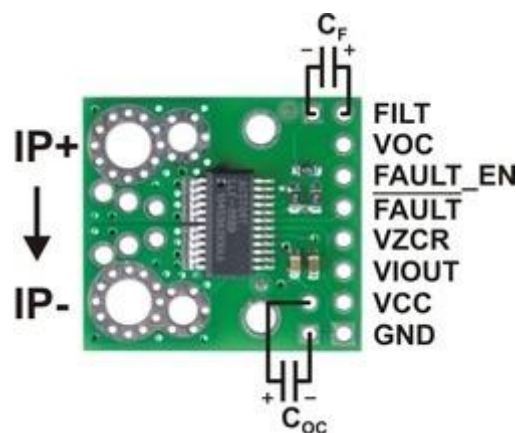


## POLOLU ACS709 CURRENT SENSOR CARRIER -

75A TO +75A

### USER'S GUIDE

#### USING THE SENSOR



#### ELECTRICAL CONNECTIONS

The only connections required to use this sensor are the input current (IP+ and IP-), logic power (VCC and GND), and the sensor output (VIOUT). All of the other pins are optional, as are the two external capacitors shown in the diagram to the right.

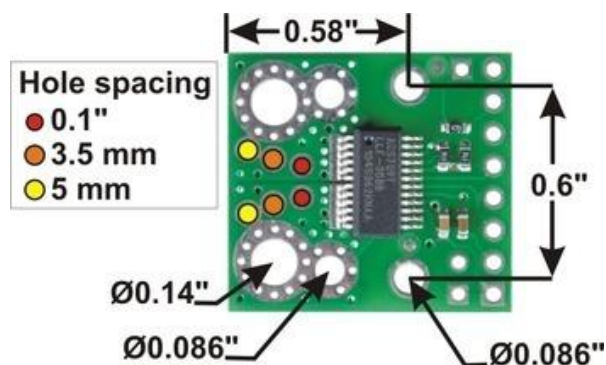
The sensor requires a supply voltage of 3 V to 5.5 V to be connected across the VCC and GND pads, which are labeled on the bottom silkscreen. The sensor outputs an analog voltage that is linearly proportional to the input current. The quiescent output voltage is  $VCC/2$  and changes by 28 mV per amp of input current (when  $VCC = 5\text{ V}$ ), with positive current increasing the output voltage and negative current decreasing the output voltage. For an arbitrary input current  $i$  (in amps), the sensor's output voltage can be more generally represented as:

$$VIOUT = (0.028\text{ V/A} * i + 2.5\text{ V}) * VCC / 5\text{ V}$$

The VZCR pin is the voltage reference output pin and can be used as a zero current (0 A) reference. It will be approximately equal to  $VCC/2$  and lets you more accurately compute the current from the VIOUT output voltage.

The FILT pin lets you adjust the board's bandwidth by adding a capacitor,  $C_F$ , to ground (a ground pad has been added next to the FILT pin for convenience). Without any external filter capacitor, the bandwidth is 120 kHz. The datasheet provides more information on how the external filter capacitor affects bandwidth.

The FAULT pin is normally high and latches low when the current exceeds the overcurrent fault switchpoint ( $I_{oc}$ ). This switchpoint is set by the voltage applied to the VOC pin and is dependent on the voltage divider shown in the schematic diagram below. By default,  $I_{oc}$  is set to 57 A, but it can be altered by adding external resistors to the voltage divider to change the VOC voltage. Once the FAULT pin is latched low, it can be reset by driving the FAULT\_EN input low (this input is pulled high on the board). An external capacitor,  $C_{oc}$ , can be added to increase the overcurrent fault response time. Without this capacitor, the fault response time is typically under 2  $\mu s$ . For detailed information on using the overcurrent fault feature, including some key restrictions on the overcurrent threshold, please refer to the ACS709 datasheet (1MB pdf).



ACS709 current sensor carrier mounting holes and current inputs.



ACS709 current sensor carrier with solderless ring terminal connectors (not included).

