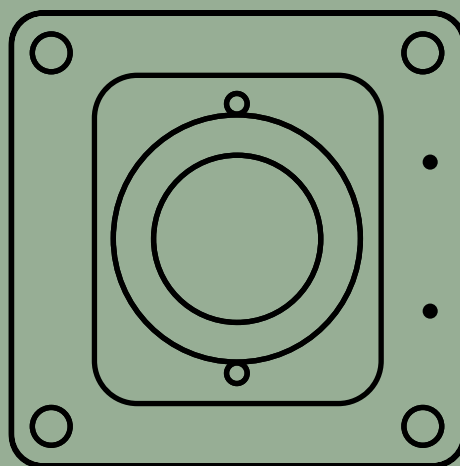


*ZED X One Core

Monocular Camera Overview

The ZED X One Core is a compact, barebone monocular camera designed for OEMs who need a vision module that fits effortlessly into small enclosures and tightly integrated robotic systems.

Its native MIPI interface connects to a capture card for low-latency acquisition, supporting up to four cameras. The capture card is compatible with the NVIDIA® Jetson AGX Thor™ through the NVIDIA® Holoscan Sensor Bridge, enabling efficient deployment of advanced edge-AI pipelines. It also supports the NVIDIA® Jetson AGX Orin™ Developer Kit.



*ZED X One Core Main Features & General Specifications



Barebone OEM integration

The ZED X One Core is a compact, lightweight camera module designed for seamless OEM integration. Its minimal footprint fits easily into embedded enclosures and tightly integrated robotic systems.

Thor-ready MIPI interface

The native MIPI interface provides deterministic, low-latency data transfer for robotics. Combined with NVIDIA® Holoscan and Jetson Thor™ compatibility, it streamlines edge-AI deployment for advanced perception pipelines.

Multi-camera synchronization

Hardware synchronization for multiple connected cameras at frame-level within microseconds. Capture the machines surroundings with multiple cameras, all triggered simultaneously.

Global Shutter HD 60fps

The global shutter sensor delivers distortion-free imaging with smooth Full HD capture at 60fps. It ensures sharp detail and reliable performance in fast-moving, high-dynamic applications.

High-performance IMU

The integrated IMU combines a 16-bit triaxial accelerometer and gyroscope with vibration resistance and ultra-low noise for precise motion tracking in dynamic environments.

Versatile lens options

Choose from fisheye, wide or narrow lenses to match your field-of-view needs, from fisheye ultra-wide coverage to precise, focused inspection.

| Camera | |
|-------------------|---|
| Sensor Type | 1/2.6" 2.3MP CMOS - Global Shutter |
| Output Resolution | 1920x1200 @60fps 1920x1080 @60fps 960x600 @120fps |
| Image Format | 16:10 |
| Output Format | Raw 10 / YUV 4:2:0 (Argus) |
| Field of View | |
| Fisheye lens | Max. 204°(H) x 137°(V) x 218°(D) |
| Wide lens | Max. 110°(H) x 80°(V) x 120°(D) |
| Narrow lens | Max. 73°(H) x 45°(V) x 87°(D) |
| Focal Length | |
| Fisheye lens | 1.38mm (0.054") |
| Wide lens | 2.2mm (0.086") |
| Narrow lens | 4.6mm (0.18") |
| Aperture | |
| Fisheye lens | f/2.0 |
| Wide lens | f/2.2 |
| Narrow lens | f/2.0 |
| Distortion | |
| Fisheye lens | < 18.80% (F-θ) |
| Wide lens | < 4.39% |
| Narrow lens | -6.7% |
| Interface | MIPI Micro I-PEX cable |

| Sensors | |
|-------------------------|--|
| Image | RGB Global Shutter Sensor |
| Motion | BOSCH BMI088 IMU |
| Physical Specifications | |
| Dimensions | |
| Fisheye lens | 27 x 27 x 29.72 mm (1.06 x 1.06 x 1.17") |
| Wide lens | 27 x 27 x 34.52 mm (1.06 x 1.06 x 1.34") |
| Narrow lens | 27 x 27 x 31.27 mm (1.06 x 1.06 x 1.23") |
| Mounting | 4x 2.2mm diameter holes |
| Weight | |
| Fisheye lens | 17g (0.04 lb.) |
| Wide lens | 19g (0.04 lb.) |
| Narrow lens | 14g (0.03 lb.) |
| Operating Temp. | -20°C to +60°C (-4°F to 140°F) |
| Power consumption | Power via MIPI 0.8W (240mA @ 3.3VDC) |
| Warranty | 2-year warranty |
| System Requirements | |
| System | NVIDIA® Jetson |
| OS | Jetson Linux (L4T) v35.1 or newer |

