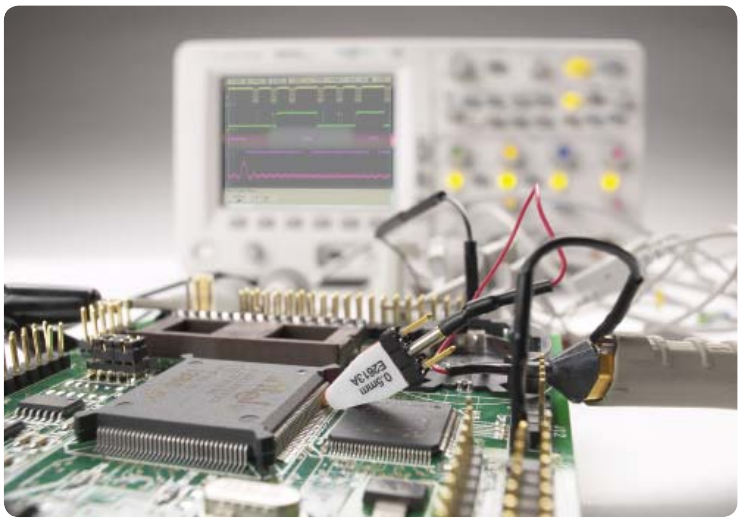
Agilent Technologies 5000, 6000 and 7000 Series InfiniiVision Oscilloscope Probes and Accessories

Selection Guide Data Sheet



To get the most out of your scope, you need the right probes and accessories for your particular application. That's why Agilent Technologies offers a complete family of innovative probes and accessories for the 5000, 6000 and 7000 Series InfiniiVision oscilloscopes. For the most up-to-date and complete information about Agilent's accessories, please visit our web site at:

www.agilent.com/find/scope_probes

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Probe Compatibility Table

For ordering information when replacing your probe or probe accessory: Refer directly to the page number listed in the table of contents for your probe model.

To assist you in selecting the proper probe for your application: Use our probe compatibility table below to find the probes that are recommended for use with your 5000, 6000, and 7000 Series InfiniiVision oscilloscope.

Probe type	Probe model	DSO5000A 100 MHz	DSO5000A 300 - 500 MHz	MSO/DSO6000A[5] 100 MHz	MSO/DSO6000A[5] 300 MHz - 1 GHz MSO/DSO7000A/B 100 MHz - 1 GHz
Passive probes page 3	N2863A 10:1 300 MHz (included in 5000 Series 100/300 MHz)	Recommended	Compatible	Compatible	Compatible
	10070C 1:1 20 MHz	Recommended	Recommended	Recommended	Recommended
	10073D 10:1 500 MHz (included in 6000/7000 Series 300 MHz - 1 GHz and 5000 Series 500 MHz)	Compatible	Recommended	Compatible	Recommended
	10074D 10:1 150 MHz (included in 6000 Series 100 MHz)	Recommended	Compatible	Recommended	Compatible
	N2873A 10: 1 500 MHz (optional to 7000B)	Recommended	Recommended	Compatible	Recommended
High-voltage passive probes page 5	10076B 4 kV	Recommended	Recommended	Recommended	Recommended
	N2771A 30 kV	Recommended	Recommended	Recommended	Recommended
Differential active probes page 6	1130A 1.5 GHz[1]	Compatible	Recommended	Incompatible	Recommended
	1141A 200 MHz (use with 1142A)	Compatible	Recommended	Compatible	Recommended
	N2791A 25 MHz	Recommended	Recommended	Incompatible	Recommended
	N2891A 70 MHz	Recommended	Recommended	Recommended	Recommended
	N2790A 100 MHz (with AutoProbe)	Recommended	Recommended	Recommended	Recommended
	N2792A 200 MHz	Recommended	Recommended	Recommended	Recommended
	N2793A 800 MHz	Recommended	Recommended	Recommended	Recommended
Single-ended active probes page 11	1156A 1.5 GHz[2] (with AutoProbe)	Compatible	Recommended	Incompatible	Recommended
	1144A 800 MHz (use with 1142A)	Incompatible	Recommended	Incompatible	Recommended
	1145A 750 MHz 2-ch (use with 1142A)	Incompatible	Recommended	Incompatible	Recommended
Mixed signal oscilloscope logic probes[3] page 13	01650-61607 16-channel	Incompatible	Incompatible	Recommended	Recommended
	54620-68701 2x8-channel (included in MSO6000A)	Incompatible	Incompatible	Recommended	Recommended
Current probes page 15	1146A 100 kHz	Recommended	Recommended	Recommended	Recommended
	N2780A 2 MHz (use with N2779A)	Recommended	Recommended	Recommended	Recommended
	N2781A 10 MHz (use with N2779A)	Recommended	Recommended	Recommended	Recommended
	N2782A 50 MHz (use with N2779A)	Recommended	Recommended	Recommended	Recommended
	N2783A 100 MHz (use with N2779A)	Recommended	Recommended	Recommended	Recommended
	1147A 50 MHz (with AutoProbe)	Recommended	Recommended	Incompatible	Recommended

1. *The 1130A probe amplifier supports both single- and differential-ended measurements. Higher bandwidth InfiniiMax probe model 1131A, 1132A, and 1134A are also supported by 5000, 6000, and 7000 Series 300 MHz - 1 GHz models.*
2. *The 1157A and 1158A are also supported by all 5000, 6000, and 7000 Series 300 MHz - 1 GHz models.*
3. *Recommended for MSO6000A, and MSO7000A/B, MSOs only.*
4. *These Infiniium active probes are not supported by 5000, 6000, and 7000 Series – 1152A, 1153A, 1154A, 1155A, 1159A, 1168A, and 1169A.*
5. *MSO/DSO6000A 100-MHz models do not support any Agilent active probes with AutoProbe interface.*

Passive Probes

- Designed for optimal performance with your Agilent 5000, 6000, and 7000 Series scope
- 1:1 and 10:1 attenuation
- 20 MHz to 500 MHz

Rugged, high-quality probes at a reasonable price

Agilent 10070-family passive probes are-a great choice if you're looking for high quality at a very reasonable price. These general-purpose probes are designed specifically to give you optimal performance with your 5000, 6000 and 7000 Series oscilloscopes. Ruggedized for general-purpose measurements, they feature a durable cable and a solid stainless steel probe body encased with a hard, fracture-resistant plastic. They're designed and tested to ensure the probes operate in the toughest of conditions

The N2863A low-cost passive probe provides a 10:1 attenuation and features a high input resistance of 10 MΩ.