The input current can be connected to the board in a variety of ways. Holes with 0.1", 3.5 mm, and 5 mm spacing are available as shown in the diagram above for

connecting male header pins or terminal blocks. For high-current applications, you can solder wires directly to the through-holes that best match your wires, or you can use solderless ring terminal connectors, as shown in the picture above. The large through-holes are big enough for #6 screws.

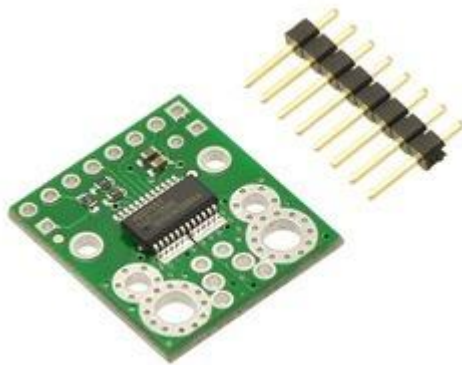
**Warning:** This product is intended for use below 30 V. Working with higher voltages can be extremely dangerous and should only be attempted by qualified individuals with appropriate equipment and protective gear.

## MOUNTING INFORMATION

The board has two mounting holes on the logic side of the board. These mounting holes are 0.6" apart and are designed for #2 screws.

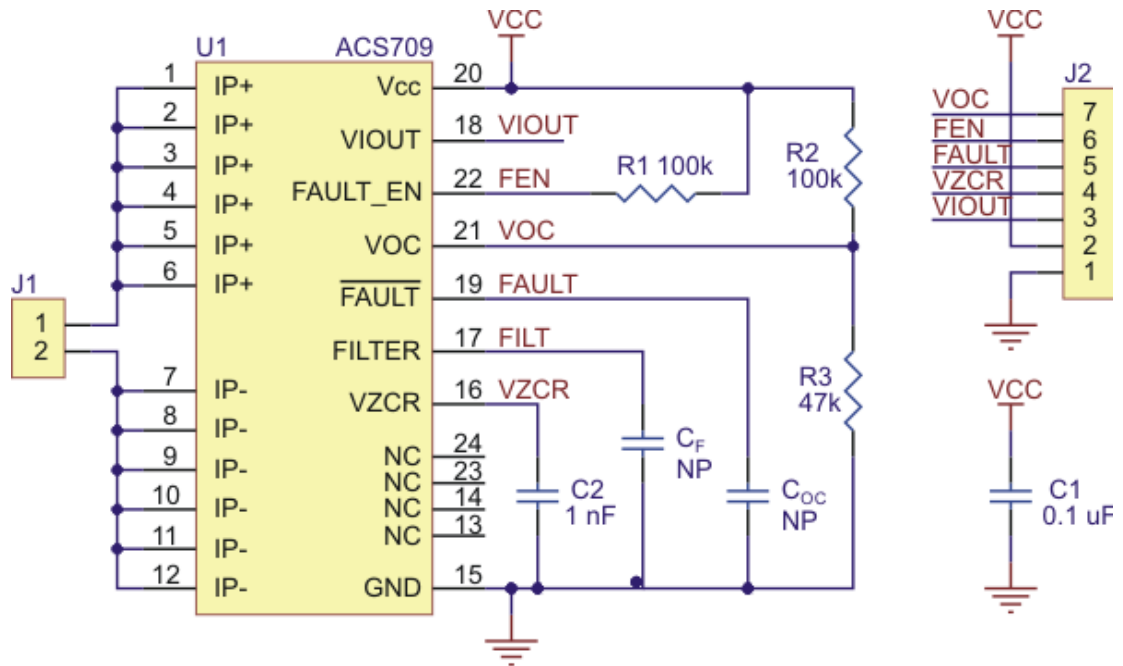
## INCLUDED COMPONENTS

This board ships assembled with all surface mount components, and an 8×1 strip of 0.1" header pins is included but not soldered in, as shown in the picture below.



ACS709 current sensor carrier with included 8 × 1 0.1" header pins.

SCHEMATIC DIAGRAM



ACS709 current sensor carrier schematic diagram.