*ZED X One Core Detailed Specifications

Image Sensor

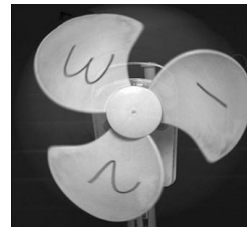
The ZED X One Core sensor delivers 2.3MP clarity and strong low-light capabilities, ideal for capturing crisp and distortion-free footage of fast moving objects in robotics applications.

| | |
|-------------------|---|
| Sensor Type | 1/2.6" 2.3MP CMOS |
| Array Size | 1928 x 1208 pixels |
| Pixel Size | 3µm x 3µm |
| Shutter | Electronically synchronized global shutter |
| Output Resolution | 1920x1200 @60fps 1920x1080 @60fps cropping mode 960x600 @120fps binning mode |
| Output Format | RAW10 (v4l2) / NV21 (Argus) |
| Max S/N Ratio | 38dB |
| Dynamic Range | 71.4dB |
| Sensitivity | 22.3Ke/Lux*s |
| Camera Control | Exposure, analog & digital gain, gamma, white balance, saturation, sharpness, denoising, brightness, contrast |

Distortion free images of fast moving objects



Rolling Shutter



Global Shutter

Motion Sensor BMI088 IMU

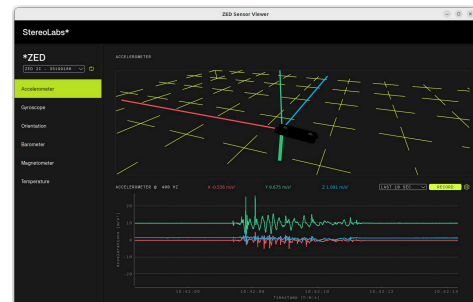
The integrated IMU is a high-performance 6-axis inertial sensor with a 16-bit triaxial accelerometer and gyroscope, providing precise orientation and motion detection for our cameras. Offering high vibration robustness and excellent temperature stability, it's ideal for harsh industrial robotics environments.

| | |
|-----------------------------|------------------|
| Motion Sensor | BOSCH BMI088 IMU |
| Accelerometer Range | +/- 12G |
| Accelerometer Resolution | 0.36 mg |
| Accelerometer Noise Density | 2.3 mg |
| Gyroscope Range | +/- 1000 dps |
| Gyroscope Resolution | 0.03 dps |
| Gyroscope Noise Density | 0.20 dps |
| Sensitivity Error | +/- 0.5% |
| Output Data Rate | 200 Hz |

Sensors API

You can access these sensors and acquire sensor data by using the Sensors API.

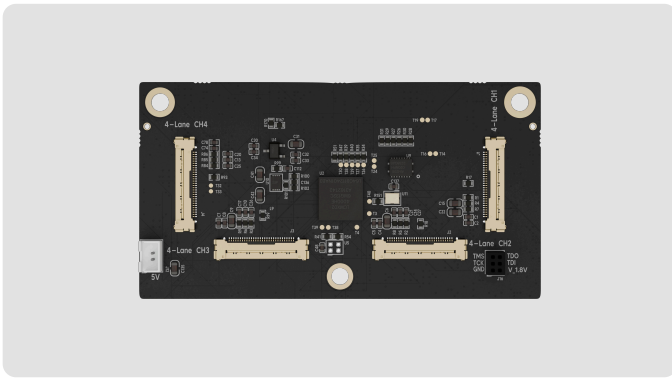
Please visit stereolabs.com/docs for tutorials.



