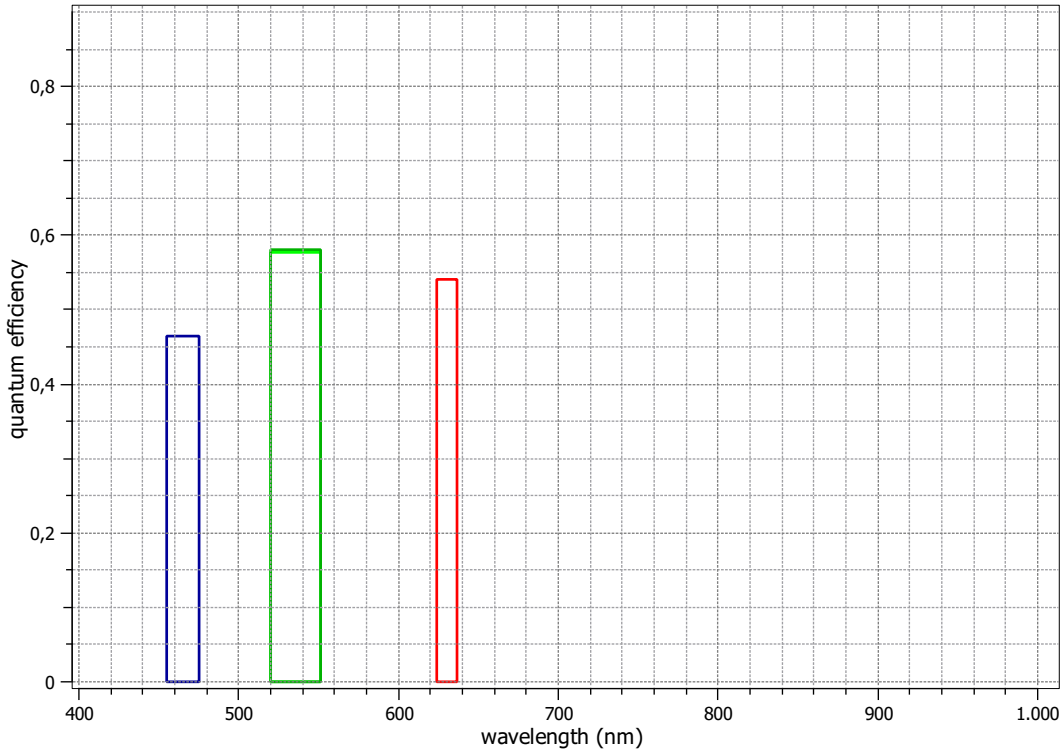
EMVA 1288 Summary Sheet

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-90C.I
Serial number	700003733777
Sensor diagonal	15.98 mm
Lens category	C-Mount
Resolution	4096 × 2160, 12 bit
Pixel size (h×v)	3.45 μm × 3.45 μm
Sensor	Sony IMX255
Sensor type	CMOS
Shutter type	Global shutter
Overlap cap.	Overlapped
Max. frame rate	0.0 Hz
Interface type	GEV

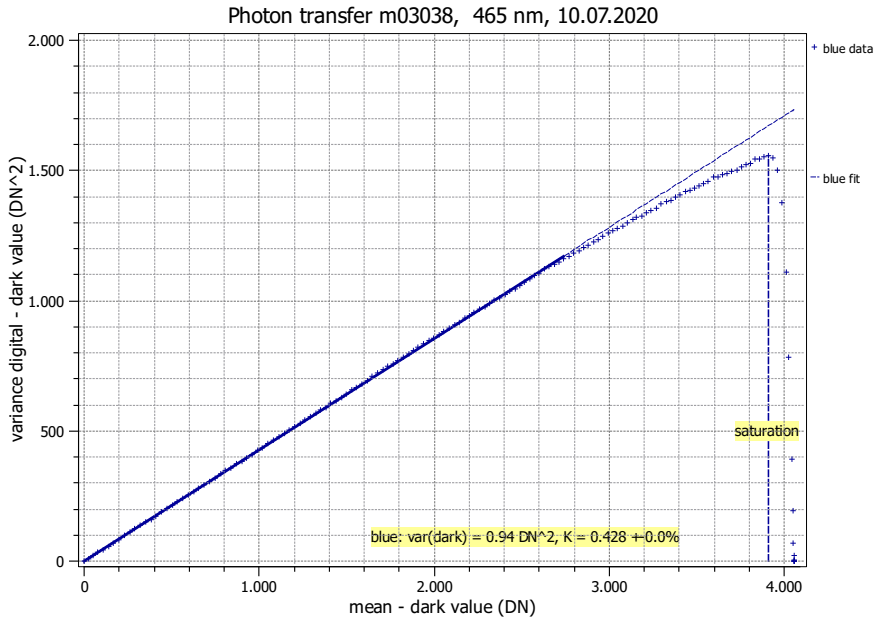
Type of data presented	Single
Operation point 1	
Wavelength centroid	465.1 nm
Wavelength FWHM	20.5 nm
Gain, black-level	1.0 / 39.0
Operation point 2	
Wavelength centroid	535.7 nm
Wavelength FWHM	31.9 nm
Gain, black-level	1.0 / 39.0
Operation point 3	
Wavelength centroid	630.3 nm
Wavelength FWHM	13.2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



