Agilent Technologies

User's Quick Start Guide

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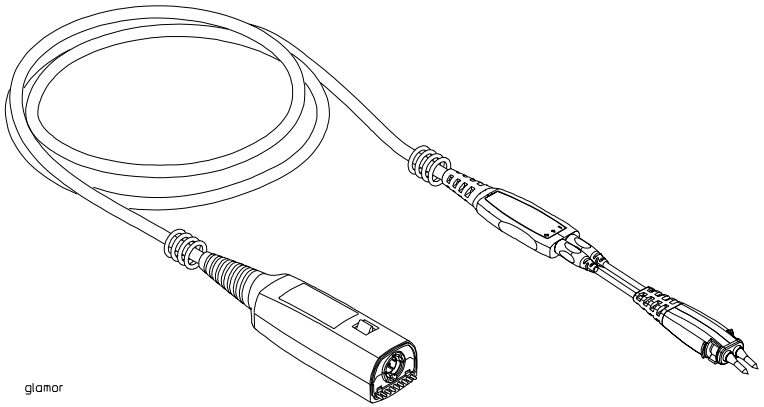


For Safety information and Regulatory information, see the pages at the back of this guide.

1131A 3.5 GHz, 1132A 5 GHz, and 1134A 7 GHz InfiniiMax Active Probes

In This Book

This guide provides user and service information for the 1131A, 1132A, and 1134A InfiniiMax Active Probes.

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

Contents

1 General Information

1

General Information

1131A 3.5 GHz, 1132A 5 GHz, and 1134A 7 GHz InfiniiMax Active Probes

The 1131A, 1132A, and 1134A InfiniiMax Active Probes are probe solutions for high-frequency applications. The probes are compatible with the Infiniium AutoProbe Interface which completely configures the Infiniium series of oscilloscopes for the probes.

These probes are also compatible with the N1022A probe adaptor for use with the Infiniium 86100A Digital Communication Analyzer or with the 1143A external power supply.

To inspect the probe

❑ 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 1-2 later in this chapter.

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

❑ Inspect the probe.

- If there is mechanical damage or defect, or if the probe does not operate properly or pass performance tests, 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.

InfiniiMax Accessories Supplied and Replaceable Parts

Figure 1-1

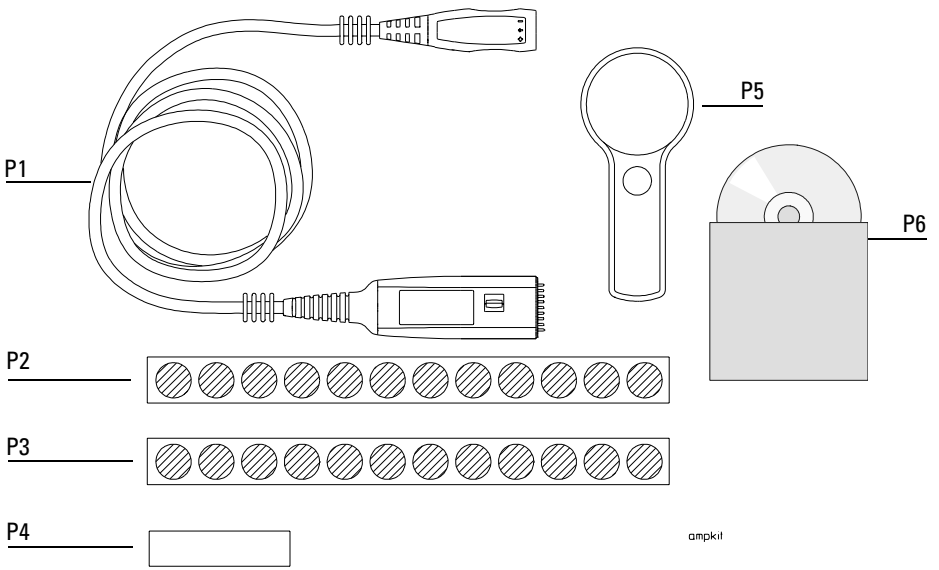
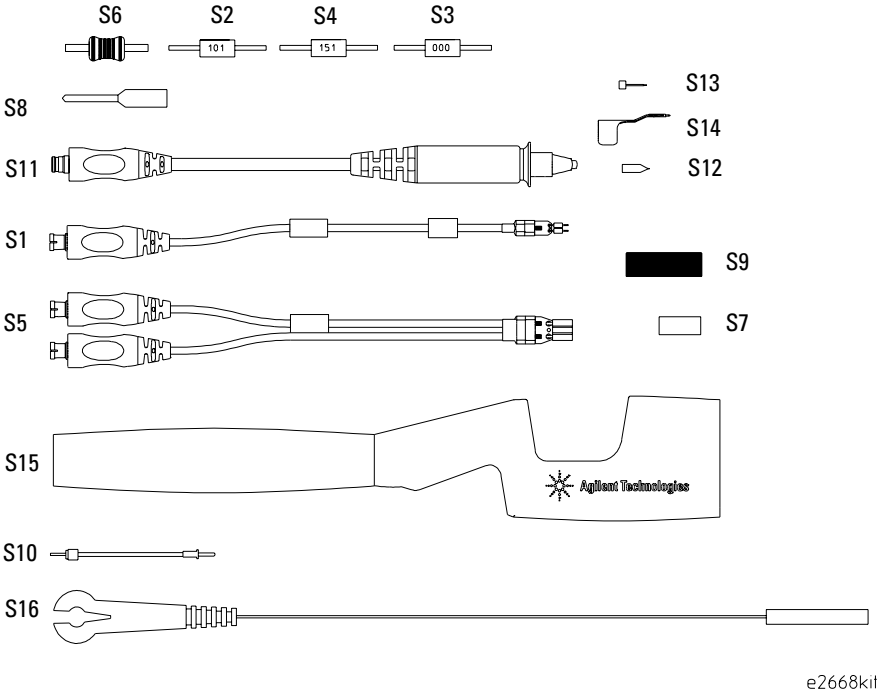


Table 1-1

Item	Description	Qty	Agilent Part Number
P1	Probe amplifier	1	1NB7-8517
P2	Velcro dots, hooks	1	
P3	Velcro dots, loops	1	
P4	Velcro strip	1	
P5	Magnifying glass	1	
P6	CD-ROM containing Adobe Acrobat files with more in-depth information on probe performance, performance verification, and service.	1	

E2668A Single-ended Connectivity Kit

Figure 1-2



Some parts have been enlarged to show more detail.