*ZED X One Core Accessories

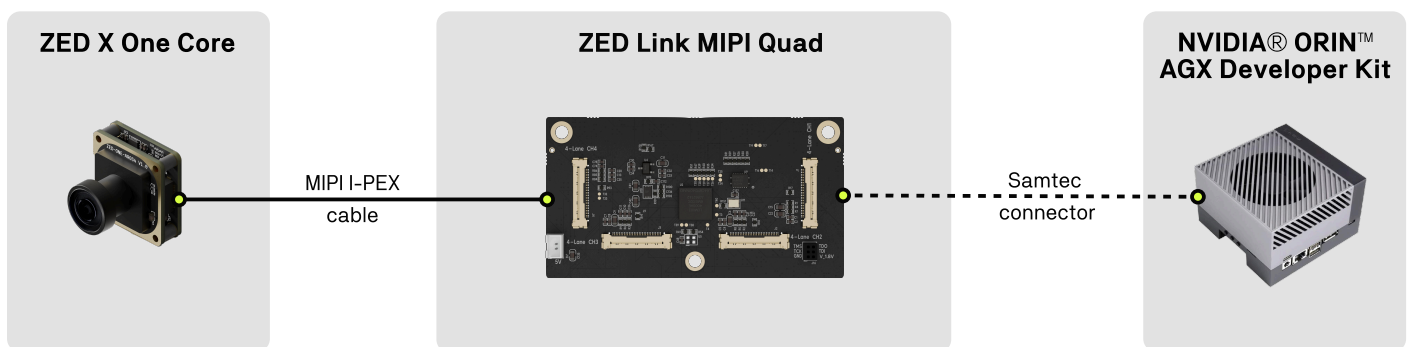
Capture Card

To capture the ZED X One Core on NVIDIA® Jetson Thor™, use ZED Link MIPI capture card that connects to NVIDIA® Holoscan Sensor Bridge. For Orin™ AGX platform, our MIPI capture card connects directly to the Jetson's CSI port.

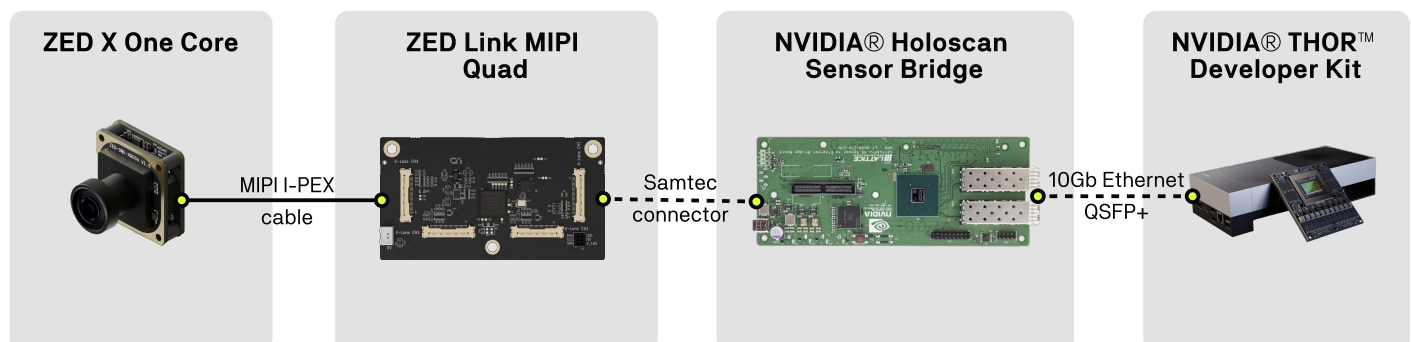


| | |
|------------------------|--|
| Model | ZED Link MIPI Capture Card |
| Compatibility | NVIDIA® Jetson AGX Orin™ Developer Kit (J12) NVIDIA® Holoscan Sensor Bridge |
| Max. number of cameras | Capture 4x MIPI camera input in SD/HD, up to 1920x1200@60fps |
| Size | 75 x 40 mm |

