

## Mako U-503



- ON Semi (Aptina) CMOS sensor
- High frame rates
- Ultra-compact
- Extensively tested accessories

Small and powerful

### Mako U - Ultra-compact USB3 Vision cameras

Mako U-503 with ON Semi MT9P031 runs 14.0 frames per second at 5.0 MP resolution.

The Mako U is an attractively priced camera in a compact rugged industrial housing. It's equipped with an USB3 Vision-compliant interface technology to enable a reliable connection to your host system and image processing solution. Basic functionalities, including screw mount connectors and multiple I/Os, facilitate straightforward system integration. Mako cameras are equipped with high-quality CMOS sensors to support the realization of future-oriented applications.

Mako U monochrome USB3 Vision cameras have the same compact housing with a form factor of 49.5 x 29 x 29 mm. Screw locks ensure a safe electrical connection even in harsh industrial environments.

Every model is powered over the USB interface and has opto-isolated I/Os. The GPIOs give Mako U maximum flexibility to adapt to specific needs. The two non-isolated GPIO lines are TTL-based and programmable as input or output.

Options:

- Various IR cut/pass filters, protection glass, various lens mounts

### Specifications

Mako U-503	
Interface	USB3 Vision
Resolution	2592 (H) × 1944 (V)

## Mako U-503

Sensor ON Semi MT9P031

Sensor type CMOS

Shutter mode Rolling shutter

Sensor size Type 1/2.5

Pixel size 2.2  $\mu\text{m}$   $\times$  2.2  $\mu\text{m}$

Lens mount (default) C-Mount, CS-Mount

Max. frame rate at full resolution 14 fps

ADC 12 Bit

Image buffer (RAM) 128 MByte

### Imaging performance

Imaging performance data is based on the evaluation methods in the EMVA 1288 Release 3.1 standard for characterization of image sensors and cameras. Measurements are typical values for monochrome models measured at full resolution without optical filter. Contact Sales or AE for more information.

Quantum efficiency at 529 nm 52 %

Temporal dark noise 7.0  $e^-$

Saturation capacity 6200  $e^-$

Dynamic range 58.6 dB

Absolute sensitivity threshold 7.4  $e^-$

### Output

Bit depth 8/12 Bit

Monochrome pixel formats Mono8, Mono12, Mono12p

### General purpose inputs/outputs (GPIOs)

TTL I/Os 2 programmable GPIOs

Opto-isolated I/Os 1 input, 1 output

### Operating conditions/dimensions

Operating temperature +5 °C to +45 °C (housing temperature)

Power requirements (DC) Power over USB 3.0

Power consumption 1.9 W at 5 VDC

Mass 60 g

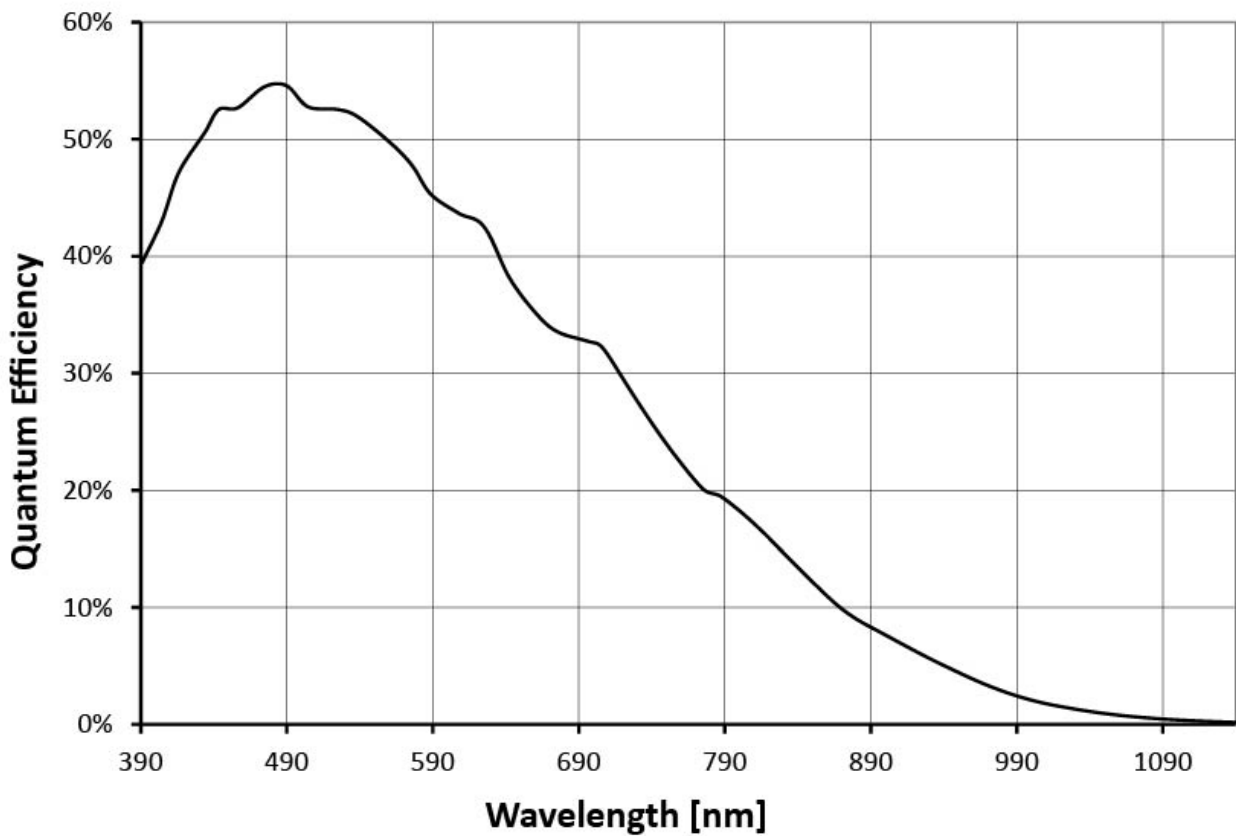
Body dimensions (L  $\times$  W  $\times$  H in mm) 49.5  $\times$  29  $\times$  29 (including connectors)