Table 1-2

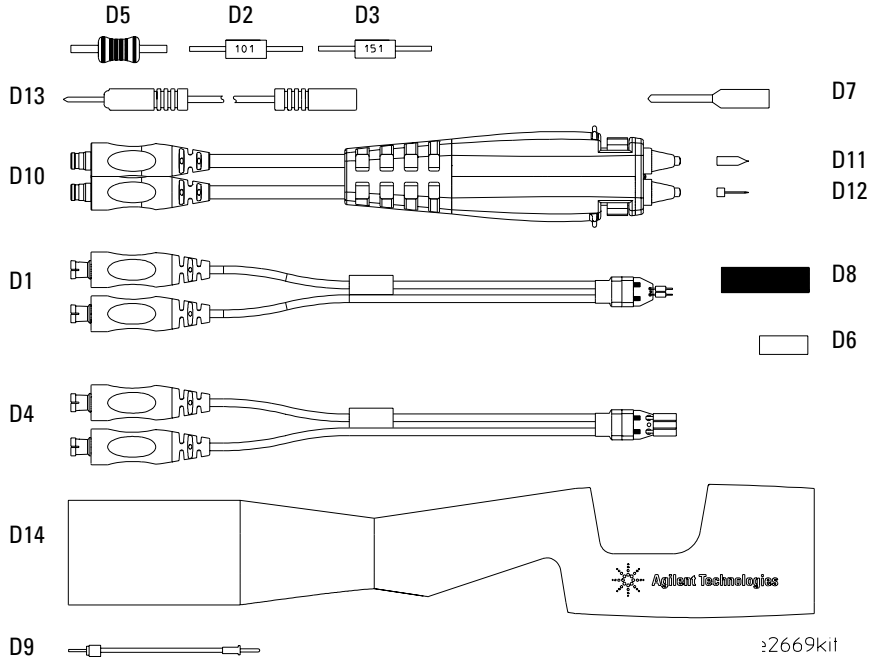
E2668A Accessories Supplied

Item	Description	Qty	Agilent Part Number
S1	Solder-in single-ended probe head	1	E2679A
S2	Resistor for solder-in single-ended probe head (full bandwidth, 100 Ω)	4	01131-81508
S3	Resistor for solder-in single-ended probe head (full and medium bandwidth, 0 Ω)	8	01131-81504
S4	Resistor for solder-in single-ended probe head (medium bandwidth, 150 Ω)	4	01131-81506
S5	Socketed differential probe head	1	E2678A
S6	Resistor for socketed differential probe head (full bandwidth, 82 Ω)	20	01130-81506
S7	Square pin socket	8	01131-85201
S8	Square pin socket with 20 mil pin	8	01131-85202
S9	Heatshrink tubing for square pin socket accessories	8	01130-41101
S10	Damped wire accessory	12	01130-21302
S11	Single-ended browser	1	E2676A
S12	Resistive tip for single-ended browser (blue)	10	01131-62102
S13	Non-resistive tip for browser (black)	5	01131-46102
S14	Ground collar assembly for single-ended browser	2	01130-60005
S15	Ergonomic handle	1	01130-43202
S16	Socketed ground lead	1	5063-2120

Before using the resistors, the resistor wires must be cut to the correct dimensions. For the correct dimensions see “Resistor Dimensions” on page 1-17

E2669A Differential Connectivity Kit

Figure 1-3



Some parts have been enlarged to show more detail.

Table 1-3

E2669A Accessories Supplied

Item	Description	Qty	Agilent Part Number
D1	Solder-in differential probe head	4	E2677A
D2	Resistor for solder-in differential probe head (full bandwidth, 100 Ω)	16	01131-81508
D3	Resistor for solder-in differential probe head (medium bandwidth, 150 Ω)	16	01131-81506
D4	Socketed differential probe head	2	E2678A
D5	Resistor for socketed differential probe head (full bandwidth, 82 Ω)	40	01130-81506
D6	Square pin socket	8	01131-85201
D7	Square pin socket with 20 mil pin	8	01131-85202
D8	Heatshrink socket accessory	8	01130-41101
D9	Damped wire accessory	12	01130-21302
D10	Differential browser	1	E2675A
D11	Resistive tip for differential browser (blue)	20	01131-62102
D12	Non-resistive tip for browser (black)	10	01131-46102
D13	Ground wire for differential probe amplifier	1	01131-21301
D14	Ergonomic handle	1	01131-43201

Before using the resistors, the resistor wires must be cut to the correct dimensions. For the correct dimensions see “Resistor Dimensions” on page 1-17

Replaceable Parts and Additional Accessories

Table 1-4

Vendor	Part Number	Description	Qty
Cascade® Microtech		EZ-Probe® positioner	1
Agilent	E2675A Consists of:	Differential browser kit	
		Differential browser	1
	01131-62102	Resistive tip for browser (blue)	20
	01131-46102	Non-resistive tip for browser	10
	01131-43201	Ergonomic handle for browser	1
Agilent	E2676A Consists of:	Single-ended browser kit	
		Single-ended browser	1
	01130-60005	Ground collar assembly	2
	01131-62102	Resistive tip for browser (blue)	10
	01131-46102	Non-resistive tip for browser	5
	01130-43202	Ergonomic handle for browser	1
Agilent	E2677A Consists of:	Solder-in differential probe head kit	
		Solder-in differential probe head	1
	01131-81508	Resistor 100 Ω full bandwidth	4
	01131-81506	Resistor 150 Ω medium bandwidth	4
Agilent	E2678A Consists of:	Socketed single-ended and differential probe head kit	
		Socketed differential probe head	1
	01130-81506	Resistor 82 Ω full bandwidth	20
	01131-21302	Damped wire accessory	6
	01131-85201	Square pin socket	4
	01131-85202	Square pin socket with 20 mil pin	4
	01130-41101	Heatshrink socket accessory	4
Agilent	E2679A Consists of:	Solder-in single-ended probe head kit	
		Solder-in single-ended probe head	1
	01131-81508	Resistor 100 Ω full bandwidth	4
	01131-81506	Resistor 150 Ω medium bandwidth	4
	01131-81504	Resistor 0 Ω ground resistor	8
Agilent	E2655A	Probe deskew and performance verification kit	1
Agilent	1NB7-8517	Replacement Probe Amp	1
Agilent AVX Components BREL International	01131-81504 HR01000J RMB16-000-J	Resistor for solder-in single-ended probe head (full and medium bandwidth, 0 Ω)	1

