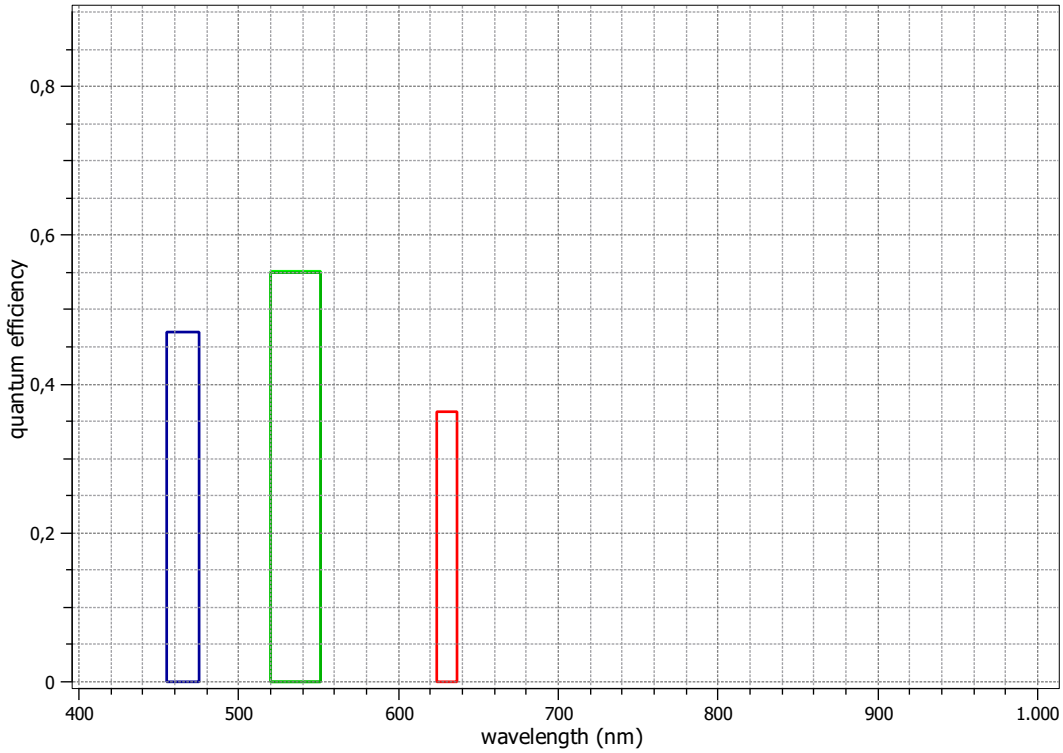
EMVA 1288 Summary Sheet

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 RGB Release 7, 21.08.2018, SN 0001(Baumer).

Measurements performed by Technical and Application Support Center, Baumer Optronic GmbH.

Vendor	Baumer
Model	VLXT-650C.I
Serial number	700006247636
Sensor diagonal	34.99 mm
Lens category	M58 mount
Resolution	8400 × 7000, 12 bit
Pixel size (h×v)	3.20 μm × 3.20 μm
Sensor	GPixel GPIXEL_GMAX3265
Sensor type	CMOS
Shutter type	Global shutter
Overlap cap.	Overlapped
Max. frame rate	0.0 Hz
Interface type	GEV