The N2873A is a 500 MHz, 10:1 miniature passive probe that can be used with all InfiniiVision Series. Compact 2.5-mm probe head diameter, low input capacitance, and various fine-pitch probe tip accessories make the N2873A passive probe ideal for probing densely populated IC components or surface-mount devices used in today's high-speed digital applications. For more information about N2870A Series passive probes and accessories, check out Agilent's literature number, 5990-3930EN.

Accessories available for 10070C/73D/74D passive probes

5081-7705	Probe-tip-to-BNC (m) adapter
5081-7697	Retractable Hook tip for 1007xC/D
8710-2063	Dual-lead adapter provides easy connection from probe signal and ground to fine-pitch probing accessories.
10072A	Fine-pitch probing kit includes 10 SMT clips and 2 dual-lead adapters.
10075A	0.5 mm IC probing kit. Contains four 0.5 mm IC clips and 2 dual-lead adapters.

Accessories available for N2863A passive probe

0960-2900	Retractable hook tip for N2862A/B, N2863A/B

Accessories available for N2873A (and other N287xA Series passive probes)

0960-2905	Sprung Hook adapter 2.5 mm for N2870A, 71A,72A, 73A, 75A
0960-2906	Ground Lead 15cm for N2870A Series probes
0960-2908	10 Self-adhesive copperpads 2x2 for N2870A Series probes
0960-2898	Dual Lead-Adapter for N2870A Series probes

Standard accessories that come with each probe

10070C/10073D/10074A	N2863B	N2873A
Retractable hook tip, Qty 1 Colored identification tag, 2 each of 4 colors Ground bayonet, Qty 1 IC insulation cap, Qty 1 Adjustment tool, Qty 1 Ground lead, Qty 1 BNC adapter, Qty 1	Retractable hook tip, Qty 1 Colored identification tag, 2 each of 4 colors Spring ground, Qty 1 IC insulation cap, Qty 1 Insulation cap, Qty 1 Adjustment tool, Qty 1 Ground lead, Qty 1 BNC adapter, Qty 1 Probe tip, Qty 1	Spring loaded probe tips, Qty 2 Rigid probe tips, Qty 2 Ground blade, Qty 1 Ground spring, Qty 1 Sprung hook, Qty 1 Ground lead, Qty 1 Copper pads, Qty 2 IC cap – 0.5mm, 0.65mm, 0.8mm, 1mm, 1.27mm, Qty 1 each BNC adapter, Qty 1 Insulating cap, Qty 1 Protection cap, Qty 1 Trimmer tool, Qty 1 Color coded rings, 3x4 colors

Passive Probes

Ordering information for Agilent passive probes

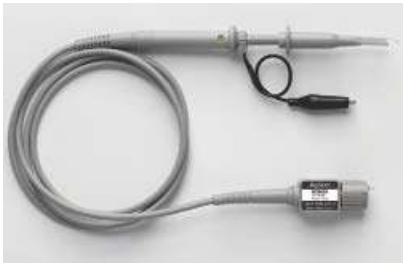
N2873A	10:1 500 MHz miniature passive probe
N2863A	10:1 300 MHz passive probe
10070C	1:1 20 MHz passive probe
10073D	10:1 500 MHz passive probe
10074D	10:1 150 MHz passive probe



10073D/74D passive probe



N2873A passive probe with standard accessorie



N2863A passive probe

Characteristics for Agilent passive probes

	10070C	10073D	10074D	N2863A	N2873A
Bandwidth	20 MHz	500 MHz	150 MHz	300 MHz	500 MHz
Risetime (calculated)	< 17.5 ns	< 700 ps	< 2.33 ns	< 1.16 ns	< 700 ps
Attenuation ratio	1:1	10:1	10:1	10:1	10:1
Input resistance	1 MΩ	2.2 MΩ	10 MΩ	10 MΩ	10 MΩ
Input capacitance	Approx 70 pF	Approx 12 pF	Approx 15 pF	Approx 12 pF	Approx 9.5 pF
Maximum input (dc + peak ac)	500 V CAT I 400 V CAT II	500 V CAT I 400 V CAT II	500 V CAT I 400 V CAT II	300 Vrms CAT I and II	400 V CAT I, 300 V CAT II
Compensation range	None	6 - 15 pF	9 - 17 pF	5 - 30 pF	10 - 25 pF
Probe readout	Yes	Yes	Yes	Yes	Yes
Cable length	1.5 m	1.5 m	1.5 m	1.2 m	1.2 m

High-voltage Passive Probes

- Ideal for measuring up to 30 kV
- Up to 250 MHz bandwidth
- 100:1 or 1000:1 attenuation

10076B high-voltage probe

The Agilent 10076B 4 kV 100:1 passive probe gives you the voltage and bandwidth you need for making high-voltage measurements. Its compact design makes it easier to probe today's small power electronics components and its rugged construction means it can withstand rough handling without breaking.

Characteristics 10076B

Bandwidth	250 MHz (–3dB)
Risetime (calculated)	< 1.4 ns
Attenuation ratio	100:1
Input resistance	66.7 MΩ (when terminated into 1 MΩ)
Input capacitance	Approx 3 pF
Maximum input	4000 Vpk
Compensation	6-20 pF Range
Probe readout	Yes
Cable length	1.8 m



10076B passive probe

N2771A high-voltage probe

The N2771A is a 1000:1 divider probe for the measurement of fast high voltage signals up to 30 kV dc + peak ac, 10 kV rms.

The probe's large size and rugged construction provides superior protection. The ground lead is fed through the body of the probe and protrudes behind the safety barrier, keeping the ground connection away from the high voltage. Typical applications include PMT's, motor drives, high voltage switches, magnatrons and modern projection systems.

