

USB components

Multi-Sensor Cameras

Base unit and sensor boards

- Up to four pixel-synchronous sensors connected to the base unit by flex-foil cable (LVDS data transfer)
- Free positioning of the external sensors
- Plug and play functionality: sensors can be added or removed easily; different sensor types may be connected to the same main board
- FPGA chip with 256 MB RAM
- Individual configuration of each sensor
- Highspeed USB 2.0 interface
- SDK and API included, same API on all cameras
- Trigger input and strobe output



Photo similar to original product

Camera Configuration

Configure your multi-sensor camera with

- one base unit **VRmMFC** and
- 2, 3, or 4 sensor boards **VRm(M)S-X**.
Color and monochrome variants of the same sensor type may be used on the same base unit.

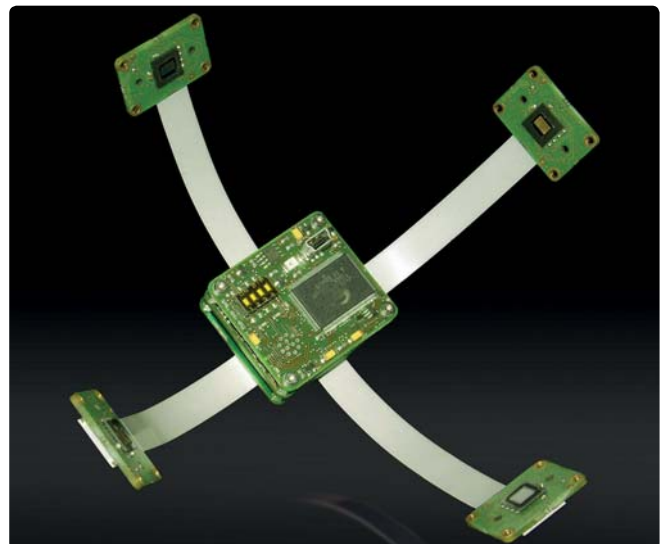
Available Sensor Board Designs

OEM: sensor board without optics

COB M9LP: sensor board with M9 low profile lens mount and 6.0 mm F2.8 lens coated with IR-cut filter (sensor board VRmMS-12 only)

COB S-mount M12: sensor board with M12 lens mount, 12.0 mm F2.0 lens, and filter glass

COB C-mount: sensor board with C-mount and filter glass (no lens included)



Options

Flex Foil Cables

- Cable lengths up to 100 cm (standard: 21 cm)

Optics (COB designs only)

- Filter glass: window glass, IR-pass/cut filter, without filter (COB M12 and COB C-mount only).
- Further lenses on request (COB M12 only).

USB components

VRmMFC

Base unit

Physical Characteristics

Dimensions

| | |
|----------------------|-----------------|
| Number of Boards | 3 |
| Board Stack Size | 42 x 40 x 21 mm |
| Mounting Holes | 36 x 32 mm |
| Inter-board Distance | 5 mm |

Ambient Conditions

| | |
|-----------------------|----------------|
| Operating Temperature | 0 ... +40 °C |
| Storage Temperature | -30 ... +80 °C |

Interfaces

USB 2.0 port (USB Mini-B); power supply via USB

Hirose DF14-15P for trigger, strobe, and external power supply

Camera Features

All sensors are triggered synchronously; the image data of all sensors is always available at the same time with sensor ID, timestamp, and framecounter

