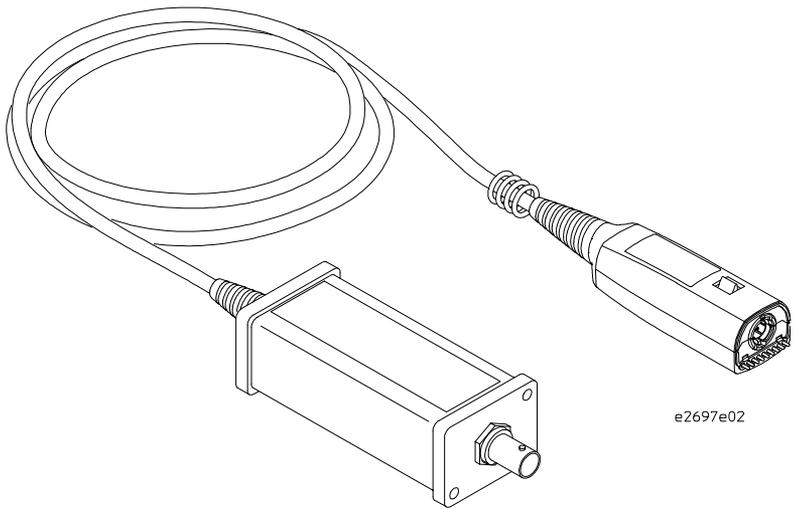

User's Guide

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E2697A 1 M Ω Impedance Adapter

In This Book

This guide provides user and service information for the E2697A 1 M Ω Impedance Adapter.

Chapter 1 gives you general information such as inspection, cleaning, accessories supplied, and specifications and characteristics of the probe.

Chapter 2 provides service information.

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E2697A 1 M Ω Impedance Adapter

The E2697A provides the 1 M Ω impedance input required by some oscilloscope probes for use with the 5485xA series Infiniium oscilloscopes. In addition, the E2697A has a built-in coupling control which allows you to switch from dc to ac coupling and a built-in attenuation control which allows you to switch from 10:1 to 1:1 attenuation.

To inspect the adapter

Inspect the shipping container for damage.

Keep a damaged shipping container or cushioning material until the contents of the shipment have been checked for completeness and the instrument has been checked mechanically and electrically.

Check the accessories.

Accessories supplied with the instrument are listed in "Accessories Supplied" in table 1-1 later in this chapter.

- If the contents are incomplete or damaged notify your Agilent Technologies Sales Office.

Inspect the adapter.

- If there is mechanical damage or defect, or if the adapter does not operate properly or pass the performance test, notify your Agilent Technologies Sales Office.
- If the shipping container is damaged, or the cushioning materials show signs of stress, notify the carrier as well as your Agilent Technologies Sales Office. Keep the shipping materials for the carrier's inspection. The Agilent Technologies Office will arrange for repair or replacement at Agilent Technologies' option without waiting for claim settlement.

Accessories Supplied

The following figure and table show the accessories supplied with the E2697A 1 M Ω Impedance Adapter.

Figure 1-1

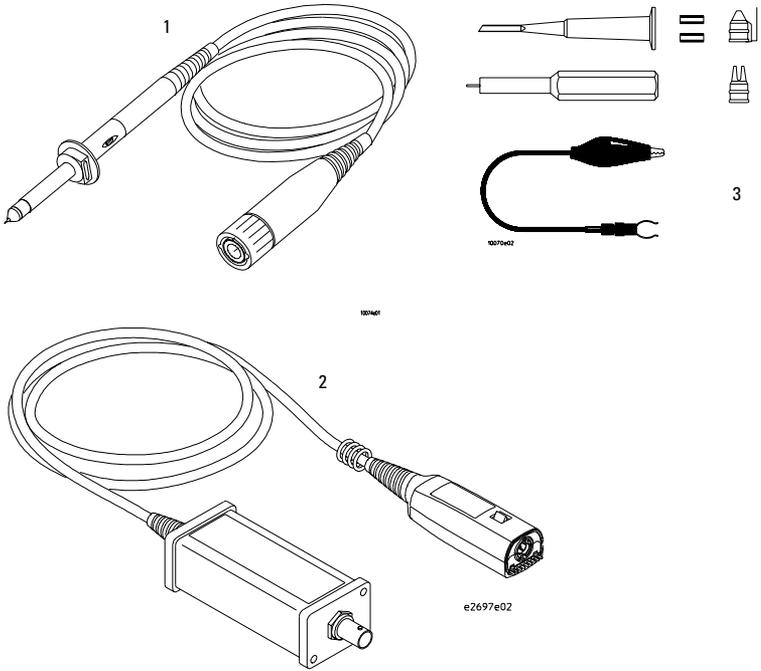


Table 1-1

Accessories Supplied

Item	Description	Qty	Agilent Part Number
1	500 MHz, 10:1 Passive Probe	1	10073C
2	1 M Ω Impedance Adapter	1	
3	10073C Probe Accessories	1	

Characteristics and Specifications

The following characteristics are typical for the active probe. The specification is a warranted parameter.

