

Sensor Information

Model Name	ON Semiconductor Python 300
Type	1/4" progressive scan CMOS
Shutter	Global Shutter
Resolution	640 x 480 pixels
Scan Area	3.07 mm x 2.3 mm
Pixel Size	4.8 μm x 4.8 μm

Data Quality

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

Dark Noise (σ)	11 e- typical
Saturation	8000 e- typical
Dynamic Range	57 dB typical
SNR	39 dB typical
Quantum efficiency η	40 % @ 465 nm, 43 % @ 536 nm, 46 % @ 631 nm typical

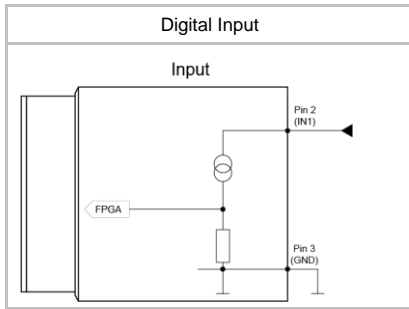
Acquisition

Resolution	640 px x 480 px		
Interface Frame Rate (depends on used interface performance)	Format	Resolution	max. Frame Rate (@ Trigger Mode) ²⁾
	Full Frame	640 x 480	217 fps
	Binning 2x2	320 x 240	217 fps
	Binning 2x1	320 x 480	217 fps
	Binning 1x2	640 x 240	217 fps
Acquisition Frame Rate ¹⁾	217 fps $t_{\text{readout}} = 4.62 \text{ msec}$ (max. Res. Full Frame) @ 10 bit		
Pixel Formats	BayerRG8, BayerRG10		
Partial Scan	True Partial Scan with increasing Frame Rate on Y direction, Region of Interest (ROI) arbitrary Width: minimum 16, increment 16 Height: minimum 2, increment 2		
Adjustable Acquisition Frame Rate	Off or 0.01 ... 4048 Hz		
Acquisition Mode	Continuous, Single Frame and Multi Frame		
Acquisition Status	AcquisitionActive, AcquisitionTrigger Wait		
Exposure Mode	Timed		
Shutter Mode	-		
Readout Mode	Overlapped, Sequential		

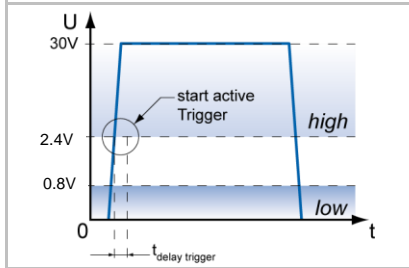
Image Pre-Processing

Analog Controls	Exposure Time (40 μsec ... 1 sec Step Size 1 μsec) Gain (0... 12 dB), Offset (0 ... 63 LSB 10 bit)
Color Models	Raw Bayer
Color Processing	-
Color Adjustment	Manual White Balance
Color Enhancement	-
Color Tolerance	-
Binning Horizontal	1 or 2
Binning Vertical	1 or 2
Image Flipping	Horizontal, vertical
Defect Pixel Correction	via Defect Pixel List with up to 512 Pixel Coordinates
Fix Pattern Noise Correction	yes

¹⁾ 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	Readout
Trigger Sources	Hardware (Line0), Software or Off fixed Trigger Delay out of t_{readout} : ¹⁾ 11 μsec @ 10 bit max. Trigger Delay during t_{readout} : ¹⁾ 25 μsec @ 10 bit
Trigger Delay	-
External Flash Sync	via Exposure Active $t_{\text{delay flash}} \leq 3 \mu\text{sec}$, $t_{\text{duration}} = t_{\text{exposure}}$

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	1 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^{32}
Payload Size	0 ... 614400 Byte
Timestamp	64 bit
Packet Delay	0 .. 2^{32} - 1 Ticks
Packet Resend	Resend Buffer: 32 MB (32 Images)
GigE Vision	v2.0 (v1.2 backward compatible)

