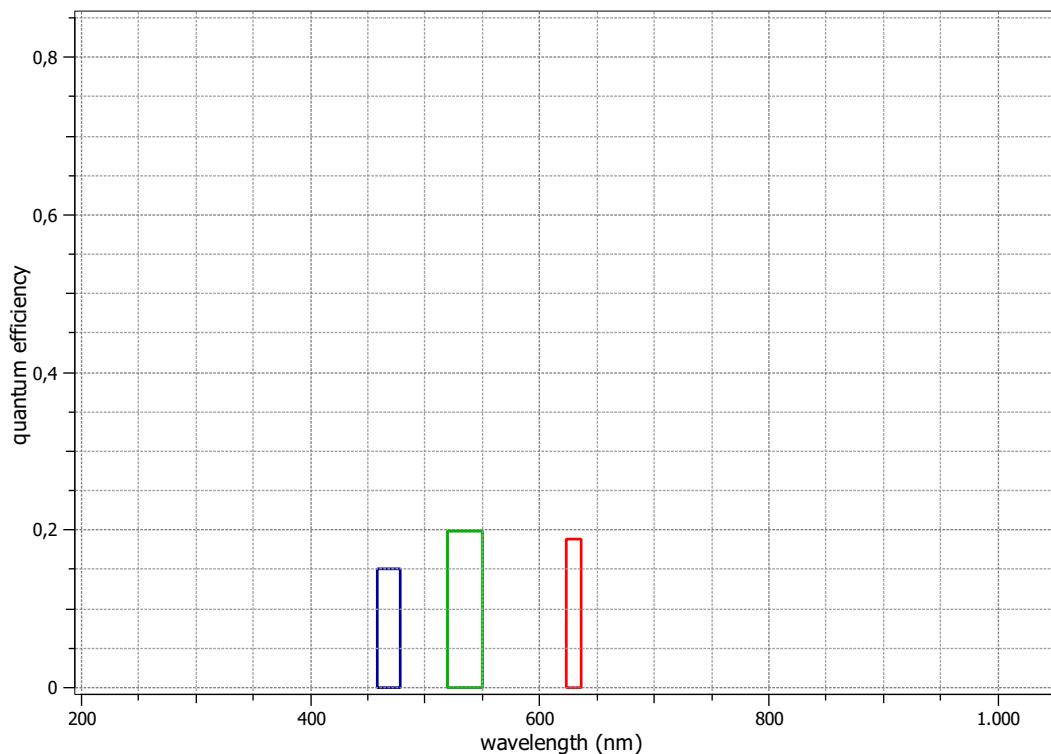


## EMVA 1288 Data Sheet m0805

This datasheet describes the specification according to the standard 1288 release 3.1 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras" issued on December 30, 2016 by the European Machine Vision Association (EMVA), published at [www.standard1288.org](http://www.standard1288.org) and the *zenodo EMVA 1288 community* with proprietary extensions from AEON. The measurements were performed with the AEON ACC3 Release 6, 26.11.2016, SN 0005(MatrixVision.

