

3273 CLAMP ON PROBE

CLAMP SENSOR



Broad Range from DC to 50 MHz Guarantees High-Sensitivity Measurement

Wide-Range Current Probe Allows Direct Input to Oscilloscope



ISO14001
JQA-E-90091



<http://www.hioki.co.jp/>

HIOKI company overview, new products, environmental considerations and other information are available on our website.

Recent advances in the fields of high-speed power semiconductor devices, switching power supplies, and compact inverters have intensified the need for precise, wide-range current waveform monitoring.

The 3273 CLAMP ON PROBE covers an extremely wide range from DC to 50 MHz. High signal-to-noise ratio and high sensitivity are further advantages which make this product ideal for today's demanding applications. When powered from the FET probe power supply terminals of an oscilloscope or from the dedicated power supply 3272, the 3273 can be directly connected to a BNC input, allowing convenient waveform monitoring.



A conventional wired current measurement setup requires CT elements, shunt resistors or other means of interrupting the signal path, making the measurement setup complex and prone to problems. **The 3273 CLAMP ON PROBE** provides a neat and efficient solution. Simply by connecting it to the BNC input of the monitoring device and clamping the probe over the measurement object, current waveform can be observed with high precision and over a wide range.

Features

- **Wide measurement range: DC to 50 MHz**
- **High S/N ratio: measurement of milliampere waveforms possible**
- **Direct connection to BNC input of oscilloscope possible**
- **Highly accurate current detection**
- **Newly developed indium-antimony (InSb) thin-film Hall element**
- **Simple overload protector prevents overheating**
- **Easy measurement procedure**
- **Compact dimensions and light weight**
- **Optional power supply unit 3272 available**

The power supply unit 3272 is designed specially for the 3273. It has connectors for powering two 3273 units at the same time.

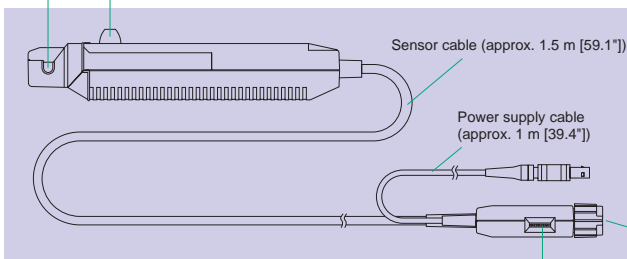


● Sensor head

High-precision assembly containing molded and ferrite parts, Hall element, etc. The Hall element is a thin-film type developed by HIOKI that improves detection sensitivity over a wide frequency range.

● Open/close lever

Sliding lever that serves to open and close the sensor head. Maximum opening for measurement is 5 mm (diameter).

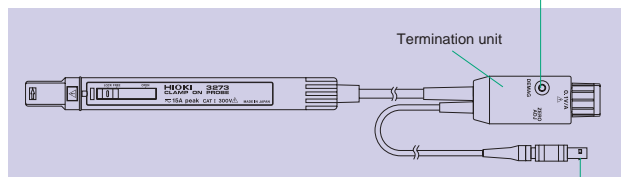


● Zero adjust dial

Serves to compensate the influence of offset voltage, temperature drift, and other factors.

● Degauss switch

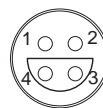
Allows removing of any residual magnetism that has built up in the magnetic core due to power on/off switching, excessive input, etc.



● Power supply plug

Connects to the FET probe power supply outlet of an oscilloscope or to the optional 3272 power supply unit. (Provided that connector type, pin assignment, voltage, and capacity rating match, the 3273 can be powered also from another source. For operation safety, be sure to refer to the specifications to ensure an exact match.)

Power supply plug pin assignment



- 1 : Not connected
- 2 : GND
- 3 : V- (-12V)
- 4 : V+ (+12V)

(Plug as seen from the front)

* Connector type: LEMO inc./ FFA.0S.304.CNAC42Z

● BNC output connector

Can be connected directly to the BNC input of an oscilloscope or level recorder or similar device.

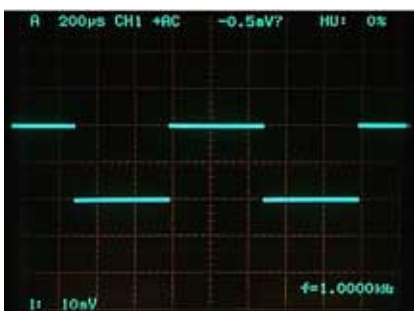
Output voltage rate: 0.1 V/A

(The 3273 is internally terminated. Use only equipment with an input impedance of 1 MΩ or more.)

