



# Agilent 4339B/4349B High Resistance Meters

Product Overview

**Within Budget.  
Without Compromise.**

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

For precision bench-top applications, the 1-channel 4339B is the premier solution for accurate high resistance and low current tests. For high resistance testing in manufacturing environments, the 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: 4349B

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



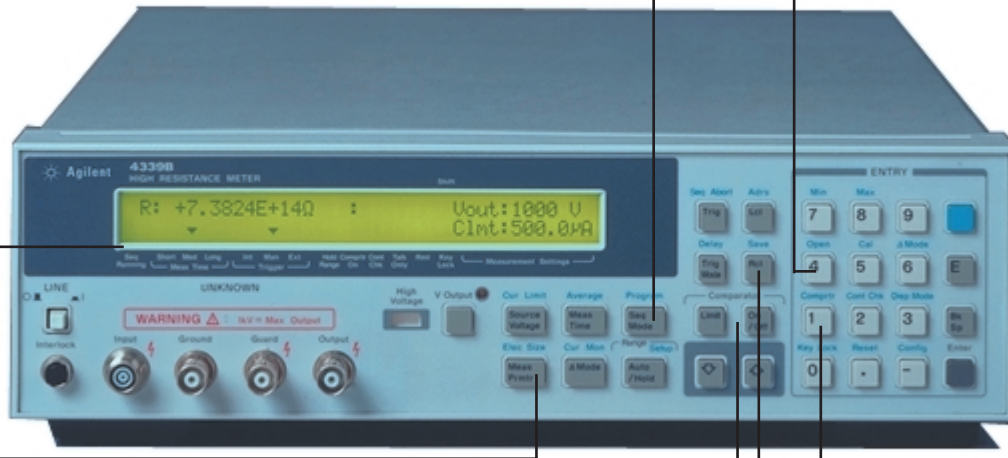
**Agilent Technologies**

Innovating the HP Way

**Display:**  
LCD with back-light. Displays measurement values. Instrument slates and comparator results.

**Test Sequence Program:**  
Controls a series of resistance measurements. (Charge-Measure-Discharge)

**Open:**  
Compensate leakage current and capacitance in test fixtures and cables.



**Measurement Parameter:**  
Select the right parameter for the measurement.

**Comparator:**  
Select values for High, IN, and LOW testing.

**Save/Recall:**  
Store and retrieve up to 10 measurement states.

**Contact Check:**  
Verifies reliability of capacitor test connections.



**Agilent 4349B 4-channel High Resistance Meter**

**Key parameters and Specifications**

	Agilent 4339B	Agilent 4349B
<b>Test Channels</b>	1	4 (Option 001: 2 ch)
<b>Test Voltage (Vdc)</b>	0.1 to 1000	Requires external power source
<b>Measurement Parameters</b>	R, I, pv, ps	R, I
<b>Measurement Range (Ω)</b>	10 <sup>3</sup> to 1.6x10 <sup>16</sup>	10 <sup>3</sup> to 10 <sup>15</sup>
<b>Basic Accuracy</b>	0.6%	2%
<b>Display Resolution</b>	3 / 4 / 5 digits	3 / 4 / 5 digits
<b>Measurement Time</b>	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 Agilent 16339A Component Test Fixture

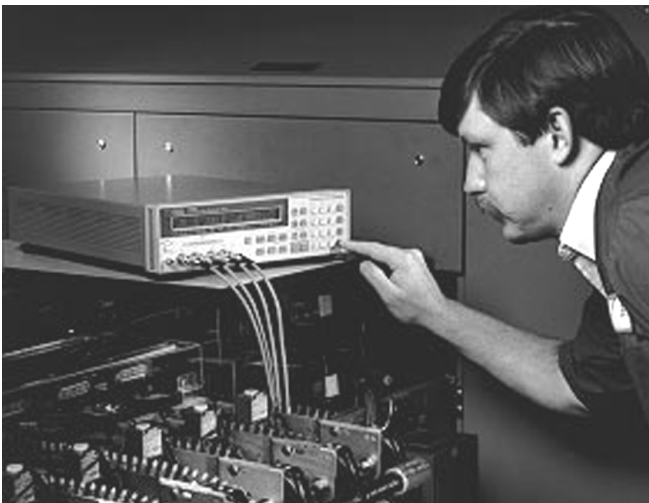
**4339B solutions for high  
voltage material testing**

