Agilent
89607A WLAN Test Suite Software

Technical Overview

- **IEEE 802.11a/b/g standards-based transmitter tests**
- **One-button pass/fail testing**
- **Automatic operation**
- **PC-based software works with a variety of Agilent analyzers**

Speed standards-based testing of your IEEE 802.11a/b/g WLAN transmitter with the 89607A WLAN test suite software. This standards-based test suite provides the convenience of automatic one-button test set-up and execution with the confidence of knowing your design is being tested based on the techniques, parameters and specifications set down in the IEEE 802.11 a/b/g standards.

The 89607A WLAN test suite software is ideal for characterizing the overall PHY layer performance of your WLAN transmitter. Evaluate your transmitter design against the IEEE standards. Take advantage of standardized tests to qualify parts or do acceptance testing. Use the software for manufacturing test; you can even modify the pass/fail limits to add some margin between what IEEE requires and what you test to. All this and more is available from this software.

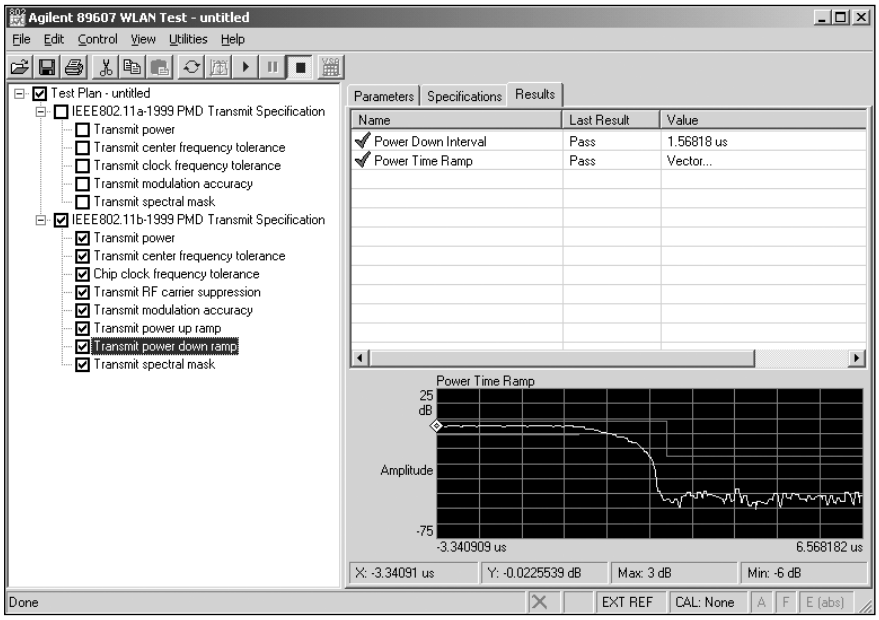

Figure 1. 89607A WLAN test suite

Agilent Technologies

Covers IEEE 802.11a/b/g WLAN Tests

The WLAN test suite software provides all of the IEEE 802.11 a/b/g WLAN transmitter tests. Test set-up is easy. Click on the WLAN standard you want, select the tests you want to use, then click "▶". The software does the rest. Whether you want to use all of the tests to assure complete assessment or use a few tests to reduce overall test time and speed device evaluation, the 89607A WLAN test suite makes the process of test selection easy.

