

# N2795A/96A/97A Single-ended Active Probes

Data Sheet

## **Key Features**

- High resistance (1MΩ) and low capacitance (1 pF) input for low loading
- Wide input dynamic range (±8V) and offset range (±12V for N2796A/97A, ±8V for N2795A)
- · Built-in headlight for better visibility while probing
- Includes various probe tip accessories
- Direct connection to AutoProbe interface (no power supply required)
- Provides full system bandwidth with InfiniiVision and Infiniium oscilloscopes with bandwidths up to 1 GHz
- N2797A for extreme temperature environmental chamber testing at –40 to +85 °C

The N2795A/96A are low-cost, 1 and 2 GHz single-ended active probes with the AutoProbe interface (compatible with Agilent's InfiniVision and Infiniium family of oscilloscopes). These probes integrate many of the characteristics needed for today's general-purpose, high-speed probing - especially in digital system design, component design/characterization, and educational research applications. Its 1M $\Omega$  input resistance and extremely low input capacitance (1 pF) provide ultra low loading of the DUT. This, accompanied with superior signal fidelity, makes these probes useful for most of today's digital logic voltages. And with their wide dynamic range (±8 V) and offset range (±12 V for N2796A/97A, ±8 V for N2795A), these probes can be used in a wide variety of applications.

For high signal integrity probing, the N2795A 1 GHz and N2796A 2 GHz active probes are perfect complements to Agilent's 500 MHz – 600 MHz and 1 GHz bandwidth scopes, respectively. The N2796A 2 GHz probe can also be used with Agilent's 2 GHz or higher bandwidth Infiniium scope as a low cost alternative to InfiniiMax probes.

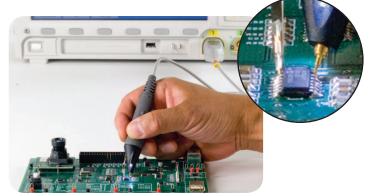
Testing devices over extreme temperature ranges is quite common these days. The N2797A single-ended active probe





N2795A/96A active probe with standard accessories

N2797A with standard accessories



A White LED headlight can be turned on to illuminate the circuit under test for better visibility while probing

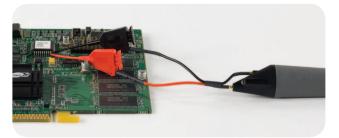
is the industry's first low-cost high input impedance active probe with rugged probe tips for environmental chamber testing of ICs and devices. The probe gives the ability to probe signals at drastic temperature swings ranging from -40 to +85 °C. The probe provides 1.5 GHz of bandwidth and a 2 m long cable.

The N2795A/96A/97A are equipped with a pleasant white LED headlight to illuminate the circuit under test. The probes are powered directly by the InfiniiVision and Infiniium Autoprobe interface, eliminating the need for an additional power supply. The probes also come with a number of accessories that allow for easy connections to the circuit under test.





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Use flex nose clip adapters with the dual lead adapter to obtain access to IC leads or head connectors.

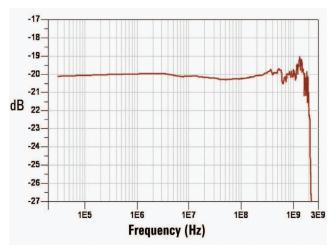


The dual lead adapter allows you to easily connect the probe to a popular 0.1" pin header with 0.025" square pins.

