



## Sensor Information

Model Name	Sony IMX249
Type	1/1.2" progressive scan CMOS
Shutter	Global Shutter
Resolution	1920 x 1200 pixels
Scan Area	11.25 mm x 7.03 mm
Pixel Size	5.86 $\mu$ m x 5.86 $\mu$ m



## Data Quality

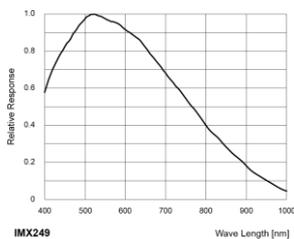
@ 20 °C, gain = 1, exposure time = 4 msec

Dark Noise ( $\sigma$ )	7.9 e- typical
Saturation	32000 e- typical
Dynamic Range	71 dB typical
SNR	45 dB typical
Quantum efficiency $\eta$	68% @ 536 nm typical

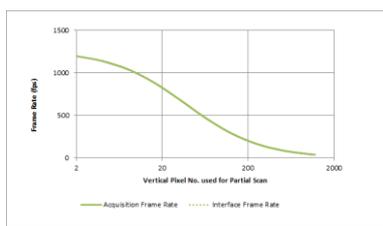
## Acquisition

Resolution	1920 px x 1200 px		
Acquisition Frame Rate	38 fps   $t_{\text{readout}} = 25.8$ msec (max. Res. Full Frame) @ 12 bit <sup>1)</sup>		
Interface Frame Rate	Format	Resolution	max. Frame Rate (@ Trigger Mode)
(depends on used USB interface performance)			
	Full Frame	1920 x 600	38 fps
	Binning 2x2	960 x 600	38 fps
	Binning 2x1	960 x 1200	38 fps
	Binning 1x2	1920 x 600	38 fps
Pixel Formats	Mono8, Mono12		
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	Off or Off or 0.01 ... 1200 Hz		
Frame Rate	-		
Acquisition Mode	Continuous, Single Frame and Multi Frame		
Acquisition Status	AcquisitionActive, AcquisitionTrigger Wait		
Exposure Mode	Timed		

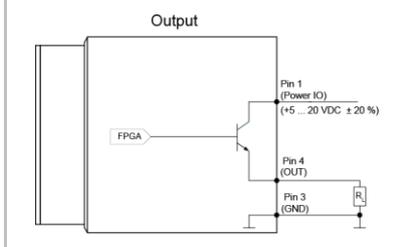
Sensor Graph: Relative Response



Frame Rates / Partial Scan  
(Measured at Mono8/BayerRG8-Format)



## Digital Output



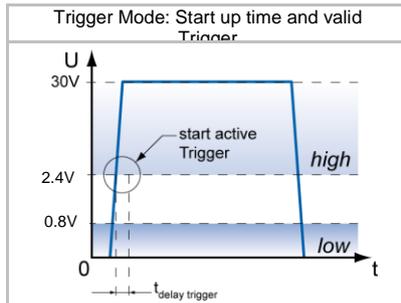
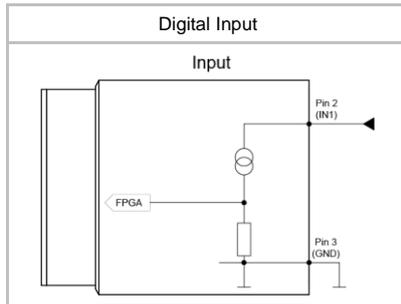
<sup>1)</sup> Sensor readout, different from pixel format

## Image Pre-Processing

Analog Controls	Exposure Time (57 $\mu$ sec ... 60 sec   Step Size 1 $\mu$ sec) Gain (0...48 dB), Offset (0 ... 255 LSB   12 bit)
Color Models	Mono
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

## 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 $t_{\text{readout}}$ : <sup>1)</sup> 46 $\mu$ sec @ 12 bit max. Trigger Delay during $t_{\text{readout}}$ : <sup>1)</sup> 62.5 $\mu$ sec @ 12 bit
Trigger Delay	-
External Flash Sync	via Exposure Active $t_{\text{delay flash}} \leq 3$ $\mu$ 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	no image buffer no image buffer (Trigger Mode) / no (Free Running Mode)
Non-volatile Memory	128 kb

## Interface Data

Interface	USB3.0 (5000 Mbits/sec)
USB Vendor ID / Product ID	0x2825 / 0x126

## USB 3 Vision® Features

Events	-
Transmission via Asynchronous Message Channel	-
Frame Counter	up to 2 <sup>32</sup>
Payload Size	0 ... 4608000 Byte
Timestamp	64 bit
USB Vision	v1.0.1

## Interfaces and Connectors

Data and Power Interface	USB 3.0 USB 2.0	Transfer Rate 5000 Mbits/sec -
Connector:	USB 3.0 Micro B	
Pin Assignment:	VBUS D- D+ ID GND	MicB_SSTX- MicB_SSTX+ GND_DRAIN MicB_SSRX- MicB_SSRX+
Process	Connector:	M8/4-pin (SACC-DSI-M 8MS-4CON-L180)
Interface	Assignment:	1 - VCC (Out)      3 - GND (IN) 2 - IN+              4 - OUT

