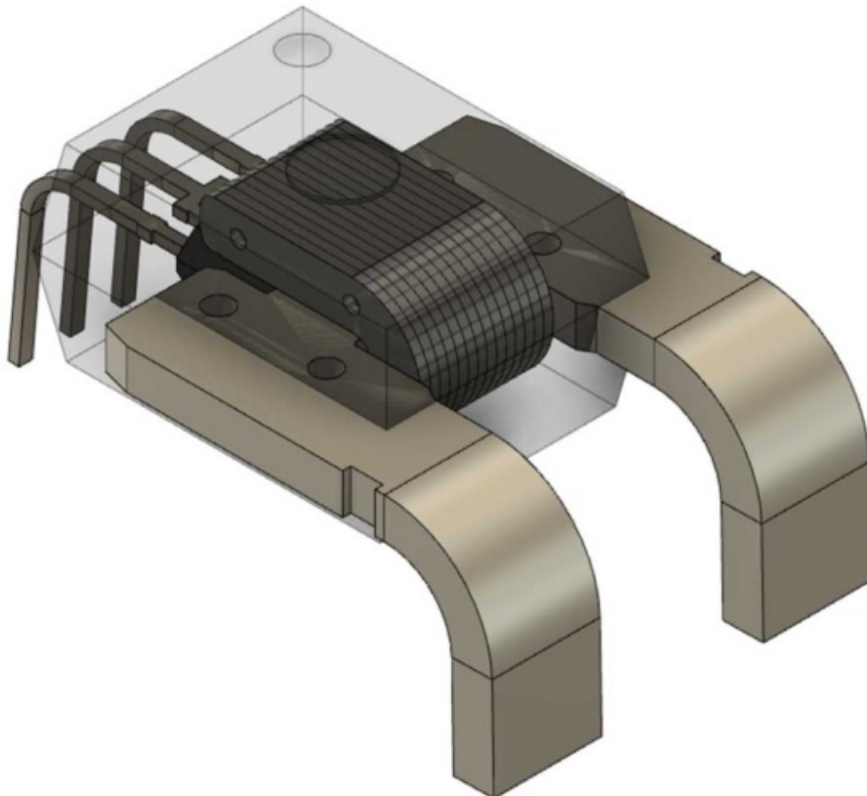


## ALLEGRO micro Systems CT428-50AC Xtreme Sense Isolated Current Sensor User Guide

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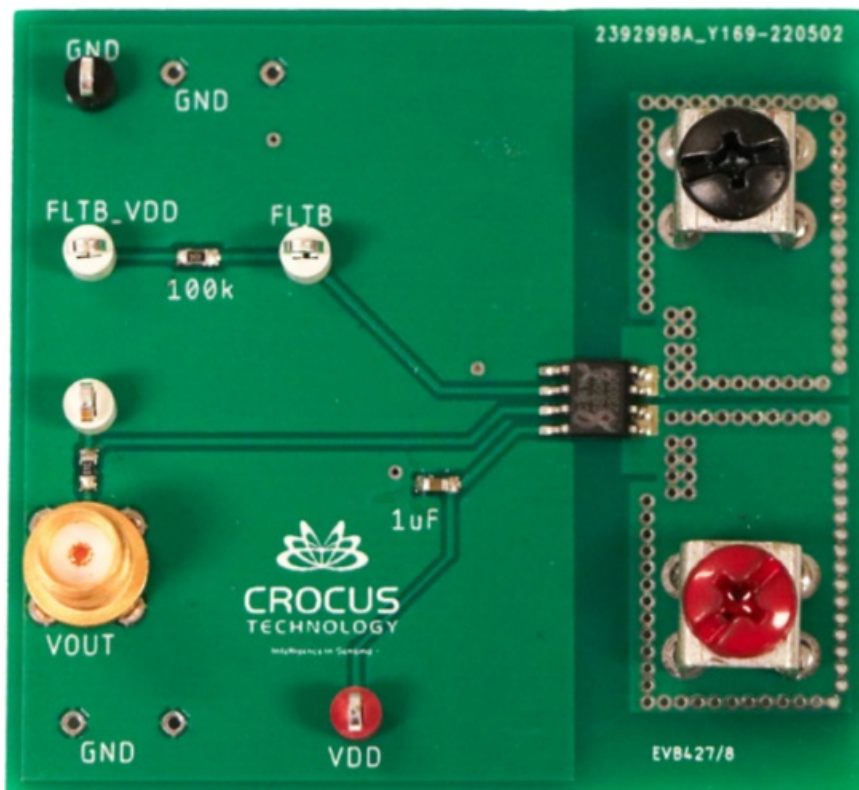


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## DESCRIPTION

The Allegro Micro Systems CTD428-50AC evaluation board contains the CT428—Xtreme Sense™ tunnel magnetoresistance (TMR) integrated circuit (IC). This user guide describes the operation and use of the evaluation board as an engineering tool for evaluating the CT428 IC performance in application.



