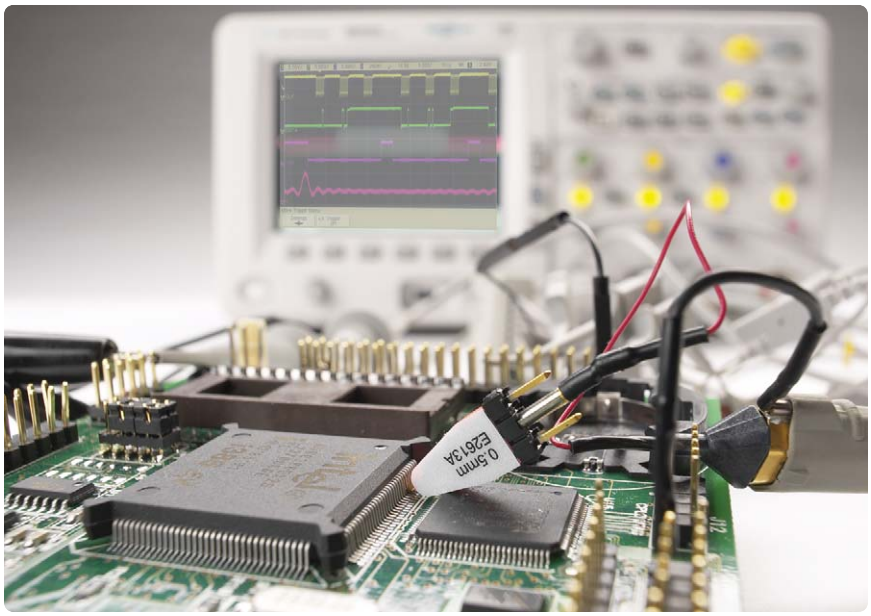
Agilent Technologies 6000 and 54600 Series Oscilloscope Probes and Accessories

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 6000 and 54600 Series scopes.

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Agilent Technologies

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 6000 and 54600 Series oscilloscope.

Probe Type	Probe Model	54621A/D, 54622A/D, 54624A	54641A/D, 54642A/D	MSO/DSO6000A[5] 100 MHz	MSO/DSO6000A[4] 300 MHz - 1 GHz
Passive Probes Page 3	10070C 1:1 20 MHz	Recommended	Recommended	Recommended	Recommended
	10073C 10:1 500 MHz (Included in 6000 and 54640 Series)	Compatible	Recommended	Compatible	Recommended
	10074C 10:1 150 MHz (Included in 54620 Series)	Recommended	Compatible	Recommended	Compatible
High-voltage Passive Probes Page 4	10076A 4 kV	Recommended	Recommended	Recommended	Recommended
	N2771A 30 kV	Recommended	Recommended	Recommended	Recommended
Active Differential Probes Page 5	1130A 1.5 GHz [1]	Incompatible	Incompatible	Incompatible	Recommended
	N2772A 20 MHz (use with N2773A)	Recommended	Recommended	Recommended	Recommended
	1141A 200 MHz (use with 1142A)	Compatible	Recommended	Compatible	Recommended
Active Single-ended Probes Page 8	1156A 1.5 GHz [2]	Incompatible	Incompatible	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 10	10085-68701 2x8-channel	Recommended	Recommended	Recommended	Recommended
	54620-68701 16-channel (included in 54621D/22D/41D/42D and MSO6000A)	Recommended	Recommended	Recommended	Recommended
Current Probes Page 11	1146A 100 kHz	Recommended	Recommended	Recommended	Recommended
	N2774A 50 MHz (use with N2775A)	Recommended	Recommended	Recommended	Recommended
	1147A 50 MHz	Incompatible	Incompatible	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 6000 series.
[2] The 1157A and 1158A are also supported by 6000 series.
[3] Recommended for 54621D/22D/41D/42D and MSO6000A MSOs only.
[4] These Infiniium active probes are not supported by 6000 series — 1152A, 1153A, 1154A, 1155A, 1159A, 1168A, and 1169A.
[5] MSO/DSO6000A 100 MHz models do not support any Agilent Infiniium active single-ended or differential probes.

Passive Probes

- **Designed for optimal performance with your Agilent 6000 and 54600 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 6000 and 54600 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.

Probes come with the following accessories:

- General-purpose retractable hook tip hooks onto wires and test points for hands-free probing
- Ground bayonet provides short, flexible ground lead for high-frequency measurements
- General-purpose alligator clip ground lead for versatile grounding
- Color tags (2 orange, 2 white, 2 blue and 2 green) to place at both ends of probe cable to help you quickly identify probes

Accessories available for passive probes

5081-7705	Probe-tip-to-BNC (m) adapter
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.

