

EVB111-5A Evaluation Board User Manual

DESCRIPTION

The EVB111 evaluation board is designed to demonstrate the current sensing capabilities of the CT110 linear magnetic sensor from Allegro MicroSystems. The CT110 is a current sensor based on XtremeSense™ TMR Technology. It features a full-bridge configuration comprised of four TMR elements monolithically integrated with active CMOS circuitry, allowing it to have high resolution and low noise in a small package footprint. This user guide describes how to connect and use the EVB111-5A evaluation board.

FEATURES

- Current Range: +5 A_{DC} / ±5 A_{PK}
- Gain: 30.0 mV/V/A to 88.2 mV/V/A
- 2 kV_{RMS} Galvanic Isolation
- 2.7 V to 5.0 V Tolerance

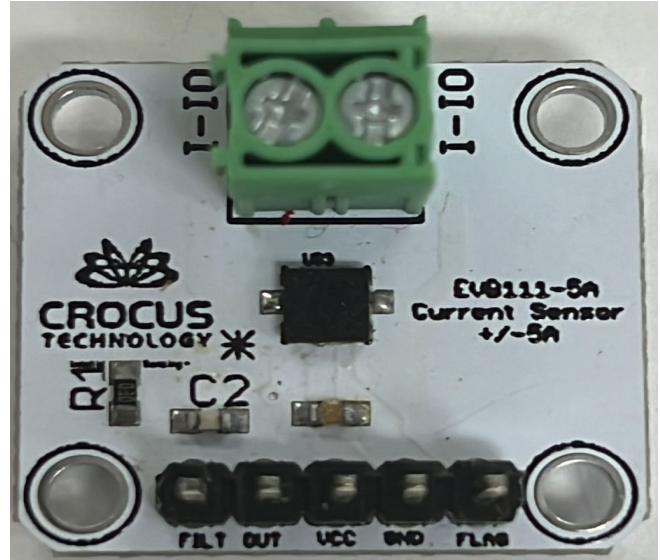


Figure 1: EVB111-5A Evaluation Board

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Table 1: EVB111-5A Evaluation Board Configurations

| Configuration Name | Part Number | Output Current (A) |
|--------------------|--------------|--------------------|
| EVB111-5A | CT110FDC-ID6 | 5 |

Table 2: General Specifications

| Specification | Min. | Typ. | Max | Units |
|-------------------------|------|------|-----|-------|
| Input Operating Voltage | 2.7 | – | 5.0 | V |
| Input Operating Current | –5.0 | – | 5.0 | A |
| Cutoff Frequency (3 dB) | – | 10 | – | kHz |

USING THE EVALUATION BOARD

This section provides an overview of the connections and configuration options of the EVB111-5A evaluation board. Each group of connections highlighted in Figure 2 has a detail section below. The EVB111-5A datasheet contains detailed information on the use and functionality of each pin. Consult the datasheet for more detailed information than is contained in this user guide.

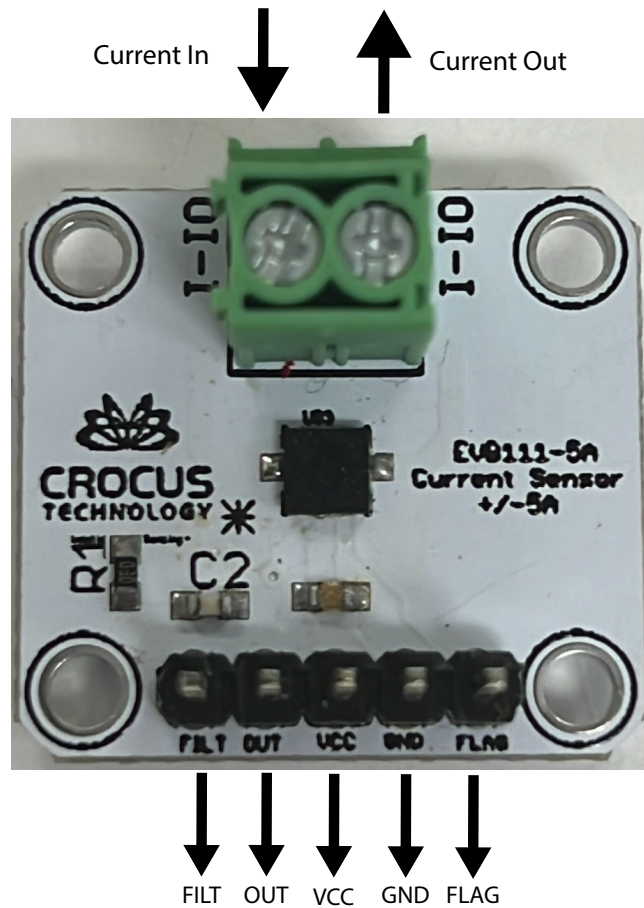


Figure 2: EVB111-5A evaluation board connections

Power Input

Connect a power supply to VCC and GND. Current that does not exceed $5 A_{DC}$ can be applied to the terminal block and measured. It is best to use short cables that are at least 18 AWG.