**Figure 1:** CT428-50AC Evaluation Board

## FEATURES

- Integrated current-carrying conductor

- Linear analog output voltage
- Response time: ~300 ns
- Low noise
- Filter function to reduce noise on output pin
- Immunity to common mode fields: –54 dB
- Overcurrent detection
- Supply voltage: 3 V to 3.6 V

EVALUATION BOARD CONTENTS

- CT428-50AC evaluation board

Table 1: CT428-50AC Evaluation Board Configurations

Configuration Name	Part Number	Sensitivity	Band width
CT428-50AC Evaluation Board	CTD428-HSN850MR	50 mV/V	1 MHz

Table 2: General Specifications

Specification	Min	Nom	Max	Units
Input Operating Temperature	–40	–	125	°C
Input Operating Current	–20	–	20	A

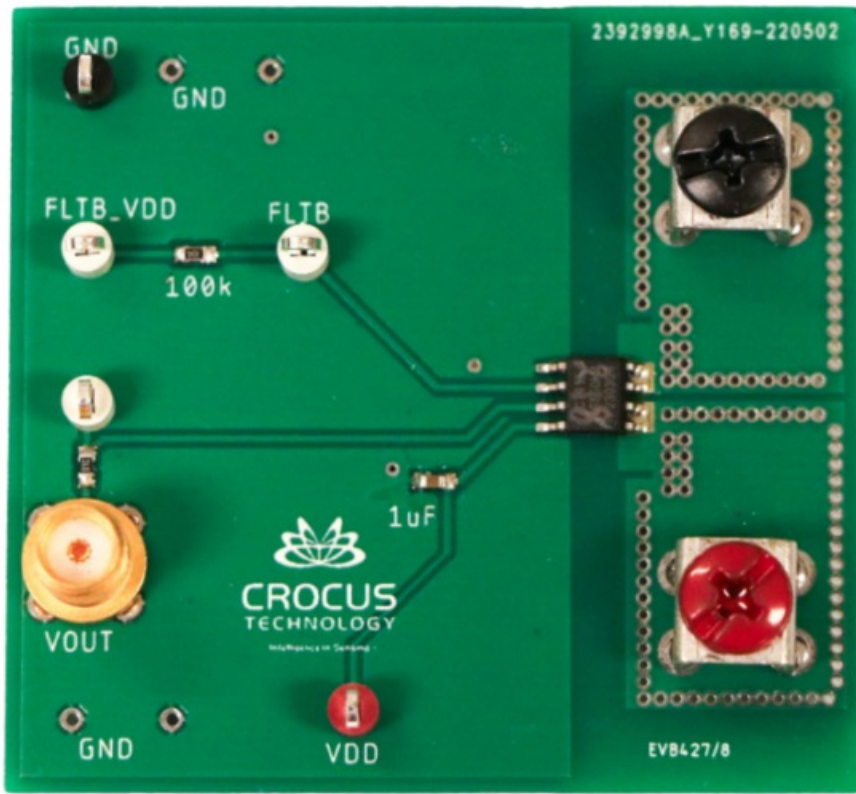
USING THE EVALUATION BOARD

Introduction

The CT428 is a high-bandwidth and ultra-low-noise integrated contact current sensor that uses Allegro-patented XtremeSense™ TMR technology to enable high-accuracy current measurements for many consumer, enterprise, and industrial applications. The device supports eight current ranges where the integrated current-carrying conductor (CCC) handles up to 65 A of current and generates a current measurement as a linear analog output voltage. The device achieves a total output error of less than ±1% full-scale (FS).The device has a 300 ns output response time when the current consumption is ~6 mA, and it is immune to common-mode fields. The CT428 has an integrated overcurrent detection (OCD) circuit to identify out-of-range currents (OCD), and the result is output to the fault bar (FLT) pin.

The FLT is an open-drain, active-low digital signal that is activated by the CT428 to alert the microcontroller that a fault condition has occurred. The CT428 is offered in an industry-standard 8-lead small-outline integrated circuit (SOIC) package that is green and Restriction of Hazardous Substances (RoHS) compliant.

This section provides an overview of the connections and configuration options of the CT428 evaluation board. The proper configuration is highlighted and detailed in **Figure 2**. The CT428 datasheet contains detailed information about the use and functionality of each pin and detailed specifications about the sensor. For more detailed information, refer to the product datasheet.



