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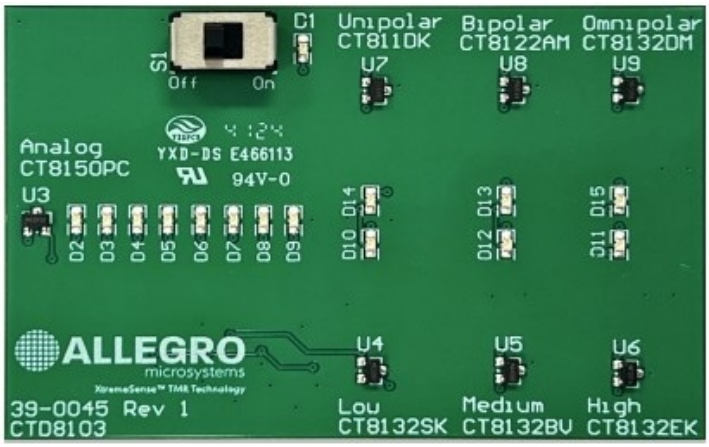
ALLEGRO CT813X Sensor Evaluation Board



DESCRIPTION

The CTD8103 evaluation board is designed to test the functionality of the CT813x sensor family. For more information on each sensor, refer to the CT8132 data sheet. The CT813x series of omnipolar tunnel magnetoresistance (TMR) digital switches are designed for consumer and industrial applications. The devices are based on Allegro patented XtremeSense™ TMR technology with integrated CMOS process to provide a monolithic solution for superior sensing performance. The CT813x digital switches offer stable magnetic operation over the operating temperature range. This product family has very low power consumption—as low as 110 nA—which is ideal for battery-operated products where minimal current consumption is required. The devices support magnetic fields down to 9 G for applications where there is a large air gap requirement.

FEATURES

- Sensitivity with BOP range: 9 to 70 G
- Ultra-low power consumption: ~110 nA @ VDD = 1.8 V and fS = 2 Hz
- Sensor polarity: omnipolar, bipolar, unipolar

EVALUATION BOARD CONTENTS

CTD8103 Evaluation Board

Table 1: CTD8103 Evaluation Board Configurations

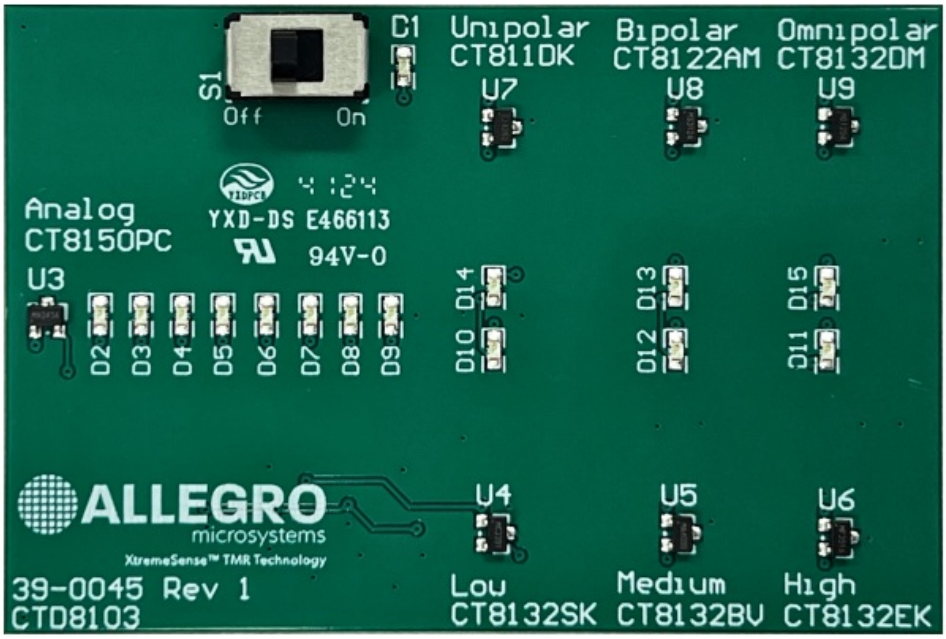
Configuration Name	Part Number
CTD8103	CT8132SK-IS3
	CT8132BV-IS3
	CT8132EK-IS3
	CT8132DM-IS3
	CT8111DK-IS3
	CT8122AN-IS3
	CT8150PC-IS3

