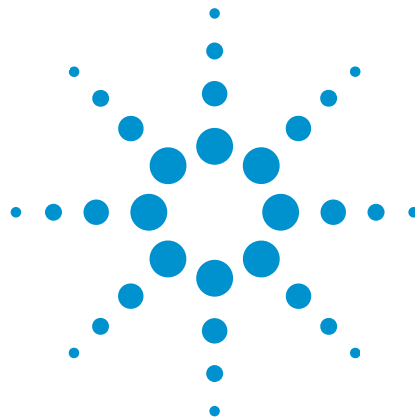
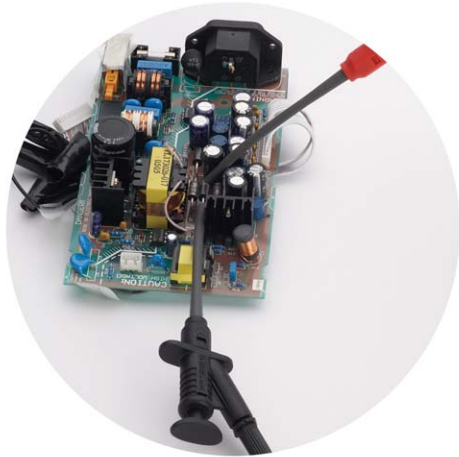
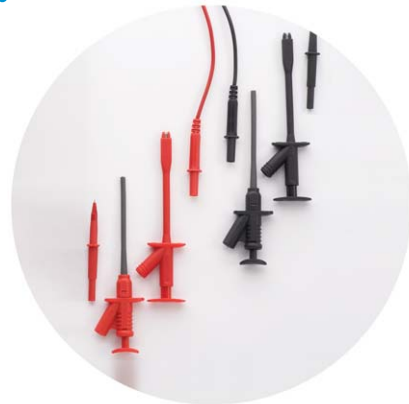


N2790A and N2791A 100/25 MHz High-voltage Differential Probe

Data Sheet



Oscilloscope users often need to make floating measurements where neither point of the measurement is at earth ground. Use the N2790A or N2791A high-voltage differential probe to make safe and accurate floating measurements with an oscilloscope. The N2790A and N2791A high-voltage differential probes allow conventional earth-grounded Agilent oscilloscopes to be used for floating signal measurements.



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With a differential amplifier in the probe head, the N2790A is rated to measure differential voltage up to 1,400 VDC + peak AC with high CMRR (common mode rejection ratio) of >50 dB at 1 MHz and the N2791A can measure differential voltage up to 700 V differential or common mode. The N2790A and N2791A differential probe offers sufficient dynamic range and bandwidth for your application to make the floating measurements found in power electronics circuits safely and accurately.

The N2790A and N2791A differential 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 both small or large components in tight places. The N2790A also has an overrange indicator which alerts the user when the probe input exceeds the dynamic range of the probe.

The N2791A is compatible with any oscilloscope with 1 Mohm BNC input. The N2791A probe's 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's power is supplied by the Agilent oscilloscope's probe interface.



Figure 1. N2790A high voltage differential probe with standard accessories



Figure 2. N2791A 25-MHz high-voltage differential probe with standard accessories

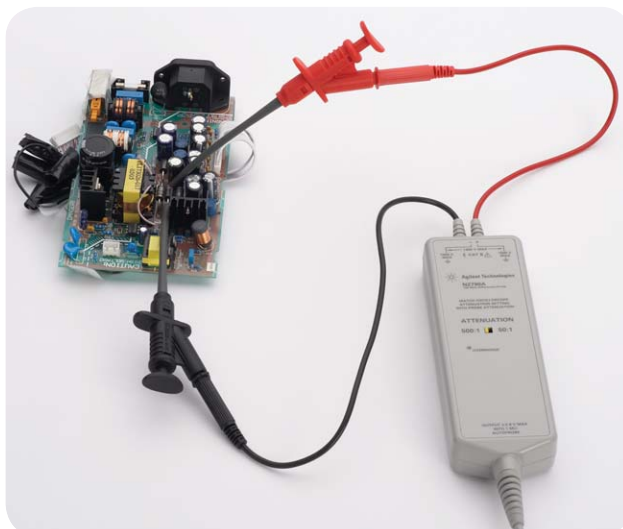


Figure 3. Versatile probe tip accessories allow you to access small or large components in tight places.

