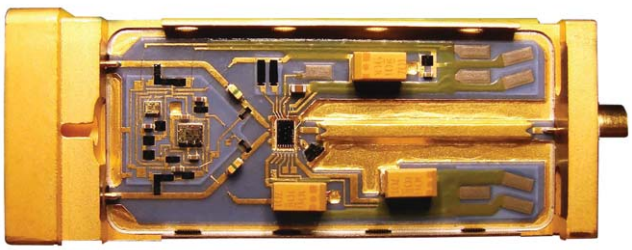
Agilent InfiniiMax III probing system

Data Sheet

World's highest speed and highest performing probe system

- Full 30 GHz bandwidth to the probe tip
- Industry's lowest probe and scope system noise
- Industry's highest fidelity and accuracy due to bandwidth and extremely low loading
- Probe amplifiers loaded with measured s-parameters for more accurate response correction
- Bandwidth upgradable
- Variety of probe heads for different use models with maximum usability



Unmatched Performance

Industry leading probe bandwidth

The InfiniiMax III probing system offers you the highest performance available for measuring differential and single-ended signals, with flexible connectivity solutions for today's high-density ICs and circuit boards. Four different InfiniiMax III probe amplifiers ranging from 16 GHz to 30 GHz are available for matching your probing solution to your performance and budget requirements. A proprietary 200 GHz fT InP (indium phosphide) IC process with backside ground vias and novel thick film technology is utilized to accommodate your highest performance needs and is unmatched by any product in the market.

Agilent Technologies

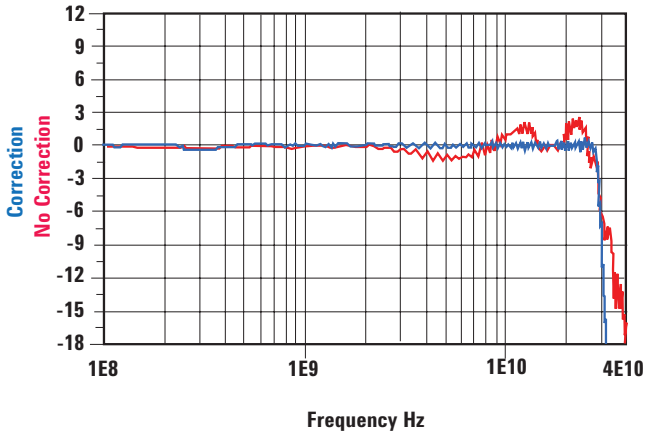
Highest fidelity and accuracy

InfiniiMax III provides the highest bandwidth and incredibly low loading to allow for a new level of signal fidelity and accuracy. Continuing the probe head topology pioneered by Agilent in the InfiniiMax I and II probe systems, four new probe heads are provided to accommodate multiple use models: an 30 GHz browser that is extremely usable, an 28 GHz ZIF probe head with economical replaceable/ removable ZIF tips, an 28 GHz 2.92 mm probe head which allows cabled measurements using 2.92 mm, 3.5 mm, or SMA coax cables, and an economical 16 GHz solder-in probe head for less demanding measurements.

Uncompromised Usability

More accurate probe correction

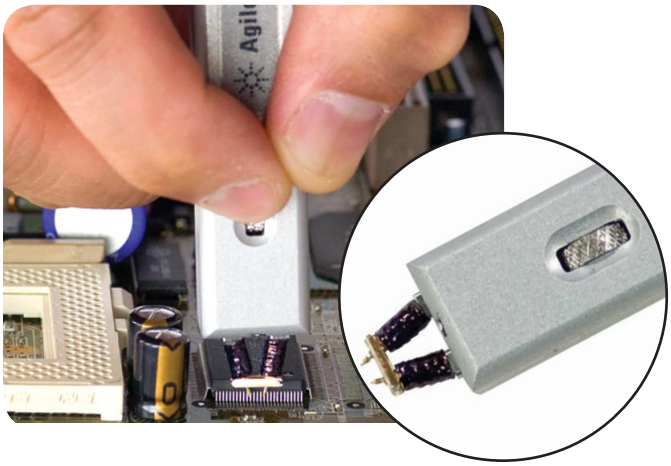
Each individual InfiniiMax III probe amplifier contains its own frequency response data. The 90000-X Series oscilloscopes download this data and automatically correct the response of the unique probe system. Traditionally, probe correction uses a nominal model based on a typical probe amplifier, not the specific amplifier being used. Generally, the biggest variation between probing systems is a result of the probe amplifier. The ability to correct a specific probe amplifier's response results in a more accurate probe correction, which yields a more accurate measurement.



