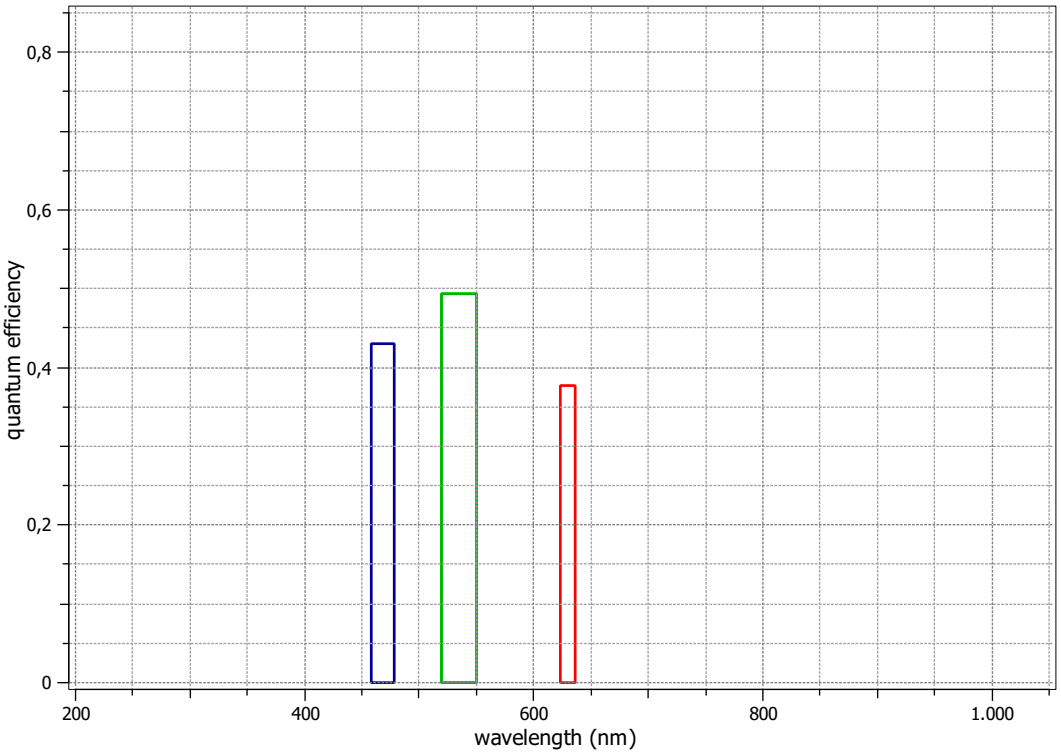
EMVA 1288 Data Sheet m0835

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` 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 VISION
Model	mvBlueCOUGAR-XD1016C
Serial number	GX214787
Sensor diagonal	16.81 mm
Lens category	C-Mount
Resolution	5328 × 3040, 12 bit
Pixel size (h×v)	2.74 μm × 2.74 μm
Sensor	IMX542
Sensor type	CMOS
Shutter type	Global
Overlap cap.	Overlapping
Max. frame rate	7.2 Hz
Interface type	GigE Vision

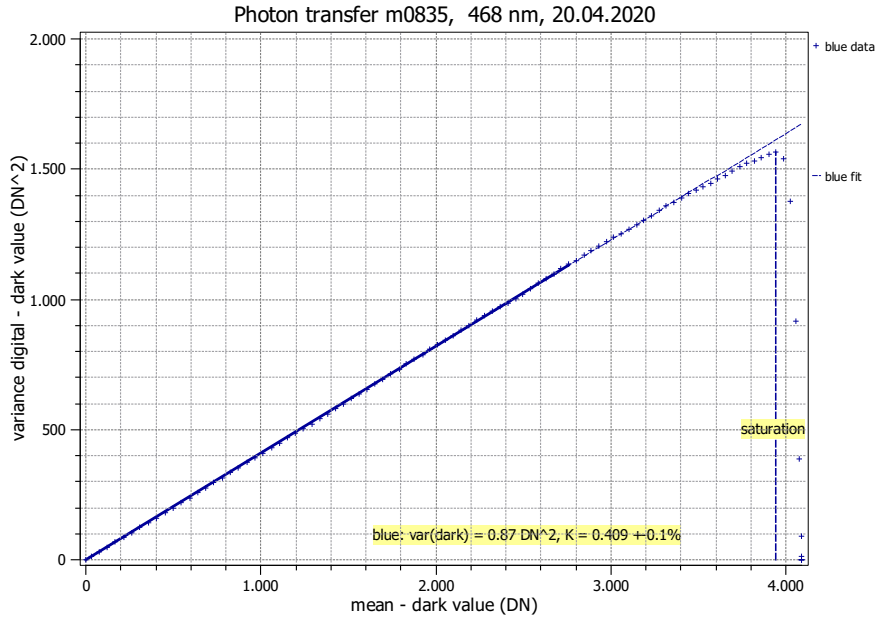
Type of data presented	Single
Operation point 1 (page 5)	
Wavelength centroid	468.0 nm
Wavelength FWHM	20.0 nm
Gain, black-level	0dB, 0.1
Operation point 2 (page 20)	
Wavelength centroid	535.0 nm
Wavelength FWHM	31.0 nm
Gain, black-level	0dB, 0.1
Operation point 3 (page 35)	
Wavelength centroid	630.0 nm
Wavelength FWHM	13.0 nm
Gain, black-level	0dB, 0.1
Optional data measured	
None	