Ordering Information for Agilent Technologies Passive Probes

All 10070-family passive probes include one retractable hook tip, one ground bayonet, one IC probing tip, one alligator ground lead and a compensation screwdriver.

10070C	1:1 20 MHz passive probe
10073C	10:1 500 MHz passive probe
10074C	10:1 150 MHz passive probe
10072A	Fine-pitch probing kit
10075A	0.5 mm IC probing kit
5081-7705	Probe-tip-to-BNC (m) adapter
8710-2063	Dual-lead adapter

10074C Passive Probe

Specifications for Agilent Technologies 10070 Family Passive Probes

	10070C	10073C	10074C
Bandwidth	20 MHz	500 MHz	150 MHz
Risetime (Calculated)	< 17.5 ns	< 700 ps	< 2.33 ns
Attenuation Ratio	1:1	10:1	10:1
Input Resistance (when terminated into 1 MΩ)	1 MΩ	2.2 MΩ	10 MΩ
Input Capacitance	Approx 70 pF	Approx 12 pF	Approx 15 pF
Maximum Input (dc + peak ac)	500 V CAT I (mains isolated) 400 V CAT II (post receptacle mains)	500 V CAT I (mains isolated) 400 V CAT II (post receptacle mains)	500 V CAT I (mains isolated) 400 V CAT II (post receptacle mains)
Compensation Range	None	6 - 15 pF	9 - 17 pF
Probe Readout	Yes	Yes	Yes
Cable Length	1.5 m	1.5 m	1.5 m

High-voltage Passive Probes

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

10076A high-voltage probe

The Agilent 10076A 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.

Specifications for 10076A

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 Range	6-20 pF
Probe Readout	Yes
Cable Length	1.8 m

10076A 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.

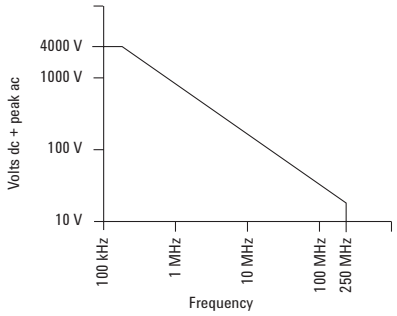
Specifications for N2771A

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 width at probe handle) x 33 cm

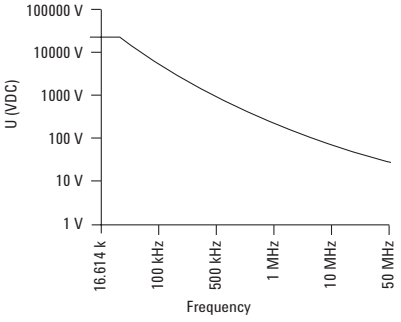
N2771A High-voltage Probe

Ordering Information for Agilent Technologies High-voltage Probe

10076A	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 includes one retractable pincher tip, one ground lead, one insulation cap, two measuring pins and two colored tags



10076A Derating Curve



N2771A Derating Curve

High Frequency Active Differential Probe

Agilent 1130A InfiniiMax High-Performance Active Probe System

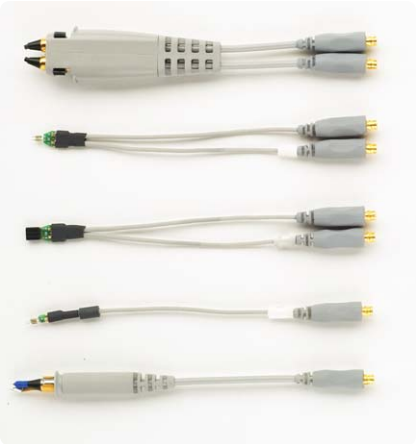
- **1.5 GHz InfiniiMax probe system**
- **InfiniiMax probe amplifier supports both differential- and single-ended measurements for a more cost-effective solution**
- **Unrivaled InfiniiMax probing accessories support browsing, solder-in, and socketed use models at the maximum performance available**
- **Compatible with 6000 Series oscilloscopes (300 MHz - 1 GHz only)**

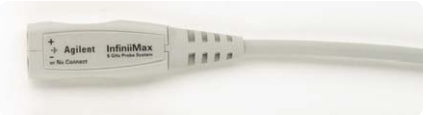
The 1.5 GHz 1130A InfiniiMax probe amplifier is a perfect complement to the 6000 Series 1 GHz models. Its 1.5 GHz bandwidth, extremely low input capacitance (0.32 pF), high common mode rejection and the patented resistor probe tip technology provide ultra low loading of the DUT and superior signal fidelity. 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 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.