Agilent oscilloscope compatibility	Max number of N2790A probes supported by oscilloscope
InfiniiVision 5000, 6000 (except 100 MHz), and 7000 Series with version 5.2 software	4
Infiniium 8000, 54830 Series with version 5.7 software	4
Infiniium 9000 Series with version 2.0 software	4

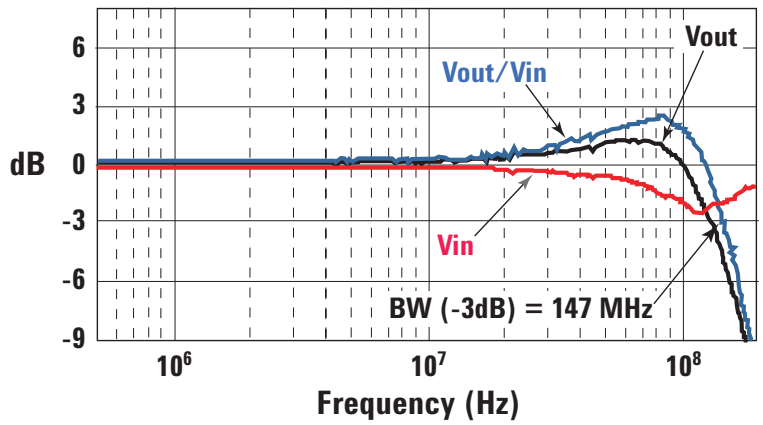


Figure 4. V_{out}/V_{in} vs. frequency response of N2790A

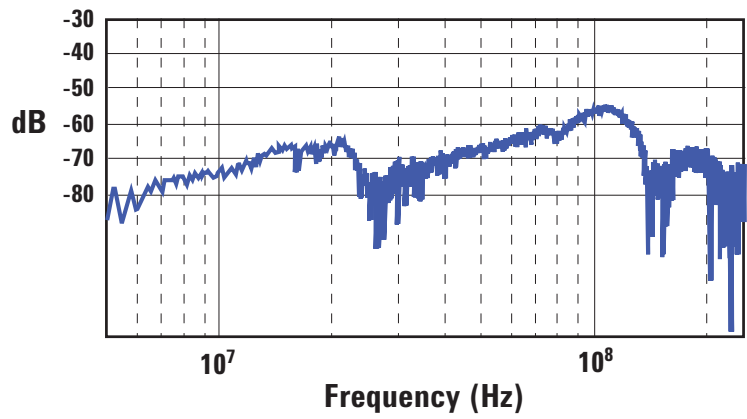


Figure 5. Frequency response (V_{out}/V_{in}) of N2790A when inputs are driven in common (common mode rejection)

