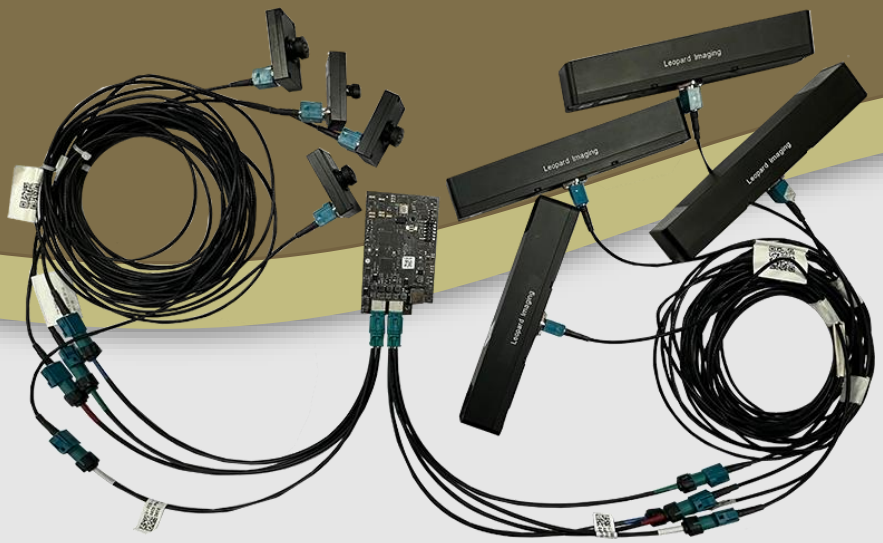
LEOPARD IMAGING

LI-AGO-ADP-HAWK-OWL-Q



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+1 (408)217-1960

Sales:

sales@leopardimaging.com

Support:

support@leopardimaging.com

TECHNICAL FEATURES

- Compatible with NVIDIA® Jetson AGX Orin™ Developer Kit and LI-AGO-CB carrier board
- Adapter board: LI-JAG-ADP-GMSL2-8CH
- Sensor: ON Semiconductor CMOS image sensor AR0234CS
- Active pixels: 1920 (H) x 1200 (V)
- Color camera
- Weight: ~ 1019 g (LI-JAG-ADP-GMSL2-8CH adapt + 4 OWL cameras + 4 HAWK cameras)
- Connector: FAKRA connector FAKRA Z TYPE
- Allows customization
- Part#: **LI-AGO-ADP-HAWK-OWL-Q**

OWL LENS SPECIFICATIONS

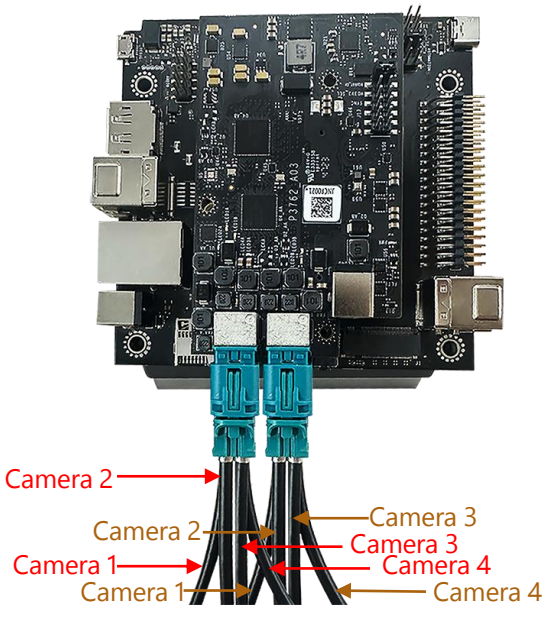
Focal Length	1.34 ± 5%
Aperture, F/#	2.0 ± 5%
Field of View (FOV)	202° ± 3° horizontal
	127.2° ± 2° vertical
IR Filter	650 nm ± 10 nm IR cut filter
Lens Mount	M12 x 0.5

APPLICATIONS

- Bar Code Scanner
- Gesture Recognition
- 3D Scanning
- Positional Tracking
- Iris Scanning
- Augmented Reality
- Virtual Reality
- Biometrics
- Machine Vision

HAWK LENS SPECIFICATIONS

Focal Length	2.8 mm
Aperture, F/#	2.0
Field of View (FOV)	147.5° diagonal
	121.5° horizontal
	73.5° vertical
Optical Distortion	< -65.3%
Relative Illumination	> 30.0%
IR Filter	650 nm IR cut filter
Glass Cover	No
Lens Mount	Active Alignment (AA)