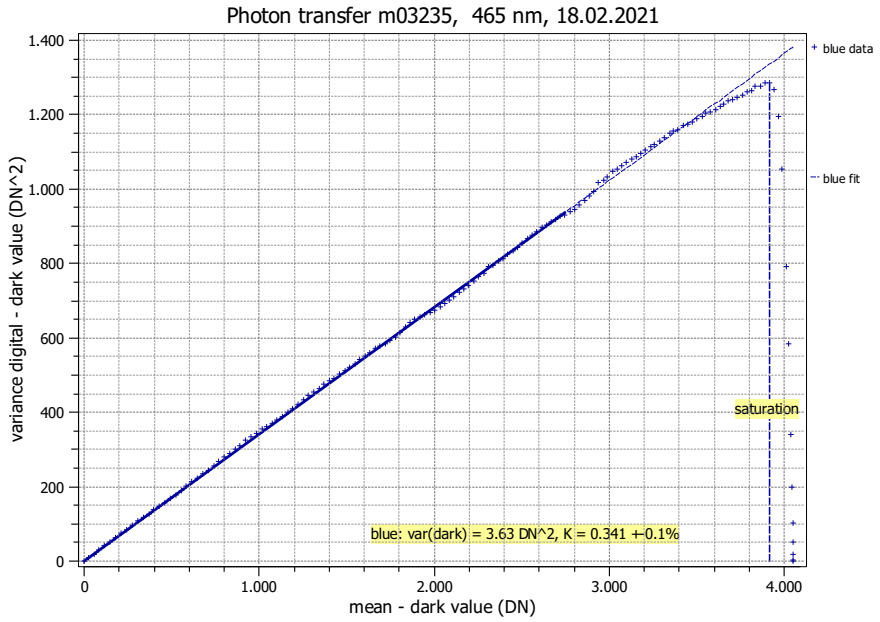
Type of data presented	Single
Operation point 1	
Wavelength centroid	465.1 nm
Wavelength FWHM	20.5 nm
Gain, black-level	1.0 / 39.0
Operation point 2	
Wavelength centroid	535.7 nm
Wavelength FWHM	31.9 nm
Gain, black-level	1.0 / 39.0
Operation point 3	
Wavelength centroid	630.3 nm
Wavelength FWHM	13.2 nm
Gain, black-level	1.0 / 39.0
Optional data measured	
None	



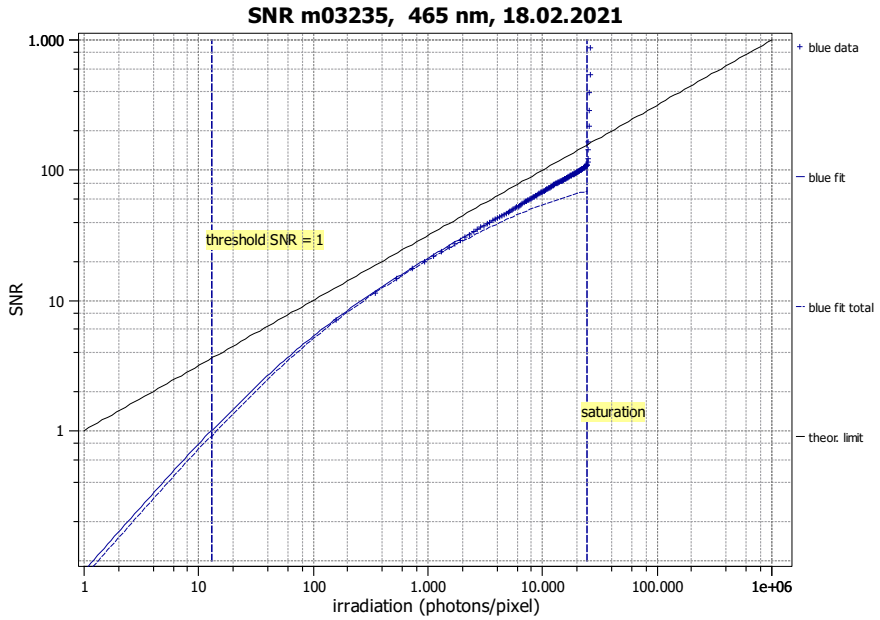
Summary Sheet for Operation Point 1 at a Wavelength of 465 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	25.3 °C
Exposure time	801.00 µs	Camera body temperature	41.4 °C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	465 nm, 20.5 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	47.1%