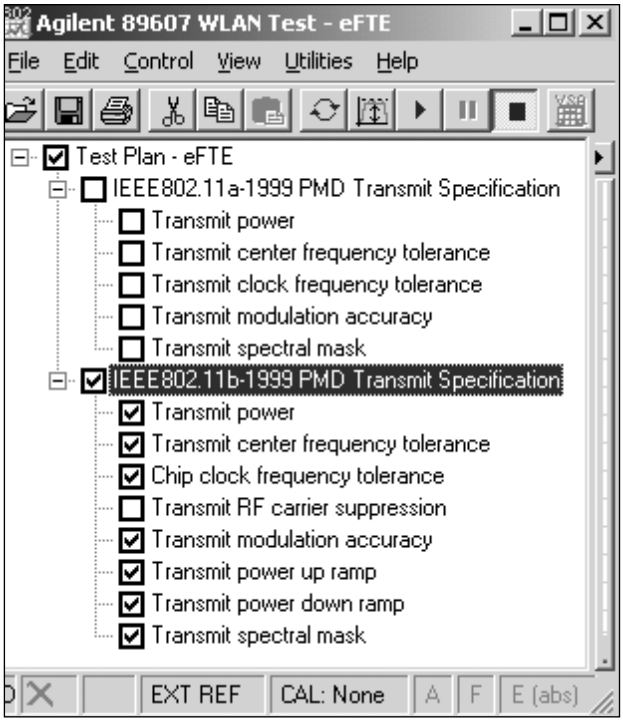

Figure 2. Test your IEEE 802.11a/b/g WLAN transmitter to the IEEE standard

Flexible Results Displays

Results are displayed, as each test executes, as pass/fail and measured data. A table containing a summary of the test results is also provided. Download the data to a spreadsheet, a report, or store it on your network. Two COM API program examples will automatically generate Excel or Word test reports to document your work.

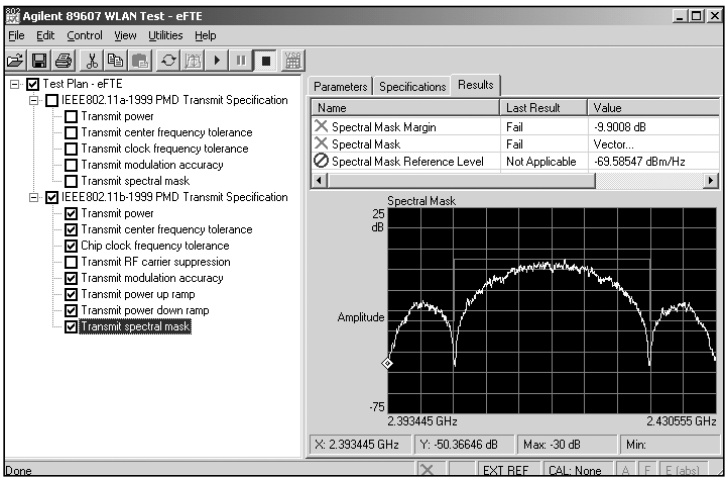

Figure 3. Detailed results, failed IEEE 802.11b transmit spectral mask test

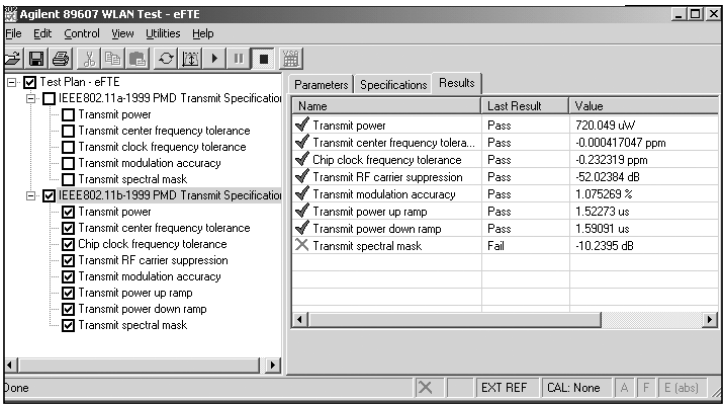

Figure 4. Summary results of IEEE 802.11b transmit tests showing failed transmit spectral mask test

View and Change the Test Specifications

The 89607A software comes already programmed with the transmitter performance specifications called out in the standards, both single value tests and test masks. View these specifications by clicking the "**Specifications**" tab for any test step. Modify them as required. You can even change the profile of the test masks. Once you have the values set to meet your needs, save them in a named test plan for recall and reuse.