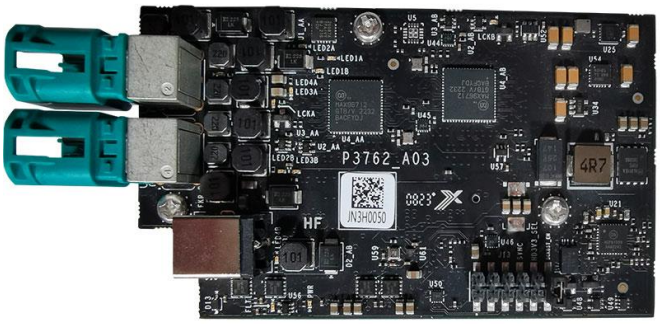
NOTE:

- Camera connection order is based on the version of the driver. The order shown above is for the driver based on R35.3.1 (Jetpack 5.1.1).
- NVIDIA® Jetson AGX Orin™ Developer Kit is **NOT** included

BOM DETAILS

#	Items	Part Number	QTY	Unit
1	Adapter Board	LI-JAG-ADP-GMSL2-8CH V2.0	1	Piece
2	Owl CAMERA	LI-AR0234CS-GMSL2-OWL	4	EA
3	Hawk CAMERA	LI-AR0234CS-STEREO-GMSL2-30	4	EA
4	12 VDC power supply	LI-PS12-03 (GST60A12-P1M + LI-PC-US-18AWG)	1	Set
5	4T1 cable	LI-FCB-4T1-SS-0.3M-NP-A0	2	Piece
6	Fakra cable	FAK-SMZSMZ-3M	8	Piece
7	Screws (M3*0.5*5)	602M0030050A92A1	3	Piece
8	Standoffs (M2.5*8.15+4)	621MU0030081A35A1	3	Piece

LI-JAG-ADP-GMSL2-8CH V2.0



HAWK Camera

OWL Camera

LI-FCB-4T1-SS-0.3M-NP-A0 cable

Fakra cable

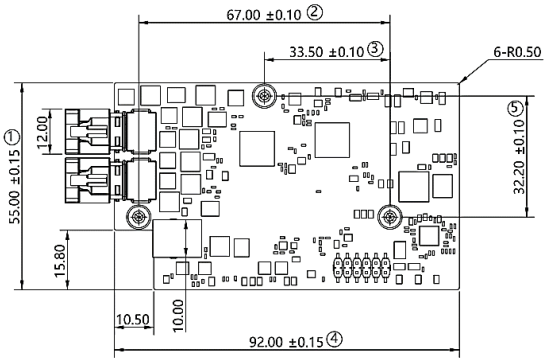
GMSL2 DeSer Board (LI-JAG-ADP-GMSL2-8CH)

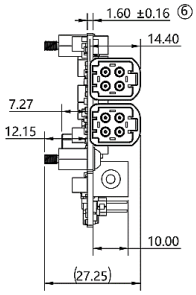
TECHNICAL FEATURES

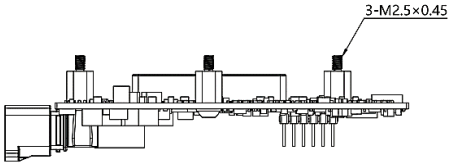
- Compatible with NVIDIA® Jetson AGX Orin™ Developer Kit and LI-AGO-CB carrier board
- Supports up to 8 GMSL2 cameras
- Supports external 12 VDC power supply
- DeSerializer: Maxim MAX96712
- Operating temperature: 0 ℃ ~ +35 ℃ (Adopted the temperature range of NVIDIA® Jetson AGX Orin™ Developer Kit)
- Weight: ~ 55 g (Without cable and power)
- Part#:

Leopard Imaging Part#	LI-JAG-ADP-GMSL2-8CH
NVIDIA Part#	P3762_A03

DIMENSIONS







NOTE:

- Other unmarked tolerances are ± 0.3 mm.
- ⊗ marked are important sizes.
- All materials are compliant with RoHS & REACH requirements.
- Unit: mm

INTERFACE J501 (Base Board Connector)

- Part#: QTH-060-02-L-D-A
- Number of Positions: 120
- Number of Rows: 2
- Pitch: 0.5 mm
- J501 can connect to NVIDIA® Jetson AGX Orin™ Developer Kit.