Characteristics for N2771A

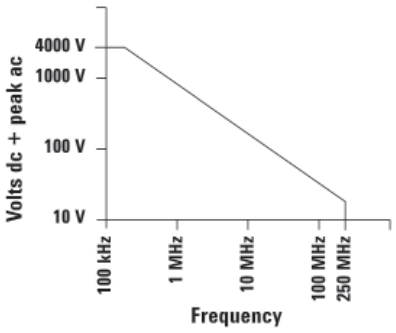
Bandwidth	50 MHz (–3dB)
Risetime	<7 ns
Attenuation ratio	1000:1
Input resistance	100 MΩ (when terminated into 1-MΩ)
Input capacitance	1 pF
Compensation range	7-25 pF
Max. voltage	15 kV dc, 10 kV rms, 30 kV dc + peak ac
Operating temperature	0°C to +50°C, 80% RH
Storage temperature	–20°C to +70°C, 90% RH
Dimensions	2 cm (max width of probe stem after handle) x 33 cm 7.5 cm (max probe widthat probe handle) x 33 cm



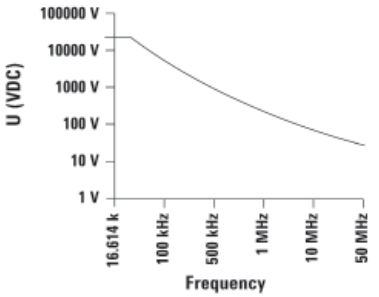
N2771A high-voltage probe

Ordering information for Agilent high-voltage probe

10076B	High-voltage probe: includes one retractable hook tip, one-ground-bayonet, one IC probing tip, one-alligator ground lead and a compensation screwdriver
N2771A	High-voltage probe: includes alligator ground lead, 1-sharp-probe tip
10077A	Accessory kit for 10076A/B: includes one retractable pincher tip, one ground lead, one insulation cap, two measuring pins and two colored tags



10076B derating curve



N2771A derating curve

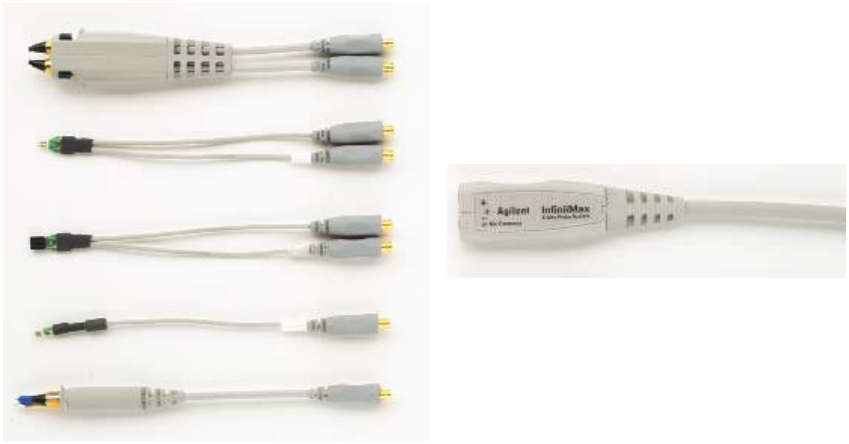
InfiniiMax Active Probes and Accessories

Agilent 1130A InfiniiMax High-performance Active Probe System

- 1.5 GHz InfiniiMax probe system
- InfiniiMax probe amplifier supports both differential- and single-ended measurements for a more cost-effective solution
- Unrivaled InfiniiMax probing accessories support browsing, solder-in, and socketed use models at the maximum performance available
- Compatible with 5000, 6000 and 7000 Series oscilloscopes (except for 6000 series 100 MHz models)

The 1.5-GHz 1130A InfiniiMax probe amplifier is a perfect complement to the 6000 Series 1-GHz models. Its 1.5-GHz bandwidth, extremely low input capacitance (0.32-pF), high common mode rejection and the patented resistor probe tip technology provide ultra low loading of the DUT and superior signal fidelity. Agilent's innovative InfiniiMax 1130A differential probe is the easiest-to-use, and highest performance probing system available for high-speed digital design, and represent a new industry standard for accuracy, flexibility and reliability. Designers can achieve 1-GHz system bandwidth in conjunction with 1-GHz 6000 and 7000 Series oscilloscopes even when manually browsing with the probe or making hands-off measurements. Optional solder-in probe heads and solder-in sockets as well as browser configuration provide full bandwidth at the probe tip.

Operating characteristics	
Probe bandwidth (–3dB)	> 1.5 GHz
Rise and fall time (10% to 90%)	233 psec
System bandwidth (–3dB)	1130A with MSO/DSO610xA, and MSO/DSO7104A: 1 GHz
Input capacitance	Cm = 0.1 pF Cm is between tips Cg = 0.34 pF Cg is ground for each tip Cdiff = 0.27 pF Differential mode capacitance = Cm + Cg/2 Cse = 0.44 pF Single-ended mode capacitance = Cm + Cg
Input resistance	Differential mode resistance = 50 kΩ ± 1% Single-ended mode resistance = 25 kΩ ± 1%
Input dynamic range	±2.5 V
Input common mode range	±6.75 V dc to 100 Hz; ±1.25 V > 100 Hz
Maximum signal slew rate	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
Offset range	± 12.0 V when probing single-ended
Maximum input voltage	30 Vpeak, CAT I
ESD tolerance	>8 kV from 100 pF, 300 Ω HBM
Maximum number of probes supported by 5000/6000/7000 Series	2



Agilent 1130A InfiniiMax probe offers you the highest performance available for measuring differential and single-ended signals.

InfiniiMax Active Probes and Accessories (continued)

Agilent 1130A InfiniiMax High-Performance Active Probe System

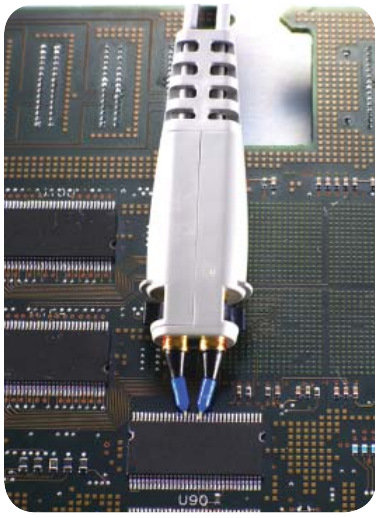
Ordering information for Agilent InfiniiMax 1130A probe and accessories

Probe amplifier	
1130A	1.5 GHz InfiniiMax probe amplifier (order one or more probe heads or connectivity kits per amplifier)

Connectivity kits	
E2669A	InfiniiMax connectivity kit for differential/single-ended measurements
E2668A	InfiniiMax connectivity kit for single-ended measurements