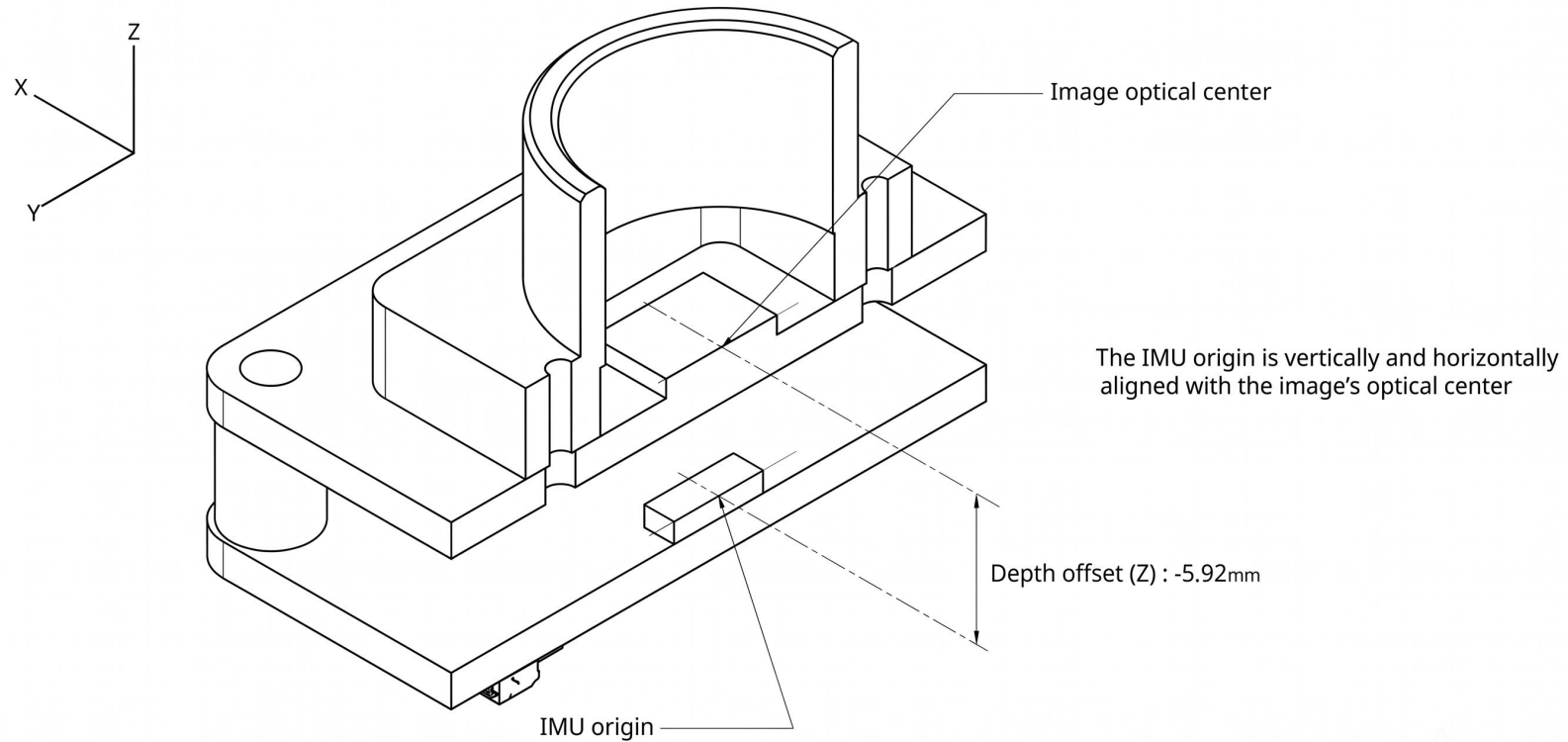
Workflow overview with NVIDIA® Jetson AGX Orin™ Developer Kit