Measurements performed by T.Renner, Matrix Vision GmbH

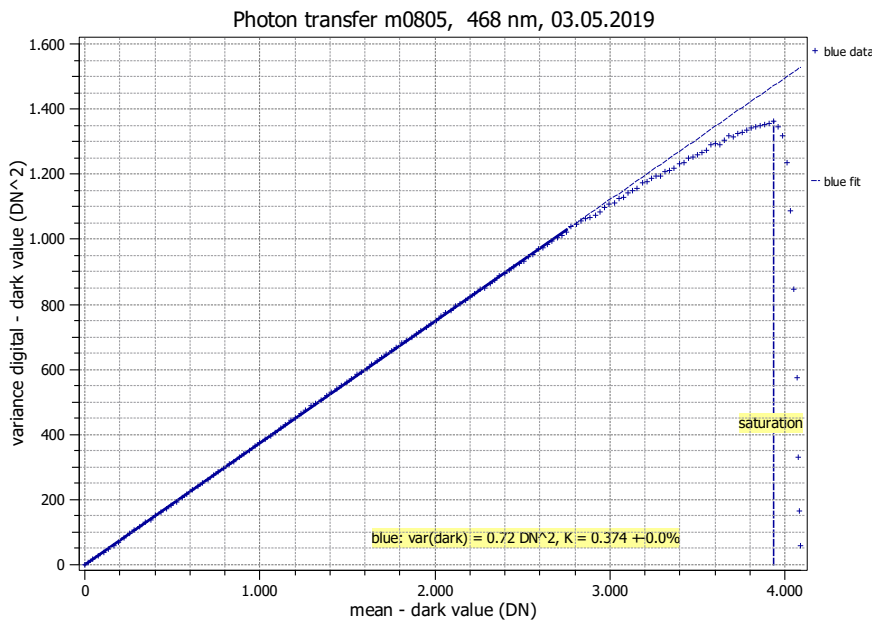
Vendor	MATRIX VI-SION	Type of data presented	Single
Model	mvBlueCOUGAR-X105pC	<b>Operation point 1 (page 5)</b>	
Serial number	GX027179	Wavelength centroid	468.0 nm
Sensor diagonal	11.07 mm	Wavelength FWHM	20.0 nm
Lens category	C-Mount	Gain, black-level	0dB, 0.1
Resolution	2464 × 2056, 12 bit	<b>Operation point 2 (page 20)</b>	
Pixel size (h×v)	3.45 μm × 3.45 μm	Wavelength centroid	535.0 nm
Sensor	IMX250_POL	Wavelength FWHM	31.0 nm
Sensor type	CMOS	Gain, black-level	0dB, 0.1
Shutter type	Global	<b>Operation point 3 (page 35)</b>	
Overlap cap.	Overlapping	Wavelength centroid	630.0 nm
Max. frame rate	11.78 Hz	Wavelength FWHM	13.0 nm
Interface type	GigE Vision	Gain, black-level	0dB, 0.1
		<b>Optional data measured</b>	None



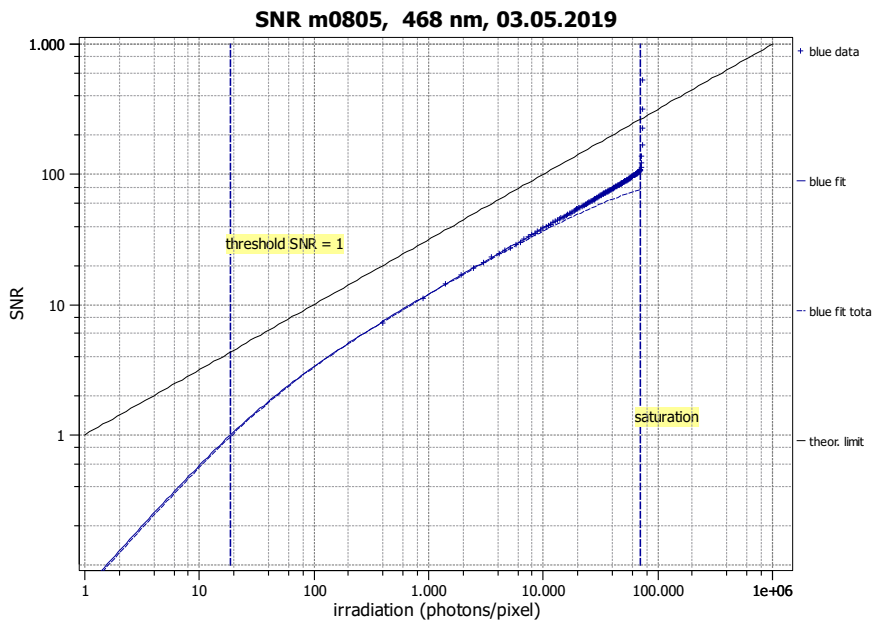
## Summary Sheet for Operation Point 1 at a Wavelength of 468 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	25.3°C
Exposure time	3.00 ms	Camera body temperature	26.9°C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	Mono12	Wavelength, centr., FWHM	468 nm, 20.0 nm

