CTD310LS-AT8

CT310 Evaluation Board User Guide

DESCRIPTION

The CT310 is a 2D angle sensor in a dual full-bridge configuration from Allegro developed on its patented XtremeSense™ 2D tunnel magnetoresistance (TMR) technology. The operating magnetic field for this 2D sensor is 250 to 900 G and has an angle error of less than 0.6° over temperature following a one-time offset, gain, and phase compensation. The sensitive axes of the TMR elements are orthogonal to each other, providing a 90° phase separation between the sine and cosine outputs when measured differentially. This phase separation is inherently independent of magnet pole spacing and air gap. The CT310 is available in an 8-lead think-shrink small-outline package (TSSOP) and, for space-critical applications, a low-profile, small-form-factor 8-lead dual-flat no-lead (DFN) package that is 2 mm × 2 mm × 0.45 mm in size. The packages are RoHS compliant and lead (Pb) free with a 100% matte tin-plated leadframe.

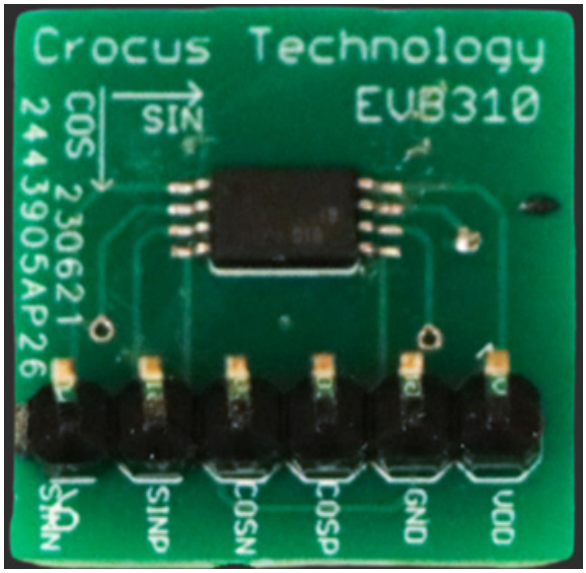


Figure 1: CT310 Evaluation Board

FEATURES

- Angle error of less than 0.6° (after one-time compensation) over full temperature range
- Dual full-bridge resistor network
- Operating magnetic field: 250 to 900 G
- Differential outputs for SIN and COS axes
- Supply voltage: 1 to 5.5 V
- AEC-Q100 Grade 1

EVALUATION BOARD CONTENTS

- CT310 evaluation board

Table of Contents

Table 1: CT310 Evaluation Board Configurations

Configuration Name	Part Number
CT310 Evaluation Board	CTD310LS-AT8

Table 2: General Specifications

Specification	Min	Nom	Max	Units
Input Operating Voltage	1	–	5.5	V
Input Operating Temperature	–40	25	125	ºC
Input Operating Magnetic Field	25	60	90	mT

USING THE EVALUATION BOARD

Introduction

This section provides an overview of the connections and configuration options of the CT310 evaluation board. Each group of connections highlighted in Figure 2 is detailed in the sections that follow. The CT310 datasheet contains detailed information about the use and functionality of each pin and should be consulted for more detailed information than is contained in this user guide.

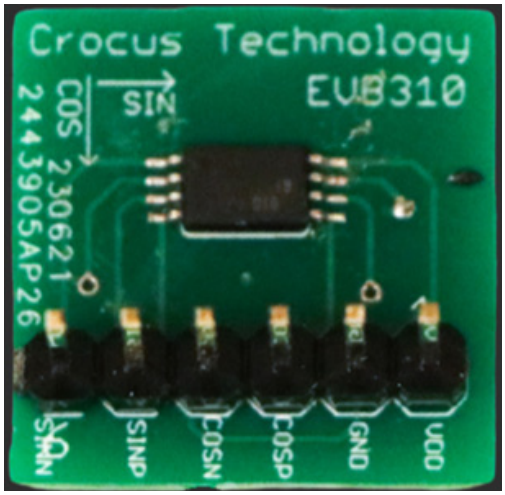
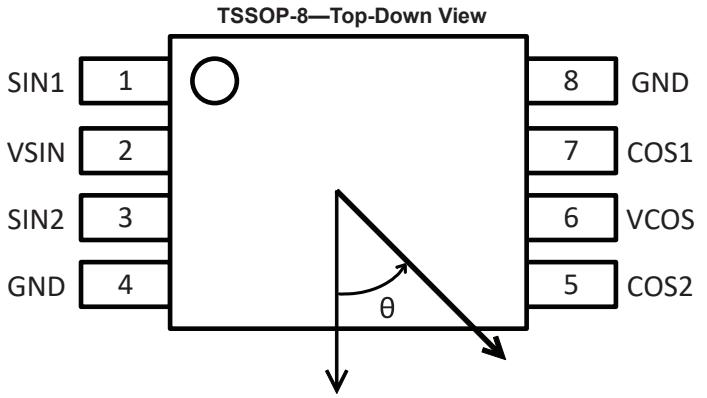


