

# Passive Component Test Challenges

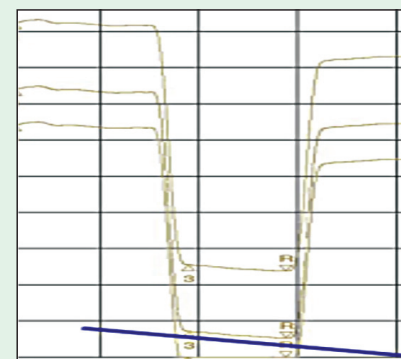
## Optimizing the building blocks

Passive components are critical to the design of a wide variety of electronic equipment ranging from wireless communication equipment to highly sophisticated radar systems. When considering the essential building blocks of microwave circuits, from the simplest transmission line to the most complex filter or coupling network, performance and repeatability are critical to system operation.

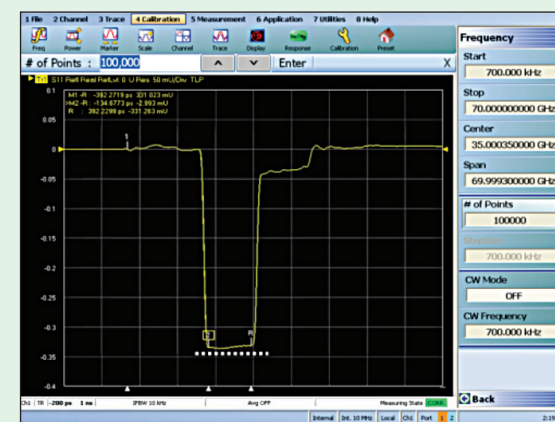
## Today's Challenges:

<b>Achieving Higher Performance</b>	Measurement uncertainties lead to large component specification guard-bands and reduced guaranteed performance.  Inaccurate component models require higher system performance buffers.
<b>Locating Impedance Problems</b>	Low quality, low frequency S-parameter data produces low quality time domain impedance profiles.
<b>Reducing Design Cost and Cycle Time</b>	Inaccurate device or component models lengthen the design cycle and number of design turns. Poor causality reduces confidence in simulations. DC extrapolation errors degrade model accuracy and can cause non-convergence in 3-D EM simulators.
<b>Meeting Performance and Cost Targets</b>	Difficult to make performance/cost trade-offs or meet cost targets in cutting-edge performance components if lacking confidence in measurement results.
<b>Changing Measurement Needs Over Time</b>	Increasing frequency needs or moving from 2-port devices now to multi-port devices in the future can lead to the need for expensive new test equipment purchases.

## Beatty Standard Impedance Profiles Using Low pass Time Domain



Poor low frequency S-parameter data from VNA using only couplers leads to DC-extrapolation errors and a slope in results for 25 ohm section. Noise impact on DC extrapolation causes wide variation in impedance results.



High quality low frequency S-parameter data from VNA with bridge/coupler hybrid architecture minimizes DC-extrapolation errors and gives accurate flat results with no observable variation due to noise effects.

Discover What's Possible™



# Passive Component Measurement Solutions

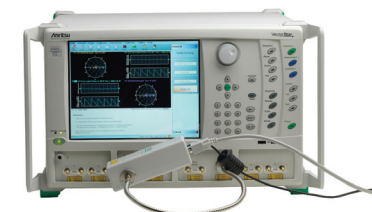


## Anritsu VectorStar enables optimization of the building blocks

The Anritsu VectorStar™ MS4640B Series offers the best VNA performance across the widest frequency bandwidth. Microwave capability from 70 kHz to 20/40/50 and 70 GHz, broadband measurements from 70 kHz to greater than 110 GHz, high accuracy time domain, and wide dynamic range frequency domain measurements make the VectorStar the ideal tool for passive microwave component designers and manufacturers.

Feature	Benefit
<b>Highest Measurement Performance Over Broadest Frequency Span</b>	<ul style="list-style-type: none"> <li>• 70 kHz to 70/110 GHz means one system can cover a wide range of frequency bands and eliminate uncertainties due to concatenation</li> <li>• Stability provides better “practical” accuracy with fewer repeated measurements and greater confidence</li> </ul>
<b>Best Time Domain Analysis</b>	<ul style="list-style-type: none"> <li>• Broadest coverage from 70 kHz to 70/110 GHz provides best combination of accurate and hi-res low-pass time domain results</li> <li>• 100,000 points provide best-in-class alias-free range</li> <li>• Time Domain Analysis provides accurate characterization of impedance profiles due to high quality low frequency S-parameter data</li> </ul>
<b>Hybrid Bridge-Coupler VNA Architecture</b>	<ul style="list-style-type: none"> <li>• DC extrapolation errors in modeling minimized by use of bridge structure for capture of high quality low frequency S-parameter data</li> <li>• High frequency data quality assured by use of directional couplers</li> <li>• Higher quality data → better device models → fewer design turns</li> </ul>
<b>Precision AutoCal</b>	<ul style="list-style-type: none"> <li>• Confidence in measurement results for those working on cutting-edge designs due to Anritsu's AutoCal module that provides measurement uncertainty levels as low as those obtained in time-consuming sliding load calibrations</li> </ul>
<b>Complete Upgrade Ability Within Family</b>	<ul style="list-style-type: none"> <li>• Meet budget targets; buy what is needed now and protect investment by upgrading later</li> <li>• Spread spending across budget years due to ability to add options or upgrade frequency ranges later</li> <li>• Test-set concept permits port-count to be increased when required</li> </ul>

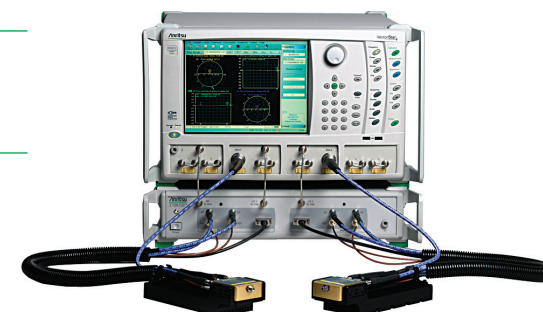
## MS4640B VectorStar Series 70 kHz to 20/40/50/70 GHz



## MS4640B VectorStar Series Multi-port Solutions



## ME7838A VectorStar 70 kHz to 110+ GHz Solution



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