General Specifications

Specification	Min	Nom	Max	Units
Supply Voltage Range	1.7	3.3	5.5	V
Output Voltage Range	0	–	5.5	V
Outout Current	–3.0	–	3.0	mA
Bypass Capacitor	–	1.0	–	µF
Operating Magnetic Flux	–450	–	450	G
Operating Temperature	–40	25	85	°C

USING THE EVALUATION BOARD

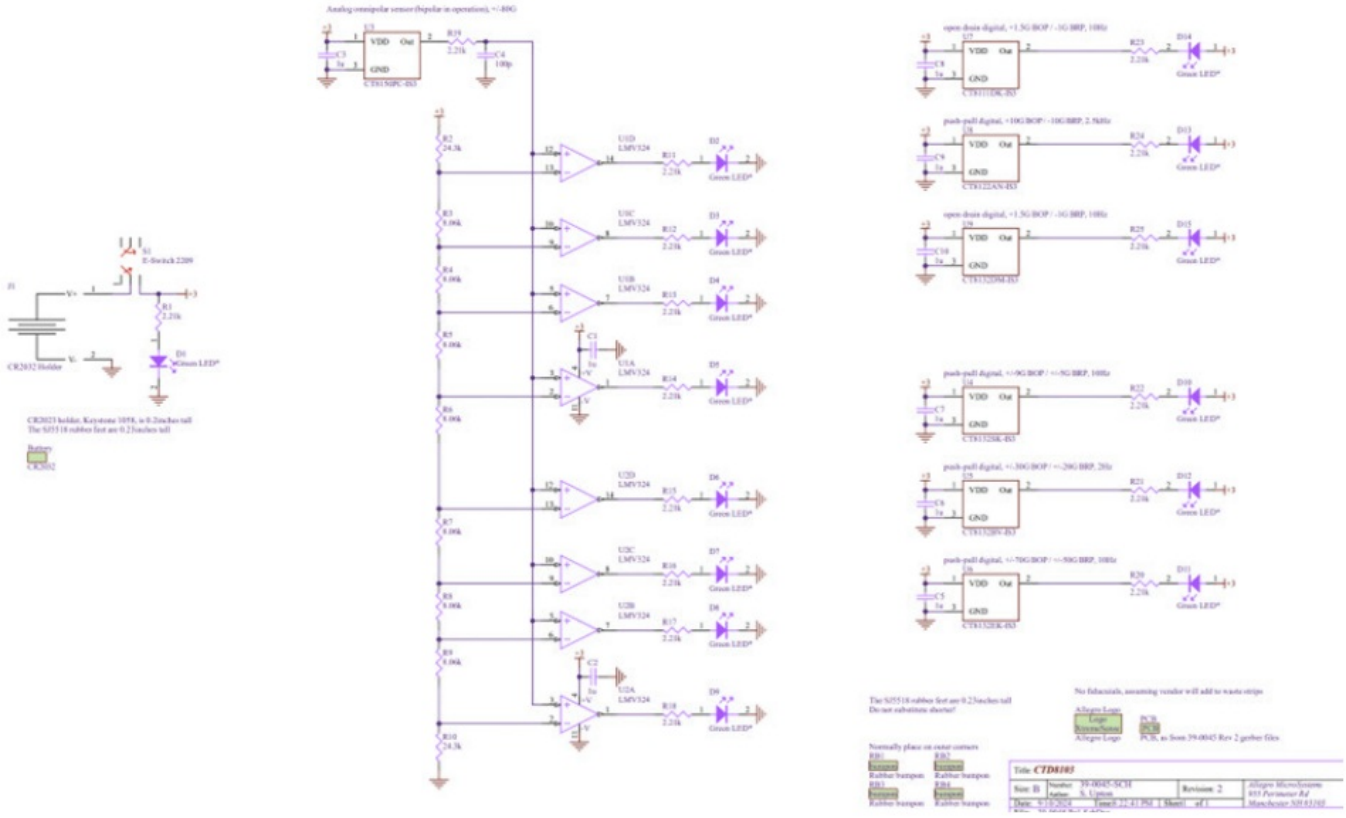
This section provides an overview of the connections and configuration options of the EVB8103 Evaluation Board evaluation board. Figure 2 highlights the proper configuration and is detailed below. The CT81xx and CT815x datasheets each contain detailed infor-mation on the use and functionality of each pin, as well as detailed specifications about the sensor, and should be consulted for more detailed information than is contained in this user guide.