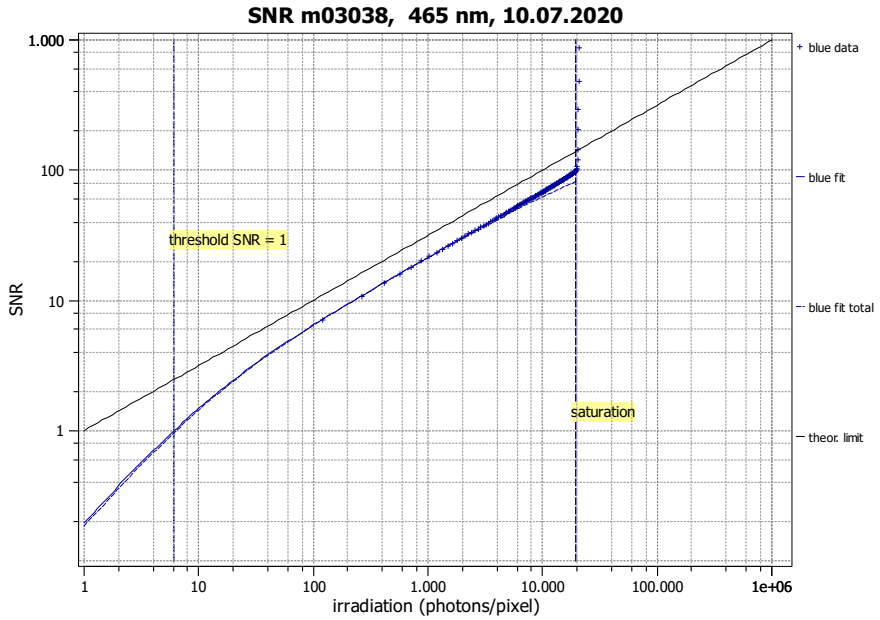
Summary Sheet for Operation Point 1 at a Wavelength of 465 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	27.9 °C
Exposure time	796.00 µs	Camera body temperature	42.7 °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	46.4%

Overall system gain

K	0.428 DN/e$^-$
$1/K$	2.339 e$^-$/DN

Temporal dark noise

σ_d	2.17 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.97 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	96
	39.6 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.05 %

Absolute sensitivity threshold

$\mu_{p.\mathrm{min}}$	6.09 p
$\mu_{p.\mathrm{min.area}}$	0.512 p/µm^2
$\mu_{e.\mathrm{min}}$	2.83 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.238 e$^-$/µm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	19660 p
$\mu_{p.\mathrm{sat.area}}$	1652 p/µm^2
$\mu_{e.\mathrm{sat}}$	9128 e$^-$
$\mu_{e.\mathrm{sat.area}}$	767 e$^-$/µm^2

Dynamic range

DR	3228
	70.2 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.78 e$^-$
	0.33 DN
PRNU_{1288}	0.63 %