PINOUT DETAILS OF J501

PIN#	Pin Name	Module Pin#	Description	Type/Di	Voltage Level
1	BB_CSI0_D0P	E42	CSI 0 Data 0	Output	MIPI DPHY/CPHY
3	BB_CSI0_D0N	E41			
5	GND	—	Ground	Ground	—
7	BB_CSI0_CLKP	F43	CSI 0 Clock	Output	MIPI DPHY/CPHY
9	BB_CSI0_CLKN	F42			
11	GND	—	Ground	Ground	—
13	BB_CSI0_D1P	E39	CSI 0 Data 1	Output	MIPI DPHY/CPHY
15	BB_CSI0_D1N	E38			
17	GND	—	Ground	Ground	—
19	BB_CSI2_D0P	A41	CSI 2 Data 0	Output	MIPI DPHY/CPHY
21	BB_CSI2_D0N	A42			
23	GND	—	Ground	Ground	—
25	BB_CSI2_CLKP	B43	CSI 2 Clock	Output	MIPI DPHY/CPHY
27	BB_CSI2_CLKN	B42			
29	GND	—	Ground	Ground	—
31	BB_CSI2_D1P	C42	CSI 2 Data 1	Output	MIPI DPHY/CPHY
33	BB_CSI2_D1N	C41			
35	GND	—	Ground	Ground	—
37	BB_CSI4_D0P	G48	CSI 4 Data 0	Output	MIPI DPHY/CPHY
39	BB_CSI4_D0N	G47			
41	GND	—	Ground	Ground	—
43	BB_CSI4_CLKP	F48	CSI 4 Clock	Output	MIPI DPHY/CPHY
45	BB_CSI4_CLKN	F47			
47	GND	—	Ground	Ground	—
49	BB_CSI4_D1P	E47	CSI 4 Data 1	Output	MIPI DPHY/CPHY
51	BB_CSI4_D1N	E48			
53	GND	—	Ground	Ground	—
55	—	—	—	—	—
57	—	—	—	—	—
59	BB_CSI5_D0P	D42	CSI 5 Data 0	Output	MIPI DPHY/CPHY
61	BB_CSI5_D0N	D43			
63	GND	—	Ground	Ground	—
65	BB_CSI5_CLKP	C44	CSI 5 Clock	Output	MIPI DPHY/CPHY
67	BB_CSI5_CLKN	C45			
69	GND	—	Ground	Ground	—

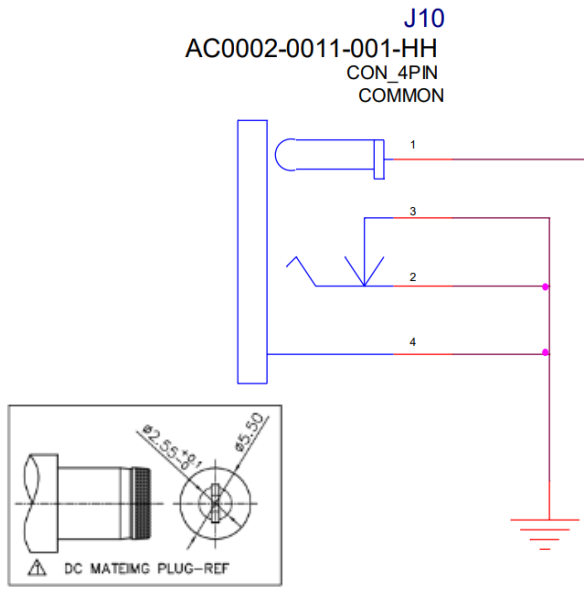
PIN#	Pin Name	Module Pin#	Description	Type/Di	Voltage Level
71	BB_CSI5_D1P	D46	CSI 5 Data 1	Output	MIPI DPHY/CPHY
73	BB_CSI5_D1N	D45			
75	BB_I2C3_CLK	F53	General I2C #3	Bidir	1.8V
77	BB_I2C3_DAT	E53			
79	GND	—	Ground	Ground	—
81	—	—			—
83	—	—			—
85	CAM_FRSYNC1	A62	Camera FRSYNC #1	Output	3.3V
87	BB_I2C2_CLK	J61	General I2C #2	Bidir	1.8V
89	BB_I2C2_DAT	K61			
91	BB_CAM0_MCLK02	J54	Camera #0 Master Clock	Input	1.8V
93	BB_CAM0_PWDN	L49	Camera #0 Powerdown	Input	1.8V
95	BB_AGGA_ERRB*	L5	Aggregator A error signal	Output	1.8V
97	CAM_FRSYNC3	E59	Camera FRSYNC #3	Input	3.3V
99	GND	—	Ground	Ground	—
101	—	—	—	—	—
103	BB_CAM_INT3	F60	Camera Interrupt #3	Output	1.8V
105	BB_I2C1_CLK	A53	General I2C #5	Bidir	1.8V
107	BB_I2C1_DAT	C53			
109	—	—	—	—	—
111	—	—	—	—	—
113	—	—	—	—	—
115	GND	—	Ground	Ground	—
117	BB_CAM_INT1	E61	Camera Interrupt #1	Output	1.8V
119	PWR_EN_1V8	E12	System power enable	Input	1.8V
2	BB_CSI1_D0P	G41	CSI 1 Data 0	Output	MIPI DPHY/CPHY
4	BB_CSI1_D0N	G42			
6	GND	—	Ground	Ground	—
8	BB_CSI1_CLKP	H43	CSI 1 Clock	Output	MIPI DPHY/CPHY
10	BB_CSI1_CLKN	H42			
12	GND	—	Ground	Ground	—
14	BB_CSI1_D1P	J41	CSI 1 Data 1	Output	MIPI DPHY/CPHY
16	BB_CSI1_D1N	J42			
18	GND	—	Ground	Ground	—
20	BB_CSI3_D0P	E45	CSI 3 Data 0	Output	MIPI DPHY/CPHY
22	BB_CSI3_D0N	E44			
24	GND	—	Ground	Ground	—
26	BB_CSI3_CLKP	F46	CSI 3 Clock	Output	MIPI DPHY/CPHY
28	BB_CSI3_CLKN	F45			
30	GND	—	Ground	Ground	—

