

Low Noise Amplifier Testing Challenges



Active Devices Pose Many Test Challenges

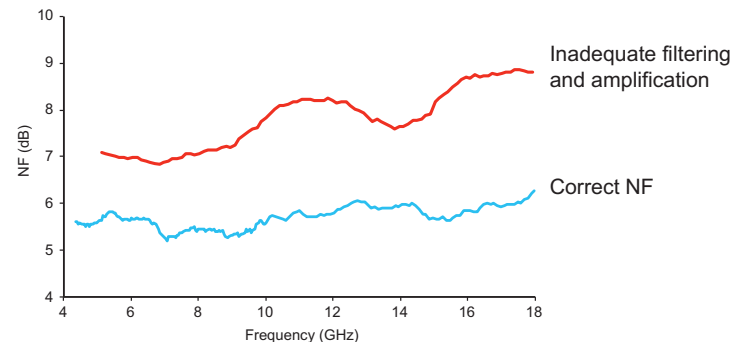
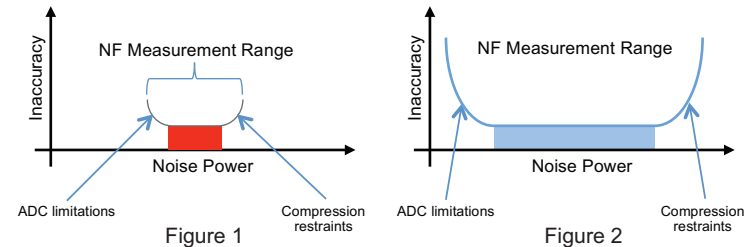
Designers, modelers, and manufacturers of RF and microwave frequency amplifiers used in applications such as radar, wireless communication, or high-speed digital communication systems at either the wafer-level or as a packaged part face many test challenges. Higher performance requirements in the face of tighter budgets and more demands on test engineer time result in the need for test systems which provide technical leadership while remaining cost effective, easy to use, and flexible.

Today's Challenges

High frequency measurements	There is a continuing trend for systems/devices at higher (millimeter-wave) frequencies. Examples include 77 GHz car collision avoidance radar and 94 GHz airport radar and materials measurements.
Broader access to challenging measurements	Many active device measurements can be challenging and only useable by test experts. This limits who can make the measurements and in what part of the product lifecycle they can be used.
Greater device and system performance demands	It is important to know how an active device behaves (e.g., gain compression) at various frequencies to ensure optimum performance of the device and the system in which it is used. It can be very time consuming to switch between multiple displays to investigate how one parameter varies under different conditions (e.g. frequency).
Tight budgets	Resources are always tight. Most often test engineers are forced to sacrifice performance for price.
Test platform flexibility	Technology moves fast. Test platforms need to be able to address today's needs with the flexibility to meet tomorrow's emerging requirements.
On-wafer measurements	At the wafer level, both linear and non-linear amplifiers/transistors typically operate in a non-50 ohm environment.

Simplifying NF Measurements

For some test systems, configuring a noise figure test setup can be particularly challenging. It is often necessary to add pre-amplification and filtering in front of the measurement receiver to ensure the sensitivity required to make a quality measurement. If too little amplification is used, there may be too much jitter from the instrument A/D converter. If too much power or amplification is applied, compression can impact the measurements. Selecting a test system that provides a wide NF measurement range enables greater configuration flexibility, simplifying setup and offering the ability to test a wider variety of devices.



Low Noise Amplifier Testing Solutions

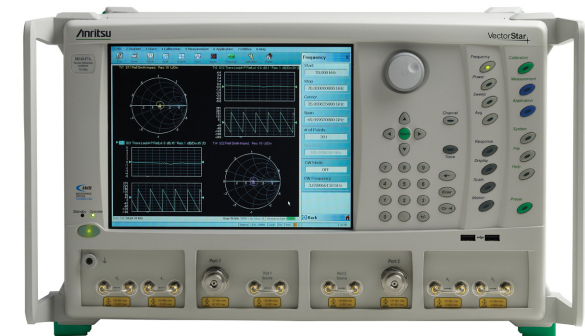


Anritsu VectorStar Brings Industry First 125 GHz VNA NF Measurement Capability

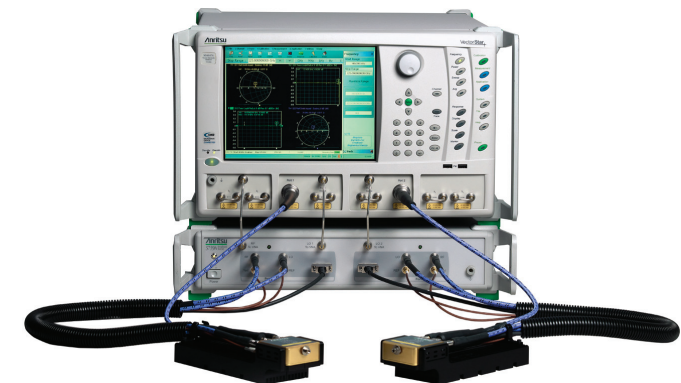
As part of the overall Anritsu active device test offering, MS4640A-041 is an option that adds noise figure (NF) measurement capability to the MS4640A VectorStar VNA Series. The new capability is based on a cold source technique for improved accuracy. Various levels of match and fixture correction are available for additional enhancement. VectorStar is the only VNA platform capable to measure noise figure from 70 kHz to 125 GHz and has a unique receiver optimized for noise figure measurements from 30 GHz to 125 GHz.

Anritsu Active Device Test Advantages Include:	Benefit
Noise Figure (NF) Measurement Technical Leadership	
ONLY 70 kHz to 125 GHz NF measurement capability ONLY optimized noise receiver for measurements from 30 GHz to 125 GHz	<ul style="list-style-type: none"> • Enables industry-first capability!! • Measure actual vs. predicted performance
Wide NF measurement range over which noise power is low enough not to compress the receiver but high enough to minimize noise contributions from ADC jitter	<ul style="list-style-type: none"> • More composite receiver construction flexibility to reduce the need for setup changes or optimize DUT test conditions for higher accuracy, repeatability, or more measurement range • Enables good measurements over a wider variety of user skill levels
NF capability at cost effective price	<ul style="list-style-type: none"> • More capability with existing budget • Need less budget for the capability required
Unique Gain Compression Measurement/Display	
Gain compression over frequency capability (up to 401 frequency points on one graph)	<ul style="list-style-type: none"> • Characterize performance over DUT's operating bandwidth in one step • Ensure optimum DUT performance
Advanced System Architecture	
Flexible architectural design	<ul style="list-style-type: none"> • Room to grow for future capability expansion • Flexibility to grow system as needs grow or budgets permit
Non-50 ohm Test Environment	
Unique ability to combine active and passive tuning of source and load impedance for real-world test conditions	<ul style="list-style-type: none"> • Account for both fundamental and harmonic content for optimum DUT performance

MS4640A VectorStar Series 70 kHz to 20/40/50/70/110+ GHz



ME7838A VectorStar Series Broadband VNA Solution 70 kHz to 125 GHz



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