

# ALLEGRO CT4022 Evaluation Board User Guide

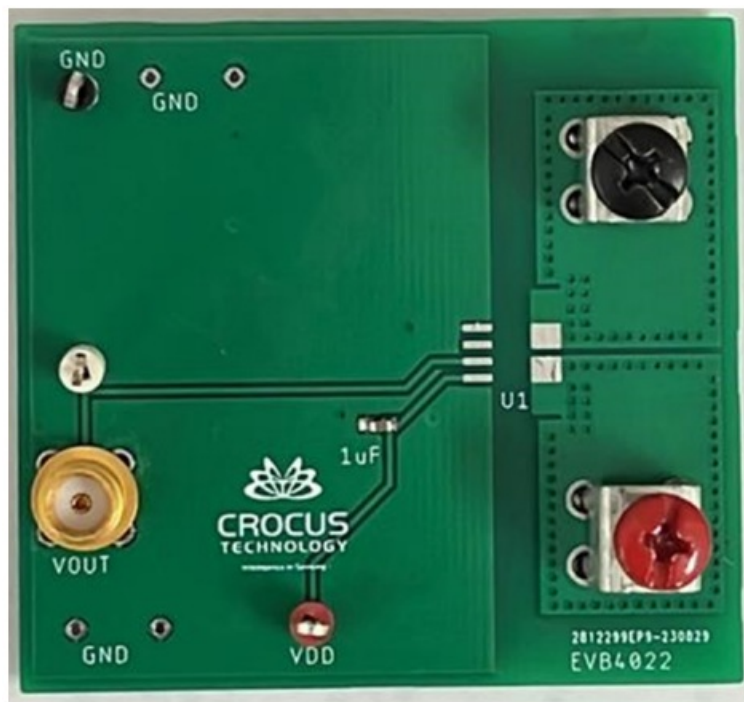
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**ALLEGRO CT4022 Evaluation Board**



## Product Usage Instructions

- This section provides an overview of the connections and configuration options of the CTD4022 evaluation board.
- The proper configuration is shown in Figure 2 and is detailed in the sections that follow.
- Detailed information about the use and functionality of each pin and detailed specifications about the sensor are provided in the CT4022 datasheet.
- For more detailed information than is contained in this user guide, refer to the CT4022 datasheet.

## DESCRIPTION

- The CT4022 is a highly linear, XtremeSense™ TMR-based current sensor.
- The tunneling-magnetoresistance (TMR) sensor is differential, which enables common-mode field rejection to cancel out stray magnetic fields.
- The primary conductor is only 0.5 mΩ, which enables the sensor to withstand high inrush current and to minimize power loss.
- The current applied to the pin of the primary conductor generates an internal differential magnetic field.
- The TMR sensor provides a proportional voltage to the differential magnetic field and simultaneously rejects common-mode stray magnetic fields.
- The pins of the primary conductive path and the sensor leads are galvanically isolated.
- This enables high-side current sensing without the need for additional isolation techniques.

## FEATURES

- Optimized for high dV/dt applications
- 500 kHz bandwidth
- Common-mode field rejection
- 0.5 mΩ primary conductor resistance

- Ratiometric output from supply voltage

### EVALUATION BOARD CONTENTS

- CT4022 evaluation board

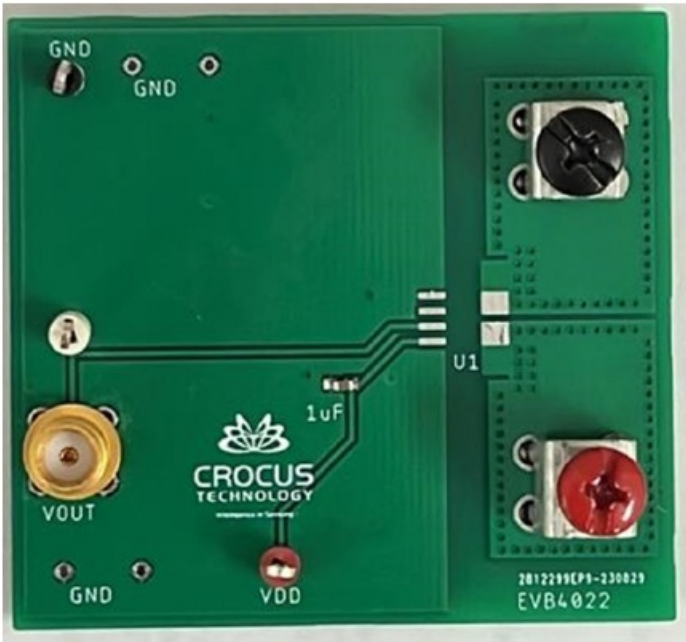


Figure 1: CT4022 Evaluation Board

Table 1: CT4022 Evaluation Board Configurations

Configuration Name	Part Number
CT4022-20AC Evaluation Board	CT4022-H20BSN8
CT4022-50AC Evaluation Board	CT4022-H50BSN8