- Resistivity mathematics built-in: surface and volume
- Agilent 16008B Resistivity Cell for solid samples
- Easy measurements with test sequence program function (controls charge-measure-discharge sequence)
- Customize your fixture cabling with the Agilent 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 GPIB interface
- Reduce ground-loops with isolated handler interface
- Pass/fail testing with comparator function (High/In/Low)



**Capacitor evaluation with the 4349B**

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

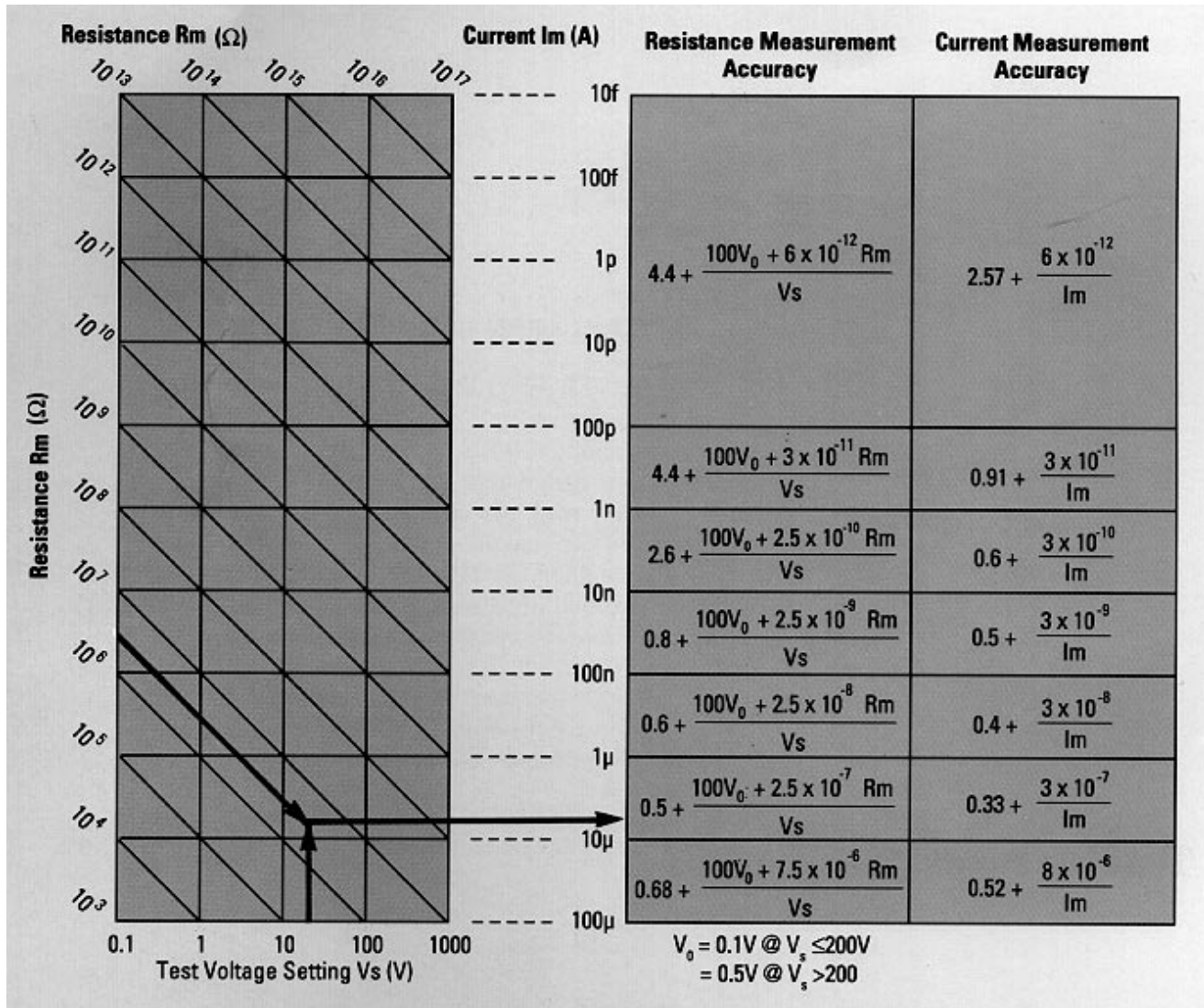


Figure 1. Conversion Diagram

Table 1. Agilent 4339B Measurement Accuracy ( $\pm\%$  of reading)