Vendor	Part Number	Description	Qty
Agilent AVX Components BREL International	01131-81508 HR01101J RMB16-101-J	Resistor for solder-in single-ended probe head (full bandwidth, 100 Ω)	1
Agilent AVX Components BREL International	01131-81506 HR01151J RMB16-151-J	Resistor for solder-in differential probe head (medium bandwidth, 150 Ω)	1
Agilent BC Components Vishay	01130-81506 2312 903 08209 SMA0204/ MK1HF5082R1%	Resistor for socketed differential probe head (full bandwidth, 82 Ω)	1

Characteristics and Specifications

Table 1-5

Characteristics and Specifications		
Bandwidth[1] (-3 dB)		
1134A	> 7 GHz	
1132A	> 5 GHz	
1131A	> 3.5 GHz	
Rise and Fall Time[3] (10% to 90%)		
1134A	< 61 ps calculated from	$t_r \cong \frac{0.43}{\text{Bandwidth}}$
1132A	< 86 ps	
1131A	< 123 ps	
Oscilloscope and Probe System Bandwidth (-3 dB)		
1134A with 54855A	6 GHz	
1132A with 54854A	4 GHz	
1131A with 54846B	2.25 GHz	
Input Capacitance		
Cm	0.10 pF	Model for input C is Cm is between tips and Cg is to ground for each tip
Cg	0.34 pF	
Cdiff	0.27 pF	Differential mode capacitance (capacitance when probing a differential signal = Cm + Cg/2)
Cse	0.44 pF	Single-ended mode capacitance (capacitance when probing a single-ended signal = Cm + Cg)
Input Resistance[1]	50 kΩ ±1%	Differential mode resistance
	25 kΩ ±1%	Single-ended mode resistance each side to ground
Input Dynamic Range	±2.5 V	Differential or single-ended

Input Common Mode Range	±6.75 V	dc to 100 Hz
	±1.25 V	> 100 Hz
Maximum Signal Slew Rate (SRmax)[2]	18 V/ns	When probing a single-ended signal
	30 V/ns	When probing a differential signal
DC Attenuation	10:1 ±3% before calibration on oscilloscope 10:1 ±1% after calibration on oscilloscope[1]	
Zero offset error referred to input	< 30 mV before calibration on oscilloscope < 5 mV after calibration on oscilloscope[1]	
Offset Range[1]	±12.0 V	When probing single-ended
Offset Accuracy	< 3% of setting before calibration on oscilloscope < 1% of setting after calibration on oscilloscope[1]	
Noise referred to input	3.0 mVrms	
Propagation Delay	6 ns	
Maximum Input Voltage	40 V Peak, CAT I[3]	Maximum non-destructive voltage on each input ground
ESD Tolerance	> 8 kV from 100 pF, 300 Ω HBM	

1 Denotes Warranted Specifications, all others are typical. Measured using the probe amp and solder-in differential probe head with full bandwidth resistor (01131-81501).
2 Srmax of a sine wave = Amp x 2 x π x frequency or SRmax of a step ≅ Amp x 0.6 / trise (20 to 80%) for more information see Table 1-7 on page 16.
3 Values shown are for the probe amp and solder-in differential probe head with full bandwidth resistor. Factor for calculating rise time from bandwidth will vary slightly for other probe heads due to different roll-off characteristics.

CAT I and CAT II Definitions

Installation category (overvoltage category) I: Signal level, special equipment or parts of equipment, telecommunication, electronic, etc., with smaller transient overvoltages than installation category (overvoltage category) II.

Installation category (overvoltage category) II: Local level, appliances, portable equipment etc., with smaller transient overvoltages than installation category (overvoltage category) III.

General Characteristics

The following general characteristics apply to the active probe.

Table 1-6

General Characteristics

Environmental Conditions

	Operating	**Non-operating**
Temperature	0 °C to +55 °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
Altitude	Up to 4,600 meters	Up to 15,300 meters
Power Requirements	+12 Vdc @ 11 mA -12 Vdc @ 5 mA +5 Vdc @ 28 mA -5 Vdc @ 92 mA 0.84 W	(voltages supplied by AutoProbe Interface)
Weight	approximately 0.69 kg	
Dimensions	Refer to the outline in figure 1-7.	
Pollution degree 2	Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected.	
Indoor use only		

Slew Rate Requirements for Different Technologies

The following table shows the slew rates for several different technologies. The maximum allowed input slew rate is 18 V/ns for single-ended signals and 30 V/ns for differential signals. Table 1-7 shows that the maximum required slew rate for the different technologies is much less that of the probe.

Table 1-7

Slew Rate Requirements

Name of Technology	Differential Signal	Max Single-Ended Slew Rate [1] (V/ns)	Max Differential Slew Rate [2] (V/ns)	Driver Min Edge Rate (20%-80% ps)	Max Transmitter Level (Diff V)
PCI Express (3GIO)	YES	9.6	19.2	50	1.6
RapidIO Serial 3.125Gb	YES	8.0	16.0	60	1.6
10GbE XAUI (4x3.125Gb)	YES	8.0	16.0	60	1.6
1394b	YES	8.0	16.0	60	1.6
Fibre Channel 2125	YES	8.0	16.0	75	1
Gigabit Ethernet 1000Base-CX	YES	7.8	15.5	85	2.2
RapidIO 8/16 2Gb	YES	7.2	14.4	50	1.2
Infiniband 2.5Gb	YES	4.8	9.6	100	1.6
HyperTransport 1.6Gb	YES	4.0	8.0	113	1.5
SATA (1.5Gb)	YES	1.3	2.7	134	0.6
USB 2.0	YES	0.9	1.8	375	1.1
DDR 200/266/333	NO	7.2	n/a	300	3.6
PCI	NO	4.3	n/a	500	3.6
AGP-8X	NO	3.1	n/a	137	0.7

1 The probe specification is 18 V/ns
2 The probe specification is 30 V/ns

Resistor Dimensions

In order to make measurements with proper fidelity, the resistor leads must be trimmed to a specified length and one end bent 90 degrees as shown in figure 1-4 and figure 1-5. The resistor in figure 1-6 needs to be trimmed but does not require any bending.