### Photon Transfer



### Signal-to-Noise Ratio



#### Quantum efficiency

$\eta$  15.0%

#### Overall system gain

$K$  0.374 DN/e<sup>-</sup>

$1/K$  2.675 e<sup>-</sup>/DN

#### Temporal dark noise

$\sigma_d$  2.13 e<sup>-</sup>

$\sigma_{y,\text{dark}}$  0.85 DN

#### Signal-to-noise ratio

SNR<sub>max</sub> 103

40.2 dB

6.7 bit

$1/\text{SNR}_{\text{max}}$  0.98 %

#### Absolute sensitivity threshold

$\mu_{p,\text{min}}$  18.79 p

$\mu_{p,\text{min,area}}$  1.579 p/μm<sup>2</sup>

$\mu_{e,\text{min}}$  2.82 e<sup>-</sup>

$\mu_{e,\text{min,area}}$  0.237 e<sup>-</sup>/μm<sup>2</sup>

#### Saturation capacity

$\mu_{p,\text{sat}}$  70009 p

$\mu_{p,\text{sat,area}}$  5882 p/μm<sup>2</sup>

$\mu_{e,\text{sat}}$  10515 e<sup>-</sup>

$\mu_{e,\text{sat,area}}$  883 e<sup>-</sup>/μm<sup>2</sup>

#### Dynamic range

DR 3725

71.4 dB

11.9 bit

#### Spatial nonuniformities

DSNU<sub>1288</sub> 0.68 e<sup>-</sup>

0.25 DN

PRNU<sub>1288</sub> 0.86 %

#### Linearity error

LE<sub>min</sub> -0.47%

LE<sub>max</sub> 1.26%

#### Dark current

$\mu_{c,\text{mean}}$  1 ± 2 e<sup>-</sup>/s

0.5 DN/s

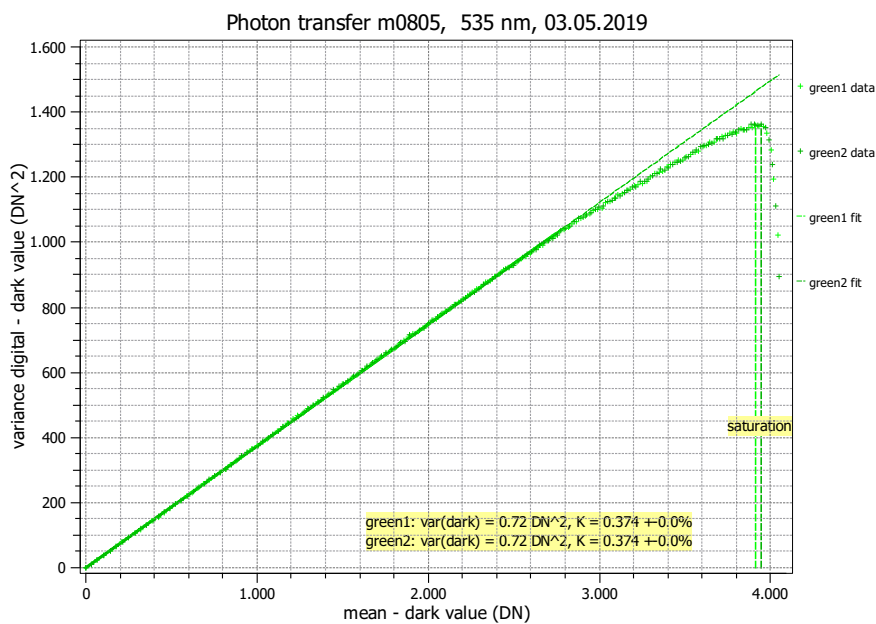
$\mu_{c,\text{var}}$  10 ± 0 e<sup>-</sup>/s

$T_d$  — °C

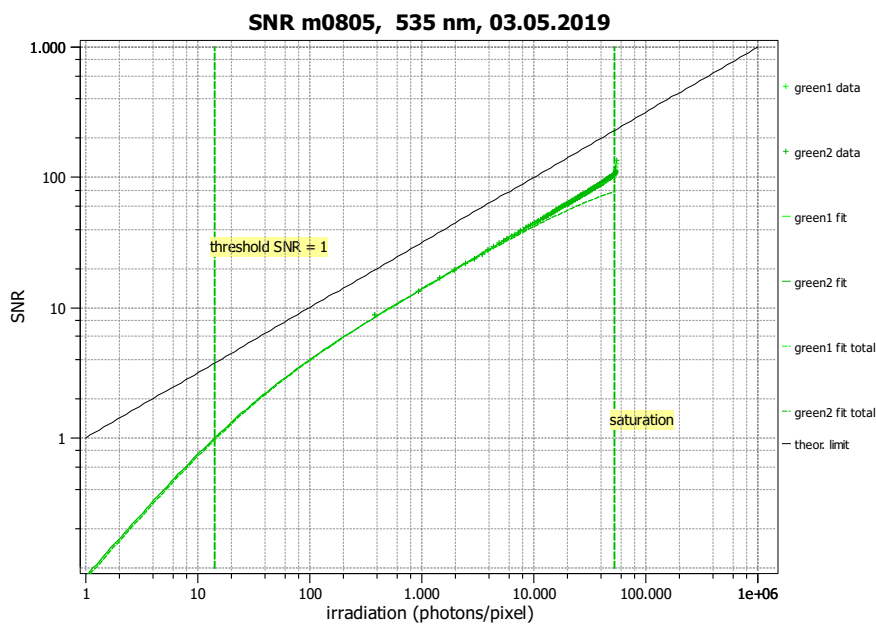
## Summary Sheet for Operation Point 2 at a Wavelength of 535 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	25.4°C
Exposure time	3.00 ms	Camera body temperature	26.9°C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	Mono12	Wavelength, centr., FWHM	535 nm, 31.0 nm

