LEOPARD IMAGING

LI-AF0130-VCL-MIPI-085H

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INTRODUCTION

The LI-AF0130-VCL-MIPI-085H is an advanced Time-of-Flight (ToF) MIPI camera module designed for precise 3D depth measurement. This ToF camera is equipped with ONSEMI 1.2 MP smart iToF sensor AF0130 and four flood illuminators. It features on-camera depth computation, enabling precise 3D depth measurements without requiring external processing. It ensures reliable performance across various scenarios, featuring a depth range of 0.2m to 6.5m and an impressive ±1.5% accuracy. The camera excels in challenging lighting conditions, thanks to its superior low-light and ambient light performance. Additionally, its four-laser operation extends the depth range at VGA resolution, offering enhanced flexibility for diverse applications.

SPECIFICATIONS

Sensor	1.2 MP Smart iToF BSI CMOS Global Shutter depth Sensor AF0130
Optical Format	1/3.2"
Pixel Size	3.5 µm
Resolution	1280 (H) x 960 (V)
Output Format	RAW
Maximum Frame Rate	60 fps @ 1.2 MP 100 fps @ VGA
Shutter	BSI Global shutter
Interface	MIPI (2 Lanes, 2 Gbps/lane)
Depth Range	0.2 m ~ 6.5 m
Depth Accuracy	± 1.5%
Power Consumption	TBD
Operating Temp	TBD
Storage Temp	TBD
Weight	~ 186 g

Applications

- Robot Navigation
- 3D Reconstruction
- Human-Machine Interaction
- Gesture Recognition
- Facial Recognition

LENS SPECIFICATIONS

Focal Length	2.47 mm
Aperture, F/#	1.2
Field of View (FOV)	85.1° horizontal
	65.3° vertical
	108.9° diagonal
IR Filter	940 nm BPF

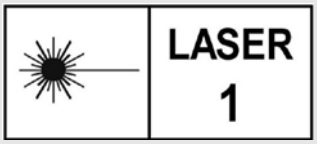
VCSEL SPECIFICATIONS

Wavelength	940 nm
Field of Illumination (FOI)	103˚ (Horizontal)
	84˚ (Vertical)
QTY on Camera	4

NOTE:

- Avoid hitting VCSEL when camera assembly and operating.
- Keep wide clear upon VCSEL when camera operating.

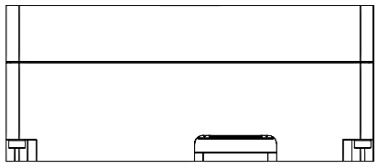
Laser Projector Safety and Certificates

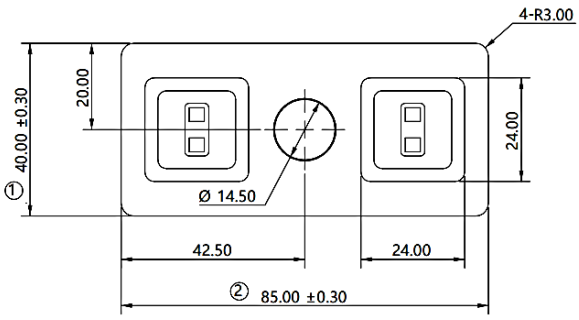
Safety	Class 1 laser product 
Certificates	IEC 60825-1 : 2014 EN 60825-1 : 2014 + A11 : 2021 CAN/CSA-E60825-1 :15 Complies with FDA performance standards for laser products except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019,

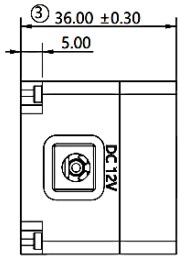
Laser Projector Maintenance

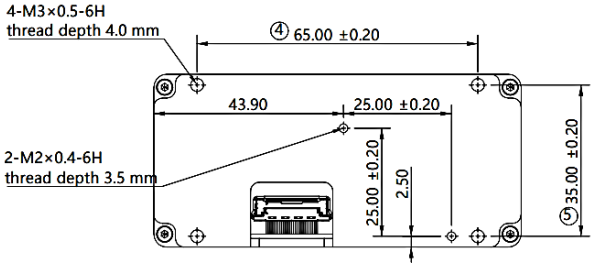
- Make maintenance after a period of use, such as cleaning dust.
- Return to factory for repair when meeting VCSEL work unnormal.