Overall system gain

K	0.341 DN/e$^-$
$1/K$	2.931 e$^-$/DN

Temporal dark noise

σ_d	5.52 e$^-$
$\sigma_{y.\mathrm{dark}}$	1.90 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	107
	40.6 dB
	6.7 bit
$1/\mathrm{SNR}_{\max}$	0.93 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	12.97 p
$\mu_{p.\mathrm{min.area}}$	1.266 p/µm^2
$\mu_{e.\mathrm{min}}$	6.10 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.596 e$^-$/µm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	24404 p
$\mu_{p.\mathrm{sat.area}}$	2383 p/µm^2
$\mu_{e.\mathrm{sat}}$	11488 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1122 e$^-$/µm^2

Dynamic range

DR	1882
	65.5 dB
	10.9 bit

Spatial nonuniformities

DSNU_{1288}	2.70 e$^-$
	0.92 DN
PRNU_{1288}	1.11 %

Linearity error

$\mathrm{LE}_{\min}$	-0.16%
$\mathrm{LE}_{\max}$	0.23%

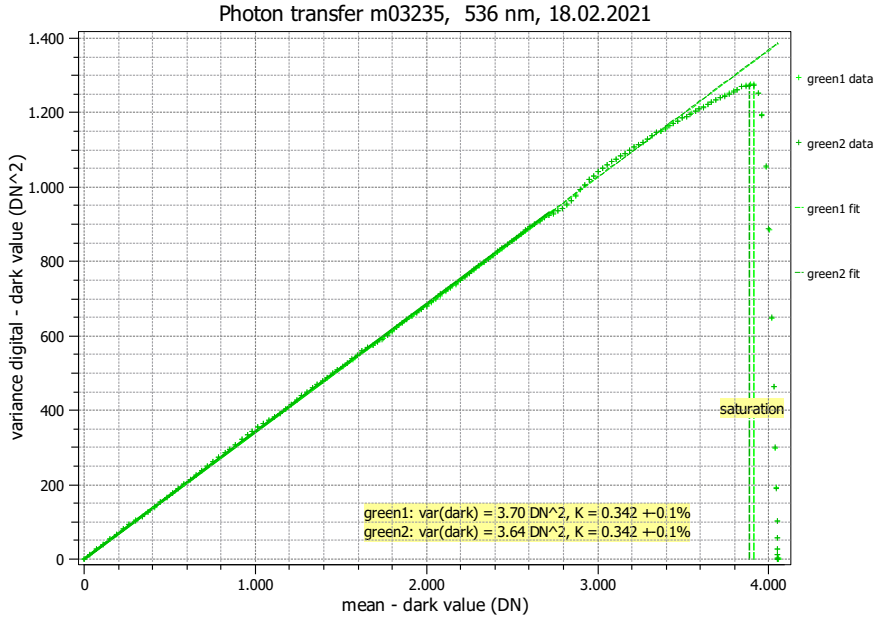
Dark current

$\mu_{c.\mathrm{mean}}$	21 ± 0 e$^-$/s
	7.1 DN/s
$\mu_{c.\mathrm{var}}$	20 ± 0 e$^-$/s
T_d	— °C