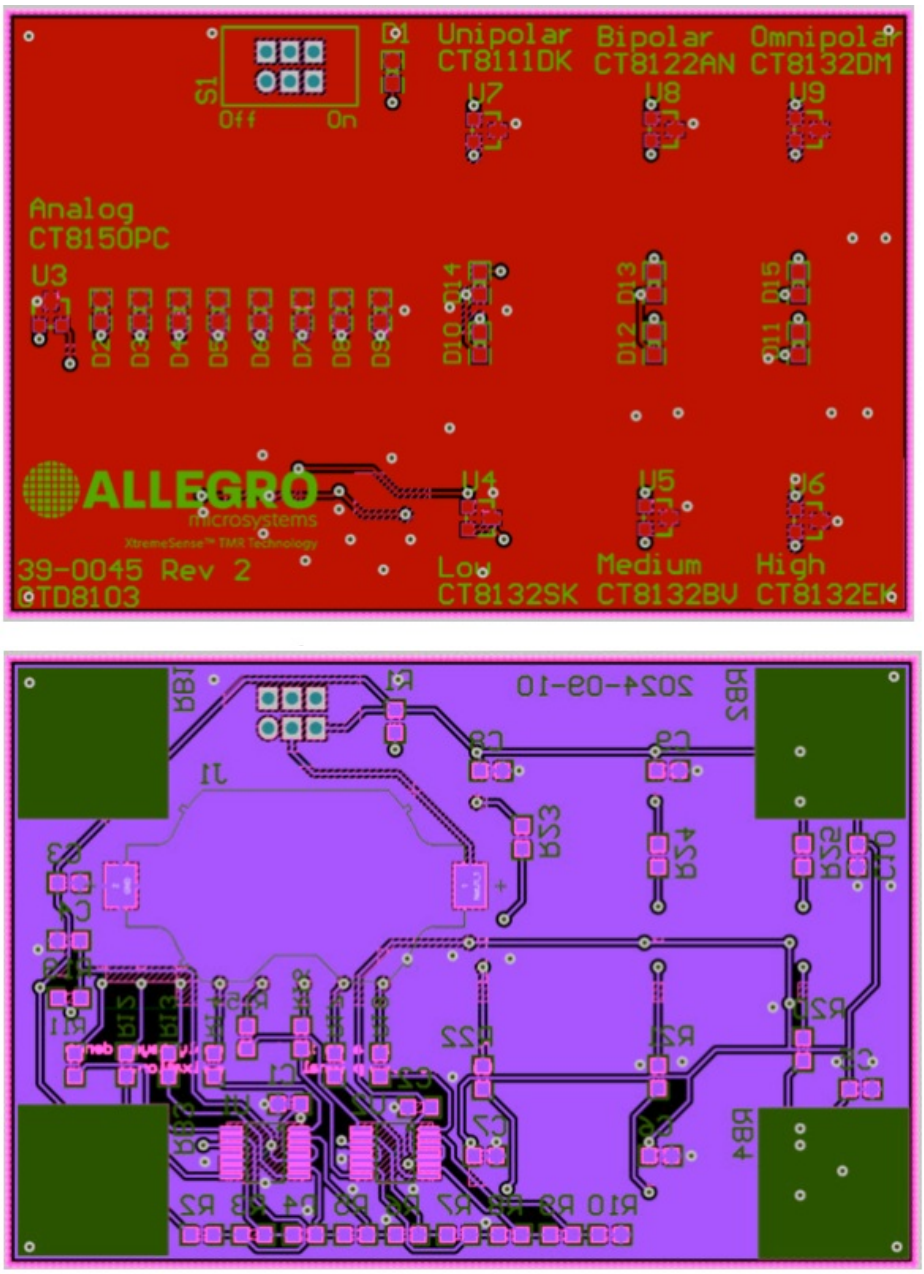
Power Input and Board Configuration

First, turn the switch on to power on the board. Make sure the battery is in place. Once the switch is on, the sensors are responsive to magnetic fields and indicate their powered state by flashing the LEDs on the board. Holding a magnet to each sensor activates the cor-responding LED. For the unipolar sensor, a magnet held in front of the sensor turns on the LED, and removing the magnet turns off the LED. For the bipolar sensor, holding a magnet in front of the sensor or behind the sensor turns on the LED. For the omnipolar switch, holding a magnet in front of the sensor turns on the LED, and holding a magnet behind the sensor turns off the LED. This board is designed to test and compare the functionalities of each sensor.