Board Configuration

The two-connector terminal block connects and drives the external current to be measured. Do not exceed $5 A_{DC}$.

Use the 5-pin male header on the PCB to bias the IC and measure the output. Apply the bias voltage between the VCC and GND pins to power the PCB. The voltage at the OUT pin is proportional to the current flowing through the EVB. The output on the FLAG pin changes state when the current exceeds the maximum rated current of the device.

The EVB111-5A also has an RC low pass filter on the PCB with a 3 dB cutoff frequency of 10 kHz, and the filtered signal voltage can be accessed from the FILT pin of the PCB.

SCHEMATIC

Figure 3 shows the schematic of the EVB111-5A evaluation board.

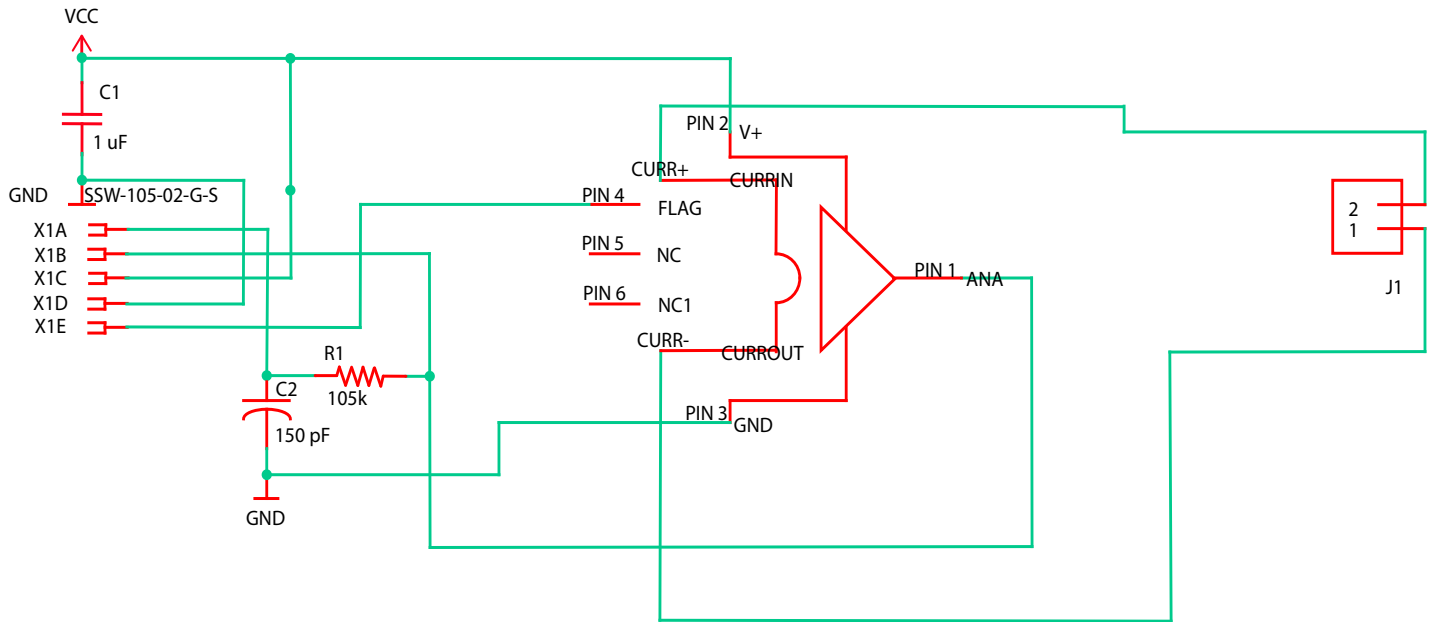


Figure 3: EVB111-5A evaluation board schematic

LAYOUT

Figures 4 and 5 show the top and bottom layers of the EVB111-5A evaluation board.