### General Specifications

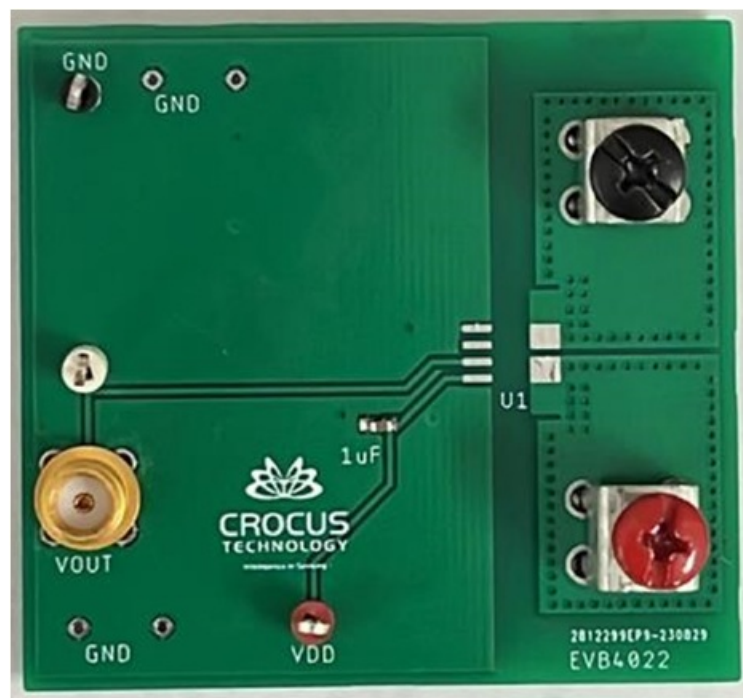
Table 2: General Specifications

Specification	Min	Typ	Max	Units
Supply Voltage Range	3	3.3 or 5	5	V
Supply Current Range	–65	–	65	A
Input Operating Temperature	–40	–	125	°C
<b>CT4022-H20BSN8 Variant</b>				
Input Operating Current	–20	–	20	A
<b>CT4022-H50BSN8 Variant</b>				
Input Operating Current	–50	–	50	A

## USING THE EVALUATION BOARD

### Introduction

- This section provides an overview of the connections and configuration options of the CTD4022 evaluation board.
- The proper configuration is shown in Figure 2 and is detailed in the sections that follow.
- Detailed information about the use and functionality of each pin and detailed specifications about the sensor are provided in the CT4022 datasheet.
- For more detailed information than is contained in this user guide, refer to the CT4022 datasheet.



**Figure 2: EVB4022 Evaluation Board**

### Power Input and Board Configuration

- Connect a current supply to the two terminal screws and ensure that the current does not exceed 65 A or reduce to less than  $-65$  A.
- Attach a voltage source to VDD and GND that does not exceed 6 V (typically 3.3 V or 5 V). Attach an SMA connector to VOUT to read the output voltage based on the input current.
- The sensor provides a continuous linear analog output voltage that represents the current measurement.
- The output voltage range of OUT is from 10% VCC to 90% VCC with a VOQ of 10% of VCC and 50% of VCC for unidirectional and bidirectional currents, respectively.

## Power-On Time

- Power-on time of 200  $\mu$ s is the amount of time required by CT4022 to start up, fully power the chip, and become fully operational from the moment the supply voltage is applied.
- This time includes the ramp-up time and the settling time (within 10% of steady-state voltage under an applied magnetic field) after the power supply has reached the minimum VCC.

## SCHEMATIC

- The schematic of the CT4022 evaluation board is shown in Figure 3.

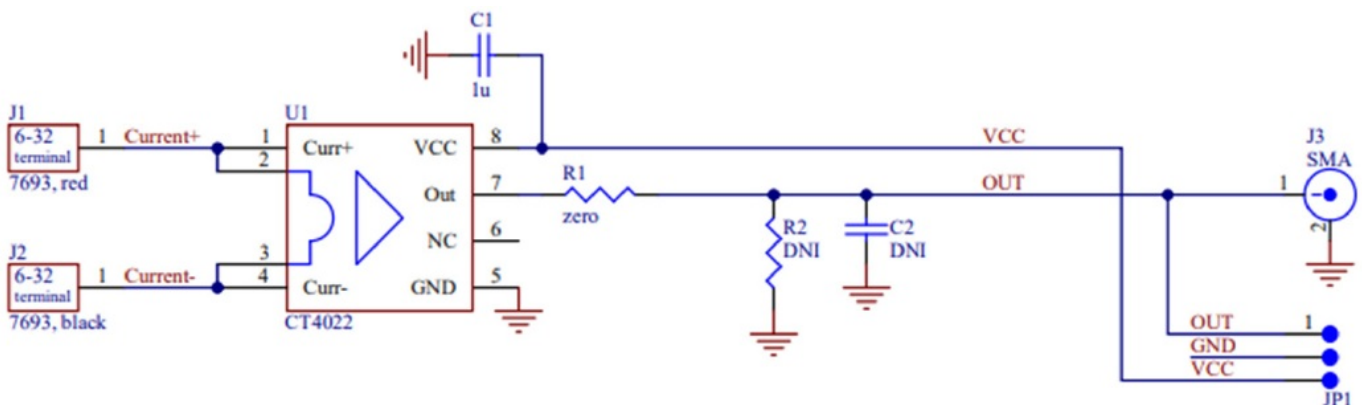


Figure 3: CT4022 Evaluation Board Schematic

## LAYOUT

- The top and bottom layers of the CT4022 evaluation board are shown in Figure 4 and Figure 5, respectively.