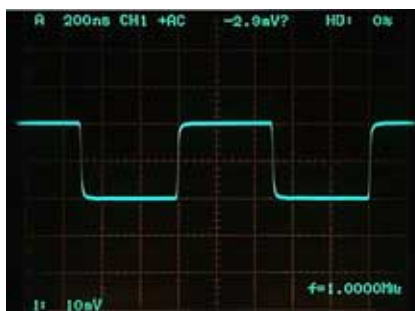
Wide Measurement Range (DC to 50 MHz), High Sensitivity (S/N Ratio)

Important Characteristics

■ Square wave response

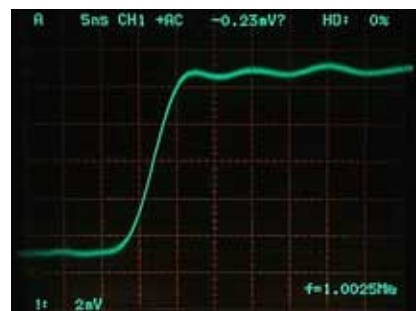


Input: 1 kHz square wave 200 mAp-p
(Oscilloscope bandwidth 400 MHz)



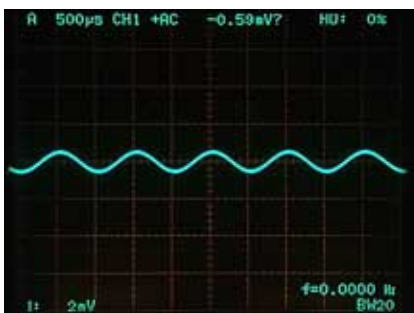
Input: 1 MHz square wave 200 mAp-p
(Oscilloscope bandwidth 400 MHz)

■ Transient response

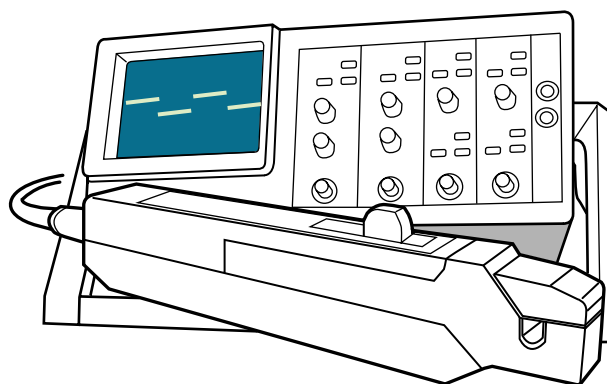


Input: Rise time 3 ns 100 mAp-p
(Oscilloscope bandwidth 400 MHz)

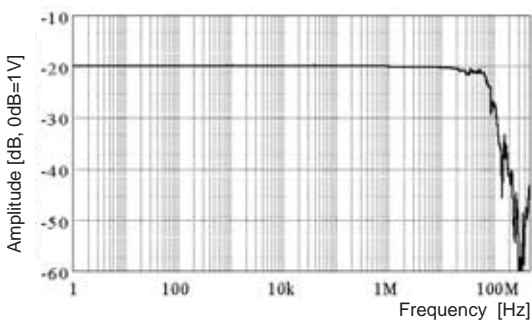
■ Low-current measurement



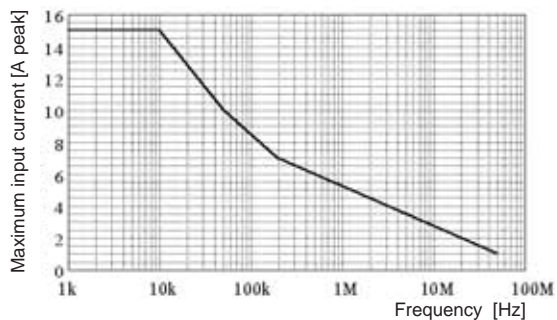
Input: 1 kHz sine wave 10 mAp-p
(Oscilloscope bandwidth 20 MHz)



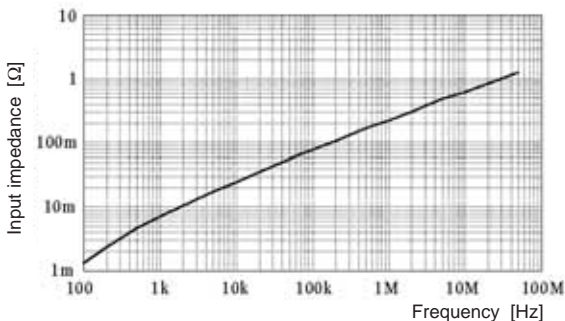
■ 1. Frequency response



■ 2. Continuous maximum input rating (frequency derating)



■ 3. Input impedance



■ 3273 Specifications

(Temperature 23±3 °C [73°F+5°F], 30 minutes after power-on)

