Clamp-on Current Probes

- Up to 100 MHz bandwidth and 500 Arms current measurement range
- Hybrid technology to measure ac and dc
- Compatible with 1 MΩ scope input

Accurate current measurements without breaking the circuit

Compatible with any scope or voltage measuring instruments with BNC input, the 1146B and N2780B Series current probes offer accurate and reliable solutions for measuring dc and ac currents. The probes use a hybrid technology that includes a Hall effect sensor, which senses the dc current and a current transformer, which senses the ac current, making it unnecessary to make an electrical connection to the circuit.

1146B 100 kHz current probe

The 1146B ac/dc current probe provides accurate display and measurement of currents from 100 mA to 100 Arms, dc to 100 kHz, without breaking into the circuit. A battery level indicator and overload indicator help ensure proper readings. It connects directly to the scope through a 2-m coaxial cable with an insulated BNC.

1147B 50-MHz current probe with AutoProbe interface.

1146B 100-kHz current probe.

1147B/N2893A 50-MHz/ 100-MHz current probe with AutoProbe interface

The 1147B/N2893A is a wide bandwidth, dc to 50-MHz/100-MHz current probe. The probe offers flat frequency response across the entire dc to 50-MHz/100-MHz bandwidth, low noise (< –2.5 mArms) and low circuit insertion loss.

The 1147B/N2893A probe is compatible with the AutoProbe interface, which completely configures the oscilloscope for the probe when used with the 3000 InfiniiVision Series scopes with AutoProbe interface. Probe power is provided by the scope, so there is no need for an external power supply. The N2893A uniquely provides auto demagnetization and offset elimination feature when used in conjuction with InfiniiVision or Infiniium scopes.

N2893A 100-MHz current probe with AutoProbe interface.

N2780B/81B/82B/83B/83L 2-MHz/10-MHz/50-MHz/ 100-MHz current probe

The N2780B Series current probes are high bandwidth, active current probes, featuring flat bandwidth, low noise (2.5 mArms) and low circuit insertion loss. In conjunction with the power supply (model N2779A), this probe can be used with any oscilloscope having a high-impedance BNC input. The companion power supply N2779A (3 x 12 Vdc output) lets you connect up to any three N2780B-83B current probes to a single power supply.

The N2783L 80 MHz current probe offers 5 m long cable, which allows you to reach DUTs in long distances very easily. Other than the bandwidth performance, the N2783A and N2783L have the same electrical performance other than bandwidth. The N2783L also requires the N2779A power supply to power the probe.

N2780B Series current probes with N2779A power supply.

Clamp-on Current Probes (Continued)

Characteristics of the 1146B current probe

Bandwidth [1]	dc to 100 kHz (–3 dB)
Current range [1]	100 mV/A:100 mA to 10 A peak 10 mV/A:1 to 100 A peak
Output signal	1000 mV peak max
AC current accuracy [1]	
Range	100 mV/A (50 mA to 10 A peak)
Accuracy	3% of reading ± 50 mA
Range	10 mV/A (500 mA to 40 A peak)
Accuracy	4% of reading ± 50 mA
Range	10 mV/A (40 A to 100 A peak)
Accuracy	(40 A to 100 A peak) 15% max at 100 A
Noise	Range 10 mV/A: 480 µV Range 100 mV/A: 3 mV
Insertion impedance	0.01 Ω (50/60 Hz)
Maximum working voltage	600 Vrms CAT II or 300 Vrms CAT III
Maximum common mode voltage	600 Vrms CAT II or 300 Vrms CAT III
Influence of adjacent conductor	< 0.2 mA/A AC
Influence of conductor position	< 0.2 mA/A AC
Battery	9 V alkaline (NEDA 1604A, IEC 6LR61)
Low battery	Green LED on when ≤ 6.5 V
Battery life	55 hours typical

Note: Reference conditions 23 ± 5 °C, (73.4 ± 41 °C) 20 to 75% relative humidity, dc to 1 kHz, probe zeroed, 1-minute warmup, batteries at 9 V + 0.1 V, external magnetic field < 40 A/m, no dc component, no external current carrying conductor, 1 MΩ/100 pF load, conductor centered in jaw.

1. Characteristics marked with asterisks are specified performance. Others are typical characteristics.

Characteristics of the 1147B/ N2893A current probe

Bandwidth (–3 dB)	dc to 50 MHz (1147B) dc to 100 MHz (N2893A)
Risetime	7 ns or less (1147B), 3.5 ns or less (N2893A)
Maximum current (continuous)	15 A peak, 15 A DC, 10 Arms (when two probes are used with InfiniiVision scope) 30A peak, 30 A DC, 24 Arms (when one probe is used with InfiniiVision 3000X, 5000/6000/7000 scope)
Maximum peak current (non-continuous)	30 A peak (when two probes are used with InfiniiVision scope) 32 A peak (when one probe is used with InfiniiVision scope)
Output voltage rate	0.1 V/A
Amplitude accuracy	± 1% rdg, ± 10 mA (dc and 45 to 66 Hz, rated current)
Noise	Equivalent to 2.5 mArms or less (for 20 MHz bandwidth measuring instrument)
Temperature coefficient for sensitivity	± 2% or less (within a range of 0 to 40 °C or 32 to 104 °F)
Effect of external magnetic fields	Equivalent to a maximum of 20 mA (in a dc to 60 Hz, 400 A/m magnetic field)
Maximum rated power	3 VA (with rated current)
Maximum input voltage	300 V CAT I
Diameter of measurable :conductors	5 mm dia. (0.2 in dia.)
Probe interface	AutoProbe interface
Cable lengths	Sensor cable: Appox. 1.5 m (59.0n in) Power supply cable: Appox. 1 m (39.4 in)
Maximum number of probes supported	2

Note: The above specifications are guaranteed at 23 ± 3 °C (or 73 ± 5 °F).

Characteristics of N2780B Series current probes

Bandwidth (–3 dB)	dc to 2 MHz (N2780B) dc to 10 MHz (N2781B) dc to 50 MHz (N2782B) dc to 80 MHz (N2783L) dc to 100 MHz (N2783A)
Maximum current (continuous)	500 A (N2780B) 150 A (N2781B) 30 A (N2782B/83B/83L)
Maximum peak current (non-continuous)	700 A peak (N2780B) 300 A peak (N2781B) 50 A peak (N2782B/83B/83L)
Maximum input voltage	300 V CAT I (N2782B/83B/83L) 300 V CAT III, 600 V CAT II (N2780B/81B)
Output voltage rate	0.01 V/A (N2780B/81B) 0.1 V/A (N2782B/83B/83L)
Amplitude accuracy	± 1.0 % rdg ± 500 mA (N2780B) ± 1.0 % rdg ± 100 mA (N2781B) ± 1.0 % rdg ± 10 mA (N2782B) ± 1.0 % rdg ± 10 mA (N2783B/83L)

Ordering information for Keysight current probes

1146B	100-kHz current probe
1147B	50-MHz current probe with AutoProbe interface
N2893A	100-MHz current probe with AutoProbe interface
N2780B	2-MHz current probe
N2781B	10-MHz current probe
N2782B	50-MHz current probe
N2783L	80-MHz current probe with 5 m long cable
N2783B	100-MHz current probe
N2779A	3-channel power supply for N2780B/81B/82B/83B/83L

For more information about the N2780B Series current probes, refer to the Keysight N2780B Series current probe data sheet, literature number 5989-6432EN.