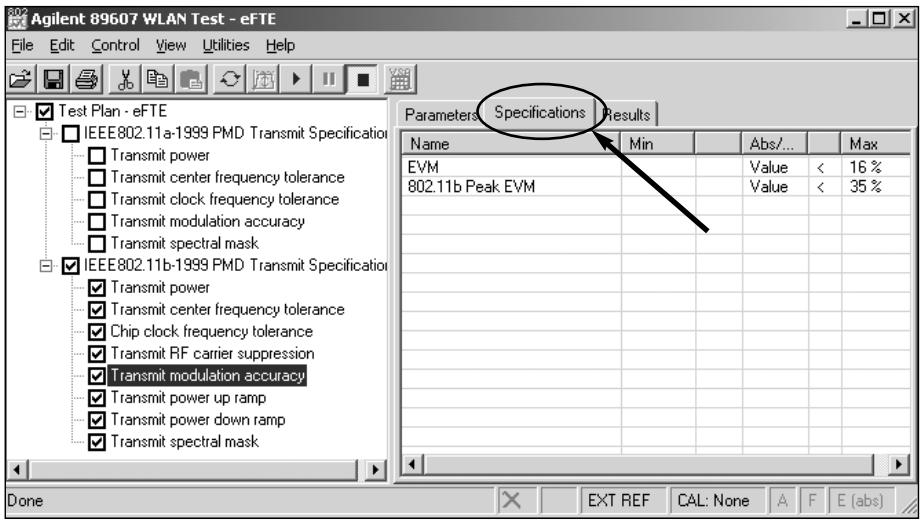

Figure 5. Specifications for the IEEE 802.11b transmit modulation accuracy test

Advanced Help Text

The WLAN test suite software contains some of the most complete help text in the industry. This text will speed your learning of the WLAN test suite and help you get the most out of your test software investment.

Fit the Hardware to Your Measurement Needs

Team the PC-based WLAN test suite software with Agilent's modular 89600 Series VXI analyzers or our WLAN-specific instrument combinations.

- **89640**
  2.7 GHz RF vector signal analyzer

  This high performance VXI-based modular analyzer tunes from DC to 2.7 GHz with 36 MHz of analysis bandwidth. Connection to the PC is via IEEE 1394 FireWire®. Best for measuring IEEE 802.11b/g.

- **89641**
  6.0 GHz RF vector signal analyzer

  The 89641A VXI-based vector signal analyzer offers DC to 6.0 GHz tuning range and 36 MHz of analysis bandwidth. Connection to the PC is via IEEE 1394 FireWire. Measures IEEE 802.11a/b/g.

- **89650S wide bandwidth VSA analyzer with high performance spectrum analysis**

  The 89650S combines your choice of three high-performance PSA Series spectrum analyzers with either a 40 or 80 MHz wideband IF, along with the 89601A VSA software. Connection to the PC is via LAN. This provides the power of vector signal analysis with the high dynamic range, amplitude and phase flatness, and versatility of Agilent's premier spectrum analyzer.

- **89611 IF vector signal analyzer with a PSA spectrum analyzer**

  Team the 89607A software with the 89611 modular IF vector signal analyzer and any of Agilent's PSA spectrum analyzer family equipped with Option H70 or HY7 for high performance WLAN PHY layer testing, both in-band and out-of-band. Connect these instruments to your PC via IEEE 1394 FireWire and LAN or GPIB.

- **89611 IF vector signal analyzers with an ESA spectrum analyzer**

  Team the 89607A software with the 89611 modular IF vector signal analyzer and selected models of Agilent's ESA Series (E4404B or E4407B) spectrum analyzers equipped with Option H70 for mid-performance WLAN PHY layer testing, both in-band and out-of-band. Connect these instruments to your PC via IEEE 1394 FireWire and either LAN[1] or GPIB.

- **N9020A MXA signal analyzer**

  The MXA signal analyzer drives signal and spectrum analysis to the next generation, offering the highest performance in a mid-range analyzer. Innovative breakthroughs enable the MXA signal analyzer to achieve the industry's fastest signal and spectrum analysis, eliminating the compromise between speed and performance. Team the 89607A WLAN test suite with the MXA for high speed, good performance PHY layer testing.

