

# Mako G

## G-223



- Ultra-compact design
- IEEE 1588 PTP
- Power over Ethernet
- Trigger over Ethernet

## GigE Vision camera, CMOSIS/ams CMV2000 CMOS sensor, 49.5 fps

Mako G-223 is a 2.2 megapixel GigE machine vision camera that incorporates the high quality Type 2/3 (12.7 mm diagonal) CMOSIS/ams CMV2000 CMOS sensor. At full resolution, this camera runs 49.5 frames per second. With a smaller region of interest, higher frame rates are possible.

Mako G cameras have the same ultra-compact form factor and the same mounting positions as many analog cameras. All models include Power over Ethernet, three opto-isolated outputs, and a 64 MB image buffer. The image quality profits from the precisely aligned sensor. By default monochrome models ship with no optical filter and color models ship with a Type Hoya C-5000 IR cut filter.

### Benefits and features:

- Monochrome (G-223B) and color (G-223C) models
- GigE Vision interface with Power over Ethernet
- Screw mount RJ45 Ethernet connector for secure operation in industrial environments
- Supports cable lengths up to 100 meters (CAT-6 recommended)
- Comprehensive I/O functionality for simplified system integration
- Trigger over Ethernet Action Commands allow for a single cable solution to reduce system cost
- IEEE 1588 Precision Time Protocol allows for easy synchronization of multiple cameras and devices on network
- Popular C-Mount lens mount
- Easy camera mounting via standard M3 threads on top and bottom of housing or optional tripod adapter
- Easy software integration with Allied Vision's [Vimba Suite](#) and compatibility to the most popular [third party image-processing libraries](#).
- Defect pixel masking feature with the Defect Mask Loader tool that allows you to manage a user defined defective pixel list to match your application and optimize the life cycle of the camera.

- Select between B 270 ASG protection glass and filter types: Jenofilt 217 IR cut filter, Hoya C-5000 IR cut filter, RG715 IR pass filter, or RG830 IR pass filter

See the [Modular Concept](#) for lens mount and optical filter options.

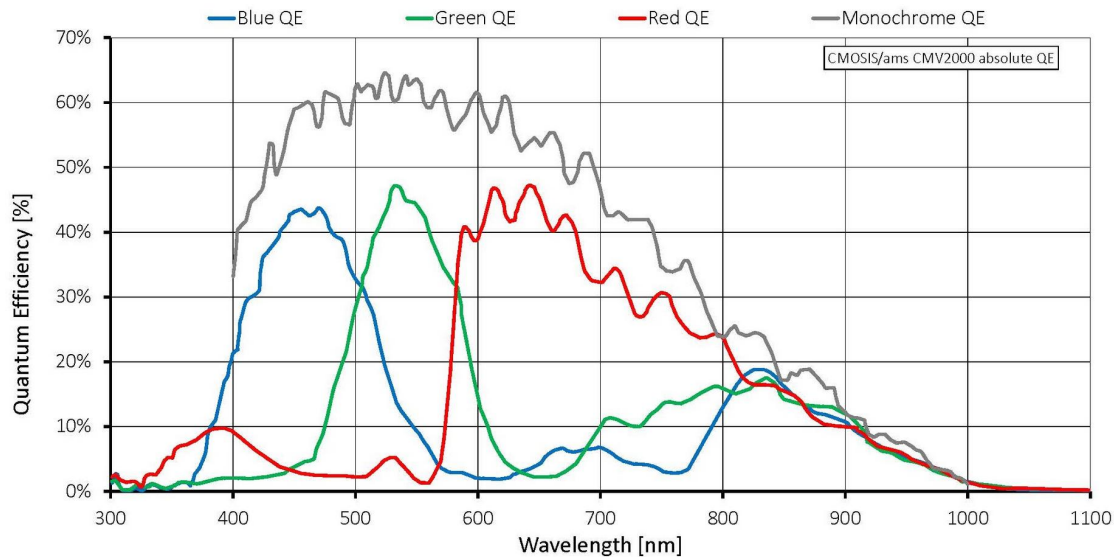
See the [Customization and OEM Solutions](#) webpage for additional options.

## Specifications

<b>Mako G</b>	<b>G-223</b>
Interface	IEEE 802.3 1000BASE-T, IEEE 802.3af (PoE)
Resolution	2048 (H) × 1088 (V)
Sensor	CMOSIS/ams CMV2000
Sensor type	CMOS
Shutter mode	Global shutter
Sensor size	Type 2/3
Pixel size	5.5 μm × 5.5 μm
Lens mounts (available)	C-Mount, CS-Mount, S-Mount
Max. frame rate at full resolution	49.5 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	77 %
Temporal dark noise	13.2 e <sup>-</sup>
Saturation capacity	9800 e <sup>-</sup>
Dynamic range	57.1 dB
Absolute sensitivity threshold	13.7 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	BayerGB8, BayerGB12, BayerGB12Packed
<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)	12 to 24 VDC AUX or 802.3at Type 1 PoE

