Measurement and Modeling Device Characterization Services

DATA SHEET / 1H-003

Maury Microwave

// JULY 2020

Why Measurement Services?

Maury's team of experienced application engineers operates its state-of-the-art characterization laboratories to provide time-sensitive measurement services each and every day. Maury customers have taken advantage of our expertise and resources to meet their objectives on time and on budget. Some of the reasons our customers work with us include: completing short term or infrequent projects, eliminating bottlenecks and accelerating delivery by working in parallel, validating in-house measurements, establishing proof of concept and system justification, always using state-of-the-art tools, reducing capital expenditures and improving the balance sheet.

We are better suited to meet our customers' needs due to the flexibility associated with measurement and modeling device characterization services.

Scenario 1: Short-term or project-specific need

Tom has been mandated to design an application-specific amplifier which will be integrated into his company's next-generation transceiver. Since Tom's projects each have unique requirements, Tom has not been able to acquire his own load pull system, let alone the periphery instruments required to integrate the solution or the experience required to operate the system efficiently. Tom takes advantage of Maury's experience and resources by executing a measurement service and is able to complete his project without the investment in capital equipment.

Scenario 2: System proof-of-concept and justification

John believes a noise parameter measurement system would improve his overall low-noise amplifier development time by validating his models, and allowing him to make refinements on an ongoing basis. Before making the investment in capital equipment, John contracts a measurement service and receives a complete set of measurement results as a deliverable. With data in hand, John proves he is able to improve his LNA design flow and feels secure in acquiring his own system.

Scenario 3: Eliminating bottleneck and accelerating delivery

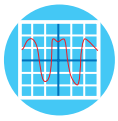
Lisa is responsible for technology selection at her company and is in the process of evaluating multiple device topologies. With Lisa's deadline to report her findings approaching quickly, Lisa knows she will not be able to complete her evaluation within the allotted time period. Lisa outsources a portion of her measurements in order to increase her effective measurement capacity and is therefore able to complete all measurements, and compile her report with recommendations, in time.

Lab Equipment*

- Network analyzers: Keysight N5242A, N5245A, N5247A
- Signal sources: Keysight N5181A, N5183A, E4438C
- Signal analyzers: Keysight N9010A, N5242A/N5245A/N5247A, NI 5644R, Maury Microwave MT2000E4-120
- Noise analyzers: Keysight N8975A, N5242A/N5245A/N5247A with option 029
- Power meters: Keysight N1911A, E4416A, E4417A, E4418B, E4419B, U2002A, and power sensors
- IV analyzers: AMCAD Engineering AMBILT pulsed IV system
- Oscilloscopes: Keysight DSO7104A, DSO1024A and probes
- Probe stations: Cascade Summit 9000 manual, Summit 11K manual, Summit 12K semi-automatic
- Impedance tuners: multiple Maury Microwave MT981BL01, MT982BL01, MT984AL01, MT2000E4-120
- Miscellaneous: DC and RF accessories

** Equipment list accurate at date of print*

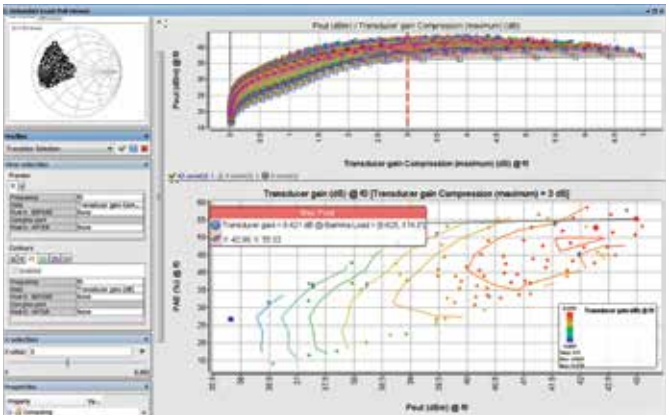
Customers may receive a partial credit on paid measurement services when purchasing a device characterization system within 180 days. Please inquire with Maury sales.

