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MICRO CTD455-BB-06B5
Evaluation Board

ALLEGRO MICRO CTD455-BB-06B5 Evaluation Board Owner's Manual

Contents

ALLEGRO MICRO CTD455-BB-06B5 Evaluation Board

Product Information

Specifications

- **Model:** CT455-A48B5-TS08
- **Type:** Evaluation Board

Description

The CT455-A48B5-TS08 Evaluation Board is designed to provide users with a platform to evaluate and test various functionalities.

Features

- **Feature** 1
- **Feature** 2
- **Feature** 3

Product Usage Instructions

Getting Started

1. Unbox the CT455-A48B5-TS08 Evaluation Board.
2. Connect the necessary cables and power source as instructed in the manual.
3. Power on the board following the provided guidelines.

Functionality Testing

Utilize the features of the board to test specific functionalities.

1. Perform Function A by following the steps outlined in the user guide.
2. Test Feature B by inputting the required parameters.
3. Evaluate Function C for its performance under different conditions.

Troubleshooting

- If you encounter any issues while using the board, refer to the troubleshooting section of the user manual for guidance.

Maintenance

- Ensure the board is kept in a clean and dust-free environment.
- Regularly check for any loose connections or signs of wear and tear.

Safety Precautions

- Always follow the safety guidelines provided in the user manual when operating the CT455-A48B5-TS08 Evaluation Board.

FAQ

Q: How do I update the firmware of the evaluation board?

A: Firmware update instructions can be found in the user manual.
Ensure to follow the steps carefully to avoid any errors.

Q: Can I use the board with external peripherals?

A: Yes, the board supports connectivity with external peripherals. Refer to the manual for compatibility and connection details.

DESCRIPTION

- The Allegro CTD455 evaluation board demonstrates the advantages of the CT455 high dV/dt optimized XtremeSense™ TMR coreless current sensor in enabling high-accuracy current measurements for many consumer, enterprise, and industrial applications.
- The device supports a ±6 mT magnetic field range where the CT455 senses and translates the magnetic field into a linear analog output voltage. The device achieves a total error output of less than ±1.0% over supply voltage and temperature after calibration.
- While the sensor is pre-programmed to compensate for gain and offset temperature drift, the ability to adjust offset and gain relaxes mechanical tolerances during sensor mounting. The device has less than 300 ns output response time, while the current consumption is approximately 6.0 mA. The CT455 is housed in a very low-profile, industry-standard 8-lead TSSOP package that is both green and RoHS compliant.

FEATURES

- **Preset magnetic field range:** ±6 mT
- **Low-noise** performance
- **Optimized** for high dV/dt applications
- **Linear analog** output voltage
- **Response time:** <300 ns
- **Supply voltage:** 5.0 V
- **Operating temperature:** –40°C to 125°C

Figure 1: CTD455-BB-06B5 Evaluation Board

Table 1: CTD455-BB-06B5 Evaluation Board Configurations

Configuration Name	Part Number	Output Voltage Range	Bandwidth
CTD455-BB-06B5	CT455-A48B5-TS08	0.50 to 4.50 V	1 MHz

Table 2: General Specifications

Specification	Min.	Nom.	Max.	Units
Input Operating Temperature	–40	–	125	°C
Input Operating Voltage	4.75	5.0	5.50	V

USING THE EVALUATION BOARD

- This section provides an overview of the connections and configuration options of the CTD455-BB-06B5 evaluation board. Figure 2 highlights the proper configuration.
- The CT455 datasheet contains detailed information on the use and functionality of each pin, and detailed specifications about the sensor, and should be consulted for more information than is contained in this user guide.

Figure 2: CTD455-BB-06B5 Evaluation Board with Busbar

Power Input and Board Configuration

- When current is flowing through a busbar above or below the CT455, the XtremeSense TMR sensor inside the chip senses the field which in turn generates a differential voltage signal that then goes through the Analog Front-End (AFE) to output a current measure-ment as low as ±1.0% full-scale total output error (EOUT).
- The chip is designed to enable a fast response time of 300 ns for the current measurement from the OUT pin as the bandwidth for the CT455 is 1.0 MHz. Even with a high bandwidth, the chip consumes a minimal amount of power.