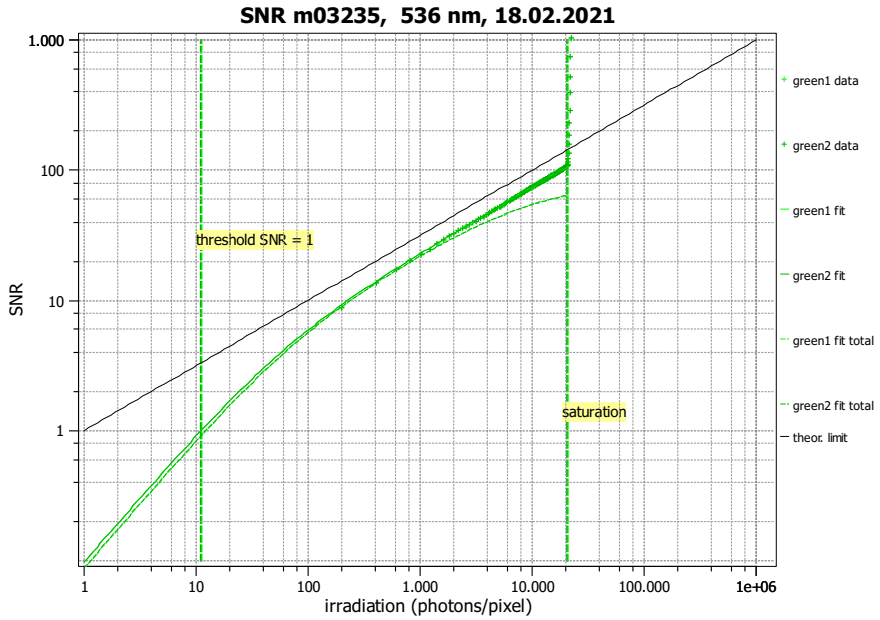
Summary Sheet for Operation Point 2 at a Wavelength of 536 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	26.8 °C
Exposure time	1.58 ms	Camera body temperature	44.9 °C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	536 nm, 31.9 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	55.1%

Overall system gain

K	0.342 DN/e$^-$
$1/K$	2.925 e$^-$/DN

Temporal dark noise

σ_d	5.56 e$^-$
$\sigma_{y.\mathrm{dark}}$	1.92 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	107
	40.6 dB
	6.7 bit
$1/\mathrm{SNR}_{\max}$	0.94 %

Absolute sensitivity threshold

$\mu_{p.\min}$	11.15 p
$\mu_{p.\min.\mathrm{area}}$	1.089 p/μm^2
$\mu_{e.\min}$	6.15 e$^-$
$\mu_{e.\min.\mathrm{area}}$	0.600 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	20668 p
$\mu_{p.\mathrm{sat.area}}$	2018 p/μm^2
$\mu_{e.\mathrm{sat}}$	11390 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1112 e$^-$/μm^2