Specifications

Operating Characteristics

Probe Bandwidth (–3dB)	> 1.5 GHz
Rise and Fall Time (10% to 90%)	233 psec
System Bandwidth (–3dB)	1130A with MSO/DSO610xA: 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 6000 Series	2





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

High Frequency Active Differential Probe (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

For more comprehensive information about 1130A InfiniiMax probe amplifier and its accessories, refer to the Agilent Infiniium 54800 Series Oscilloscope Probes, Accessories, and Options data sheet with Agilent literature number 5968-7141EN.

Active Differential Probes

- **20 MHz to 1.5 GHz bandwidth**
- **Switchable attenuation**
- **Measure up to 600 V CAT III and 1000 V CAT II**

N2772A 20 MHz Differential Probe

Use the Agilent N2772A Differential Probe with any of the 54600 Series oscilloscopes to safely measure floating circuits with the oscilloscope grounded. With 20 MHz bandwidth and switchable attenuation of 20:1 and 200:1, it provides the versatility for a broad range of applications including high-voltage circuits, motor speed controls, power supply design, and electronic high-power converters.

Each probe comes with 2 sharp probe tips for use on small components and in tight places, 2 retractable probe hooks for connecting to smaller wires and through-hole components, and 2 alligator clips for use with larger cables.

This probe requires a 9 V battery or Agilent N2773A power supply.

Specifications for N2772A Differential Probe

Bandwidth	20 MHz
Risetime	17.5 ns
Attenuation Ratio	20:1 and 200:1 selectable via switch on probe
High CMRR	80 dB @ 60 Hz, 50 dB @ 1 MHz
Input Impedance	Between inputs: 10 MΩ, 5 pF
Measure up to 600 V CAT III	
Maximum Number of Probes Supported by 6000 Series	4

1141A 200 MHz Differential Probe

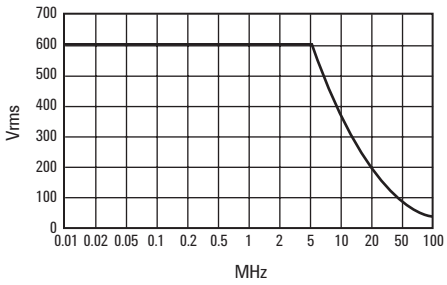
The 1141A is a 1x FET differential probe with 200 MHz bandwidth and a 3000:1 CMRR. The probe has a high-input resistance and low input capacitance of 7 pF to minimize circuit loading. The 1141A must be used with 1142A probe control and power module, which controls input coupling modes dc, dc with variable 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 6000 and 54640 Series.

Specifications for 1141A Differential Probe

Bandwidth	200 MHz
Risetime (Calculated)	1.75 ns
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
Maximum Input Voltage	200 Vdc + peak ac (probe alone) 500 Vdc + peak ac (with attenuator)
Maximum Number of Probes Supported by 6000 Series	4

Ordering Information for Agilent Technologies Differential Probes and Power Supply

N2772A	20 MHz differential probe, supplied with a retractable hook, sharp probe tips and alligator clips
N2773A	Power supply for N2772A
1141A	200 MHz differential probe
1142A	Probe control and power module for 1141A



Derating of each input for the N2772A

N2772 20 MHz Differential Probe

1141A 200 MHz Differential Probe

High-Frequency Active Single-ended Probe

Agilent 1156A High-bandwidth Active Single-ended 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 6000 Series oscilloscopes (300 MHz - 1 GHz only)**

The Agilent 1156A is a 1.5 GHz active probe for use with Agilent 6000 Series or Infiniium oscilloscopes. Its high bandwidth (1.5 GHz), low input capacitance (< 0.8 pF) and high input resistance (100 kΩ) input minimizes ultra low loading of the DUT, making it ideal for the companion for the new 6000 Series oscilloscopes. When used with the 6000 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 provide smaller, lighter and more rugged probe tip that enable 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 Specifications – Operating Characteristics

