



## Mako U

### U-051

- Latest CMOS sensor
- High frame rates
- Ultra-compact
- Extensively tested accessories

## Mako U-051B with CMOS ON Semi PYTHON 500 sensor

Mako U-051B is a monochrome USB3 Vision camera with the ON Semiconductor PYTHON 500 CMOS sensor. All Mako USB 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	U-051
Interface	USB3 Vision
Resolution	800 (H) × 600 (V)
Sensor	ON Semi PYTHON 500
Sensor type	CMOS
Sensor size	Type 1/3.6
Pixel size	4.8 μm × 4.8 μm
Lens mount (default)	C-Mount, CS-Mount
Max. frame rate at full resolution	391 fps
ADC	10 Bit
Image buffer (RAM)	128 MByte

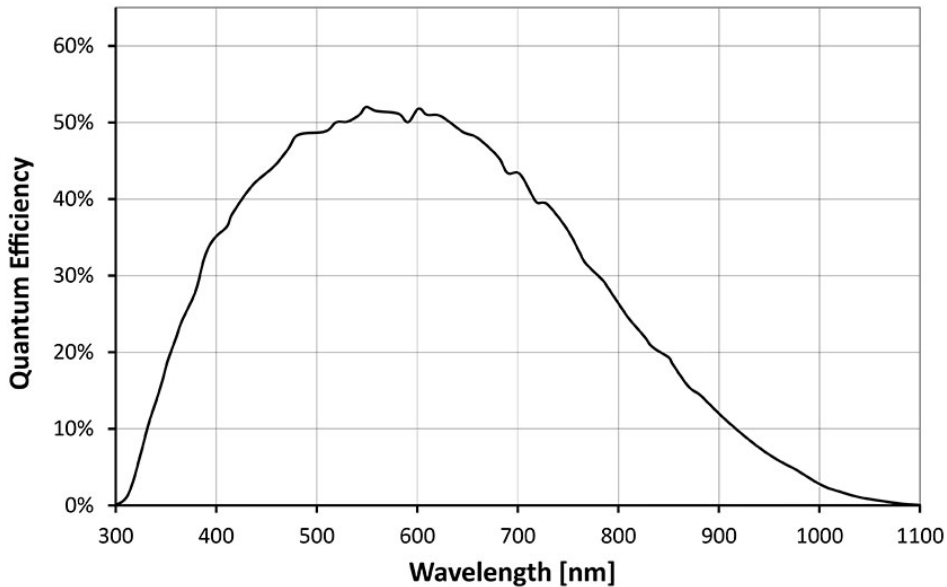
### Imaging performance

**Mako U**
**U-051**

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	50 %
Temporal dark noise	8.2 e <sup>-</sup>
Saturation capacity	6300 e <sup>-</sup>
Dynamic range	57.1 dB
Absolute sensitivity threshold	9.0 e <sup>-</sup>
<b>Output</b>	
Bit depth	8/10 Bit
Monochrome pixel formats	Mono8, Mono10p
<b>General purpose inputs/outputs (GPIOs)</b>	
TTL I/Os	2 programmable GPIOs
Opto-isolated I/Os	1 input, 1 output
<b>Operating conditions/dimensions</b>	
Operating temperature	+5 °C to +45 °C (housing temperature)
Power requirements (DC)	Power over USB 3.0
Power consumption	2.7 W @ 5 VDC
Mass	60 g
Body dimensions (L × W × H in mm)	49.5 × 29 × 29 (including connectors)
Regulations	CE: 2014/30/EU (EMC), 2011/65/EU, incl. amendment 2015/863/EU (RoHS); FCC Class B

