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 Infinium 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 InfiniiVision and Infinium 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 1MΩ 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 Infinium 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 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 Infinium 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.

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

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<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N2795A</th>
<th>N2796A</th>
<th>N2797A</th>
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</thead>
<tbody>
<tr>
<td><strong>Probe bandwidth</strong>&lt;sup&gt;*&lt;/sup&gt; (&lt;–3 db)</td>
<td>1 GHz</td>
<td>2 GHz</td>
<td>1.5 GHz **</td>
</tr>
<tr>
<td><strong>Risetime</strong> (calculated, 10-90%)</td>
<td>350 psec</td>
<td>175 psec</td>
<td>233 psec</td>
</tr>
<tr>
<td><strong>System bandwidth</strong> (with Agilent oscilloscope)</td>
<td>500/600 MHz (with Agilent’s 500/600 MHz InfiniiVision/Infinium oscilloscope)</td>
<td>1 GHz (with Agilent’s 1 GHz InfiniiVision/Infinium oscilloscope)</td>
<td>1 GHz (with Agilent’s 1 GHz InfiniiVision/Infinium oscilloscope)</td>
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<tr>
<td><strong>Attenuation ratio</strong> (@DC)</td>
<td>10:1 ± 0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input dynamic range</strong></td>
<td>–8 V to +8 V (DC or peak AC)</td>
<td></td>
<td></td>
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<tr>
<td><strong>Non-destructive max input voltage</strong></td>
<td>–20 V to +20 V</td>
<td></td>
<td></td>
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<tr>
<td><strong>Offset range</strong></td>
<td>±8 V</td>
<td>±12 V</td>
<td>±12 V</td>
</tr>
<tr>
<td><strong>DC offset error</strong> (Output zero)</td>
<td>&lt; ±1 mV</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Flatness</strong> (at 25 °C)</td>
<td>Typical 0.4 dB (100 kHz - 100 MHz)</td>
<td>Typical 0.3 dB (10 Hz – 100 MHz)</td>
<td>Typical 0.3 dB (10 Hz – 100 MHz)</td>
</tr>
<tr>
<td><strong>Flatness over temperature</strong> (–40 to +85 °C)</td>
<td>Typical 0.6 dB (100 kHz - 500 MHz)</td>
<td>Typical 0.8 dB (100 MHz – 1 GHz)</td>
<td>Typical 0.8 dB (100 MHz – 1 GHz)</td>
</tr>
<tr>
<td><strong>Input resistance</strong></td>
<td>1 MΩ +0 %, –2.5 %</td>
<td>1 MΩ ±3%</td>
<td></td>
</tr>
<tr>
<td><strong>Input capacitance</strong></td>
<td>1 pF</td>
<td></td>
<td></td>
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<tr>
<td><strong>Probe noise</strong></td>
<td>&lt; 2.5 mVrms (referred to input)</td>
<td></td>
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<tr>
<td><strong>Output impedance</strong></td>
<td>50 Ω</td>
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**Standard accessories**
- 2 each spring probe tip
- 2 rigid probe tip
- 1 each flex nose clip adapter (red and black)
- 1 each copper pad, 10x
- 1 each Y-lead adapter, 10 cm
- 1 each right angle ground, 5 cm
- 1 each right angle ground, 10 cm
- 2 each ground blade
- 1 each offset ground
- 1 each flex ground
- 4 color coded rings (each yellow, green, blue and purple)
- 10 each solderable tip
- 5 each rigid probe tip
- 2 each flex nose clip adapter (red and black)
- 1 each pico hook tip (red and black)
- 1 each pico hook tip (red and black)
- 2 each Y-lead adapter, 9 cm (800 MHz)
- 2 each Y-lead adapter, 6 cm (1 GHz)
- 2 each right angle ground, 5 cm
- 2 each ground blade
- 4 color coded rings (each yellow, green, blue and purple)

**Others (included)**
- 1 each accessory configuration card

**Compatible Agilent scopes**
- Agilent InfiniiVision 3000 X-, 4000 X-, 5000, 6000, 7000 (except 6000, 100MHz) and Infinium 9000, 90000, 90000 X-Series (with N5442A)
- Agilent InfiniiVision 3000 X-, 4000 X- and Infinium 9000, 90000 and 90000 X-/Q-Series (with N5442A)

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<table>
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<tr>
<th>Model number</th>
<th>Description</th>
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<tr>
<td>N2795A</td>
<td>1 GHz single-ended active probe</td>
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<tr>
<td>N2796A</td>
<td>2 GHz single-ended active probe</td>
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<tr>
<td>N2797A</td>
<td>1.5 GHz extreme temperature single-ended active probe</td>
</tr>
<tr>
<td>N2798A</td>
<td>Accessory kit for N2797A</td>
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<sup>*</sup> denotes warranted electrical specifications after 20 minute warm-up, all others are typical
<sup>**</sup> typical 2 GHz, when used with rigid probe tip, ground blade and handheld
Measurement Plots

Frequency response of N2796A (Vout/Vin)

Time domain step response of N2796A (Agilent MSO9404A)

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