	Services Offered	Measurement Parameters	Measurement Capability
	DC and Pulsed IV Measurements	Fixed and swept voltages and currents for Id, Ig, Vd, Vg and computation of gm	On-wafer and in-fixture DC and Pulsed IV characterization up to 1000V and 30A
	CW and Pulsed S-Parameter	Two-port S-parameter (S11, S12, S21, S22) characterization at user-defined reference plane	On-wafer and in-fixture CW and pulsed-CW S-parameter measurements between 10 MHz and 67 GHz
	Noise Figure/ Parameters Measurements	Noise figure: NF50 Noise parameters: NF50, NFmin, Γopt, Rn, noise circles (typical noise measurements performed in screen room / Faraday cage)	On-wafer and in-fixture measurements Noise figure – 10 MHz to 50 GHz Noise parameters – 400 MHz to 67 GHz
	Power Measurements- CW/ Pulsed-CW Signal	Power parameters including available and delivered input power (Pin), delivered output power (Pout) at individual frequencies, transducer and power gain, power-added and drain efficiency, intermodulation distortion products (IMD, if applicable)	On-wafer and in-fixture power measurements between 10 MHz and 67 GHz CW and pulsed-CW, single-tone and two-tone RF signal DC and pulsed bias conditions Fixed and swept impedance at fundamental and harmonic frequencies
	Power Measurements- Modulated Signal	In addition to power parameters above, modulated parameters including adjacent channel power/ leakage (ACLR/ACPR) and error vector magnitude (EVM)	On-wafer and in-fixture power measurements between 400 MHz and 40 GHz using commercial and user-defined modulated signal
	Power Measurements- Nonlinear VNA (NVNA)	In addition to power parameters above, nonlinear time-domain current and voltage waveforms and RF load lines	On-wafer and in-fixture power measurements between 400 MHz and 40 GHz

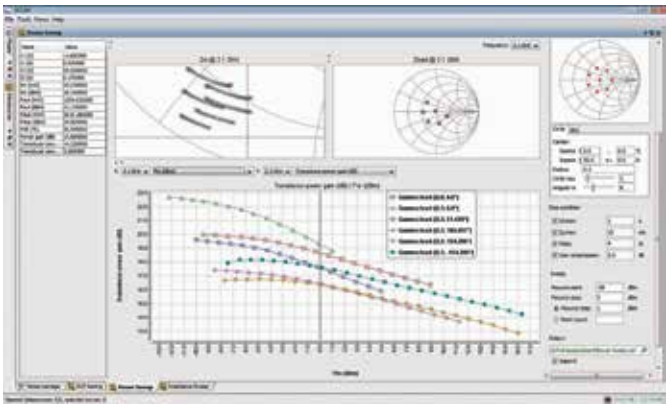
Please contact us to explore how Maury can support your measurement and modeling needs.

Sample Measurements

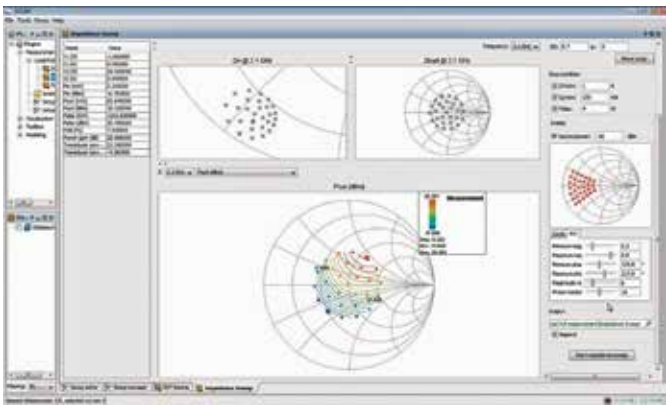
Visualization of output power vs PAE at fixed 3dB gain compression