- **N4010A wireless connectivity test set**

  The N4010A is a test set designed to quickly and accurately measure emerging wireless connectivity formats in the 2.4 GHz band. The N4010A offers bandwidth up to 40 MHz, making it an ideal test platform for WLAN RF measure ments. The N4010A is an effective measurement tool for develop ment, integration, pre-qualifica tion, and volume manufacturing.

- **Agilent 16800/16900 and 1680/1690 Series logic analyzers**

  Now you can analyze the digital portions of your designs with the same tools you use to analyze your analog portion. The logic analyzer provides the physical connection into your circuits, and streams out the logic signal corresponding to I and Q. The 89600 VSA software formats this signal, and then displays and analyzes it using the wealth of tools available within the software. You no longer need to download to an external math program, or develop your own display and measurement algorithms. For more information, see *Direct Digital Measurements,* literature number 5989-2382EN.

Use your own PC

Load the 89607A WLAN test suite software on your PC, connect to the measurement hardware and start making measurements. The 89607A works on any PC running Windows® 2000 SP2 or XP Professional platform with an IEEE 1394, LAN or GPIB interface to connect to the hardware.

1. ESA LAN connectivity available only through a LAN-GPIB gateway such as Agilent's E5810A.

Additional Software When You Need to Do More

For engineers working with today's emerging broadband communication systems, the Agilent 89601A Series vector signal analysis (VSA) software is an indispensable tool for basic research, product development, manufacturing and field-testing.

Working with the same hardware front ends as the 89607A WLAN test suite software, the 89601A VSA software provides high performance RF and modulation trouble-shooting tools to complement WLAN test suite. It offers traditional RF spectrum displays, baseband (I/Q) analysis, signal capture and playback, RF and IF triggering, a wide variety of analog and digital demodulators, and an extensive set of time, frequency and modulation analysis tools. These capabilities make the VSA software ideal for evaluating narrowband and broadband digital communication signals.

Ordering Information

89607A	WLAN test suite
89607A-100	Basic WLAN test suite with hardware connectivity (required)

Specifications (typical)[1]

VXI analysis hardware (89640, 89641)

Standard	IEEE 802.11a	Notes	IEEE 802.11b	Notes
Total power	±2 dB	3	±2 dB	12
Center frequency tolerance	±10 Hz	3, 5	±12 Hz	12, 4
Clock frequency tolerance	±0.3 ppm	3, 5, 6	±1 ppm	12, 4
Residual constellation error	–43 dB	3, 7	—	
Residual RMS EVM	—		2.0%	12
Residual center frequency leakage	–60 dB	3	–60 dB	12
Spectral flatness	±0.2 dB		±0.2 dB	
Max burst length	1367 symbols		27 ms	
Estimated test time	11 s/3 s	11, 12	11 s/6 s	15, 11

89611 with spectrum analyzer [PSA (H70/HY7), ESA (H70)]

Standard	IEEE 802.11a	Notes	IEEE 802.11b	Notes
Total power accuracy	±4 dB	3, 4	±4 dB	3, 12
Total power repeatability	±0.25 dB	6	±0.25 dB	5
Center frequency tolerance	±10 Hz	3, 5	±30 Hz	12, 4
Clock frequency tolerance	±0.3 ppm	3, 5, 6	±1 ppm	12, 4
Residual constellation error	–43 dB	3, 7, 8	—	
Residual RMS EVM	—		2.0%	12, 13
Residual center frequency leakage	–60 dB	3	–60 dB	12
Spectral flatness	±0.2 dB	10	±0.2 dB	9
Max burst length	1367 symbols		27 ms	
Estimated test time	13 s/3 s	11, 12	14 s/7 s	15, 11

PSA Series spectrum analyzers E4440A, E4443A, E4445A, with 80 MHz IF (Option 122) or 40 MHz IF (Option 140), plus preselector bypass (Option 123) (also 89650S)