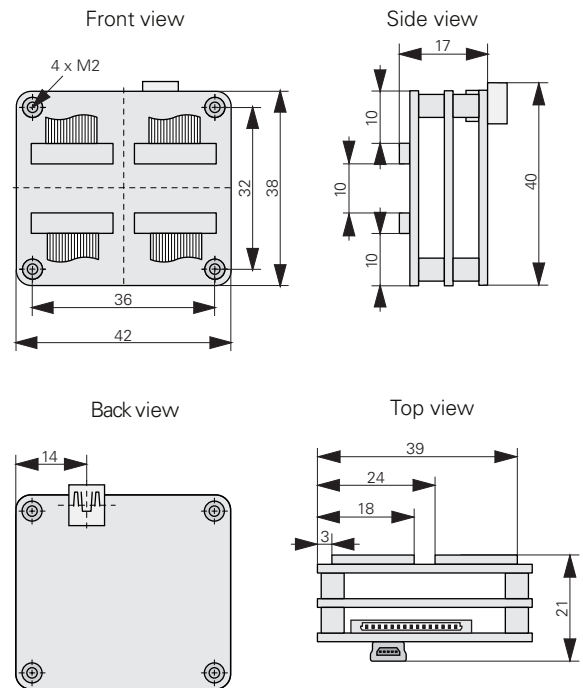
User programmable windowing and panning

Freely definable region of interest (ROI) per sensor

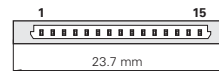
Individual exposure time per sensor

Adjustable anti-blooming circuit

Base Unit



Hirose DF14-15P



| Pin | Signal | Pin | Signal |
|-----|----------|-----|-------------------------------|
| 1 | +5 V I/O | 9 | TTL Trigger In (+3.3 ... 5 V) |
| 2 | +5 V I/O | 10 | TTL Strobe Out (+5 V) |
| 3 | GND | 11 | reserved |
| 4 | reserved | 12 | reserved |
| 5 | reserved | 13 | GND |
| 6 | reserved | 14 | reserved |
| 7 | reserved | 15 | reserved |
| 8 | GND | | |

USB components

VRmS-9

Sensor board

Sensor Characteristics

| | |