**Figure 2:** CT428-50AC Evaluation Board

## Power Input

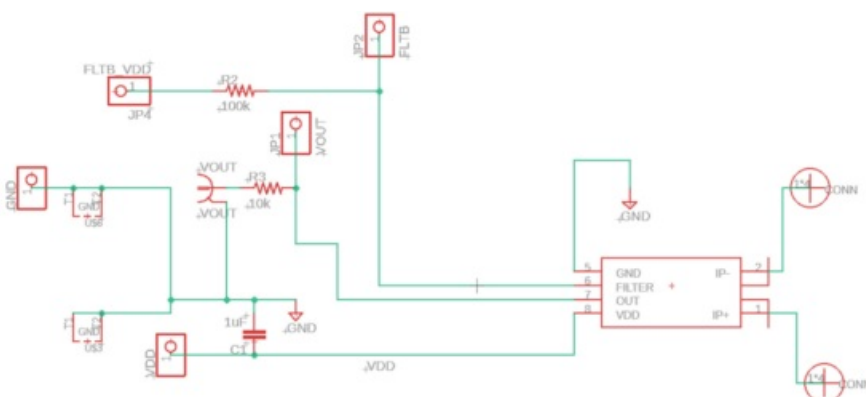
The two large connectors (with screws) are used to connect and drive the external current to be measured. Due to the PCB trace thermal limitation of the CT428 evaluation board, do not exceed 50 APK.

## Board Configuration

A fully assembled evaluation board is illustrated in Figure 1 and Figure 2. The current to be measured is connected to the screw connectors located on the right side of the PCB. These connectors are galvanically isolated from the rest of the PCB. The CT428 can be biased by applying a 3.3 V bias voltage between the VDD and GND pins on the PCB and its output can be measured either from the VOUT SMA connector or the VOUT header pin on the PCB.

## SCHEMATIC

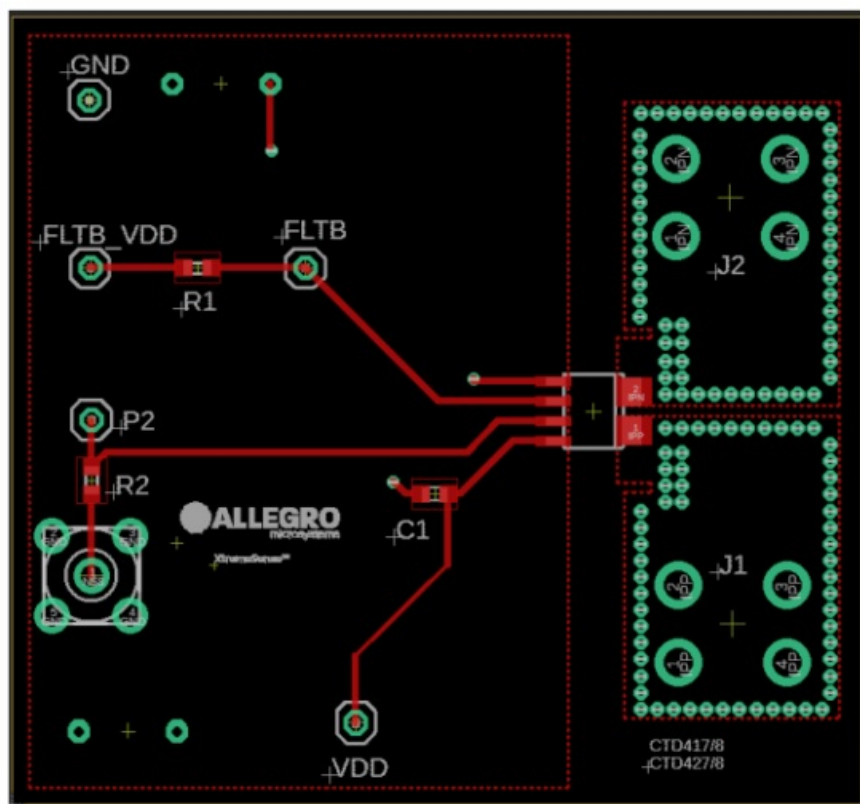
The schematic of the CT428-50AC evaluation board is shown in **Figure 3**.