Interfaces and Connectors

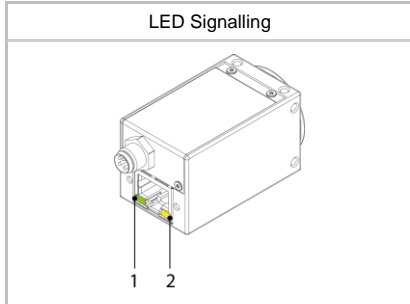
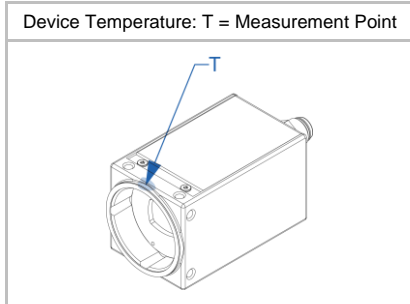
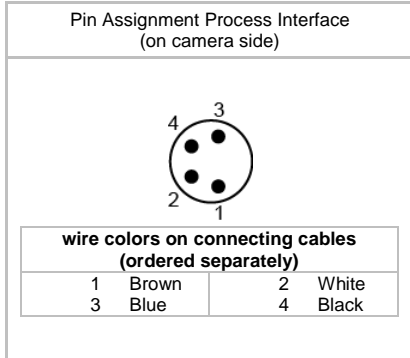
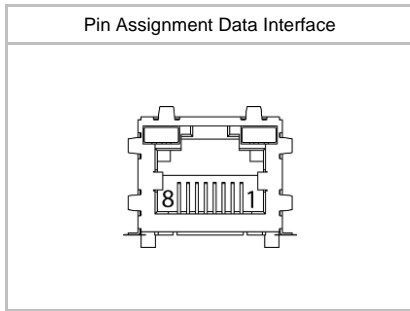
Data and Power Interface	Gigabit Ethernet	Transfer Rate	1000 Mbits/sec
	Fast Ethernet	Transfer Rate	100 Mbits/sec
	Connector:	8P8C Modular Jack (RJ45) screw lock type	
	Pin Assignment:	1 – MX1+	5 – MX3-
		2 – MX1-	6 – MX2-
		3 – MX2+	7 – MX4+
		4 – MX3+	8 – MX4-

Process Interface	Connector:	M8/4-pin (SACC-DSI-M 8MS-4CON-L180)	
	Assignment:	1 - VCC (Power and OUT)	3 - GND (Power and IN)
		2 - IN+	4 - OUT



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

¹⁾ Sensor readout, different from pixel format



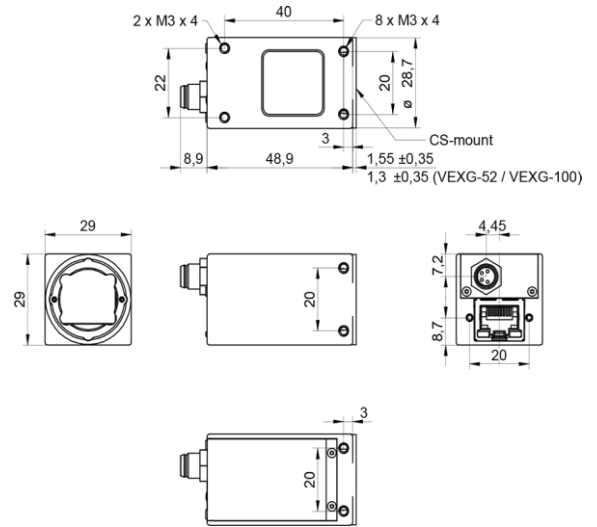
Optical Data

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 ... +65 °C @ T = Measurement Point
	Ambient temperature above 0 °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: 100 ... 200 mA
Power over Ethernet	-
Power Consumption	approx. 2.2 W @ 12VDC and 217 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, EAC
KC Registration No. / Date	- / -
MTBF	72 years @ T = 45 °C / 48 years @ T = 60 °C 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 4.7 msec
SFNC Version	v2.1

Factory Settings after Start-Up

Trigger Mode	Off (Free Running)
Analog Controls	Exposure Time: 4 msec, Gain: 0 dB, Offset: 0
Pixel Format	BayerRG8
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 ²⁾
VGA	640 x 480	216	214
CIF	352 x 288	348	347
QCIF	176 x 144	646	640
LineScan	640 x 256	388	386
	640 x 128	714	706
	640 x 64	1228	1209
	640 x 32	1919	1882
	640 x 16	2673	2598
	640 x 8	3322	3223
	640 x 4	3787	3646
	640 x 2	4065	3912
	640 x 1	-	-

²⁾ depends on the used interface