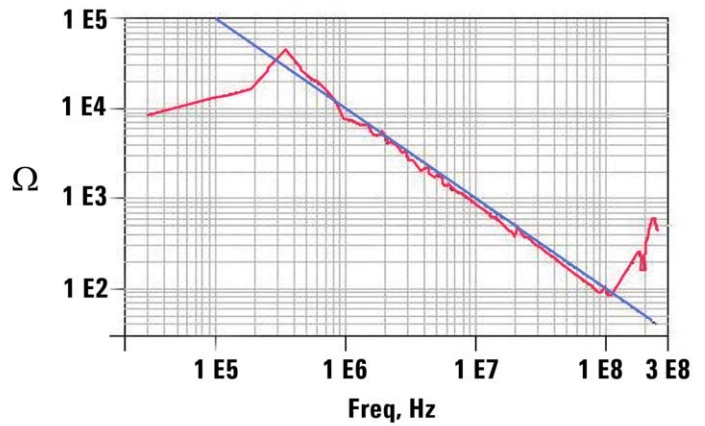


Figure 6. Input impedance vs. frequency of N2790A

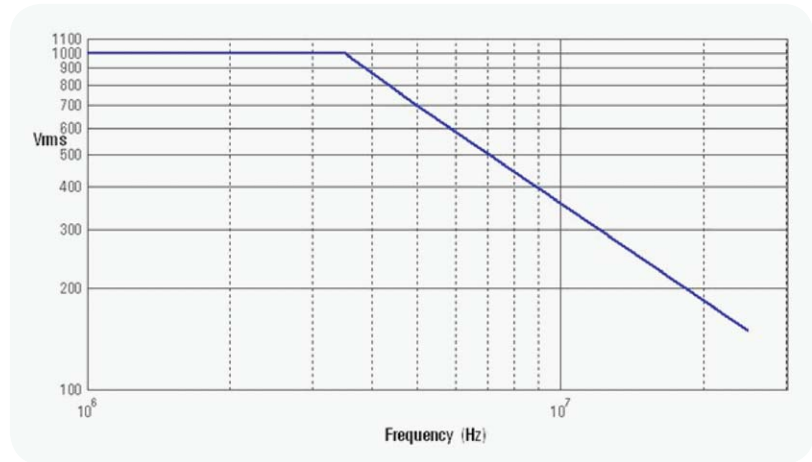


Figure 7. Voltage derating curve of N2790A (voltage between either input and ground)

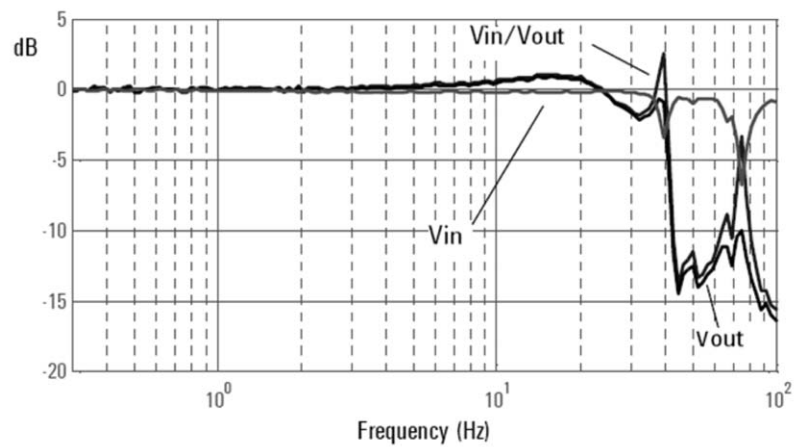


Figure 8. V_{out}/V_{in} vs. frequency response of N2791A

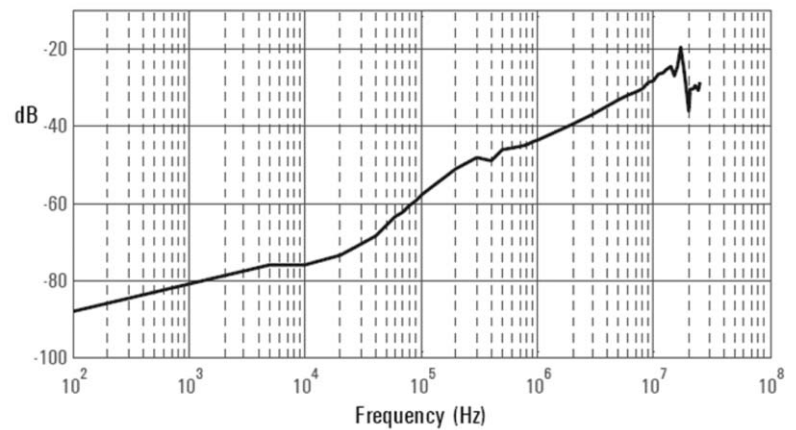


Figure 9. Frequency response (V_{out}/V_{in}) of N2791A when inputs are driven in common (common mode rejection)