DIMENSIONS







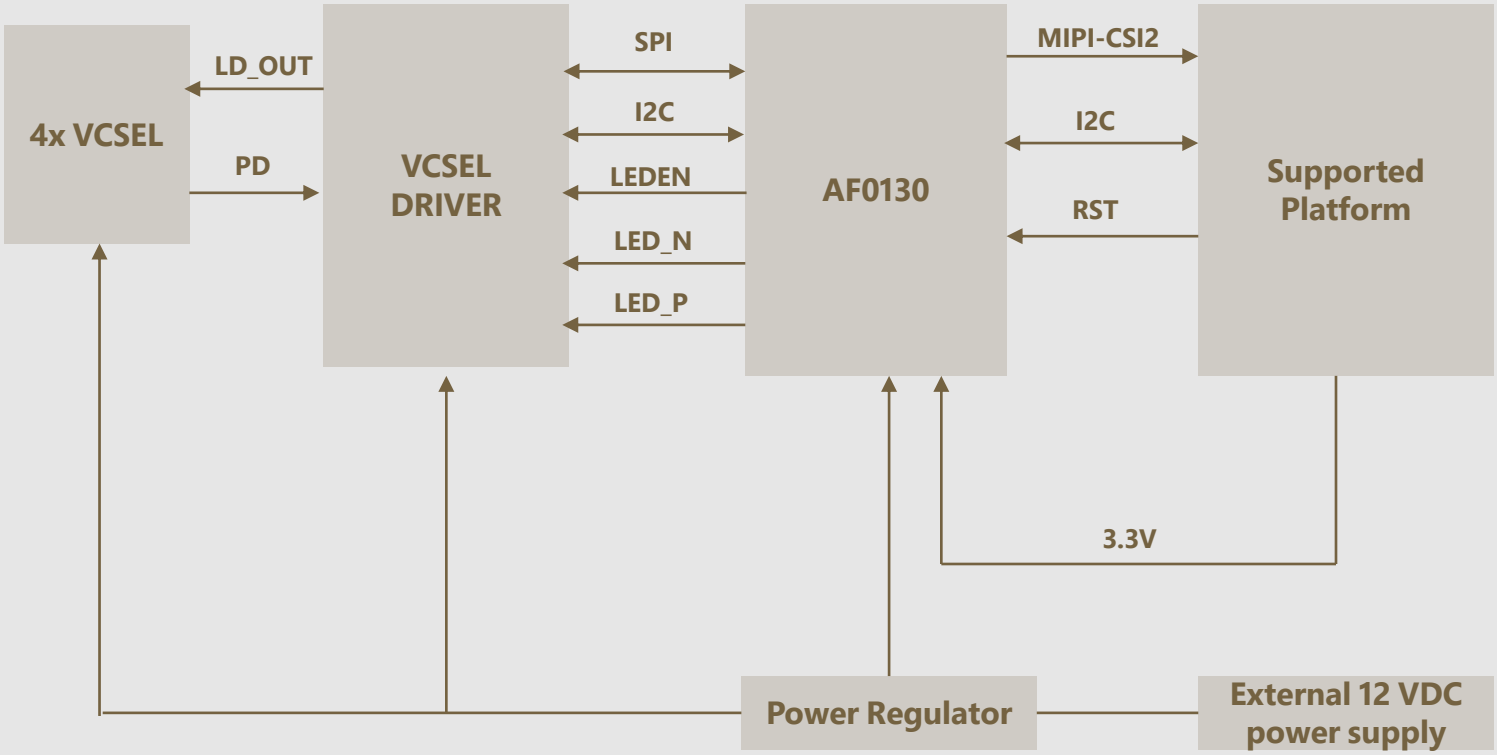


NOTE:

- Other unmarked tolerances refer to the Tolerance table.
- All materials are compliant with RoHS requirements.
- ⊗ marked are important sizes.
- Unit: mm

TOLERANCE TABLE					
LENGTH TOLERANCE		CHAMFER TOLERANCE		ANGLE TOLERANCE	
Size X	Tolerance	Size X	Tolerance	Size X	Tolerance
0.5 < X≤3	±0.1	0.5 < X≤3	±0.2	X≤10	±1°
3 < X≤6	±0.1	3 < X≤6	±0.5	10 < X≤50	±30'
6 < X≤30	±0.2	6 < X≤30	±1	50 < X≤120	±20'
30 < X≤120	±0.3	X > 30	±2	120 < X≤400	±10'
120 < X≤400	±0.5			X > 400	±5'
400 < X≤1000	±0.8				
X > 1000	±1.2				