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Power consumption	2.4 W at 12 VDC; 2.8 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:

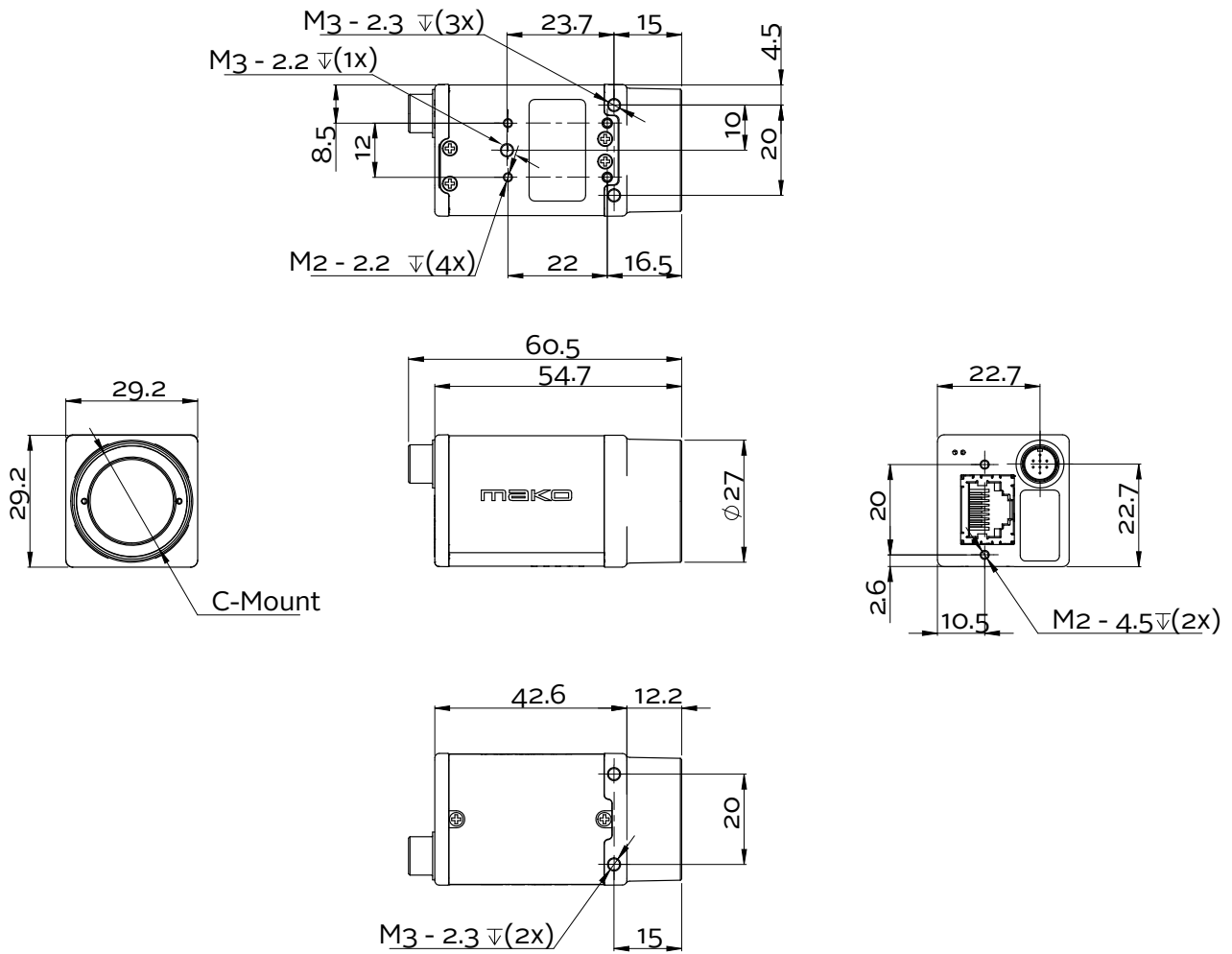
- Auto gain (manual gain control: 0 to 26 dB; 1 dB increments)
- Auto exposure (manual exposure control: 30  $\mu$ s to 153 s; 1  $\mu$ s increments)
- Auto white balance (G-223C only)
- Color correction, hue, saturation (G-223C only)
- Defect pixel masking (user defined with Defect Mask Loader tool)
- Gamma correction
- One look-up table
- Piecewise Linear HDR mode
- Region of interest, separate region for auto features



## Camera control features:

- Event channel
- Image chunk data
- IEEE 1588 Precision Time Protocol
- Storable user sets
- StreamBytesPerSecond (bandwidth control)
- Stream hold
- Sync out modes: Trigger ready, input, exposing, readout, imaging, strobe, GPO
- Temperature monitoring (main board only)
- Trigger over Ethernet Action Commands

## Technical drawing





## Applications

Mako G-223 is ideal for a wide range of applications including:

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