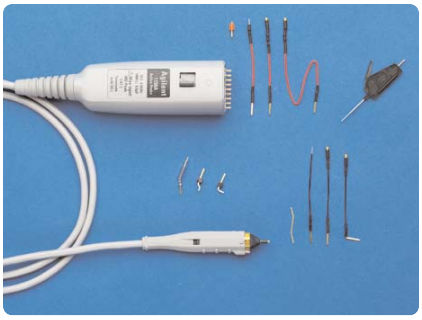
Probe Bandwidth (–3dB)	> 1.5 GHz
Rise and Fall Time (10% to 90%) Calculated from tr=0.35/bandwidth	233 psec
System Bandwidth (–3dB)	1156A with MSO/DSO610xA: 1 GHz
Input Capacitance	0.8 pF
Input Resistance	100 kΩ ± 1%
Input Dynamic Range	±2.5 V
DC Attenuation	10:1 ± 3% before calibration 10:1 ± 1% after 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 6000 Series	4

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)



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.

Active Single-ended Probes

- **Up to 800 MHz bandwidth**
- **10:1 attenuation**
- **Compatible with 6000 Series 300 MHz - 1 GHz or 54640 Series 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 6000 Series or 54640 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.

Specifications for 1144A Active Probe

Bandwidth	800 MHz
Risetime (Calculated)	440 ps
Attenuation Ratio	10:1, ±2%
Input Resistance	1 MΩ, ±5%
Maximum Input Voltage	±40 Vdc + peak ac
Input Capacitance*	2 pF (typical)
Input Dynamic Range*	0 to ±7.0 V
Maximum Number of Probes Supported by 6000 Series	4

* Operating characteristics

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 6000 Series or 54640 Series oscilloscope, the 1142A power supply is required.

Specifications 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 6000 Series	2

* Operating characteristics

Ordering Information for Agilent Technologies 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

1144A Active Probe

1145A Active Probe

Mixed Signal Oscilloscope Logic Probes

- **Same cables used for high-performance logic analyzers**
- **Flying leads offer flexibility and convenience**

MSO probes offer great value and performance

These probes for the MSO6000A, 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 with flying leads makes it possible to connect at several different places on your device under test. The probe cable 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, it is possible to 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 5462xD, 5464xD, and MSO6000A MSOs.

Specifications for Agilent Technologies 54620-68701 Logic Probe

Input Impedance	100 kΩ
Input Capacitance	8 pF

The 10085-68701 16-channel logic probe and termination adapter is designed to make it easy to connect to industry-standard, 20-pin board connectors. This probe consists of a 2 m logic analyzer probe cable and a 01650-63203 termination adapter that provides the proper RC networks in a very convenient package. Three 20-pin, low-profile, straight board connectors are included. Additional board connectors can be ordered from Agilent Technologies or 3M.

Specifications for Agilent Technologies 10085-68701 Logic Probe and Termination Adapter

Input Impedance	100 kΩ
Input Capacitance	12 pF

10085-68701 Logic Probe

54620-68701 Logic Probe

Ordering Information for Agilent Technologies Logic Probes

54620-68701	Logic probe with 2 x 8 flying leads. Includes 20 IC clips and 5 ground leads
10085-68701	Logic probe and termination adapter

Board Connectors

1251-8106	(3M part #2520-6002) 20-Pin, low profile (straight)
1251-8473	(3M part #2520-5002) 20-Pin, low profile (right angle)

Termination adapter included in the 10085-68701

Current Probes

- **Choice of dc-100 kHz and dc-50 MHz bandwidth**
- **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 N2774A 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 300 MHz - 1 GHz 6000 Series scope. Probe power is provided by the scope, so there is no need for an external power supply.

N2774A 50 MHz Current Probe

The N2774A is a high bandwidth, active current probe, featuring flat bandwidth (dc-50 MHz), low noise (<2.5 mArms) and low circuit insertion loss. In conjunction with the power supply (model N2775A), this probe can be used with any oscilloscope having a BNC input. The companion power supply N2775A (2x 12 Vdc output) lets you connect two N2774As to a single power supply.

N2774A 50 MHz current probe and N2775A power supply

1147A 50 MHz current probe with AutoProbe interface

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
Phase Shift	< 1° from dc to 65 Hz on 10 mV/A < 1.5° from dc to 65 Hz on 100 mV/A
Noise	Range 10 mV/A: 480 µV Range 100 mV/A: 3 mV
Slew Rate	Range 10 mV/A: 20 mV/µs Range 100 mV/A: 0.3 V/µs
Insertion Impedance	(50/60 Hz) 0.01 Ω
Rise or Fall Time	Range 100 mV/A: 3 µs Range 10 mV/A: 4 µs
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

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

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 of 1147A/N2774A Current Probe

Bandwidth (-3 dB)	dc to 50 MHz
Risetime	7 ns or less
Rated Current	15 A peak (ac+dc components)
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	BNC (N2774A) AutoProbe interface (1147A)
Cable Lengths	Sensor cable: Appox. 1.5 m (59.0″) Power supply cable: Appox. 1 m (39.4″)
Maximum Number of Probes Supported	2 (1147A) 4 (N2774A with 2 N2775A)

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

Ordering information for Agilent current probes

1146A	100 kHz current probe
N2774A	50 MHz current probe
N2775A	Power supply for N2774A
1147A	50 MHz current probe with AutoProbe interface

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.