Extensive line-up of probe heads and accessories

Agilent's InfiniiMax III probes support a wide variety of high-speed applications with an extensive line-up of probe heads and accessories.

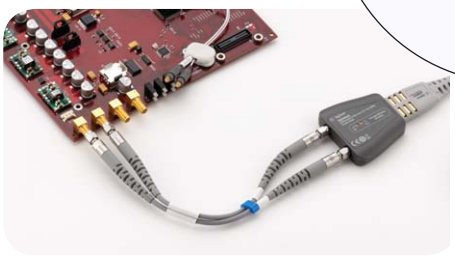
- N5445A browser head (30 GHz) is the best choice for general-purpose trouble shooting of differential signals with z-axis compliance and variable spacing from 20 mil – 125 mil (or 0.5 mm – 3.1 mm). The span between the signal tips is easily adjusted with a thumb wheel on the browser. Integrated LED lighting at the tip illuminates the probing area for better visibility. Order N5476A for replacement browser tips (set of 4).



- N5439A ZIF probe head provides 28 GHz bandwidth in an economical replaceable tip form factor. Because of their extremely low loading, the ZIF tips can be left on the DUT as the probe head is moved from one probing site to the next. Order N5440A (450 Ω) or N5447A (200 Ω) for a set of 5 ZIF tips with plastic sporks to aid in soldering the tips to your DUT. Variable spacing from 5 mil – 80 mil (or 0.127 mm – 2 mm).

- N5444A 2.92 mm/3.5 mm/SMA probe head (28 GHz) allows you to connect two 2.92 mm, 3.5 mm or SMA cables to make a differential measurement on a single oscilloscope channel. Order N5448A 2.92 mm head flex cables (10" or 25 cm) to extend the cable length and add convenience.

  The N5444A provides for a termination to a common DC voltage rather than to ground, which is required for many signal standards. It is implemented such that from DC to ~1kHz the termination is 55 Ω to the termination voltage, and above ~10 kHz the termination is 50 Ω to 0.9 times the termination voltage. The termination voltage range is ±4 V with a minimum step of 5 mV and a maximum current of 80 mA. The termination voltage can be controlled internally by the oscilloscope or applied externally using the supplied DC jack.



- N5441A solder-in probe head is an economical, semi-permanent connection that provides up to 16 GHz of bandwidth. Variable span of the leads ranges from 5 mil – 80 mil (or 0.127 mm – 2 mm).

- N5442A Precision BNC 50 Ω adapter allows you to use your existing InfiniiMax I (1130A-1134A), InfiniiMax II (1168A/69A), 1156A-58A active probes or a general purpose 50 Ω BNC cable with the Infiniium 90000-X Series oscilloscope.

- N5449A high impedance adapter allows the connection of probes that require a high impedance scope input such as a high impedance passive probe, 1147A current probe, or N2790A differential probe to the Infiniium 90000-X Series oscilloscopes. The N5449A provides switchable AC/DC coupling as well as 10:1 and 1:1 attenuation settings. The adapter comes with a N2873A 500 MHz 10:1 passive probe.

- N5477A sampling oscilloscope adapter makes the InfiniiMax III probing system fully compatible with the Infiniium 86100C DCA-J sampling oscilloscope. Previously the DCA-J was limited to 13 GHz of probing, but with the N5477A, the DCA-J now has 30 GHz of probing, increasing its performance and flexibility.

- N5443A performance verification and deskew fixture is required to calibrate and verify the performance of the InfiniiMax III probe. Agilent is currently the only oscilloscope vendor in the market that provides the hardware for the customer to validate their high performance probing system.

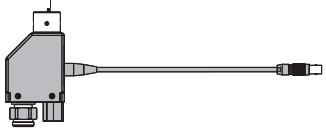
Bandwidth upgradeability

As frequencies have continued to increase, so have the cost of probes. The InfiniiMax III system offers the world's first fully upgradeable probe amplifier. Purchase a 16 GHz probe amplifier today, knowing that in the future, you can upgrade the amplifier to higher bandwidths (20/25/30 GHz) at a fraction of the cost of a new probe amplifier.

