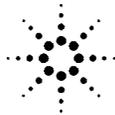


Agilent 16334A Test Fixture

Operation and Service Manual

Third Edition



Agilent Technologies

Innovating the HP Way

Agilent Part No. 16334-90010

September 2008

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Manual Printing History

The manual's printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates that are incorporated at reprint do not cause the date to change.) The manual part number changes when extensive technical changes are incorporated.

January 1990 First Edition (part number: 16334-90000)

December 1999 Second Edition (part number: 16334-90000)

September 2008 Third Edition (part number: 16334-90010)

Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific WARNINGS elsewhere in this manual may impair the protection provided by the equipment. In addition it violates safety standards of design, manufacture, and intended use of the instrument.

The Agilent Technologies assumes no liability for the customer's failure to comply with these requirements.

- **Ground The Instrument**

To avoid electric shock hazard, the instrument chassis and cabinet must be connected to a safety earth ground by the supplied power cable with earth blade.

- **DO NOT Operate In An Explosive Atmosphere**

Do not operate the instrument in the presence of flammable gasses or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

- **Keep Away From Live Circuits**

Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with the power cable connected. Under certain conditions, dangerous

voltages may exist even with the power cable removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

- DO NOT Service Or Adjust Alone

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

- DO NOT Substitute Parts Or Modify Instrument

Because of the danger of introducing additional hazards, do not install substitute parts or perform unauthorized modifications to the instrument. Return the instrument to a Agilent Technologies Sales and Service Office for service and repair to ensure that safety features are maintained.

- Dangerous Procedure Warnings

Warnings, such as the example below, precede potentially dangerous procedures throughout this manual. Instructions contained in the warnings must be followed.

WARNING

Dangerous voltages, capable of causing death, are presenting this instrument. Use extreme caution when handling, testing, and adjusting this instrument.

Safety Symbol

General definitions of safety symbols used on the instrument or in manuals are listed below.



Instruction Manual symbol: the product is marked with this symbol when it is necessary for the user to refer to the instrument manual.



Alternating current.



Direct current.



On (Supply).



Off (Supply).



In position of push-button switch.



Out position of push-button switch.



Frame (or chassis) terminal. A connection to the frame (chassis) of the equipment which normally include all exposed metal structure.

WARNING

This warning sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in injury or death to personnel.

CAUTION

This Caution sign denotes a hazard. It calls attention to a procedure, practice, condition or the like, which, if not correctly performed or adhered to, could result in damage to or destruction of part or all of the product.

NOTE

Note denotes important information. It calls attention to a procedure, practice, condition or the like, which is essential to highlight.

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Agilent Technologies certifies that this product met its published specifications at the time of shipment from the factory. Agilent Technologies further certifies that its calibration measurements are traceable to the United States National Institute of Standards and Technology, to the extent allowed by the Institution's calibration facility, or to the calibration facilities of other International Standards Organization members.

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For any assistance, contact your nearest Agilent Technologies Sales and Service Office. Addresses are provided at the back of this manual.

Typeface Conventions

| | |
|--|--|
| Bold | Boldface type is used when a term is defined. For example: icons are symbols. |
| <i>Italic</i> | Italic type is used for emphasis and for titles of manuals and other publications. |
| [Hardkey] | Indicates a hardkey labeled "Hardkey." |
| Softkey | Indicates a softkey labeled "Softkey." |
| [Hardkey] - Softkey1 - Softkey2 | Indicates keystrokes [Hardkey] - Softkey1 - Softkey2 . |

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1 **Operation**

This operation note provides complete information on the 16334A Test Fixture.

DESCRIPTION

The 16334A Test Fixture is designed for use with the instruments, type of LCR/Impedance meter.

The latest applicable instruments for 16334A test fixture is described in the Accessories Selection Guide for Impedance Measurements of 5965-4792E.

The 16334A is a direct attachment, 4-terminal pair type fixture which is equipped with a tweezer type probe for measurement of leadless components such as chip capacitors.

The tweezer tips are replaceable. The distance between the tweezer tips is continuously adjustable according to the distance between the DUT terminals. A compensation block is furnished for compensation to be minimize the effects of residual impedance and the stray admittance.

