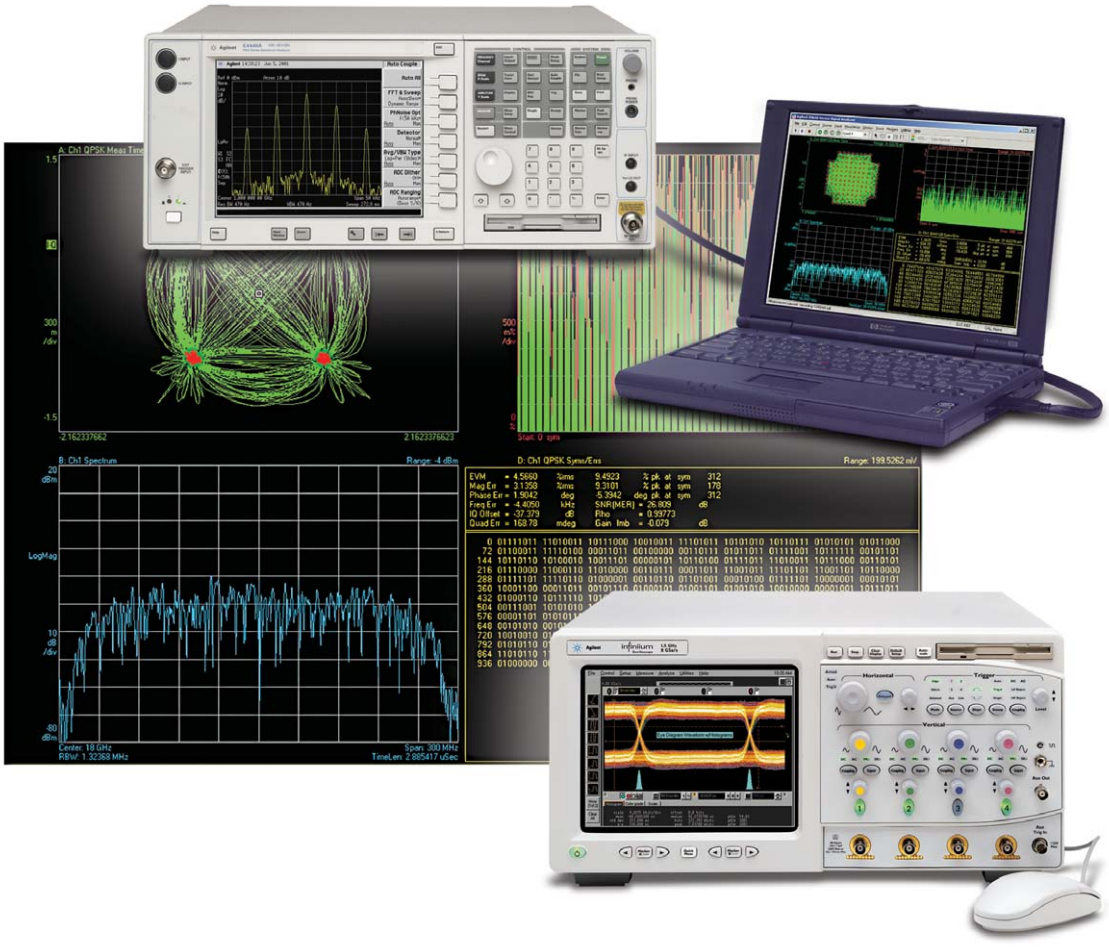
Wideband Vector Signal Analysis Systems

- *300 MHz bandwidth vector signal measurements to 50 GHz*
- *System calibration over the 300 MHz bandwidth*



Agilent Technologies

Industry's Only 300 MHz Analysis Bandwidth to 50 GHz

Perform calibrated measurements on signals with up to 300 MHz bandwidth and to frequencies of 50 GHz. With the combination of new enhancements in Agilent's 89601A VSA software, E4440A Series PSA spectrum analyzer, and Infiniium oscilloscope, analysis of complex digital signals as well as pulse compression radars are now made easy.

