World-Class Accuracy & Measurement Range

- 500 A (rms), 800 A (rms) Rated for measurement of large currents
- 4 MHz (±3 dB) Wide measurement frequency range
- ±10 ppm Excellent linearity (500 A rated specifications)
- ±0.02% rdg. (±0.007% f.s.) Superior basic measurement accuracy (500 A rated specifications)
- 120 dB (100 kHz) High Common-Mode Rejection Ratio (CMRR)
For True Current Measurement

High inverter efficiency and improved power saving technology performance for the power electronics, natural energy, and automotive industries.
Responding to the advanced demands of every industrial field.

AC/DC Current Sensor CT6904

Specifications

<table>
<thead>
<tr>
<th>Rated 500 A (rms)</th>
<th>Measurement Frequency Range</th>
<th>Linearity</th>
<th>Measurement Accuracy</th>
<th>CMRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model: CT6904</td>
<td>4 MHz (±3 dB)</td>
<td>±10 ppm</td>
<td>±0.02% rdg.</td>
<td>120 dB (100 kHz)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated 800 A (rms)</th>
<th>Measurement Frequency Range</th>
<th>Linearity</th>
<th>Measurement Accuracy</th>
<th>CMRR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model: CT6904-60</td>
<td>4 MHz (±3 dB)</td>
<td>±12.5 ppm</td>
<td>±0.025% rdg.</td>
<td>120 dB (100 kHz)</td>
</tr>
</tbody>
</table>
High Performance Combination

POWER ANALYZER
PW6001
Achieve maximum performance when used in combination with the POWER ANALYZER PW6001
**Superior Performance**

**World-Class**

**Measurement Frequency Range of 4 MHz**

Current sensor performance is maximized with the "Zero Flux (Fluxgate Detection)" measurement method. High-frequency currents are detected with the winding (CT method), and DC to low frequency currents are detected with the "flux gate." Newly developed opposed split coil technology *1 is used in winding (CT) areas, achieving a wide measurement range from DC to 4 MHz.

![Opposed Split Coil Technology Diagram](image)

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**High Accuracy and Measurement Stability**

±10 ppm Linearity, ±0.02% rdg. ±0.007% f.s. Basic Accuracy (500 A Rated Specifications)

By using a fluxgate element for DC to low frequency current detection, we have been able to achieve a level of measurement accuracy and temperature stability that is not possible with the Hall element method.

![Frequency Characteristics Graph](image)

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Linearity: Changes the input current (DC) at intervals of 100 A from +500 A to 0 A to -500 A to 0 A to +500 A to measure the output voltage. Determined by the difference between the regression line (calculated from the above measurements) and measurement points.
High Noise Resistance

**Common-Mode Rejection Ratio (CMRR) of 120 dB or More (100 kHz)**

The opposed split coil is completely shielded with a uniquely shaped solid shield, achieving both broad bandwidth and superior noise resistance. This allows accurate measurement without influence from surrounding voltage.

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**Solid Shield**

Aluminum shield machined into a unique shape to eliminate influence on current measurements

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**Significant Resistance to Conductor Position Effects**

**Stable Measurement with High Reproducibility**

The solid shield not only improves noise resistance but also significantly reduces the effect from the conductor position. Even at high frequency, the conductor position has little effect on measurement values, enabling measurements with high reproducibility.

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**Comparison of Effect of Conductor Position on Inner Core (CT6904 and Conventional Model)**

For 60 Hz

For 100 kHz
Unmatched Measurement Range and Noise Resistance

Example Applications

High-Precision and Efficiency Testing of SiC/GaN Inverters
A wide range and small voltage current phase error are essential for the highly precise measurement of switching frequency power during PWM output.

The CT6904 features flat frequency characteristics over a wide range to provide accurate measurement of not only fundamental wave current, but also switching frequency current. Since the CT6904 achieves both wide-range and highly accurate measurement performance, it can be used in combination with a power analyzer for more precise measurements of inverter input/output power and efficiency than ever before.

Reactor/Transformer Loss Analysis
Reactor and transformer loss measurement is becoming increasingly important for furthering the efficiency and miniaturization of power converters.

Switching current is often obscured by noise. Thanks to the excellent noise resistance of the CT6904, you can now measure this type of signal with ease.