The specifications of the 16334A are given in Table 1-2, and the typical characteristics are shown in Figure 1-2, and listed in Table 1-3.

Figure 1-1

Product Overview

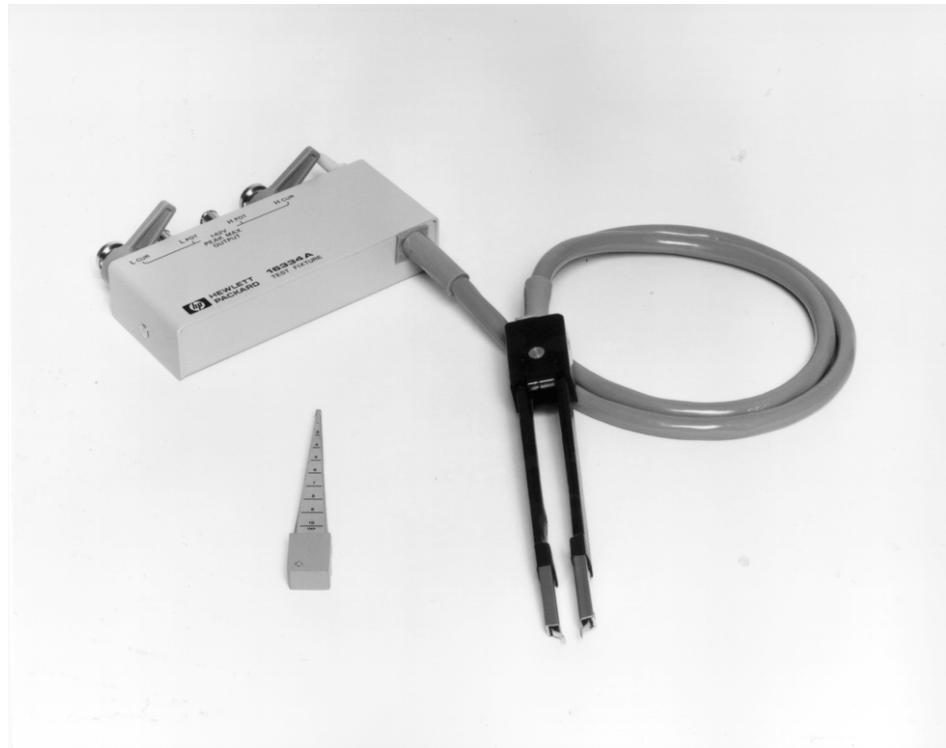


Table 1-1

Accessories

| Description | Agilent Part No |
|--------------------|--------------------|
| Compensation Block | 16334-60001 |
| Tweezer Tip | 16334•09002 (1ea.) |

Specifications

Table 1-2

| | |
|------------------------------|---|
| Function: | For use with 4192A, 4194A, 4274A, 4275A, 4276A, 4277A and 4278A instruments. Permits connecting miniature leadless components to the UNKNOWN terminals (4-terminal pair configuration) of the 4192A, 4194A, 4274A, 4275A, 4276A, 4277A, or 4278A. |
| Measurable Components: | Miniature components with terminals on opposite faces (Distance between component terminals \leq 10mm). |
| Terminal Configuration: | 4-terminal pair configuration from BNC connectors to the top of the tweezers (excluding the tweezer tips). |
| Cable Length: | Approximately 1m |
| Maximum Voltage: | \pm 42V peak max. (AC+DC) |
| Measurement Frequency Range: | 5 Hz to 15 MHz |
| Cable Length: | Approximately 1m (from BNC connector to the top of the tweezers) |
| Weight: | Approximately 0.29 kg |

Typical Characteristics

Table 1-3 Typical Characteristics

| Model | Applicable Measurement Range | | Incremental error (1 MHz \times f) | |
|---------------------|------------------------------|-----------------------|--------------------------------------|--------------------------------|
| | Parameter Value | Measurement Frequency | Parameter reading error (%) | Offset value for D |
| 4192A | Full range | Full range | $-2 \cdot (f/10)^2 \%^{*1}$ | $-0.02 \cdot (f/10)^2 \%^{*1}$ |
| 4194A | | below 15 MHz | | |
| 4274A | | Full range | - | - |
| 4275A | | | $-2 \cdot (f/10)^2 \%^{*1}$ | $-0.02 \cdot (f/10)^2 \%^{*1}$ |
| 4276A | | | - | - |
| 4277A ^{*2} | | | -0.02% | -0.0002% |
| 4278A ^{*2} | | | -0.02% | -0.0002% |