|--------------------|---------------------------------------|
| Type | Aptina MT9M001 |
| Technology | CMOS, rolling shutter |
| Mono/Color | monochrome |
| Sensor Size | 1/2" |
| Resolution | 1288 x 1032 |
| Pixel Size | 5.2 μm x 5.2 μm |
| Max. Frame Rate * | 16 Hz |
| Min. Exposure Time | 38 μs |
| Bit Depth | 8/10 bit |
| Pixel Clock | 26.6 MHz |
| Responsivity | > 2.1 V/lux·sec |
| Dynamic Range | 68 dB linear |

Physical Characteristics

Dimensions

Board Size

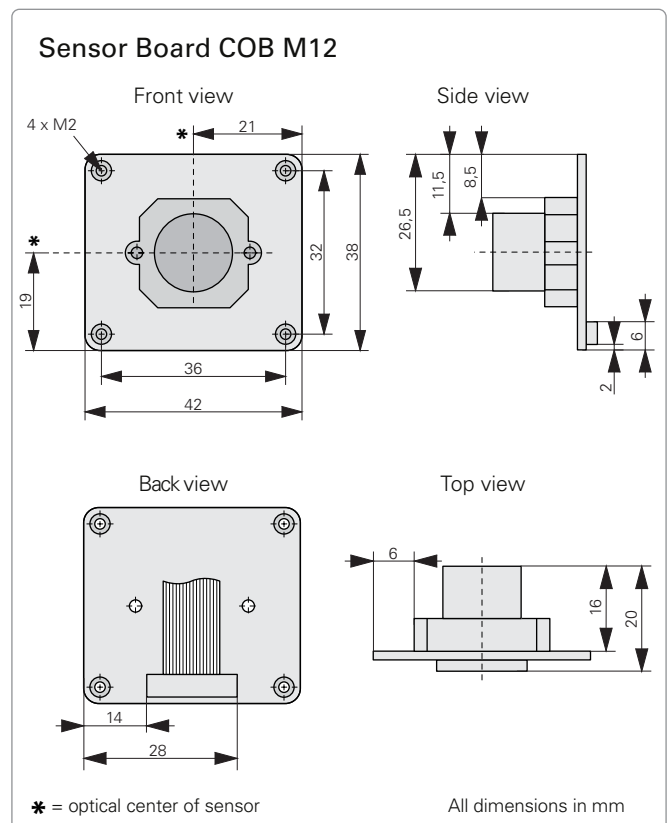
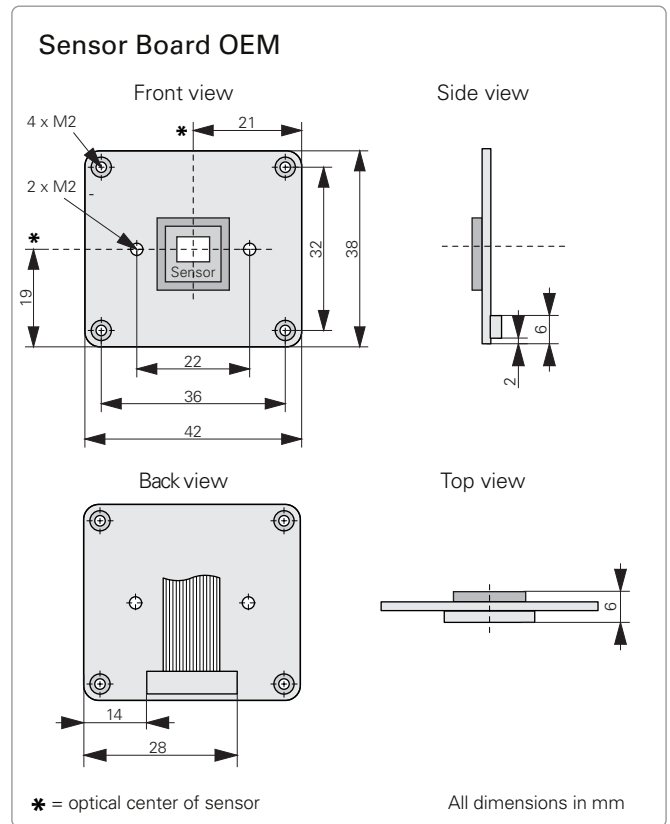
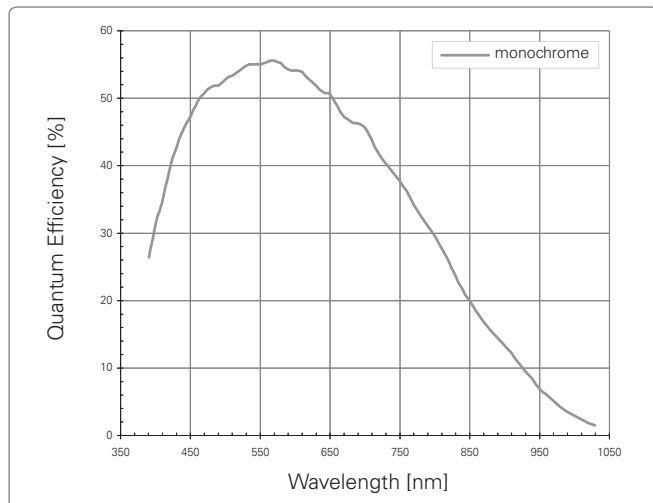
| | |
|-----------------|-----------------|
| OEM | 42 x 38 x 6 mm |
| COB S-mount M12 | 42 x 38 x 20 mm |
| COB C-mount | 46 x 42 x 24 mm |