PIN#	Pin Name	Module Pin#	Description	Type/Di	Voltage Level
32	BB_CSI3_D1P	G44	CSI 3 Data 1	Output	MIPI DPHY/CPHY
34	BB_CSI3_D1N	G45			
36	GND	—	Ground	Ground	—
38	BB_CSI6_D0P	K44	CSI 6 Data 0	Output	MIPI DPHY/CPHY
40	BB_CSI6_D0N	K43			
42	GND	—	Ground	Ground	—
44	BB_CSI6_CLKP	J44	CSI 6 Clock	Output	MIPI DPHY/CPHY
46	BB_CSI6_CLKN	J45			
48	GND	—	Ground	Ground	—
50	BB_CSI6_D1P	H46	CSI 6 Data 1	Output	MIPI DPHY/CPHY
52	BB_CSI6_D1N	H45			
54	GND	—	Ground	Ground	—
56	—	—	—	—	—
58	—	—	—	—	—
60	BB_CSI7_D0P	A44	CSI 7 Data 0	Output	MIPI DPHY/CPHY
62	BB_CSI7_D0N	A45			
64	GND	—	Ground	Ground	—
66	BB_CSI7_CLKP	B45	CSI 7 Clock	Output	MIPI DPHY/CPHY
68	BB_CSI7_CLKN	B46			
70	GND	—	Ground	Ground	—
72	BB_CSI7_D1P	C47	CSI 7 Data 1	Output	MIPI DPHY/CPHY
74	BB_CSI7_D1N	C48			
76	BB_CAM_ERROR1	L15	Camera Error #1	Output	1.8V
78	BB_CAM_ERROR2	L9	Camera Error #2	Output	1.8V
80	GND	—	Ground	Ground	—
82	—	—	—	—	—
84	BB_CAM_ERROR3	A7	Camera Error #3	Output	1.8V
86	BB_CAM_ERROR4	L4	Camera Error #4	Output	1.8V
88	PS_ALL_PG	H53	Power Good Signal	Output	1.8V
90	BB_CAM1_PWDN	F10	Camera #1 Powerdown	Input	1.8V
92	BB_AGGB_ERRB*	F9	Aggregator B error signal	Output	1.8V
94	PRS_CMP_DATA_READY	H55	Altimeter &magnetometer data ready signal	Output	1.8V
96	CAM_FS_SEL	G7	Selection signal for FRSYNC on GPIO header	Output	1.8V
98	CAM_FRSYNC2	F59	Camera FRSYNC #2	Input	3.3V
100	GND	—	Ground	Ground	—
102	VCC_1V8_CONN	—	1.8V power supply	Power	—
104	BB_CAM_INT4	D60	Camera Interrupt #4	Output	1.8V
106	BB_CAM_INT2	D62	Camera Interrupt #2	Output	1.8V

PIN#	Pin Name	Module Pin#	Description	Type/Di	Voltage Level
108	VCC_3V3_F	—	3.3V power supply	Power	—
110	VCC_3V3_F	—	3.3V power supply	Power	—
112	—	—	—	—	—
114	—	—	—	—	—
116	GND	—	Ground	Ground	—
118	VCC_3V3_F	—	3.3V power supply	Power	—
120	VCC_3V3_F	—	3.3V power supply	Power	—

INTERFACE J10 (DC Jack)

- Part#: AC0002-0011-001-HH
- Number of Positions: 4



INTERFACE J13 (GPIO Header)