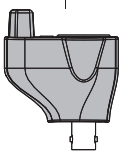
InfiniiMax III probing system family diagram

DCA-J 86100 Wideband Oscilloscope

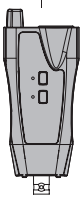
90000-X Series Oscilloscope



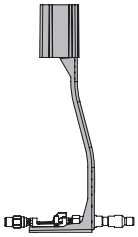
N5477A
Sampling Scope Adapter



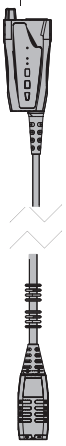
N5442A
Precision BNC
50 Ω Adapter



N5449A
High Impedance
Adapter



PV/Deskew Fixture
and Stand
(properly positions
probe for PV testing)



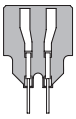
InfiniiMax III Amplifiers
N2800A (16 GHz)
N2801A (20 GHz)
N2802A (25 GHz)
N2803A (30 GHz)

50 Ω Autoprobe Probes
(InfiniiMax I or II probes,
1156A-58A probes, etc.)

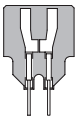
N2873A
500 MHz Passive Probe
(or other similar probes**)

1147A Current Probe
or
N2790A High Voltage
Differential Probe
(or other similar probes***)

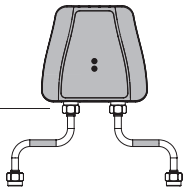
N5439A
ZIF Probe Head



N5447A
200 Ω ZIF Tip
(high sensitivity)

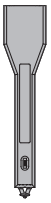


N5440A
450 Ω ZIF Tip
(normal sensitivity)



N5444A
2.92mm/3.5mm/SMA
Probe Head

N5441A
Solder-in Probe Head
(16 GHz max)



N5445A
Browser Probe Head

N5448A 2.92mm Extension Cables
(optional - used in place of supplied semi-rigid cable set)

*Components are not drawn to scale.

**The N5449A includes one N2873A probe. The adapter is specifically tuned for the N2873A probe, but other similar probes (1 MΩ input) can be used. Other probes may not meet the bandwidth specification.

***The N5449A is also compatible with other similar active probes with the Autoprobe interface and outputs designed to drive 1 MΩ inputs.

Performance characteristics (of N2803A, 30 GHz probe amplifer, with each probe head)

N2802A: BW=25 GHz, tr=17.4 psec N2801A: BW=20 GHz, tr=21.7 psec N2800A: BW=16 GHz, tr=27.1 psec

	N2803A with N5439A and N5447A (ZIF 200Ω)	N2803A with N5439A and N5440A (ZIF 450Ω)	N2803A with N5445A (browser)	N2803A with N5441A (solder-in)	N2803A with N5444A (SMA adapter)
Probe bandwidth (-3dB), probe only	28 GHz (typical)	28 GHz (typical), 26 GHz* (warranted)	30 GHz (typical), 28 GHz* (warranted)	17.2 GHz (typical)	28 GHz
Rise and fall time, probe only	20.9 psec (10-90%), 13.8 psec (20-80%)	20.9 psec (10-90%), 13.8 psec (20-80%)	16.2 psec (10-90%), 10.9 psec (20-80%)	34.8 psec (10-90%), 26.6 psec (20-80%)	18.8 psec (10-90%), 12.7 psec (20-80%)
System bandwidth (-3dB) with DSO/DSAX93204A	28 GHz	28 GHz	30 GHz	16 GHz	28 GHz
Rise and fall time with DSO/DSAX93204A	15.5 psec (10 -90%) 11.0 psec (20-80%)	15.5 psec (10 -90%) 11.0 psec (20-80%)	14.3 psec (10 -90%) 10.2 psec (20-80%)	27.1 psec (10 -90%) 19.2 psec (20-80%)	15.5 psec (10 -90%) 11.0 psec (20-80%)
Input capacitance	Cdiff=32fF, Cse=44fF	Cdiff=32fF, Cse=44fF	Cdiff=35fF, Cse=50fF	Cdiff=77fF, Cse=105fF	N/A
DC input resistance*	Rdiff = 50 kΩ ± 2%, Rse = 25 kΩ ± 2%	Rdiff = 100 kΩ ± 2%, Rse = 50 kΩ ± 2%			55 Ω to Vterm
Input resistance >10 kHz	Rdiff = 500 Ω, Rse = 250 Ω	Rdiff = 1 K Ω, Rse = 500 Ω			50 Ω to 0.909x Vterm
Input voltage range (differential or single-ended)	0.8Vpp, ±0.4V (HD2&3<-38db), 1.6Vpp, ±0.8V (HD2&3<-34db)**	1.6Vpp, ±0.8V (HD2&3 <-38db), 2.5Vpp, ±1.25V (HD2&3 <-34db)**	1.6Vpp, ±0.8V (HD2&3 <-38db), 2.5Vpp, ±1.25V (HD2&3<-34db)**		2.5 Vrms
Input common mode range	±6V DC to 250Hz ±1.25V > 250Hz	±12V DC to 250Hz ±2.5V > 250Hz	±12V DC to 250Hz ±2.5V > 250Hz		±12V DC to 250Hz ±2.5V > 250Hz (must not exceed max input voltage)
DC attenuation ratio	3:1	6:1	6:1		
Offset range	±16V when probing a single-ended signal	±16V when probing a single-ended signal	±16V when probing a single-ended signal		±16V when probing a single-ended signal (must not exceed max input voltage)
Noise referenced to input, probe only	2mVrms	4mVrms			
Maximum input voltage	18V peak Cat I				Same as input voltage range