Solder-in 100 Ohm and 0 Ohm Full Bandwidth Resistors

The following part number resistors must be trimmed and bent as shown in figure 1-4.

- 01131-81508 (100 Ohm)
- 01131-81504 (0 Ohm)

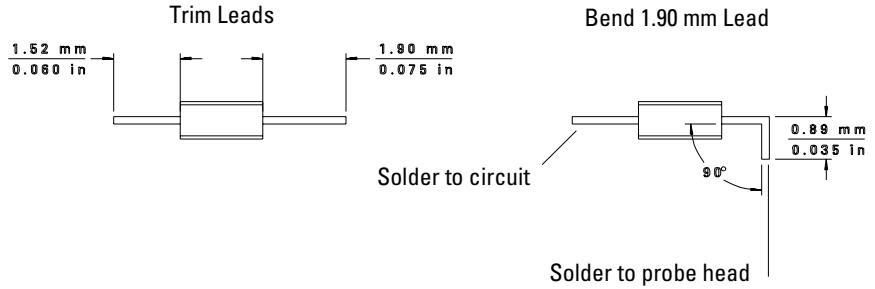
The equipment required is:

- Exacto knife
- Agilent supplied template included with resistors
- Magnifying device
- Tweezers (2)

The instructions for trimming and bending the resistor are:

1. Using tweezers, place resistor body inside the rectangle of the trim template.
2. Using the Exacto knife, trim the leads even with the trim lines.
3. Place resistor body inside the rectangle of the bend template.
4. Using another pair of tweezers, bend the 1.90 mm (0.075 in) lead 90 degrees.

Figure 1-4



Solder-in 150 Ohm and 0 Ohm Medium Bandwidth Resistors

The following part number resistors must be trimmed and bent as shown in figure 1-5.

- 01131-81506 (150 Ohm)
- 01131-81504 (0 Ohm)

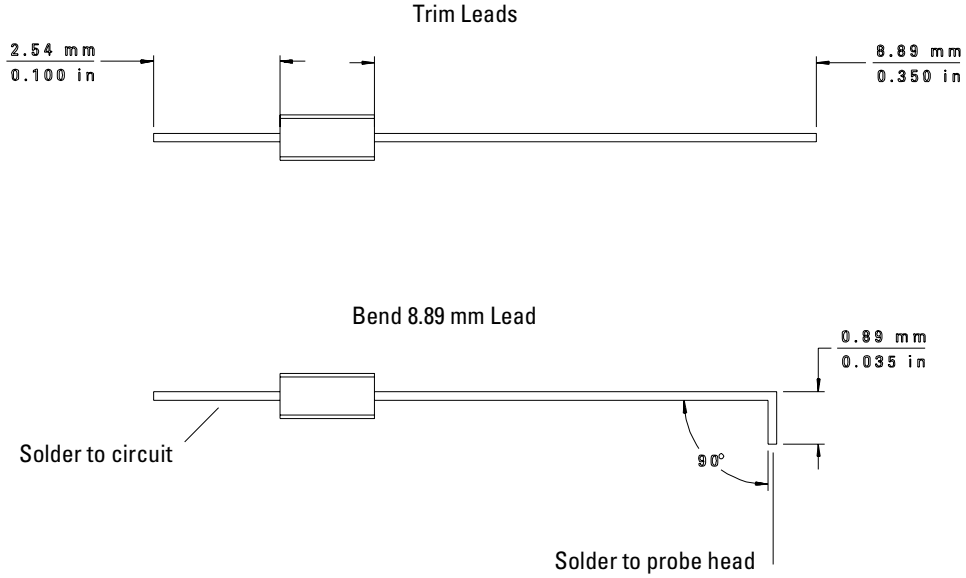
The equipment required is:

- Exacto knife
- Agilent supplied template included with resistors
- Magnifying device
- Tweezers (2)

The instructions for trimming and bending the resistor are:

1. Using tweezers, place resistor body inside the rectangle of the trim template.
2. Using the Exacto knife, trim the leads even with the trim lines.
3. Place resistor body inside the rectangle of the bend template.
4. Using another pair of tweezers, bend the 8.89 mm (0.360 in) lead 90 degrees.

Figure 1-5



82 Ohm Resistor

The following part number resistors must be trimmed as shown in figure 1-6.

- 01130-81506

The equipment required is:

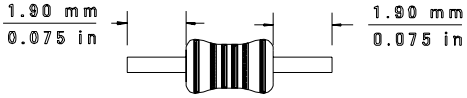
- diagonal cutters
- Agilent supplied template included with resistors
- Magnifying device
- Tweezers

The instructions for trimming the resistor are:

1 Using tweezers, place resistor body inside the rectangle of the trim template.

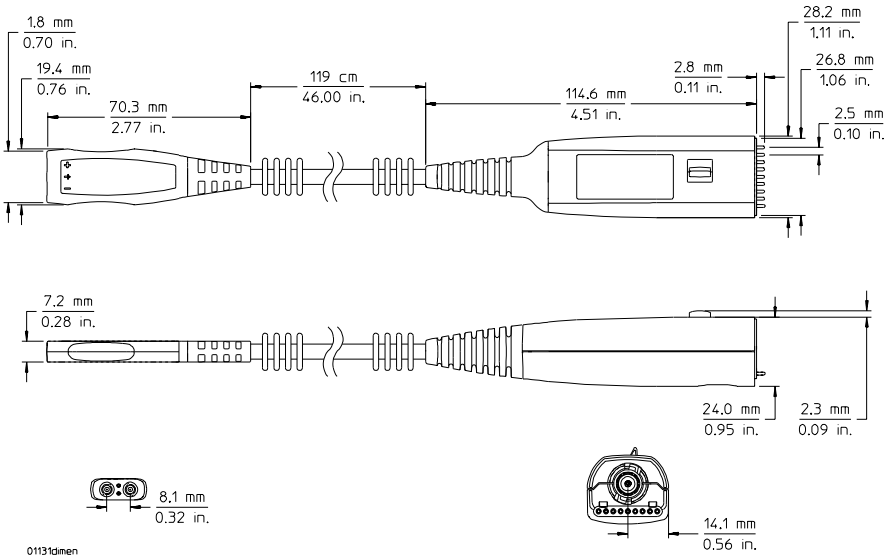
2 Using the diagonal cutters, trim the leads even with the trim lines.