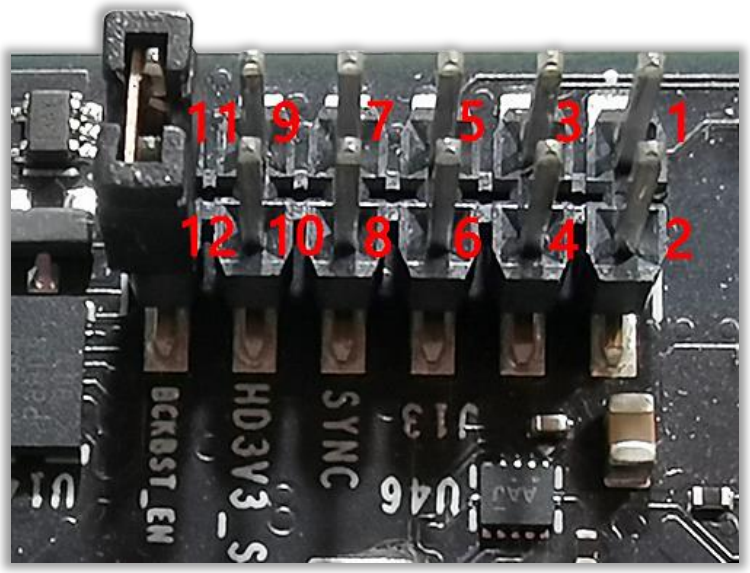
- Part#: TSM-106-01-T-DV-P-TR
- Number of Positions: 12
- Number of Rows: 2
- Pitch: 2.54 mm
- Jumper for Pin9_10 and Pin11_12:

Pin No.	Description
Pin9_10	Select IO signal level for connector, 1.8V or 3.3V. • Default 1.8V, NO jumper
Pin11_12	• Default: with jumper, from external power (9 ~ 15 VDC) to buck boost circuit (convert to 12 VDC) to POC. • No jumper: bypass buck boost, directly use external 12 VDC power.

NOTE:

The jumper is only for Pin9_10 and Pin11_12.

Please do not use on other pins from 1 to 8.

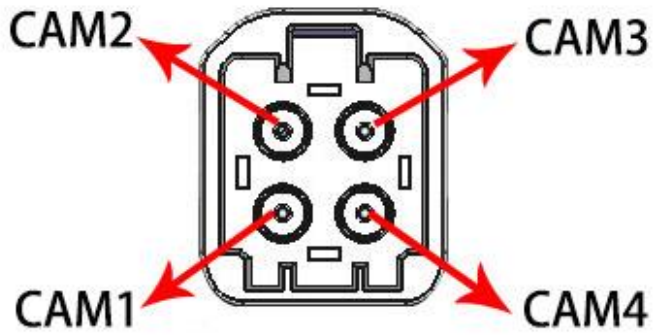


PINOUT DETAILS OF J13

PIN#	Pin Name	Description	Type/Di	Voltage Level
1	VCC_HEADER	Power 1.8V/3.3V selectable	—	1.8V
3	MFP5_ACC2_INT1_HEADER	Camera interrupt2	Output	1.8V
5	MFP6_GRYO2_INT3_HEADER	Camera interrupt4	Output	1.8V
7	FRSYNC_HEADER	Camera frame sync	Bidir	
9	HEADER_VCC_SEL	Select 1.8V/3.3V for Header	Input	—
11	12V_EN_BYPASS	Select the Power Path for POC	Input	—
2	MFP11_ACC1_INT1_HEADER	Camera interrupt1	Output	1.8V
4	MFP12_GRYO1_INT3_HEADER	Camera interrupt3	Output	1.8V
6	GND	Ground	Ground	—
8	GND	Ground	Ground	—
10	GND	Ground	Ground	—
12	GND	Ground	Ground	—

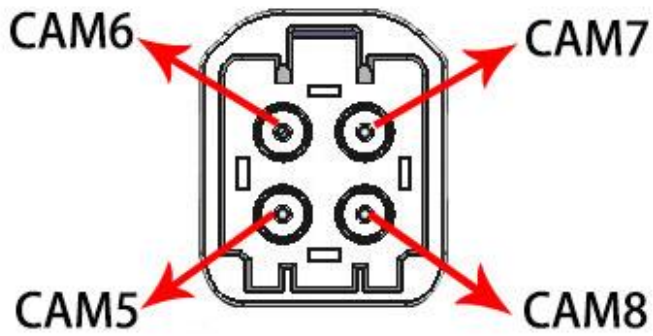
INTERFACE J1_AA (GMSL to CSI Capture)

- Part#: 410AF04NFTB2T1CZ
- Number of Positions: 4
- Mating Connector: 2298721-9



INTERFACE J1_AB (GMSL to CSI Capture)

