LEOPARD IMAGING

# LI-VB1940-MIPI-120H


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## INTRODUCTION

The LI-VB1940-MIPI-120H is a MIPI CSI-2 camera equipped with 5.1 megapixel, 2.25 µm global shutter image sensor VB1940 which could capture up to 60 frames per second in a 2560 x 1984 resolution format. This camera outputs RAW data.

## SPECIFICATIONS

| | |
|---|---|
| Sensor | 5.1MP Global Shutter RGB NIR Sensor |
| Optical Format | 1/2.5" |
| Shutter Type | Global shutter |
| Resolution | 2560 (H) x 1984 (V) (active pixels) |
| Pixel Size | 2.25 µm x 2.25 µm |
| Color / Mono | RGB NIR |
| Output Format | RAW 10-bit / 8-bit |
| Maximum Frame Rate | 60 fps @ Full resolution |
| ISP | Not included |
| Interface | 4-lane MIPI CSI-2 |
| Power Consumption | 90 mA @3.3 VDC<br>(2560 x 1984 @ 20 fps) |
| Operating Temp | -30°C ~ +85°C |
| Storage Temp | -40°C ~ +85°C |
| Weight | ~ 14 g |
| Part# | LI-VB1940-MIPI-120H |

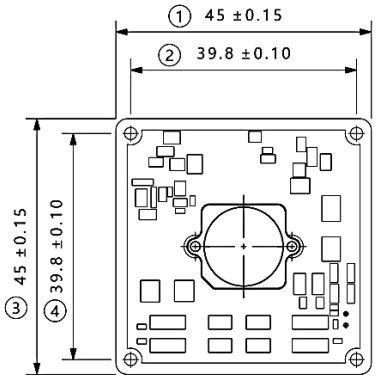
## APPLICATIONS

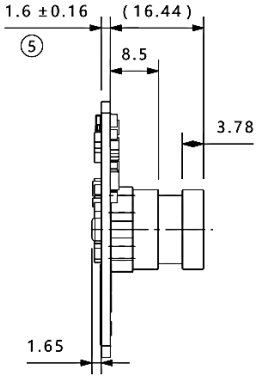
- Robotic Vision
- Autonomous Driving
- Driver Monitoring System
- Occupant Monitoring System

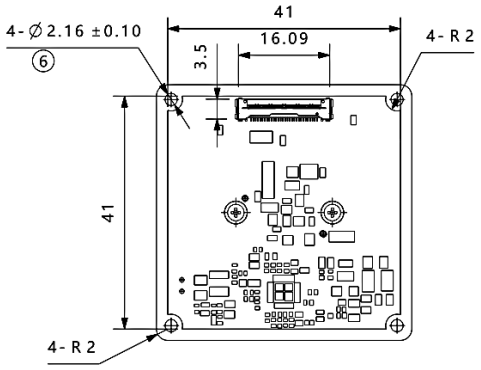
## LENS SPECIFICATIONS

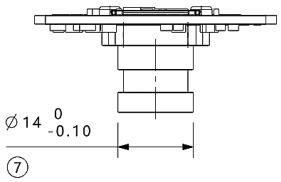
| | |
|---|---|
| Effective focal Length | 2.94 ± 5% mm |
| Aperture, F/# | 2.0 ± 5 |
| Field of View (FOV) | 120˚ horizontal |
| IR Filter | Visible + 940 nm band pass filter |
| Relative Illumination | (49.4 ±5) % |
| Optical Distortion | -79% ± 5% |
| Lens Mount | M12 x P0.5 |

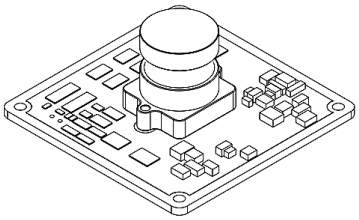
## DIMENSIONS



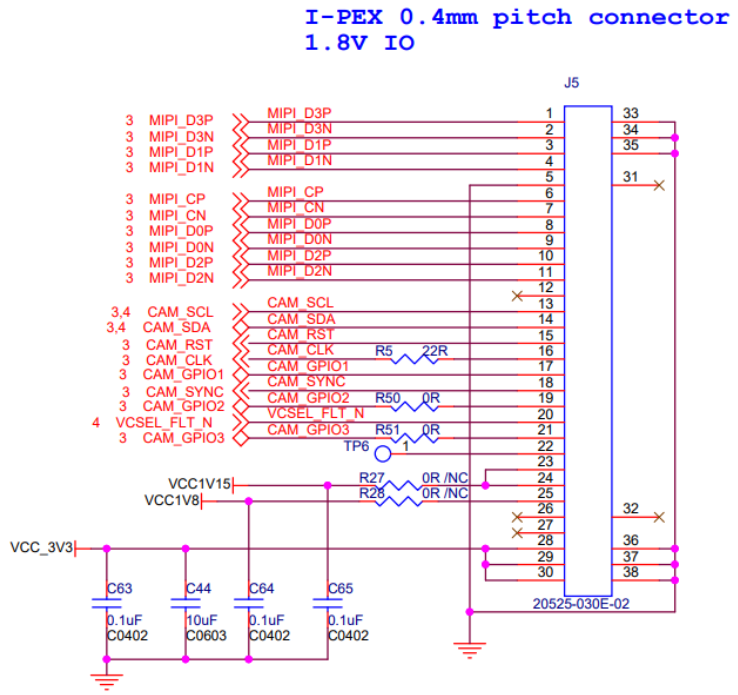
| TOLERANCE TABLE | | | | | |
|---|---|---|---|---|---|
| LENGTH TOLERANCE | | CHAMFER TOLERANCE | | ANGLE TOLERANCE | |
| Size X | Tolerance | Size X | Tolerance | Size X | Tolerance |
| 0.5<X≤3 | ±0.1 | 0.5<X≤3 | ±0.2 | X≤10 | ±1° |
| 3<X≤6 | ±0.1 | 3<X≤6 | ±0.5 | 10<X≤50 | ±30' |
| 6<X≤30 | ±0.2 | 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 | | | | |

