HP 4339B/4349B
High Resistance Meters

Product Overview

Within Budget.
Without Compromise.

Introducing the HP 4339B and HP 4349B High Resistance Meters used for making ultra-high resistance measurements.

For precision bench-top applications, the 1-channel HP 4339B is the premier solution for accurate high resistance and low current tests.

For high resistance testing in manufacturing environments, the HP 4349B offers simultaneous 4-channel high resistance measurements for increased test throughput.

Satisfy Your Needs For ...

High quality results

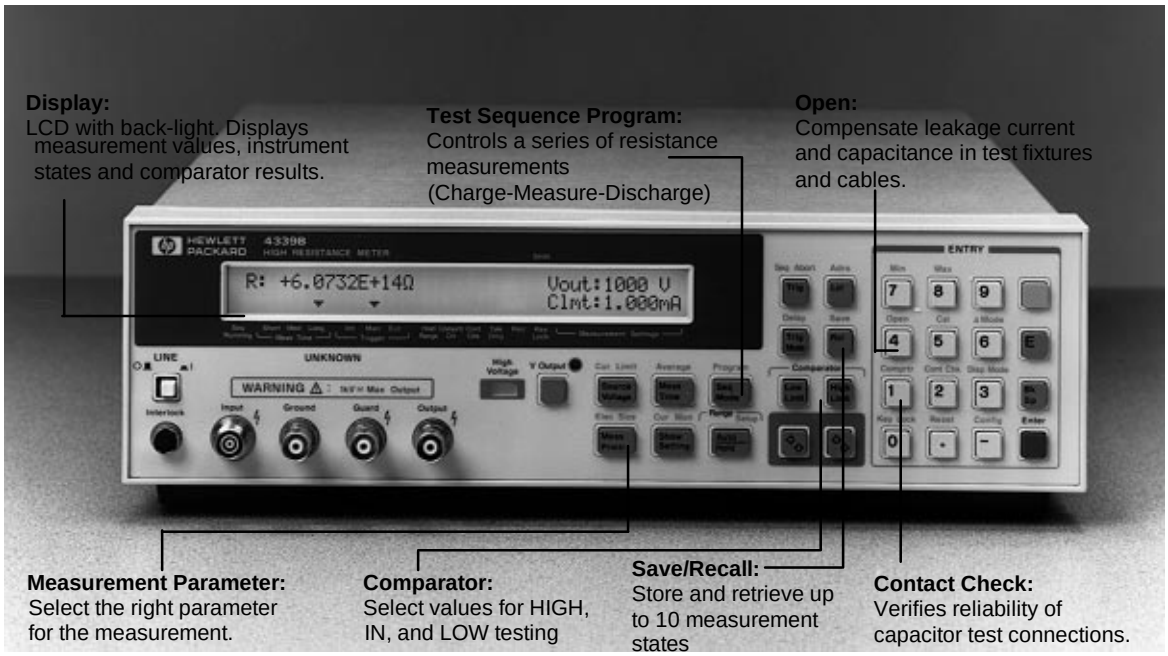
- High confidence testing with contact check function
- Remove parasitics with error correction
- Consistent data with 0.6% basic accuracy
- Compensation for handler contact chattering with trigger delay.

Versatile Measurements

- Select from four test parameters
- Use a variety of test fixtures and accessories
- Perform a charge-measure-discharge sequence with the test sequence program function
- Save and recall up to ten measurement setups

High test throughput: HP 4349B

- 9.5 ms measurements
- 4-channels for multiple DUTs
- 4-channel simultaneous testing
- Fast contact checking: 2 ms/measurement
- HP-IB and handler interfaces
- Ideal for high volume capacitor testing



HP 4349B 4-channel High Resistance Meter

Key parameters and Specifications

	HP 4339B	HP 4349B
Test Channels	1	4 (Option 001: 2 ch)
Test Voltage (Vdc)	0.1 to 1000	Requires external power source
Measurement parameters	R, I, ρv, ρs	R, I
Measurement Range (Ω)	10^3 to $1.6x10^{16}$	10^3 to 10^{15}
Basic Accuracy	0.6%	2%
Display Resolution	3 / 4 / 5 digits	3 / 4 / 5 digits
Measurement Time	10ms/30ms/390ms	9.5ms/28ms/98ms/397ms