- Part#: 410AF04NFTB2T1CZ
- Number of Positions: 4
- Mating Connector: 2298721-9



4T1 Cable (LI-FCB-4T1-SS-0.3M-NP-A0)

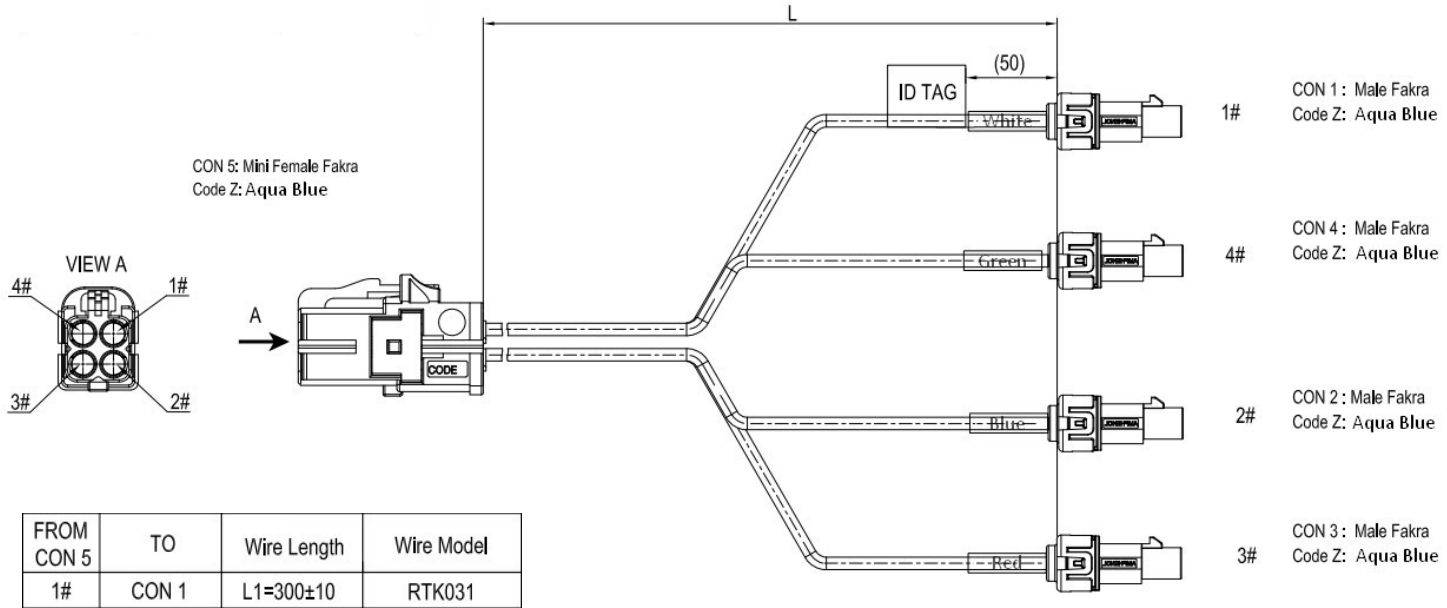
TECHNICAL FEATURES

- Supports multiple length Farka cable from Leopard Imaging, including FAK-SMZSMZ-6M, FAK-SMZSMZ-5M and FAK-SMZSMZ-3M.

  NOTE: **FAK-SMZSMZ-3M** is the default Fakra cable used in LI-AGO-ADP-HAWK-OWL-Q. For other length, you could purchase via the following address:

  - FAK-SMZSMZ-6M: https://leopardimaging.com/product/accessories/cables/fak-smzsmz-6m/
  - FAK-SMZSMZ-5M: https://leopardimaging.com/product/accessories/cables/fak-smzsmz-5m/
- Its Mini Female Fakra connector is compatible with Nvidia Jetson platform
- Length: 300 ± 10 mm
- Weight: ~ 42 g
- Part#: **LI-FCB-4T1-SS-0.3M-NP-A0**

MECHANICAL DIAGRAM



FROM CON 5	TO	Wire Length	Wire Model
1#	CON 1	L1=300±10	RTK031
2#	CON 2	L2=300±10	RTK031
3#	CON 3	L3=300±10	RTK031
4#	CON 4	L4=300±10	RTK031