Individual probe heads	
E2675A	InfiniiMax differential browser probe head and accessories
E2676A	InfiniiMax single-ended browser probe head and accessories
E2677A	InfiniiMax differential solder-in probe head and accessories
E2678A	InfiniiMax single-ended/differential socketed probe head and accessories
E2679A	InfiniiMax single-ended socketed probe head and accessories
E2695A	Differential SMA probe head
N5425A/N5426A	12-GHz differential ZIF solder-in probe head and ZIF probe tips
N5451A	InfiniiMax long-wire ZIF probe tips (for use with N5425A ZIF probe head)
N5450A	InfiniiMax extreme temperature extension cable (that allows for probing in environments from –55 to +150 degrees C)
N2880A	InfiniiMax in-line attenuator kit (pairs of 6 dB, 12 dB and 20 dB attenuator in a kit)
N2881A	InfiniiMax DC blocking caps (a pair of 30V DC blocking cap)

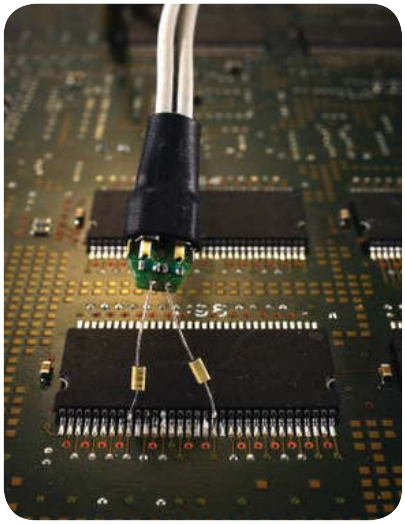
For more comprehensive information about 1130A InfiniiMax probe amplifier and its accessories, refer to the Agilent Infiniium Oscilloscope Probes, Accessories, and Options data sheet with Agilent literature number 5968-7141EN.



InfiniiMax browser head on board



InfiniiMax ZIF tip soldered on board



InfiniiMax solder-in probe head with long wires

High Voltage Differential Active Probes

- 25 MHz to 800 MHz bandwidth
- Switchable attenuation
- Measure up to 1,400 V CAT II and 7 kV CAT I

N2790A/91A and N2891A high voltage differential probes

Oscilloscope users often need to make floating measurements where neither point of the measurement is at earth ground. Use N2790A, N2791A or N2891A high voltage differential probe to make safe and accurate floating measurements with oscilloscope. The N2790A, N2791A and N2891A high voltage differential probes allow conventional earth-grounded Agilent oscilloscope to be used for floating signal measurements.
Each probe offers user selectable attenuation settings that make it highly versatile, allowing it to be used for a broad range of applications. The probe comes with probe tip accessories for use with small and large components in tight spaces. The N2791A and N2891A are compatible with any oscilloscope with 1 Mohm BNC input. The N2791A and N2891A probe power is supplied by included 4x AA batteries or USB host port of the scope or PC via a supplied USB power cable. The N2790A is compatible with the Agilent's AutoProbe interface where the probe power is supplied by the Agilent oscilloscope's probe interface.

Characteristics for N2790A, N2791A and N2891A differential probe

	N2790A	N2791A	N2891A
Bandwidth	100 MHz	25 MHz	70 MHz
Risetime	3.5 nsec	14 nsec	5 nsec
Attenuation ratio	50:1 / 500:1	10:1 / 100:1	100:1 / 1000:1
CMRR	-80 dB at 50/60 Hz -50 dB at 1 kHz -50 dB at 1 MHz	-80 dB at 50/60 Hz -40 dB at 1 MHz	-80 dB at 50/60 Hz -60 dB at 20 kHz
Max input voltage to ground	±1000 V (CAT II) ±600 V (CAT III)	±700 V at 100:1 ±70 V at 10:1	±7000 V at 1000:1 ±700 V at 100:1
Max input voltage between two inputs	±1400 V at 500:1 ±140 V at 50:1	±700 V at 100:1 ±70 V at 10:1	±7000 V at 1000:1 ±700 V at 100:1
Max number of probes supported by 5000/6000/7000 Series	4	4	4

1141A 200 MHz differential probe

The 1141A is a 1x FET differential probe with 200-MHz bandwidth and a 3000:1 CMRR. The probe has a high-input resistance and low input capacitance of 7-pF to minimize circuit loading. The 1141A must be used with 1142A probe control and power module, which controls input coupling modes dc, dc with variable offset, and dc reject. Two attenuators, 10x and 100x are provided to expand the linear differential input range to ±30V. This probe works with any 50-Ω input oscilloscope including 5000, 6000 and 7000 Series.

Characteristics for 1141A differential probe

	1141A
Bandwidth	200 MHz
Risetime	1.75 nsec
Attenuation ratio	10:1 and 100:1 with attenuater
High CMRR	3000:1 at 1-MHz 10:1 at 100-MHz
Input impedance	Between inputs: 1 MΩ, 7 pF
Max input voltage	200 Vdc + peak ac (probe alone) 500 Vdc + peak ac (with attenuator)
Max number of probes supported by 5000/6000/7000 Series	4



1141A 200 MHz differential probe with 1142A probe control and power module

High Voltage Differential Active Probes (continued)

N2792A 200 MHz and N2793A 800 MHz general-purpose differential probe

The N2792A 200 MHz and N2793A 800 MHz differential probes provide the superior general-purpose differential signal measurements required for today's high-speed power measurements, vehicle bus measurements and digital system designs.

The N2792A and N2793A probes offer a 10:1 attenuation setting and high input resistance and low input capacitance to minimize circuit loading.

Both probes are compatible with any oscilloscopes with 50 ohm BNC input. The probe can be powered by any USB port on a scope or computer, or by an internal battery.

Characteristics for N2792A and N2793A differential probes

	N2792A	N2793A
Bandwidth	200 MHz	800 MHz
Risetime	1.75 nsec	437 psec
Attenuation ratio	10:1	10:1
CMRR	80 dB at 50/60 Hz -50 dB at 10 MHz	-60 dB at 50/60 Hz -15 dB at 500 MHz
Max input voltage to ground	±60 V	±40 V
Max input voltage between two inputs	±20 V	±15 V
Max number of probes supported by 5000/6000/7000 Series	4	4

Ordering information for Agilent differential probes and power supply

1141A	200 MHz differential probe
1142A	Probe control and power module for 1141A
N2790A	100 MHz, 1.4 kV differential probe with AutoProbe interface
N2791A	N2791A 25 MHz, 700 V differential probe
N2792A	N2792A 200 MHz, 20 V differential probe
N2793A	N2793A 800 MHz, 15 V differential probe
N2891A	N2891A 70 MHz, 7,000 V differential probe
0960-2926	DB9 adapter for N2792A differential probe
0960-2927	DB9 adapter for N2793A differential probe