Workflow overview with NVIDIA® Holoscan and Jetson Thor™

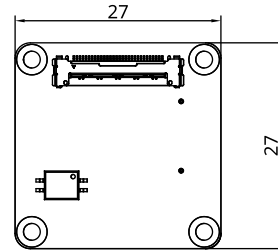


*ZED X One Core Sensor Positions

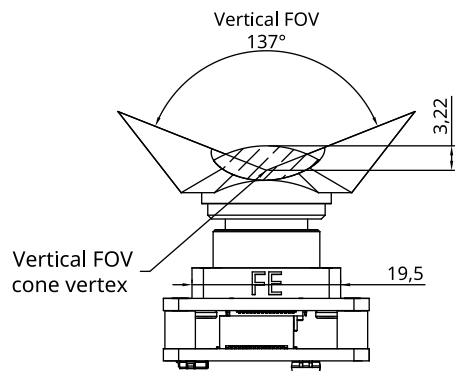
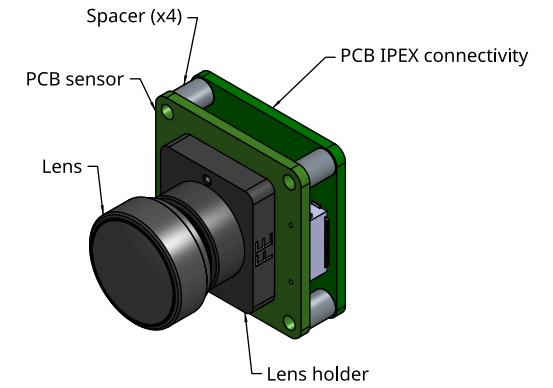


The offset values specify the location of the IMU origin with respect to the center of the image plane.

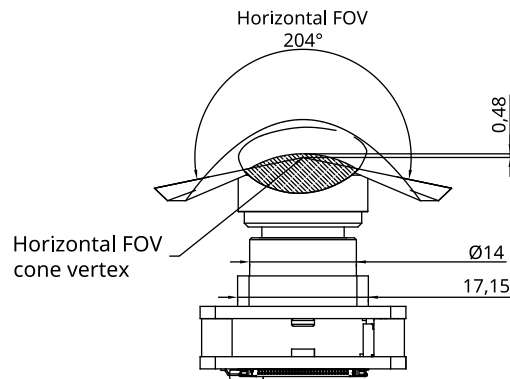
*ZED X One Core - Fisheye lens Technical Drawings



