

M981xAS Series VCA Vector Component Analyzer

What Is a Vector Component Analyzer?

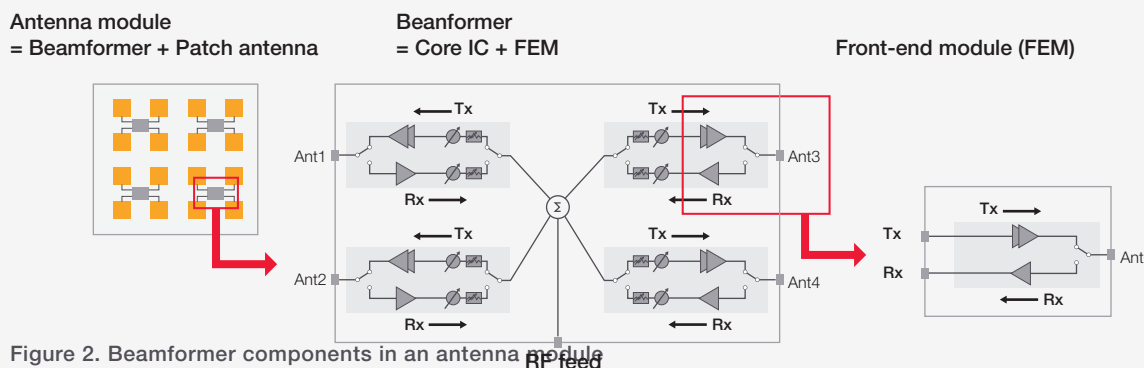
A vector component analyzer (VCA) combines the component characterization capabilities of vector network analyzers (VNAs) and the modulated signal measurements of signal analyzers into one platform. The Keysight M981xAS Series VCA offers vector-corrected measurements on all the continuous-wave (CW) and modulated signal measurements you need for wireless and satellite components. You can measure gain, phase, VSWR, harmonics, spurious, IMD, noise figure, modulation distortion, and more.



Figure 1. Keysight M9815A vector component analyzer

Measuring Next-Generation Devices

Multiband beamforming antennas play an increasing role in sorting our ever-growing wireless traffic. At the heart of these antennas, beamformer integrated circuits (ICs) drive multiple transmit/receive (T/R) modules (Figure 2). Each T/R module contains complex active components and requires a wide variety of tests, including CW measurements like gain and phase as well as modulated signal measurements like error vector magnitude, adjacent channel power, and noise power ratio. Amplifiers in wireless and space applications operate in their compression regions, requiring distortion tests to characterize real-world operation.



You need to perform many different measurements multiple times when testing T/R modules. If your beamformer IC has 16 T/R modules and you have a network analyzer with four ports and a spectrum analyzer with one port, your measurement setup will limit your test speed. A multiport VCA provides simultaneous stimulation of every port on your device under test, significantly reducing test time.

Faster Measurements with a Multiport Architecture

Many labs turn to PXI-based VNAs for multiport measurements. PXI instruments scale to your application and provide unmatched speed for multiport device characterization. Figure 3 shows how a multiport PXI VNA significantly reduces the number of sweeps required for multiport device characterization.

