

- ON Semi CMOS sensor
- Power over Ethernet
- Switchable shutter modes
- Ultra-compact design

Small and powerful

## Ultra-compact GigE Vision cameras

Mako G-503 with ON Semi MT9P031 / MT9P006 runs 14.0 frames per second at 5.0 MP resolution.

Mako G is an attractively priced GigE Vision-compliant camera in a compact rugged industrial housing. Many models include advanced functionalities such as Precision Time Protocol (PTP), Trigger over Ethernet (ToE) Action Commands, and Power over Ethernet (PoE). Screw mount RJ45 connector and multiple I/Os facilitate your straightforward system integration. Mako G cameras are also available as Near Infrared (NIR) and polarizer variants.

Easy software integration with Allied Vision's [Vimba Suite](#) and compatibility to the most popular [third party image-processing libraries](#).

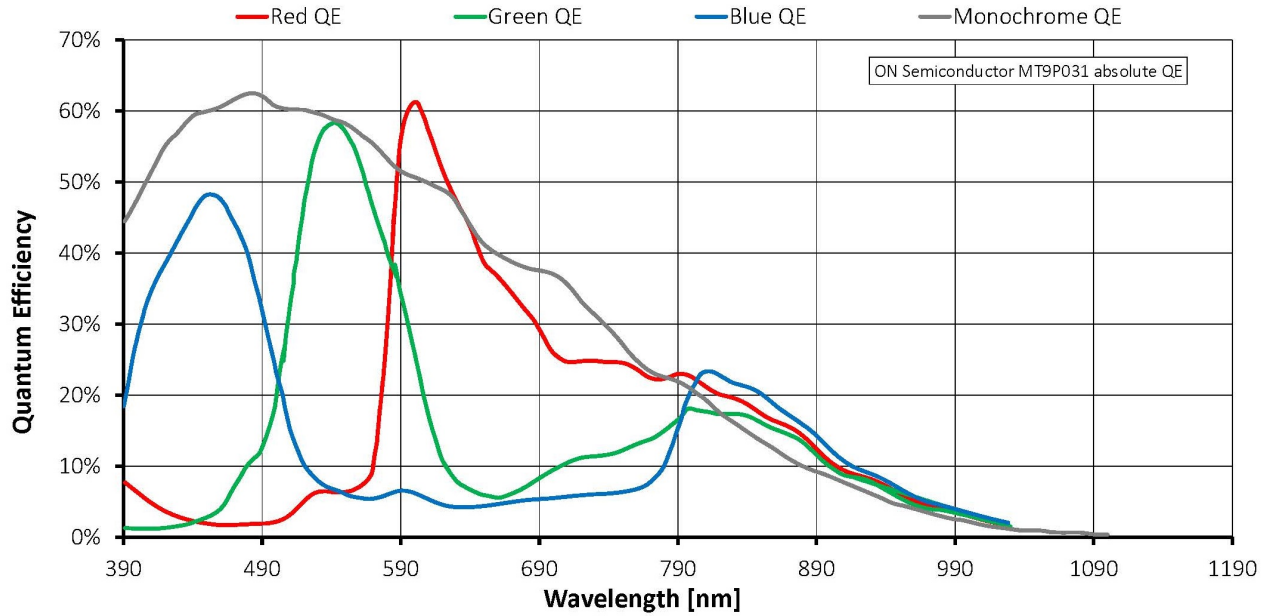
See the [Modular Concept](#) for lens mount, housing variants, optical filters, case design, and other modular options. See the [Customization and OEM Solutions](#) webpage for additional options.

## Specifications

Mako G-503	
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Resolution	2592 (H) × 1944 (V)
Sensor	ON Semi MT9P031 / MT9P006
Sensor type	CMOS
Shutter mode	Global reset and Rolling shutter
Sensor size	Type 1/2.5
Pixel size	2.2 μm × 2.2 μm

<b>Mako G-503</b>	
Lens mounts (available)	C-Mount, CS-Mount
Max. frame rate at full resolution	14 fps
ADC	12 Bit
Image buffer (RAM)	64 MByte
<b>Imaging performance</b>	
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	55 %
Temporal dark noise	7.5 e <sup>-</sup>
Saturation capacity	6000 e <sup>-</sup>
Dynamic range	57.6 dB
Absolute sensitivity threshold	8.0 e <sup>-</sup>
<b>Output</b>	
Bit depth	8/12 Bit
Monochrome pixel formats	Mono8, Mono12, Mono12Packed
YUV color pixel formats	YUV411Packed, YUV422Packed, YUV444Packed
RGB color pixel formats	RGB8Packed, BGR8Packed
Raw pixel formats	BayerGR8, BayerGR12Packed, BayerGR12
<b>General purpose inputs/outputs (GPIOs)</b>	
Opto-isolated I/Os	1 input, 3 outputs
<b>Operating conditions/dimensions</b>	
Operating temperature	+5 °C to +45 °C housing temperature
Power requirements (DC)	10.8 to 26.4 VDC AUX or 802.3at Type 1 PoE
Power consumption	2.0 W at 12 VDC; 2.2 W PoE
Mass	80 g (with C-Mount)
Body dimensions (L × W × H in mm)	60.5 × 29.2 × 29.2 (including connectors)
Regulations	CE: 2014/30/EU (EMC), 2011/65/EU, including amendment 2015/863/EU (RoHS); FCC Class B; CAN ICES-003