(-3 db)       (Infinit/Vision and Infinit/Wision/ (acticulated, 10.90%)       (Infinit/Vision/ (Acticulated, Adjunt 5500/500       175 psec       233 psec       (Infinit/Vision/ Adjunt 5500/500       (Infinit/Vision/ Adjunt 5500/500       2 m       Approx. 100 g       Approx. 100		N2795A	N2796A	N2797A		N2795A	N2796A	N2797A
(calculated, 1.99%)       500/500 MHz (with A glient's 500/500	Probe bandwidth* (-3 db)	1 GHz	2 GHz	1.5 GHz**	Internal power			
10.90%)         10.90%)         10.90%)         10.90%         10.9	Risetime	350 psec	175 psec	233 psec	Cable length	1.3 m		2 m
System         500/500 MHz (with Agilent's Adjent's 500/500 Agilent's scilloscope)         1 GHz (with Agilent's Agilent's Soliloscope)         1 GHz (with Agilent's Agilent's Soliloscope)         0 Hz (with Agilent's Soliloscope)           Attenuation ratio (@DC)         0 Stilloscope)         1 Hz (with Agilent's Soliloscope)         1 Hz (with Agilent's Soliloscope)         1 Hz (with Agilent's Soliloscope)         -40 to 70 °C -40 to +85 °C           Marking (@DC)         1 Hz (with Agilent's Agilent Soliloscope)         1 Hz (with Agilent's Soliloscope)         1 Hz (with Agilent's Agilent's Soliloscope)         -40 to 70 °C -40 to +85 °C           Mondestructive (@DC)         -9 V to +80 VC or peak AC)         -9 Parking Agilent's Soliloscope)         -9 Parking Agilent's Soliloscope)         -9 Parking Soliloscope)         -9 Parking Agilent's Soliloscope)         -40 to 70 °C -40 to +85 °C           Offset arrang (DC After range Soliloscope)         -9 V to +80 VC or peak AC)         -9 Parking Agilent's Soliloscope)         -1 Park Soliloscope)         -1 Park Agilent's Soliloscope)           Flatness over (Fatness over (Fatness over (Fatness over (Fatness over (Fatnestatrange)         -1	(calculated,				Probe weight	Approx. 1	00 g	Approx. 108 g
(with Agilent brinnium oscilloscope)         MHz Infinium infinium oscilloscope)         Infinium infinium oscilloscope)         Infinium infinium oscilloscope)         Infinium oscilloscope)         Infinininfinium oscilloscope)         Infinium o	System				operating	-40 to 70 °C -40 to -		–40 to +85 °C
Attenuation ratio       10:1 ± 0.5%       Derating       Bow hill effect         (@DC)       -8 V to +8 V (DC or peak AC)       humidity       Non-operating       90% RH (@ 65 °C         max input       -20 V to +20 V       ±12 V       ±12 V       Derating       4000 m         Diffset range       ±6 V       ±12 V       ±12 V       ±12 V       ±12 V       000 Hz - 10 MHz       -2 each spring probe tip       -1 each flex nose clip         Offset range       ±6 V       ±12 V       ±12 V       ±12 V       -2 each flex nose clip       -1 each plex nose clip       -2 each Plex nose clip       -2 each Plex nose clip	(with Agilent oscilloscope)	MHz InfiniiVision/ Infiniium	1 GHz InfiniiVision/ Infiniium	Infiniium	Ambient non-operating temperature			
Imput dynamic       -8 V to +8 V (DC or peak AC)       Non-operating       90% HI @ 5% C         range       -20 V to +20 V       humidity       Operating       4000 m         Non-destructive       -20 V to +20 V       altitude       altitude         Wondestructive       -20 V to +20 V       ±12 V       ±12 V       ±12 V       ±12 V         Offset range       ±8 V       ±12 V       ±12 V       ±12 V       ±12 V       2 raid provide tip       -10 each solderable ti         Coffset error       <±1 mV	Attenuation ratio				humidity			
range       -20 V to +20 V         Non-destructive       -20 V to +20 V         max input       voltage         Offset range       ±8 V       ±12 V       ±12 V         DC offset error       <±1 mV	Input dynamic	—8 V	to +8 V (DC or p	eak AC)		90% RH @ 65 °C		
