**OAK-D IoT-75 (USB boot)**

# Features

* Movidius Myriad X VPU
* 32Kb I2C EEPROM
* USB3.1, gen2 10gbps
* 2x 2-lane MIPI connects OV9282 1MP global shutter cameras with no IR filter
* 1x center 4-lane MIPI connects IMX378 12 MP color rolling shutter camera
* ¼ -20 tripod mount on the bottom of the unit
* VESA-spec (7.5cm, M4) set of mounting holes on the back of the unit

# Applications

* Industrial automation
* Robotics
* Surveillance IP camera
* Security systems
* Remote intelligence

# Description

The Luxonis OAK-D IoT-75 is an AI Edge vision system driven by Movidius Myriad X VPU. The system is powered over a USB Type-C. OAK-D IoT-75 has three on-board cameras which implement stereo and RGB vision, piped directly into the DepthAI Myriad X VPU for depth and AI processing. The data is then output to a host via USB 3.1 Gen1.

OAK-D IoT-75 integrates ESP32-WROOM-32D (Wi-Fi 2.4 GHz to 2.5 GHz) module which connects OAK-SoM-IoT over QSPI.

Flashing/debugging ESP32 is possible over UART bridge, connecting to micro USB2 connector over USB.

**Device Information**

|  |  |
| --- | --- |
| **PART NUMBER** | **SIZE (WxHxD)** |
| OAK-D-IoT-75 | 104mm x 41mm x 23.3mm |

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Figure 1 – OAK-D IoT-75

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|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Electrical Characteristics | |  |  |  |  |
| Absolute Maximum Ratings1 | | |  |  |  |
|  | | |  |  |  |
| **SYMBOL** | **RATINGS** | | **MIN** | **MAX** | **UNIT** |
| **V**BUS | USB input supply voltage range.2 | | 3.5 | 5.5 | V |
| **I**VBUS | Maximum input current requirement | |  | 2 | A |
| **T**stq | Ambient temperature | | 0 | 60 | C |

## 

## Recommended Operating Conditions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SYMBOL** | **RATINGS** | **MIN** | **TYP** | **MAX** | **UNIT** |
| **V**BUS | VBUS input supply voltage |  | 5V | 5.25 | V |
| **P** | Power consumption requirement | 4 | 6 | 7.5 | W |
| **PIDLE** | VBUS idle power draw (Myriad X booted) |  | 2.5 |  | W |
| **T**A | Ambient operating temperature |  |  | 50 | °C |

1. Stresses beyond those listed under *Absolute Maximum Ratings* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended* *Operating Conditions*. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
2. According to industry standard Universal Serial Bus (USB) specifications

# IoT device with integrated ESP32 module

OAK-D IoT-75 integrates ESP32-WROOM-32D module connected to the OAK-SoM-IoT (Myriad X) over two QSPI busses. SPI1 bus (VDDIOB\_GPIO) is meant to be used for main data flow between Myriad X and EPS32, where ESP32 is master. This bus uses a 3V3 GPIO logic level and is also fully exposed on one of the headers on the PCB (for more refer to the schematics).

Second QSPI bus is SPIO0, ESP32, Myriad X, NOR flash and IMU (BNO086) are all connected to the same bus. SPI NOR flash is a peripheral which is selected with CS0 and can be accessed from both Myriad X and ESP32 (read/write). IMU is also peripheral and can be selected with CS1. In most use cases ESP32 is master, but in the same way Myriad X can be master accessing both peripherals.

Communication between EPS32 and Myriad X is not meant to be executed on the SPI0 bus, but in case that would be requiered both can be either a master or a slave device.

This bus uses a 1V8 GPIO logic level and is also fully exposed on one of the headers on the PCB (for more refer to the schematics).

# Camera sensors characteristics

|  |
| --- |
| Center Color Camera |

The color sensor on the stereo depth module in addition to color image provides texture information. Usages for the texture information include overlay on a depth image to create a color point cloud and overlay on a 3D model for reconstruction.

