

KEYSIGHT TECHNOLOGIES (AGILENT HP)

4191A

The HP 4191A is an RF Impedance Analyzer designed by Hewlett-Packard (later Agilent/Keysight) for fully automatic, high-performance measurement of impedance parameters of electronic devices and materials. Operating from MF to the UHF region, it features a built-in frequency synthesizer, dual-mode digital sweep operations, and an integrated DC bias source.

SPECIFICATIONS

General

Interfaces	HP-IB (IEEE-488)
Display	Dual 4.5-digit digital displays
Warm-up Time	30 minutes

Physical

Power Supply	100, 120, 220 V $\pm 10\%$, 240 V $+5\%/-10\%$, 48 to 66 Hz, ≤ 150 VA
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	425.5 mm × 235 mm × 574 mm mm
Weight	approx. 24 kg kg

Stimulus AC Signal Characteristics

Frequency Range	1 MHz to 1000 MHz
Frequency Resolution	100 kHz to 200 kHz (100 Hz to 200 Hz optional)
Frequency Accuracy	± 15 ppm
Test Signal Source	Built-in synthesizer

Measurement Capabilities & Parameters

Primary Measurement Parameters	Resistance (R), Reactance (X), Conductance (G), Susceptance (B), Inductance (L), Capacitance (C), Impedance ($ Z $), Admittance ($ Y $)
Secondary Measurement Parameters	Dissipation factor (D), Quality factor (Q), Phase angle, Reflection parameters
Impedance Measurement Range ($ Z $, R)	1.0000 Ω to 99.999 k Ω
Reactance Measurement Range (X)	1.0000 Ω to 99.999 k Ω
Admittance Measurement Range ($ Y $)	10.000 μ S to 999.99 mS
Conductance Measurement Range (G)	10.000 μ S to 999.99 mS
Inductance Measurement Range (L)	0.1000 nH to 99.999 mH
Capacitance Measurement Range (C)	0.1000 pF to 99.999 μ F

DC Bias Source

Internal DC Bias Voltage Range	Up to ±40 V
DC Bias Sweep Capability	Swept voltage bias supported

Sweep & Measurement Speed

Sweep Types	Linear, Logarithmic
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Display & User Interface

Measurement Display Resolution	4.5 digits (simultaneous readout of two parameters)
Frequency Control	Front panel keyboard controlled

Calibration & Compensation

Calibration Functions	Automatic calibration
Self-Test Capability	Integrated self-test diagnostic mode
Electrical Length Compensation Range	0 to 99.9 cm

Measurement Speed

Measurement Time	150 ms (Normal mode), 45 ms (High-speed mode)
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Test Signal Source

Test Signal Level Range	-2 dBm to -15 dBm (continuously variable)
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Measurement Control

Trigger Modes	Internal, External, Manual
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Measurement Performance

Reference Impedance	50 Ω
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Inputs & Outputs

Recorder Output	0 to 1 V (for X, Y1, Y2 analog outputs)
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Hardware Options & Connectivity

Test Port Connector	APC-7
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DC Bias

DC Bias Voltage Resolution	10 mV (0 to ±9.99 V), 100 mV (±10.0 to ±40.0 V)
DC Bias Voltage Accuracy	±(0.12% of setting + 15 mV)

Measurement Modes

Deviation Measurement Modes	Delta, Delta percent (Δ, Δ%)
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TECHNOLOGY

RF Impedance Analysis

APPLICATIONS

Electronic device and material impedance measurement