Mounting Holes 36 x 32 mm

Ambient Conditions

Operating Temperature 0 ... +40 °C

Storage Temperature -30 ... +80 °C



* Maximum value at full ROI with minimum exposure time. Actual value depends on pixel clock, sensor settings, and image format.

USB components

VRmS-12

Sensor board

Sensor Characteristics

| | |
|--------------------|--|
| Type | Aptina MT9V024 |
| Technology | CMOS, global shutter |
| Mono/Color | monochrome or color |
| Sensor Size | 1/3" wide |
| Resolution | 754 x 480 |
| Pixel Size | 6 μm x 6 μm |
| Max. Frame Rate * | 69 Hz |
| Min. Exposure Time | 30 μs |
| Bit Depth | 8/10 bit |
| Pixel Clock | 26.6 MHz |
| Responsivity | 4.8 V/lux-sec |
| Dynamic Range | 55 dB linear 80 ... 100 dB high dynamic |

Physical Characteristics

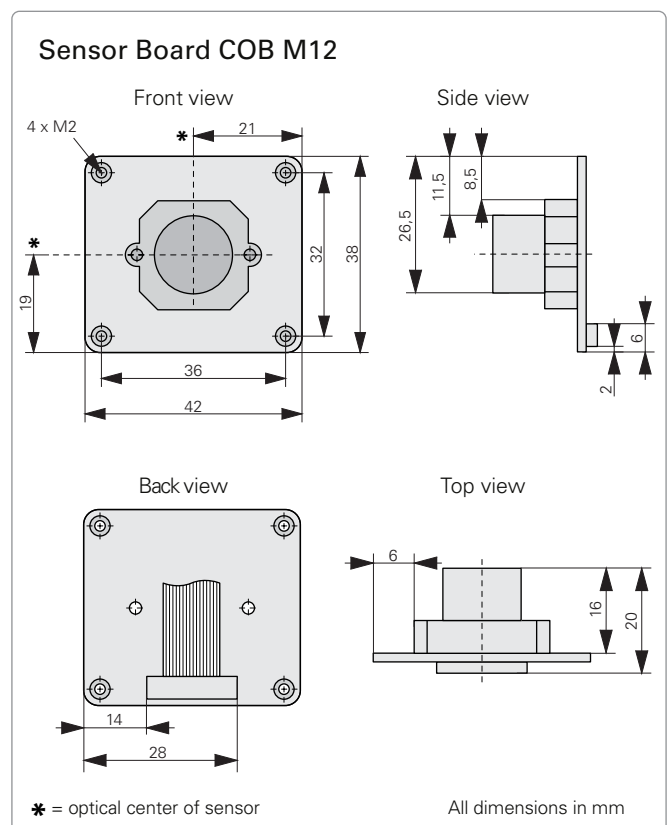
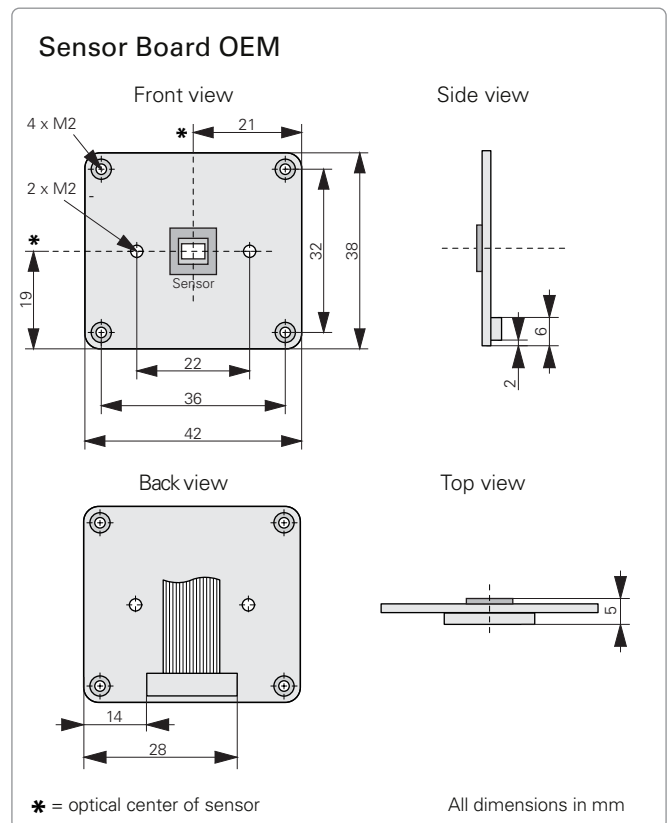
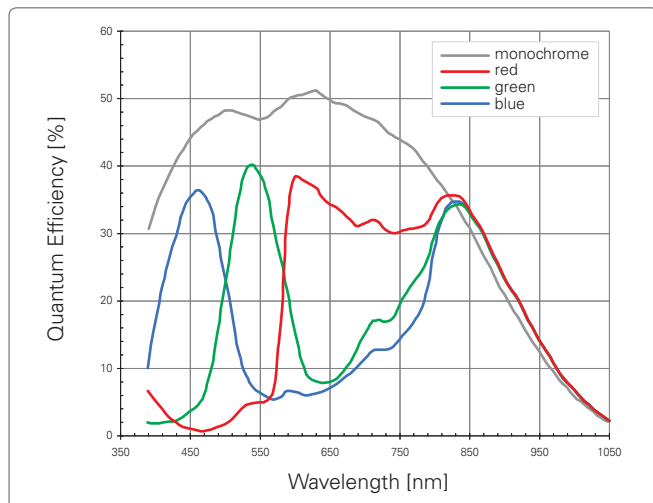
Dimensions

| | |
|-----------------|-----------------|
| Board Size | |
| OEM | 42 x 38 x 5 mm |
| COB S-mount M12 | 42 x 38 x 20 mm |
| COB C-mount | 46 x 42 x 24 mm |

Mounting Holes 36 x 32 mm

Ambient Conditions

| | |
|-----------------------|----------------|
| Operating Temperature | 0 ... +40 °C |
| Storage Temperature | -30 ... +80 °C |



* Maximum value at full ROI with minimum exposure time. Actual value depends on pixel clock, sensor settings, and image format.

USB components

VRmMS-12

Small sensor board

Sensor Characteristics

| | |
|--------------------|--|
| Type | Aptina MT9V024 |
| Technology | CMOS, global shutter |
| Mono/Color | monochrome or color |
| Sensor Size | 1/3" wide |
| Resolution | 754 x 480 |
| Pixel Size | 6 μm x 6 μm |
| Max. Frame Rate * | 69 Hz |
| Min. Exposure Time | 30 μs |
| Bit Depth | 8/10 bit |
| Pixel Clock | 26.6 MHz |
| Responsivity | 4.8 V/lux-sec |
| Dynamic Range | 55 dB linear 80 ... 100 dB high dynamic |