N2890A 100 MHz, 1.4 kV differential probe with AutoProbe interface



N2791A 25 MHz, 700 V differential probe



N2792A 200 MHz, 20 V differential probe



N2793A 800 MHz, 15 V differential probe

Single-ended Active Probes

Agilent 1156A Single-ended Active Voltage

- 1.5 GHz probe bandwidth; < 233 ps rise/fall time
- 100 kΩ, 0.8 pF non-resonant input impedance
- Small size for easier probing
- Compatible with 5000, 6000 and 7000 Series (except for 6000 Series 100 MHz models)

The Agilent 1156A is a 1.5GHz active probe for use with Agilent InfiniiVision or Infiniium oscilloscopes. Its high bandwidth (1.5GHz), low input capacitance (0.8pF) and high input resistance (100 kΩ) input minimizes ultra low loading of the DUT, making it ideal for the companion for the 5000, 6000 or 7000 Series oscilloscopes. When used with the 5000, 6000 or 7000 Series, the 1156A offers you a full bandwidth of the scope to the probe tip, giving you the accurate insight into your hi-speed device.

Incorporating the most advanced mechanical and electrical design technologies, the 1156A provides smaller, lighter and more rugged probe tip that enables direct and easy access to fine pitch ICs and components. With the 1156A probe, a damping resistor is placed as close as possible to the point being probed, which keeps the input impedance from resonating low, and it also allows a flat frequency resonance across the entire bandwidth of the probe. The 1156A is designed to withstand 40-V peak AC input and > –5-kV of ESD, so it will function reliably in adverse condition.

Key Characteristics	
Probe bandwidth (–3dB)	> 1.5 GHz
Rise and fall time (10% to 90%) calculated from tr = 0.35/bandwidth	233 psec
System bandwidth (–3dB)	1156A 1 GHz InfiniiVision 6000/7000 scope: 1 GHz
Input capacitance	0.8 pF
Input resistance	100 kΩ ± 1%
Input dynamic range[1]	5 Vp-p
DC attenuation	10:1 ± 3% before calibration 10:1 ± 1% after calibration
Offset range	±15.0 V
Offset accuracy	< 3% of setting before calibration 1% of setting after calibration
Maximum input voltage	40 Vpeak, CAT I
ESD tolerance	> 5 kV from 100 pF, 300 Ω HBM
Maximum number of probes supported by 5000/6000/7000 Series	4

Note [1]: for waveforms with edges >3 nsec, dynamic range is >12 Vp-p.

Ordering information for Agilent 1156A active probe

1156A	1.5 GHz single-ended active probe

Accessories	
E2637A	Precision measurement kit (includes 2 solderable ground sockets with 2 green resistive signal pins)
E2638A	Solderable-tip 5 cm resistive signal leads (10) with ground leads (3)
E2639A	Micro clips, Qty. 4
E2640A	Resistive signal tips Qty. 8
E2641A	Ground blade assembly Qty. 8



Agilent 1156A active probe with accessories

For more comprehensive information about 1156A active probe, refer to the Agilent 1156/57/58A Active Probes Product Overview with Agilent literature number 5988-3361EN.

Single-ended Active Probes

- Up to 800-MHz bandwidth
- 10:1 attenuation
- Compatible with 5000, 6000, and 7000 Series 300-MHz - 1-GHz oscilloscopes

Agilent 1144A active probe

The 1144A features 800-MHz bandwidth, 1-MΩ input resistance, 2-pF input capacitance, 10:1 attenuation and ±40-Vdc + peak ac maximum input voltage. An FET at the input allows a high input resistance and low input capacitance which minimizes the loading of the circuit under test. The output impedance of the probe is 50-Ω which allows the probe cable to be extended with a 50-Ω coaxial cable. To use this probe with 5000, 6000 or 7000 Series oscilloscope, the 1142A power supply is required. The 01144-61604 adapter can be used with the power supply to provide power for two channels of active probing.

Characteristics for 1144A active probe

Bandwidth	≥ 800 MHz
Risetime (calculated)	≤ 440 ps
Attenuation ratio	10:1, ±2% (when connected to an instrument input of 50 ohm, ±0.5%)
Input resistance	1 MΩ, ±5%
Maximum input voltage	±40 V (dc + peak ac)
Input capacitance*	2 pF (typical)
Input dynamic range*	0 to ±7.0 V
Power requirements	dc ±12 V to ±15 V ±5% (at approximately 75 mA each supply)
Weight	
Net	Approximately 180 g (6.5 oz)
Probe body	35 g (~1.25 oz)
Shipping	Approximately 0.8 kg (1.75 lb)
Temperature	
Operating	0 to 55 °C (32 to 131 °F)
Non-operating	–40 to +70 °C (–40 to +158 °F)
Humidity	
Operating	Up to 95% relative humidity (non-condensing) at 40 °C (104 °F)
Non-operating	Up to 90% relative humidity at 65 °C (149 °F)
Altitude	
Operating	Up to 4,600 meters (15,000 ft)
Non-operating	Up to 15,300 meters (50,000 ft)
Maximum number of probes supported by 5000/6000/7000 Series	4



1144A active probe

* *Operating characteristics*

Single-ended Active Probes (continued)

Agilent 1145A 2-channel active probe

The two-channel 1145A low-mass active probe has a probe tip that weighs less than 1-gram making it ideal for attaching to find pitch ICs and probing surface mount components. The probe combines high bandwidth (750-MHz), low input capacitance (2-pF) and high input resistance (1-MΩ). A versatile set of accessories are provided and when used in conjunction with the Wedge adapter, the 1145A provides a hands-free solution for probing 0.5-mm and 0.65-mm IC packages. To use this probe with 5000, 6000 or 7000 Series or oscilloscope, the 1142A power supply is required.

Characteristics for 1145A active probe

Bandwidth	750 MHz
Risetime (calculated)	470 ps
Attenuation ratio	10:1, ±3%
Input resistance	1 MΩ, ±2%
Maximum input voltage	±40 Vdc + peak ac
Input capacitance*	2 pF (typical)
Input dynamic range*	0 to ±6.0 V
Maximum number of probes supported by 5000/6000/7000 Series	2

Ordering information for Agilent active probes

1144A	800 MHz active probe
1145A	2-channel 750 MHz active probe
1142A	Power supply for 1144A and 1145A
01144-61604	Splitter cable assy



1145A active probe

* *Operating characteristics*

Mixed Signal Oscilloscope Logic Probes

- Compatible with all 40-pin logic probe
- Flying leads offer flexibility and convenience

MSO probes offer great value and performance

These logic probes for the MSO6000A, MSO7000A/B, 5462xD, and 5464xD Mixed Signal Oscilloscopes (MSOs) are the same ones used with Agilent industry-leading high-performance logic analyzers. This means we can offer the best performance, great value and access to the industry's broadest range of logic probing accessories.

