

### Sensor Information

Model Name	ON Semiconductor MT9J003
Type	1/2.5" progressive scan CMOS
Shutter	Rolling Shutter, Global Reset Shutter
Resolution	3856 x 2764 pixels
Scan Area	6.43 mm x 4.61 mm
Pixel Size	1.67 μm x 1.67 μm

### Data Quality

@ 20 °C, gain = 1, exposure time = 4 msec

Dark Noise ( $\sigma$ )	7 e- typical
Saturation	5200 e- typical
Dynamic Range	56 dB typical
SNR	37 dB typical
Quantum efficiency $\eta$	40 % @ 465 nm, 32 % @ 536 nm, 20 % @ 631 nm typical

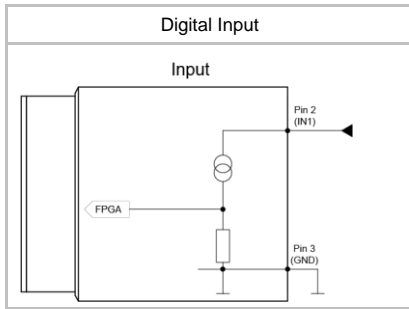
### Acquisition

Resolution	3856 px x 2764 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) <sup>2)</sup>
	Full Frame	3856 x 2764	7 fps
	Binning 2x2	1928 x 1382	7 fps
	Binning 2x1	1928 x 2764	7 fps
	Binning 1x2	3856 x 1382	7 fps
Acquisition Frame Rate <sup>1)</sup>	7 fps   $t_{\text{readout}} = 138.5 \text{ msec}$ (max. Res. Full Frame) @ 12 bit		
Pixel Formats	BayerRG8, BayerRG12, BayerRG12p		
Partial Scan	True Partial Scan with increasing Frame Rate on X and Y direction, Region of Interest (ROI) arbitrary Width: minimum 96, increment 16 Height: minimum 2, increment 2		
Adjustable Acquisition	no		
Frame Rate	no		
Acquisition Mode	Continuous, Single Frame and Multi Frame		
Acquisition Status	AcquisitionActive, AcquisitionTrigger Wait		
Exposure Mode	Timed		
Shutter Mode	Rolling, Global Reset		
Readout Mode	not available		

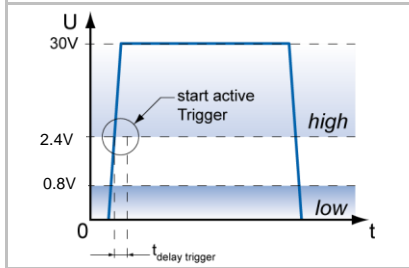
### Image Pre-Processing

Analog Controls	Exposure Time (48 μsec ... 1 sec   Step Size 1 μsec) Gain (0... 12 dB), Offset (0 ... 255 LSB   12 bit)
Color Models	Raw Bayer
Color Processing	-
Color Adjustment	Manual White Balance Automatic White Balance (Once or Continuous)
Color Enhancement	Color Transformation to sRGB color space by optimized Matrix for 6500 K, 3000 K Lightsources or User defined Matrix
Color Tolerance	-
Binning Horizontal	1 or 2
Binning Vertical	1 or 2
Image Flipping	no
Defect Pixel Correction	via Defect Pixel List with up to 512 Pixel Coordinates
Fix Pattern Noise	yes
Correction	

<sup>1)</sup> Sensor readout, different from pixel format



Trigger Mode: Start up time and valid Trigger



## Process Synchronization

Trigger Mode	Off (Free Running), On (Trigger)
Trigger Overlap Type	Trigger Mode On: Off Trigger Mode Off: Readout
Trigger Sources	Hardware (Line0), Software or Off max. Trigger Delay out of t <sub>readout</sub> : <sup>1)</sup> 6985 µsec / 539.1 µsec @ 12 bit (Rolling / Global Reset) max. Trigger Delay during t <sub>readout</sub> : <sup>1)</sup>
Trigger Delay	-
External Flash Sync	via Exposure Active t <sub>delay flash</sub> ≤ 3 µsec, t <sub>duration</sub> = t <sub>exposure</sub>