### Photon Transfer



### Signal-to-Noise Ratio



#### Quantum efficiency

$\eta$  19.8%

#### Overall system gain

$K$  0.374 DN/e<sup>-</sup>

$1/K$  2.673 e<sup>-</sup>/DN

#### Temporal dark noise

$\sigma_d$  2.13 e<sup>-</sup>

$\sigma_{y,\text{dark}}$  0.85 DN

#### Signal-to-noise ratio

SNR<sub>max</sub> 102

40.2 dB

6.7 bit

$1/\text{SNR}_{\text{max}}$  0.98 %

#### Absolute sensitivity threshold

$\mu_{p,\text{min}}$  14.20 p

$\mu_{p,\text{min,area}}$  1.193 p/ $\mu\text{m}^2$

$\mu_{e,\text{min}}$  2.82 e<sup>-</sup>

$\mu_{e,\text{min,area}}$  0.237 e<sup>-</sup>/ $\mu\text{m}^2$

#### Saturation capacity

$\mu_{p,\text{sat}}$  52685 p

$\mu_{p,\text{sat,area}}$  4426 p/ $\mu\text{m}^2$

$\mu_{e,\text{sat}}$  10456 e<sup>-</sup>

$\mu_{e,\text{sat,area}}$  878 e<sup>-</sup>/ $\mu\text{m}^2$

#### Dynamic range

DR 3711

71.4 dB

11.9 bit

#### Spatial nonuniformities

DSNU<sub>1288</sub> 0.76 e<sup>-</sup>

0.28 DN

PRNU<sub>1288</sub> 0.83 %

#### Linearity error

LE<sub>min</sub> -0.47%

LE<sub>max</sub> 0.79%

#### Dark current

$\mu_{c,\text{mean}}$   $1 \pm 2$  e<sup>-</sup>/s

0.4 DN/s

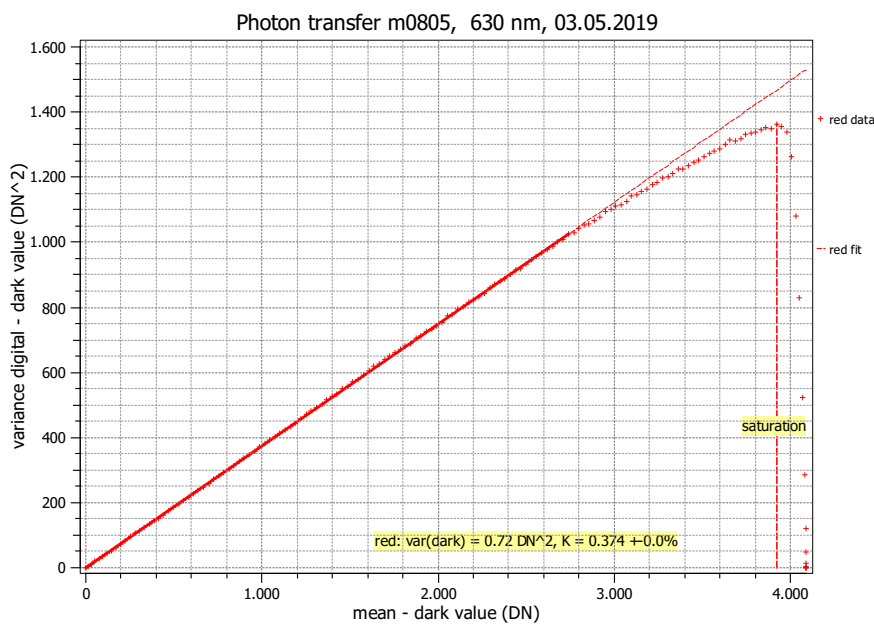
$\mu_{c,\text{var}}$   $10 \pm 0$  e<sup>-</sup>/s

