



LEOPARD
IMAGING

LI-IPX-KW33000-MIPI-TOF-088H



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TECHNICAL FEATURES

- Compatible with NVIDIA® Jetson AGX Orin™ Developer Kit and USB30 Kit
- Adapter board: LI-IPEX-FPC24-ADP
- Sensor: Nuvoton VGA-Pixel TOF and IR Image Sensor KW33000A1K
- Active pixels: 640 (H) x 480 (V)
- Wide range: TBD
- 940 nm dot and flood VCSEL included
- 2-lane MIPI & 12-bit RAW output
- Allows customization
- Weight: ~ 75 g
- Power Consumption: 316 mA @ 5V (640 x 480 @ 30 fps)
- Operating temperature: TBD
- Storage temperature: TBD

Applications

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

BOM DETAILS

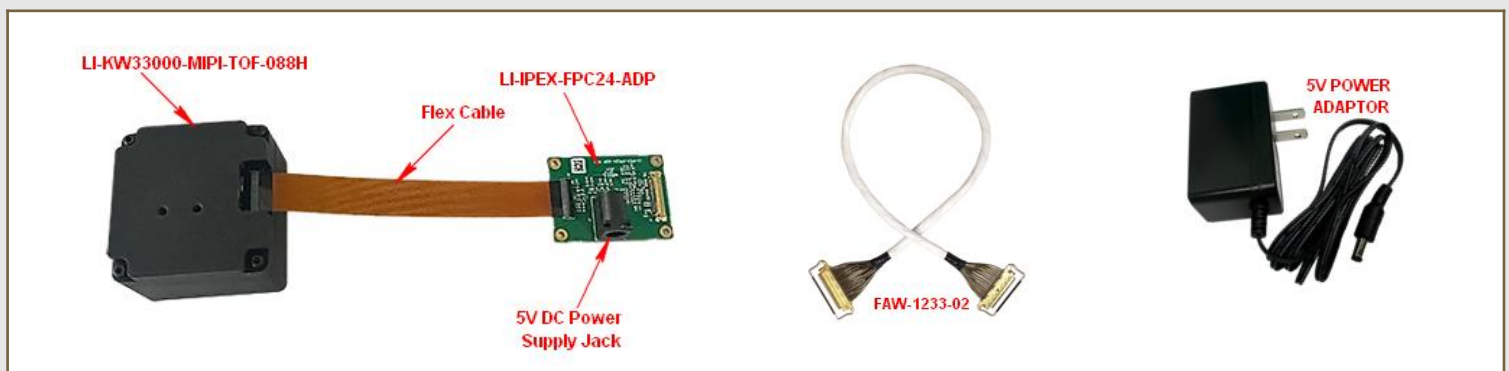
#	Items	Part Number	QTY	Unit
1	Adapter Board	LI-IPEX-FPC24-ADP	1	EA
2	TOF CAMERA	LI-KW33000-MIPI-TOF-088H	1	EA
3	Flex Cable	Flex cable	1	EA
4	I-PEX Cable	FAW-1233-02 (200mm)	1	EA
5	5V DC Power Supply	LI-PS5-01	1	EA