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| **Image sensor** | Sony IMX378 |
| **Active pixels** | 4056x3040@60fps |
| **Output video format** | RAW12/10/8 |
| **Focus type** | Auto Focus 8cm - ∞ / Fixed Focus 50cm- ∞ |
| **FOV** | 78° |
| **Shutter Type** | Rolling shutter |
| **IR sensitive** | No |

## Stereo vision gray scale camera

Stereo cameras compare the features and based on the disparity determines the distance/depth of the object tracked on by the product. It also provides the depth map in color and raw depth map in gray scale.

|  |  |
| --- | --- |
| **Parameter** | **Value** |
| **Image sensor** | OmniVision OV9282 |
| **Active pixels** | 1280x800@120FPS |
| **Output video format** | 8/10-bit RAW |
| **Focus type** | Fixed Focus 19.6cm - ∞ |
| **FOV** | 89.5° |
| **Shutter Type** | Global shutter |
| **IR sensitive** | No |

# Mechanical Information

The following information is [the most](http://www.ti.com/corp/docs/legal/termsofuse.shtml) [current](http://www.ti.com/corp/docs/legal/termsofuse.shtml) data available for the designated device. This data is subject to change without notice and without revision of this document.

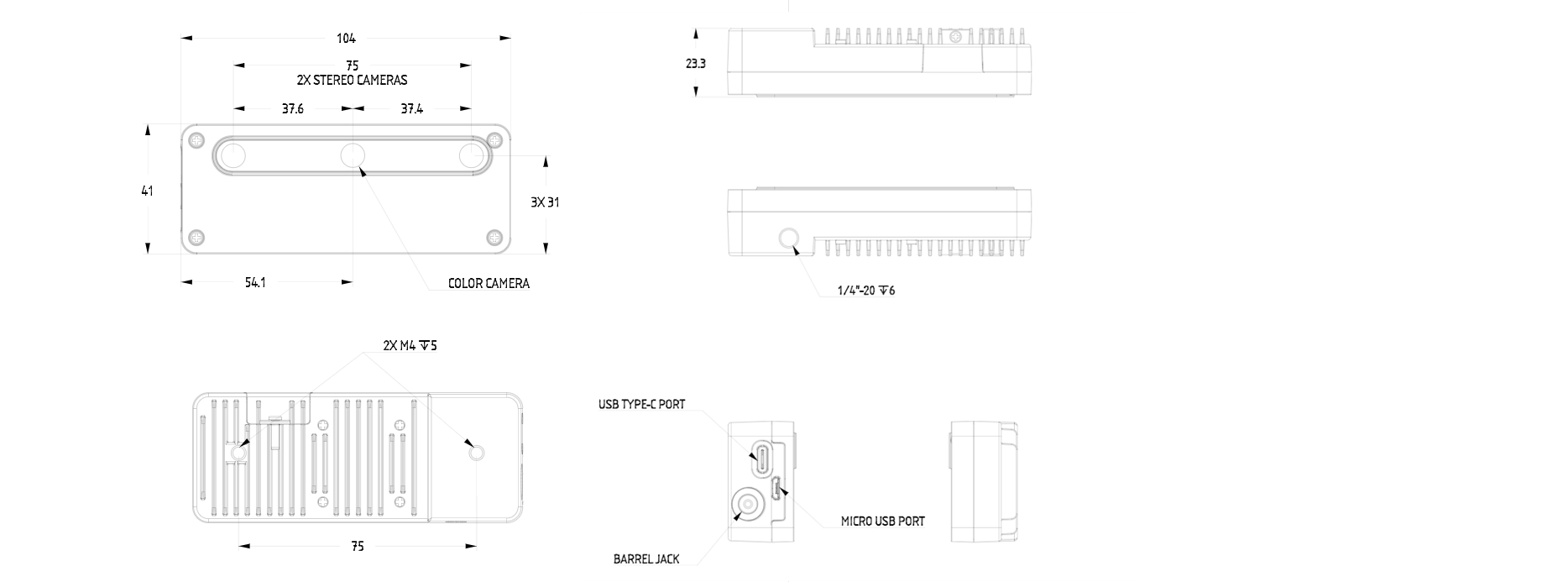
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Figure 2 – OAK-D IoT-75 Mechanical measurements