CS-50A | CS-100A | CS-200A

Hall-Effect Current Sensor boards

The CS-50A, CS-100A and CS-200A are Hall effect current sensor boards capable of measuring Bi-directional current flow. These devices can be used in AC and DC systems requiring isolation from the measured circuit. These boards have low insertion loss and more connection options compared to conventional resistive current shunts.

Features and Benefits

- Measures Bi-directional AC and DC currents
- Low noise, Low loss Monolithic Hall IC
- High isolation from measured circuit
- 3V to 5V single supply operation
- Measured circuit up to 300V AC/DC
- High capacity stitched copper pads
- Analog output proportional to measured current
- Flexible connection and mounting options
- Easy to deploy with most uController systems

Applications

- Battery Chargers and Power supplies
- High current RC and Robotic battery systems
- Motor Control and Load detection
- Solar / Wind powered systems
- Automotive audio equipment
- Telecom Power supplies
- Welding machines
- 2-way radio equipment
- Power management systems
- RV and other recreational vehicle battery systems

Typical Characteristics

Characteristic	CS-50A	CS-100A	CS-200A
Supply Voltage	3.0 - 5.5v	3.0 - 5.5v	3.0 - 5.5v
Supply Current	10-14ma@5V	10-14ma@5V	10-14ma@5V
Sensitivity @ 5v Vcc	40mv/A ±2mv	20mv/A ±2mv	10mv/A ±2mv
Sensitivity @ 3.3v Vcc	26mv/A ±1mv	12.8mv/A ±1mv	6.5mv/A ±1mv
Vout at zero current	½ Vcc	½ Vcc	½ Vcc
Normal operating Temperature	-20 to 85 C	-20 to 85 C	-20 to 85 C
Current range @ 5v Vcc	50A	100A	200A
Current range @ 3.3v Vcc	50A	100A	200A
Working voltage	300V	300V	300V

The sensitivity of these devices vary proportionally with supply voltage(Vcc) used. If Vcc is other than stated above, Sensitivity can be determined by feeding a known current load to the device and use the formula on the next page. Calibrating these devices on the host microcontroller against a known current load will increase accuracy in most applications.

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Typical Application

These current sensor boards outputs an analog voltage(Vout) in linear proportion to the current flowing across the sensor. This output voltage can then be monitored by an Analog to Digital converter (ADC). Vout is typically ½ that of the Vsupply(Vcc) with zero current flowing through the board, Vout increases from ½ Vcc with a forward current flow and decreases with reversed flow (see FIG. 1 a). The amount of voltage increment per Ampere of flowing current is the device Sensitivity.

Vout = 1/2(Vcc) + (Current)Sensitivity or Current = Vout - 1/2(Vcc) / Sensitivity

Example: Vcc=5v, Current=50Amps, Sensitivity=20mv/Amp(CS-100A)

Vout = 1/2(5) + (50)(0.02) = 3.5 volts

Simple code for reading current in Arduino™ Environment. Vout connected to ADC1, Vcc=5v

```
Current = ((analogRead(1)*(5.00/1024))- 2.5)/ .02;
```

For voltage measurement, a voltage sense tap is provided on the PCB. This is directly connected to one of the current pads and is not isolated, keep that in mind when using high voltages or non-common ground systems.