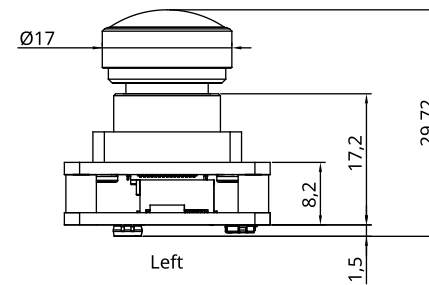
Back



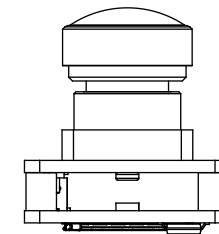
Right



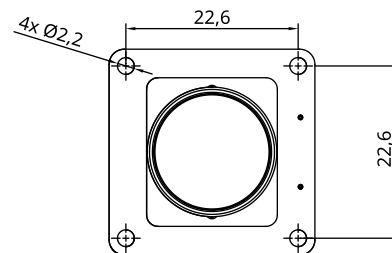
Bottom



Left

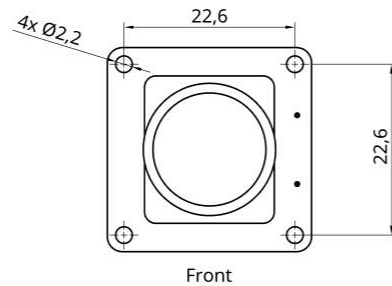
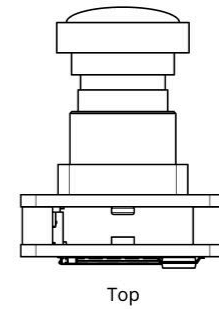
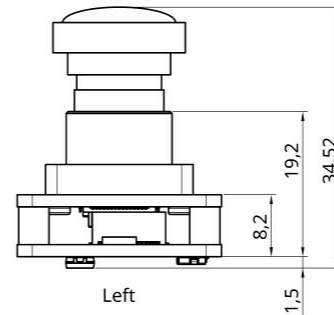
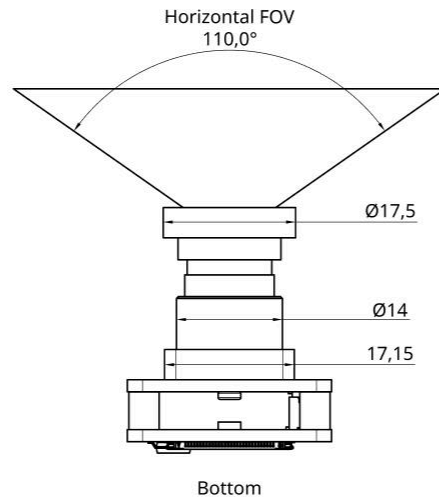
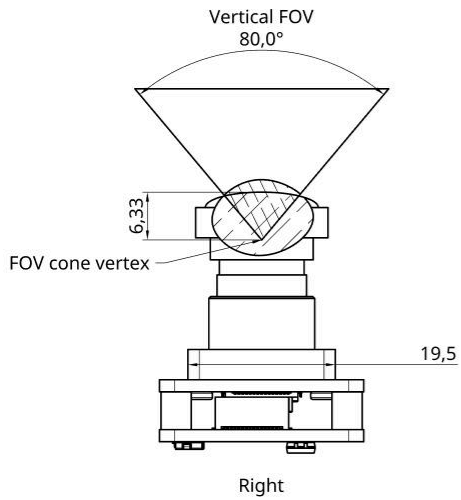
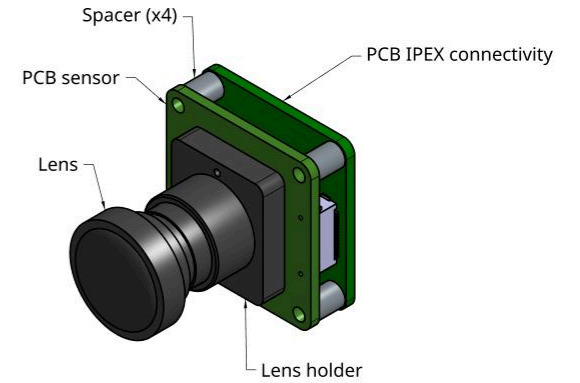
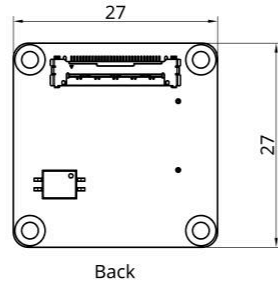


Top

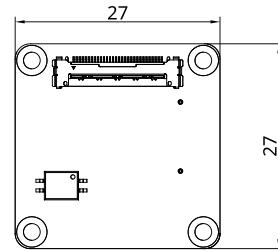


Front

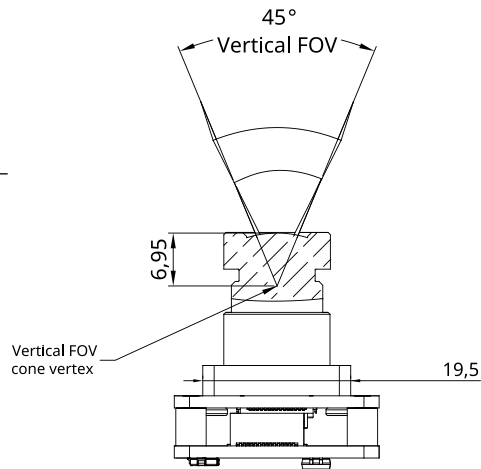
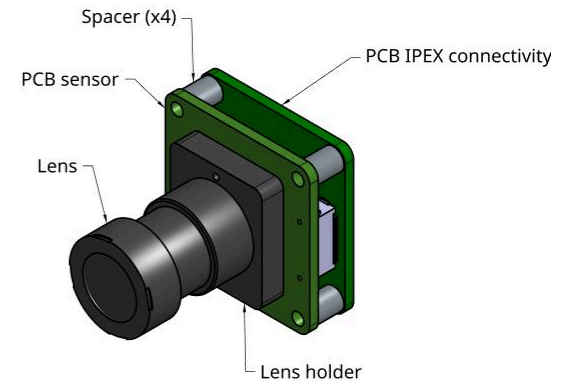
*ZED X One Core - Wide lens Technical Drawings



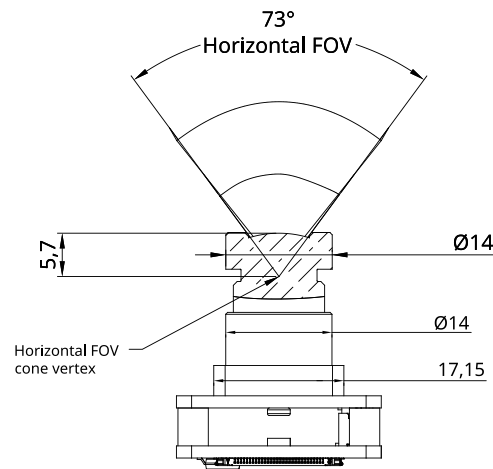
*ZED X One Core - Narrow lens Technical Drawings