The 54620-68701 2 x 8-signal logic probe is divided into two sets of eight channels so you can probe pins that are far apart and work conveniently with only one set if that's all you require. For optimal signal fidelity, connect ground at each logic probe, in addition to taking a common ground to all eight signals via a separate ground connector on the probe pod. This probe is included with MSO7000A and MSO6000A MSOs.

Characteristics for Agilent 54620-68701 logic probe

Input impedance	100 kΩ
Input capacitance	8 pF

The 01650-61607 is the 40-pin (F) to 40-pin (F) logic probe cable for Agilent's 6000 Series and 54600 Series MSOs. This cable gives the MSO the standard 40-pin female input connector that many Agilent logic analyzers have. With this cable, a user can connect a wide variety of logic analyzer probes such as Mictor, Samtec, and Soft Touch probes.

Characteristics for Agilent 01650-61607 logic probe

Input impedance	100 kΩ
Input capacitance	12 pF



01650-61607 logic probe



54620-68701 logic probe

Ordering information for Agilent logic probes

54620-68701	Logic probe with 2 x 8 flying leads. Includes 20 IC clips and 5 ground leads
01650-61607	40-pin (F) to 40-pin (F) logic probe cable

Mixed Signal Oscilloscope Logic Probes (continued)

The 6000 and 7000 Series MSO digital channels were architected to be compatible with a wide variety of probing accessories developed over 20 years for logic analyzers. There's a good chance that the logic analyzer accessories you already own work with your MSO. With the addition of an optional 40-pin cable, 01650-61607, the MSO accepts numerous logic analyzer accessories:

- E5346A 34-channel Mictor connector probe
- E5385A 34-channel Samtec connector
- E5383A 16-channel flying lead set
- 01650-63203 16-channel termination adaptor (also available as a bundle of both the termination adapter and the 40-pin cable with PN 10085-68701)
- E5404A 34-channel soft touch pro connectorless probe
- E5394A 34-channel soft touch connectorless probe
- E5396A 16-channel soft touch connectorless probe
- Any other accessory that connects to a logic analyzer via a 40-pin cable

For logic accessories of greater channel width than MSO digital channels (> 16 channels), there are two use models.

- Route up to sixteen signals to the probe and don't use the additional probe channels.
- Route up to 32 signals to the probe and measure ½ of them at a time. Simply plug the 40-pin cable to the other side of the probe to see the other ½ of the signals.



E5346A 34-channel Mictor connector probe



E5385A 34-channel Samtec connector probe



E5396A 16-channel soft touch connectorless probe

Current Probes

- Up to 100 MHz bandwidth and 500 Arms current
- Hybrid technology to measure ac and dc
- Compatible with any 1 MΩ scope input

Accurate current measurements without breaking the circuit

Compatible with any scope or voltage measuring instruments with BNC input, the 1146A and N2780A Series current probes offer accurate and reliable solutions for measuring dc and ac currents. The probes use a hybrid technology that includes a Hall effect sensor, which senses the dc current and a current transformer, which senses the ac current, making it unnecessary to make an electrical connection to the circuit.

1146A 100 kHz current probe

The 1146A ac/dc current probe provides accurate display and measurement of currents from 100 mA to 100 Arms, dc to 100-kHz, without breaking into the circuit. A battery level indicator and overload indicator help ensure proper readings. It connects directly to the scope through a 2 m coaxial cable with an insulated BNC.



1146A 100 kHz current probe

1147A 50-MHz current probe with AutoProbe interface

The 1147A is a wide bandwidth, dc to 50-MHz current probe. The probe offers flat frequency response across the entire dc to 50-MHz bandwidth, low noise (< –2.5-mArms) and low circuit insertion loss.

The 1147A probe is compatible with the AutoProbe interface, which completely configures the oscilloscope for the probe when used with the 5000/7000 Series and 300-MHz - 1-GHz 6000 Series scope. Probe power is provided by the scope, so there is no need for an external power supply.



1147A 50-MHz current probe with AutoProbe interface

N2780A/81A/82A/83A 2-MHz/10-MHz/50-MHz/ 100-MHz current probe

The N2780A Series current probes are high bandwidth, active current probes, featuring flat bandwidth, low noise (< –2.5-mArms) and low circuit insertion loss. In conjunction with the power supply (model N2779A), this probe can be used with any oscilloscope having a high-impedance BNC input. The companion power supply N2779A (3x 12 Vdc output) lets you connect three N2779As to a single power supply.



N2780A Series current probes with N2779A power supply

Current Probes (continued)

Characteristics of the 1146A current probe

Bandwidth*	dc to 100 kHz (–3 dB)
Current range*	100 mV/A:100 mA to 10 A peak 10 mV/A:1 to 100 A peak
Output signal	1000 mV peak max
AC current accuracy*	
Range	100 mV/A (50 mA to 10 A peak)
Accuracy	3% of reading ±50 mA
Range	10 mV/A (500-mA to 40 A peak)
Accuracy	4% of reading ±50 mA
Range	10 mV/A (40 A to 100 A peak)
Accuracy	15% max at 100 A
Noise	Range 10 mV/A: 480 µV Range 100 mV/A: 3 mV
Insertion impedance	(50/60 Hz) 0.01 Ω
Maximum working voltage	600 Vrms max.
Maximum common mode voltage	600 Vrms max.
Influence of adjacent conductor	< 0.2 mA/A AC
Influence of conductor position	0.5% of reading at 1-kHz in jaw
Battery	9 V alkaline (NEDA 1604A, IEC 6LR61)
Low battery	Green LED when > 6.5-V
Battery life	55 hours typical

Note: Reference conditions 23°C ± 5°C, 20 to 75% relative humidity, dc to 1 kHz, probe zeroed, 1-minute warmup, batteries at 9 V + 0.1 V, external magnetic field <40 A/m, no dc component, no external current carrying conductor, 1 MΩ/ 100 pF load, conductor centered in jaw.

