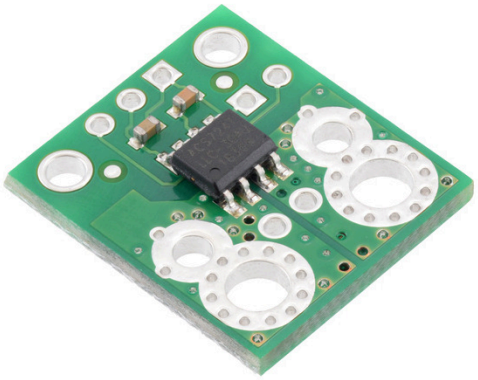
ACS724LLCTR-30AU Current Sensor Carrier 0A to 30A



Pololu item #: 4046
Brand: Pololu supply outlook
Status: Active and Preferred
RoHS 3

Price break	Unit price (US$)
1	6.95
5	6.39
25	5.88
100	5.41

Quantity: 1 Add to cart
backorders allowed Add to list

This board is a simple compact carrier of Allegro's **ACS724LLCTR-30AU** Hall effect-based, electrically isolated current sensor, which offers a low-resistance (~1.2 mΩ) current path and a high 120 kHz bandwidth for fast response times.

Part Suffix	Range	Sensitivity @ 5 V	Zero Point @ 5 V	Supply Voltage
30AU	0-30 A (unidirectional)	133 mV/A	0.5 V	4.5 V to 5.5 V

Alternatives available with variations in these parameter(s): current range Select variant…

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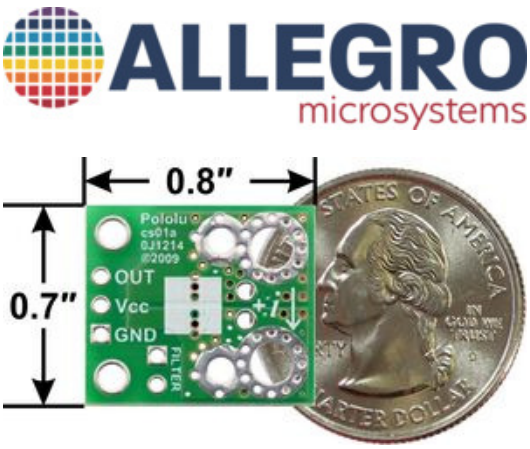
Description **Specs (10)** **Pictures (9)** **Resources (6)** FAQs (0) **On the blog (1)** **Distributors (29)**

Overview

We are offering these breakout boards with support from Allegro Microsystems as an easy way to use or evaluate their ACS724LLCTR Hall effect-based, electrically isolated current sensors; we therefore recommend careful reading of the **ACS724 datasheet** before using this product. The following list details some of the sensor's key features:



- Hall effect-based sensor with electrically isolated current path allows the sensor to be inserted anywhere along the current path and to be used in applications that require electrical isolation.
- Differential Hall sensing rejects common-mode fields, so the orientation of the sensor relative to uniform external magnetic fields (e.g. the Earth's magnetic field) has less effect on the measurement.
- The conductive path internal resistance is typically 1.2 mΩ, and the PCB is made with 2-oz or 4-oz copper, depending on the sensor version, so very little power is lost in the module.

Processing math: 100%

- High-bandwidth 120 kHz analog output voltage proportional to
- Typical 4 µs response time.
- Optional FILTER pin simplifies bandwidth limiting for better n lower frequencies.
- Integrated digital temperature compensation circuitry allov temperature in an open loop sensor.
- Automotive-grade operating temperature range of -40°C to 15
- 0.7″×0.8″ carrier board offers a variety of ways to insert it i (breadboard-compatible) power, ground, and output pins.
- Unidirectional and bidirectional versions available.

The pads are labeled on the bottom silkscreen, as shown in the picture to the right. The silkscreen also shows the direction that is interpreted as positive current flow via the **+i** arrow.