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



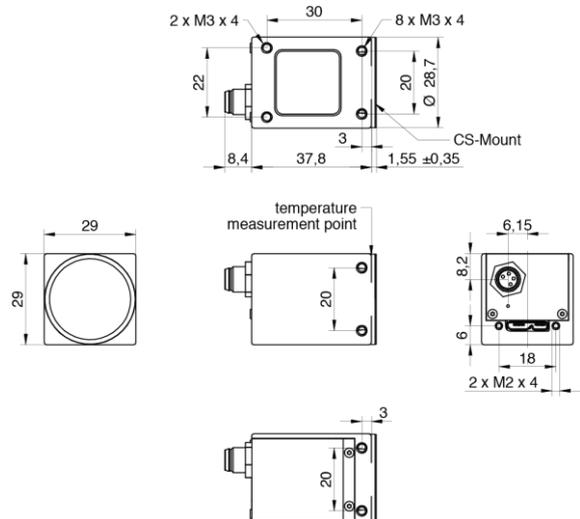
## Optical Data

Lens Mount	CS-Mount
Optical Filter	-

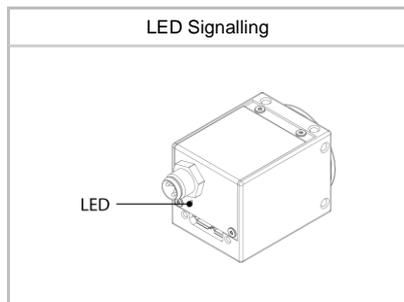
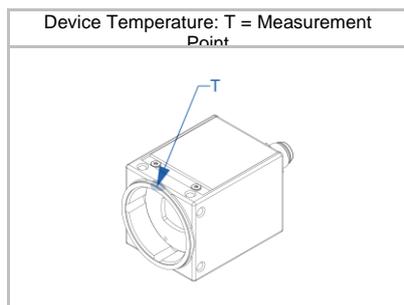
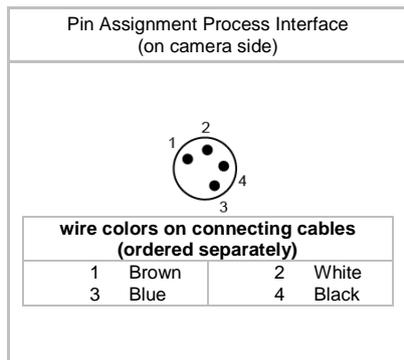
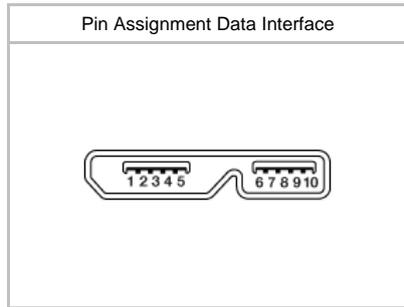
## Mechanical Data

Housing	Zinc die casting, nickel-chrome-plated, IP40 (with mounted lens and USB 3.0 cable)
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Dimensions



Weight	90 g
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## Environmental Data

Storage Temperature	-10 °C ... +70 °C
Operating Temperature <sup>1)</sup>	+5 °C ... +65 °C @ T = Measurement Point Ambient temperature above 50 °C requires heat dissipation measures
Humidity	10 % ... 90 % non-condensing

<sup>1)</sup> the maximum temperature for Sony sensor characteristics (sensor performance) are guaranteed up to °C @ Measurement Point

## LED Signalling

LED	Green flash	Power on, no link active
	Green	Link active USB 3.0
	Red	Error
	Yellow	Sensor Readout activity
	Red flash	Update

## Electrical Data

Power Supply (ext.)	bus powered via USB3.0 interface	
Power Consumption	1.5 W @ 38 fps (Factory Setting "Default")	
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	
	$U_{EXT}$ :	5 ... 30 V DC
	$I_{OUT}$ :	max. 50 mA
	$t_{ON}$ = typ. 1.5 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 defects in the electronic system. Ground loops are to be avoided and can lead to destruction of the device.

## Conformity

Conformity	CE, RoHS, REACH
KC Registration No. / Date	- / -
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 25.77 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	Mono8
Partial Scan	Off
Acquisition Frame Rate	-
Timer	-
Defect Pixel Correction	ON
Fixed Pattern Noise Correction	-
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>
Full HD	1920 x 1080	42	43
SXGA	1280 x 1024	45	45
XGA	1024 x 768	59	59
SVGA	800 x 600	75	75
VGA	640 x 480	92	92
CIF	352 x 288	147	147
QCIF	176 x 144	263	264
LineScan	1920 x 1024	45	45
	1920 x 512	87	87
	1920 x 256	163	163
	1920 x 128	289	289
	1920 x 64	470	470
	1920 x 32	685	684
	1920 x 16	888	886
	1920 x 8	1043	1040
	1920 x 4	1142	1138
	1920 x 2	1200	1995
	1920 x 1		-

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