* Denotes warranted characteristic. All others are typical.

** Harmonic distortion < -38dB is standard; < -34dB wider input range with slightly increased distortion

Ordering Information

InfiniiMax III probe amplifier models

Model Number	Description	Recommended oscilloscope
N2803A	30 GHz InfiniiMax III probe amplifier	DSO/DSAX93204A 32 GHz Infiniium oscilloscope DSO/DSAX92804A 28 GHz Infiniium oscilloscope
N2802A	25 GHz InfiniiMax III probe amplifier	DSO/DSAX92504A 25 GHz Infiniium oscilloscope
N2801A	20 GHz InfiniiMax III probe amplifier	DSO/DSAX92004A 20 GHz Infiniium oscilloscope
N2800A	16 GHz InfiniiMax III probe amplifier	DSO/DSAX91604A 16 GHz Infiniium oscilloscope

Note: N2800A-N2803A InfiniiMax probe amps are not compatible with existing InfiniiMax I or II probe heads.

InfiniiMax III probe heads

Model Number	Description	Notes
N5445A	InfiniiMax III browser head	Order N5476A for replacement probe tips (set of 4)
N5439A	InfiniiMax III ZIF probe head	Order N5440A (450 Ω) or N5447A (200 Ω) for a set of 5 ZIF tips with plastic sporks.
N5444A	InfiniiMax III 2.92 mm/3.5 mm/SMA probe head	Order N5448A 2.92 mm head flex cables to extend the cable length.
N5441A	InfiniiMax III solder-in probe head	

Note: N54xxA InfiniiMax III probe heads are not compatible with InfiniiMax I or II probe amps.

InfiniiMax III probe adapters

Model Number	Description	Notes
N5442A	Precision BNC adapter (50 Ω)	For use with InfiniiMax I and II probes, 1156A-58A etc.
N5449A	High impedance probe adapter	Includes one N2873A 500MHz 10:1 passive probe
N5477A	Sampling scope adapter	For use with Agilent 86100C DCA-J sampling scope
N5443A	Performance verification and deskew fixture	

Probe bandwidth upgrade options

Model Number	Description	Notes
N5446A	16 GHz to 20 GHz bandwidth upgrade	
N5446B	20 GHz to 25 GHz bandwidth upgrade	
N5446C	25 GHz to 30 GHz bandwidth upgrade	

Note: Purchase two or more upgrade options to go from 16 to 25 or 30 GHz and 20 to 30 GHz. To upgrade the probe bandwidth, you simply need to send the probe to the Agilent service center.

Other recommended accessories for InfiniiMax III probing system

Model Number	Description	Notes
N2787A	3D probe positioner	For hands-free probing
N2812A	High performance input cable, 2.92 mm connectors, 1 m length	For use with Infiniium 90000-X Series oscilloscope
MV-23	Carson Optical MagniVisor	www.carsonoptical.com/Magnifiers

Note: Purchase two or more upgrade options to go from 16 to 25 or 30 GHz and 20 to 30 GHz.

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