A variety of options are available with different current sensing ranges and sensitivities:

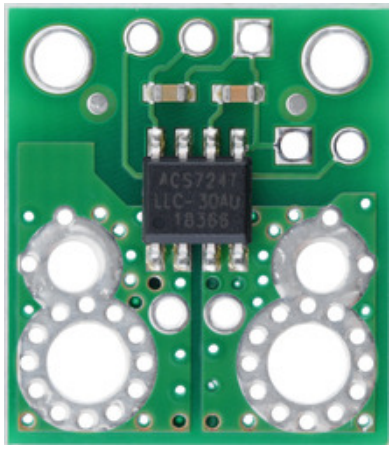
ACS724 Current Sensor Carriers		
Sensitivity[1]	**Unidirectional range**	**Bidirectional range**
800 mV/A	**0A to 5A**	**-2.5A to +2.5A**
400 mV/A	**0A to 10A**	**-5A to +5A**
200 mV/A	**0A to 20A**	**-10A to +10A**
133 mV/A	**0A to 30A**	
100 mV/A		**-20A to +20A**
66 mV/A		**-30A to +30A**
40 mV/A		**-50A to +50A**

[1] Sensitivity shown for Vcc = 5V.

Alternatives available with variations in these parameter(s): current range **Select variant…**

These versions all look very similar, and while you can distinguish them by reading the text on the IC, we also provide a white box on the bottom silkscreen where you can add your own distinguishing markings if so desired.

Details for item #4046



ACS724LLCTR-30AU Current Sensor Carrier 0A to 30A, top view.

ACS724LLCTR-30AU Current Sensor Carrier 0A to 30A with included 0.1″ header pins.

This carrier features the ACS724LLCTR-30AU, which operates at 5 V and is designed for unidirectional input current from 0 A to 30 A. This version can be visually distinguished from the other versions by the “30AU” written on the IC as shown in the pictures above.

Part Suffix	Range	Sensitivity @ 5 V	Zero Point @ 5 V	Supply Voltage
30AU	0-30 A (unidirectional)	133 mV/A	0.5 V	4.5 V to 5.5 V

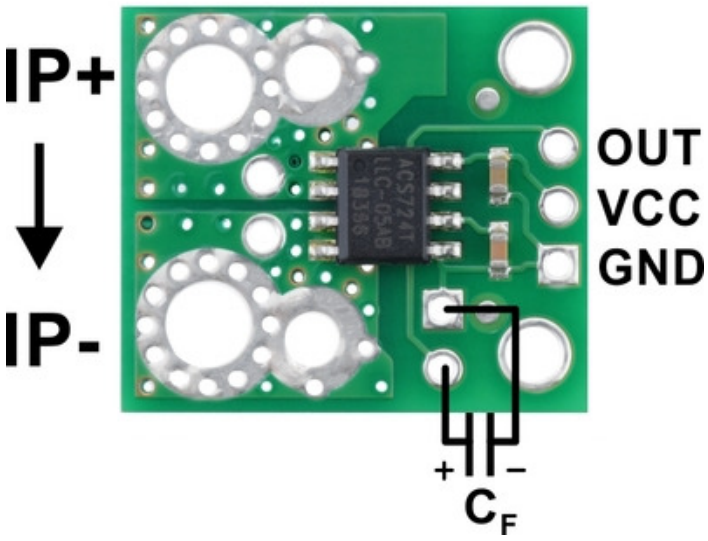
When Vcc is 5 V, the output voltage has a zero point at 0.5 V and increases by 133 mV per amp of input current. More generally, More generally, the sensor’s zero point and sensitivity depend on VCC as follows:

$$\text{Zero Point} = \frac{V_{\text{CC}}}{10}$$

$$\text{Sensitivity} = 0.133\frac{\text{V}}{\text{A}} \cdot \left(1 + \frac{\left(V_{\text{CC}} - 5\text{V}\right) \cdot 1.3}{5\text{V}}\right)$$

This board ships assembled with all surface mount components, and a 3×1 strip of **0.1″ header pins** is included but not soldered in.

Using the sensor



This sensor has five required connections: the input current (IP+ and IP-), logic power (VCC and GND), and the sensor output (VIOUT).