Linearity error

$\mathrm{LE}_{\min}$	-0.57%
$\mathrm{LE}_{\max}$	1.53%

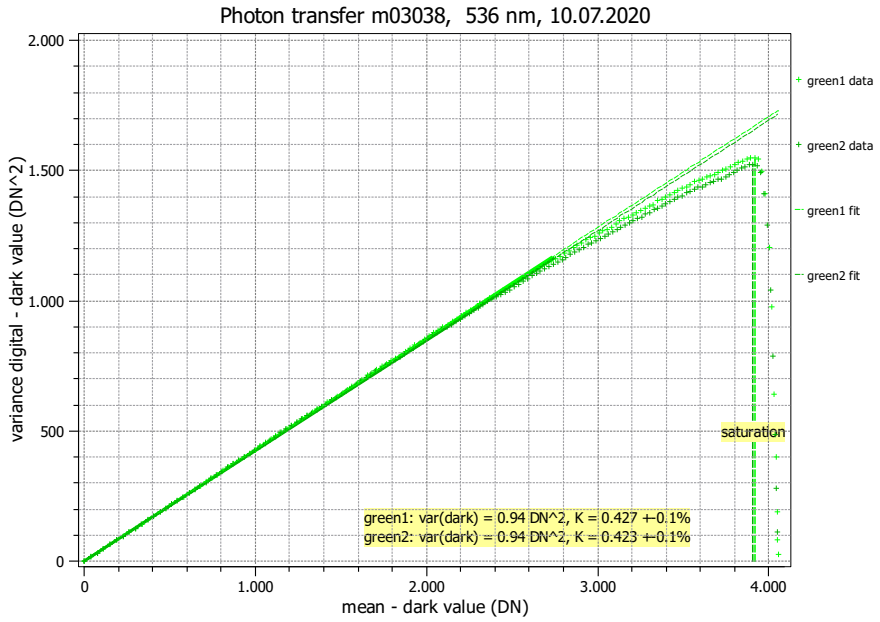
Dark current

$\mu_{c.\mathrm{mean}}$	-0.5 ± 0.2 e$^-$/s
	-0.23 DN/s
$\mu_{c.\mathrm{var}}$	2.6 ± 0.3 e$^-$/s
T_d	— °C

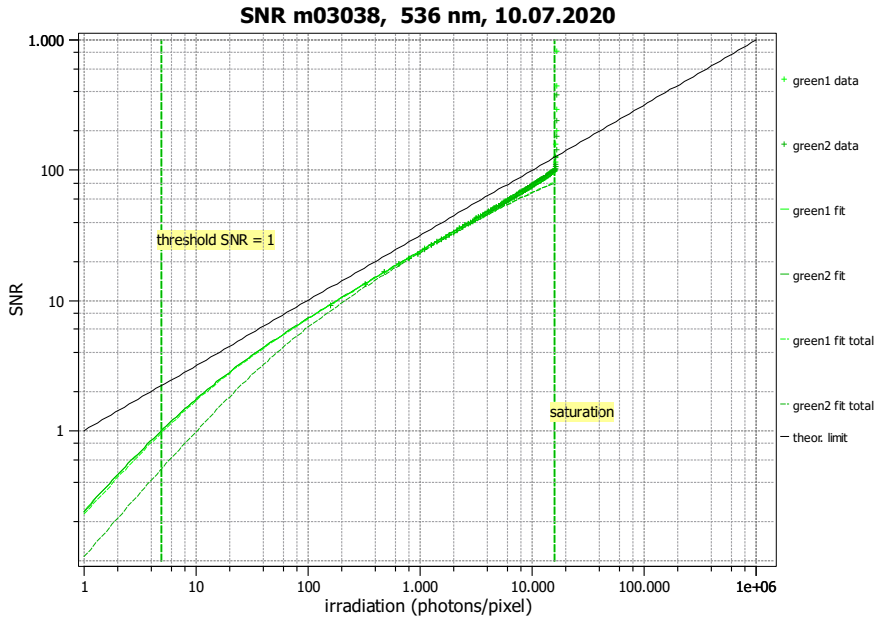
Summary Sheet for Operation Point 2 at a Wavelength of 536 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	28.5 °C
Exposure time	796.00 µs	Camera body temperature	43.8 °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	57.7%

Overall system gain

K	0.427 DN/e$^-$
$1/K$	2.342 e$^-$/DN

Temporal dark noise

σ_d	2.17 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.97 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	96
	39.6 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.05 %

Absolute sensitivity threshold

$\mu_{p.\min}$	4.90 p
$\mu_{p.\min.\mathrm{area}}$	0.411 p/µm^2
$\mu_{e.\min}$	2.83 e$^-$
$\mu_{e.\min.\mathrm{area}}$	0.237 e$^-$/µm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	15840 p
$\mu_{p.\mathrm{sat.area}}$	1331 p/µm^2
$\mu_{e.\mathrm{sat}}$	9141 e$^-$
$\mu_{e.\mathrm{sat.area}}$	768 e$^-$/µm^2

Dynamic range

DR	3234
	70.2 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.79 e$^-$
	0.34 DN
PRNU_{1288}	0.67 %

