

Clamp-On Current Sensors

Direct-on-PCB Solutions for Industrial/Automotive Applications

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Tech Brief



Current sensing provides vital information for monitoring, controlling, protecting and optimizing electrical systems in a wide range of applications across multiple sectors. Current sensor integration has therefore become a key factor to consider when developing new systems and retrofitting existing ones, consequently increasing market expectations and requirements for current sensors in terms of system applicability, ease of use, performance and costs.

To match the current sensing needs of the industrial and light vehicle markets, CTS has developed a clamp-on sensing solution that is easily integrated with printed circuit boards (PCBs). In combination with a standard integrated circuit (IC), these clamp-on magnetic field concentrators can measure currents up to 200A with an accuracy within 1%, providing cost-effective and precise current sensing for PCB mount cables.

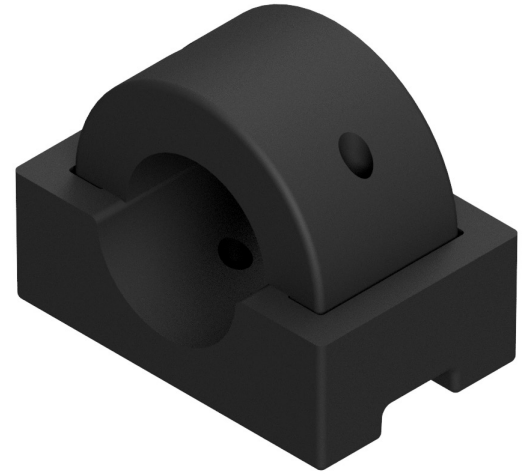
CTS clamp-on current sensors emphasize end-use flexibility and can accommodate varying current ranges without requiring customer-specific alteration and design. The mechanical design allows for direct-on-PCB mounting, reducing system costs and integration complexities while still maintaining high performance.

Application

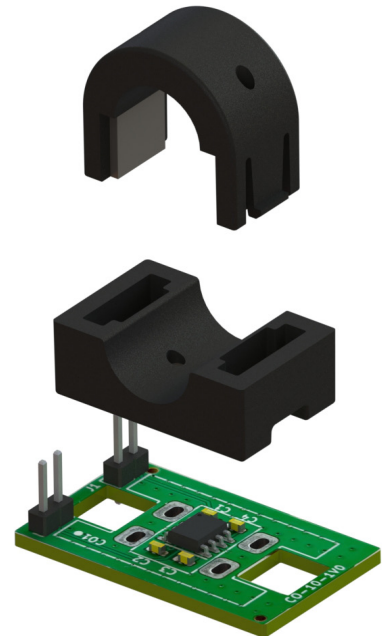
CTS engineers work closely together with customers to create unique solutions, and the clamp-on current sensors have been developed on the basis on our extensive knowledge of the industrial sensing needs in the low-to-mid current range. The result is a sensing solution that can accommodate a wide and diverse range of applications such as distribution panels, solar installations, data centers, motor control and battery monitoring systems (BMS).

The CTS clamp-on current sensor is designed to work in conjunction with Melexis IMC-Hall® technology that utilizes the Hall-effect to turn the magnetic field created around the conductor into a voltage signal proportional to the current running through it. The clamp-on design enables highly accurate readings that are ferromagnetically shielded against unwanted interference (stray field) while eliminating the need to cut or otherwise interrupt the cable. The sensor can be mounted directly on PCBs for easy system integration, and no additional fixation is needed during installation thanks to an integrated snap-fit mechanism.

Our clamp-on sensor is available off-the-shelf via our global distribution network, making it easily accessible to customers around the world. For large volume requests and multi-channel needs, our engineers will work with customers to develop custom solutions to match the specific requirements of the application in question.



The CO-SF-10 magnetic field concentrator for clamp-on current sensing.

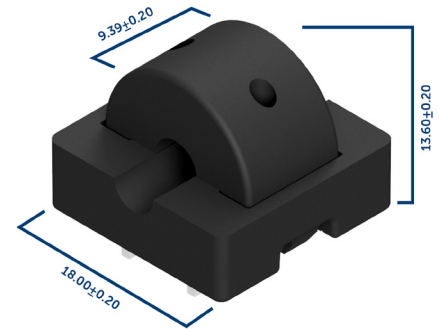


Thanks to an integrated snap-fit mechanism, the clamp-on current sensor features direct-on-PCB mounting.

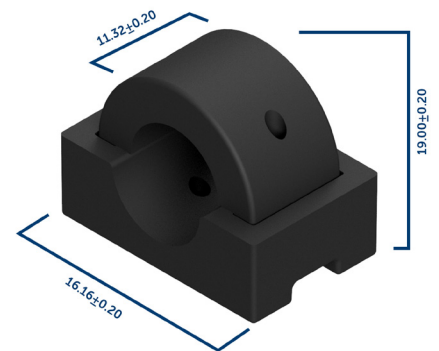
Specifications			
Parameter	Unit	CO-04-SF	CO-10-SF
Current Range	A	+/-200	+/-200
Sensor Output Accuracy	%	+/- 1	+/- 1
Operating Temperature	°C	10-120	10-120
AC Frequency Range	MHz	< 30	< 30

Magnetic Material		
Parameter	Unit	Value
Relative Permeability	-	100000
Initial Relative Permeability	-	7000
Saturation Flux Density	T	1
Hysteresis	A/m	2.8
Curie Temperature	°C	450

Plastic Material		
Parameter	Unit	Value
Material	-	Glass-Reinforced PA6
Glass-Fiber Content	%	15
Usage Temperature Range	°C	10-120



CO-04-SF dimensions



CO-10-SF dimensions

Sensing Expertise

CTS has supplied major OEMs in the industrial and automotive markets with high-performance sensors since the 1970s. Our sensing products are found throughout vehicles and heavy equipment designed by the world's top manufacturers, monitoring current, speed, vibration, throttle position and a variety of other safety and efficiency-related areas. With more than 500 million sensors already delivered, we have both the engineering expertise and the production capabilities to accommodate unique customer requests and support a wide array of applications.

About CTS

CTS is a leading designer and manufacturer of products that Sense, Connect, and Move. We manufacture sensors, actuators, and electronic components in North America, Europe, and Asia, and provide solutions to OEMs in the aerospace & defense, medical, industrial, communications, information technology, and transportation industries.

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