NOTE

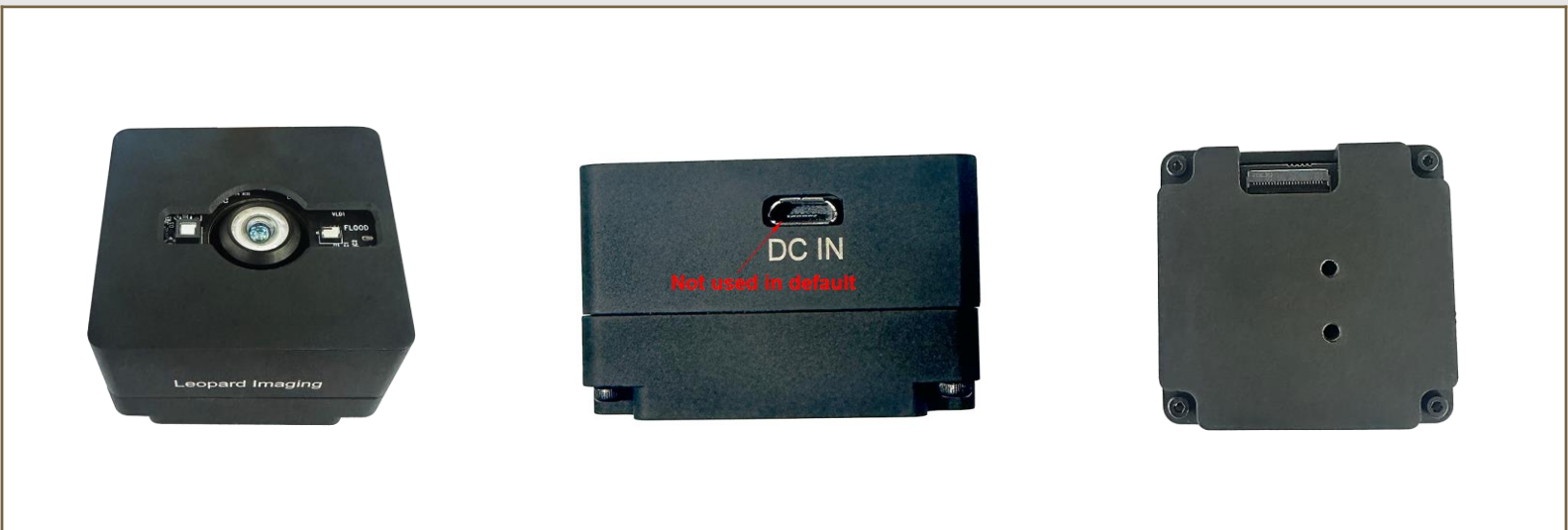
1. **FAW-1233-02 (200mm)** is the default I-PEX cable used. For other length, you could purchase via the following address:

- FAW-1233-xx: https://leopardimaging.com/?s=faw-1233&post_type=product&type_aws777=true

2. If need other length Flex cables, please contact sales for more details.



LI-KW33000-MIPI-TOF-088H



SPECIFICATIONS

Sensor	Nuvoton VGA-Pixel TOF and IR Image Sensor KW33000A1K
Optical Size	1/4"
Resolution	640 (H) x 480 (V) (active pixels)
Pixel Size	5.6 x 5.6 μm
Output Format	12-bit RAW
Maximum Frame Rate	60 fps @ 640 x 480
Measurable Range	TBD
Accuracy	TBD
Power Supply	5 VDC NOTE: 5 VDC power supply from power adaptor. Micro USB 5V DC IN not used in default.
VCSEL	Included
Power Consumption	316 mA @ 5 VDC (640 x 480 @ 30 fps)
Operating Temp	TBD
Storage Temp	TBD
Weight	~ 69 g

LENS SPECIFICATIONS

Focal Length	2.36 mm
Aperture, F/#	1.3
IR Filter	940 nm IR filter
Field of View (FOV)	111.2° (D) / 88.2° (H) / 65.6° (V)
Relative Illumination	70.7% at \varnothing 4.48 mm
Optical Distortion	-35.3% at \varnothing 4.48 mm
TV Distortion	-10.0%