Figure 1-6



Probe Dimensions

Figure 1-7



1131A, 1132A, and 1134A Active Probe Dimensions

To use and calibrate the probe

The Infiniium family of oscilloscopes provides both power and offset control to the 1131A, 1132A, and 1134A active probes 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 signal within the 5 volt peak-to-peak (12 volts peak-to-peak for slow signals) dynamic range of the probe.

Before using the 1131A, 1132A, or 1134A probes, a calibration and deskew should be performed.

1. **Connect the probe output to the oscilloscope input.**
2. **Calibrate the oscilloscope and probe combination using the Infiniium probe calibration routine.**

   When the probe has been calibrated, the dc gain, offset zero, and offset gain will be calibrated. The degree of accuracy specified at the probe tip is dependent on the oscilloscope system specifications.

Probe handling considerations

This probe has been designed to withstand a moderate amount of physical and electrical stress. However, with an active probe, the technologies necessary to achieve high performance do not allow the probe to be unbreakable. You should treat the probe with care. It can be damaged if excessive force is applied to the probe tip. This damage is considered to be abuse and will void the warranty when verified by Agilent Technologies service professionals.

- Exercise care to prevent the probe end from receiving mechanical shock.
- Store the probe in a shock-resistant case such as the foam-lined shipping case which came with the probe.

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.

Replacing the Mini-axial Lead Resistors on Solder-In Tips

When the leads of the mini-axial resistors become damaged or break off due to use, the resistors can be replaced. The recommended equipment and procedure for replacing the resistors is outlined below.

Table 1-8

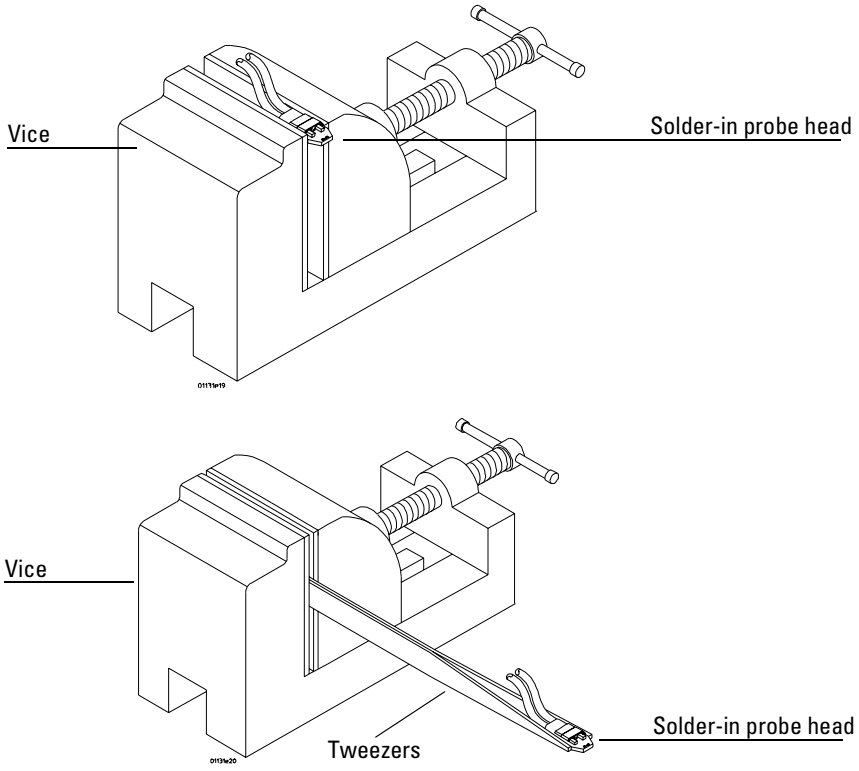
Equipment
Vice or clamp for holding tip
Metcal STTC-022 (600 °C) or STTC-122(700 °C) tip soldering iron or equivalent. The 600 °C tip will help limit burning of the FR4 tip PC board.
0.381 mm (0.015 in) diameter RMA flux standard tin/lead solder wire
Fine stainless steel tweezers
Rosin flux pencil, RMA type (Kester #186 or equivalent)
Diagonal cutters
Magnifier or low power microscope
Ruler

Soldering Procedure

1 Use the vice or clamp to position the tip an inch or so off the work surface for easy access. If using a vice, grip the tip on the sides with light force. If using a tweezers clamp, grip the tip either on the sides or top and bottom. See figure 1-8.

CAUTION When tightening the vice, use light force to avoid damaging the solder-in probe head.

Figure 1-8



2 Make sure soldering iron tip is free of excess solder. Grab each resistor lead or body with tweezers and pull very gently up. Touch the soldering iron to solder joint just long enough for the resistor to come free of the tip pc board. Do not keep the soldering iron in contact with the tip any longer than necessary in order to limit burning and damage to the pc board. This solder joint has very low thermal mass so it should not take very long for the joint to melt and release.

3 Prepare the mounting hole(s) for new resistors by insuring that the holes are filled with solder. If they are not, use the soldering iron and solder to fill the holes. Again, do not leave the iron in contact with the tip any longer than necessary. When the hole(s) are filled with solder use the flux pencil to coat the solder joint area with flux.

4 Prepare the mini-axial lead resistor for attachment to tip pc board. See "Resistor Dimensions" on page 1-17 for dimensions and directions on preparing resistor leads. Lead to be attached to tip pc board will have a 90 degree bend to go into through hole in the tip pc board.