Linearity error

$\mathrm{LE}_{\min}$	-0.69%
$\mathrm{LE}_{\max}$	1.77%

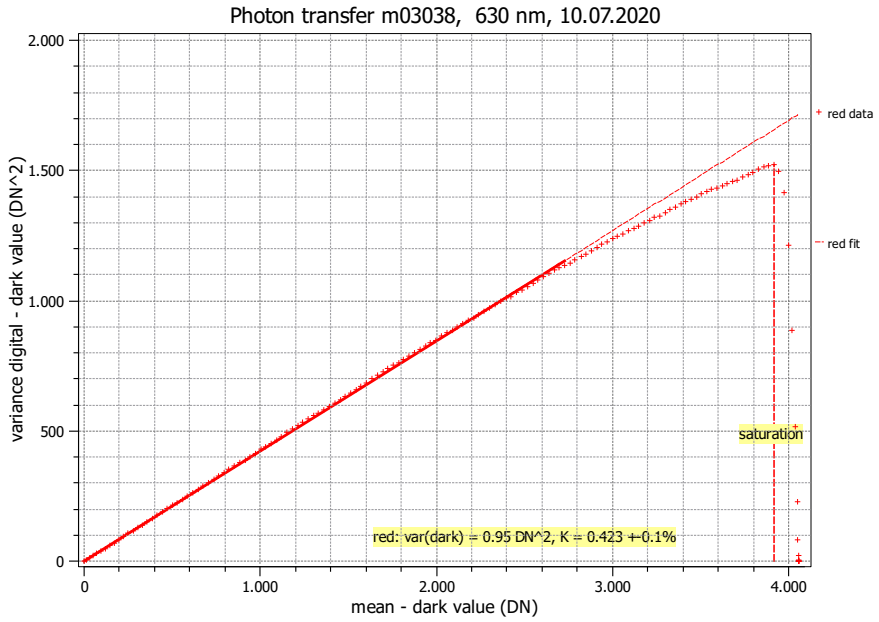
Dark current

$\mu_{c.\mathrm{mean}}$	-0.5 ± 0.2 e$^-$/s
	-0.23 DN/s
$\mu_{c.\mathrm{var}}$	2.7 ± 0.3 e$^-$/s
T_d	— °C

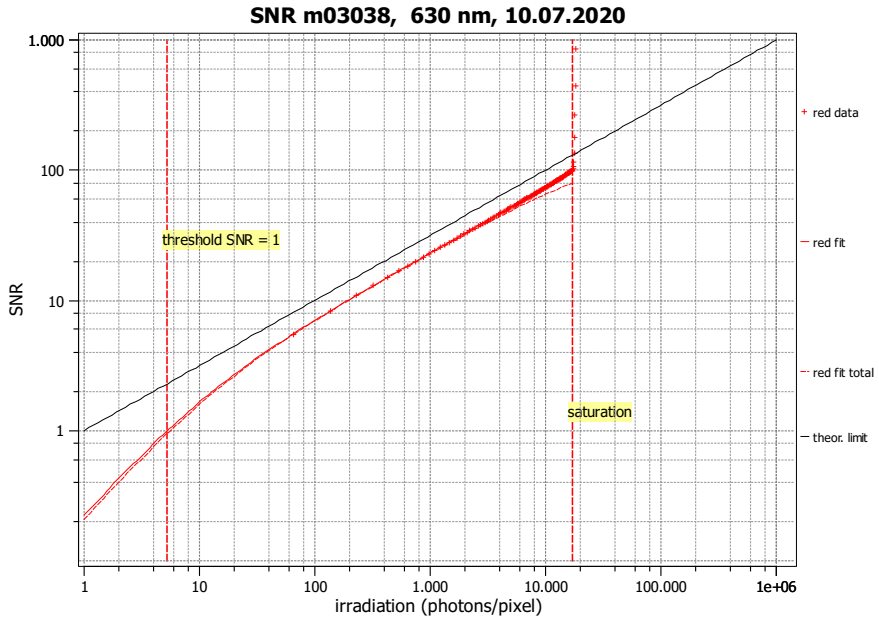
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	29.0 °C
Exposure time	796.00 µs	Camera body temperature	44.3 °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	54.2%

Overall system gain

K	0.423 DN/e$^-$
$1/K$	2.363 e$^-$/DN

Temporal dark noise

σ_d	2.21 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.98 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	97
	39.7 dB
	6.6 bit
$1/\mathrm{SNR}_{\max}$	1.04 %

Absolute sensitivity threshold

$\mu_{p.\min}$	5.29 p
$\mu_{p.\min.\mathrm{area}}$	0.444 p/µm^2
$\mu_{e.\min}$	2.86 e$^-$
$\mu_{e.\min.\mathrm{area}}$	0.240 e$^-$/µm^2

Saturation capacity

$\mu_{p.\mathrm{sat}}$	17197 p
$\mu_{p.\mathrm{sat.area}}$	1445 p/µm^2
$\mu_{e.\mathrm{sat}}$	9313 e$^-$
$\mu_{e.\mathrm{sat.area}}$	782 e$^-$/µm^2

Dynamic range

DR	3254
	70.2 dB
	11.7 bit

Spatial nonuniformities

DSNU_{1288}	0.93 e$^-$
	0.39 DN
PRNU_{1288}	0.71 %

Linearity error

$\mathrm{LE}_{\min}$	-0.41%
$\mathrm{LE}_{\max}$	0.54%

Dark current

$\mu_{c.\mathrm{mean}}$	-0.75 ± 0.27 e$^-$/s
	-0.32 DN/s
$\mu_{c.\mathrm{var}}$	0.36 ± 0.28 e$^-$/s
T_d	— °C