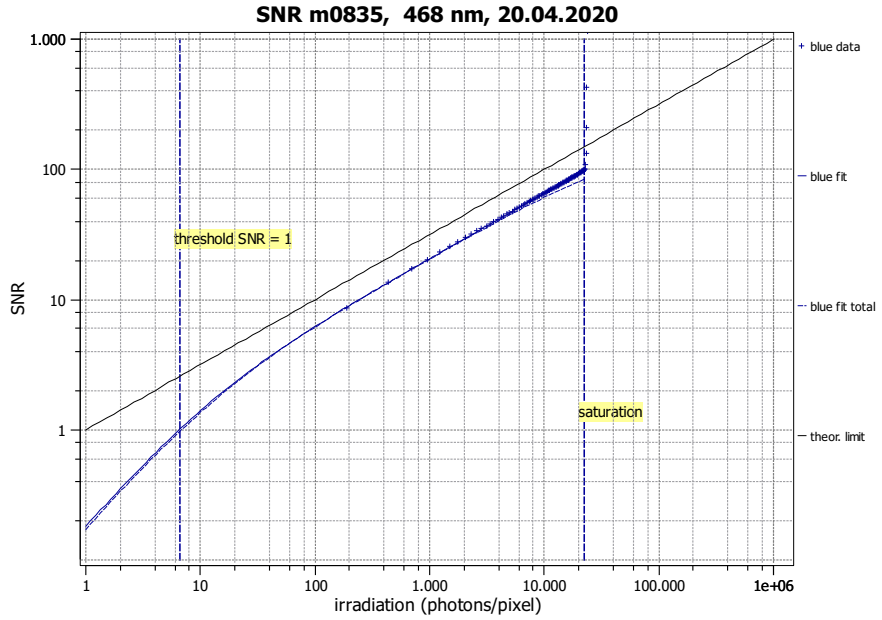
Summary Sheet for Operation Point 1 at a Wavelength of 468 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	22.6°C
Exposure time	2.00 ms	Camera body temperature	35.7°C
Frame rate	3.6 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	468 nm, 20.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	43.0%

Overall system gain

K	0.409 DN/e$^-$
$1/K$	2.443 e$^-$/DN

Temporal dark noise

σ_d	2.17 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.94 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	98
	39.8 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.02 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	6.60 p
$\mu_{p.\mathrm{min.area}}$	0.879 p/μm^2
$\mu_{e.\mathrm{min}}$	2.84 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.378 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	22385 p
$\mu_{p.\mathrm{sat.area}}$	2982 p/μm^2
$\mu_{e.\mathrm{sat}}$	9630 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1283 e$^-$/μm^2

Dynamic range

DR	3392
	70.6 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.76 e$^-$
	0.31 DN
PRNU_{1288}	0.61 %

