



# COMPONENT & SEMICONDUCTOR MEASUREMENT

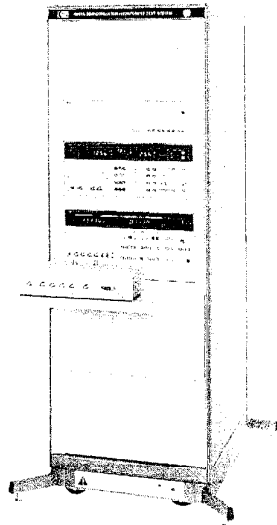
## Semiconductor/Component Test System

### Model 4061A

- Ready to use—supplied with 7 turn-key application pacs
- Reliable impedance and current measurements with one probing
- Productivity improvement through accurate and fast measurement over wide range



DESIGNED FOR  
**HP-IB**  
SYSTEMS



HP 4061A

### Description

The HP 4061A Semiconductor/Component Test System is a dedicated system for making efficient, automatic evaluation of the fundamental characteristics of semiconductor and electronic components required in R & D and production areas. This system employs reliable, accurate measurements and high speed data processing to perform more reliable evaluations with speed and less manpower. The HP 4061A is supplied with 7 sophisticated applications programs and is flexible in both software and hardware. Thus, the system can output measurement results in nearly any required data format.

The switching subsystem, designed especially for use with the HP 4061A, allows both impedance and current measurement without changing DUT connection. Using this new switching subsystem, and by making impedance measurements, the HP 4061A performs evaluation of Doping profile, Oxide capacitance, Flat band condition, Threshold voltage, Surface charge, and Minority carrier life time/surface generation velocity. The HP 4061A also measures leakage current and reverse/forward current-voltage characteristics. Surface state density evaluation, using both high (e.g., 1 MHz) and low frequency (Quasi-static) C-V measurements and data processing are also possible by making modifications to system software.

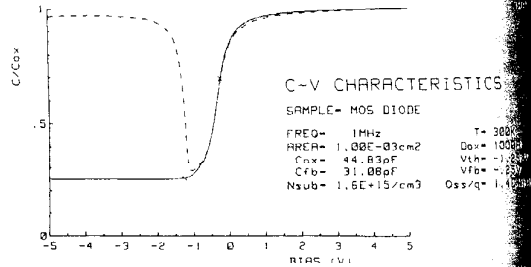
The system offers significant improvement in both yield and quality in production through fast and reliable measurements and evaluations. It is also a valuable evaluation tool for the development of new materials and devices. The HP 4061A provides the flexibility to meet the future measurement requirements of the electronics industry.

### System Configuration

- HP 4140B pA Meter/DC Voltage Source
- HP 4275A Multi-frequency LCR Meter
- Switching Subsystem
- HP 29402C 56-inch Rack Cabinet

### Furnished Application Software

Semiconductor high/low frequency C-V characteristics, I-V characteristics, C-t characteristics and Zerbst analysis, Impedance Frequency/Bias characteristics, Ideal C-V curve.



### Specification

For detailed specifications on each of the instruments used in the HP 4061A, refer to the individual data sheets.

### Switching Subsystem

The switching subsystem consists of a switch control module and a switching module with interconnecting cables.

**Function:** Switches connection from DUT to either Multi-frequency LCR Meter or the pA Meter/DC Voltage source.

**System Measurement Range** (only deviations from individual instrument specifications are listed.)

### Impedance Measurements (HP 4275A)

**Frequency range:**  $\leq 1$  MHz

**Measurement parameters:** C-G

**Capacitance:**  $\leq 2000$  pF (with  $D \leq 0.1$ )

**\*Accuracy:** (accuracy of HP 4275A)  $\times 1.5 + \Delta C$  (at 23°C)

$$\Delta C = 1.4 \times 10^{-3} C \times f^2 \text{ (pF)} + 5 \text{ counts}$$

**Conductance:**  $\leq 12$  mS ( $D \leq 0.1$ )

**\*Accuracy:** (accuracy of 4275A)  $\times 1.5 + \Delta G$  (at 23°C)

$$\Delta G = 6 \times 10^{-3} C \times f(S) + 5 \text{ counts}$$

\* f: frequency in MHz

Cx: Measured capacitance value in pF

At 5°C to 40°C,  $\Delta C$  and  $\Delta G$  doubles. Example: Assuming 1000 pF and  $f = 1$  MHz,  $C = (1.4 \times 10^{-3} \cdot 10^3 \cdot (10^6)^2) / 1000$  counts = 1.4 pF + 5 counts

### Current Measurements (HP 4140B)

**Accuracy:** (accuracy of HP 4140B)  $\times 1.5 + 5$  counts

After one-hour warmup and at DUT terminal of switching module

### Impedance Measuring Section (HP 4275A)

See the HP 4275A's page.

### Current Measurement Section (HP 4140B)

See the HP 4140B's page.

### General Information

**Operating temperature:** 5°C to 40°C,  $\leq 70\%$  RH at 40°C

**Power:** 100, 120, 220, and 240V, +5% to 10%, 48 to 66 Hz, 300 VA

**Size:** 535 mm W x 1635 mm H x 770 mm D (21" x 64.4" x 30")

**Weight:** Approximately 125 kg (275 lbs).

### System Controller

HP 9000 Series 200 Model 226A/236A/226S/236S  
Technical Computer

### Ordering Information

**HP 4061A Semiconductor/Component Test System** (does not include controller)

**Opt. 001:**  $\pm 100$  V dc Bias for HP 4275A

**Opt. 002:** 1-3-5 Frequency Steps for HP 4275A

**Opt. 026\*:** System library for HP 9826A/S controller

**Opt. 036\*:** System library for HP 9836A/S controller

\*Must order either OPT. 026 or 036.

NOTE: Refer to HP 4061A data sheet for details