



# S8780A Wireless Device Solution

Verify Your Wi-Fi 6E and 802.11be Designs

## Look to the Future with a New Solution for IEEE 802.11 Testing

While fifth generation (5G) gets a lot of attention, the Institute of Electrical and Electronics Engineers (IEEE) 802.11 is not standing still. Higher data rates are available today with 802.11ax. Further improvements in speed with higher-order modulation and larger signal bandwidth are planned. The next wireless local area network (WLAN) standard, 802.11be, will support higher bandwidth and modulation than 5G does today.

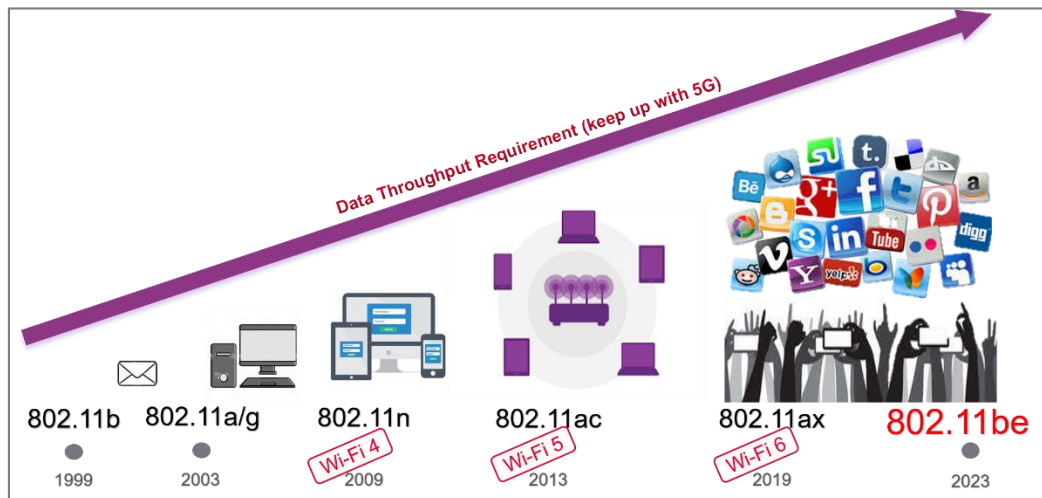


Figure 1. Evolution of WLAN technologies

Signal bandwidths up to 320 MHz – twice the bandwidth of 802.11ax signals today – and 4096 quadrature amplitude modulation (QAM) are two of the biggest changes introduced within the physical layer (PHY) of this new technology.

The S8780A is ready. Verifying Wi-Fi 6E and 802.11be devices is quick and easy with bandwidth to 800 MHz and frequency to 7.3 GHz. Generating and analyzing 1024QAM and 4096QAM signals uses application software based on Keysight's familiar PathWave Signal Generation and X-Series Applications.



The 3rd Generation Partnership Project (3GPP) is investigating the extension of Long-Term Evolution (LTE) and 5G into unlicensed spectrum above 6 GHz as part of Release 17, planned for December 2021. The S8780A is ready today with applications to test LTE and 5G.

## Maximize Throughput without Sacrificing Flexibility

More bands and more antennas would seem to add test time and reduce throughput. The 32 ports of the S8780A flexibly test multiple bands, multiple antennas, and multiple devices supporting many use cases.

## Simplify your test system

The S8780A solution makes it easy to test the three WLAN bands. Each of the 32 ports supports all three bands and is configurable as half duplex or full duplex. Disconnecting and reconnecting your device to test in a different band is unnecessary saving valuable test time.

Internal switching and splitting of signals eliminate the need for separate test system components reducing calibration time and test system maintenance. Configure each port to calibrate and verify every antenna, no matter the frequency or bandwidth. Testing multiple devices and/or multiple antennas is your choice.