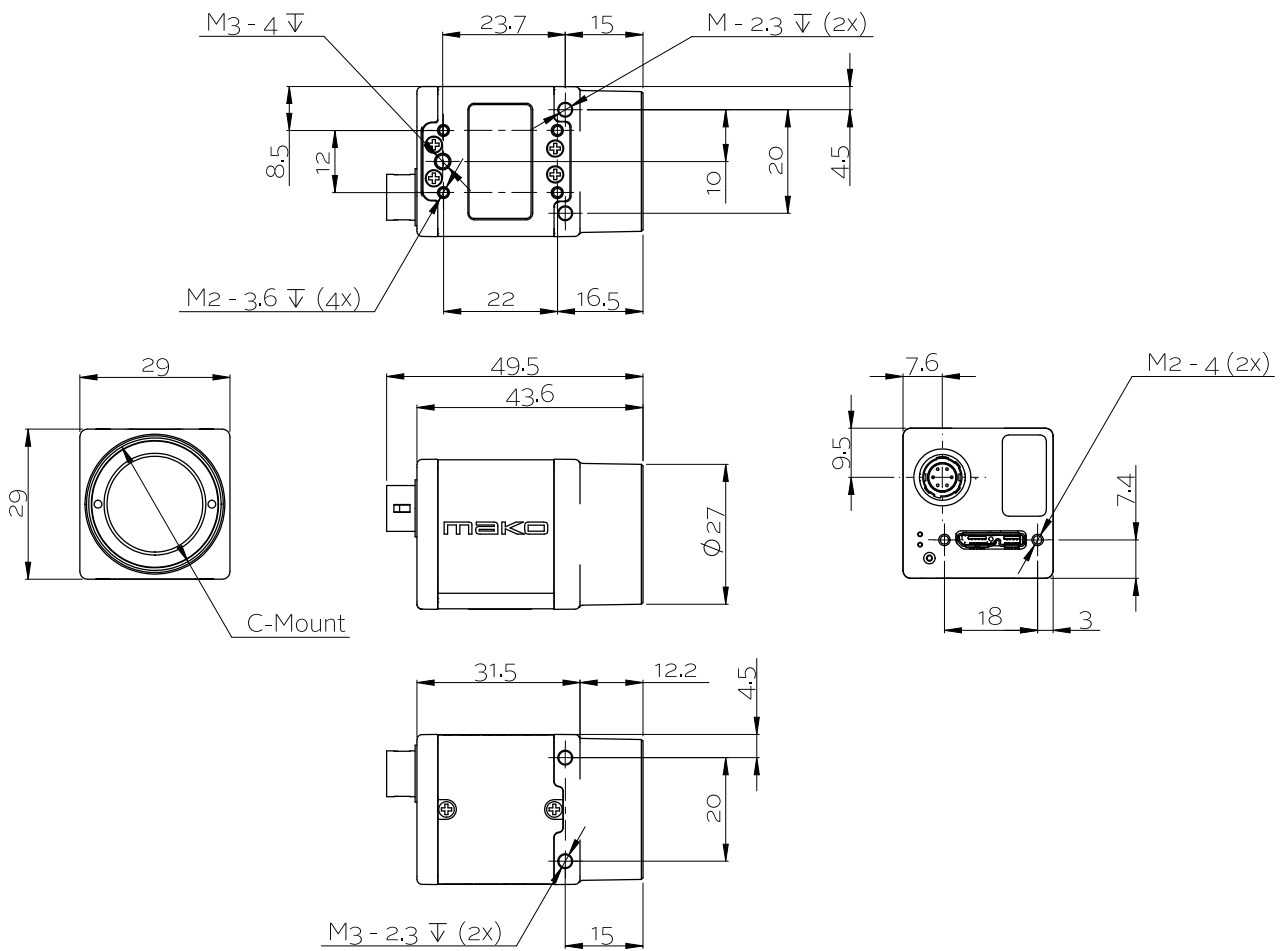
## Quantum efficiency



## Features

- Defect pixel correction (on/off)
- Fixed pattern noise correction (on/off)
- Region of interest (ROI)
- Gain (manual control, 0 to 20 dB)
- Exposure (manual control, 44.2  $\mu$ 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