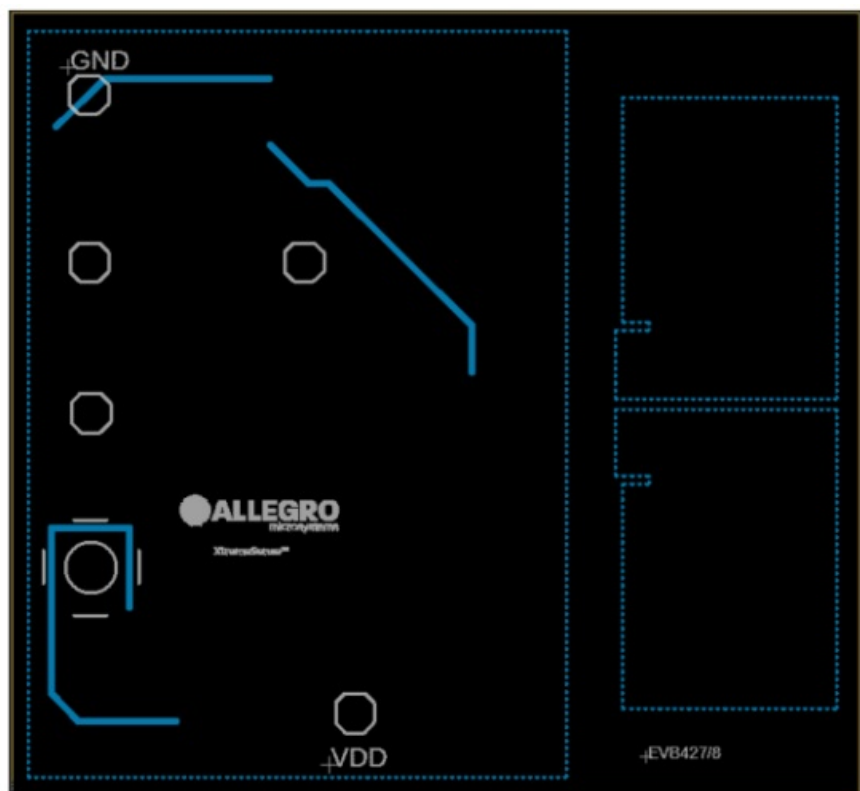
**Figure 3:** CT428-50AC Evaluation Board Schematic

## LAYOUT

The top and bottom layers of the CT428-50AC evaluation board are shown in **Figure 4** and **Figure 5**, respectively.



**Figure 4:** Top Layer



**Figure 5:** Bottom Layer

**BILL OF MATERIALS**

Designator	Quantity	Description	Manufacturer	Manufacturer Part Number
PCB	1	CT428-50AC evaluation board	Allegro Micro Systems	—
U1	1	CT428 sensor	Allegro Micro Systems	—
C1	1	1.0 $\mu$ F, X5R or better SMD Capacitor 0603	TDK	CGA3E1X7R1E105K080AC
R2	1	10 k $\Omega$ , $\pm$ 10% or better SMD Resistor 0603	Panasonic, AVX, Yageo	ERJ-3GEYJ103V
R1	1	100 k $\Omega$ , $\pm$ 10% or better SMD Resistor 0603	Yageo	RC0603FR-07100KL
Vout	1	SMA Connector	Clinch Connectivity	142-0701-201
J1, J2	2	Screw Connectors	Key stone, Block master	534-7701
J2	1	M3 Terminal Screw Red	Key stone	36-7701-2
J1	1	M3 Terminal Screw Black	Key stone	36-7701-3
GND, FLT B_VDD, FLT B_VDD, P2	5	Male Header Connectors – Single pin	Würth Elektronik	732-5334-ND

**RELATED LINKS**

CT428 product page:  
<https://www.allegromicro.com/en/products/sense/current-sensor-ics/zero-to-fifty-amp-integrated-conductor-sensor-ics/ct425-6-7-8>  
For samples or applications 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
—	June 7, 2024	Initial release
1	August 7, 2024	Updated evaluation board images (pages 1 – 4) and BOM (page 5)

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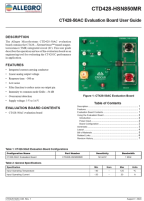
## Customer Support

Allegro Micro Systems 955 Perimeter Road Manchester, NH 03103-3353 U.S.A.

[www.allegromicro.com](http://www.allegromicro.com)



## Documents / Resources

	<p><a href="#">ALLEGRO micro Systems CT428-50AC Xtreme Sense Isolated Current Sensor</a> [pdf] User Guide</p> <p>CT428-50AC, CTD428-HSN850MR, CT428-50AC Xtreme Sense Isolated Current Sensor, CT428-50AC, Xtreme Sense Isolated Current Sensor, Sense Isolated Current Sensor, Isolated Current Sensor, Current Sensor, Sensor</p>
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## References

- [User Manual](#)

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

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