Non-destructive     -20 V to +20 V       max input voltage     -20 V to +20 V       Offset range     ±8 V       ±12 V     ±12 V       Offset range     ±8 V       ±1 mV     -2 each spring probe tip       Coffset error     <±1 mV	range				1		4000 m	
voltage         0 (kV HDM         0 (kV HDM           Offset range         ±8 V         ±12 V         ±12 V         10 each solderable til accessories         - 2 each spring probe tip accessories         - 10 each solderable til accessories         - 10 each solderable til accessories         - 10 each solderable til accessories           Cutput zero)         Flatness         Typical 0.4 dB         Typical 0.3 dB         - 1 each flat nose clip adapter (red and black)         - 1 each right angle ground, 5 cm           (at 25 °C)         (100 MHz - 100 MHz)         (10 Hz - 100 MHz)         - 1 GHz         - 1 each right angle ground, 5 cm         - 2 each Y-lead adapte           (at 25 °C)         (100 MHz - 100 KHz)         (1 GHz - 1.5 GHz)         - 1 each fight angle ground, 10 cm         - 2 each Y-lead adapte           Typical 0.3 dB         Typical 0.3 dB         Typical 0.6 dB         - 1 each fight angle ground, 10 cm         - 2 each right angle           Flatness over         Typical 0.6 dB         Typical 0.3 dB         - 1 each fight angle ground, 10 cm         - 2 each right angle           (-40 to +85 °C)         Typical 0.8 dB         Typical 0.8 dB         - 1 each fight angle ground, 5 cm         - 2 each right angle           (-40 to +85 °C)         Typical 0.8 dB         (10 KHz - 100 KHz)         - 2 each right angle         - 2 each right angle           (10 to Hz - 1.5 GHz)	Non-destructive	-20 V to +20 V						
Offset range       ±8 V       ±12 V       ±12 V         Offset range       ±8 V       ±12 V       ±12 V         DC offset error       <±1 mV					ESD		8 kV HBM	
3       2 raise proper tip       - 2 raise proper tip       - 5 each right proper tip         Co offset error (Qutput zero)       < ± 1 mV	-	+8 V	+12 V	+12 \/			e tip	- 10 each solderable tip
HardingsTypical 0.6 dBTypical 0.8 dBTypical 0.3 dBTypical 0.3 dBTypical 0.3 dBTypical 0.8 dBTypical 2.5 dBTypical 1.3 dETypical 0.8 dBTypical 0.8	DC offset error (Output zero)	±0 V		±12 V	accessories	- 1 each flex nose clip adapter - 2 each flex nos		
Indutes overinput call 0.3 dB- 4 color coded ringstemperature(10 Hz – 100 KHz)- 4 color coded rings(-40 to +85 °C)Typical 0.6 dB(100 KHz – 100 MHz)(100 KHz – 100 MHz)Typical 0.8 dB(100 MHz – 500 MHz)Typical 2.0 dB(500 MHz – 1 GHz)Typical 2.0 dB(500 MHz – 1 GHz)Typical 2.5 dB100MHz) and Infiniium 9000, 90000.Input resistance*1 MΩ +0 %, -2.5 %1 MΩ ±3%Input1 pF90000 X-Series (with N5442A)Capacitance1 PFProbe noise< 2.5 mVrms (referred to input)	Flatness (at 25 °C)	(100 kHz - 100 MHz) Typical 0.6 dB (100 MHz - 500 MHz) Typical 0.8 dB (500 MHz - 1 GHz) Typical 1.3 dB		(10 Hz – 100 MHz) Typical 0.8 dB (100 MHz – 1 GHz) Typical 2.0 dB	_	<ul> <li>1 each Y-lead adapter, 10 cm</li> <li>1 each right angle ground, 5 cm</li> <li>1 each right angle ground, 10 cm</li> <li>2 each ground blade</li> <li>1 each offset ground</li> <li>1 each flex ground</li> <li>4 color coded rings (each</li> </ul>	<ul> <li>(red and black)</li> <li>2 each Y-lead adapter,</li> <li>9 cm (800 MHz)</li> <li>2 each Y-lead adapter,</li> <li>6 cm (1 GHz)</li> <li>2 each right angle ground, 5 cm</li> </ul>	
