Analog 1D Linear Demo

User Guide

DESCRIPTION

The Analog 1D Linear Demo is a multipurpose demonstration/evaluation board that can be used to evaluate Allegro's analog output 1D linear sensors, including:

- A1391, A1392, A1393, A1395
- A31010SEHALT-4, A31010SEHALT-10

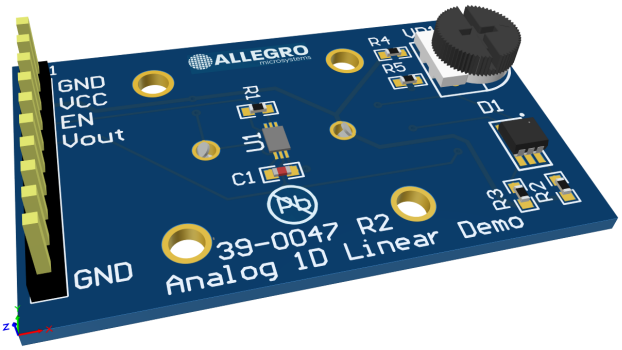

Figure 1: Analog 1D Linear Demo

USING THE EVALUATION BOARD

The Analog 1D Linear Demo may be used as a battery-powered demonstration aid or as a breakout board for evaluating the I/O of the Allegro 1D linear magnetic sensor. Integrated red and blue LEDs (D1) are used to show when the output has moved away from the quiescent (zero-field) voltage, representing a magnetic field applied to the Allegro sensor. The sensitivity of the LEDs are tunable with the variable resistor (VR1).

Battery-Powered Demonstration

The Analog 1D Linear Demo can be powered from a 3 V, CR1220 battery (not included), which can be installed on the back-side battery holder (B1, positive side away from the PCB).

Applying a magnetic field in the operational range of the Allegro sensor changes the output of the Allegro sensor (see product-specific datasheet for operational ranges). Moving the output voltage above the V_{REF+} threshold turns the red LED on, and moving the output voltage below the V_{REF-} threshold turns the blue LED on. V_{REF+} and V_{REF-} are adjustable using the variable resistor (VR1), useful if the LED sensitivity response is tuned too high or too low.

Note that out of the box, the enable signal is not connected to the supply voltage. If enable is needed for operational performance of the Allegro sensor, this can be supplied by shorting EN and VCC pins together, either on the JP1 pin header (pins 2 and 3) or by populating R1 with a 0 Ω resistor. Alternatively, enable can be controlled by applying the appropriate signal to the EN pin.

Breakout Evaluation

The Analog 1D Linear Demo pin header (JP1) provides access to the supply voltage, ground, enable, and output voltage signals from the sensor, useful for evaluating the Allegro sensor in a bench environment.

When supplying voltage to the VCC pin, ensure that no battery is populated in the battery holder (B1).

Analog 1D Linear Demo Configurations

Table 1: Analog 1D Linear Demo Configurations

Configuration Name	Allegro Sensor
ASEK-1391-KIT-T	A1391
ASEK-1392-KIT-T	A1392
ASEK-1393-KIT-T	A1393
ASEK-1395-KIT-T	A1395
ASEK-31010-4-KIT-T	A31010SEHALT-4
ASEK-31010-10-KIT-T	A31010SEHALT-10