Table 1-2

Characteristics and Specifications	
Bandwidth (-3 dB)	500 MHz (with 10073C probe)
Rise and Fall Time (10% to 90%)	700 ps calculated from $t_r = \frac{0.35}{\text{Bandwidth}}$
Input Impedance¹	1 MΩ ±1% (~ 12 pF)
Input Dynamic Range	±0.8 V (internal attenuator at 1:1) ± 8.0 V (internal attenuator at 10:1)
Input Dynamic Range (with 10073C 10:1 probe)	±8.0 V (internal attenuator at 1:1) ± 80 V (internal attenuator at 10:1)
Input Coupling	dc, ac (7 Hz)
DC Attenuation	1.16:1 (internal attenuator at 1:1) ² 11.6:1 (internal attenuator at 10:1) ³
Offset Range	±5.0 V (internal attenuator at 1:1) ± 50 V (internal attenuator at 10:1)
 Maximum Input Voltage	±100 V (dc + ac)(ac < 100 kHz), CAT I

1 Denotes Warranted Specifications, all others are typical. Specifications are valid after a warm-up period and within ± 5 °C of the calibration temperature.

2 At scale settings > 200 mV/div signal size limited by input dynamic range.

3 At scale settings > 2 V/div signal size limited by input dynamic range.

General Characteristics

The following general characteristics apply to the active probe.

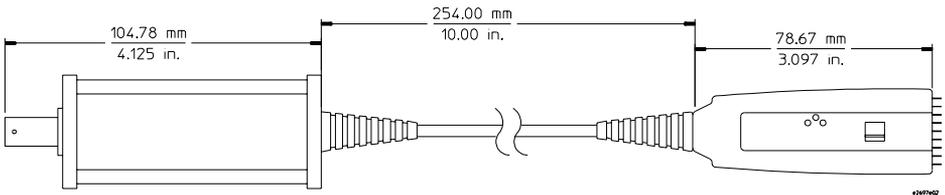
Table 1-3

General Characteristics

Environmental Conditions

	Operating	Non-operating
Temperature	0 °C to +40 °C	-40 °C to +70 °C
Humidity	up to 95% relative humidity (non-condensing) at +40 °C	up to 90% relative humidity at +65 °C
Power Requirements	+12 Vdc @ 1.9 mA typical +5 Vdc @ 51 mA typical -5 Vdc @ 26 mA typical -12 Vdc @ 1.9 mA typical 0.43 W	(voltages supplied by AutoProbe Interface)
Weight	approximately 0.69 kg	
Dimensions	Refer to the outline in figure 1-2.	
Pollution degree 2	Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.	
Indoor use		

Figure 1-2



E2697A 1 MΩ Impedance Adapter Dimensions

To use the adapter

The Infiniium family of oscilloscopes provides both power and offset control to the E2697A 1 M Ω impedance adapter through the front panel connector. Probe offset is changed by adjusting the vertical offset control on the Infiniium oscilloscope. The control should be adjusted to center your waveform within the dynamic range of the probe.

For best accuracy, you should calibrate the oscilloscope, adapter, and probe combination using the Infiniium probe calibration routine before using the 1 M Ω impedance adapter assembly. When the probe has been calibrated, the dc gain, zero offset, and offset gain will be calibrated. The controls for setting these parameters can be found by selecting Setup→[Channel Number]→Probes... from the Infiniium main menu.

Cleaning the probe

If the probe requires cleaning, disconnect it from the oscilloscope and clean it with a soft cloth dampened with a mild soap and water solution. Make sure the probe is completely dry before reconnecting it to the oscilloscope.

Introduction

This chapter provides service information for the E2695A 1 M Ω Impedance Adapter. The following sections are included in this chapter:

- Service strategy
- Returning to Agilent Technologies for service
- Troubleshooting and failure symptoms

Service Strategy

If the 1 M Ω impedance adapter is under warranty, normal warranty services apply. If the 1 M Ω impedance adapter is not under warranty, a failed adapter can be exchanged for a reconditioned one at a nominal cost.