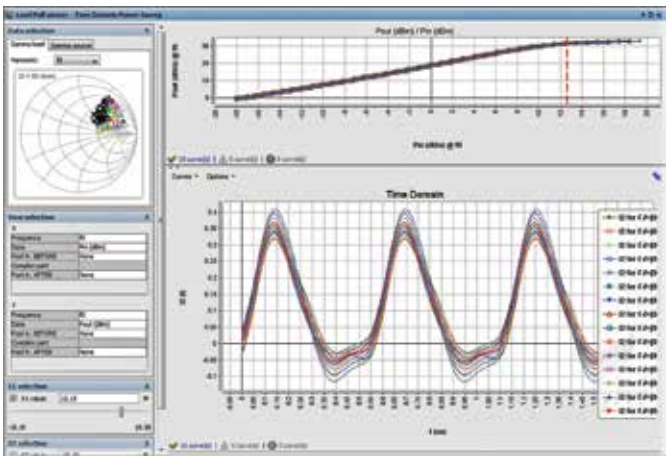
Power sweep at multiple impedances



Impedance sweep at fixed power

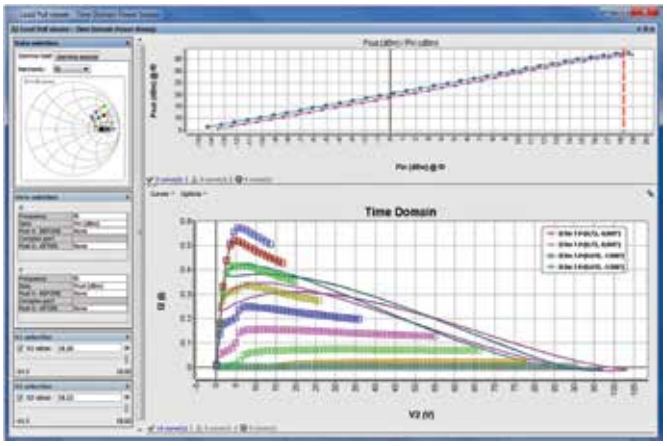


Output current waveforms at constant input power under varying load impedances

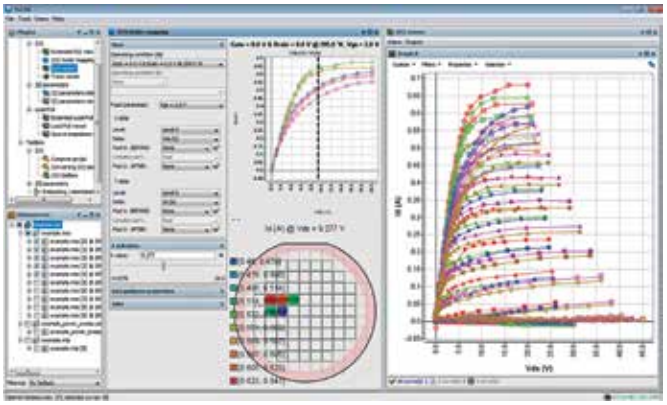


Sample Measurements Continued

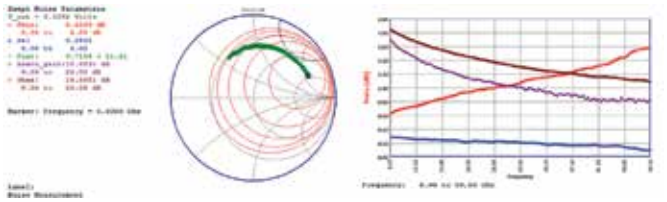
DC and RF load lines at constant input power under varying load impedances



