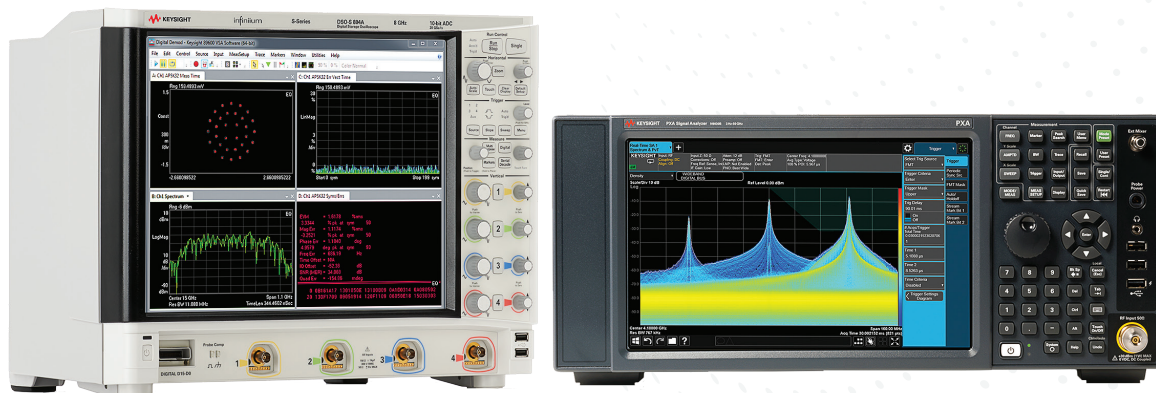


Wideband Signal Analysis for Satellite Test, Reference Solution

The wideband signal analysis for satellite test, reference solution provides a cost-effective, flexible approach to measuring wideband signals in a variety of applications, including satellite amplifier test.



Next Generation Satellite Test Challenges

Characterizing amplifiers intended to be used in wideband communications applications, such as Ka-band high throughput satellite (HTS) systems supporting high data rates, can pose some unique challenges. Measurements such as EVM, noise power ratio, gain compression, and phase distortion, can be good indicators of a component's performance when deployed in a system. Evaluating these results over operational power and temperature range can further deepen the understanding of an amplifier's behavior.

Wideband Signal Analysis for Satellite Test, Reference Solution

The wideband signal analysis for satellite test, reference solution¹ consists of a Keysight signal analyzer, an Infiniium S-Series oscilloscope, and the 89600 VSA software. This reference solution takes advantage of the signal analyzer's wide bandwidth IF output, the high dynamic range of the Infiniium oscilloscope, and the powerful 89600 VSA software to deliver a wideband, high-dynamic range signal analysis solution at an affordable price. This solution does not require an external stimulus. Correction data is exported from the X-Series analyzer to the 89600 VSA software so the user does not need to do time consuming calibrations for acceptable measurement results. Correction data is quickly loaded when the user changes center frequency and span, and the full analysis capabilities of the 89600 VSA can then be utilized. The corrections contain both amplitude and phase information, enabling the 89600 VSA to make accurate analyses of chirp linearity, signal modulation for cell phone networks, or even custom modulation.