5 Holding the resistor lead in one hand and soldering iron in the other, position the end of the resistor lead (after the 90 degree bend) over the solder filled hole. Touch the soldering iron to the side of the hole. When the solder in the hole melts, the resistor lead will fall into the hole. Remove soldering iron as soon as lead falls into the hole. Again, the thermal mass of the joint is very small so extra dwell time is not needed with the soldering iron to insure a good joint.

Tips for Using Solder-In Probe Heads

- Don't solder in resistors leads with a big ball of solder right next to the resistor body. Normally the nickel lead will limit the heat transfer to the resistor body and protect the resistor, but if a ball of solder is right next to the resistor body on the lead, the resistor may come apart internally and ruin the resistor.
- When soldering in leads to DUT always use plenty of flux. The flux will insure a good, strong solder joint without having to use an excessive amount of solder.
- Don't use the wrong value of resistor at the wrong length. See "Resistor Dimensions" on page 1-17 for dimensions and directions on preparing resistor leads.
- Make sure the zero ohm resistor is used for ground leads on the single-ended probe head.
- Strain relieve the micro coax leading away from the solder-in tips using hook-and-loop fasteners or adhesive tape to protect delicate connections.
- Note that for the differential solder-in probe head, the + and - connection can be determined when the probe head is plugged into the probe amplifier, so which way the tip is soldered in is not important.

Using Probe Accessories

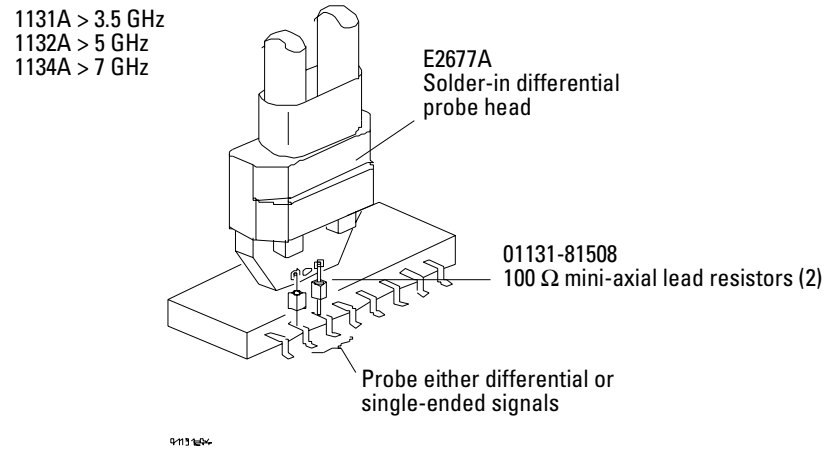
The 1131A, 1132A, and 1134A active probes come with a CD-ROM which contains more in-depth information about connecting the probe to your circuit.

The probe configurations shown in this section are the ones recommended for the best performance for different probing situations.

Solder-in Differential Probe Head (Full Bandwidth)

This probe configuration provides the full bandwidth signals and the lowest capacitive loading for measuring both single-ended and differential signals. The probe head resistors must be soldered to the circuit that you are measuring. Because of the small size of the resistor leads, it is easy to solder them to very small geometry circuits.

Figure 1-9



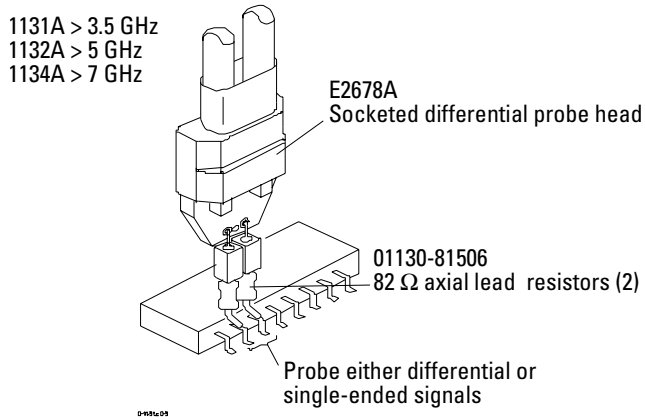
Solder-in Differential Probe Head (Full Bandwidth)

Socketed Differential Probe Head (Full Bandwidth)

This probe configuration provides the full bandwidth signals and minimal capacitive loading for measuring both single-ended and differential signals. The 82 Ω axial lead resistors are soldered to the circuit that you are measuring. The socketed differential probe head is plugged on to the resistors. This makes it easier to move the probe from one location to another. Because of the larger size of the resistor leads, the target for soldering must be larger than the solder-in probe heads.

The spacing of the resistors for the socketed tip differential probe head is 0.1 inches (2.54 mm). The target on the board should be two vias that can accept the 0.02 inches (0.5 mm) diameter resistor lead, or if putting vias on the board adds too much capacitance, then put pads on the board so the resistor leads can be bent in an "L" shape and soldered down.

Figure 1-10

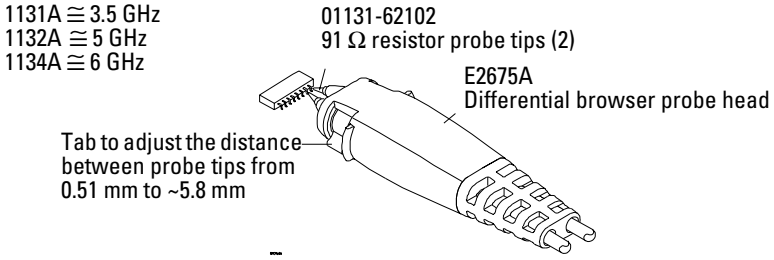


Socketed Differential Probe Head (Full Bandwidth)

Differential Browser

The differential browser configuration is the best choice for general purpose troubleshooting of a circuit board. The tab on the side of the probe allows the probe tips to be adjusted for different circuit geometries.