Standard	IEEE 802.11a	Notes	IEEE 802.11b	Notes
Total power	±2 dB	3	±2 dB	12
Center frequency tolerance	±10 Hz	3, 5	±12 Hz	12, 4
Clock frequency tolerance	±0.3 ppm	3, 5, 6	±1 ppm	12, 4
Residual constellation error	–43 dB	3, 7	—	
Residual RMS EVM	—		2.0%	12
Residual center frequency leakage	–60 dB	3	–60 dB	12
Spectral flatness	±0.2 dB		±0.2 dB	
Max burst length	1367 symbols		27 ms	
Estimated test time	11 s/3 s	11, 12	11 s/6 s	15, 11

Requirements

Operating system	Windows 2000, XP Professional
89600 VSA analysis software	Not required. Not recommended for installation on PC with 89601A V3.02 or lower installed. It will erase these older versions of 89601A code. Contact Agilent for information on upgrading your 89601A software.

Notes are on the following page.

Notes

1. Measurements are specified for 2.4 GHz to 2.5 GHz for IEEE 802.11b/g and 5.15 GHz to 5.35 GHz, and 5.725 GHz to 5.825 GHz for IEEE 802.11a.

2. Averaged measurement of ≥ 20 bursted fully coded IEEE 802.11a OFDM frames of ≥ 16 data symbols in length.

3. Improved by using 89600 file feature: RF and IF calibration for external devices.

4. Relative to the frequency reference.

5. Relative to 250 kHz symbol clock.

6. Result may be improved by 2 dB by enabling data-aided equalizer. Results assume signal is full power of measurement range.

7. In 2.4 GHz band: Range ≥ –40 dBm; in 5 GHz band: Range ≥ –25dBm

8. For > 3 GHz, requires signal power ≥ –10 dBm. Requires range to be set to 5 dB+ (measured signal power). This will cause the overload indicator to be present, but will provide better EVM results.

9. Use without extended calibration leads to spectral flatness of ±1.25 dB. Repeatability of flatness is ±0.1 dB for 2 to 3 GHz measurements and ±0.4 dB for 5 to 6 GHz measurements.

10. Measures 20 frames with 16 data symbols, and spectral mask test with 2 ms of capture and 80 MHz total span. Assumes 3 GHz P4 computer running Windows XP. Increased CPU performance improves test time.

11. Test time without running spectral mask test.

12. Measurement ≥ 1 bursted fully coded IEEE 802.11b packet ≥ 282 µs in length.

13. Use without extended calibration leads to a residual RMS EVM of 3.0%.

14. Assumes 1 GHz sample rate.

15. Measures 1 packet with 282 µs packet length, and spectral mask test with 2 ms of capture and 80 MHz total span. Assumes 3 GHz P4 computer running Windows XP. Increased CPU performance improves test time.

Related Literature List

89600 Vector Signal Analyzer CD, literature number 5980-1989E

89600 Series Vector Signal Analysis Software 89601A/89601AN/89601N12, Technical Overview, literature number 5989-1679EN

89600 Series Vector Signal Analysis Software 89601A/89601AN/89601N12, Data Sheet, literature number 5989-1786EN

Hardware Measurement Platforms for the Agilent 89600 Series Vector Signal Analysis Software, Data Sheet, literature number 5989-1753EN

89600 Series Vector Signal Analyzers, VXI Configuration Guide, literature number 5968-9350E

89650S Wideband Vector Signal Analyzer System with High Performance Spectrum Analysis, Technical Overview, literature number 5989-0871EN

89650S Wideband Vector Signal Analyzer System with High Performance Spectrum Analysis, Configuration Guide, literature number 5989-1435EN

89604A/89604AN Distortion Test Suite Software, Technical Overview, literature number 5988-7812EN

Related Web Resources

For more information, visit:
www.agilent.com/find/89600

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Agilent Open simplifies the process of connecting and programming test systems to help engineers design, validate and manufacture electronic products. Agilent offers open connectivity for a broad range of system-ready instruments, open industry software, PC-standard I/O and global support, which are combined to more easily integrate test system development.

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