Physical Characteristics

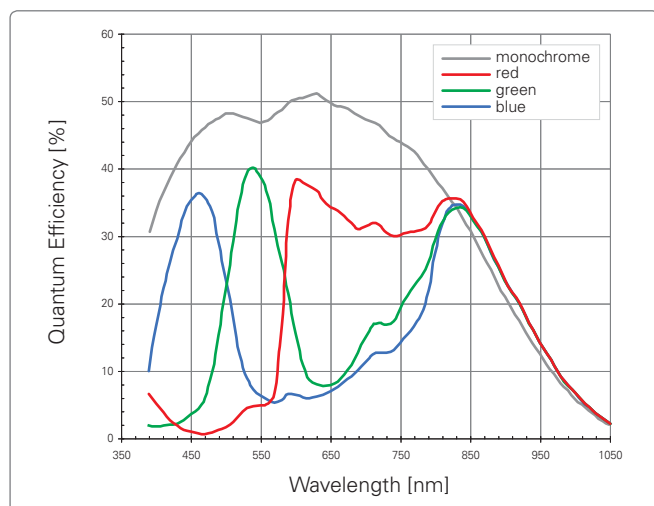
Dimensions

| | |
|-----------------|-----------------|
| Board Size | |
| OEM | 28 x 19 x 5 mm |
| COB M9LP | 28 x 19 x 11 mm |
| COB S-mount M12 | 28 x 19 x 17 mm |

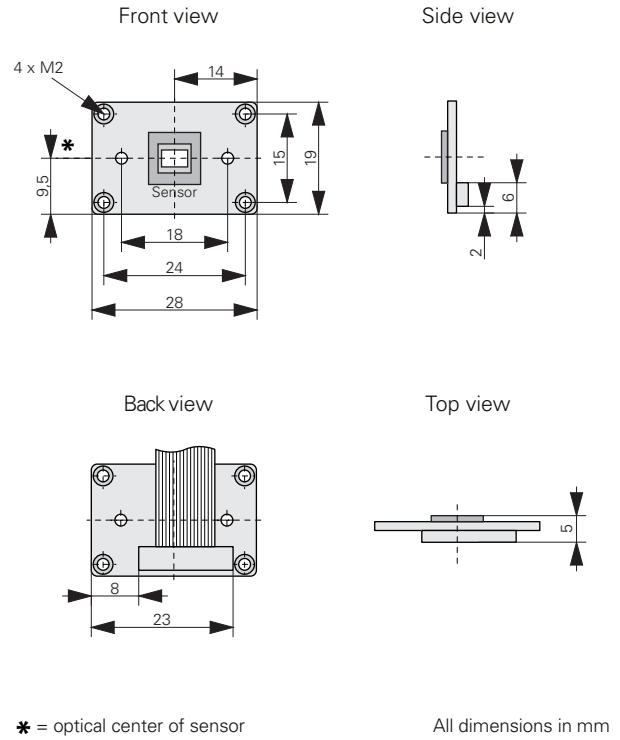
| | |
|----------------|------------|
| Mounting Holes | 24 x 15 mm |
|----------------|------------|

Ambient Conditions

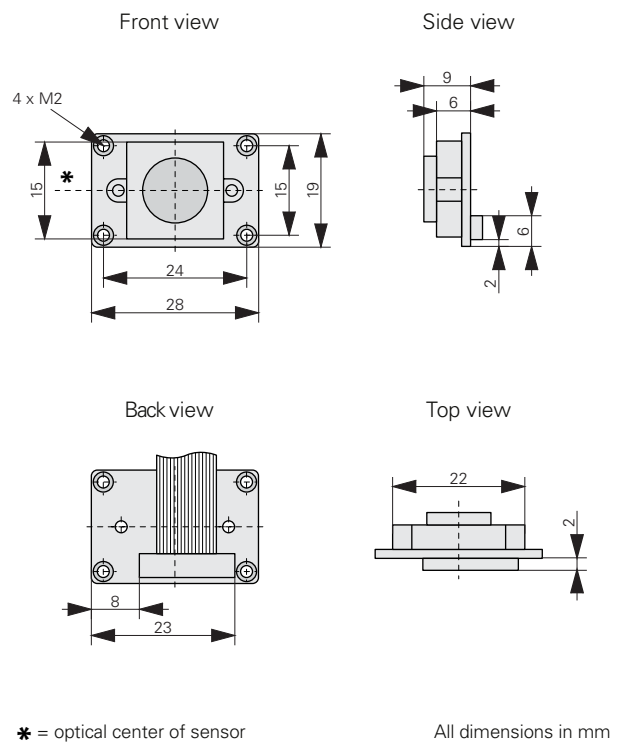
| | |
|-----------------------|----------------|
| Operating Temperature | 0 ... +40 °C |
| Storage Temperature | -30 ... +80 °C |



Sensor Board OEM



Sensor Board COB M9LP



* Maximum value at full ROI with minimum exposure time. Actual value depends on pixel clock, sensor settings, and image format.