Unit: mm

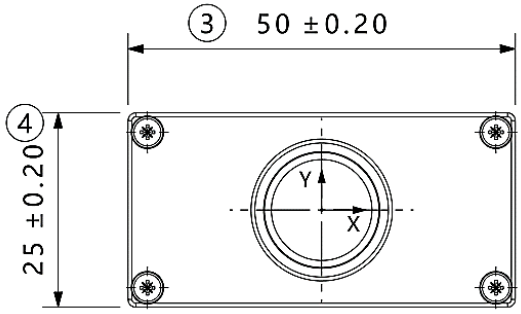
OWL Camera (LI-AR0234CS-GMSL2-OWL)

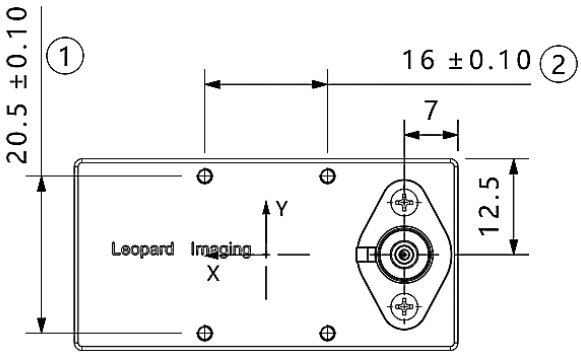
CAMERA SPECIFICATIONS

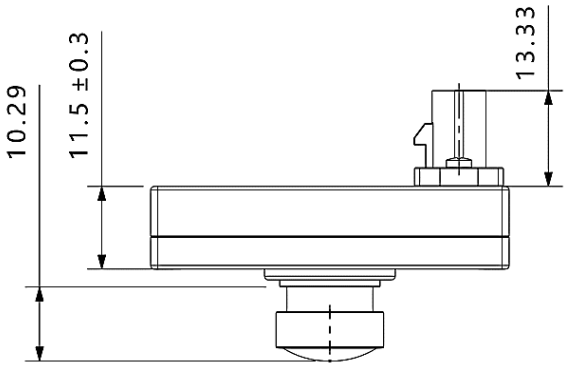
Sensor	ON Semiconductor CMOS Image Sensor AR0234CS
Optical Format	1/2.6"
Resolution	1920 (H) x 1200 (V)
Pixel Size	3.0 x 3.0 µm
Output Format	10-bit RAW data
Frame Rate	120 fps @ full resolution
Shutter	Global shutter
Serializer	Maxim MAX9295A/B
Color / Mono	Color sensor
FAKRA Connector	FAKRA Z TYPE
Certification	FCC, CE
Power Supply Range	9 ~ 19 VDC
Power Consumption	70 mA @ 12 VDC
Weight	~ 37 g
Part#	LI-AR0234CS-GMSL2-OWL

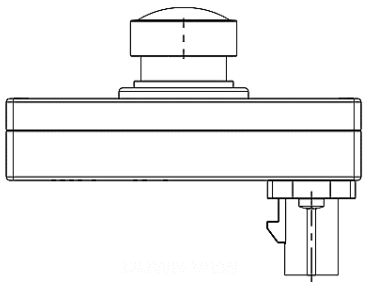
IMAGING ORIENTATION

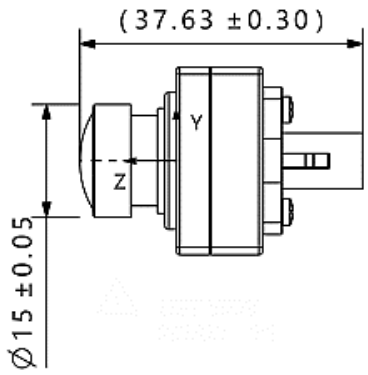
DIMENSIONS

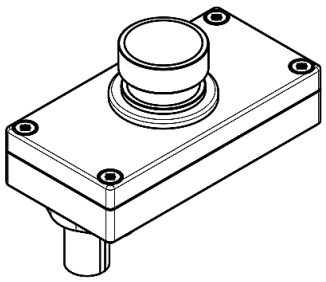












NOTE:

- ⊗ marked are important sizes.
- All materials are compliant with RoHS requirements.
- Tolerances for others unmarked refer to the Tolerance Table.
- 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				

