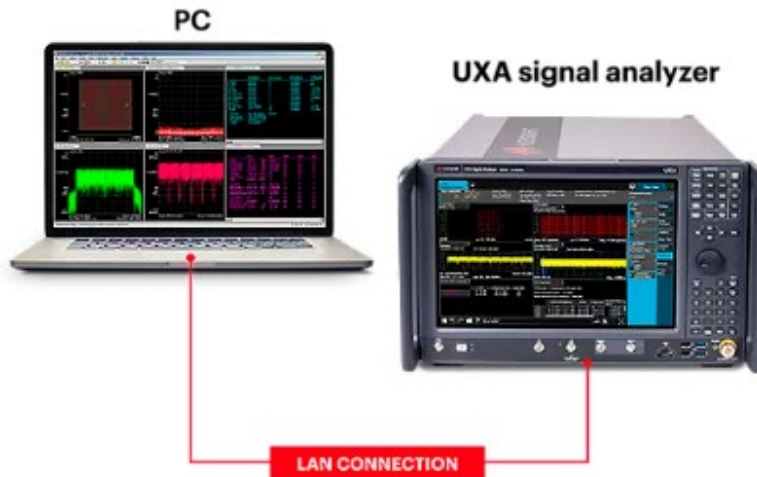


Figure 1. Keysight Wi-Fi7 EVM measurement solution

Summary

- EVM is the most widely used modulation quality metric in digital communications systems, quantifying the performance of a digital radio transmitter or receiver.
- The IEEE defines the maximum permitted transmitter constellation error as part of the standard.
- Engineers need high-performance solutions to enable easier testing and evaluation and demonstrate that their wireless devices meet regulations.

For more information: [WLAN 802.11x EVM Measurements](#)



Keysight WLAN EVM measurement solution

- N9042B UXA X-Series signal analyzer
- N9077EM2E WLAN 802.11be measurement application
- 89601BHXC PathWave VSA high-throughput WLAN modulation analysis

For more information on Keysight Technologies' products, applications, or services, please visit: www.keysight.com

This information is subject to change without notice. © Keysight Technologies, 2022, Published in USA, October 11, 2022, 7122-1108.EN