USB components

VRmS-14

Sensor board

Sensor Characteristics

| | |
|--------------------|---|
| Type | Sony ICX445 |
| Technology | CCD, interline transfer |
| Mono/Color | Monochrome or color |
| Sensor Size | 1/3" |
| Resolution | 1296 x 966 |
| Pixel Size | 3.75 μm x 3.75 μm |
| Max. Frame Rate * | 16 Hz |
| Min. Exposure Time | 15 μs |
| Bit Depth | 8/10 bit |
| Pixel Clock | 26.6 MHz |

Physical Characteristics

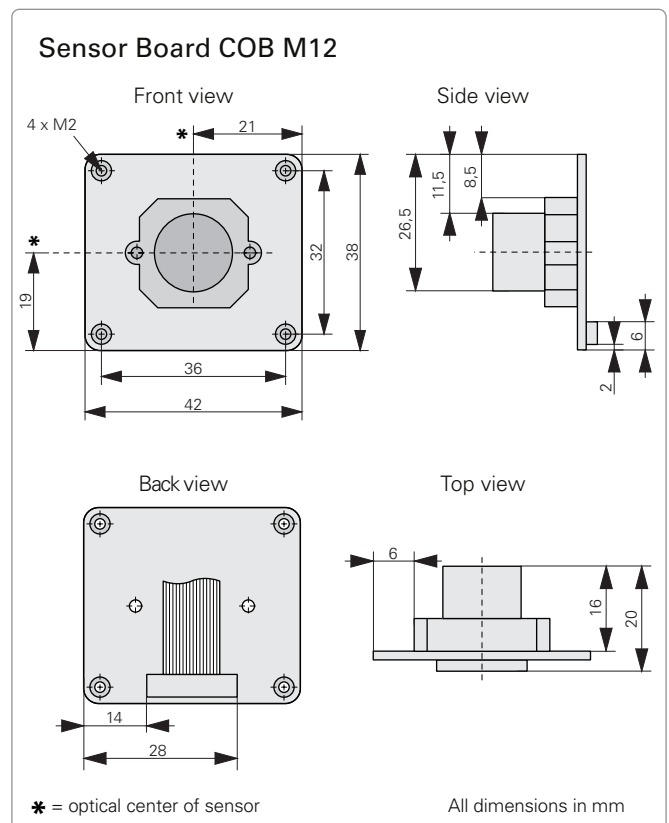
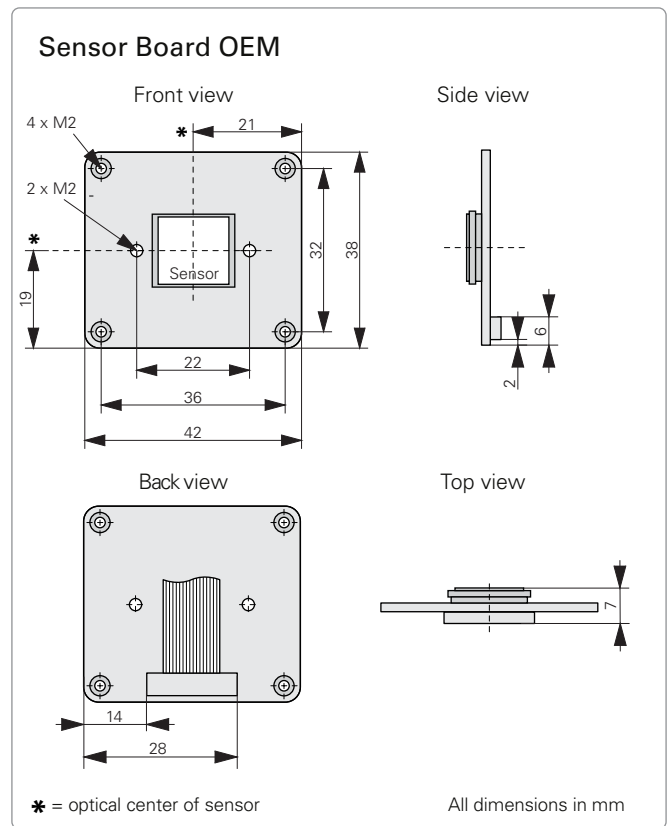
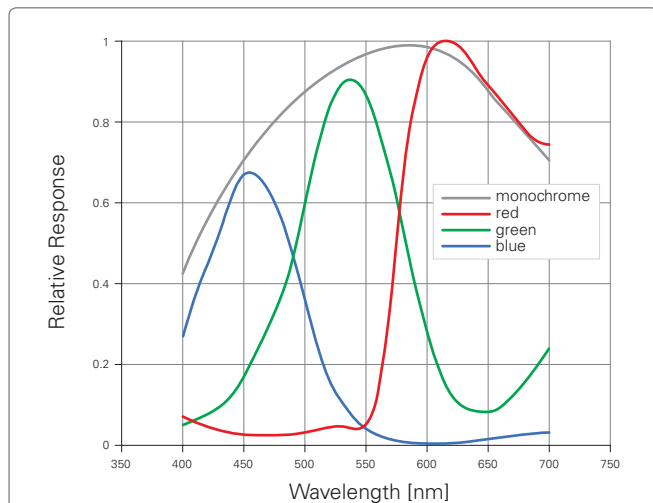
Dimensions

