

KEYSIGHT TECHNOLOGIES (AGILENT HP)

E4991A

The Keysight (formerly Agilent) E4991A is an RF impedance and material analyzer designed to deliver high-precision component and material evaluation from 1 MHz to 3 GHz. It features a basic impedance measurement accuracy of $\pm 0.8\%$ and provides a comprehensive set of sweep parameters including frequency, AC signal level, and DC bias. Operating on a Windows-based architecture, the analyzer includes built-in VBA programming capabilities for streamlined automation. With available options, the E4991A can perform direct read-outs of material permittivity and permeability, as well as complex on-wafer and temperature characteristic measurements.

SPECIFICATIONS

General

Interfaces	LAN, GPIB
Display	Color LCD with Windows-styled user interface
Internal Storage	Internal HDD and 3.5-inch 1.44 MB Floppy Disk Drive
Warm-up Time	30 minutes

Physical

Power Supply	90 to 132 VAC / 198 to 264 VAC, 47 to 63 Hz, 350 VA max
Operating Temperature	5 to 40 °C °C

Test Signal Characteristics

Frequency Range	1 MHz to 3 GHz
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Measurement Parameters

Impedance Parameters	$ Z $, $ Y $, θ , R, X, G, B, L, C, D, Q, $ \Gamma $, Γ_x , Γ_y
Material Measurement Parameters	Permittivity (ϵ), Permeability (μ) (Option dependent)

Measurement Range and Accuracy

Basic Impedance Accuracy	$\pm 0.8\%$
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Sweep Characteristics

Sweep Parameters	Frequency, AC Level, DC Bias
Number of Sweep Points	2 to 801 points

Display and Analysis

Programming / Scripting	Built-in VBA (Visual Basic for Applications) programming function
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Material Measurement (Optional)

Material Measurement	Direct read-out permittivity and permeability (Option dependent)
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General Specifications

On-Wafer Measurement	Supported (Option dependent)
Temperature Characteristic Measurement	Supported (Option dependent)
Test Fixture Compatibility	Supports various test fixtures for components

Inputs & Outputs

Test Port Connector	7 mm (APC-7) on test head
Output Impedance	50 Ω (nominal)

Performance

DC Bias (Option 001)	±40 V, ±50 mA
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Calibration & Correction

Calibration Methods	Open, Short, Load, Low-Loss Capacitor
Compensation Methods	Open, Short, Port Extension, Fixture Electrical Length

Frequency

Frequency Resolution	1 mHz
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Measurement

Impedance Measurement Range	120 mΩ to 52 kΩ (10% accuracy range)
Averaging	1 to 999 factor

Control & Trigger

Trigger Modes	Internal, External, Manual, Bus
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TECHNOLOGY

RF Impedance and Material Analysis

APPLICATIONS

High-frequency component evaluation, dielectric and magnetic material characterization, on-wafer testing

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