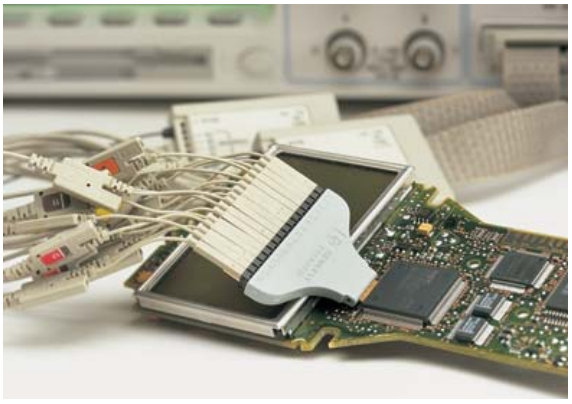
IC Clip Kits

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

Printer Kit

- **Easily print screens and setups**
- **No separate power supply required**
- **Compatible only with 54620/40 Series**

Everything you need for easy and portable documentation

The Agilent N2727A printer kit comes complete with everything you need for easy documentation directly from your 54600 Series scope. It lets you easily print screen displays and key setup parameters so you can include them in reports and share them with colleagues.

You don't need a separate power supply with this thermal printer because it's powered directly from your oscilloscope. And it includes a specially designed short, flat, parallel cable to make it easy to connect to your scope.

Store the printer in the special pouch that fits on top of your scope – it includes a separate compartment where you can conveniently store your probes and accessories, too. It comes with three rolls of printer paper – enough for you to print 200 screen captures with setup information.

Specifications for Agilent Technologies N2727A Printer Kit

Dimensions (Printer)	166 mm x 166 mm x 66 mm
Typical Print Speed	2:33 minutes
Typical Scope Spool Time	9 seconds

Ordering information

N2727A	Printer kit (includes Seiko DPU-414 thermal printer, printer pouch, power cable, special parallel cable, 3 rolls of printer paper
N2728A	10 rolls of printer paper (Can also be purchased directly from a Seiko distributor.) Dimension of paper roll 4-3/8" width x 1-13/16"diameter

CAN Trigger Module

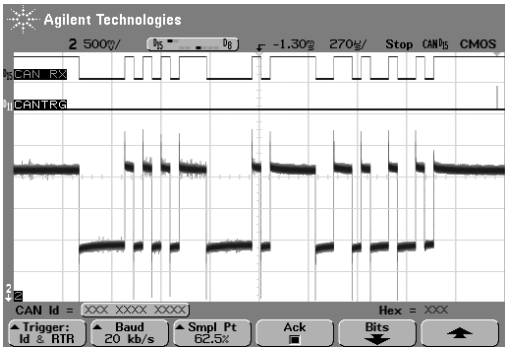
- **Trigger on CAN 2.0A/B message frames with user specified IDs and/or data**
- **Trigger on Error frames**
- **Differential CAN**
- **Acknowledge On/Off**
- **Built In QuickHelp**
- **Remote Control via GPIB/RS232**
- **Compatible with 54621D, 54622D, 54641D, 54642D**

The N2758A CAN trigger module extends your Mixed Signal Oscilloscope's (MSO) capabilities beyond the standard CAN SOF trigger. The module enables the MSO to isolate and trigger on a particular frame's content. This triggering allows you to:

- sort through frame traffic on the bus
- isolate frames of interest
- specify particular frame characteristics
- trigger and measure latency between CAN frames meeting the user specification

The CAN trigger module is ideal for analyzing all traffic on the broadcast network. Quickly find frames that meet the specifications you select with an isolating capability similar to pattern triggering across multiple channels in the parallel domain. Synchronize to the particular frame then examine the system behavior of interest.

The N2758A kit includes the CAN trigger module, digital cable, ten grabbers, and two probe ground leads.