Figure 1-11

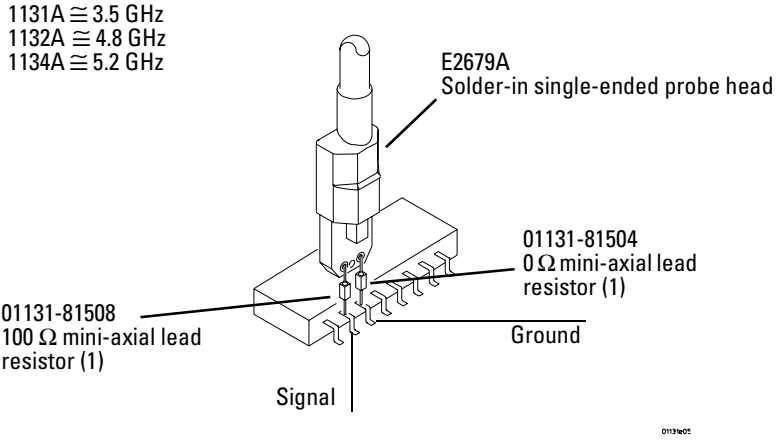


Differential Browser

Solder-in Single-ended Probe Head (Full Bandwidth)

This probe configuration provides good bandwidth measurements of single-ended signals with a probe head that is physically very small. The probe head resistors must be soldered to the circuit that you are measuring. Because of the small size of the resistor leads, it is easy to solder them to very small geometry circuits.

Figure 1-12

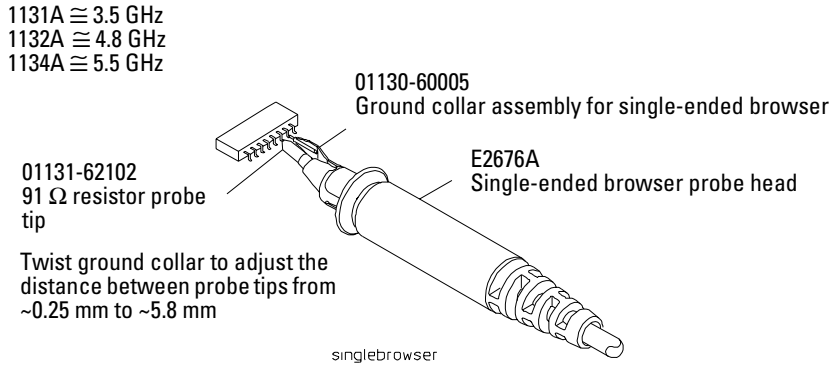


Solder-in Single-ended Probe Head

Single-ended Browser

The single-ended browser is a good choice for general purpose probing of single-ended signals when physical size is critical.

Figure 1-13

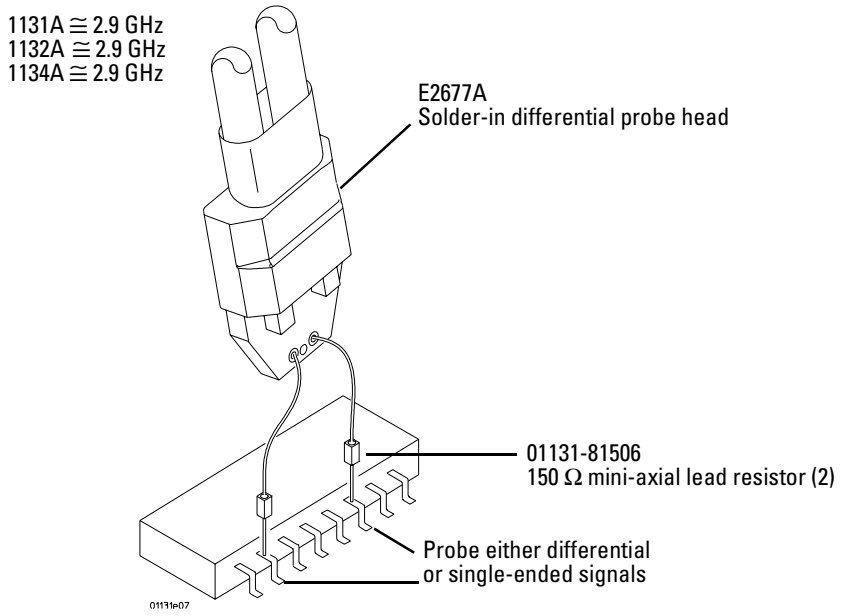


Single-ended Browser

Solder-in Differential Probe Head (Medium Bandwidth)

This probe configuration provides medium bandwidth measurements of differential or single-ended signals. The longer resistor length allows connection to widely spaced points or points in tight areas. The probe head resistors must be soldered to the circuit that you are measuring. Because of the small size of the resistor leads, it is easy to solder them to very small geometry circuits. This configuration can probe circuit points that are farther apart than the full bandwidth configurations.

Figure 1-14

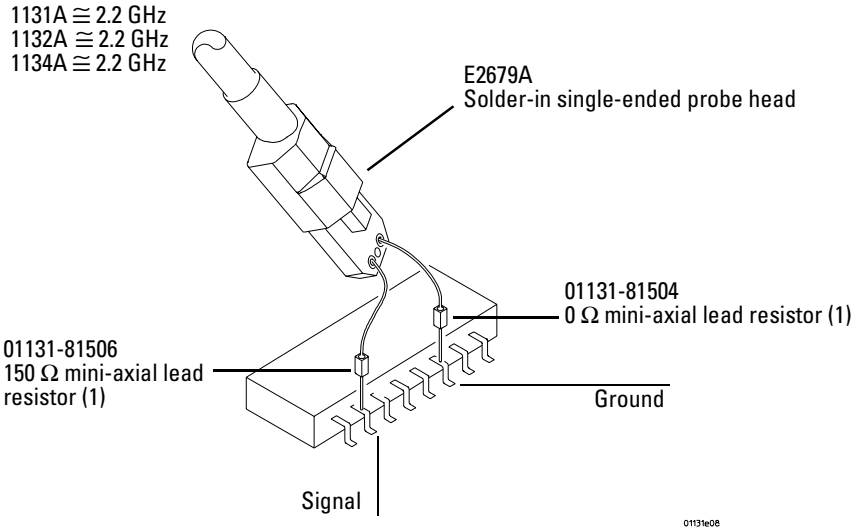


Solder-in Differential Probe Head (Medium Bandwidth)

Solder-in Single-ended Probe Head (Medium Bandwidth)

This probe configuration provides medium bandwidth measurements of single-ended signals. The longer resistor lead length allows connection to widely spaced points or points in tight areas. The probe head resistors must be soldered to the circuit that you are measuring. Because of the small size of the resistor leads, it is easy to solder them to very small geometry circuits. This configuration can probe circuit points that are farther apart than the full bandwidth configurations.