SCHEMATIC



LAYOUT



BILL OF MATERIALS

Table 3: CTD8103 Evaluation Board Bill of Materials

ELECTRICAL COMPONENTS				
Designator	**Quantity**	**Description**	**Manufacturer**	**Manufacturer Part Number**
PCB	1	CTD8103 PCB	Allegro MicroSystems	–
U1, U2	2	LMV324, IC, TSSOP14, quad op-amp	Texas Instruments	LMV324 IC
U3	1	CT8150PC-IS3	Allegro MicroSystems	–
U4	1	CT8132SK-IS3	Allegro MicroSystems	–
U5	1	CT8132BV-IS3	Allegro MicroSystems	–
U6	1	CT8132EK-IS3	Allegro MicroSystems	–
U7	1	CT8111DK-IS3	Allegro MicroSystems	–
U8	1	CT8122AN-IS3	Allegro MicroSystems	–
U9	1	CT8132DM-IS3	Allegro MicroSystems	–
S1	1	Switch Slide DPDT 100 mA 12 V	E-Switch	EG2209
Battery	1	CR2032 battery 3 V	Panasonic - BSG	CR2032
C1, C2, C3, C5, C6, C7, C8, C9, C10	9	1 µF Capacitor, 0603, monolythic, X7R	Kemet	C0603X105K4RACAUTO7411
C4	1	100 pF Capacitor, 0603, monolythic, C0G, 50 V	Kemet	C0603C101J5GAC7411
D1–15	15	LED, 0603, 2.65 V, green, 50mcd at 2 mA	Kingbright	APHD1608LCGCK
R1, R11–25	16	2.21 kΩ Resistor, 0603, 100 mW, thick film, 1%	Panasonic	ERJ3EKF2211V
R2, R10	2	24.3 kΩ Resistor, 0603, 100 mW, thick film, 1%	Yageo	RC0603FR-1024K3L
R3–9	7	8.06 kΩ Resistor, 0603, 100 mW, thick film, 1%	Vishay	RCA06038K06FKEA
OTHER COMPONENTS				
Designator	**Quantity**	**Description**	**Manufacturer**	**Manufacturer Part Number**
J1	1	CR2032 Battery Holder	Adam Tech	BH-25E-1
RB1, RB2, RB3, RB4	4	Bumpon, rubber, 0.5 inch square, black	3M	SJ5012-0-ND

RELATED LINKS

https://www.allegromicro.com/en/products/sense/switches-and-latches/micropower-switches-latches/ct811-2-3

Revision History

Number	Date	Description
–	December 12, 2024	Initial release

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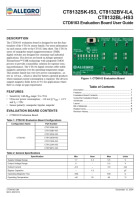
Allegro MicroSystems 955 Perimeter Road
Manchester, NH 03103-3353 U.S.A. www.allegromicro.com

FAQ

- **Q: Where can I find more detailed information about the sensor?**
  A: Detailed information about the sensor can be found in the CT81xx and CT815x datasheets. These documents contain comprehensive details on pin functionalities, specifications, and usage guidelines.
- **Q: What is the recommended operating temperature for the evaluation board?**
  A: The recommended operating temperature is specified in the general specifications section. Ensure that the board operates within this temperature range for optimal performance.

Documents / Resources

	ALLEGRO CT813X Sensor Evaluation Board [pdf] User Guide CT8132SK-IS3, CT8132BV-IL4, CT8132BL-HS3, CT813X Sensor Evaluation Board, CT813X, Sensor Evaluation Board, Evaluation Board

References

- User Manual

ALLEGRO

ALLEGRO, CT8132BL-HS3, CT8132BV-IL4, CT8132SK-IS3, CT813X, CT813X Sensor Evaluation Board, Evaluation Board, Sensor Evaluation Board

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