Use the N2758A CAN trigger module with the 54621D, 54622D, 54641D, 54642D Mixed Signal Oscilloscopes (MSOs) for quick and easy triggering.

Ordering Information

Accessories included: one digital probe with eight general purpose digital channels and 16-pin ribbon cable connection to connect to CAN trigger module, ten grabbers, two probe ground leads, User's Guide, and software upgrade

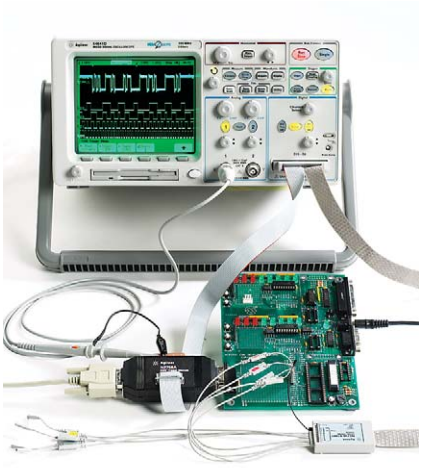
N2758A	CAN trigger hardware module

Additional Orderable Accessories

5090-4833	Grabbers (Qty 20)
5959-9333	Probe Lead (Qty 5)
5959-9334	Probe Grounds (Qty 5)
5959-9335	Pod Ground (Qty 5)

CAN Trigger Module (continued)

Specifications/Characteristics	N2758A
Compatibility	54621D, 54622D, 54641D, 54642D
Probe	Dedicated Probe module – DB9 connector to CAN bus
Sample point control	Baud rate dependent: 68% at 10 kb/s; 60.0%, 70.0%, 80.0% selectable at 800 kb/s; 62.5%, 75.0%, and 87.5% selectable at all other baud rates
Supported baud rates	10 k / 20 k / 33.3 k / 50 k / 62.5 k / 83.3 k / 100 k / 125 k / 250 k / 500 k / 800 k / 1 Mb/s (Superset of CiA Specifications)
Synchronous view of other channels	Yes – 2 analog + 8 digital
Ack	User enable/disable of Acknowledge Generation
Electrical	
Input, CAN_L, CAN_H	ISO 11898-24 V Compliant (Differential) The CAN_H, CAN_L lines can swing from ± 36 V, CAT I
Separate pass through current	Support pass through of 4 Amperes on CAN Power signal on standard CiA DB9 pinout. 40 V DC, Max. CAT I
Mechanical	
Weight	0.51 kg (1.125 lb)
Probe points	CAN_H, CAN_L
Digital probe length	1710 mm (67.3 in)
CAN probe length	500 mm (19.7 in)
Size	190 mm x 294 mm x 40 mm
Connector	Supports connection to System Under Test via CiA standard DB9 connectors and pinouts. Provides a tee breakout connection scheme, no extra cable or converters needed to probe standard DB9 systems
Environmental	
Ambient temperature	Operating 0°C to +50°C; Non-operating –40°C to +70°C
Humidity	50% to 95% RH at +25°C to +40°C for 24 hours
Altitude	To 3048 m (10,000 ft)
Pollution Degree2	Normally only dry non-conductive pollution occurs. Occasionally a temporary conductivity caused by condensation must be expected.
Indoor use only	This instrument is rated for indoor use only.
Installation categories	CAT I: Mains isolated
Trigger	
Trigger	Supports user specified ID's and/or Data for CAN 2.0A and CAN 2.0B compliant messages
ID trigger	Standard (11 bit) and extended (29 bit) ID's supported, Per bit ID specification includes Don't Care, allowing for trigger on groups of ID's
Trigger modes	
Start of Frame	will trigger on the Start of Frame (SOF) bit of a Data frame, Remote Transfer Request (RTR) frame, or an Overload frame
Remote Frame ID (RTR)	will trigger on CAN frames matching the specified ID of a Remote frame
Data Frame ID (~RTR)	will trigger on CAN frames matching the specified ID of a Data frame
Remote or Data Frame ID	will trigger on the specified ID, regardless if it is a Remote frame or a Data frame
Data Frame ID and Data	will trigger on CAN Data frames matching the specified ID, Data, and the DLC (Data length code can be set from 1 to 8 bytes)
Error Frame	will trigger on CAN active Error frames
Max trigger rate	Max CAN Frame Rate @ 1 Mbit/s
Trigger delay	~ 20 µs from EOF delimiter completion of matching message, typical
Viewable trigger signal	Digital channel 11
Viewable RX signal	Digital channel 15