Figure 1-15

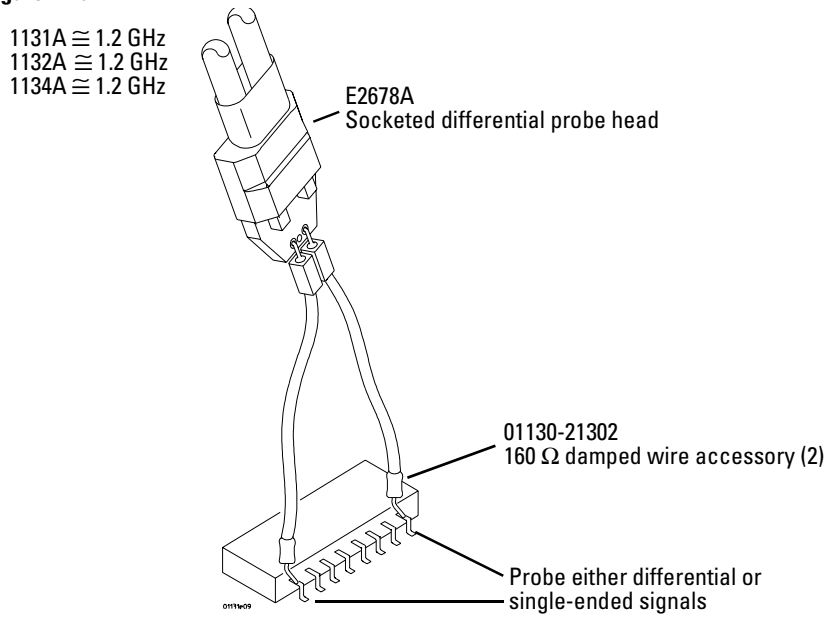


Solder-in Single-ended Probe Head (Medium Bandwidth)

Socketed Differential Probe Head with Damped Wire Accessory

This probe configuration provides maximum connection reach and flexibility with good signal fidelity but lower bandwidth for measuring differential or single-ended signals. The damped wires must be soldered to the circuit that you are measuring. This configuration can probe circuit points that are farther apart than other configurations.

Figure 1-16



Socketed Differential Probe Head with Damped Wire Accessory

Servicing the Probe

For information on servicing the 1131A, 1132A, and 1134A probes and for verifying probe performance there are Adobe Acrobat files on the CD-ROM that comes with your probe.

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DECLARATION OF CONFORMITY

according to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Agilent Technologies, Inc.

Manufacturer's Address: 1900 Garden of the Gods Road
Colorado Springs, Colorado
80907 U.S.A.

Declares, that the product

Product Name: Active Probe for Infiniium Oscilloscope Family

Model Number(s): 1131A, 1132A, and 1134A

Product Option(s): This declaration covers all options of the above products

Conforms to the following product standards:

EMC	**Standard**	**Limit**
	IEC 61326-2:2002/EN 61326-1:1997	
	CISPR 11:1997+A1:1999 / EN 55011:1991	Group 1, Class A[1]
	IEC 61000-4-2:1995+A1:1998+A2:2000/EN 61000-4-2:1995	4kV CD, 8kV AD
	IEC 61000-4-3:1995+A1:1998+A2:2000/EN 61000-4-3:1995	3V/m, 80-1000 MHz
	IEC 61000-4-4:1995+A1:2000+A2:2001/EN 61000-4-4:1995	0.5kV signal lines, 1kV power lines
	IEC 61000-4-5:1995/EN 61000-4-5:1995	0.5kV signal lines, 1kV line ground
	IEC 61000-4-6:1996+A1:2000/EN 61000-4-6:1996	3V, 0.15-80 MHz
	IEC 61000-4-11:1994/EN 61000-4-11:1994	1 cycle, 100%
	Canada: ICES/NMB-001:1998	
	Australia/New Zealand: AS/NZS 2064.1	

Safety IEC 61010-1:1990+A1:1992+A2:1995/EN 61010-1:1993+A1:1995
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: 2002-8-28

Ken Wyatt

Ken Wyatt/Product Regulations Manager

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

Product Regulations

EMC		Performance Criteria
	IEC 61326-2:2002/EN 61326-1:1997	
	CISPR 11:1997+A1:1999 / EN 55011:1991-Group 1 Class A	
	IEC 61000-4-2:1995+A1:1998+A2:2000/EN 61000-4-2:1995 (ESD4kV CD,8kV AD)	B
	IEC 61000-4-3:1995+A1:1998+A2:2000/EN 61000-4-3:1995 (3V/m 80% AM)	B
	IEC 61000-4-4:1995+A1:2000+A2:20001/EN 61000-4-4:1995(EFT 0.5kV line-line, 1kV line-earth)	B
	IEC 61000-4-5:1995/EN 61000-4-5:1995 (Surge 0.5kV line-line, 1kV line-earth)	A
	IEC 61000-4-6:1996+A1:2000/EN 61000-4-6:1996 (3V 80% AM, power line)	N/A
	IEC 61000-4-11:1994/EN 61000-4-11:1994 (Dips 1 cycle, 100%)	A
	Canada: ICES/NMB-001:1998	
	Australia/New Zealand: AS/NZS 2064.1	
Safety	IEC 61010-1:1990+A1:1992+A2:1995/EN 61010-1:1993+A2:1995	
	Canada: CSA-C22.2 No. 1010.1:1992	
	USA: UL 3111-1:1994 {optional}	

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).

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.
N/A - Not applicable

Sound Pressure Level N/A

Regulatory Information for Canada

ICES/NMB-001:1998
This ISM device complies with Canadian ICES-001.
Cet appareil ISM est confomre 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

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 fuseholders. 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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Notices

Manual Part Number

01134-97002, Jan. 2003

Print History

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