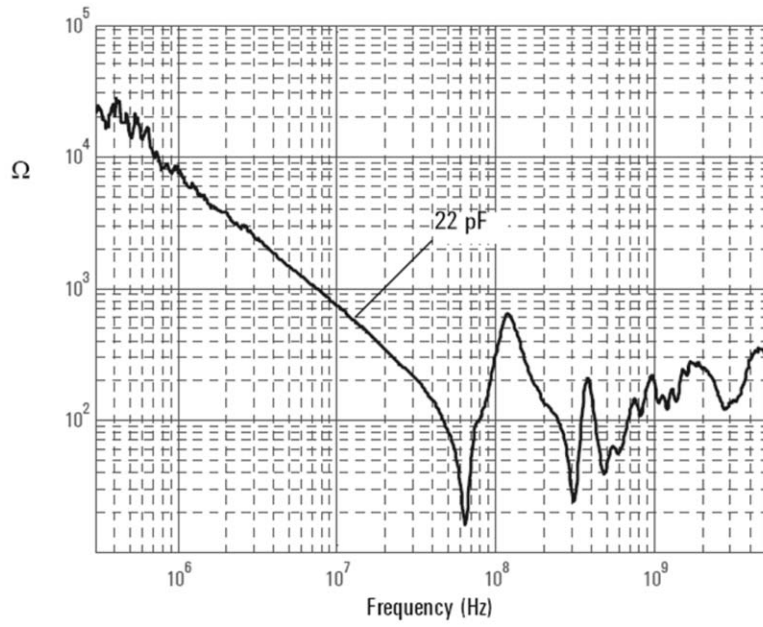


Figure 10. Input impedance vs. frequency of N2791A

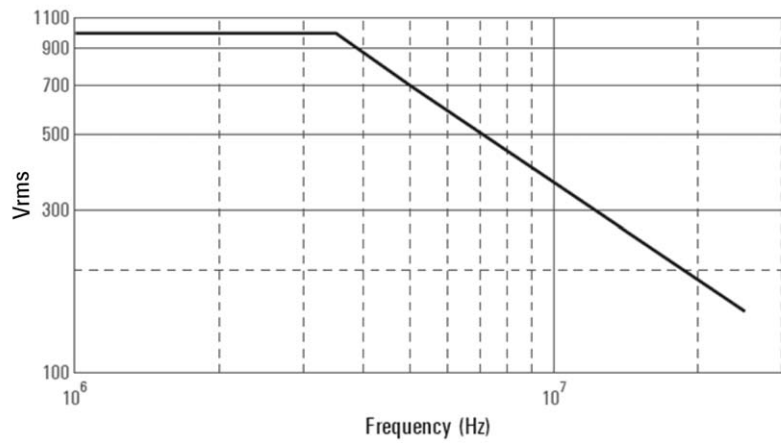


Figure 11. Voltage derating curve of N2791A (voltage between either input and ground)