High quality measurements with flexible hardware

- Resolve data to 5 digits (3, 4, or 5 digits selectable)
- Make precise measurements with 0.6% basic accuracy
- Verify DUT performance at the exact voltage rating
- Reliable and safety measurements with HP 16339A Component Test Fixture

HP 4339B solutions for high voltage material testing

- Resistivity mathematics built-in: surface and volume
- HP 16008B Resistivity Cell for solid samples
- Easy measurements with test sequence program function (controls charge-measure -discharge sequence)
- Customize your fixture cabling with the HP 16117C Test Leads

System features you need to be successful

- Maximize accuracy with error correction
- Test capacitor contact failure with contact check function
- Automate testing with HP-IB interface
- Reduce ground-loops with isolated handler interface
- Pass/fail testing with comparator function (High/In/Low)

Capacitor evaluation with HP 4349B

- Optimize capacitor Vdc rating tests
- Increase throughput four times with 4-channels
- Improve reliability with contact check
- Get low noise results with HP 16117E Test Lead

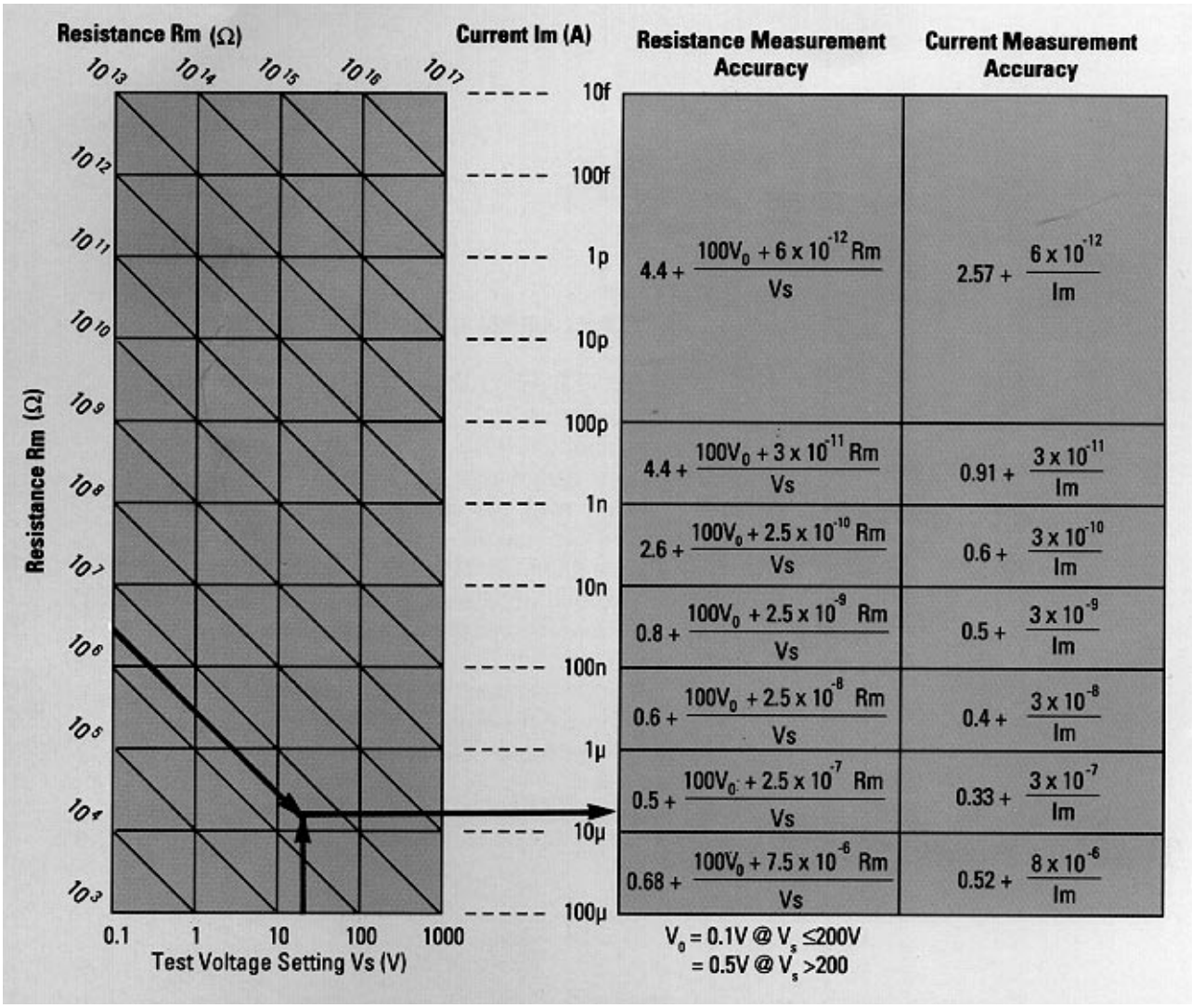


Figure 1. Conversion Diagram

Table 1. HP 4339B Measurement Accuracy (±% of reading)

Specifications

Measurement Accuracy

HP 4339B Test Conditions*:

1. Warm up time: ≥ 30 minutes
2. Ambient temperature: 23 ± 5°C
3. Test cable length: ≤ 1.5 meter.
4. Open error correction performed.
5. LONG measurement time setting.
6. Contact check: OFF

Accuracy Parameters:

Rm: Measured resistance value in ohms.
Im: Measured current value in amperes.
Vs: Source voltage in volts.
Vo: 0.1V@Vs≤200V, 0.5V@Vs> 200V

Accuracy Example:

To determine the accuracy of a measurement use Figure 1, Conversion Diagram.
For example: determine the accuracy of a 5MΩ (=5x10^{6}Ω) measurement at 50Vdc.
Rm = 5x10^{6}Ω
Vs = 50V

The intersection of Rm running parallel to the 10^{6}Ω diagonal line intersects the vertical Vs line at the second row from the bottom of the diagram. Moving horizontally across to Table 1, the following equation is found:

$$0.5 + \frac{100Vo + (2.5\times10^{-7}\times Rm)}{Vs}$$

Entering the values for Rm, Vo and Vs yields an accuracy of ±0.725%.