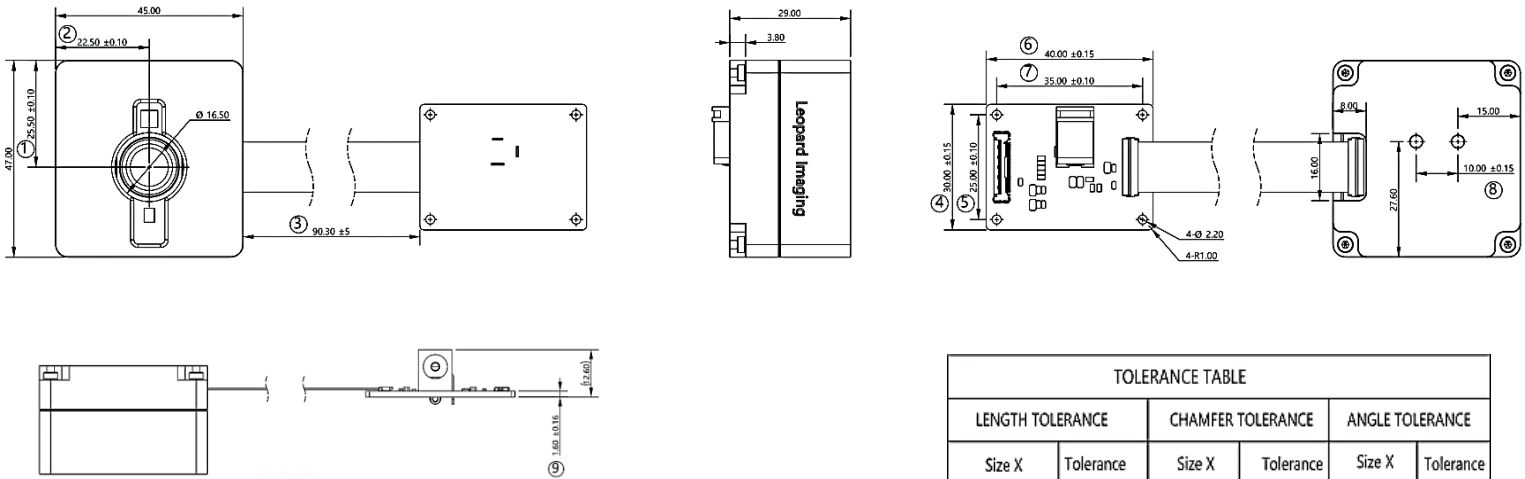
DOT VCSEL SPECS

Wavelength	940 nm
Field of Illumination	110° horizontal
	130° vertical
Number of Dots (within FOI)	3000

FLOOD VCSEL SPECS

Wavelength	940 nm
Field of Illumination (FOI)	140° horizontal
	110° vertical
Operating Power	10.2 W (Pop,25 °C; I= Iop1,25°C)

DIMENSIONS: LI-IPX-KW33000-MIPI-TOF-088H

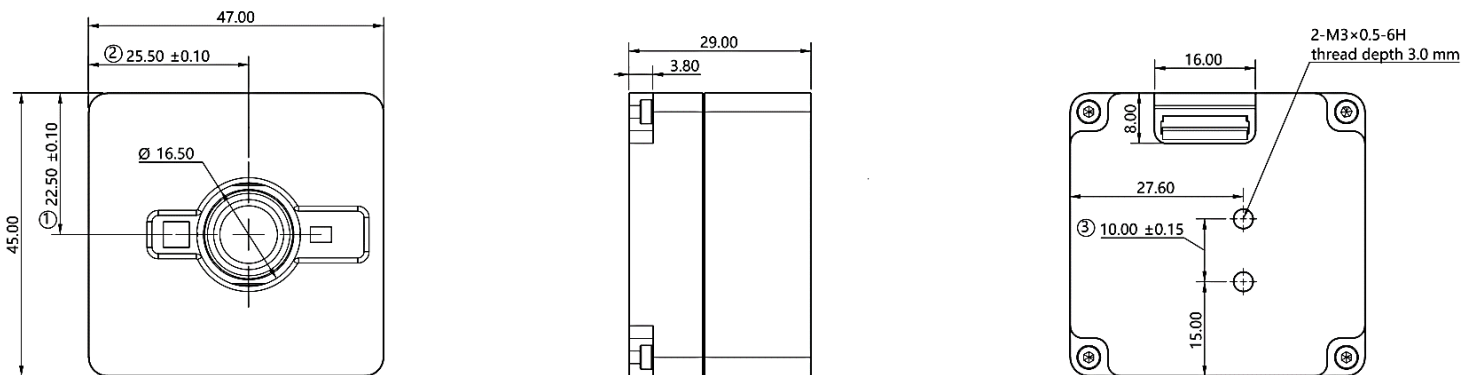


NOTE:

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

TOLERANCE TABLE					
LENGTH TOLERANCE		CHAMFER TOLERANCE		ANGLE TOLERANCE	
Size X	Tolerance	Size X	Tolerance	Size X	Tolerance
$0.5 < X \leq 3$	± 0.1	$0.5 < X \leq 3$	± 0.2	$X \leq 10$	$\pm 1^\circ$
$3 < X \leq 6$	± 0.1	$3 < X \leq 6$	± 0.5	$10 < X \leq 50$	$\pm 30'$
$6 < X \leq 30$	± 0.2	$6 < X \leq 30$	± 1	$50 < X \leq 120$	$\pm 20'$
$30 < X \leq 120$	± 0.3	X > 30	± 2	$120 < X \leq 400$	$\pm 10'$
$120 < X \leq 400$	± 0.5			X > 400	$\pm 5'$
$400 < X \leq 1000$	± 0.8				
$X > 1000$	± 1.2				