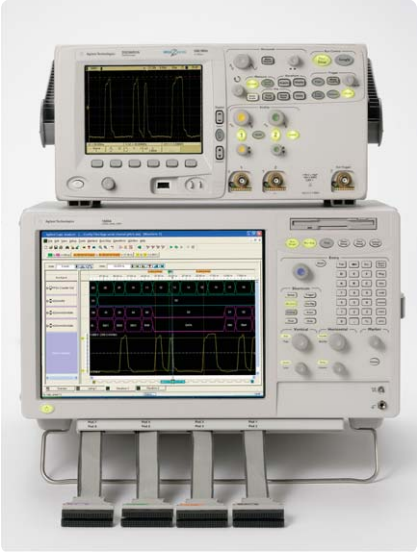
The N2758A CAN trigger module reduces the time required to debug your mixed signal CAN based designs.

The N2758A CAN trigger module makes it easy to sort through frame traffic and isolate a specific frame.

E5850A Time-correlation fixture for Agilent logic analyzer and oscilloscope

Unleash the complementary power of a logic analyzer and an oscilloscope

Easily make time-correlated measurements between an Agilent 1680, 1690 or 16900 Series logic analyzer and a 6000 Series oscilloscope. The time-correlated logic analyzer and 6000 Series oscilloscope waveforms are integrated into a single logic analyzer waveform display for easy viewing and analysis. You can also trigger the 6000 Series oscilloscope from the logic analyzer (or vice versa), automatically de-skew the waveforms and maintain marker tracking between the two instruments.



Make time-correlated measurements between an Agilent logic analyzer and oscilloscope with the Agilent E5850A time-correlation fixture.

Agilent E5850A Features	
Automated Setup	Quickly get to your first measurement using the logic analyzer's help wizard for easy setup, regardless of which supported Agilent oscilloscope you connect to.
Integrated Waveform Display	Instantly verify the logical and temporal relationships between the analog and digital portions of your design. View oscilloscope and logic analyzer waveforms integrated into a single logic analyzer waveform display.
Automatic Measurement De-skew	Save time and gain confidence in measurement results with measurements that are automatically de-skewed in time.
Cross Trigger the Logic Analyzer and Oscilloscope	Start your debug approach from either the analog or digital domain with the flexibility to trigger the oscilloscope from the logic analyzer (or vice versa).
Tracking Markers	Precisely relate information on the oscilloscope's display to the corresponding point in time on the logic analyzer display with tracking markers. The oscilloscope's time markers automatically track adjustments of the logic analyzer's global makers.

Table 1. Key features and benefits of integrating Agilent oscilloscope and logic analyzer capabilities.

Compatibility	
Logic Analyzers	Agilent 1680, 1690 and 16900 Series (Software version 3.20 or higher)
Oscilloscopes	Agilent 6000, Infiniium 54830 and DSO80000 Series (Software version 3.90 or higher)

Logic Analyzer and Oscilloscope Connection	
Number of oscilloscopes connected to a logic analyzer	1
Logic analyzer connections	LAN, Trigger In, Trigger Out
Oscilloscope connections	LAN, Trigger In, Trigger Out

Product Number	Description
E5850A	Time-Correlation Fixture (Integrate Agilent logic analyzer and oscilloscope)

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 54600 Series**

To simplify the task of transferring images and waveform data to your PC, Agilent IntuiLink software is included free with 100 MHz, 350 MHz, and 500 MHz 54600 Series scopes. IntuiLink 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 application 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.

If you choose one of the 60 MHz 54600 Series scopes, you can download free Agilent IntuiLink software available at **www.agilent.com/find/intuilink**

Specifications for Agilent Technologies IntuiLink

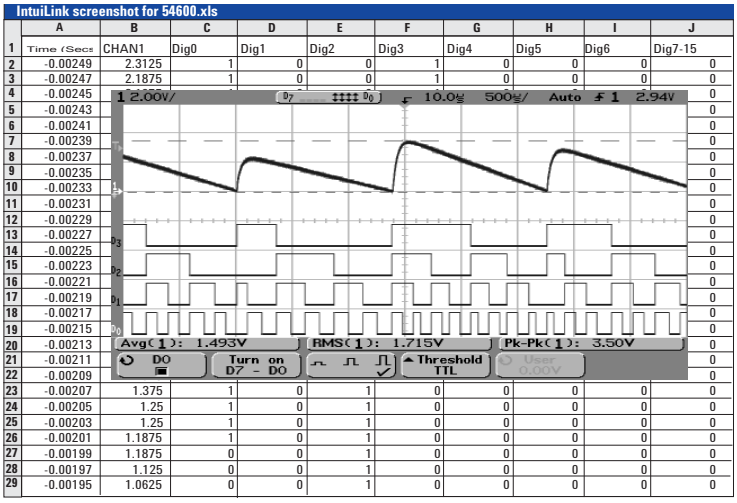
Minimum PC Configuration Requirement	Windows® 95/98/NT® 4.0 SP4 or higher/Windows 2000, Pentium 90, 32MB RAM, 50 MB free disk space, installed GPIB I/O
Environment supported	
Applications	Microsoft Excel 97 and 2000 Microsoft Word 97 and 2000
Software Development	Visual Basic® 5.0/6.0 VBA 5.0/6.0 Agilent VEE 5.0 or greater LabView 5.1 or greater Visual C/C++ 5.0/6.0