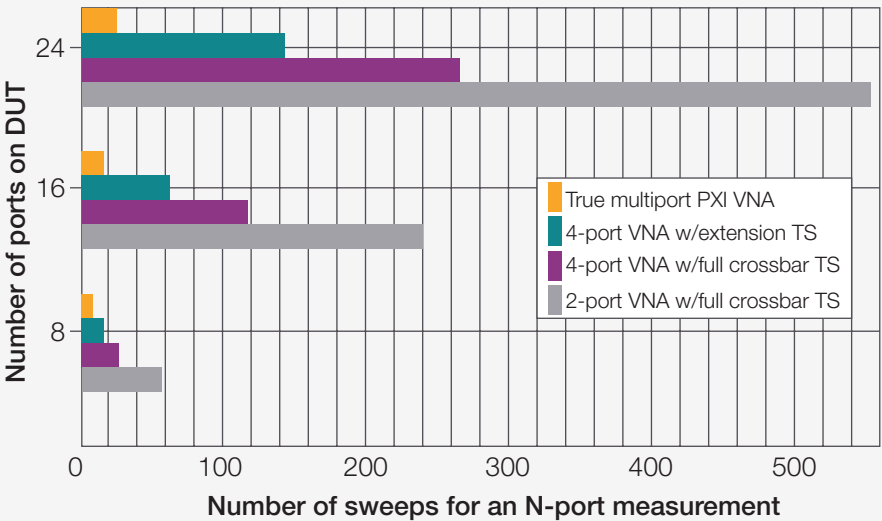


Figure 3. Sweeps required for multiport devices

The VCA is based on a PXI VNA to take advantage of the fast, scalable measurements that the PXI platform provides. Two types of PXI modules make up the VCA: Keysight M980xA VNAs and receiver modules. Figure 4 shows a general block diagram of both modules. Direct access to the receivers provides higher accuracy in modulated signal measurements, and elimination of the signal sources reduces the cost of expanding the VCA setup with more receiver ports.

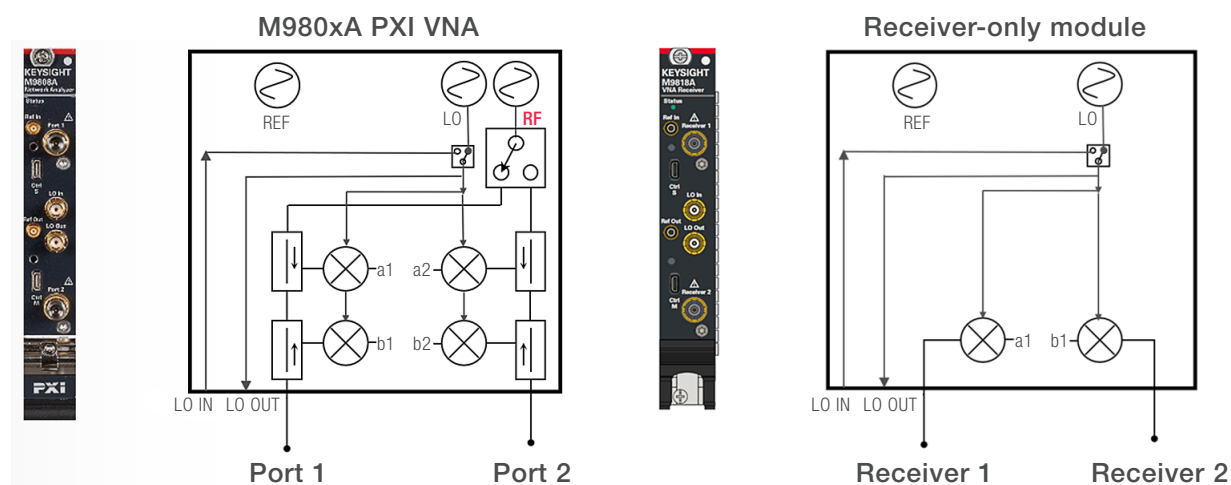


Figure 4. PXI VNA and receiver-only modules

The VCA's modular multiport architecture enables production labs to quickly verify complex designs without investing in high-end network and spectrum analyzers.

Summary

The VCA combines the device characterization of network analyzers with the modulated signal capabilities of signal analyzers to enable you to perform the wide variety of tests required for the latest 5G and wireless technologies. The modular architecture lets you buy only as many ports as you need and upgrade at any time as your measurement needs evolve.

Learn more

Data Sheet – <https://www.keysight.com/us/en/assets/3120-1346/data-sheets/M981xAS-Series-PXIe-Vector-Component-Analyzer.pdf?id=3116986>

M9818AS Product Page – <https://www.keysight.com/en/pdx-3067707-pn-M9818AS/pxi-vector-component-analyzer-100-khz-to-53-ghz?cc=US&lc=eng>

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