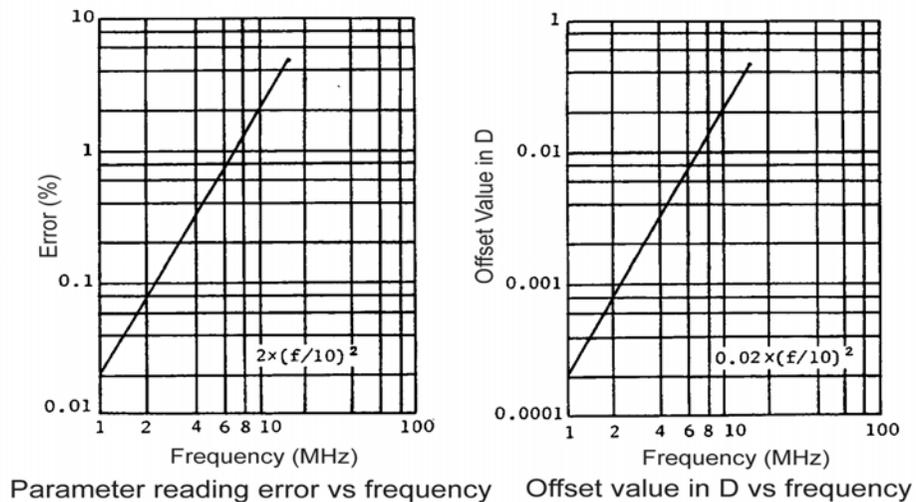
*1. There are some cases where the actual incremental error exceeds this limit when this fixture is used with an 4192A or 4275A.

*2. The maximum measurement frequency of the 4277A and 4278A is 1 MHz, so the incremental error is available only for 1 MHz measurements.

NOTE

f is the measurement frequency in MHz. The incremental error is available at the frequency range 1 MHz to 15 MHz, and incremental error applies after the completion of ZERO-OPEN/SHORT compensation.

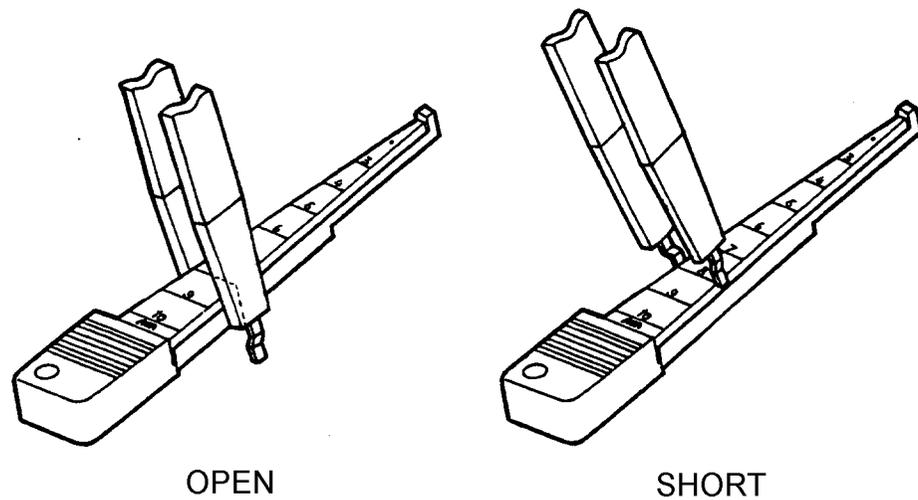
Figure 1-2 Incremental Error



ZERO OFFSET ADJUSTMENT

The 16334A has inherent residual impedance and stray admittance that affects the accuracy of the measurements. To compensate for, or negate, these residuals in order to minimize measurement error, the instrument's zero offset adjustment procedure should be performed. The zero offset adjustment procedure is described in the instrument's manual. When performing the zero offset adjustment, use compensation block Agilent PN 16334-60001 (furnished with probe). An illustration showing how to use the compensation block is shown in Figure 1-3.