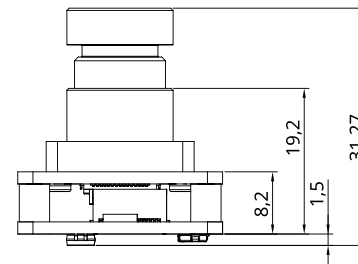
Back



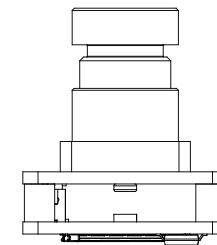
Right



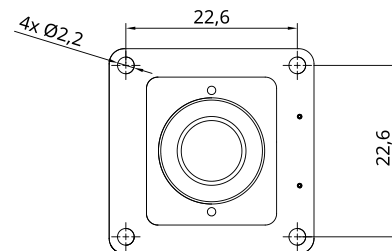
Bottom



Left



Top



Front

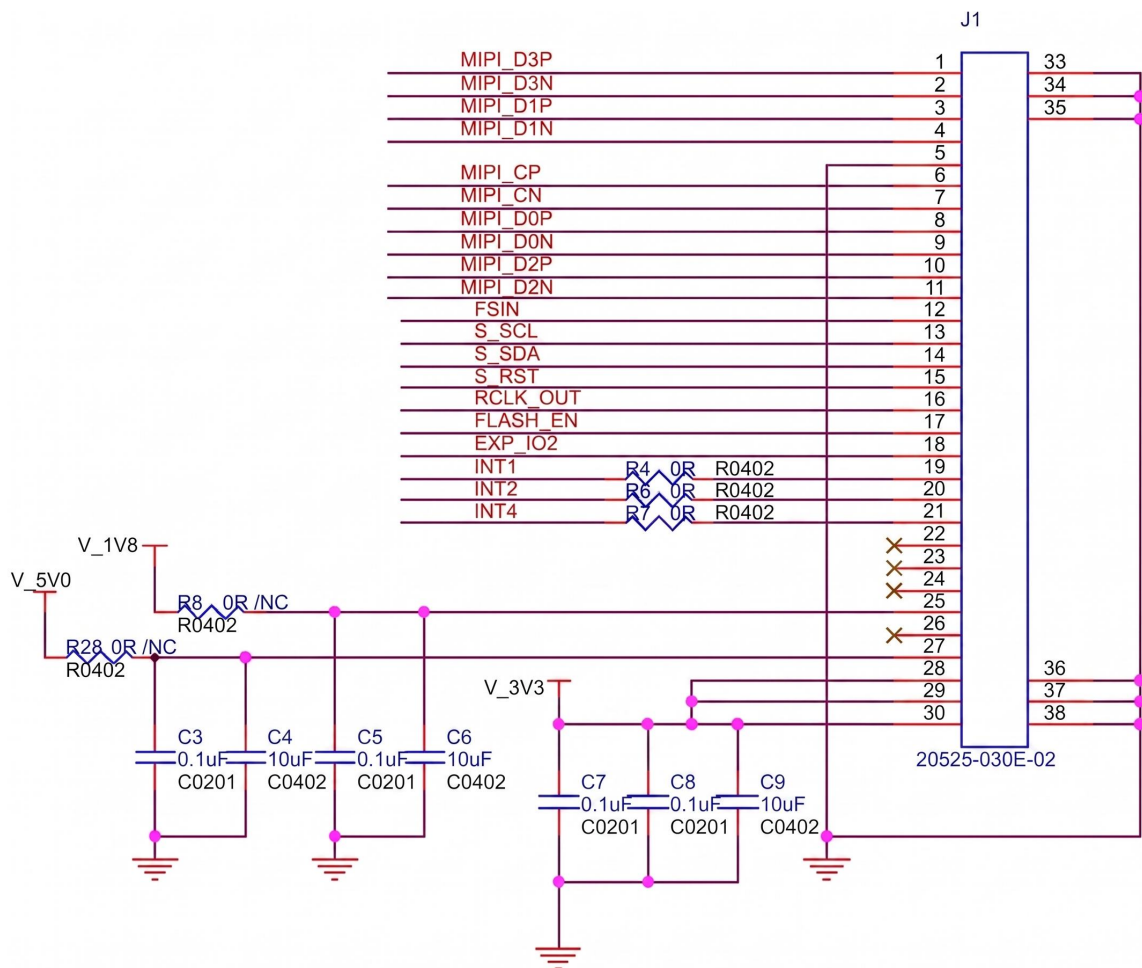
*ZED X One Core Interfaces

I-PEX 20525-030E-02 (30-PIN)