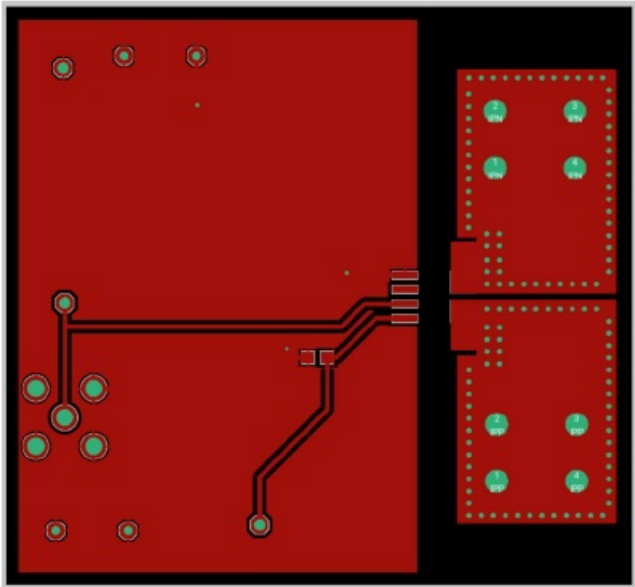


Figure 4: Top Layer

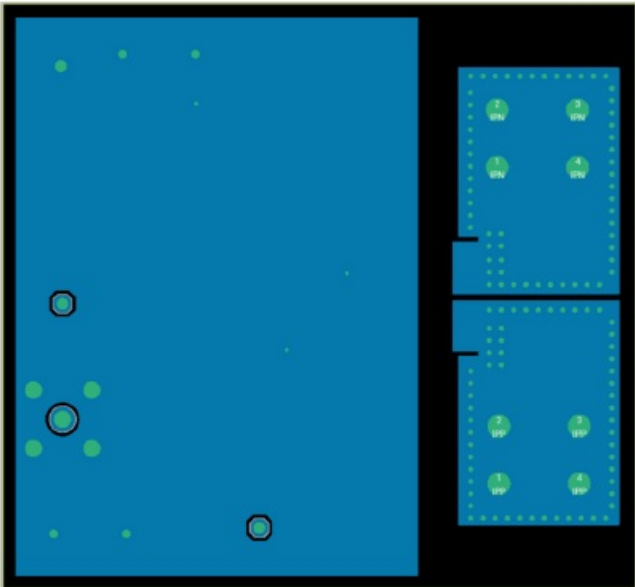


Figure 5: Bottom Layer

**BILL OF MATERIALS**

Table 3: Evaluation Board Bill of Materials

ELECTRICAL COMPONENTS				
Designator	Quantity	Description	Manufacturer	Manufacturer Part Number
PCB	1	CTD4022 evaluation board	Allegro MicroSystems	—
U\$2	1	CT4022 sensor	Allegro MicroSystems	—
JP3	3	Male header connectors	Wurth Elektronik	61300111121
C1	1	Capacitor, ceramic, 1 $\mu$ F, 25 V, 10% X7R 4803	TDK	MSAST168SB7105KTNA01
VOUT	1	SMA connector	Samtec	SAM8971-ND
C1	1	Capacitor, ceramic, 1 $\mu$ F, 25 V, 10% X7R 0603	TDK	MSAST168SB7105KTNA01
—	2	Connector heads	TE Connectivity	225693-E225693-E
—	2	M3 $\times$ 6 mm metal screws for connector heads	UXCell	a15120300ux0251

## RELATED LINKS

- CT4022 product page: <https://www.allegromicro.com/en/products/sense/current-sensor-ics/sip-package-zero-to-thousand-amp-sensor-ics/ct4022>

## APPLICATION SUPPORT

- For samples or application support contact, visit <https://www.allegromicro.com/en/about-allegro/contact-us/technical-assistance> and navigate to the appropriate region.

## Revision History

Number	Date	Description
—	November 13, 2024	Initial release

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## CONTACT

- Allegro MicroSystems
- 955 Perimeter Road
- Manchester, NH 03103-3353 U.S.A.
- [www.allegromicro.com](http://www.allegromicro.com)

## FAQ

- **Where can I find more information about the CT4022 product?**
  - You can find more information about the CT4022 product.
- **How can I get samples or application support?**
  - For samples or application support, visit Allegro and navigate to the appropriate region.

## Documents / Resources

	<a href="#">ALLEGRO CT4022 Evaluation Board [pdf] User Guide</a> CT4022 Evaluation Board, CT4022, Evaluation Board, Board
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## References

- [User Manual](#)

[Manuals+](#), [Privacy Policy](#)

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