SCHEMATIC

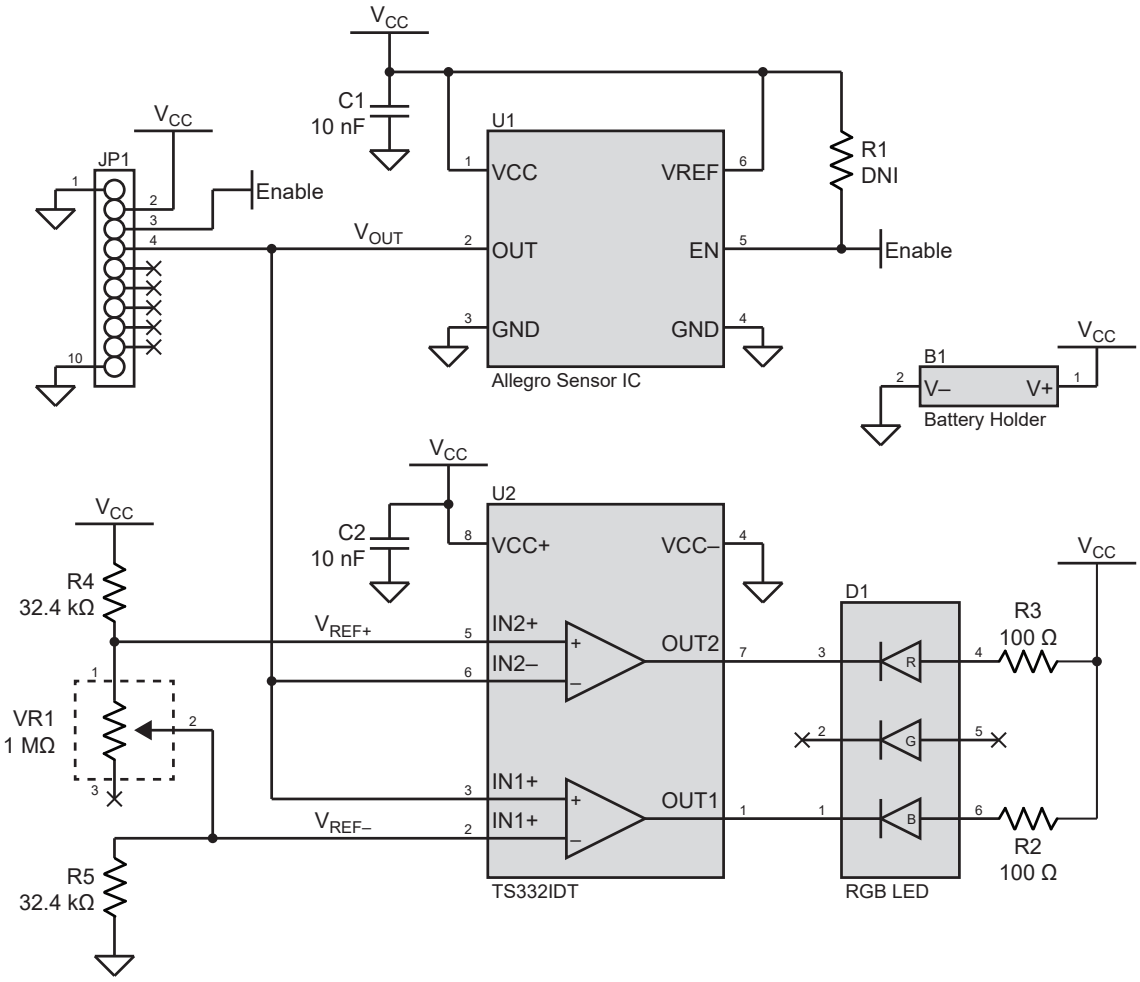

Figure 2: Analog 1D Linear Demo Schematic

LAYOUT

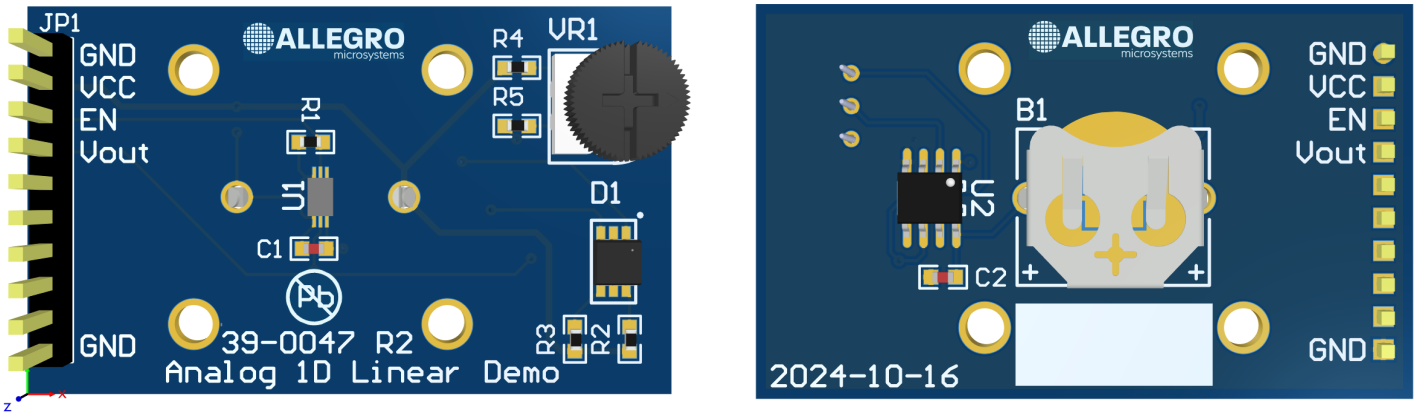

Figure 3: Analog 1D Linear Demo Layout Render

- PCB dimensions: 50.8 mm × 30.48 mm (2" × 1.2")
- Mounting hole dimensions: 3 mm holes on a 20 mm grid

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BILL OF MATERIALS

Table 2: Bill of Materials

ELECTRICAL COMPONENTS					
Designator	**Quantity**	**Description**	**Manufacturer**	**Manufacturer Part Number**	**Comment**
U1	1	Allegro sensor	Allegro MicroSystems	*Variable*	Variable (user selectable, see Table 1)
U2	1	Comparator, general purpose, open-drain, 8-SOIC	STMicroelectronics	TS332IDT	
JP1	1	Connector header, through hole, 10 position, 0.100" (2.54 mm)	TE Connectivity	9-146277-0-10	
B1	1	Battery retainer, coin, 12 mm, 1 cell, PC pin	Keystone Electronics	3001	
D1	1	LED, RGB, 6PLCC, SMD	Cree LED	CLY6D-FKC-CK1N1D1BB7D3D3	
VR1	1	Thumbwheel potentiometer, 1 MΩ, 0.5 W, through hole	Bourns Inc.	3352T-1-105LF	
R1	1	0 Ω, jumper, 0603, 100 mW, thick film	Yageo	RC0603FR-070RL	Not populated, can added by user if tying EN to VCC is desired
R2, R3	2	100 Ω, ±1%, 0603, 100 mW, thick film	Yageo	RC0603FR-07100RL	
R4, R5	2	32.4 kΩ, ±1%, 0603, 100 mW, thick film	Yageo	RC0603FR-0732K4L	
C1, C2	2	10 nF, ±10%, 50 V, X7R, 0603, ceramic	Kyocera AVX	KGM15AR71H103KT	
OTHER COMPONENTS					
Designator	**Quantity**	**Description**	**Manufacturer**	**Manufacturer Part Number**	**Comment**
–	1	Battery, Lithium, 3 V, coin, 12.5 mm	FDK America, Inc.	CR1220	Not populated, can be added by user if battery operation is desired

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Revision History

Number	Date	Description
–	February 4, 2025	Initial release

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