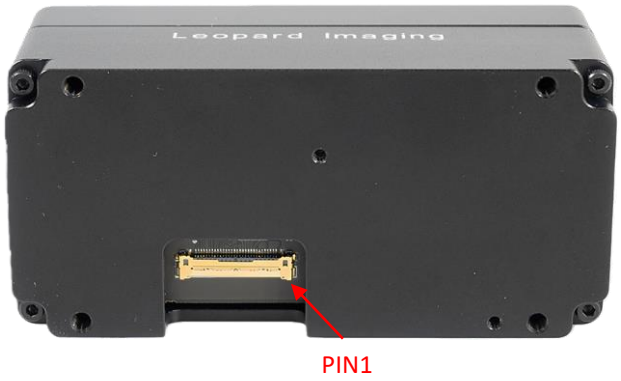
SYSTEM BLOCK DIAGRAM



MODULE INTERFACE

General

- Host side MIPI Connector Part#: 20525-030E-02
- MIPI Cable length: 300 mm
- External Power Supply: 3.3V



PINOUT DETAILS FOR HOST SIDE (MIPI Receiver side)

Pin No	Signal Name	Pin Type	Description	Voltage Level
30	-	-	-	-
29	-	-	-	-
28	MIPI_D1P	OUTPUT	MIPI Clock Data1 Differential Pair +	MIPI DPHY
27	MIPI_D1N	OUTPUT	MIPI Clock Data1 Differential Pair -	MIPI DPHY
26	GND	GND	Ground signal for digital and analog	-
25	MIPI_CKP	OUTPUT	MIPI Clock Lane Differential Pair +	MIPI DPHY
24	MIPI_CKN	OUTPUT	MIPI Clock Lane Differential Pair -	MIPI DPHY
23	MIPI_D0P	OUTPUT	MIPI Clock Data0 Differential Pair +	MIPI DPHY
22	MIPI_D0N	OUTPUT	MIPI Clock Data0 Differential Pair -	MIPI DPHY
21	-	-	-	-
20	-	-	-	-
19	CLK_EN	INPUT	CLOCK enable	1.8V
18	SCL	INPUT	1.8V IO Camera I2C SCL signal (Pulled up to 1.8V using 10k)	1.8V

Pin No	Signal Name	Pin Type	Description	Voltage Level
17	SDA	I/O	1.8V IO Camera I2C SDA signal (Pulled up to 1.8V using 10k)	1.8V
16	RST	INPUT	1.8V IO camera reset signal	1.8V
15	DMON	I/O	ITOF DMON PIN	1.8V
14	POWER_EN	INPUT	POWER_Enable	1.8V
13	TRIGGER	INPUT	1.8V IO Trigger signla for camera	1.8 V
12	RUSH_EN	I/O	1.8V_BRD ENABLE	1.8 V
11	SS_N	INPUT	SPI multiplexed chip select	1.8 V
10	MOSI	INPUT	SPI output data	1.8 V
9	MCLK	INPUT	SPI clock signal	1.8 V
8	N/A	-	No Connection	-
7	N/A	-	No Connection	-
6	N/A	-	No Connection	-
5	N/A	-	No Connection	–
4	N/A	-	No Connection	–
3	DC3.3V	POWER	3.3V Power supply for camera board	3.3V
2	DC3.3V	POWER	3.3V Power supply for camera board	3.3V
1	DC3.3V	POWER	3.3V Power supply for camera board	3.3V

External 12 VDC Power Supply

- Part#: PJ-002A
- Number of Positions: 3
- Connector Type: Jack
- Inner Diameter: 2 mm
- Outer Diameter: 6.5 mm
- The power supply adapter minimum consumption: 5A @ 12VDC

REVISION HISTORY

Revision	Description	Release Date
0.1	Initial draft	15 Jul 2025
0.2	Product upgraded.	29 Oct 2025
0.3	1. Updated pictures on the page 1 & 2. 2. Added the Laser Projector Safety and Certificates.	15 Jan 2026
0.4	Updated depth accuracy.	24 Feb 2026

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