Figure 2: CT310 Evaluation Board



Terminal List

Number	Name	Function
1	SIN1 [1]	Differential output #1 for sine
2	VSIN	Supply voltage for sine
3	SIN2 [1]	Differential output #2 for sine
4	GND	Ground for sine
5	COS2 [2]	Differential output #2 for cosine
6	VCOS	Supply voltage for cosine
7	COS1 [2]	Differential output #1 for cosine
8	GND	Ground for cosine

[1] SIN2 – SIN1 = SIN
[2] COS2 – COS1 = COS

Figure 3: CT310 Pinout Structure

Power Input

Connect a power supply to the VSIN pin, the VCOS pin, and the two GND pins. Voltage that does not exceed 5.5 V_{DC} can be applied and measured. Measurement outputs are SIN1, SIN2, COS1, and COS2. The pinout structure is listed in Figure 3.

Board Configuration

The CTD310 is a simple evaluation board that breaks out each pin of the CT310, TMR 2D angle sensor, to enable the user to measure the signals of each pin on the board. This evaluation board may be connected via its pin connectors to the user's system board to allow for performance of *in situ* and full-system evaluations.

This sensor can detect the angle in magnetic fields ranging from 20 mT to 90 mT.

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www.allegromicro.com

SCHEMATIC

The schematic of the CT310 evaluation board is shown in Figure 3.

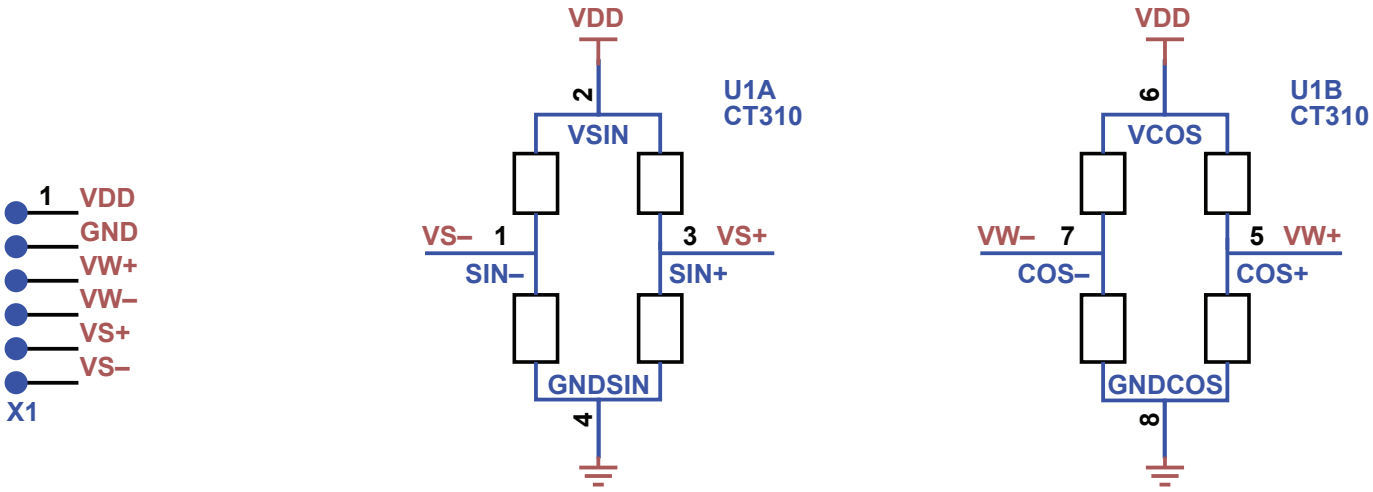

Figure 4: CT310 Evaluation Board Schematic

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LAYOUT

The top and bottom layers of the CT310 evaluation board are shown in Figure 4 and Figure 5, respectively.