Dynamic range

DR	1854
	65.4 dB
	10.9 bit

Spatial nonuniformities

DSNU_{1288}	2.79 e$^-$
	0.95 DN
PRNU_{1288}	1.26 %

Linearity error

$\mathrm{LE}_{\min}$	-0.50%
$\mathrm{LE}_{\max}$	0.69%

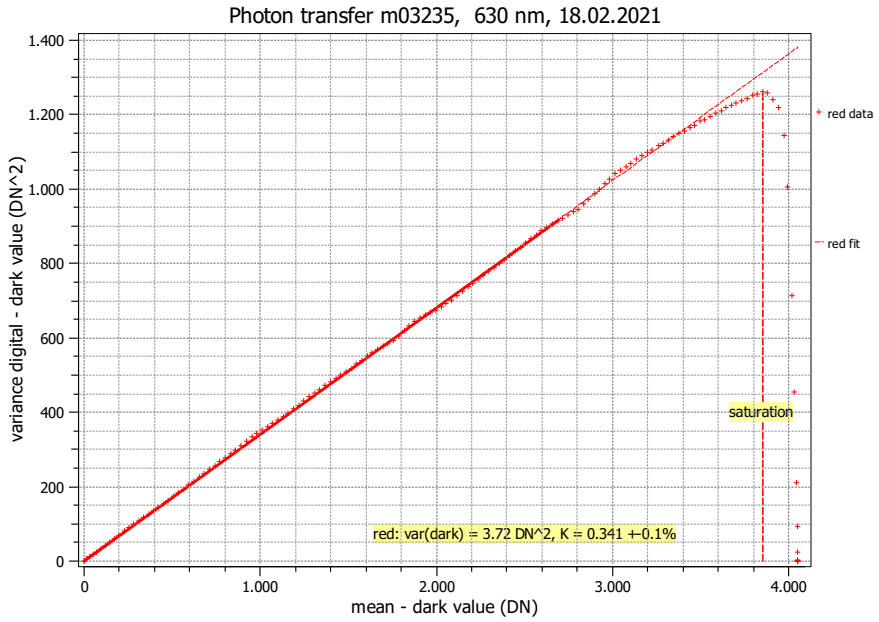
Dark current

$\mu_{c.\mathrm{mean}}$	22 ± 0 e$^-$/s
	7.7 DN/s
$\mu_{c.\mathrm{var}}$	22 ± 0 e$^-$/s
T_d	— °C

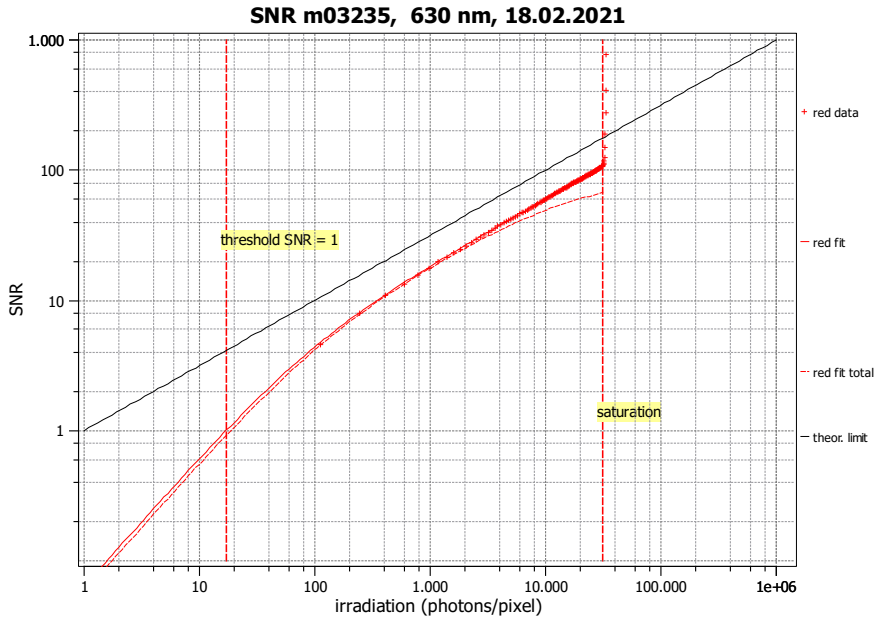
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	28.0 °C
Exposure time	1.58 ms	Camera body temperature	46.0 °C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	630 nm, 13.2 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	36.3%

Overall system gain

K	0.341 DN/e$^-$
$1/K$	2.933 e$^-$/DN

Temporal dark noise

σ_d	5.60 e$^-$
$\sigma_{y.\mathrm{dark}}$	1.93 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	107
	40.6 dB
	6.7 bit
$1/\mathrm{SNR}_{\max}$	0.94 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	17.03 p
$\mu_{p.\mathrm{min.area}}$	1.663 p/μm^2
$\mu_{e.\mathrm{min}}$	6.18 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.604 e$^-$/μm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	31299 p
$\mu_{p.\mathrm{sat.area}}$	3057 p/μm^2
$\mu_{e.\mathrm{sat}}$	11362 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1110 e$^-$/μm^2

Dynamic range

DR	1838
	65.3 dB
	10.8 bit

Spatial nonuniformities

DSNU_{1288}	2.71 e$^-$
	0.92 DN
PRNU_{1288}	1.16 %

Linearity error

$\mathrm{LE}_{\min}$	-0.73%
$\mathrm{LE}_{\max}$	0.33%

Dark current

$\mu_{c.\mathrm{mean}}$	18 ± 0 e$^-$/s
	6.3 DN/s
$\mu_{c.\mathrm{var}}$	19 ± 0 e$^-$/s
T_d	— °C