Figure 1-3 **Zero Offset Adjustment**



OPERATION

Setup and measurement procedure is as follows:

1. Set the instrument's cable LENGTH to 1m.
2. Connect the 16334A directly to the UNKNOWN terminals of the instrument.
3. Perform the ZERO offset adjustment described in the instrument's operation manual.
4. Connect the DUT to the 16334A test fixture.

WARNING

DO NOT APPLY MORE THAN -42V OF DC BIAS VOLTAGE TO THE UNKNOWN TERMINALS. AN ELECTRICAL SHOCK HAZARD WILL EXIST DURING OPERATION WHEN THE DC BIAS VOLTAGE IS GREATER THAN -42V DC.

2 **Service**

Maintenance

An exploded view of the 16334A (for parts identification) is shown in Figure 2-1. Do not disassemble any further than shown. Maintenance consists principally of cleaning contacts and replacing worn or damaged parts. Take special care when cleaning contacts. To order parts, use the Agilent Technologies part numbers listed in Table 2-12-1. If a faulty part is located in an assembly that cannot be disassembled, order the next higher assembly or return the whole device to the nearest Agilent Technologies Sales/Service Office for repair or replacement.

Figure 2-1 Parts Identification

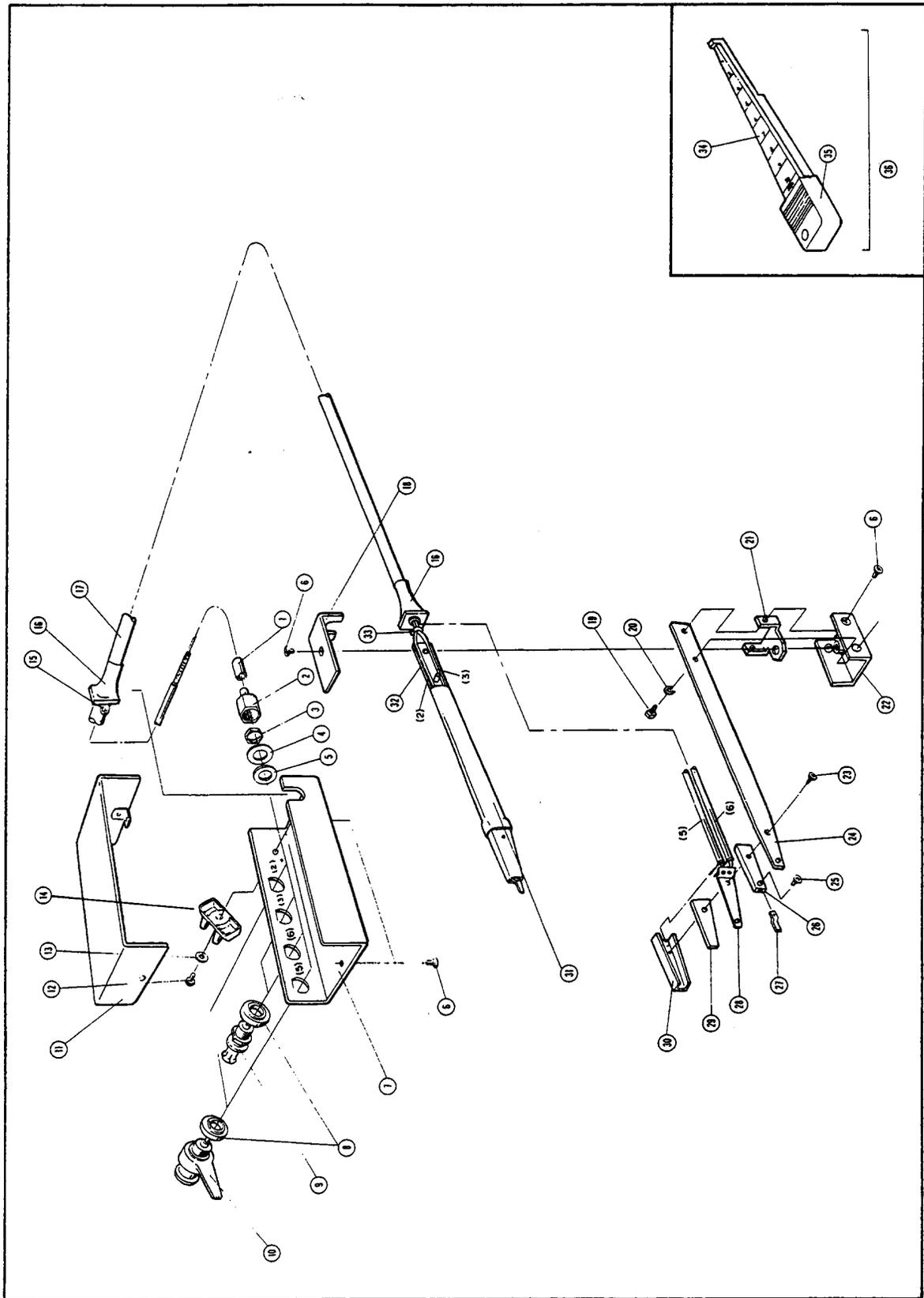


Table 2-1

Parts Identification

| Reference | Agilent Part No. | Qty. | Description | Note |
|-----------|------------------|-------------|------------------------|------|
| 1 | * | 4 | SLEEVE-METAL | 1 |
| 2 | * | 4 | NUT | 1 |
| 3 | * | 4 | NUT | 1 |
| 4 | * | 4 | WASHER | 1 |
| 5 | * | 4 | WASHER | 1 |
| 6 | 0515-0914 | 7 | SCREW | 1 |
| 7 | * | 1 | COVER-BOTTOM | 1 |
| 8 | * | 4 | INSULATOR | 1 |