### Specifications Measurement Accuracy

#### Agilent 4339B Test Conditions\*:

1. Warm up time:  $\geq 30$  minutes
2. Ambient temperature:  $23^\circ\text{C} \pm 5^\circ\text{C}$
3. Test cable length:  $\leq 1.5$  meters
4. Open error correction performed
5. LONG measurement time setting
6. Contact check: OFF

#### Accuracy Parameters:

$R_m$ : Measured resistance value in  $\Omega$   
 $I_m$ : Measured current value in amperes

$V_s$ : Source voltage in volts

$V_0$ :  $0.1V @ V_s \leq 200V$ ,  $0.5V @ V_s > 200V$

#### Accuracy Example:

To determine the accuracy of a measurement use Figure 1, Conversion Diagram.

For example: determine the accuracy of a  $5M\Omega$  ( $=5 \times 10^6\Omega$ ) measurement at 50Vdc.

$R_m = 5 \times 10^6\Omega$

$V_s = 50V$

The intersection of  $R_m$  running parallel to the  $10^6\Omega$  diagonal line intersects the vertical  $V_s$  line at the second row from the bottom of the diagram. Moving horizontally across to Table 1, the following equation is found:

$$0.5 + \frac{100V_0 + (2.5 \times 10^{-7} \times R_m)}{V_s}$$

Entering the values for  $R_m$ ,  $V_0$ , and  $V_s$  yields an accuracy of  $\pm 0.725\%$ .