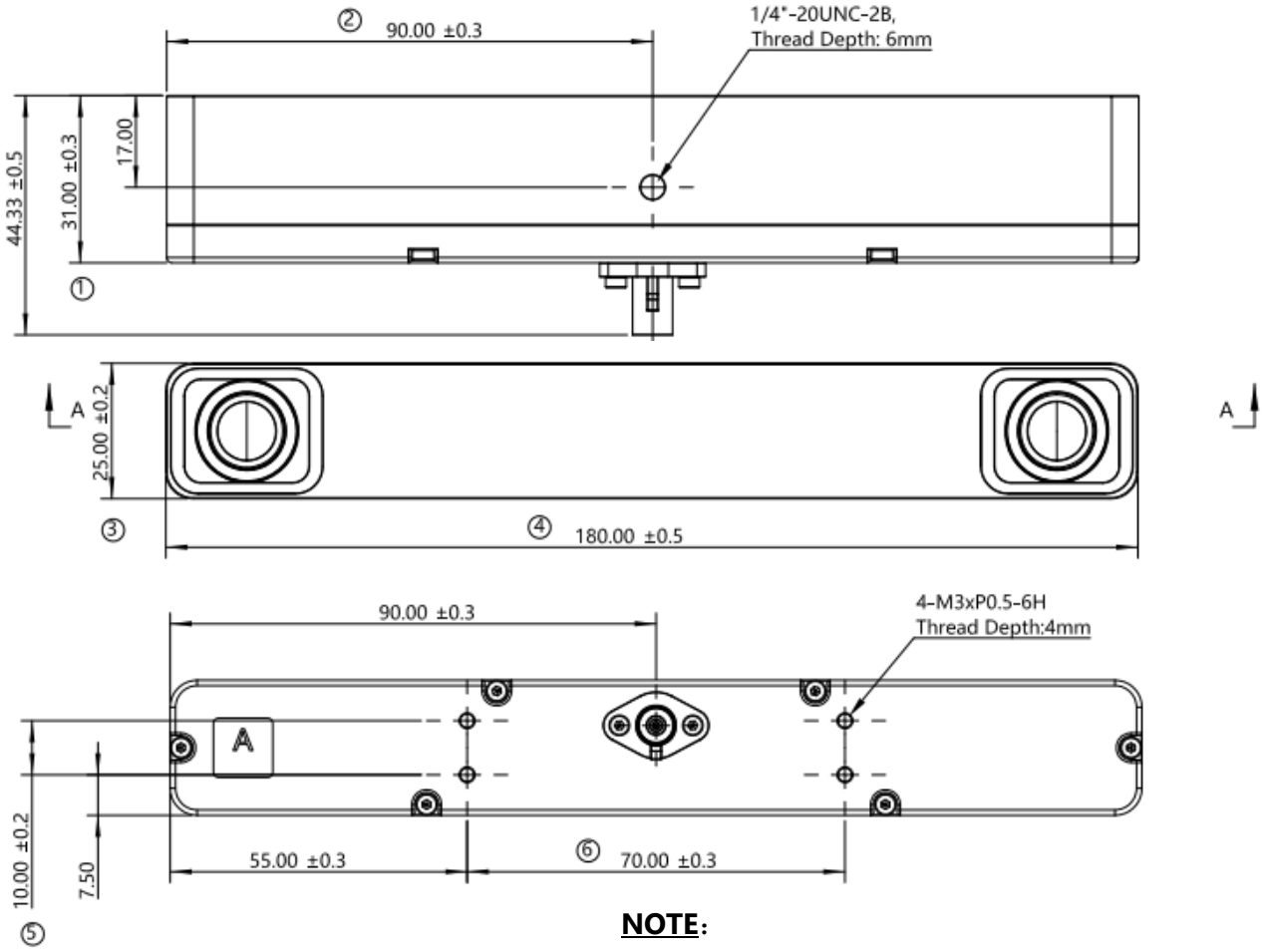
HAWK Camera (LI-AR0234CS-STEREO-GMSL2-30)

CAMERA SPECIFICATIONS

Sensor	ON Semiconductor 2.3MP CMOS Image Sensor AR0234CS
Optical Format	1/2.6"
QTY of Sensor	2
Resolution	1920 (H) x 1200 (V) (active pixels)
Pixel Size	3.0 x 3.0 µm
Baseline	150 mm
Depth Rang	1.0 ~ 8.0 m NOTE: For high Z-accuracy, the depth range can be 0.5 m to 8.0 m. However, the depth range can be up to 20 m with reduced Z-accuracy.
Output Format	10-bit RAW data
Frame Rate	60 fps @ 1920 x 1200
Shutter	Global shutter
Serializer	Maxim GMSL2
Color / Mono	Color sensor
FAKRA Connector	FAKRA Z TYPE
Certification	FCC, CE
Weight	~ 204 g
Power Supply Range	9 ~ 19 VDC
Part#	**LI-AR0234CS-STEREO-GMSL2-30**

IMAGING DIRECTION

DIMENSIONS



NOTE:

- Other unmarked tolerances are ±0.3 mm.
- All materials are compliant with RoHS requirements.
- ⊗ marked are important sizes.
- For unmarked sizes, refer to 3D model.

Unit: mm

REVISION HISTORY

Revision	Description	Release Date
0.1	First Release.	12 Mar 2024

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