| | |
|-------------------|----------------------|
| Part Number | 20525-030E-02 |
| Connector Type | FAW-1233-XX |
| Connector Profile | 30 pins 0.4 mm pitch |

Signal Voltage Levels

| Pins | Group | Level |
|----------------|--|--------------------------------------|
| 1 - 4 6 - 11 | MIPI CSI-2 data lanes (D0-D3) and clock | MIPI D-PHY signaling (1.2 V nominal) |
| 12 - 21 | Control, sync & interrupts (FSIN, I ² C, S_RST, FLASH_EN, INT1/2/4) | 1.8 V CMOS |
| 28 - 30 | VDD_3V3 supply | 3.3 V |
| 5 22 - 27 | Ground / Not Connected | — |



*ZED X One Core Interfaces

Pin Description I-PEX 20525-030E-02 (30-PIN)

| Pins | Name | Level | Dir. | Function |
|-------|----------|-------------|--------------|--|
| 1 | MIPI_D3P | D-PHY 1.2 V | Out | CSI-2 data lane 3 (+) |
| 2 | MIPI_D3N | D-PHY 1.2 V | Out | CSI-2 data lane 3 (-) |
| 3 | MIPI_D1P | D-PHY 1.2 V | Out | CSI-2 data lane 1 (+) |
| 4 | MIPI_D1N | D-PHY 1.2 V | Out | CSI-2 data lane 1 (-) |
| 5 | GND | – | – | Ground reference |
| 6 | MIPI_CP | D-PHY 1.2 V | Out | CSI-2 clock lane (+) |
| 7 | MIPI_CN | D-PHY 1.2 V | Out | CSI-2 clock lane (-) |
| 8 | MIPI_D0P | D-PHY 1.2 V | Out | CSI-2 data lane 0 (+) |
| 9 | MIPI_D0N | D-PHY 1.2 V | Out | CSI-2 data lane 0 (-) |
| 10 | MIPI_D2P | D-PHY 1.2 V | Out | CSI-2 data lane 2 (+) |
| 11 | MIPI_D2N | D-PHY 1.2 V | Out | CSI-2 data lane 2 (-) |
| 12 | FSIN | 1.8 V | In | Frame-sync / external trigger input – multi-camera synchronization |
| 13 | S_SCL | 1.8 V | In (OD) | I ² C clock – Camera control bus, host is master |
| 14 | S_SDA | 1.8 V | Bi-Dir. (OD) | I ² C data |
| 15 | S_RST | 1.8 V | In | Sensor reset |
| 16 | NC | – | – | Not connected – do not drive |
| 17 | FLASH_EN | 1.8 V | Out | Control signal to drive external light sources |
| 18 | NC | – | – | Not connected – do not drive |
| 19 | INT1 | 1.8 V | Out | IMU interrupt – BMI088 accelerometer INT1 |
| 20 | INT2 | 1.8 V | Out | IMU interrupt – BMI088 accelerometer INT2 (internally connected to INT4) |
| 21 | INT4 | 1.8 V | Out | IMU interrupt – BMI088 gyroscope INT4 (internally connected to INT2) |
| 22-27 | NC | – | – | Not connected – do not drive |
| 28-30 | VDD_3V3 | 3.3 V | Power In | 3.3 V supply input – three pins in parallel for current capacity |

*ZED X One Core Part Number

ZED X One Core Part Number

| | ZED X One Core No lens | ZED X One Core Narrow lens | ZED X One Core Wide lens | ZED X One Core Fisheye lens |
|-----|---------------------------|-------------------------------|-----------------------------|--------------------------------|
| SKU | ZED-411013 | ZED-412013 | ZED-413013 | ZED-414013 |