| | |
|-----------------|-----------------|
| Board Size | |
| OEM | 42 x 38 x 7 mm |
| COB S-mount M12 | 42 x 38 x 20 mm |
| COB C-mount | 46 x 42 x 24 mm |

Mounting Holes 36 x 32 mm

Ambient Conditions

| | |
|-----------------------|----------------|
| Operating Temperature | 0 ... +40 °C |
| Storage Temperature | -30 ... +80 °C |



* Maximum value at full ROI with minimum exposure time. Actual value depends on pixel clock, sensor settings, and image format.

USB components

VRmS-16

Sensor board

Sensor Characteristics

| | |
|--------------------|---|
| Type | Aptina MT9M021 |
| Technology | CMOS, global shutter |
| Mono/Color | Monochrome or color |
| Sensor Size | 1/3" |
| Resolution | 1280 x 960 |
| Pixel Size | 3.75 μm x 3.75 μm |
| Max. Frame Rate * | 16 Hz |
| Min. Exposure Time | 103 μs |
| Bit Depth | 10 bit |
| Pixel Clock | 26.6 MHz |

Physical Characteristics

Dimensions

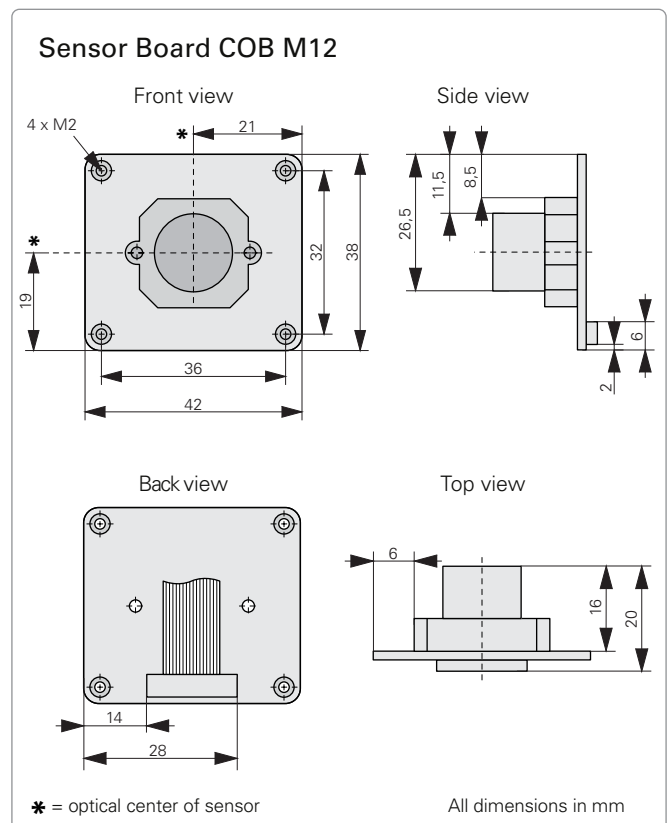
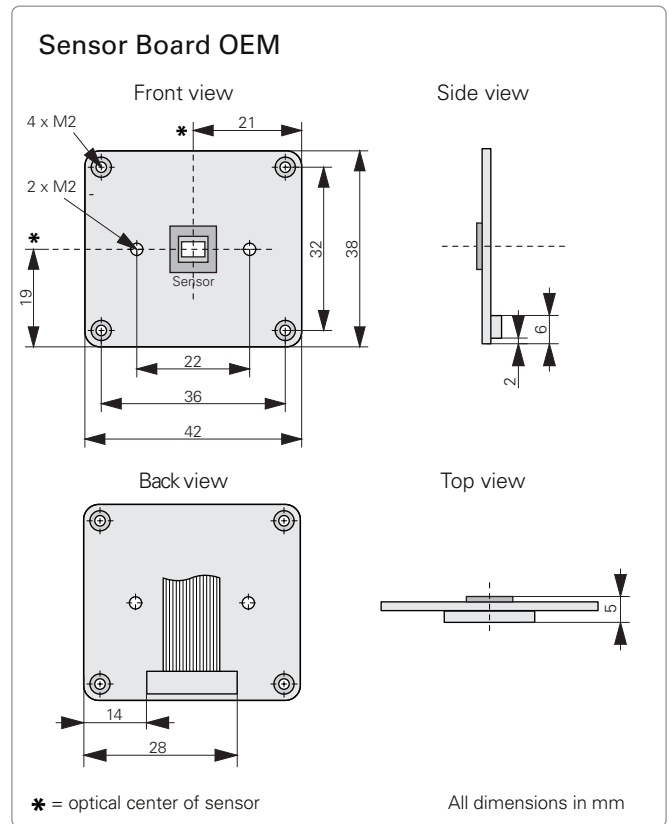
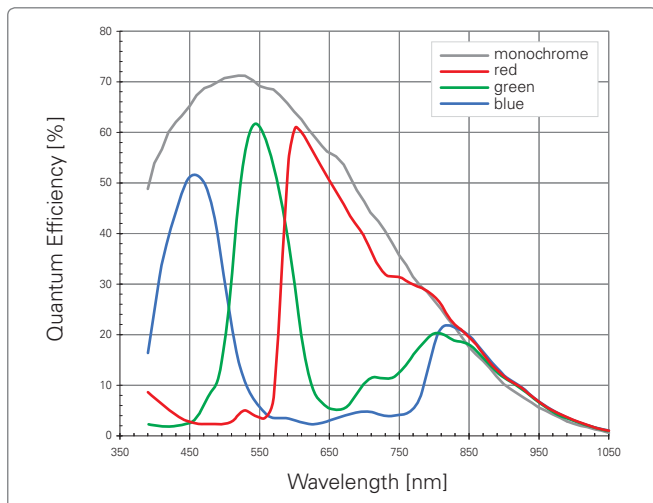
| | |
|-----------------|-----------------|
| Board Size | |
| OEM | 42 x 38 x 5 mm |
| COB S-mount M12 | 42 x 38 x 20 mm |
| COB C-mount | 46 x 42 x 24 mm |