DIMENSIONS: LI-KW33000-MIPI-TOF-088H

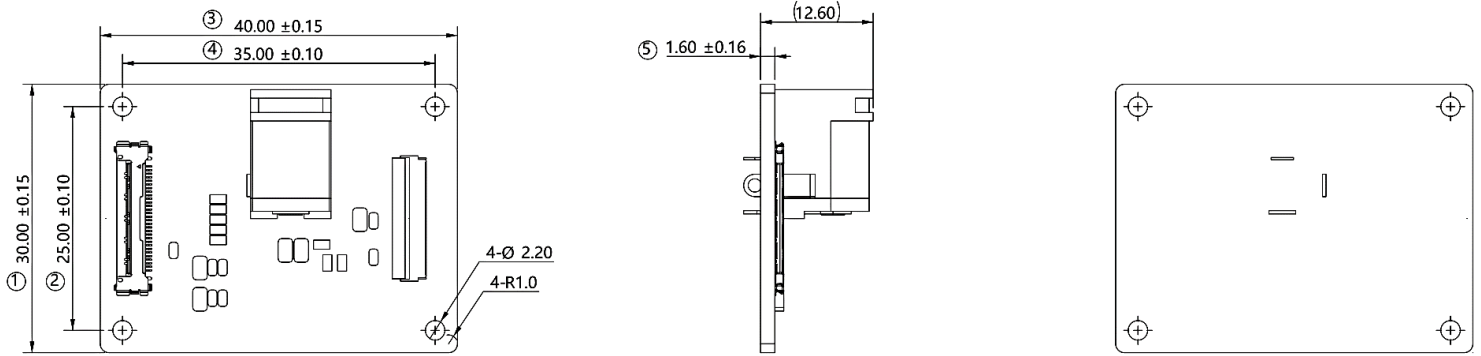


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TOLERANCE TABLE					
LENGTH TOLERANCE		CHAMFER TOLERANCE		ANGLE TOLERANCE	
Size X	Tolerance	Size X	Tolerance	Size X	Tolerance
$0.5 < X \leq 3$	± 0.1	$0.5 < X \leq 3$	± 0.2	$X \leq 10$	$\pm 1^\circ$
$3 < X \leq 6$	± 0.1	$3 < X \leq 6$	± 0.5	$10 < X \leq 50$	$\pm 30'$
$6 < X \leq 30$	± 0.2	$6 < X \leq 30$	± 1	$50 < X \leq 120$	$\pm 20'$
$30 < X \leq 120$	± 0.3	X > 30	± 2	$120 < X \leq 400$	$\pm 10'$
$120 < X \leq 400$	± 0.5			X > 400	$\pm 5'$
$400 < X \leq 1000$	± 0.8				
$X > 1000$	± 1.2				

● DIMENSIONS: LI-IPEX-FPC24-ADP



NOTE:

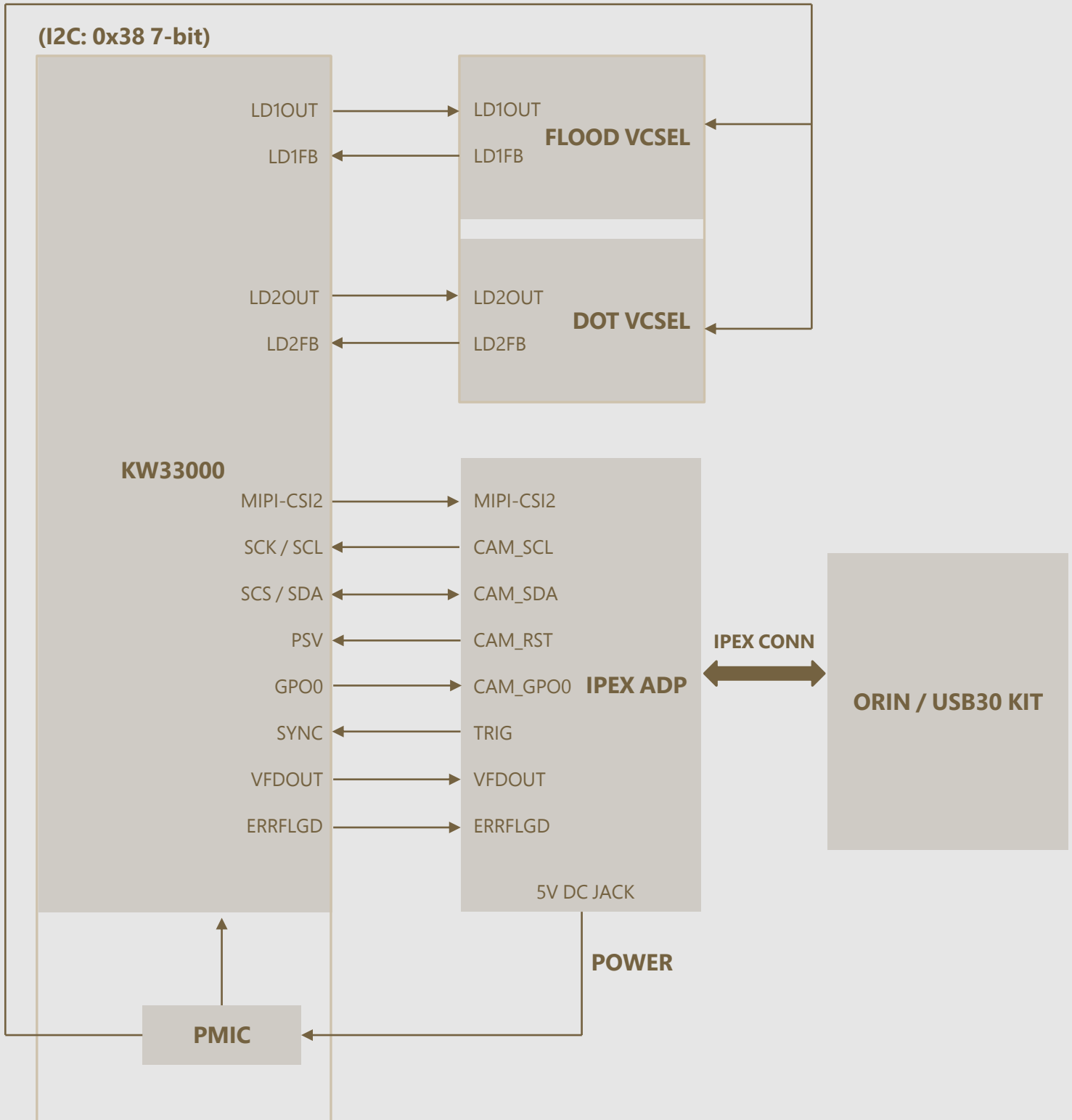
- Other unmarked tolerances refer to the tolerance table.
- ⊗ marked are important sizes.
- All materials are compliant with RoHS requirements.
- Unit: mm

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				

● IMAGE ORIENTATION



SYSTEM BLOCK DIAGRAM



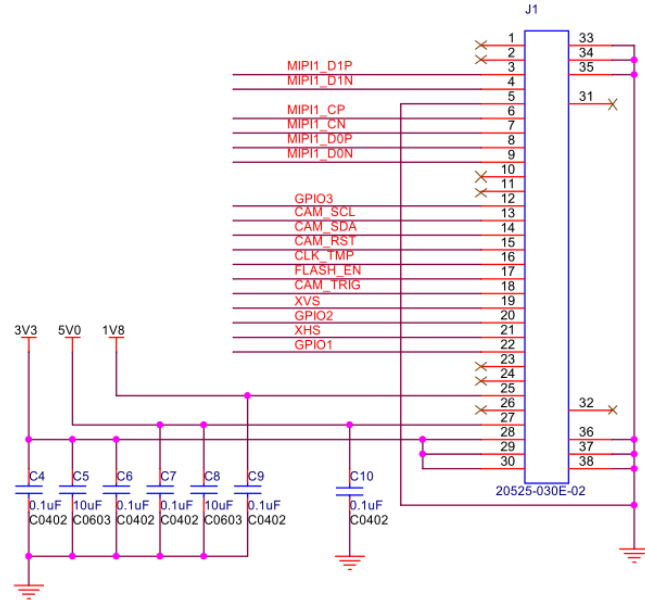
INTERFACE J1 (TO MAIN BOARD)