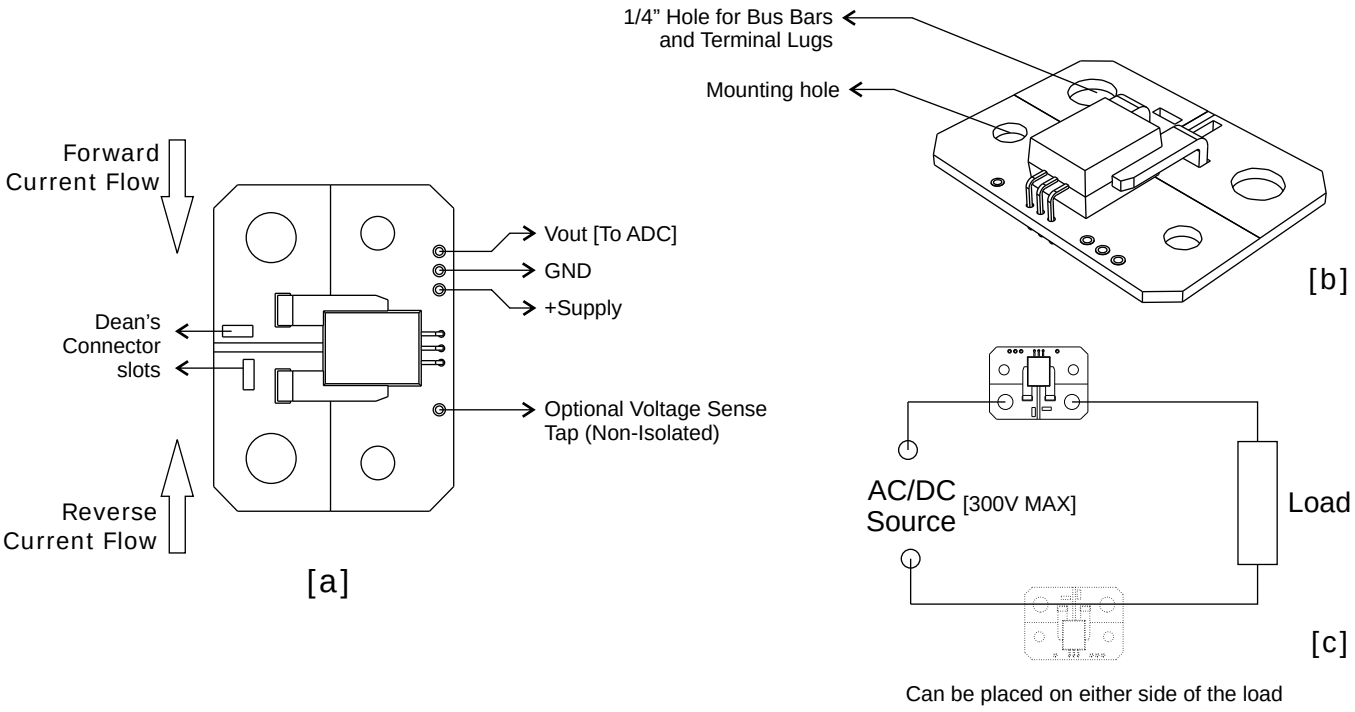
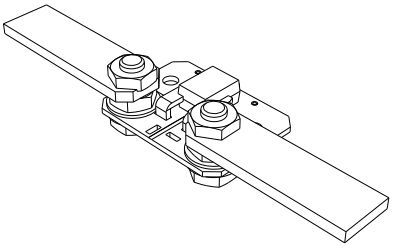


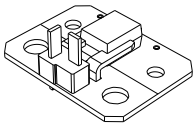
FIGURE. 1

CS-50A | CS-100A | CS-200A
Hall-Effect Current Sensor boards

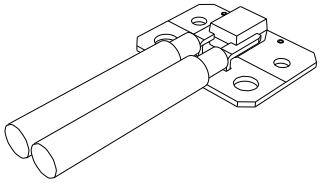
Connection and mounting options



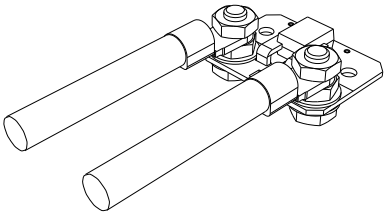
Bus Bars



Deans Connector



Direct solder



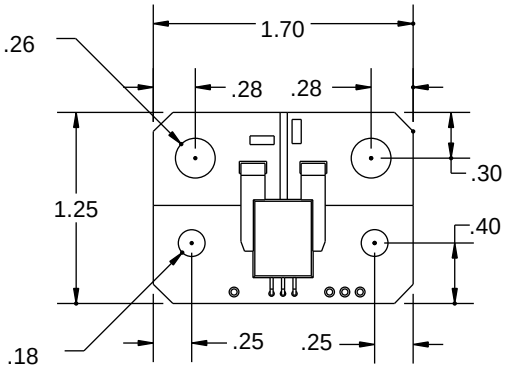
Terminal lugs

The CS-100A and CS-200A boards can be connected in numerous ways, making is easy to integrate into most applications. Here are some precautions when connecting these boards.

- Use only plated Copper, Brass or regular steel mounting hardware for Bus bars and Terminal lugs. Avoid using Stainless steel hardware between the bus bars and the PCB pads at high currents as these have high resistivity compared to the other materials. Use flat washers to ensure uniform electrical contact with the PCB current pads.
- Use the Deans connector only at its rated current, ensure good soldering of contacts and use only authentic Deans connectors.
- Use appropriately sized wires for direct solder and terminal lugs. Ensure good solder contact and mechanical stability of the joint to prevent heat build up.
- Excessive heat build-up on the device indicates a poor electrical contact.

MOUNTING

These boards can be mounted using the two holes on the PCB(FIG. 1). Spacers, studs or angle brackets should be used to elevate the board for mounting. Plastic or Metallic material can be used as these holes are on the non-conductive part of the board. Use appropriately sized mounting hardware and ensure that it does not come in contact with pads on the board.



PCB Material: FR4
Thickness: 0.063”
Copper: Stitched, 4oz. per side

Disclaimer: These devices should not be used in applications where loss of life/limb or damage to property can result from the product’s failure. Manufacturer and sellers are not responsible for said loses when using this product.