Linearity error

$\mathrm{LE}_{\min}$	-0.27%
$\mathrm{LE}_{\max}$	0.35%

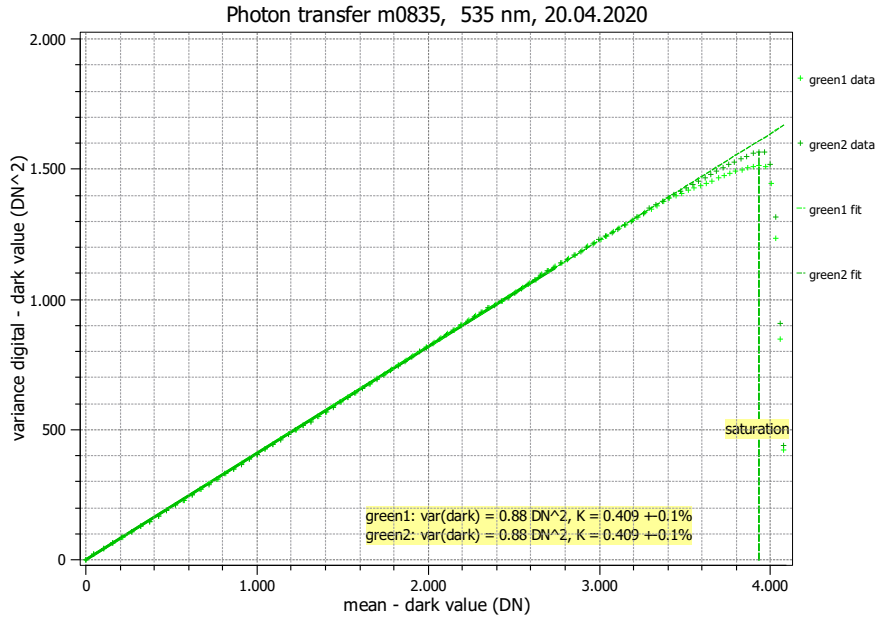
Dark current

$\mu_{c.\mathrm{mean}}$	1.3 ± 0.0 e$^-$/s
	0.54 DN/s
$\mu_{c.\mathrm{var}}$	1.2 ± 0.0 e$^-$/s
T_d	— °C

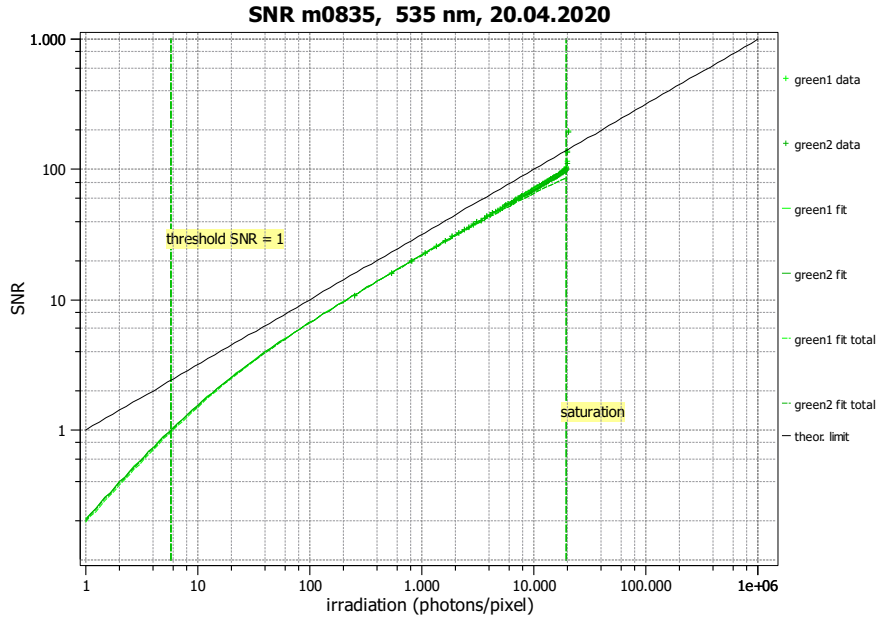
Summary Sheet for Operation Point 2 at a Wavelength of 535 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	22.7°C
Exposure time	2.00 ms	Camera body temperature	35.8°C
Frame rate	3.6 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	535 nm, 31.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	49.4%

Overall system gain

K	0.409 DN/e$^-$
$1/K$	2.444 e$^-$/DN

Temporal dark noise

σ_d	2.17 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.94 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	98
	39.8 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.02 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	5.75 p
$\mu_{p.\mathrm{min.area}}$	0.766 p/μm^2
$\mu_{e.\mathrm{min}}$	2.84 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.378 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	19388 p
$\mu_{p.\mathrm{sat.area}}$	2582 p/μm^2
$\mu_{e.\mathrm{sat}}$	9582 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1276 e$^-$/μm^2

Dynamic range

DR	3373
	70.6 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.84 e$^-$
	0.34 DN
PRNU_{1288}	0.57 %

