

Keysight N2780B Series AC/DC Current Probes

A wide selection of current probes
to meet your application's needs

Data Sheet





Figure 1. N2780B Series current probes with N2779A power supply

- Various bandwidths: DC to 2 MHz, 10 MHz, 50 MHz, 100 MHz
- DC and AC measurements
- Superior 1% accuracy and high signal-to-noise ratio
- Overload-protect function prevents probe damage from excessive input
- Direct connection to high-impedance 1 MΩ BNC input of oscilloscope
- “Demagnetize” button to remove any residual magnetism that builds up in the magnetic core
- External power supply (N2779A) lets you connect up to three N278xB current probes to a single power supply

Compatible with any oscilloscope with a high-impedance BNC input, the new N2780B Series current probes offer accurate and reliable solution for measuring DC and AC currents.

Hybrid technology for AC and DC measurements

Using hybrid technology that includes a Hall-effect sensor and an AC current transformer, the probes provide accurate measurement of DC or AC currents up to 500 Arms (for model N2780B) or DC–100 MHz (for model N2783B), without breaking into the circuit. Using split core construction, the probe easily clips on and off of a conductor.

Wide range of applications

The current probes feature broad measurement ranges (up to 500 A), flat frequency response, low noise and low insertion loss that make the probes ideal for current measurements in areas such as measuring steady state or transient current of motor drives, switching power supplies, inverters, controllers, sensors, disk drives, LCD displays, electronic ballasts and amplifiers. The high signal-to-noise ratio of the N2782B and N2783B makes them ideal for making low-level current measurements in milliampere ranges.

Accurate current measurement

A built-in DEMAG (demagnetize) function allows the removal of any residual magnetism that has built up in the magnetic core due to power on/off switching or excessive input current. In addition, voltage offset or temperature drift on the probe can be easily corrected by using the zero adjustment control.



Figure 2. N2783B, N2780B, N2781B and N2782B current probe (from left to right)

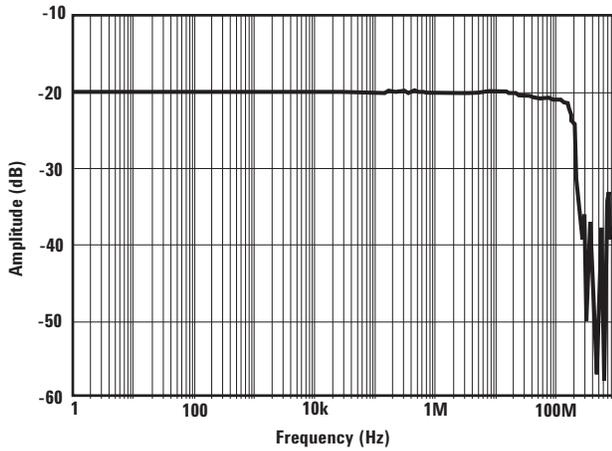


Figure 3. Frequency response of N2783B

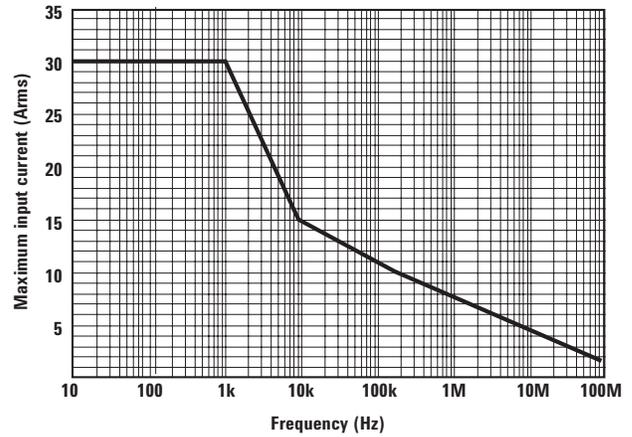


Figure 4. Continuous maximum input rating of N2783B

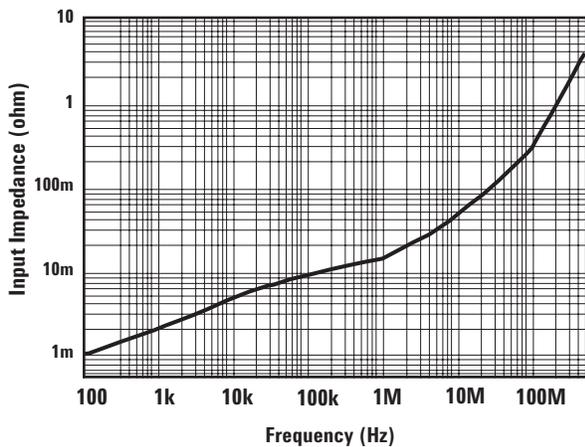


Figure 5. Insertion impedance of N2783B

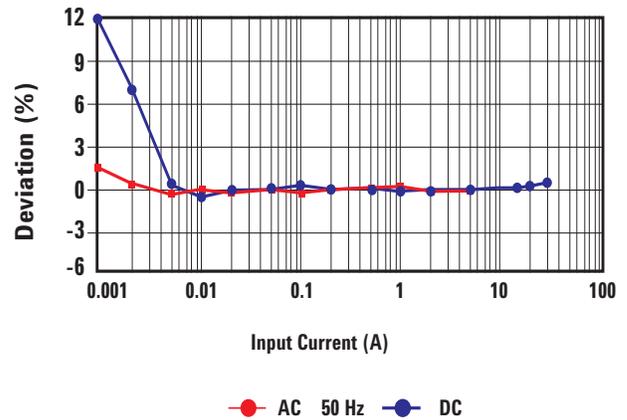


Figure 6. Amplitude accuracy characteristics of N2783B

Note: For the characteristic plots of other current probe models, refer to the N2780B Series current probe user's manual.