To return the probe to Agilent Technologies for service

Before shipping the 1 M Ω impedance adapter to Agilent Technologies, contact your nearest Agilent Technologies Sales Office for additional details.

1 Write the following information on a tag and attach it to the 1 M Ω impedance adapter.

- Name and address of owner
- 1 M Ω impedance adapter model number
- 1 M Ω impedance adapter serial number
- Description of the service required or failure indications

2 Remove all accessories from the 1 M Ω impedance adapter.

Accessories include all cables. Do not include accessories unless they are associated with the failure symptoms.

3 Protect the probe by wrapping it in plastic or heavy paper.

4 Pack the probe in foam or other shock absorbing material and place it in a strong shipping container.

You can use the original shipping materials or order materials from an Agilent Technologies Sales Office. If neither are available, place 3 to 4 inches of shock absorbing material around the probe and place it in a box that does not allow movement during shipping.

5 Seal the shipping container securely.

6 Mark the shipping container as FRAGILE.

In any correspondence, refer to 1 M Ω impedance adapter by model number and full serial number.

Troubleshooting

- If your 1 M Ω impedance adapter is under warranty and requires repair, return it to Agilent Technologies. Contact your nearest Agilent Technologies Service Center.
 - If the failed 1 M Ω impedance adapter is not under warranty, you may exchange it for a reconditioned 1 M Ω impedance adapter. See "To Prepare the 1 M Ω Impedance Adapter for Exchange" in this chapter.
-

Failure Symptoms

The following symptoms may indicate a problem with the 1 M Ω impedance adapter or the way it is used. Possible remedies and repair strategies are included.

The most important troubleshooting technique is to try different combinations of equipment so you can isolate the problem to a specific 1 M Ω impedance adapter.

Probe Calibration Fails

Probe calibration failure with an oscilloscope is usually caused by improper setup. If the calibration will not pass, check the following:

- Check that the 1 M Ω impedance adapter passes a waveform with the correct amplitude.
- If the 1 M Ω impedance adapter is powered by the oscilloscope, check that the offset is approximately correct. The 1 M Ω impedance adapter calibration cannot correct major failures.
- Be sure the oscilloscope passes calibration without the 1 M Ω impedance adapter.

Verifying the E2697A adapter input impedance

Specification: $1\text{ M}\Omega \pm 1\%$

Equipment Required

Equipment	Critical Specification	Recommended Model/Part
Oscilloscope	Software Version 3.10 or higher	Agilent 5483x-series or 5485xA-series oscilloscope
Digital Multimeter (DMM)	2-Wire Resistance Measurement, Accuracy $\pm 0.1\%$ or better	Agilent 34401A
Adapter	Dual Banana to BNC (f)	Pasternack Enterprises PE9008
Cable	Coaxial with BNC (m) at both ends	Agilent 10503A

- 1** From the Control Menu of the oscilloscope, Select Factory Default.
- 2** Plug the E2697A into Channel 1.
- 3** From the Setup menu of the oscilloscope, select Channel 1.
- 4** Click the Probes button.
- 5** In the Probe Setup dialog box set the E2697A Atten control to 1:1 and set the Coupling control to DC.
- 6** Set the DMM to measure a 2-wire resistance.
- 7** Connect the DMM to the E2697A input using a BNC cable.
- 8** Record the reading on the DMM as R1.
R1 Input Impedance _____.
The input impedance should be $1\text{ M}\Omega \pm 1\%$.
- 9** In the Probe Setup dialog box set the Atten control to 10:1.
- 10** Record the reading on the DMM as R2.
R2 Input Impedance _____.
The input impedance should be $1\text{ M}\Omega \pm 1\%$.

Service

Verifying the E2697A adapter input impedance

DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Agilent Technologies (Malaysia) Sdn. Bhd.
Manufacturer's Address: Penang Instrument Manufacturing Operation
Bayan Lepas Free Industrial Zone
11900 Penang, Malaysia

Declares, that the product

Product Name: 1 M Ω Impedance Adapter
Model Number(s): E2697A
Product Option(s): This declaration covers all options of the above product

Conforms to the following product standards:

EMC	Standard	Limit
	IEC 61326-1:1997+A1:1998+A2:2000/EN 61326-1:1997+A1:1998+A2:2000	
	CISPR 11:1997+A1:1999 / EN 55011:1998+A1:1999	Group 1, Class A ^[1]
	IEC 61000-4-2:1995+A1:1998/EN 61000-4-2:1995	4kV CD, 8kV AD
	IEC 61000-4-3:1995/EN 61000-4-3:1996	3V/m, 80-1000 MHz
	IEC 61000-4-4:1995/EN 61000-4-4:1995	0.5kV signal lines, 1kV power lines
	IEC 61000-4-5:1995/EN 61000-4-5:1995	3V, 0.15-80 MHz
	IEC 61000-4-11:1994/EN61000-4-11-1994	1 cycle, 100%
	Canada: ICES-001:1998	
	Australia/New Zealand: AS/NZS 2064.1	
Safety	IEC 61010-1:2001/EN 61010-1:2001	
	Canada: CSA-C22.2 No. 1010.1:1992	

Conformity/Supplemental Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC (including 93/68/EEC) and carries the CE-marking accordingly (European Union).

^[1]This product was tested in a typical configuration with Agilent Technologies test systems.

Date: 08/15/2003



Tan, Boon Juan / Quality Manager

For further information, please contact your local Agilent Technologies sales office, agent, or distributor.

Product Regulations

EMC	Performance Criteria ¹
IEC 61326-1:1997+A1:1998+A2:2000/EN 61326-1:1997+A1:1998+A2:2000	
CISPR 11:1997+A1:1999 / EN 55011:1998+A1:1999	B
IEC 61000-4-2:1995+A1:1998/EN 61000-4-2:1995	A
IEC 61000-4-3:1995/EN 61000-4-3:1996	B
IEC 61000-4-4:1995/EN 61000-4-4:1995	B
IEC 61000-4-5:1995/EN 61000-4-5:1995	B
IEC 61000-4-11:1994/EN61000-4-11-1994	B
Canada: ICES-001:1998	
Australia/New Zealand: AS/NZS 2064.1	

Regulatory Information for Canada

ICES/NMB-001:1998

This ISM device complies with Canadian ICES-001.
Cet appareil ISM est conforme à la norme NMB-001 du Canada.

Regulatory Information for Australia/New Zealand

This ISM device complies with Australian/New Zealand AS/NZS 2064.1

N10149

¹ Performance Criteria:

- A Pass - Normal operation, no effect.
- B Pass - Temporary degradation, self recoverable.
- C Pass - Temporary degradation, operator intervention required.
- D Fail - Not recoverable, component damage.

Safety	IEC 61010-1:2001/EN 61010-1:2001 Canada: CSA-C22.2 No. 1010.1:1992
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Additional Information:

The product herewith complies with the requirements of the Low Voltage Directive 73/23/EEC and the EMC Directive 89/336/EEC (including 93/68/EEC) and carries the CE-marking accordingly (European Union).

Sound Pressure Level N/A

Safety Notices

This apparatus has been designed and tested in accordance with IEC Publication 1010, Safety Requirements for Measuring Apparatus, and has been supplied in a safe condition. This is a Safety Class I instrument (provided with terminal for protective earthing). Before applying power, verify that the correct safety precautions are taken (see the following warnings). In addition, note the external markings on the instrument that are described under "Safety Symbols."

Warnings

- Before turning on the instrument, you must connect the protective earth terminal of the instrument to the protective conductor of the (mains) power cord. The mains plug shall only be inserted in a socket outlet provided with a protective earth contact. You must not negate the protective action by using an extension cord (power cable) without a protective conductor (grounding). Grounding one conductor of a two-conductor outlet is not sufficient protection.
- Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuse-holders. To do so could cause a shock or fire hazard.
- If you energize this instrument by an auto transformer (for voltage reduction or mains isolation), the common terminal must be connected to the earth terminal of the power source.
- Whenever it is likely that the ground protection is impaired, you must make the instrument inoperative and secure it against any unintended operation.

- Service instructions are for trained service personnel. To avoid dangerous electric shock, do not perform any service unless qualified to do so. Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation, is present.

- Do not install substitute parts or perform any unauthorized modification to the instrument.

- Capacitors inside the instrument may retain a charge even if the instrument is disconnected from its source of supply.

- 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.

- Do not use the instrument in a manner not specified by the manufacturer.

To clean the instrument

If the instrument requires cleaning: (1) Remove power from the instrument. (2) Clean the external surfaces of the instrument with a soft cloth dampened with a mixture of mild detergent and water. (3) Make sure that the instrument is completely dry before reconnecting it to a power source.

Safety Symbols



Instruction manual symbol: the product is marked with this symbol when it is necessary for you to refer to the instruction manual in order to protect against damage to the product.



Hazardous voltage symbol.



Earth terminal symbol: Used to indicate a circuit common connected to grounded chassis.

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