## Digital I/Os

Lines	Input: Line 0, Output: Line1
Output Sources	Off, ExposureActive
Line Debouncer	Low and high signal separately selectable Debouncing Time 0 ... 5 msec, Step Size: 1 µsec

## Memory

Image Buffer	31 MB 1 Images (Trigger Mode) / 1 Image (Free Running Mode)
Non-volatile Memory	128 kb

## Network Interface Data

Interface	Gigabit Ethernet 1000BASE-T 1000 Mbits/sec Fast Ethernet 100 BASE-T 100 Mbits/sec
Ethernet IP Configuration	Persistent IP, DHCP, LLA
Packet Size	576 ... 9000 Byte, Jumbo Frames supported
Image Buffer	1 Images (Trigger Mode) / 1 Image (Free Running Mode)

## GigE Vision® Features

Events	-
Transmission via Asynchronous Message Channel	
Frame Counter	up to 2 <sup>32</sup>
Payload Size	0 ... 21315968 Byte
Timestamp	64 bit, resolution in nsec, increment = 8
Packet Delay	0 .. 2 <sup>32</sup> - 1 Ticks
Packet Resend	Resend Buffer: 183 MB (6 Images)
GigE Vision	v2.0 (v1.2 backward compatible)

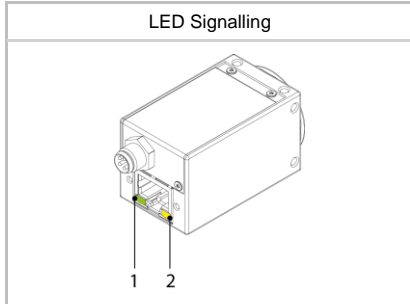
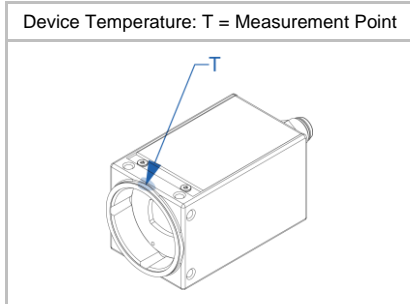
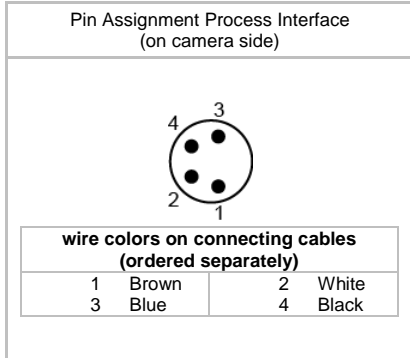
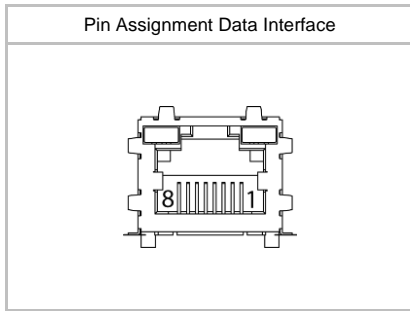
## Interfaces and Connectors

Data and Power Interface	Gigabit Ethernet	Transfer Rate	1000 Mbits/sec
	Fast Ethernet	Transfer Rate	100 Mbits/sec
	Connector:	8P8C Modular Jack (RJ45) screw lock type	
	Pin Assignment:	1 – MX1+	5 – MX3-
		2 – MX1-	6 – MX2-
		3 – MX2+	7 – MX4+
		4 – MX3+	8 – MX4-
Process Interface	Connector:	M8/4-pin (SACC-DSI-M 8MS-4CON-L180)	
	Assignment:	1 - VCC	3 - GND
		(Power and OUT)	(Power and IN)
		2 - IN+	4 - OUT



\* Note I/Os: Ground loops are to be avoided and can lead to destruction of the device.