The sensor requires a supply voltage of 4.5 V to 5.5 V to be connected across the VCC and GND pads, which are labeled on the bottom silkscreen, and the sensor outputs an analog voltage with a linear relationship to the input current:

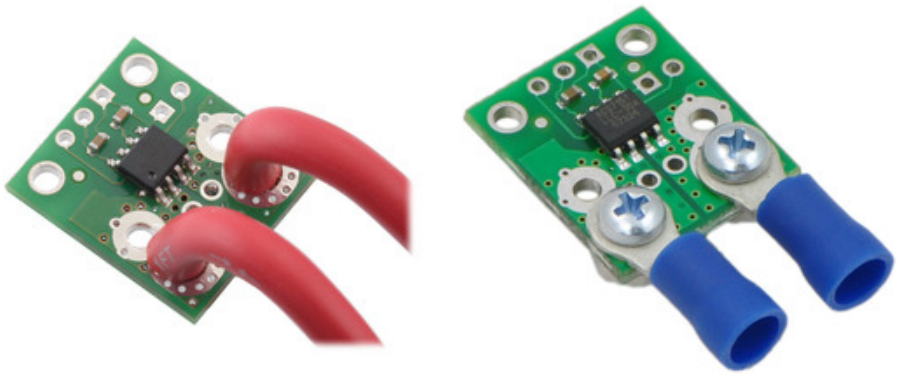
$$V_{\text{IOUT}} = \text{Zero Point} + \text{Sensitivity} \cdot I_{\text{P}}$$

$$I_{\text{P}} = \frac{V_{\text{IOUT}} - \text{Zero Point}}{\text{Sensitivity}}$$

The FILTER pin lets you adjust the board’s bandwidth by adding a capacitor to ground (a ground pad has been added next to the FILTER pin for convenience) in parallel with the 1 nF capacitor that is already on the board.

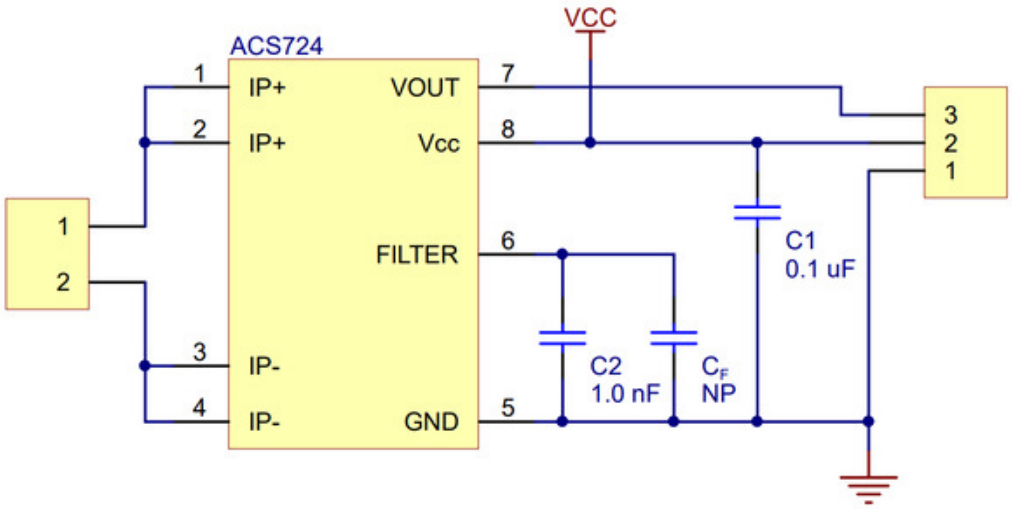
Without an added external filter capacitor, the bandwidth is about 90 kHz. The datasheet provides more information on how the filter capacitors affect bandwidth.

You can insert the board into your current path in a variety of ways. For low-current applications, you can solder **0.1″ male header pins** to the board via the smallest pair of through-holes on the input-current side of the board. For higher-current applications, you can solder wires directly to the through-holes that best match your wires, or you can use solderless ring terminal connectors. The largest through-holes are big enough for 8 AWG wires or #6 or M3.5 screws, and the second-largest through-holes (and mounting holes) are sized for 12 AWG wires or #2 or M2 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 experience.

Schematic and dimension diagrams

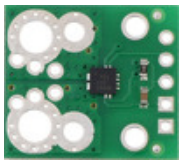
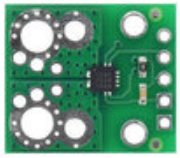
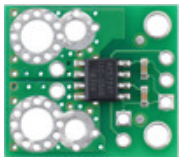
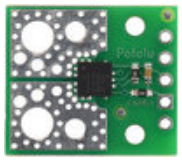
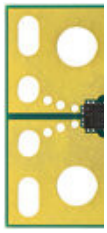


Schematic diagram of the ACS724 Current Sensor Carrier.