* *Characteristics marked with asterisks are specified performance. Others are typical characteristics.*

Characteristics of the 1147A current probe

Bandwidth (–3 dB)	dc to 50 MHz (1147A)
Risetime	7 ns or less
Maximum current (continuous)	15 A peak (ac+dc components) RMS
Maximum peak current	30 A peak; Non-continuous 50 A peak; at pulse width of 10 µs or less
Output voltage rate	0.1 V/A
Amplitude accuracy	±1% rdg, ±1 mV (dc and 45 to 66 Hz, rated current)
Noise	Equivalent to 2.5 mArms or less (for 20 MHz bandwidth measuring instrument)
Temperature coefficient for sensitivity	±2% or less (within a range of 0 °C to 40 °C or 32 °F to 104 °F)
Effect of external magnetic fields	Equivalent to a maximum of 20 mA (in a dc to 60 Hz, 400 A/m magnetic field)
Maximum rated power	3 VA (with rated current)
Rated supply voltage	dc ±12 V ±1 V
Diameter of measurable conductors	5 mm dia. (0.2" dia.)
Probe interface	AutoProbe interface
Cable lengths	Sensor cable: Appox. 1.5 m (59.0") Power supply cable: Appox. 1 m (39.4")
Maximum number of probes supported	2

Note: The above specifications are guaranteed at 23 °C ± 3 °C (or 73 °F ± 5 °F)

Characteristics of N2780A Series current probes

Bandwidth (–3dB)	dc to 2 MHz (N2780A) dc to 10 MHz (N2781A) dc to 50 MHz (N2782A) dc to 100 MHz (N2783A)
Maximum current (continuous)	500 A (N2780A) 150 A (N2781A) 30 A (N2782A/N2783A)
Maximum peak current (non-continuous)	700 A peak (N2780A) 300 A peak (N2781A) 50 A peak (N2782A/N2783A)
Output voltage rate	0.01 V/A (N2780A/N2781A) 0.1 V/A (N2782A/N2783A)
Amplitude accuracy	±1.0 % rdg ±500 mA (N2780A) ±1.0 % rdg ±100 mA (N2781A) ±1.0 % rdg ±10 mA (N2782A) ±1.0 % rdg ±10 mA (N2783A)

Ordering information for Agilent current probes

1146A	100 kHz current probe
1147A	50 MHz current probe with AutoProbe interface
N2780A	2 MHz current probe
N2781A	10 MHz current probe
N2782A	50 MHz current probe
N2783A	100 MHz current probe
N2779A	3-channel power supply for N2780A/81A/82A/83A

For more information about the N2780A Series current probes, refer to the Agilent N2780A Series current probe data sheet, Agilent literature number 5989-6432EN.

Wedge Probe Adapters

- Easy connection to surface mount ICs
- Safe, with no chance of shorting
- Mechanically non-invasive contact
- 3-, 8-, and 16-signal versions
- Supports 0.5 mm and 0.65-mm TQFP and PQFP packages

Problem-free probing

The Agilent Wedge Probe Adapter eliminates many of the frustrations associated with probing surface mount components. If you've ever accidentally shorted IC pins together, experienced electrical and/or mechanical problems with soldering small wires onto leads, or gotten frustrated juggling multiple probes while you're trying to operate your scope, the Wedge was designed with you in mind.

Make the inaccessible accessible

When you use the Wedge, you don't have to worry about shorting IC pins together on a delicate component – or worse yet on an irreplaceable prototype. The Wedge is easy to insert and it stays put. There's no need to solder small wires onto leads. The Wedge is mechanically non-invasive, so you won't damage the legs of the IC. Instead, you'll have easy access to hard-to-reach components.

Electrical reliability

The Wedge makes two contact points with each leg of the IC. This redundant physical connection increases the electrical reliability of the connection. And the Wedge's low capacitance and inductance provides superior performance to many other alternatives.

IC clip kits

An inexpensive solution for probing fine-pitch ICs, the 10072A SMT Kit includes ten IC clips and two dual-lead adapters that connect the clips directly to 10070-family probes.

The 10075A 0.5-mm IC clip kit is ideal for connecting to IC's as fine as 0.5-mm. The clip body allows many clips to be mounted side-by-side. The kit includes four 0.5-mm IC clips and two dual-lead adapters that connect the IC clips directly to 10070-family probes.

Agilent Wedge electrical characteristics

Operating voltage	< 40 V dc + peak ac
Operating current	0.5 A maximum
Capacitance between contacts	2 pF typical (all except Agilent-E2643A/44A) 4.33 pF typical at 1-MHz (Agilent-E2643A/44A)
Self-inductance	15 nH typical (all except Agilent-E2643A/44A) 37 nH typical at 1-MHz (Agilent E2642A/44A)
Cross coupling	–31 dB typical at 100-MHz (Agilent-E2643A/44A)
Contact resistance	< 0.1 Ω



Ordering information

E2613A	0.5 mm Wedge probe adapter, 3-signal, qty 1
E2613B	0.5 mm Wedge probe adapter, 3-signal, qty 2
E2614A	0.5 mm Wedge probe adapter, 8-signal, qty 1
E2643A	0.5 mm Wedge probe adapter, 16-signal, qty 1
E2615A	0.65 mm Wedge probe adapter, 3-signal, qty 1
E2615B	0.65 mm Wedge probe adapter, 3-signal, qty 2
E2616A	0.65 mm Wedge probe adapter, 8-signal, qty 1
E2644A	0.65 mm Wedge probe adapter, 16-signal, qty 1
10072A	SMT kit for 10070 probe family
10075A	0.5 mm IC clip kit

PC Connectivity

Get scope data into your PC with Agilent IntuiLink without programming

- Ideal for documentation and archiving
- Works in familiar Microsoft® Excel and Word environments
- Leverage the power of Excel for data analysis and advanced graphing
- ActiveX controls provided for more flexible scope programming
- Compatible with 5000, 6000 and 7000 Series

To simplify the task of transferring images and waveform data to your PC, Agilent IntuiLink software is offered free for all 5000, 6000 and 7000 Series scopes. IntuiLink Toolbar provides easy access to the scope data and images from within your standard PC applications. You work in a familiar environment at all times, using PC applications such as Microsoft Excel or Word to analyze, interpret, display, print, and document the data you get from the scope. The IntuiLink toolbar makes it easy, providing a simple way to download data and screenshots into a spreadsheet or document. You can also save the scope settings and retrieve them later to reproduce difficult setups like glitch capture and complex triggering.