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 54600 Series or 6000 Oscilloscopes to the PC via GPIB or RS-232 interface (for 54600 Series) and USB, LAN or GPIB interface (for 6000 Series). It provides the capability to transfer full deep memory data out of the scope. The IntuiLink for 54600 Series limits the size of acquisition data available to a maximum of 2,000 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 for 54600 Series, it is not based on Microsoft Excel or Words. 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

PC Connectivity (continued)

Standard USB, Ethernet/LAN and GPIB interfaces on 6000 Series

High-speed USB 2.0 device, 10/100 Base-T LAN and GPIB interfaces allow you to easily save your waveform data or images to your PC or print the waveforms on a connected printer.

GPIB for fast data transfers on 54600 Series

If you need fast data transfers, equip your 54600 Series scope with GPIB communication. Agilent offers a GPIB card for your PC, as well as a cable, and a GPIB I/O communication module that provides a GPIB port for your scope.

RS-232 cable

If you need an RS-232 cable for your 60 MHz 54620 Series scope, order the Agilent 34398A RS-232 cable. It comes standard with 100 MHz, 350 MHz, and 500 MHz modelsof 54600 Series.

Ordering Information

GPIB

N2757A	GPIB oscilloscope interface module (for 54600 Series)
82341C	GPIB PC card
82350A	GPIB PC card
10834A	GPIB adapter Provides additional clearance between GPIB socket and PC chassis
10833A	GPIB cable, 1 m long
10833B	GPIB cable, 2 m long
10833D	GPIB cable, 0.5 m long

RS-232 cables

34398A	RS-232 cable, 9 pin (f) to 9 pin (f) plus 9 pin (m) to 25 pin (f) adapter
34399A	RS-232 adapter kit, includes 9 pin (m) to 25 pin (m) for use with PC or printer; 9 pin (m) to 25 pin (f) for use with PC or printer; 9 pin (m) to 25 pin (m) for use with modem 9 pin (m) to 9 pin (m) for use with modem

Miscellaneous Accessories

Testmobile

The sturdy Agilent 1183A Testmobile for use with 54600 Series oscilloscope makes sharing your scope easy. Its large wheels make it easy to roll from place to place, and an adjustable-tilt tray lets you change the angle of your scope for easy viewing. 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 Technologies Testmobiles

1183A

Dimensions	49.0 cm wide x 54.0 cm deep x 81.5 cm high
Upper Tray	49.0 cm x 38.0 cm

1180CZ

Total Load Capacity	59 kg (130 lbs)
Tilt Tray	45.7 cm wide x 45.7 cm deep

1183A testmobile for 54600 scope

Carrying Case

The Agilent 1185A and N2917A Carrying Case make transporting and shipping your 54600 Series and 6000 Series oscilloscope safe and simple. A scope, optional module and other accessories fit neatly inside the padded shell of hard plastic and the case is lockable for shipment.

Specifications for the Agilent Technologies 1185A/N2917A Carrying Case

Dimensions (W x H x D)	45 cm x 42 cm x 31 cm
Material	Tough ABS Plastic

Rackmount Kit

The Agilent 1186A and N2916A Rackmount Kit position your 54600 Series 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.

Ordering Information

1183A	Testmobile (54600 Series)
1180CZ	Testmobile (6000 Series)
N2919A	Bracket for 1180CZ testmobile and 6000 Series scope
1185A	Carrying Case (54600 Series)
N2917A	Carrying Case (6000 Series)
1186A	Rackmount Kit (54600 Series)
N2916A	Rackmount Kit (6000 Series)

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

Our Promise
Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you receive your new Agilent equipment, we can help verify that it works properly and help with initial product operation.

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

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