Frequency bandwidth	: DC to 50 MHz (-3 dB) * See Fig. 1 on page 2.
Rise time	: 7 ns or less
Continuous maximum input range	: 15 A peak (DC + AC peak) * Frequency derating see Fig. 2 on page 2.
Maximum peak current	: Non-continuous 30 A peak 50 A peak at pulse width of ≤ 10 μs
Output voltage rate	: 0.1 V/A
Amplitude precision	: ±0.5% rdg. ±1 mV (DC, 45 to 66 Hz, within maximum continuous input range)
Noise	: 2.5 mA rms or less (measured with 20 MHz bandwidth equipment)
Input impedance	: * See Fig. 3 on page 2.
Sensitivity temperature characteristics	: Within ±2% (from 0 to 40 °C [32°F to 104°F])
Maximum rated power consumption	: 3 VA
Power supply voltage	: ±12 V ±1 V
Ambient conditions for usage	: 0 to 40 °C [32°F to 72°F], max. 80% rh (no condensation)
Ambient conditions for storage	: -10 to 50 °C [14°F to 122°F], max. 80% rh (no condensation)
External magnetic field resistance	: Max. 20 mA (equivalent) (in 60 Hz, 400 A/m AC field)

Maximum voltage in measurement circuit	: 300 V, CAT-I (insulator)
Measurement conductor	: Diameter max. 5 mm [0.2"]
Dimensions and mass	: Sensor: approx. 175(W)×18(H)×40(D) mm; 230 g [6.9"(W)×0.7"(H)×1.6"(D), 8.1 oz.] Termination unit: approx. 27 W×55 H×18 D mm [1.1"(W)×2.2"(H)×0.7"(D)]
Cable length	: Sensor cable: approx. 1.5 m [59.1"] (BNC connector) Power cable: approx. 1 m [39.4"] (pin assignment-see figure on page 1)
Supplied accessories	: Soft case×1
Applicable standards	
Safety standards	: EN 61010-2-031: 1994 EN 61010-2-032: 1995 Overvoltage category I (expected overvoltage 1500 V), contamination class 2
EMC	: EN 50082-1: 1992 EN 55011: 1991+A1:1997+A2: 1996

⚠ WARNING



1. To avoid short circuits and electric shock accidents when using a clamp-on sensor, use only with power lines carrying voltages within the rating limit of the sensor.
2. To avoid short circuits and electric shock accidents when the clamp-on sensor is open, do not use on bare conductors.

■ 3272 Specifications

(Temperature 23±3 °C [73°F+5°F], 30 minutes after power-on)

Suitable sensor model	: 3273 CLAMP ON PROBE
Number of power supply connectors	: 2 (connector type: LEMO inc./ ERA.OS.304.CNL)
Output voltage	: ±12 V ±1 V
Ambient conditions for usage	: 0 to 40 °C [32°F to 104°F], max. 80% rh (no condensation)
Ambient conditions for storage	: -10 to 50 °C [14°F to 122°F], max. 80% rh (no condensation)
Power requirements	: 100 V, 120 V, 220 V, 240 V AC (50/60 Hz), Please specify when ordering.
Maximum rated power consumption	: 12 VA
Dimensions and mass	: Approx. 73(W)×110(H)×186(D) mm; 1.1 kg [2.9"(W)×4.3"(H)×7.3"(D), 38.8 oz.]

Supplied accessories	: Power cord×1, spare fuse×1 (F1.0AL/250 V [220 V and 240 V models F0.5AL/250 V], dia. 5×20 mm)
Applicable standards	
Safety standards	: EN 61010-1: 1993+A2:1995 Overvoltage category II (expected overvoltage 2500 V), contamination class 2
EMC	: EN 50082-1: 1992 EN 55011: 1991+A1:1997+A2: 1996

3273 CLAMP ON PROBE



3272 POWER SUPPLY



Serves to power 3273 in cases when power from oscilloscope is not available.
Up to two 3273 units can be connected.

● Optional accessories

3272 POWER SUPPLY

[For 100 V, 120 V, 220 V, 240 V AC. Please specify when ordering.]

■ Related Products

Wide Range Clamp On Sensors for DC to 10 MHz

Models 9273 and 9274 are rated up to 10 MHz, and Models 9275 and 9276 up to 1 MHz. In conjunction with the 3270 CURRENT MONITOR or 3271 AC CURRENT MONITOR, a high-precision waveform monitoring output is obtained.



9273 CLAMP ON AC SENSOR (0.7 Hz to 10 MHz/ AC 20 A max.)
9275 CLAMP ON AC SENSOR (0.5 Hz to 1 MHz/ AC 150 A max.)
9274 CLAMP ON AC/DC SENSOR (DC to 10 MHz/20 A max.)
9276 CLAMP ON AC/DC SENSOR (DC to 1 MHz/150 A max.)
(For measurement, the separately available 3270 or 3271 is required.)

● Optional accessories

3270 CURRENT MONITOR (power supply for 9273 to 9276)
3271 AC CURRENT MONITOR (power supply for 9273 and 9275)

HIOKI

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