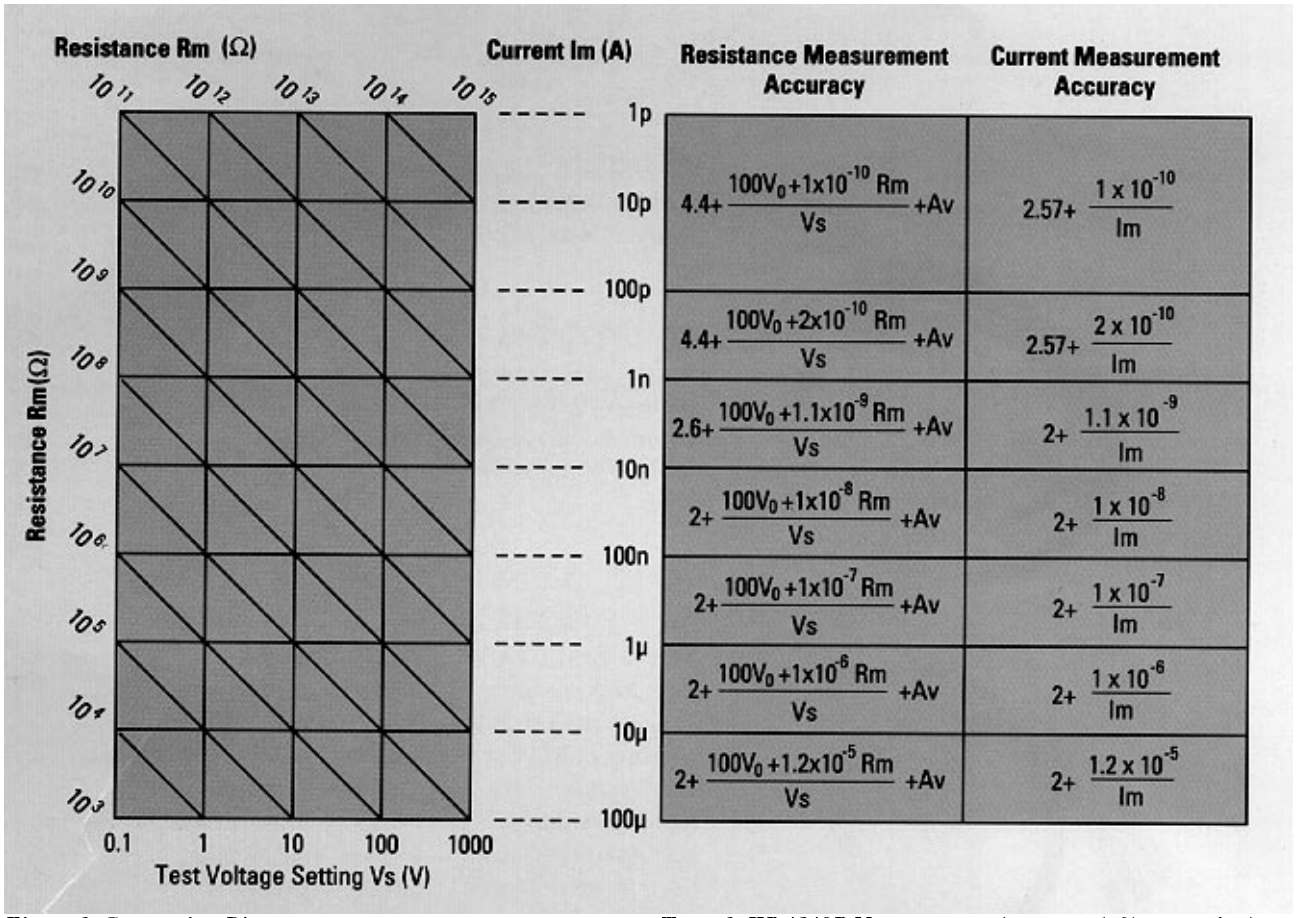


Figure 2. Conversion Diagram

Resistance Measurement Accuracy	Current Measurement Accuracy
$4.4+\frac{100V_0+1\times10^{-10}\,Rm}{Vs}+Av$	$2.57+\frac{1\times10^{-10}}{Im}$
$4.4+\frac{100V_0+2\times10^{-10}\,Rm}{Vs}+Av$	$2.57+\frac{2\times10^{-10}}{Im}$
$2.6+\frac{100V_0+1.1\times10^{-9}\,Rm}{Vs}+Av$	$2+\frac{1.1\times10^{-9}}{Im}$
$2+\frac{100V_0+1\times10^{-8}\,Rm}{Vs}+Av$	$2+\frac{1\times10^{-8}}{Im}$
$2+\frac{100V_0+1\times10^{-7}\,Rm}{Vs}+Av$	$2+\frac{1\times10^{-7}}{Im}$
$2+\frac{100V_0+1\times10^{-6}\,Rm}{Vs}+Av$	$2+\frac{1\times10^{-6}}{Im}$
$2+\frac{100V_0+1.2\times10^{-5}\,Rm}{Vs}+Av$	$2+\frac{1.2\times10^{-5}}{Im}$

Table 2. HP 4349B Measurement Accuracy (±% of reading)

HP 4349B Test Conditions*:

1. Warm up time: ≥ 30 minutes
2. Ambient temperature: 23 ± 5°C
3. Test cable length: ≤ 1.5 meter.
4. Open error correction performed.
5. 30ms measurement time setting.