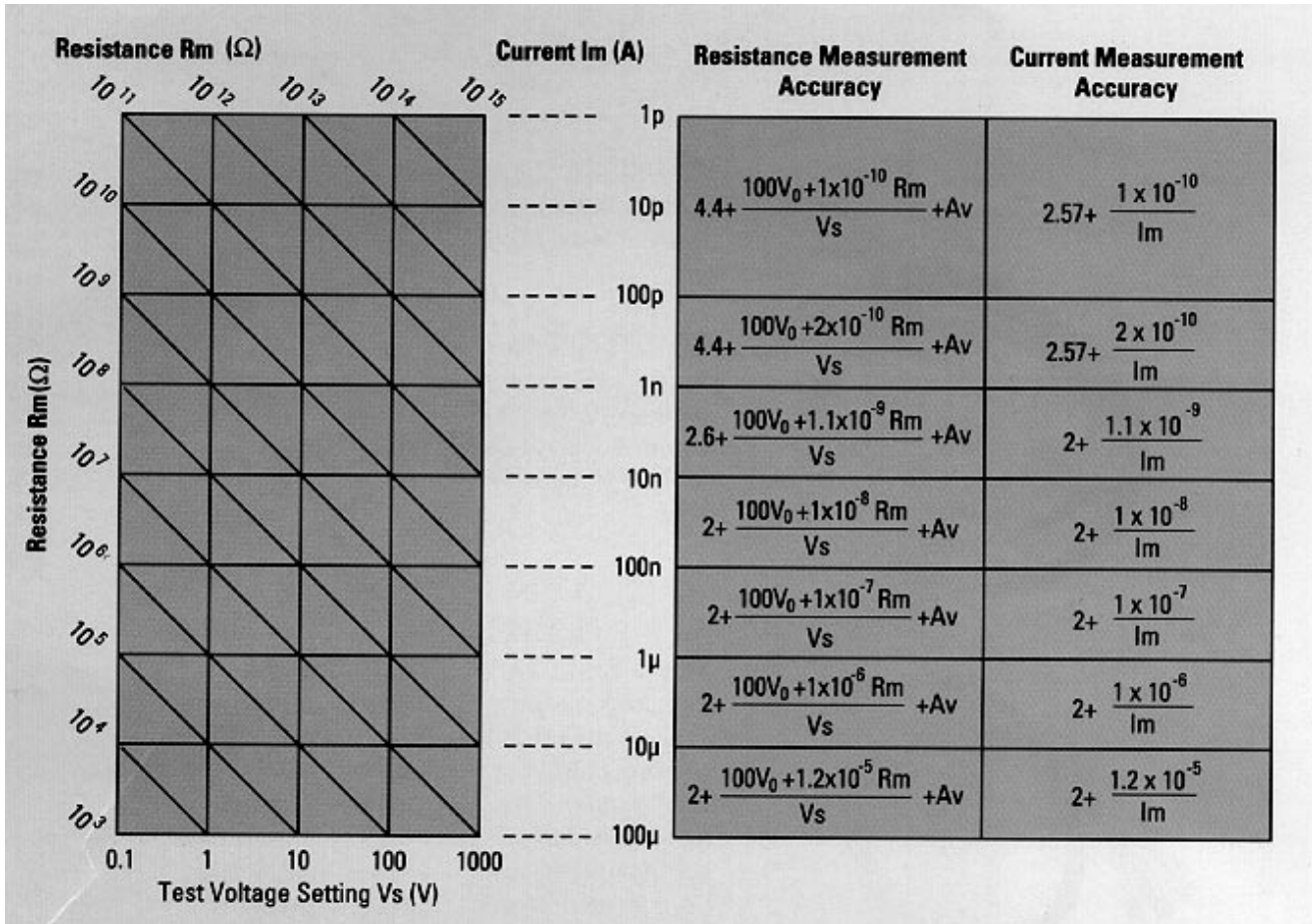


Figure 2. Conversion Diagram

Table 2. Agilent 4349B Measurement Accuracy ( $\pm\%$  of reading)

**Agilent 4349B Test Conditions\*:**

1. Warm up time:  $\geq 30$  minutes
2. Ambient temperature:  $23^\circ\text{C} \pm 5^\circ\text{C}$
3. Test cable length:  $\leq 1.5$  meters
4. Open error correction performed
5. 30ms measurement time setting

**Accuracy Parameters:**

$R_m$ : Measured resistance value in ohms  
 $I_m$ : Measured current value in amperes

**External Power Supply parameters:**

$V_s$ : Source voltage in volts  
 $V_0$ : Source offset voltage in Volts  
 $A_v$ : Voltage accuracy

\* Other test condition data available in the operation manual.

## Other Specifications

### Measurement Parameters/Ranges

Parameter	Range
<b>Agilent 4339B</b>	
R (dc resistance)	10 <sup>3</sup> Ω to 1.6 x 10 <sup>16</sup> Ω
I (dc current)	60fA to 100μA
ps (surface resistivity)	Refer to operation manual
pv (volume resistivity)	Refer to operation manual
<b>Agilent 4349B</b>	
R (dc resistance)	10 <sup>3</sup> Ω to 10 <sup>15</sup> Ω
I (dc current)	1pA to 100μA

### Measurement Conditions and Functions

*DC Test Voltage (4339B):* 0V to 1000V, 0.1Vsteps @ V ≤200V, 1.0V steps @ V >200V

*DC Test Voltage (Agilent 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 (Agilent 4339B):* 10mA @≤100V, 5mA @≤250V, 2mA @≤500V, 1mA @≤1kV

*Number of Test Channels:*

4339B: 1 channel,  
4349B: 4 channels std.,  
Option 001: 2 ch.

*Ranging:* Auto and Hold

*Trigger:* Internal, Manual, and External

*Delay Time (Trigger):* 0 ms to 9999ms in 1ms steps

*Test Cable Lengths:* 2 meters maximum

*Measurement Time (typical):*

4339B: 10 ms / 30 ms / 390 ms

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).

*GPIB:* Agilent'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 Hz-66 Hz. 45 VA (typical)

*Operating*

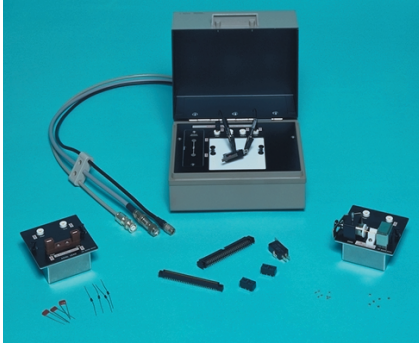
*Temperature/Humidity:*

0-45°C/≤95% RH @ 40°C.