The dimension diagram is available as a **downloadable PDF** (1MB pdf).

Comparison of the Pololu current sensor carriers

We have a variety of current sensors available with different ranges, sensitivities, and features. The table below summarizes our selection of active and preferred options:

	 **ACS711 Current Sensor Carriers**	 **ACS71240 Current Sensor Carriers**	 **ACS724 Current Sensor Carriers**	 **ACS37220 Current Sensor Compact Carriers**	 **ACS3 Current Large C**
Allegro Sensor	ACS711KEXT	ACS71240	ACS724LLCTR	ACS37220	
Sensing technology	Hall effect	Hall effect	Hall effect	Hall effect	
Logic voltage range	3.0–5.5 V	3.3V ver: 3.0–3.6 V 5V ver: 4.5–5.5 V	4.5–5.5 V	3.3V versions: 3.15–3.45 5V versions: 4.5–5.5 V	
Family current range	15.5–31 A	10–50 A	2.5–50 A	100–200 A	
Current range/ sensitivity of individual versions	Bidirectional:(1) **±15.5 A / 90 mV/A** **±31 A / 45 mV/A**	3.3V Bidirectional: **±10 A / 132 mV/A** **±30 A / 44 mV/A** **±50 A / 26.4 mV/A** 5V Bidirectional: **±10 A / 200 mV/A** **±30 A / 66 mV/A** **±50 A / 40 mV/A** 5V Unidirectional: **0–50 A / 80 mv/A**	5V Bidirectional:(2) **±2.5 A / 800 mV/A** **±5 A / 400 mV/A** **±10 A / 200 mV/A** **±20 A / 100 mV/A** **±30 A / 66 mV/A** **±50 A / 40 mV/A** 5V Unidirectional:(2) **0–5 A / 800 mv/A** **0–10 A / 400 mv/A** **0–20 A / 200 mv/A** **0–30 A / 133 mV/A**	3.3V Bidirectional: **±100 A / 13.2 mV/A** **±150 A / 8.8 mV/A** 5V Bidirectional: **±100 A / 20 mV/A** **±150 A / 13.3 mV/A** **±200 A / 10 mV/A**	3.3V Bidir **±100 A / 1** **±150 A /** 5V Bidire **±100 A /** **±150 A / 1** **±200 A /**
IC current path resistance	0.6 mΩ	0.6 mΩ	0.6 mΩ	0.1 mΩ	
PCB	2 layers, 2-oz copper	2 layers, 2-oz copper	2 layers, 2- or 4-oz copper(4)	2 layers, 2-oz copper	6 lay 2-oz c
Max bandwidth	100 kHz	120 kHz	120 kHz(3)	150 kHz	
Size	0.7″ × 0.8″	0.7″ × 0.8″	0.7″ × 0.8″	0.7″ × 0.8″	1.4″ ×
Overcurrent fault output	✔	✔		✔ User-configurable thresh	
Common-mode field rejection		✔	✔	✔	
Nonratiometric output		✔		✔	
1-piece price	$3.49	$3.95	$6.95 – $7.49	$4.95	$7.

(1) Sensitivity when Vcc = 3.3 V; actual sensitivity is ratiometric (i.e. it is proportional to Vcc).

(2) Sensitivity when Vcc = 5 V; actual sensitivity is ratiometric (i.e. it is proportional to Vcc).

(3) Bandwidth can be reduced by adding a filter capacitor.

(4) 50A version uses 4-oz copper PCB; all other versions use 2-oz copper.

(5) 50A and higher versions use a 4-layer PCB; all other versions use a 2-layer PCB.

You can also use the following selection box to see all these options sorted by current range:

Alternatives available with variations in these parameter(s): current range **Select variant…**

People often buy this product together with:

ACS724LLCTR-05AB Current Sensor Carrier -5A to +5A

ACS724LLCTR-10AU Current Sensor Carrier 0A to 10A

ACS724LLCTR-20AB Current Sensor Carrier -20A to +20A