| 9 | * | 2 | CONNECTOR-BNC | 1 |
| 10 | * | 2 | BNC-ASSY | 1 |
| 11 | 16334-04001 | 1 | COVER-TOP | |
| 12 | 0515-1550 | 1 | SCREW | |
| 13 | 2190-0206 | 1 | WASHER | |
| 14 | 16047-40000 | 1 | STOPPER | |
| 15 | 1400-0719 | 2 | CABLE-TIE | |
| 16 | 16334-40003 | 2 | CABLE BUSHING | |
| 17 | * | 105.5 cm | CABLE | 1 |
| 18 | 16334-01202 | 1 | ANGLE | |
| 19 | 16334-24002 | 1 | SCREW | |
| 20 | 2190-0584 | 1 | WASHER | |
| 21 | 16334-01213 | 1 | BRACKET | 2 |
| 22 | 16334-01211 | 1 | BRACKET | 2 |
| 23 | 0515-1873 | 2 | SCREW | |
| 24 | 16334-00612 | 1 | ARM PLATE (marked "L") | |
| 25 | 0515-1872 | 2 | MACHINE SCREW | |
| 26 | 16334-40001 | 2 | INSULATOR | |
| 27 | 16334-09002 | 2 | CONTACT (TWEEZER TIP) | |
| 28 | 16334-09001 | 2 | CONTACT | |

Table 2-1

Parts Identification

| Reference | Agilent Part No. | Qty. | Description | Note |
|-----------|------------------|---------|-------------------------|------|
| 29 | 16334-09003 | 2 | SPACER | |
| 30 | 16334-00601 | 2 | SHIELD | |
| 31 | 0890-0273 | 2x8.5cm | TUBE, HEAT SHRINKABLE | |
| 32 | 16334-00613 | 1 | ARM PLATE (marked "H") | |
| 33 | 1400-0249 | 2 | CABLE TIE | |
| 1 thru 33 | 16334-60010 | 1 | TEST FIXTURE | |
| 34 | 16334-00604 | 1 | PLATE | |
| 35 | 16334-40002 | 1 | BASE | |
| 36 | 16334-60001 | 1 | COMPENSATION BLOCK ASSY | |
| 21 (OLD) | 16334-01203 | 1 | BRACKET | 2 |
| 22 (OLD) | 16334-01201 | 1 | BRACKET | 2 |

Note 1 : Not separately replaceable. Order 16334-60010.

Note 2: For old designed (one screw) part, order the (OLD) part.

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