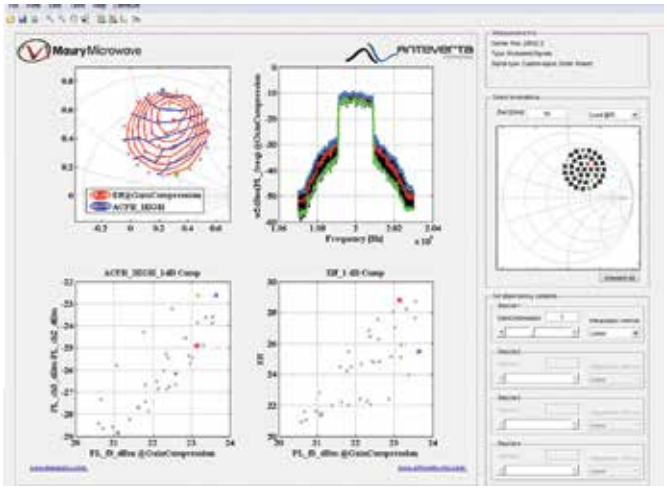
IV curves at various wafer positions



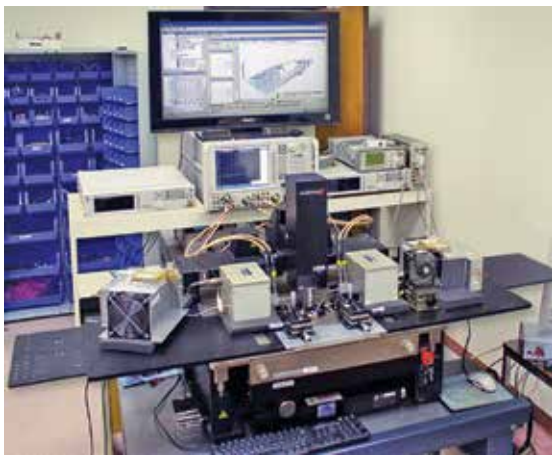
Broadband swept noise parameters

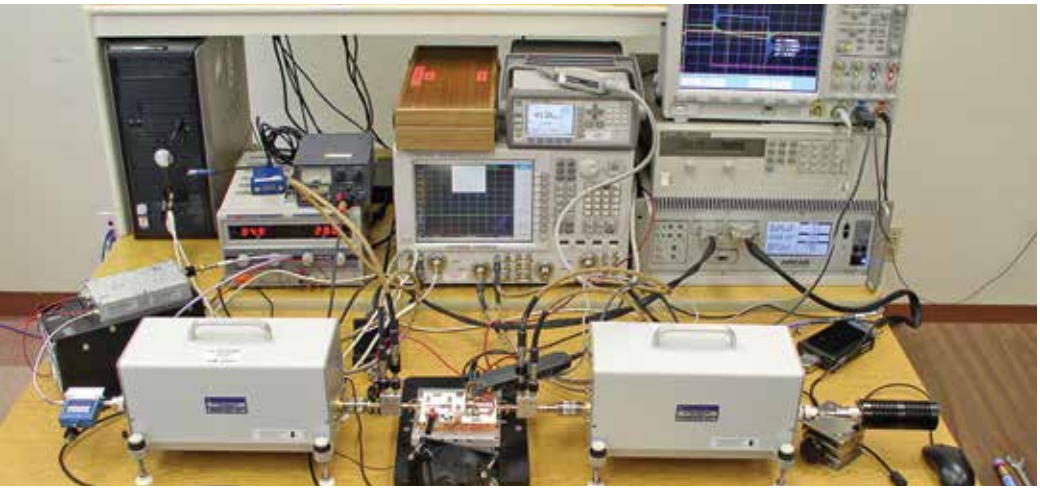


Active load pull of multi-channel LTE signal



Measurement and Modeling Device Characterization Facilities





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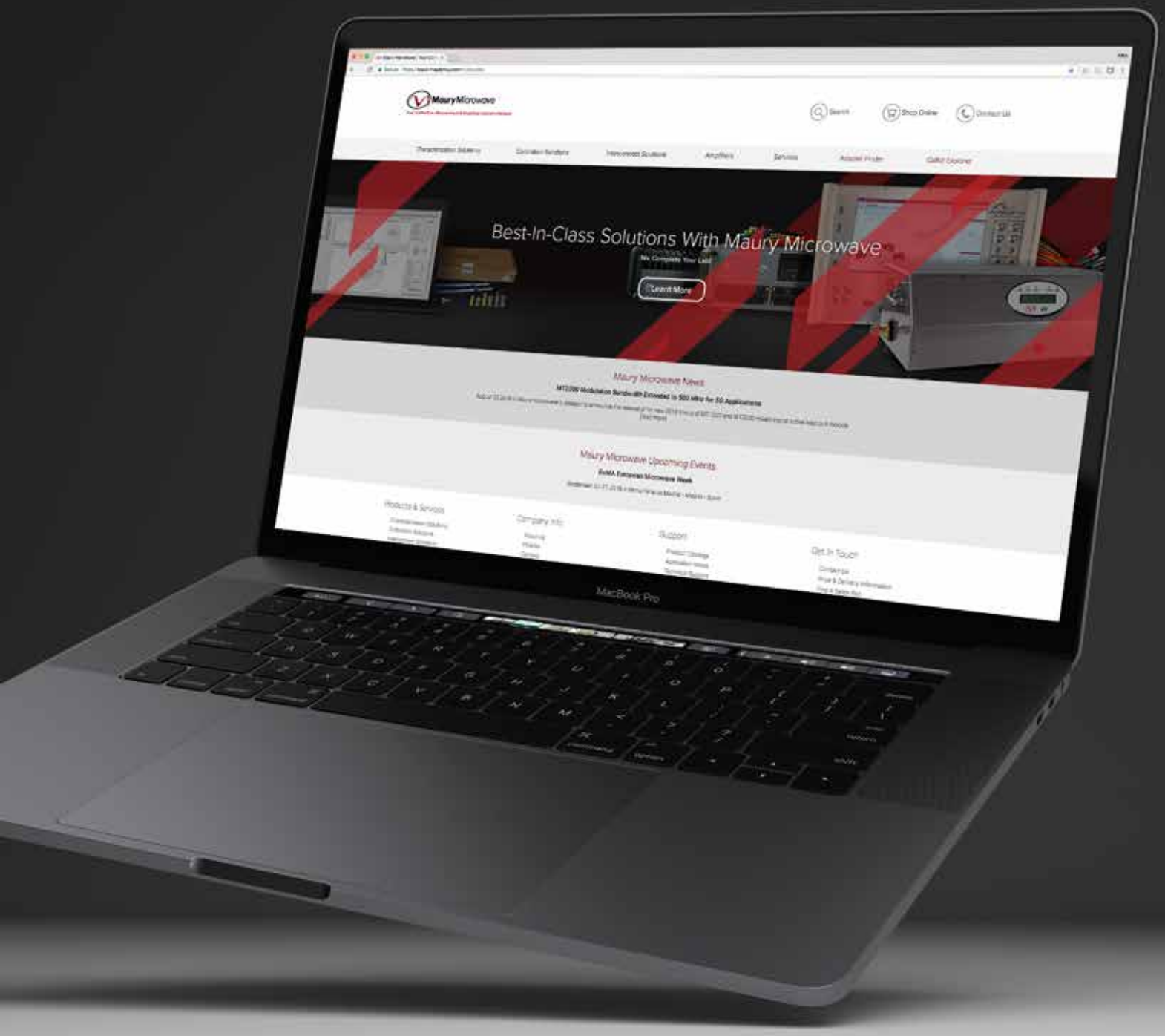
OUR PRODUCTS



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