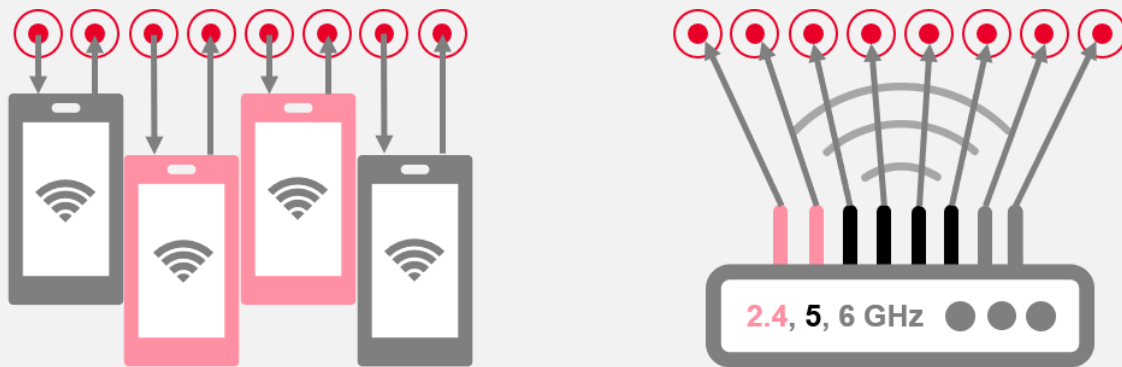


Figure 2. Test four mobile phones or one Access Point (AP) with eight antennas

Making startup quick and painless, a controller is embedded within the S8780A solution. Software licenses and applications are loaded before shipment - just plug it in, switch it on, and you are ready to test.

## Verify multiple wireless technologies

The evolution of 5G and WLAN creates a market for devices using both technologies. Consumer Premises Equipment (CPE) and mobile phones are two examples. Verifying 5G and WLAN in one test plan is easy using the S8780A.

Bluetooth® and IEEE 802.15.4, used for short-range communications, are commonly combined with WLAN in devices. Adding these technologies to a WLAN test plan is simple with the S8780A.

# A Full-Featured Solution for Design Verification Test (DVT)

Essential to every WLAN test solution are chipset control, automation, and test sequencing. In addition to these, the S8780A supports:

- IEEE 802.11a/b/g/j/p/n/ac/af/ah/ax
- Modulation up to 4096QAM
- Multi-User Multiple Input Multiple Output (MU-MIMO) and Orthogonal Frequency-Division Multiple Access (OFDMA) with statistics and RF performance for each user