Power-On Time

- Power-On Time of 100 μs is the amount of time required by CT455 to start up, fully power the chip, and become fully operational from the moment the supply voltage is greater than the UVLO voltage.
- 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.

Response Time

- Response Time of 300 ns for the CT455 is the time interval between the following terms: when the primary current signal reaches 90% of its final value, and when the chip reaches 90% of its output corresponding to the applied current.

SCHEMATIC

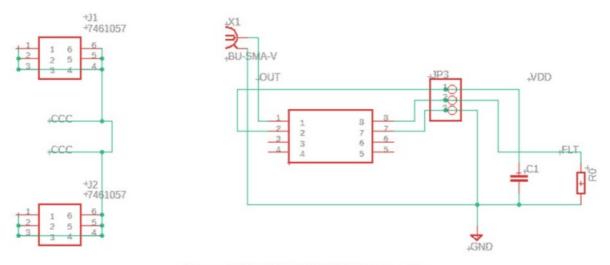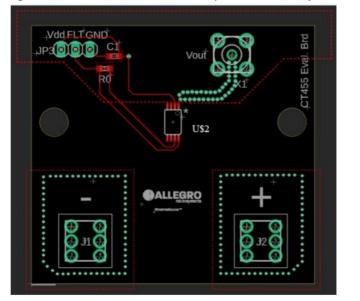Figure 3 below shows the schematic of the CTD455-BB-06B5 evaluation board.

Figure 3: CTD455-BB-06B5 Schematic

LAYOUT

Figures 4 and 5 below show the top and bottom layers of the CTD455-BB-06B5 evaluation board.
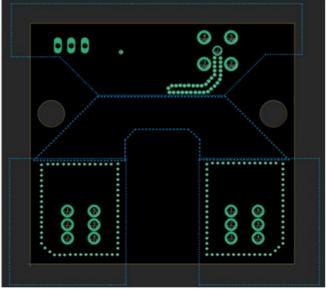

Figure 4: CTD455-BB-06B5 Top Layer

Figure 5: CTD455-BB-06B5 Bottom Layer

Bill of Materials

Table 3: CTD455-BB-06B5 Bill of Materials

Designator	Quantity	Description	Manufacturer	Manufacturer Part Number
ELECTRICAL COMPONENTS				
PCB	1	CTD455-BB-06B5 Evaluation Board	Allegro MicroSystems	–
U$2	1	CT455 Sensor	Allegro MicroSystems	–
JP3	4	Male Header Connectors	Samtec	TSW-103-07-F-S
C1	1	Capacitor, Ceramic, 1.0 µF, 25 V, 10% X7R 0603	TDK	MSAST168SB7105KTNA01
VOUT	1	SMA Connector	Samtec	SAM8971-ND
R0	1	Resistor, 0 Ω	Yageo	RC1206FR-130RL
OTHER COMPONENTS				
–	1	Busbar (1/2" width, 1/16" thick)	–	–
–	2	Connector Heads	TE Connectivity	225693-E225693-E
–	2	M3x6mm Metal Screws for Connector Heads	UXCell	a15120300ux0251
–	2	Plastic High-Temperature Screws for Busbar	Misumi	SPS-M5X15-C
–	2	Plastic High-Temperature Nuts for Busbar	Misumi	SPS-M5-N
–	2	Plastic High-Temperature Washers for Busbar	Misumi	SPS-6-W

RELATED LINKS

CT455 Product Page: **https://www.allegromicro.com/en/products/sense/current-sensor-ics/sip-package-zero-to-thousand-amp-sensor-ics/ct455**

Revision History

Number	Date	Description
–	May 23, 2024	Initial release

- **Manchester, NH 03103-3353 U.S.A.** www.allegromicro.com

Documents / Resources

[ALLEGRO MICRO CTD455-BB-06B5 Evaluation Board](#) [pdf] Owner's Manual
CT455-A48B5-TS08, CTD455-BB-06B5, CTD455-BB-06B5 Evaluation Board, CTD455-BB-06B5, Evaluation Board, Board

References

- **User Manual**