**Mako U-503**

Regulations

CE: 2014/30/EU (EMC), 2011/65/EU, incl. amendment  
2015/863/EU (RoHS); FCC Class B

## Quantum efficiency

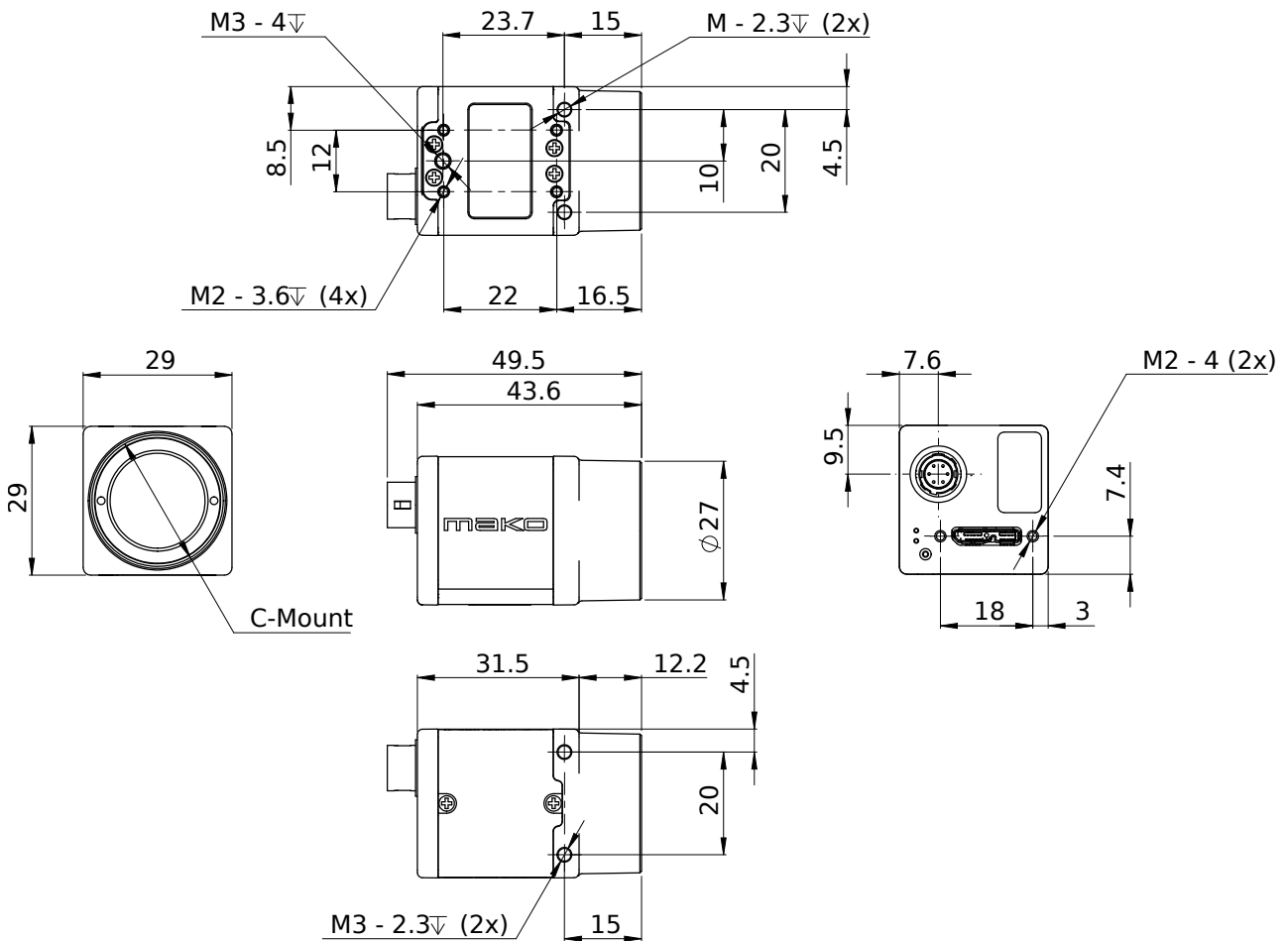


## Features

- Defect pixel correction (on/off)
- Region of interest (ROI)
- Gain (manual control, 0 to 17 dB)
- Exposure (manual control, 32  $\mu$ s to 1.4 s)
- Gamma correction
- Reverse X

- DeviceLinkThroughputLimit (easy bandwidth control)
- Sync out modes: Waiting for a trigger, exposing, readout, imaging
- Storable user sets

## Technical drawing



## Applications

The Mako U is an inexpensive USB 3.0 camera with a compact housing. USB 3.0 technology has lower latency and jitter times with less CPU load than other camera interfaces. Typical applications for Mako U cameras:

- Machine vision
- Quality control



- Inspection, surveillance
- Industrial imaging