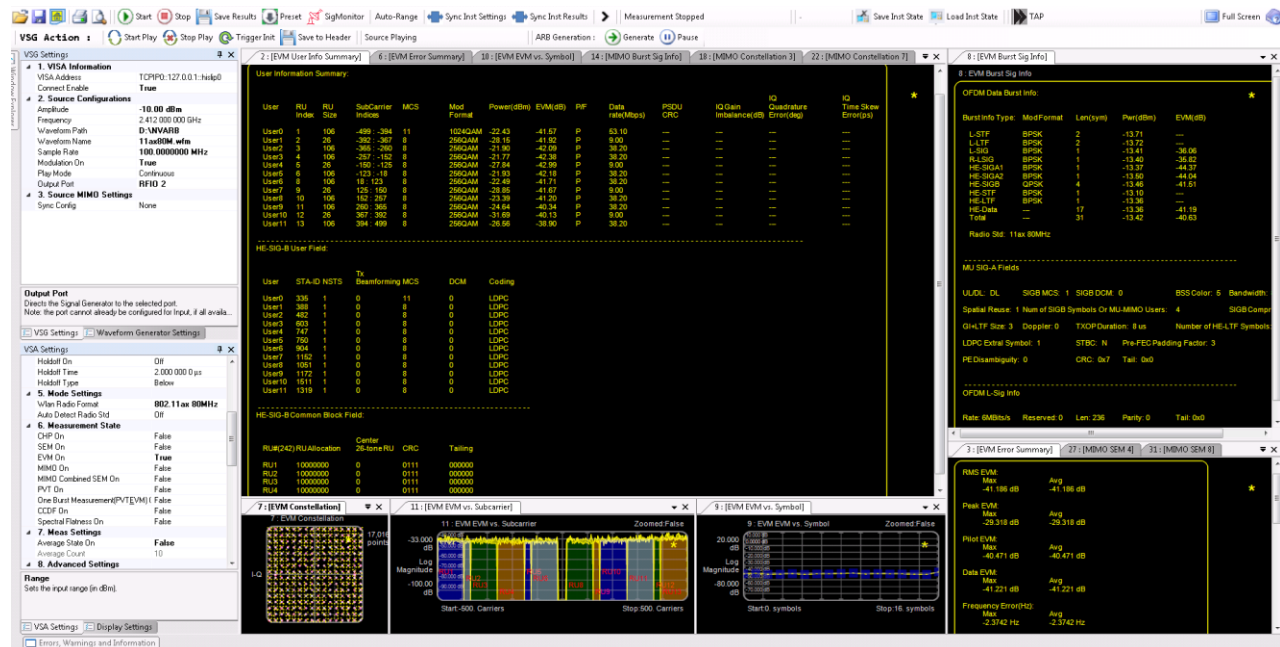


Figure 3. 802.11ax MU signal generation and analysis

- Arbitrary waveform generation for Single-User (SU) Physical Layer Convergence Protocol (PLCP) Protocol Data Units (PPDU) and MU PPDU with different Resource Unit (RU) sizes, power levels, etc.
- Up to 4x4 true MIMO and 4x4 switched MIMO
- Simultaneous testing of dual-band and triple-band devices
- Channel power, transmit spectral mask, spectral flatness, and Error Vector Magnitude (EVM) measurements

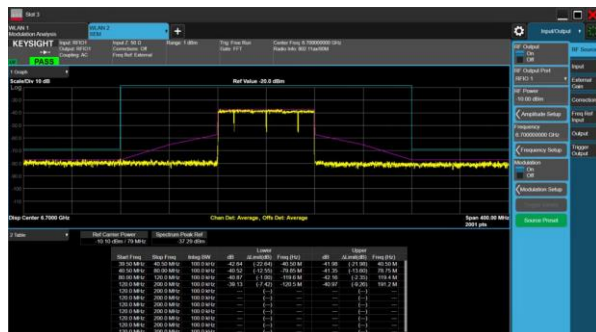


Figure 4. Transmit spectral mask results

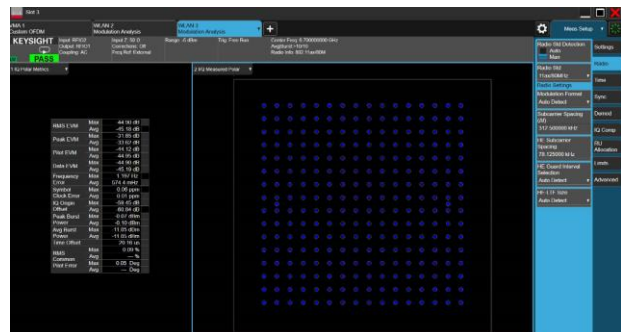


Figure 5. EVM results

## IEEE 802.11ax Measurement Summary

### Transmit specification

WLAN application software analyzes WLAN signals captured by the Vector Signal Analyzer (VSA).

IEEE 802.11ax (D6.1)	Description	WLAN application software
27.3.19.1	Transmit spectral mask	Spectrum emission mask
27.3.19.2	Spectral flatness	Spectral flatness
27.3.19.3	Transmit center frequency and symbol clock frequency tolerance	Frequency error and symbol (chip) clock error
27.3.19.4.2	Transmit center frequency leakage	IQ origin offset
27.3.19.4.3	Transmitter constellation error	RMS EVM
27.3.19.4.4	Transmitter modulation accuracy (EVM) test	Modulation analysis

### Receiver specification

WLAN application software generates baseband waveforms, downloads them into the Vector Signal Generator (VSG) memory, then modulates and transmits WLAN signals at Radio Frequencies (RF) with power levels as required for WLAN receiver testing.

IEEE 802.11ax (D6.1)	Description	WLAN application software
27.3.20.2	Receiver minimum input sensitivity	Waveforms for defined PPDU
27.3.20.3	Adjacent channel rejection	Waveforms for wanted and adjacent signals
27.3.20.4	Nonadjacent channel rejection	Waveforms for wanted and non-adjacent signals
27.3.20.5	Receiver maximum input level	Waveforms for defined PPDU

## The S8780A Is the Solution to Verify Your WLAN Designs

Speed your test development, design verification, and manufacturing test with just the right capability and flexibility.

- Be ready for the future with bandwidth to 800 MHz and frequency to 7.3 GHz.
- Get the flexibility you need to optimize your test cases with up to 32 ports.
- Simplify your test system configuration with internal switching between ports.
- Analyze performance using industry-proven application software.

## S8780A Wireless Device Solution: Easy to Use, Flexible, and Future-Proof

A solution for your lab, your bench, and your production line, the S8780A is ready to test your WLAN designs. Right out of the box, its familiar application software is licensed to your specifications. Software-only upgrades and three bandwidth options ensure you get just what you need today and tomorrow.

Visit [www.keysight.com/find/e6680a](http://www.keysight.com/find/e6680a), or contact your sales representative for details.

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