Linearity error

$\mathrm{LE}_{\min}$	-0.53%
$\mathrm{LE}_{\max}$	1.29%

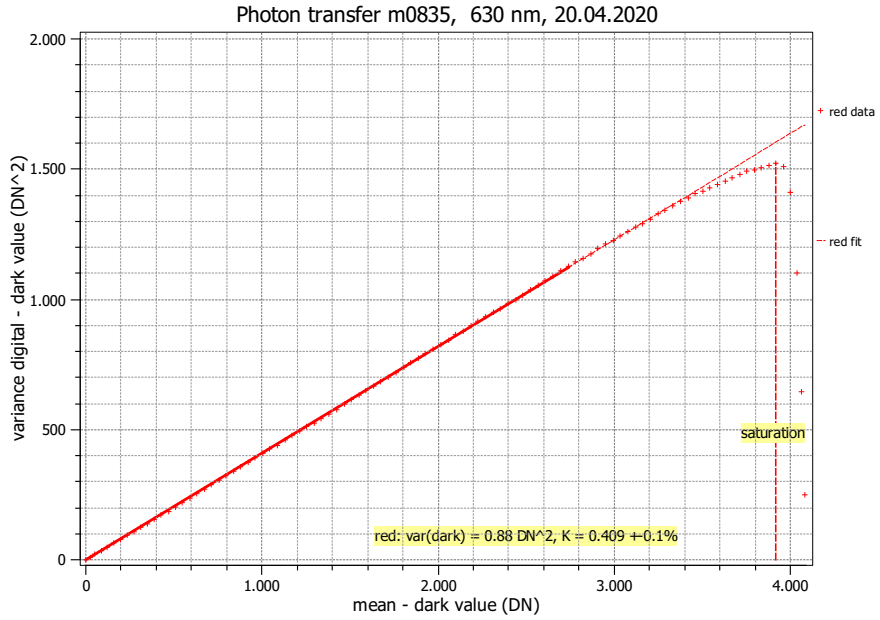
Dark current

$\mu_{c.\mathrm{mean}}$	1.3 ± 0.0 e$^-$/s
	0.54 DN/s
$\mu_{c.\mathrm{var}}$	1.2 ± 0.0 e$^-$/s
T_d	— °C

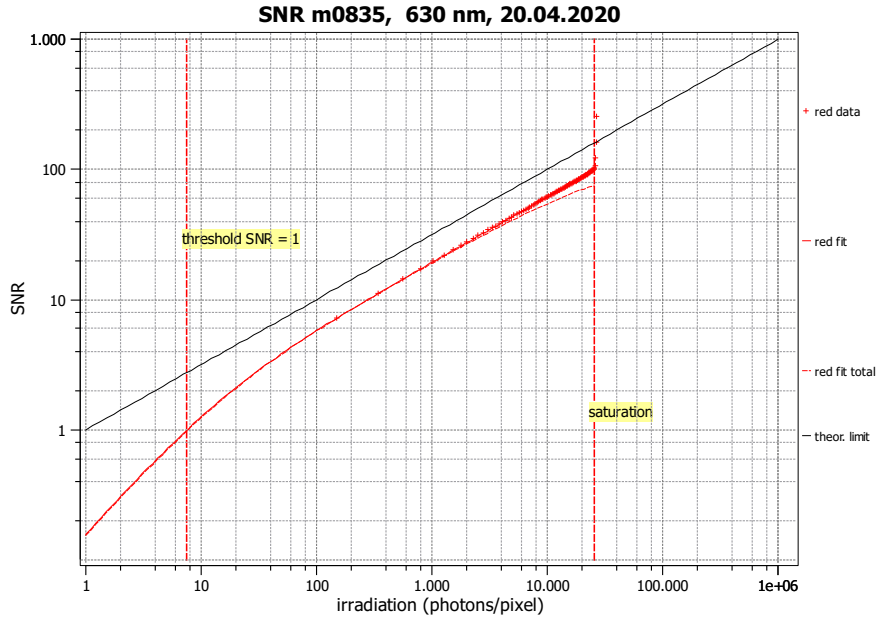
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0dB, 0.1
Exposure control	By irradiance	Environmental temperature	22.7°C
Exposure time	2.00 ms	Camera body temperature	35.9°C
Frame rate	3.6 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	630 nm, 13.0 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	37.7%

Overall system gain

K	0.409 DN/e$^-$
$1/K$	2.443 e$^-$/DN

Temporal dark noise

σ_d	2.18 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.94 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	98
	39.8 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.02 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	7.55 p
$\mu_{p.\mathrm{min.area}}$	1.006 p/μm^2
$\mu_{e.\mathrm{min}}$	2.85 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.379 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	25477 p
$\mu_{p.\mathrm{sat.area}}$	3393 p/μm^2
$\mu_{e.\mathrm{sat}}$	9604 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1279 e$^-$/μm^2

Dynamic range

DR	3373
	70.6 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.52 e$^-$
	0.21 DN
PRNU_{1288}	0.85 %

Linearity error

$\mathrm{LE}_{\min}$	-0.15%
$\mathrm{LE}_{\max}$	0.14%

Dark current

$\mu_{c.\mathrm{mean}}$	1.3 ± 0.0 e$^-$/s
	0.51 DN/s
$\mu_{c.\mathrm{var}}$	1.1 ± 0.0 e$^-$/s
T_d	— °C