In addition, by using the phase compensation function of the POWER ANALYZER PW6001, previously difficult reactor and transformer loss measurements for large currents, high frequency, and low power factors can now be performed easily and quickly.
Specifications

General Specifications (Shared specifications for both the 500 A and 800 A rated models)

- Operating environment: Indoor, Pollution Degree 2, altitude up to 2000 m (6562.20 ft)
- Operating temperature and humidity range: -10°C to 60°C (14°F to 122°F), and 80% RH or less (no condensation)
- Storage temperature and humidity range: -20°C to 80°C (-4°F to 140°F), and 80% RH or less (no condensation)
- Diode withstand voltage: 7.4 kV AC (sensed current of 1 mA), 50 Hz/60 Hz, 1 min (Distance between feed-through window and cable output terminal)
- Power supply: Power supplied from PW6001, PW3390, or CT9555*

* Operation of the CT5568 or CT5567 in combination with the CT6504 is not guaranteed.

Basic Specifications

- Maximum rated power consumption: 7 W (500 A, 65 Hz measurement, with a power supply of x 12V)
- Interface: Dedicated interface (ME15W)
- Dimensions: Approx. 139 mm (4.7 in) x 130 mm (5.12 in) x 125 mm (5.0 in) D (including protrusions and cable)
- Output cable length: Approx. 3 m (9.84 ft) (including relay box) for an output cable length of 10 m (32.81 ft)
- Output voltage: 4 mV/A ±2 mV/A
- Frequency range: DC, 45 Hz ≤ f ≤ 65 Hz ±0.02% rdg. ±0.007% f.s. ±0.025% rdg. ±0.009% f.s.
- Measurement accuracy: 4 MHz (±3 dB Typical)

Accuracy Specifications

- Accuracy guarantees: Guaranteed accuracy period: 1 year

Derating Characteristics

500 A Rated Specifications

- Maximum current [Arms]: 1000 A CAT III Expected transient overvoltage: 8000 V
- Linearly: ±10 ppm Typical (23°C (73°F)) ±15 ppm Typical (23°C (73°F)) (no input)

500 A Rated Specifications

1. PW6001 POWER ANALYZER

- For other measurement parameters, add the PW6001 accuracy and the sensor accuracy (consider the sensor rating when calculating the f.s. error).
- 500 A Rated specifications: For 10 A Range and 20 A Range, apply ±0.12% f.s. (PW6001 Range)
- 800 A Rated specifications: For 20 A Range and 40 A Range, apply ±0.12% f.s. (PW6001 Range)
- Accuracy additions defined by the POWER ANALYZER and sensor specifications also apply.

2. PW3390 POWER ANALYZER

- Add the power analyzer accuracy and the sensor accuracy (consider the rating when calculating f.s. error).
- Accuracy additions defined by the POWER ANALYZER and sensor specifications also apply.

3. CT9555 SENSOR UNIT

- Sensor accuracy: ±1.5% (When the output coaxial cable is no longer than 1.6 m (5.25 ft))
- For the specifications for an output cable length of 10 m (32.81 ft), a frequency range of DC to 1 kHz, the frequency range is 2 MHz (±3 dB Typical).
- Accuracy additions defined by the conditions in specifications for connected instruments and sensors also apply.

Phase shift correction value

1. Compensation value when performing phase shift correction with the PW6001 or PW3390 (Typical): 300 Hz -9.82° (Common to 500 A rated specifications and 800 A rated specifications)

- If you would like even more accurate compensation values, the inspection data sheet (sold separately) lists the phase shift correction value for individual items.
Unique Shape Supports a Variety of Installation Scenarios

The longer the measured conductor, the greater the measurement error due to conductor inductance and parasitic capacitance. To keep the sources of error to a minimum, it is necessary to keep the conductor short.

With the CT6904 you can select from a variety of installation methods, allowing you to minimize the length of the measured conductor.

Wall Installation Using Screws

Fastening Bracket (Built-To-Order)

The output cable can face any direction.

Dimensional Drawing (Shared specifications for both the 500 A and 800 A rated models, Unit: mm)

- Cable length: Approx. 3000
- M5 press nuts (2 locations)
- Bracket hole thickness: 7.5
- Diameter of measurable conductors: ø32 or less
- Diameter of measurable conductors: ø32 or less
- (Bracket hole thickness: 7.5)

Model Name: AC/DC CURRENT SENSOR CT6904

Model No. (Order Code) (Note)
CT6904 (500 A AC/DC Rated, ME15W terminal)

Built-To-Order

- CT6904-01 (Output Cable 10 m (32.81 ft) length)
- CT6904-60 (800 A AC/DC Rated, ME15W terminal)
- CT6904-61 (Output Cable 10 m (32.81 ft) length, 800 A AC/DC Rated)

- (Code No. None) Fastening Bracket

Option: SENSOR UNIT CT9555

Model No. (Order Code) (Note)
CT9555 For power supply when using a current sensor by itself, 1 ch, with waveform output

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