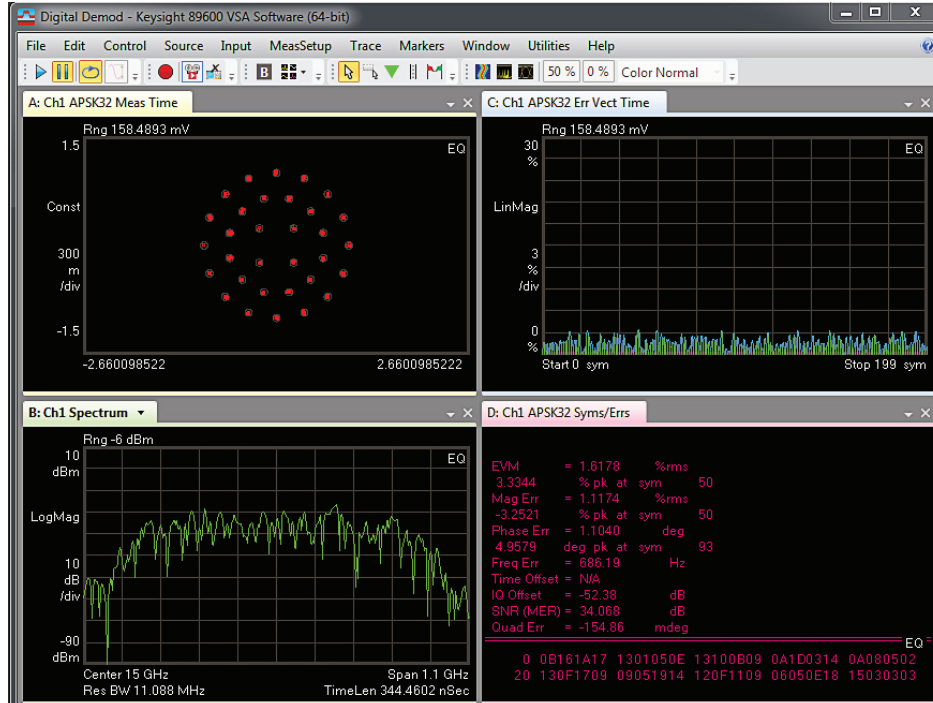
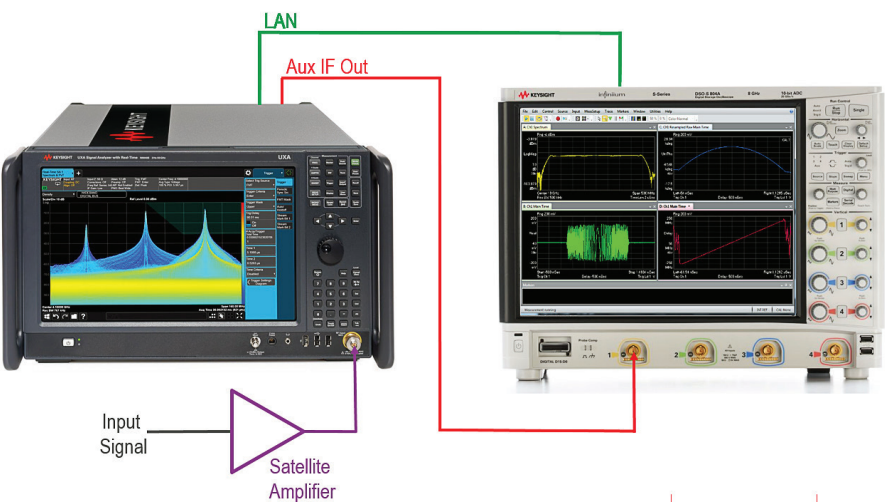


Figure 1. Demodulation of a wideband APSK signal.

1. This configuration was previously known as the Z9070B wideband signal analysis solution and may be referred to as such.

Reference Solution Architecture



Solution features and benefits	
Feature	Benefit
Flexible hardware	Instruments can be used together for wideband signal analysis, or individually for traditional swept spectrum analyzer or oscilloscope measurements
Instruments operated as single configuration	Quickly and easily setup and adjust measurement settings without needing to interact with multiple user interfaces.
Extensive analysis with 89600 VSA software	Vector signal analysis and demodulation of over 75 signal standards and modulation formats

Hardware

Product specifications and characteristics	
UXA signal analyzer	
Frequency range	3 Hz to 50 GHz
Maximum correctable bandwidth	1.1 GHz
PXA signal analyzer	
Frequency range	3 Hz to 50 GHz
Maximum correctable bandwidth	1.1 GHz
Infiniium S-Series oscilloscope	
Bandwidth	Up to 8 GHz
ADC Bits	10
Memory depth	Up to 400 Mpts

Hardware – instruments

N9040B UXA signal analyzer

www.keysight.com/find/n9040b

A Keysight N9040B UXA signal analyzer is used as a wideband downconverter, as well as to perform traditional swept measurements. The UXA signal analyzer, the highest-performance member of the X-Series, provides frequency coverage up to 50 GHz, and ensures present and future flexibility through optional measurement capabilities and hardware expandability. An N9030A or N9030B PXA may also be used as an alternate configuration. The UXA also has an option for 1 GHz internal analysis bandwidth capability.



