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ALLEGRO A31010 Analog 1D Linear Demo

Product Specifications

- **Product Name:** Analog 1D Linear Demo
- **Manufacturer:** Allegro MicroSystems
- **Model:** ASEK Series
- **Sensor Compatibility:** A1391, A1392, A1393, A1395, A31010SEHALT-4, A31010SEHALT-10

Product Usage Instructions

Battery-Powered Demonstration

1. Insert a 3 V CR1220 battery into the battery holder (B1) with the positive side facing away from the PCB.
2. If an enable signal is required, short the EN and VCC pins together on JP1 (pins 2 and 3) or populate R1 with a 0 resistor.
3. To power the board, apply the appropriate signal to the EN pin.

Breakout Evaluation

1. Connect the Analog 1D Linear Demo pin header (JP1) to supply voltage, ground, enable, and output voltage signals for bench evaluation of the sensor.
2. Ensure no battery is in B1 when supplying voltage to the VCC pin.

Analog 1D Linear Demo Configurations

Refer to Table 1 for different configurations available with corresponding Allegro sensor models.

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

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 3V, 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 VREF+ threshold turns the red LED on, and moving the output voltage below the VREF– threshold turns the blue LED on. VREF+ and VREF– 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

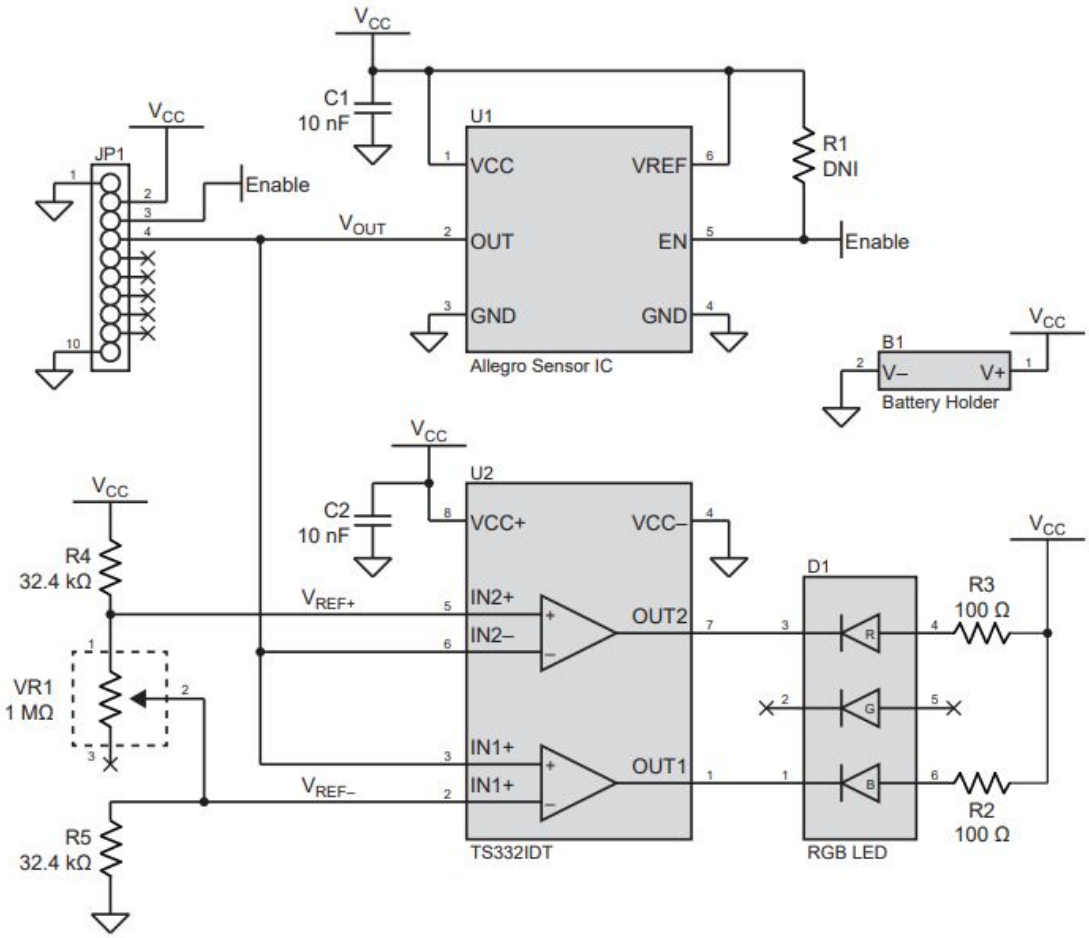

Figure 2: Analog 1D Linear Demo Schematic

LAYOUT

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

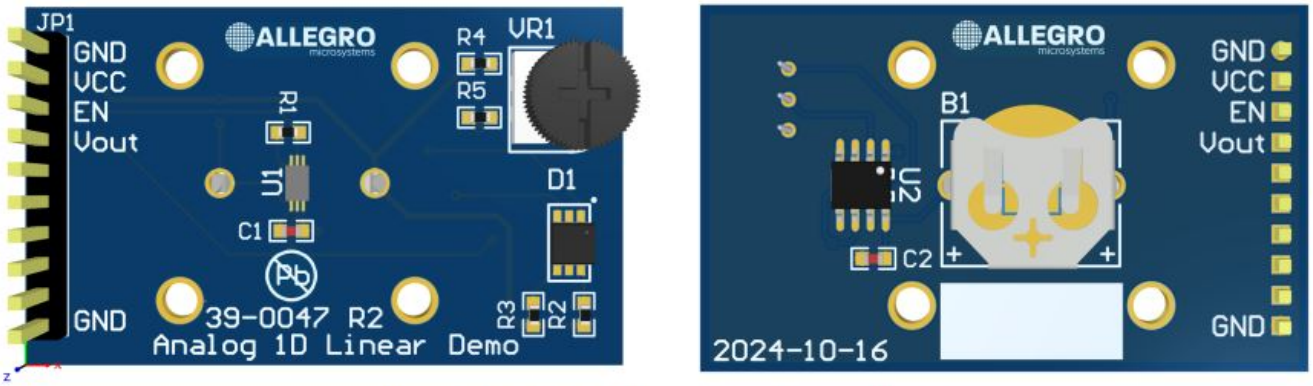

Figure 3: Analog 1D Linear Demo Layout Render

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 be 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 the user if battery operation is desired

limited to life support devices or systems, in which a failure of
- Allegro's product can reasonably be expected to cause bodily harm.
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Frequently Asked Questions (FAQ)

- **How do I adjust the sensitivity of the LEDs on the Analog 1D Linear Demo?**
  The sensitivity of the LEDs can be tuned using the variable resistor (VR1) on the board.
- **Can I use a different battery type other than a 3V CR1220 in the Analog 1D Linear Demo?**
  It is recommended to use a 3V CR1220 battery as specified for optimal performance.

Documents / Resources

	ALLEGRO A31010 Analog 1D Linear Demo [pdf] User Guide A1391, A1392, A1393, A1395, A31010SEHALT-4, A31010SEHALT-10, A 31010 Analog 1D Linear Demo, A31010, Analog 1D Linear Demo, Linear Demo

References

- User Manual

A1391, A1392, A1393, A1395, A31010, A31010 Analog 1D Linear Demo, A31010SEHALT-10, A31010SEHALT-4, ALLEGRO, Analog 1D Linear Demo, Linear Demo

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