Typical 0.8 dB (100 MHz – 500 MHz) Typical 2.0 dB (500 MHz – 1 GHz) Typical 2.5 dB (1 GHz – 1.5 GHz)Others (included)-1 each accessory configuration cardOthers (included)-1 each accessory configuration cardAgilent InfiniiVision 3000 X-, 4000 Agilent InfiniiVision 3000 X-, 4000 X- and 100MHz) and Infiniium 9000, 90000, 90000 X-Series (with N5442A)Agilent InfiniiVision 3000 X-, 4000 X- and 100MHz) and Infiniium 9000, 90000, and 90000 X-/Q- Series (with N5442A)Input capacitance1 pFModel numberDescription N2795ASeries (with N5442A)Series (with N5442A)Output impedance50 ΩN2795A1 GHz single-ended active probeN2795A2 GHz single-ended active probeN2797A1.5 GHz extreme temperature single-ended active probeN2797A1.5 GHz extreme temperature single-ended active probeN2798AAccessory kit for N2797A	Flatness over temperature (-40 to +85 °C)			(10 Hz – 100 kHz) Typical 0.6 dB		yellow, green, blue and purple)		- 4 color coded rings (each yellow, green,
Typical 2.0 dB (500 MHz – 1 GHz) Typical 2.5 dB (1 GHz – 1.5 GHz)       Agilent scopes       X-, 5000, 6000, 7000 (except 6000 100MHz) and Infiniium 9000, 90000, 90000 X-Series (with N5442A)       3000 X-, 4000 X- and Infiniium 9000, 90000 and 90000 X-/Q- Series (with N5442A)         Input resistance*       1 MΩ +0 %, -2.5 %       1 MΩ ±3%         Input       1 pF         capacitance       N2795A       1 GHz single-ended active probe         N2795A       1 GHz single-ended active probe         N2796A       2 GHz single-ended active probe         N2797A       1.5 GHz extreme temperature single-ended active probe         N2797A       1.5 GHz extreme temperature single-ended active probe				(	Others (included)			
Input       1 pF       Model number       Description         capacitance       N2795A       1 GHz single-ended active probe         Probe noise       < 2.5 mVrms (referred to input)				Typical 2.0 dB (500 MHz – 1 GHz) Typical 2.5 dB		X-, 5000, 6000, 7000 100MHz) and Infiniiu	(except 6000 m 9000, 90000,	3000 X-, 4000 X- and Infiniium 9000, 90000
ccapacitance       N2795A       1 GHz single-ended active probe         Probe noise       < 2.5 mVrms (referred to input)	Input resistance*	1 MΩ +0 %	, –2.5 %	1 MΩ ±3%				
Probe noise     < 2.5 mVrms (referred to input)       Output     50 Ω       impedance     N2796A     2 GHz single-ended active probe       denotes warranted electrical specifications after 20 minute warm-up, all others are typical     N2798A     Accessory kit for N2797A	Input capacitance	1 pF			•		aha	
N2797A     1.5 GHz extreme temperature single-ended active probe       denotes warranted electrical specifications after 20 minute warm-up, all others are typical     N2798A     Accessory kit for N2797A	Probe noise	< 2.5 mVrms (referred to input)						
denotes warranted electrical specifications after 20 minute warm-up, all others are typical N2798A Accessory kit for N2797A	Output					2 GHz single-ended active probe		
	impedance				N2797A	1 0		
		•			N2798A	Accessory kit	for N2797A	

after 20 minute warm-up, a lenotes warranted electrical specifications е туріса \*\* typical 2 GHz, when used with rigid probe tip, ground blade and handheld





Frequency response of N2796A (Vout/Vin)



Time domain step response of N2796A (with Agilent MS09404A)

3.000 M

1.000 M

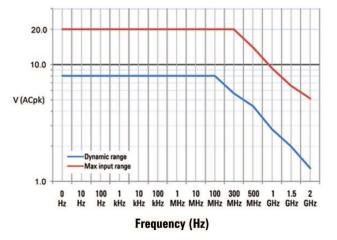
100.0 k

10.00 k

1.000 k

100.0

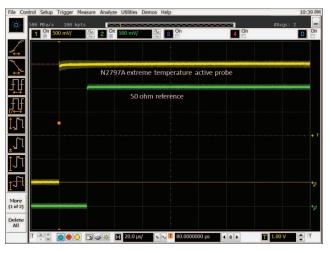
Impedance (Ohms)



Voltage derating over frequency (N2796A)



Input impedance over frequency (Red = measured, Blue = model)



N2797A measuring a step signal over -40 to +90 °C, oscilloscope in infinite persistence mode

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