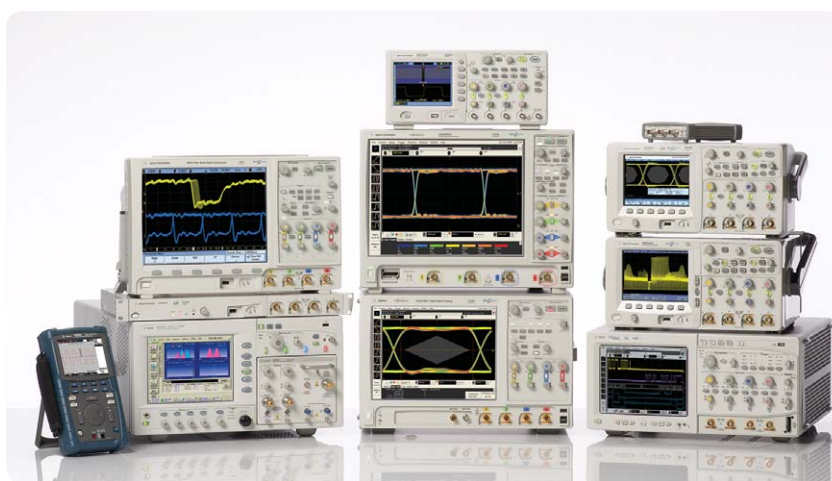
Performance characteristics and specifications

Product number	N2790A	N2791A
Bandwidth (-3dB)	≥100 MHz probe bandwidth*	≥ 25 MHz probe bandwidth
Rise time (calculated)	≤ 3.5 ns	≤ 14 ns
Attenuation	50:1 / 500:1	10:1 / 100:1
Gain accuracy (% of reading)	± 2% at 20-30°C, ± 4% at 0-20°C and 30-50°C*	
DC CMRR	-70 dB at 500 VDC	
AC 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 1MHz
Propagation delay	14 nsec at 50:1, 12.8 nsec at 500:1	
Input R//C (each input to ground)	4 Mohm // 7 pF	4 Mohm // 10 pF
Input R//C (between inputs)	8 Mohm // 3.5 pF	8 Mohm // 8 pF
Max differential operating voltage (DC+PeakAC)	±1400 V at 500:1 ±140 V at 50:1	±700 V at 100:1 ±70 V at 10:1
Max common mode operating voltage (RMS or DC+PeakAC)	±1000 V (CAT II) ±600 V (CAT III)	±700 V at 100:1 ±70 V at 10:1
Max nondestructive voltage	±1500 VDC + Peak AC differential mode ±1300 Vrms (CAT II) common mode	±1000 Vrms (CAT II) differential and common mode
Output maximum voltage range	±2.8V into 1 Mohm (500:1)	7V into 1 Mohm (100:1)
Scope's input impedance	1 Mohm AutoProbe interface	1 Mohm BNC interface
Output offset	Adjustable	± 7.5 mV (typical)
Noise referenced to input	< 300 mVrms at 500:1 < 50 mVrms at 50:1	
Temperature - operating	-10 to 50°C	-10 to 40°C
Temperature - non-operating	-51 to 71°C	-30 to 71°C
Humidity - operating	80% RH at 40°C	25-85% RH
Humidity - non-operating	90% RH at 65°C	25-85% RH
Operating altitude	2,000 m	3,000 m
Nonoperating altitude	15,300 m	15,300 m
Vibration	Agilent class GP and MIL-PRF-28800F class 3 random	
Shock	Tip end: 400g 1/2 sine wave AutoProbe BNC End: 50g 1/2 sine wave Probe circuit box: Agilent class B1 and MIL-PRF-28800F class 3	
Standard accessories	- 2 each browser tips (black and red) - 2 each alligator plunger clips (black and red) - 2 each pincer clips (black and red) - 2 each of 4 colored ID tags - DC offset adjustment tool - manual	- 2 each alligator clips (black and red) - 2 each hook clips (black and red) - USB power cord (2m) - 4 AA batteries - manual
Safety specifications	IEC61010-031	IEC61010-031

* denotes warranted specification after 20 minute warm-up, all others are typical

Ordering information

Product number	Description
N2790A	100 MHz high-voltage differential probe
N2790-68700	Probe tip accessory kit for N2790A including 2 each of browser tips, alligator plunger clips and pincer clips
N2791A	25-MHz high-voltage differential probe
N2791A-68700	Probe tip accessory kit for N2791A including 2 alligator clips and 2 hook clips



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