Accuracy Parameters

Rm: Measured resistance value in ohms

Im: Measured current value in amperes.

External Power Supply parameters:

Vs: Source voltage in volts.

Vo: Source offset voltage in Volts.

Av: Voltage accuracy.

*Other test condition data available in the operation manual.

Other Specifications

Measurement Parameters/Ranges

Parameter	Range
HP 4339B	
R (dc resistance)	$10^3\Omega$ to 1.6 x $10^{16}\Omega$
I (dc current)	60fA to 100µA
ρs (surface resistivity)	Refer to operation manual
ρv (volume resistivity)	Refer to operation manual
HP 4349B	
R (dc resistance)	$10^3\Omega$ to $10^{15}\Omega$
I (dc current)	1pA to 100µA

Measurement Conditions and Functions

DC Test Voltage (HP 4339B): 0 to 1000V, 0.1V steps @ V ≤200V, 1.0V steps @ V > 200V
DC Test Voltage (HP 4349B): None supplied, use external power supplies and voltage data entry for resistance measurements. Maximum of 5000V input and 5 digit numerical entry.
Max Current (HP 4339B): 10mA @≤100V, 5mA @≤250V, 2mA @≤500V, 1mA @≤1kV
Number of Test Channels: HP 4339B: 1 channel, HP 4349B: 4 channels std., Option 001: 2 ch.
Ranging: Auto and Hold
Trigger: Internal, Manual and External
Delay Time (Trigger): 0 to 9999ms in 1ms steps
Test Cable Lengths: 2 meters maximum
Measurement Time (typical):
HP 4339B: 10 ms / 30 ms / 390 ms
HP 4349B: 9.5 ms / 28 ms / 98 ms / 397ms

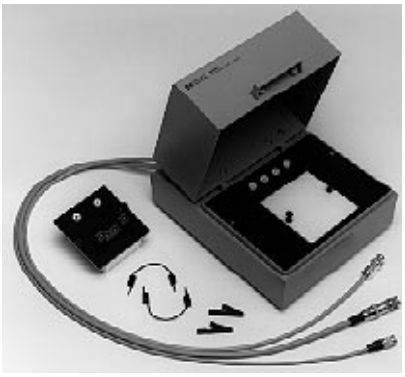
Other Instrument Functions

Error Correction: Open. (removes errors due to parasitics).
Comparator: HIGH, IN, and LOW for each of the test parameters.
Save/Recall: 10 instrument states from non-volatile memory.
Contact Check: Detects contact failure for capacitive devices. (2 ms).
HP-IB: HP's implementation of IEEE 488 for control and data.
Handler Interface: Negative logic and isolated. Signals are HIGH/IN/LOW, No Contact, EOM, Index, Alarm, Keylock, Ext. Trigger.

Physical Characteristics

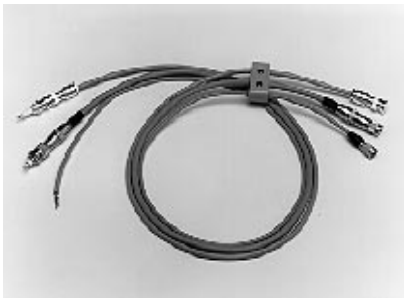
Power: 90-132 Vac or 198-264 Vac. 47-66 Hz. 45 VA (typical)
Operating Temperatur/Humidity: 0-45°C/≤95% RH @ 40°C.
Dimensions: 320(W) x 100(H) x 450(D) mm.
Weight: 6.5 kg (typical).

Test Fixtures/Accessories



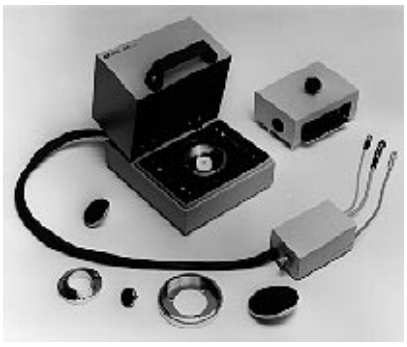
HP 16339A Component Test Fixture
For manual high voltage testing of discrete components. For HP 4339B only.