Minimum operating system requirements:

- Windows® 95/98, or Me
- Windows NT® 4.0 (with Service Pack 4 or greater, obtain at **www.microsoft.com**)
- Windows 2000
- Windows XP

Minimum MS Office application requirements:

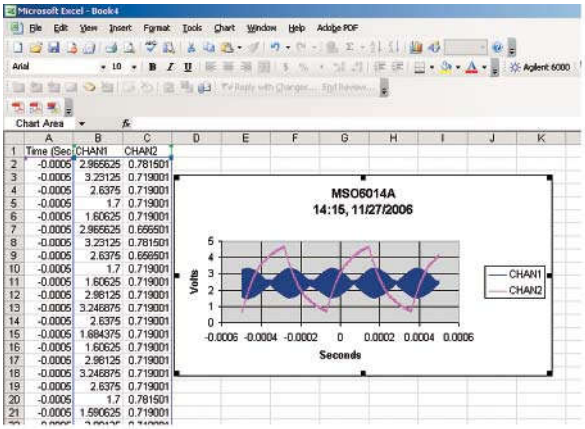
- Microsoft Office 2000 (Word or Excel) or
- Microsoft Office XP
- Microsoft Office 2003

IntuiLink Data Capture software for transferring megabytes of data to PC

The IntuiLink Data Capture is a standalone software for downloading waveform data and screen image from 5000, 6000 or 7000 Oscilloscopes to the PC via USB, LAN or GPIB (for 5000 and 6000 only) interface. It provides the capability to transfer full deep memory data out of the scope. The IntuiLink Toolbar application limits the size of acquisition data available to a maximum of 50,000 points regardless of actual number of acquisition points on the screen. With the IntuiLink Data Capture, the amount of points transferred will be the actual number of acquisition points currently displayed or you may select the number of points to download.

Unlike the IntuiLink Toolbar, it is not based on Microsoft Excel or Word. However you may still copy and paste the data on to the Microsoft applications for manipulating or charting the data.

For more information or free download of the software, visit **www.agilent.com/find/intuilink**



Simple transfer of images and data with IntuiLink Toolbar

Miscellaneous Accessories

Testmobile

The sturdy Agilent 1180CZ Testmobile for use with 6000 Series oscilloscope makes sharing your scope easy. Its large wheels make it easy to roll from place to place. For use with the Agilent 6000 Series scope, the 1180CZ Testmobile scope cart with the N2919A bracket provides convenient mobility and secure mounting of your scope.

Specifications for the Agilent Testmobiles

1180CZ	
Total load capacity	59 kg (130 lbs)
Tilt tray	45.7 cm wide x 45.7 cm deep

Carrying cases

The Agilent N2760A soft carrying case and N2917B hard carrying case make transporting and shipping your 5000 and 6000 Series oscilloscope safe and simple. A scope and other accessories fit neatly inside the padded shell for shipment. For use with the 7000 Series, order N2733A, soft carrying case.

Specifications for the Agilent carrying cases

N2917B for 5000 and 6000 Series	
Dimensions (W x H x D)	45 cm x 42 cm x 31 cm
Material	Tough ABS Plastic

N2760A for 5000 Series only	
Dimensions (W x H x D)	39 cm x 27 cm x 22 cm
Material	600 Denier Polyfoam with Tricot Foam laminate with interior pack cloth

Rackmount Kit

The Agilent N2916B Rackmount Kit positions your 5000 and 6000 Series scope in the center of the rack. Each kit includes a custom shelf with rails, 6 BNC pass-throughs and all necessary screws. For mounting the 7000 Series in the rack, order N2732A

Ordering information

1180CZ	Testmobile (6000 Series)
N2919A	Bracket for 1180CZ Testmobile and 6000 Series scope
N2917B	Hard carrying case (5000 and 6000 Series)
N2760A	Soft carrying case (5000 Series)
N2733A	Soft carring case (7000 Series)
N2916B	Rackmount Kit (5000 and 6000 Series)
N2732A	Rackmount Kit (7000 Series)



N2760A Soft carrying case for the 5000 Series



N2917B Hard carrying case for the 5000 and 6000 Series



N2916B Rackmount Kit for 5000/6000 Series

Miscellaneous Accessories

Probe positioners

- Easy-to-manipulate probe arms for hands-free browsing
- One- or two-articulated arms with stable high-mass base (N2784A and N2785A)
- Quick and stable XY positioning (N2786A)
- Stable 3D probe positioning for hard-to-reach XYZ access
- Compatible with most scope probes
- Applications: Hands-free browsing for electronic components on PC board

The N2784A and N2785A probe positioners provide quick and stable X-Y positioning for PC boards and devices that require hands-free probing.

Unlike other probe positioners that require multiple adjustments to lock the probe holder into position, the N2784A and N2785A need only the "lift and drop" motion to put the probe in place. The weight stabilization technique used in these probe holders keeps constant pressure at the probing point so the probe tip stays in position even when the target board is bumped.

The N2786A is a low cost, easy-to-use XY axis probe holder for general purpose probing appliactions. The two-leffed positioner is designed to be easy to use - the positioner itself has no controls to positioner it in place.

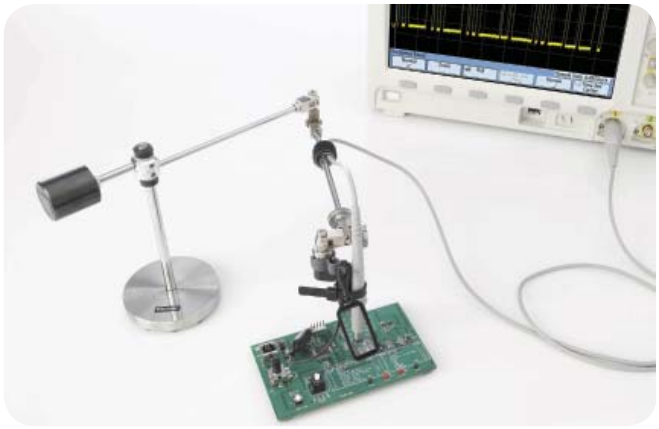
The N2787A is a 3D probe positioner with a flexible, articulating arm that can be quickly positioned in a variety of configurations.

For more information about Agilent's probe positioners, refer to the Agilent literature number 5989-9131EN.

Ordering information

Product number	Description
N2784A[1]	1-arm probe positioner
N2785A[1]	2-arm probe positioner
N2786A	two-leg probe positioner
N2787A	3D probe positioner

Note[1] Includes 3x magnifying glass, arm strap, cable tie, probe rest and manual.



N2784A one-arm probe positioner



N2786A 2-leg probe positioner



N2787A 3D probe positioner.



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