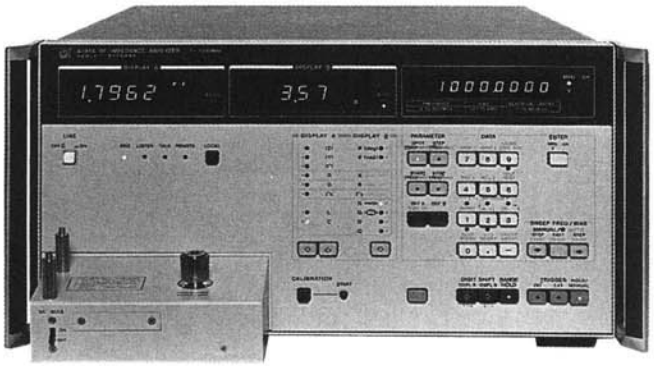
COMPONENT MEASUREMENT

RF Impedance Analyzer

HP 4191A

- 1 to 1000 MHz variable test frequency with sweep capability
- Direct reading of $|Z| - \theta$, $|Y| - \theta$, $|\Gamma| - \theta$; L • C – R • G • D • Q R – X, G – B, Γx – Γy
- High resolution—4½ digit max
- Wide measuring range—1 m – 100 k ($|Z|$)
- Versatile, easy-to-use test fixtures



HP 4191A (Shown with Opt 907 Handles)

DESIGNED FOR HP-IB SYSTEMS

Description

The HP 4191A RF Impedance Analyzer measures 14 parameters with a maximum resolution of 4½ digits. The internal synthesizer provides variable frequencies from 1 MHz through 1000 MHz covering the UHF, VHF, and video bands with automatic sweep capability. An internal dc bias supply with auto sweep function covers the voltage range of ±40 V in 10 mV steps.

The HP 4191A permits reliable measurements over a wide measuring range. Its outstanding repeatability, frequency response, and accuracy are made possible by a unique error-correction capability and specially designed test fixtures. These features allow the HP 4191A to be used in evaluating electronic materials, components, and circuitry.

The internal synthesizer provides a maximum resolution of 100 Hz (Option 002) with an accuracy of 3 ppm, allowing small changes in the resonant frequency of the device under test to be easily detected. The swept frequency capability aids in the analysis of frequency characteristics of the device.

Two complete front-panel settings (parameter selection and the sweep control) can be stored in a non-volatile memory and recalled at any time with a single key operation. This, together with the standard HP-IB interface, makes the HP 4191A extremely efficient as either a standalone or a systems instrument.

These unique features permit very wide applications in: (1) semiconductor testing such as surface state evaluation at high frequencies (C-V/G-V and conductance (G/ω-ω) characteristics), and the input/output impedance evaulation of diodes and transistors, (2) resonator, filter, and magnetic and dielectric materials testing, (3) evaluation of LCR components such as high-frequency chip and leaded components, and (4) testing of communications-related components such as cables, connectors, etc.

Specifications (Refer to data sheet for complete specifications)

Parameter measured: $|Z| - \theta$, $|Y| - \theta$, $|\Gamma| - \theta$, R – X, G – B, Γx – Γy L–R • G • D • Q, C–R • G • D • Q

Display: 4½ digit, max display 19999 counts

Deviation measurement (deviation from stored reference)
Δ: −19999 to +19999 counts Δ%: −1999.9 to +19999.9%

Measuring signal (23 ± 5° C)
Frequency range: 1 MHz to 1000 MHz
Frequency step:
Standard: 100 kHz, 1 to 500 MHz 200 kHz, 500 to 1000 MHz
Opt 002: 100 Hz, 1 to 500 MHz 200 Hz, 500 to 1000 MHz
Frequency accuracy: ±3 ppm
Signal level (into 50Ω): −20 ±3 dBm
Frequency control: spot and swept

Measuring mode
Spot measurement: At specific frequency (or dc bias)
Swept measurement: Manual or automatic sweep from start to stop frequency (or dc bias) at step frequency (or dc bias) rate in linear or logarithmic form

Auto calibration: Automatic error compensation referenced to connected terminations (0 Ω, 50 Ω, 0 S), 51 frequencies including start and stop frequencies

Electrical length compensation: Automatic compensation for electrical length of test fixtures (Range: 0 to 99.99 cm)

Internal dc bias: Voltage range: −40 to +40 V, 10 mV step
Setting accuracy: 0.1% of setting +10 mV
Bias control: spot and swept

External dc bias: Voltage range: −40 to +40 V
Max allowable current: 100 mA

Key status memory: Two sets of measuring conditions can be stored and recalled at any time. These conditions are kept in storage even when LINE is turned off.

Ranging: Auto/Range hold

Trigger: Internal, External, or Manual

Self-test: Automatic internal program test

HP-IB data output and remote control: standard

$|\Gamma|$–θ/Γx-Γy Measurement

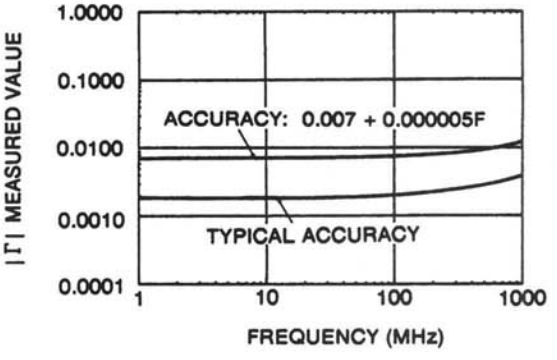
Measuring range: $|\Gamma|$, Γx, Γy: 0.0001 to 1.0000
θ: 0° to ±180.00° (0 to ± πrad.)
$|\Gamma|$,Γx,Γy resolution: 0.0001

Reference Data (Not Specified)

Temperature coefficient for $|\Gamma|$: 0.0001/° C (23 ± 5° C)

Measuring time: <800 ms or <250 ms (high speed mode)

Frequency switching time: ≤ 200 ms



General

Temperature: 0 - 55° C, <95% RH

Power: 100, 120, 220 V ± 10%, 240 V + 5% – 10%, 48 – 66 Hz, 150 VA max

Size: 425.5 mm W × 230 H × 574 mm D (16.75 in × 9 in × 22.6 in)

Weight: Approx 24 kg (52.8 lb)

Accessories furnished: Accessory case (with reference terminations included)

Accessories Available

	Price
HP 16091A Coaxial Test Fixture	$570
HP 16092A Spring Clip Test Fixture	$555
HP 16093A Binding Post Test Fixture	$225
HP 16093B Binding Post Test Fixture	$240
HP 16094A Probe Fixture	$207

Refer to page 357 for accessories.

Ordering Information

HP 4191A RF Impedance Analyser	$20,450
Opt W30 Extended repair service. See page 671.	+$465
Opt 002 100 Hz/200 Hz resolution synthesizer	+$2,190
Opt 004 Recorder Outputs	+$560