<sup>1)</sup> Sensor readout, different from pixel format



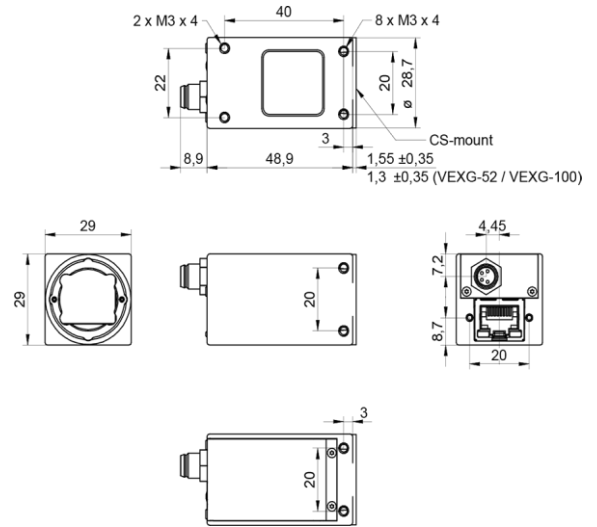
## Optical Data

Lens Mount	CS-Mount
Optical Filter	IR cut filter

## Mechanical Data

Housing	Zinc die casting, nickel-chrome-plated IP40 (with mounted lens and GigE cable)
Protection Class	IP40 (with mounted lens and GigE cable)
Weight	120 g

### Dimensions



## Environmental Data

Storage Temperature	-10 °C ... + 70 °C
Operating Temperature	+5 °C ... +60 °C @ T = Measurement Point
	Ambient temperature above 40 °C requires heat dissipation measures
Int. Temperature Sensor	no
Humidity	10 % ... 90 % non-condensing

## LED Signalling

LED	Green flash	RX active
	Green	Link ON
	Yellow	Error
	Yellow flash	TX active

## Electrical Data

Power Supply (ext.)	VCC: 12 ... 24 V DC ± 20%
	I: 90 ... 182 mA
Power over Ethernet	-
Power Consumption	approx. 2.2 W @ 12VDC and 7 fps
Digital Input	direct, without optocoupler
	$U_{IN(low)}$ : 0.0 ... 0.8 VDC
	$U_{IN(high)}$ : 3.3 ... 30 VDC
	$I_{IN}$ : <10 mA
	min. Impulse Length: 2.0 µsec
Digital Output	direct, without optocoupler
	$U_{EXT}$ : VCC
	$I_{OUT}$ : max. 50 mA
	$t_{ON}$ = typ. 3 µsec $t_{OFF}$ = typ. 40 µsec

### Caution



\* The digital I/Os are not potential-free and do not have an overrun cut-off. Incorrect wiring (overvoltage, undervoltage or voltage reversal) can lead to defect in the electronic system. Ground loops are to be avoided and can lead to destruction of the device.

## Conformity

Conformity	CE, RoHS, REACH, KC, EAC
KC Registration No. / Date	R-REI-BkR-VEXG-100MR / 10.07.2018
MTBF	- / -
	T = Measurement Point

## GenICam™ Features

Timer	-
User Sets	Factory Settings: UserSet0 (read only) Freely Programmable: UserSet1 Parameters: any user definable Parameter
Acquisition Abort	Delay up to 138.5 msec
SFNC Version	v2.3

## Factory Settings after Start-Up

Trigger Mode	Off (Free Running)
Analog Controls	Exposure Time: 4 msec, Gain: 0 dB, Offset: 0
Pixel Format	Mono8
Partial Scan	Off
Acquisition Frame Rate	-
Timer	-
Defect Pixel Correction	ON
Fixed Pattern Noise Correction	ON
Digital Input	Line0, invert = false
Digital Output	Line1, invert = false, line source = Off
GPIO 1/2	-
TriggerSource	Off

## Partial Scan @ FullFrame, min Exposure, Mono8 or BayerRG8

	Resolution	max. fps acquisition	max. fps interface <sup>2)</sup>
UHD (4K)	3840 x 2160	9	9
Full HD	1920 x 1080	33	33
SXGA	1280 x 1024	40	40
XGA	1024 x 768	56	56
SVGA	800 x 600	68	68
VGA	640 x 480	81	81
CIF	352 x 288	117	117
QCIF	176 x 144	176	176
LineScan	3856 x 2048	10	10
	3856 x 1024	18	18
	3856 x 512	32	32
	3856 x 256	53	53
	3856 x 128	77	77
	3856 x 64	101	101
	3856 x 32	120	120
	3856 x 16	132	132
	3856 x 8	139	139
	3856 x 4	143	143
	3856 x 2	145	145
	3856 x 1	-	-

<sup>2)</sup> depends on the used interface