$T_d$  — °C

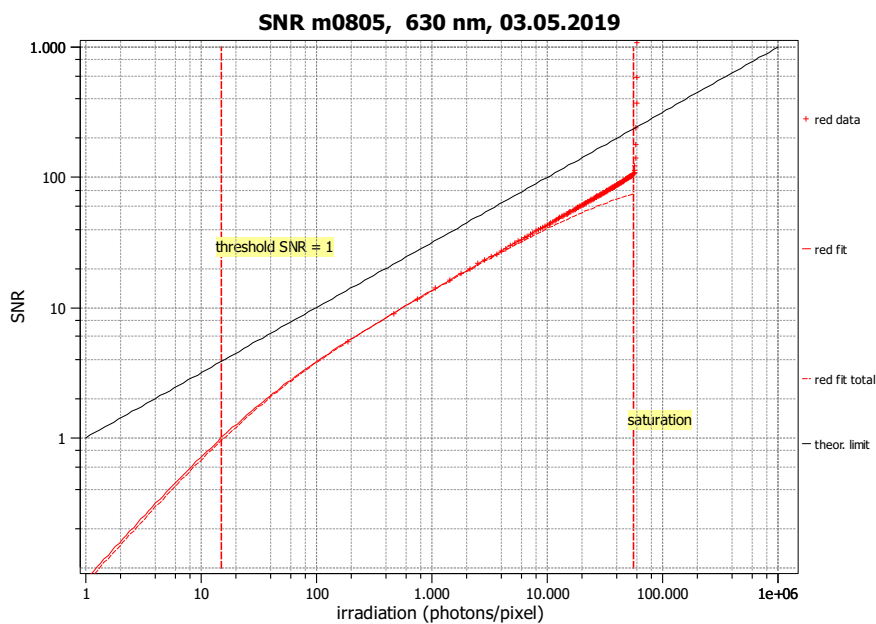
## Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	25.4°C
Exposure time	3.00 ms	Camera body temperature	26.9°C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	Mono12	Wavelength, centr., FWHM	630 nm, 13.0 nm

### Photon Transfer



### Signal-to-Noise Ratio



#### Quantum efficiency

$\eta$  18.8%

#### Overall system gain

$K$  0.374 DN/e<sup>-</sup>

$1/K$  2.672 e<sup>-</sup>/DN

#### Temporal dark noise

$\sigma_d$  2.13 e<sup>-</sup>

$\sigma_{y,\text{dark}}$  0.85 DN

#### Signal-to-noise ratio

SNR<sub>max</sub> 103

40.2 dB

6.7 bit

$1/\text{SNR}_{\text{max}}$  0.98 %

#### Absolute sensitivity threshold

$\mu_{p,\text{min}}$  14.99 p

$\mu_{p,\text{min,area}}$  1.259 p/μm<sup>2</sup>

$\mu_{e,\text{min}}$  2.82 e<sup>-</sup>

$\mu_{e,\text{min,area}}$  0.237 e<sup>-</sup>/μm<sup>2</sup>

#### Saturation capacity

$\mu_{p,\text{sat}}$  55865 p

$\mu_{p,\text{sat,area}}$  4694 p/μm<sup>2</sup>

$\mu_{e,\text{sat}}$  10507 e<sup>-</sup>

$\mu_{e,\text{sat,area}}$  883 e<sup>-</sup>/μm<sup>2</sup>

#### Dynamic range

DR 3727

71.4 dB

11.9 bit

#### Spatial nonuniformities

DSNU<sub>1288</sub> 0.86 e<sup>-</sup>

0.32 DN

PRNU<sub>1288</sub> 0.92 %

#### Linearity error

LE<sub>min</sub> -0.24%

LE<sub>max</sub> 0.50%

#### Dark current

$\mu_{c,\text{mean}}$  1 ± 2 e<sup>-</sup>/s

0.5 DN/s

$\mu_{c,\text{var}}$  10 ± 0 e<sup>-</sup>/s

$T_d$  — °C