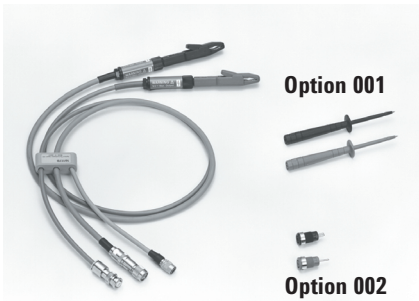
*Dimensions:* 320(W) x 100(H) x 450(D) mm.

*Weight:* 6.5 kg (typical).

## Test Fixtures/Accessories



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



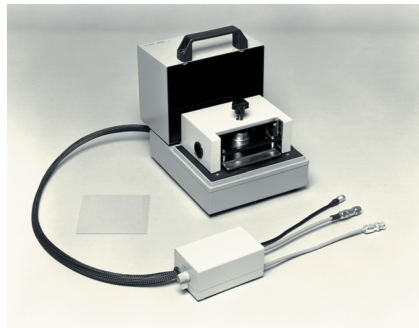
**Agilent 16117B Low Noise Test Leads**  
Wide jaw clip leads for 4339B. 1 meter cable. Applicable measurement range:  $\leq 1 \times 10^{11} \Omega$  (typical). For 4339B only. Option 001 adds a pair of pin-type probes. Option 002 adds a pair of socket adapters for connecting to a custom made fixture.



**Agilent 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 4339B only.



**Agilent 16118A Tweezer Test Fixture**  
Tweezer test fixture for easy testing for chip components. Maximum applied voltage: 100Vdc. Applicable measurement range:  $\leq 1 \times 10^{11} \Omega$  (typical). For 4339B only.



**Agilent 16008B Resistivity Cell**  
For resistivity measurements of dry sheet samples. Upper electrode is spring loaded to apply pressure. Surface and volume measurements. Installed with 50 mm 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 4339B only. Maximum applied voltage: 1000 Vdc. Sheet thickness range: 10  $\mu\text{m}$  to 100 mm.



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



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

## Ordering Information

### Agilent 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.

### Agilent 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  $\leq \pm 10\%$ .

*Ripple:*  $\leq 1$  mVrms (50/60 Hz)

*Wide band noise:*

$\leq 5 \mu\text{Vrms}/\sqrt{\text{Hz}}$  (50 Hz)

*Switching noise:*  $\leq 50$  mVrms (100 kHz)

### Agilent 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

### Agilent 4339B Test Fixtures and Accessories

#### Agilent 16008B Resistivity Cell (50 mm Diameter electrode)

- 001** Add 26 mm and 76 mm diameter electrodes
- 002** Add 26 mm diameter electrode
- 003** Add 76 mm diameter electrode

#### Agilent 16117B Low Noise Test Leads

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

### Agilent 4349B Test Fixtures and Accessories

#### Agilent 16117E Low Noise Test Lead

### Agilent Technologies' Test and Measurement Support, Services, and Assistance

Agilent Technologies aims to maximize the value you receive, while minimizing your risk and problems. We strive to ensure that you get the test and measurement capabilities you paid for and obtain the support you need. Our extensive support resources and services can help you choose the right Agilent products for your applications and apply them successfully. Every instrument and system we sell has a global warranty. Support is available for at least five years beyond the production life of the product. Two concepts underlie Agilent's overall support policy: "Our Promise" and "Your Advantage."

#### Our Promise

"Our Promise" means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you use Agilent equipment, we can verify that it works properly, help with product operation, and provide basic measurement assistance for the use of specified capabilities, at no extra cost upon request. Many self-help tools are available.

#### Your Advantage

"Your Advantage" means that Agilent offers a wide range of additional expert test and measurement services, which you can purchase according to your unique technical and business needs. Solve problems efficiently and gain a competitive edge by contracting with us for calibration, extra-cost upgrades, out-of-warranty repairs, and on-site education and training, as well as design, system integration, project management, and other professional services. Experienced Agilent engineers and technicians worldwide can help you maximize your productivity, optimize the return on investment of your Agilent instruments and systems, and obtain dependable measurement accuracy for the life of those products.

**Get assistance with all your test and measurement needs at:**  
[www.agilent.com/find/assist](http://www.agilent.com/find/assist)

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