The E4440A Series PSA spectrum analyzer is used as the down converter with the 321.4 MHz IF output connected to an Infiniium scope, which functions as the digitizer. The digitized data is then analyzed by the 89601A VSA software, which can reside on a PC or in the Infiniium scope's Windows-based PC.

With the built-in broadband calibration capability of the 89601A VSA, you can have the confidence that your measurement system evaluates your designs and equipment to the highest level of accuracy. You will now be able to determine the DUT contribution to the overall EVM being measured.

The Calibration Setup

The calibration is accomplished by using an external source, which can be an Agilent MXG, PSG or an ESG. The block diagram in Figure 1 shows the interconnection of the VSA, PSA, Infiniium oscilloscope and the calibration source.

All of the devices are controlled by the 89601A software. Simply choose the center frequency of the band you wish to analyze, set the range, connect the source to the input of the PSA, and follow the steps under the "Extended Calibration" menu. Once the calibration is complete, replace the calibration source with the DUT and perform your analysis.

Communication between the PC and the instruments can be either GPIB or LAN. The Agilent connection expert is used to make connection between the system instruments and the PC. Once communication is established the 89601A selects the PSA as the tuner and the Infiniium Oscilloscope as the digitizer. The source is also selected.

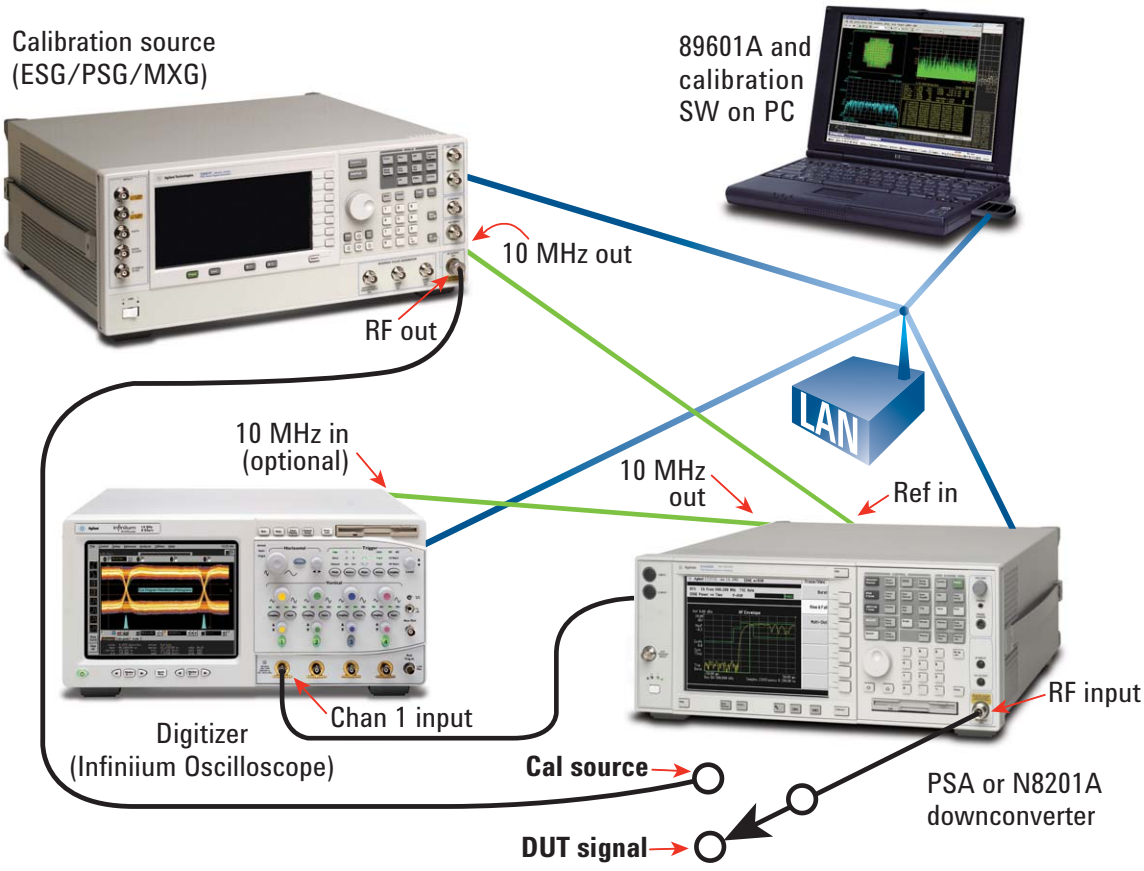


Figure 1. Configuration of VSA software, PSA downconverter, and Infiniium Oscilloscope digitizer.