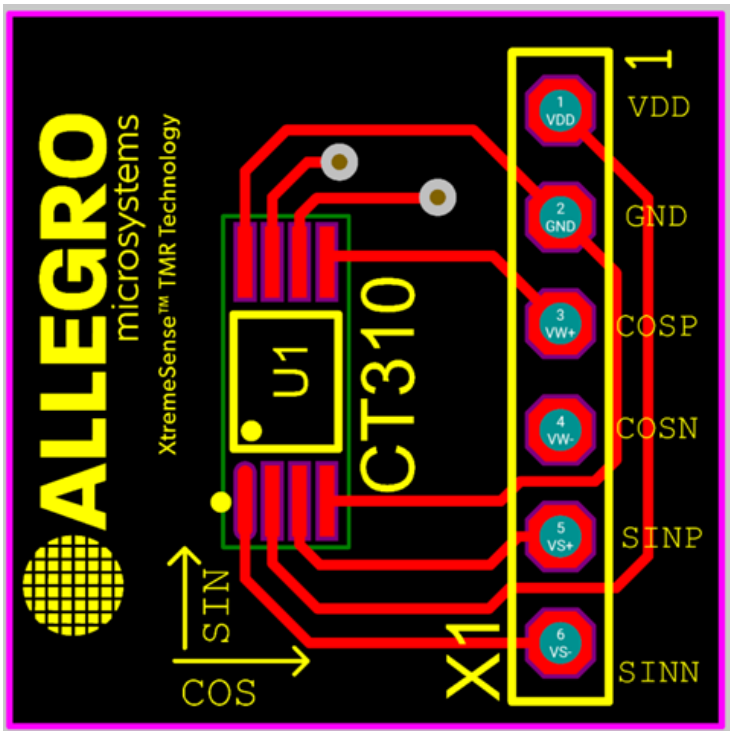

Figure 5: Top Layer

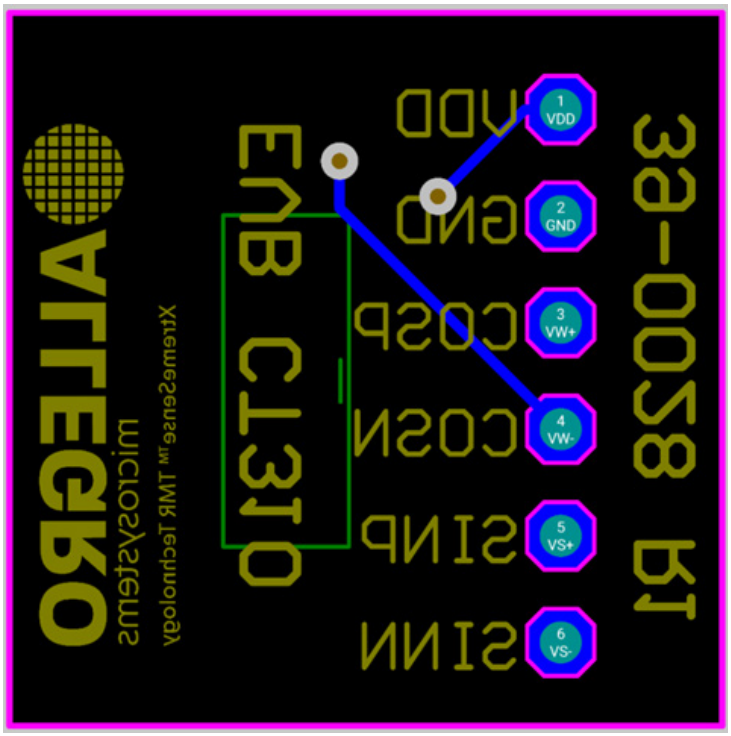

Figure 6: Bottom Layer

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BILL OF MATERIALS

Designator	Quantity	Description	Manufacturer	Manufacturer Part Number
PCB	1	CTD310 evaluation board	Allegro MicroSystems	–
U1	1	CT310LS-AT8 sensor	Allegro MicroSystems	–
X1	1	Male connector header through hole, right angle 6 position 0.100"	Sullins	PRPC006SBBN-M71RC

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RELATED LINKS

CT310 product page:

https://www.allegromicro.com/en/products/sense/linear-and-angular-position/angular-position-sensor-ics/CT310

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

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Revision History

Number	Date	Description
–	August 9, 2024	Initial release

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