HP 16117B Low Noise Test Leads
Wide jaw clip leads for HP 4339B. 1 meter cable. Applicable measurement range: $\leq 1x10^{11}\Omega$ (Typical). For HP 4339B only. Option 001 adds a pair of pin-type probes. Option 002 adds a pair of socket adapters for connecting to a custom made fixture.



HP 16117C Low Noise test Leads
Interlock, voltage source and current sensing cables. Terminations are threaded triaxial, standard BNC and bare interlock pair. Female BNC and triaxial connectors are included. For HP 4339B only.

HP 16118A Tweezer Test Fixture
Tweezer test fixture for easy testing for chip components. Maximum applied voltage: 100Vdc. Applicable measurement range: $\leq 1x10^{11}\Omega$ (Typical). For HP 4339B only.



HP 16008B Resistivity Cell
For resistivity measurements of dry sheet samples. Upper electrode is spring loaded to apply pressure. Surface and volume measurements. Installed with 50mm diameter electrode. Option 001 adds 26 mm/76 mm diameter electrodes. Option 002 adds 26mm diameter electrode. Option 003 adds 76 mm diameter electrode. For HP 4339B only. Maximum applied voltage: 1000 Vdc. Sheet thickness range: 10 µm to 100 mm.

HP 16117E Low Noise Test Lead.
Male-triaxial to male-triaxial connectors. 1 meter cable. 1 female-triaxial connector included. For HP 4349B only.

HP 16064B LED Display/Trigger Box
Displays comparator status. Cable length 1.5 meters. manual external trigger. For HP 4339B only.

Ordering Information

HP 4339B High Resistance Meter

Furnished accessories: Operation manual, shunt connector, power cable.
(Must specify manual language using the manual option, ABA or ABJ.)

Test fixtures must be ordered separately.

HP 4349B high Resistance Meter

Furnished accessories: Operation manual and power cable.
(Must specify the manual language using the manual option, ABA or ABJ.)

Note: external power source required for resistance measurements. Recommendation for external power source for measurement of 1 GW sample @ 100Vdc with accuracy ≤±10%.

Ripple: ≤1 mVrms (50/60 Hz)
Wide band noise:
≤5μVrms/$\sqrt{Hz}$ (50 Hz)
Switching noise: ≤50mVrms (100kHz)

HP 4349B Instrument Options:
001 Delete two channels (2-channel to 4-channel upgrade not available)

Manual Options:
ABA English Operation Manual
ABJ Japanese Operation Manual
0B0 Delete Operation Manual
0B1 Extra Operation Manual

Service Options:
W30 Three Year Customer Return Repair
W32 Three Year Customer Return Calibration

Cabinet Options
1CM Rack Mount Kit
1CN Front Handle Kit
(Rack flange and handle kit is not compatible)

Cal. Certificate Option:
UK6 Commercial Cal. Certificate w/Test Data

HP 4339B Test Fixtures and Accessories

HP 16008B Resistivity Cell (50mm Diameter electrode)
001 Add 26 mm and 76 mm diameter electrodes
002 Add 26 mm diameter electrode
003 Add 76 mm diameter electrode

HP 16117B Low Noise Test Leads
001 Add Pin Probes
002 Add Soldering Sockets
HP 16117C Low Noise Test Leads
HP 16118A Tweezer Test Fixture
HP 16064B LED Display/Trigger Box
HP 16339A Component Test Fixture

HP 4349B Test Fixtures and Accessories

HP 16117E Low Noise Test Lead

For more information on Hewlett-Packard Test and Measurement products, applications, or services please call your local Hewlett-Packard sales office. A current listing is available via the Web through AccessHP at http://www.hp.com. If you do not have access to the internet, please contact one of the HP centers listed below and they will direct you to your nearest HP representative.

United States:
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5301 Stevens Creek Blvd.
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1 800 452 4844

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Hewlett-Packard Canada Ltd.
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