## Quantum efficiency



## Features

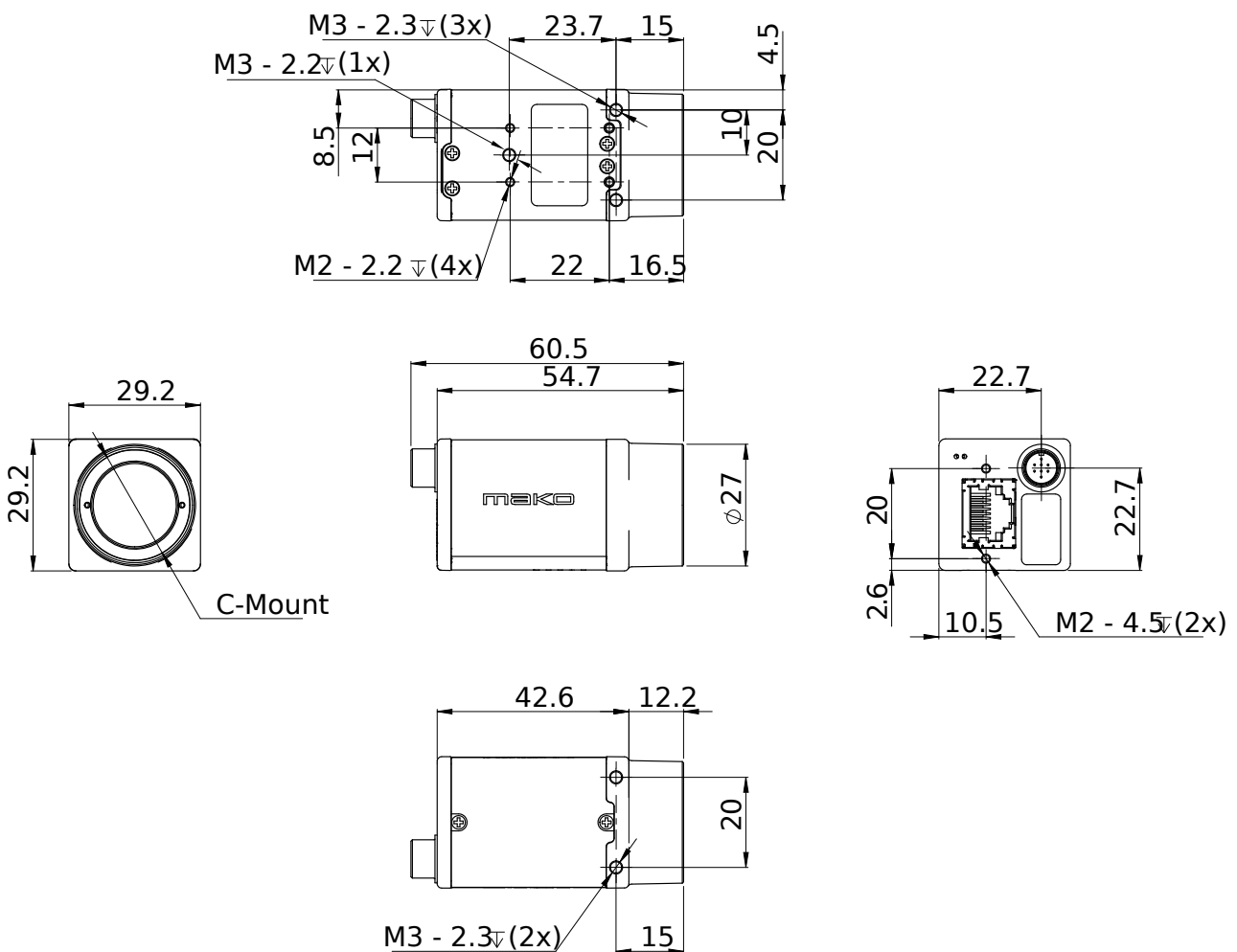
Image optimization features:

- Auto gain (manual gain control: 0 to 24 dB; 1 dB increments)
- Auto exposure (31  $\mu$ s to 1 s; 36.4  $\mu$ s increments)
- Auto white balance (color models)
- Binning
- Color transformation, hue, saturation (color models)
- Decimation
- Defect pixel masking (user defined with Defect Mask Loader tool)
- Gamma correction
- One look-up table
- Region of interest, separate region for auto features
- Reverse X/Y

## Camera control features:

- Event channel
- Image chunk data
- Storable user sets
- StreamBytesPerSecond (bandwidth control)
- Stream hold
- Switchable Rolling and Global Reset shutter modes
- Sync out modes: Trigger ready, input, exposing, readout, imaging, strobe, GPO
- Temperature monitoring (main board only)

## Technical drawing



## Applications

Mako G is suitable for all typical applications in machine vision:

- Robotics
- Quality control
- Inspection, surveillance
- Industrial imaging
- Machine vision
- Logistics