Mounting Holes 36 x 32 mm

Ambient Conditions

Operating Temperature 0 ... +40 °C

Storage Temperature -30 ... +80 °C



* Maximum value at full ROI with minimum exposure time. Actual value depends on pixel clock, sensor settings, and image format.

VRmS-18

Sensor Board

Sensor Characteristics

| | |
|--------------------|---|
| Type | Aptina MT9M024 |
| Technology | CMOS, rolling shutter |
| Mono/Color | Monochrome or color |
| Sensor Size | 1/3" |
| Resolution | 1280 x 960 |
| Pixel Size | 3.75 μm x 3.75 μm |
| Max. Frame Rate * | 16 Hz |
| Min. Exposure Time | 22 μs |
| Bit Depth | 12 bit |
| Pixel Clock | 26.6 MHz |

Physical Characteristics

Dimensions

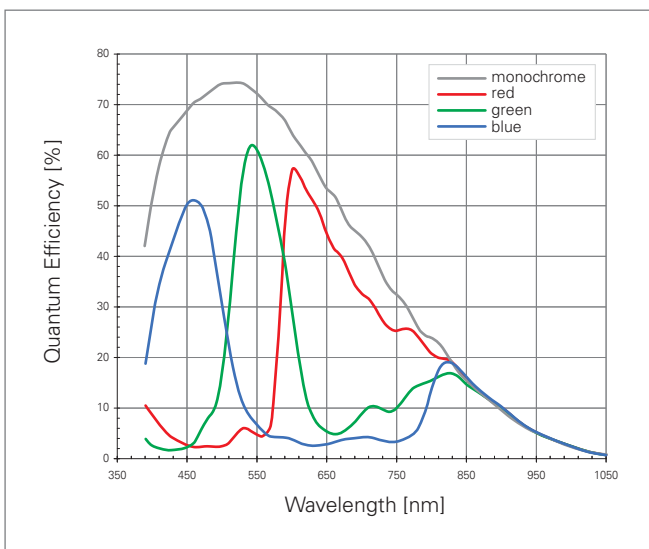
| | |
|-----------------|-----------------|
| Board Size | |
| OEM | 42 x 38 x 5 mm |
| COB S-mount M12 | 42 x 38 x 20 mm |
| COB C-mount | 46 x 42 x 24 mm |

Mounting Holes 36 x 32 mm

Ambient Conditions

Operating Temperature 0 ... +40 °C

Storage Temperature -30 ... +80 °C



* Maximum value at full ROI with minimum exposure time. Actual value depends on pixel clock, sensor settings, and image format.