**NOTE:**

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

## INTERFACE J5

- Connector Part#: 20525-030E-02
- Number of Positions: 30
- Pitch: 0.4 mm
- Mating I-PEX Cable: FAW-1233
- Sensor I2C Address: 0x10 (7-bit)
- External Power Supply: 3V3
- VCC2V8A, VCC1V8, VCC1V15 are generated from board.




## PINOUT DETAILS OF J5

| Pin No | Signal Name | Pin Type | Description | Voltage Level |
|---|---|---|---|---|
| 1 | MIPI_D3P | OUTPUT | MIPI Clock Data3 Differential Pair + | MIPI DPHY |
| 2 | MIPI_D3N | OUTPUT | MIPI Clock Data3 Differential Pair - | MIPI DPHY |
| 3 | MIPI_D1P | OUTPUT | MIPI Clock Data1 Differential Pair + | MIPI DPHY |
| 4 | MIPI_D1N | OUTPUT | MIPI Clock Data1 Differential Pair - | MIPI DPHY |
| 5 | GND | POWER | Ground signal for digital and analog | - |
| 6 | MIPI_CP | OUTPUT | MIPI Clock Lane Differential Pair + | MIPI DPHY |
| 7 | MIPI_CN | OUTPUT | MIPI Clock Lane Differential Pair - | MIPI DPHY |
| 8 | MIPI_D0P | OUTPUT | MIPI Clock Data0 Differential Pair + | MIPI DPHY |
| 9 | MIPI_D0N | OUTPUT | MIPI Clock Data0 Differential Pair - | MIPI DPHY |
| 10 | MIPI_D2P | OUTPUT | MIPI Clock Data2 Differential Pair + | MIPI DPHY |
| 11 | MIPI_D2N | OUTPUT | MIPI Clock Data2 Differential Pair - | MIPI DPHY |
| 12 | NC | - | - | - |
| 13 | CAM_SCL | INPUT | 1.8V IO Camera I2C SCL signal with 1.5kΩ onboard pull-up. | 1.8V |

| Pin No | Signal Name | Pin Type | Description | Voltage Level |
|---|---|---|---|---|
| 14 | CAM_SDA | I/O | 1.8V IO Camera I2C SDA signal with 1.5kΩ onboard pull-up | 1.8V |
| 15 | CAM_RST | INPUT | 1.8V IO Camera reset signal with 10kΩ onboard pull-up (Active Low) | 1.8V |
| 16 | CAM_CLK | INPUT | Reserved CLK for camera | 1.8V |
| 17 | CAM_GPIO1 | I/O | General-Purpose Input/Output 1 | 1.8V |
| 18 | CAM_SYNC | I/O | 1.8V IO Horizontal sync signal for camera (CAM_GPIO0) | 1.8V |
| 19 | CAM_GPIO2 | I/O | General-Purpose Input/Output 2 | 1.8V |
| 20 | VCSEL_FLT_N | INPUT | Reserved | 1.8V |
| 21 | CAM_GPIO3 | I/O | General-Purpose Input/Output 3 | 1.8V |
| 22 | TP | I/O | Reserved Test Point | - |
| 23 | VCC_1V15 | POWER | Reserved 1.15V power supply | 1.15V |
| 24 | VCC_1V15 | POWER | Reserved 1.15V power supply | 1.15V |
| 25 | VCC_1V8 | POWER | Reserved 1.8V power supply | 1.8V |
| 26 | NC | - | - | - |
| 27 | NC | - | - | - |
| 28 | VCC_3V3 | POWER | 3.3V power supply | 3.3V |
| 29 | VCC_3V3 | POWER | 3.3V power supply | 3.3V |
| 30 | VCC_3V3 | POWER | 3.3V power supply | 3.3V |

## REVISION HISTORY

| Revision | Description | Release Date |
|---|---|---|
| 0.1 | Initial draft. | 14 May 2025 |

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