Configure the Wideband Vector Signal Analysis System

▼ The following E4440A Series PSA are supported:

- E4440A to 26.5 GHz
- E4443A to 6.7 GHz
- E4445A to 13.2 GHz
- E4446A to 44 GHz
- E4448A to 50 GHz

Option 123 is required to bypass the microwave preselector[1]

▼ The following Infiniium Oscilloscopes are supported in this analysis system:

- MSO8104A
- 80000 Series
- 90000 Series

▼ The signal sources supported for 300 MHz broadband calibration are:

- E4438C Vector signal generator to 6 GHz
- E4428C Analog signal generator to 6 GHz
- E8257D Analog signal generator to 67 GHz
- E8267D Vector signal generator to 44 GHz
- N5181A Analog signal generator to 6 GHz
- N5182A Vector signal generator to 6 GHz
- N5183A Analog signal generator to 40 GHz

Typical Configurations

Frequency range	Down converter	Digitizer	Cal source
To 6 GHz	E4443A PSA	MSO8104A	N5181A MXG
To 26.5 GHz	E4440A PSA	MSO8104A	E8257D Opt 532
To 50 GHz	E4448A PSA	90000 Infiniium Oscilloscope	E8257D Opt 550
To 26.5 GHz	N8201A[2]	90000 Infiniium Oscilloscope	E8257D Opt 532

Recommended Accessories:

- LAN hub and LAN cables
- BNC cables to connect references
- BNC (F) to SMA (M) adapter

1. The microwave preselector limits the analysis bandwidth to less than 100 MHz. In order to gain the maximum bandwidth, the microwave preselector must be bypassed.
2. Performance downconverter synthetic instrument module

Performance Summary:

Frequency

- Frequency range: 3.77[4] to 49.85 GHz
- Frequency span[1]: 20 MHz to 300 MHz

Amplitude

- Full scale range: –28 to +30 dBm
- Performance:

Band	Signal-to-noise ratio[2]	Residual EVM[3]
3 to 6.6 GHz	66 dB (nominal)	2.1 % (nominal)
6.6 to 13.2 GHz	66 dB (nominal)	2.5 % (nominal)
13.2 to 19.2 GHz	66 dB (nominal)	3.2 % (nominal)
19.2 to 26.5 GHz	56 dB (nominal)	3.5 % (nominal)
26.5 to 31.5 GHz	56 dB (nominal)	3.5 % (nominal)
31.5 to 49.85 GHz	54 dB (nominal)	6 % (nominal)

Frequency response: 300 MHz span, 0.2 dB and 1.4 ° Peak to Peak

1. For information on minimum spans consult application note 5988-4096EN
2. CW signal at overload -1 dB and noise in 1 MHz BW

Full 300 MHz BW corrected signal (208 Msymbol/sec QPSK signal). A bandpass filter may be needed if the DUT has wideband noise.

1. With recabling, baseband measurements using the Infiniium Oscilloscope only. See 5988-4096EN for details.

Related Literature

- *Infiniium Oscilloscopes Performance Guide Using 89601A VSA SW,* Application Note, literature number 5988-4096EN
- *PSA Spectrum Analyzer Option 122 or Option 140 and 89600 VSA,* application note, literature number 5988-7814EN
- *10 Steps to a Perfect Digital Demodulation Measurement*, literature number 5966-0444E

More specific product information can be found at the following websites:

- PSA Spectrum Analyzers: **www.agilent.com\find\PSA**
- 89601A Vector Signal Analysis Software: **www.agilent.com\find\89601A**
- Infiniium Oscilloscopes: **www.agilent.com\find\infiniium**

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Product specifications and descriptions in this document subject to change without notice.

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