N9030B PXA signal analyzer with multi-touch

www.keysight.com/find/n9030b

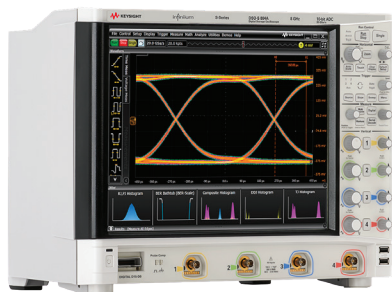
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Infiniium S-Series oscilloscope

www.keysight.com/find/s-series

An Infiniium S-Series high-definition oscilloscope is used to perform wideband demodulation analysis when paired with the N9040B UXA or the N9030B PXA signal analyzer used as a wideband downconverter. A 10-bit ADC, low-noise front end, correction filters, vertical scaling support down to 2 mV/division, and a precise time base produce high-fidelity measurements. In addition, its advanced frame and broad range of capability enable the S-Series oscilloscopes to tackle a wide range of test needs.



Software

Signal analysis

The wideband signal analysis for satellite test, reference solution utilizes the 89600 VSA software for signal analysis. The 89600 VSA software is a comprehensive set of tools for demodulation and vector signal analysis of over 75 signal standards and modulation formats, including pulse and FMCW radar analysis and custom waveforms. The signal analyzer and oscilloscope can be configured as one hardware configuration, making the 89600 VSA software¹ a single point of control for both instruments and simplifying measurement setup and analysis.

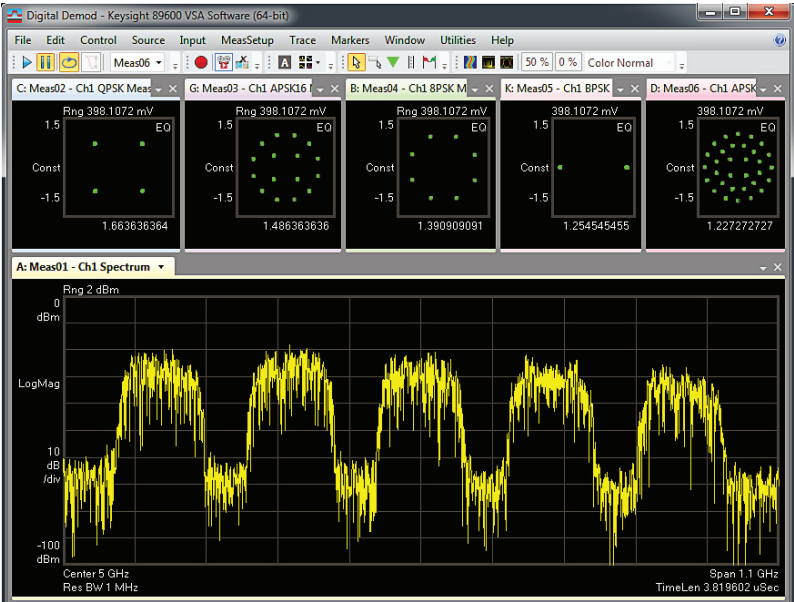


Figure 2. The wideband signal analysis for satellite test, reference solution is being used to analyze five signals at different frequencies with different modulation formats simultaneously using the multi-measurement capability of the 89600 VSA.

Recommended Reference Solution Base Configuration²

Hardware

Model	Description
N9030B	PXA signal analyzer
N9030B-544	3 Hz to 44 GHz frequency range
DSOS204A	High-definition oscilloscope: 2 GHz, 4 analog channels
DSOS000-400	400 Mpts memory depth

Software

Model	Description
89601B	89600 VSA software ³ (version 21 or later)
89601B-200	Basic vector signal analysis and hardware connectivity

1. Requires 89600 VSA software version 21 or later.
2. For a more complete set of configuration options, please refer to the Wideband Signal Analysis for Satellite Test, Reference Solution configuration guide, literature number 5992-1524EN.
3. Additional options are available. For a complete list, please refer to the 89601B VSA Configuration Guide, literature number 5990-6386EN.

www.keysight.com/find/solutions-WBSA

Learn more at: www.keysight.com

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