N2779A 3-channel power supply specifications

| | |
|---|---|
| Applicable current probes: | N2780B, N2781B, N2782B, N2783B and N2774A |
| Number of power supply connectors: | 3 |
| Connector type: | LEMO inc./FFA..0S.304.CNAC42Z |
| Output voltage: | DC (12 V, 2.5 A) |
| Maximum rated power: | 170 VA |
| Input power requirement: | AC 100-240 VAC, 50/60 Hz, 125-170 VAC |



| Model number | N2780B | N2781B | N2782B | N2783B |
|--|--|--|--|---|
| Bandwidth (-3dB) | DC to 2 MHz | DC to 10 MHz | DC to 50 MHz | DC to 100 MHz |
| Risetime | 175 ns or less | 35 ns or less | 7 ns or less | 3.5 ns or less |
| Maximum current (continuous) RMS | 500 A | 150 A | 30 A | 30 A |
| Maximum peak current (non-continuous) | 700 A peak | 300 A peak; | 50 A peak | 50 A peak |
| Lowest measurable current (at ±3% accuracy at DC, scope set to 1 mV/div and high-resolution mode on) | 20 mA | 20 mA | 5 mA | 5 mA |
| Output voltage rate | 0.01 V/A (100:1) | 0.01 V/A (100:1) | 0.1 V/A (10:1) | 0.1 V/A (10:1) |
| Max input voltage** | 600 V CAT II, 300 V CAT III | 600 V CAT II, 300 V CAT III | 300 V CAT I | 300 V CAT I |
| Amplitude accuracy* (DC and 45 to 66 Hz, rated current) | ±1.0% rdg. ± 500 mA | ±1.0% rdg. ± 100 mA | ±1.0% rdg. ± 10 mA | ±1.0% rdg. ± 10 mA |
| Noise (measured with 20 MHz bandwidth limit filter on the scope) | Equivalent to 25 mArms or less | Equivalent to 25 mArms or less | Equivalent to 2.5 mArms or less | Equivalent to 2.5 mArms or less |
| Temperature coefficient for sensitivity (within a range of 0°C to 40 °C or 32 °F to 104 °F) | ±2% or less | ±2% or less | ±2% or less | ±2% or less |
| Effect of external magnetic fields (in a DC to 60 Hz, 400 A/m magnetic field) | Equivalent to a maximum of 800 mA | Equivalent to a maximum of 150 mA | Equivalent to a maximum of 20 mA | Equivalent to a maximum of 5 mA |
| Maximum rated power | 7.2 VA (with rated current) | 5.5 VA (with rated current) | 5.6 VA (with rated cur- rent) | 5.3 VA (with rated cur- rent) |
| Rated supply voltage | DC ±12 V ±0.5 V | DC ±12 V ±1 V | DC ±12 V ±0.5 V | DC ±12 V ±0.5 V |
| Diameter of measurable conductors | 20 mm dia. (0.79" dia.) | 20 mm dia. (0.79" dia.)) | 5 mm dia. (0.2" dia.) | 5 mm dia. (0.2" dia.) |
| Diameter of measurable conductors | Sensor cable: Approx. 2 m (78.7") Power supply cable: Approx. 1 m (39.4") | Sensor cable: Approx. 2 m (78.7") Power supply cable: Approx. 1 m (39.4") | Sensor cable: Approx. 1.5 m (78.7") Power supply cable: Approx. 1 m (39.4") | Sensor cable Approx. 1.5 m (78.7") Power supply cable: Approx. 1 m (39.4") |

Note*: The amplitude accuracy specifications are guaranteed at 23°C ± 3°C (or 73°F ± 5°F)
 **: Insulated conductor should be used.

Compatible Oscilloscopes

Any oscilloscope offering 1 MΩ BNC input including Keysight Technologies, Inc. 1000, 3000 InfiniiVision 2000X, 3000X, 5000, 6000 and 7000 Series, and Infiniium 8000 and 9000 Series. You must select the input impedance of the oscilloscope to be 1 MΩ in order to make accurate measurements. If the oscilloscope you are using has a 50Ω input impedance setting only, you can purchase the Keysight E2697A 50Ω to 1 MΩ adapter for use with the Infiniium 80000 or 90000 Series or the N5449A high impedance probe adapter for use with the Infiniium 90000 X-Series.

Ordering Information

- N2780B**
2 MHz/500A AC/DC current probe
- N2781B**
10 MHz/150A AC/DC current probe
- N2782B**
50 MHz/30A AC/DC current probe
- N2783B**
100 MHz/30A AC/DC current probe
- N2779A**
3-channel power supply for
N2780B Series current probes



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