- Connector Part#: 20525-030E-02
- Number of Positions: 30
- Pitch: 0.4 mm



TO MAIN BOARD

I-PEX 0.4mm pitch connector



PINOUT DETAILS OF J1

Pin No	Signal Name	Pin Type	Description	Voltage Level
1	NC	-	No Connection	-
2	NC	-	No Connection	-
3	MIPI1_D1P	OUTPUT	MIPI1 Data Lane 1 Differential Pair +	MIPI DPHY
4	MIPI1_D1N	OUTPUT	MIPI1 Data Lane 1 Differential Pair -	MIPI DPHY
5	GND	GND	Ground signal for digital and analog	-
6	MIPI1_CP	OUTPUT	MIPI1 Clock Lane Differential Pair +	MIPI DPHY
7	MIPI1_CN	OUTPUT	MIPI1 Clock Lane Differential Pair -	MIPI DPHY
8	MIPI1_D0P	OUTPUT	MIPI1 Data0 Lane Differential Pair +	MIPI DPHY
9	MIPI1_D0N	OUTPUT	MIPI1 Data0 Lane Differential Pair -	MIPI DPHY
10	NC	-	No Connection	-
11	NC	-	No Connection	-
12	GPIO3	I/O	General-Purpose Input/Output1(Reserved)	1.8V

13	CAM_SCL	INPUT	1.8V IO Camera I2C SCL signal(Externally pull up to 1.8V using 1.5k)	1.8V
14	CAM_SDA	I/O	1.8V IO Camera I2C SDA signal(Externally pull up to 1.8V using 1.5k)	1.8V
15	CAM_RST	INPUT	1.8V IO camera reset signal (Externally pull up to 1.8V using 10k)	1.8V
16	CLK_TMP	INPUT	Reserved CLK for camera(Not used)	1.8V
17	FLASH_EN	I/O	Reserved 1.8V control signal to drive external light sources	1.8V
18	CAM_TRIG	INPUT	1.8V IO Trigger signla for camera	1.8V
19	XVS	I/O	1.8V IO, connect to ERRFLGD of sensor	1.8V
20	GPIO2	I/O	Reserved Test Point	1.8V
21	XHS	I/O	1.8V IO, connect to VFDOUT of sensor	1.8V
22	GPIO1	I/O	Reserved Test Point	1.8V
23	NC	–	No Connection	–
24	NC	–	No Connection	–
25	1V8	POWER	Reserved 1.8V power supply(Not used)	1.8V
26	NC	–	No Connection	–
27	5V0	POWER	5V power supply	5V
28	3V3	POWER	3.3V power supply	3.3V
29	3V3	POWER	3.3V power supply	3.3V
30	3V3	POWER	3.3V power supply	3.3V

USB3.0 CAMERA KIT

LI-USB30-CSLINK-IPX-TESTER



Top View



Bottom View

LI-IPX-KW33000-MIPI-TOF-088H can connect to LI-USB30-CSLINK-IPX-TESTER as a USB 3.0 camera.

Part#: **LI-USB30-IPX-KW33000-MIPI-TOF-088H**

SPECIFICATIONS

- USB 3.0 Super Speed support
- UVC compliant
- Allows customization
- 5 VDC Power Supply for camera
- Weight: ~ 86 g (Without IPEX cable, USB30 CABLE and power adaptor)
- Resolution: 640 x 480 @ 30 fps
- Power consumption: TBD
- Compatible with Windows, Linux OS and other OS which have UVC drivers



BOM

#	Items	QTY
1	LI-IPX-KW33000-MIPI-TOF-088H	1
2	LI-USB30-CSLINK-IPX-TESTER	1
3	USB3.0 Cable	1

SDK SUPPORTED

- Camera Tool Source Code in C#
- Capture & Display
- Register Access Function

- REVISION HISTORY

Revision	Description	Release Date
0.1	Initial draft.	9 Aug 2024

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