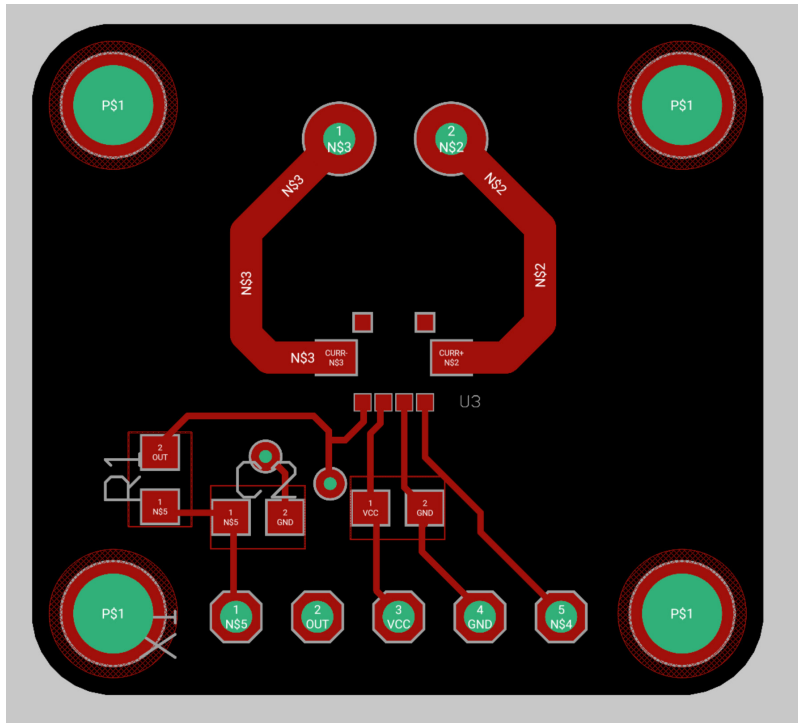


Figure 4: EVB111-5A evaluation board top layer

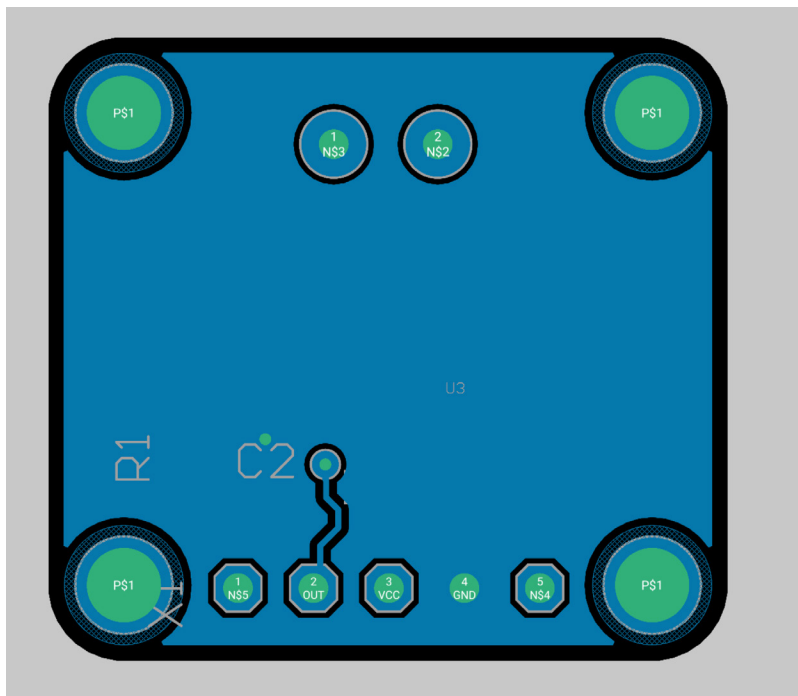


Figure 5: EVB111-5A evaluation board bottom layer

BILL OF MATERIALS

Table 3: CT110FDC-ID6 Evaluation Board Bill of Materials

| ELECTRICAL COMPONENTS | | | | |
|-----------------------|----------|---|----------------------|--------------------------|
| Designator | Quantity | Description | Manufacturer | Manufacturer Part Number |
| PCB | 1 | EVB111-5A EVAL PCB | Allegro MicroSystems | – |
| U1 | 1 | CT110 Sensor | Allegro MicroSystems | – |
| C1 | 1 | Capacitor, monolithic, 1.0 μ F, X7R, 0603 | Yageo | CC0603KRX7R7BB105 |
| C2 | 1 | Capacitor, monolithic, 100 μ F, X7R, 50 V, 0603 | AVX | 06035C104K4T2A |
| R1 | 1 | Jumper, 0 Ω jumper, 0603 | Yageo | RC0603JR-070RL |
| J1 | 1 | Terminal block, 2 position, side entry, 5mm | TE | 282836-2 |
| JP1 | 1 | Male jumper, 5 pin, gold plating | AMP | 9-146277-0-05 |

RELATED LINKS

<https://www.allegromicro.com/en/products/sense/current-sensor-ics/zero-to-fifty-amp-integrated-conductor-sensor-ics/ct110>

Revision History

| Number | Date | Description |
|--------|--------------------|-----------------|
| - | September 27, 2024 | Initial release |

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