EMVA 1288 Data Sheet m1306

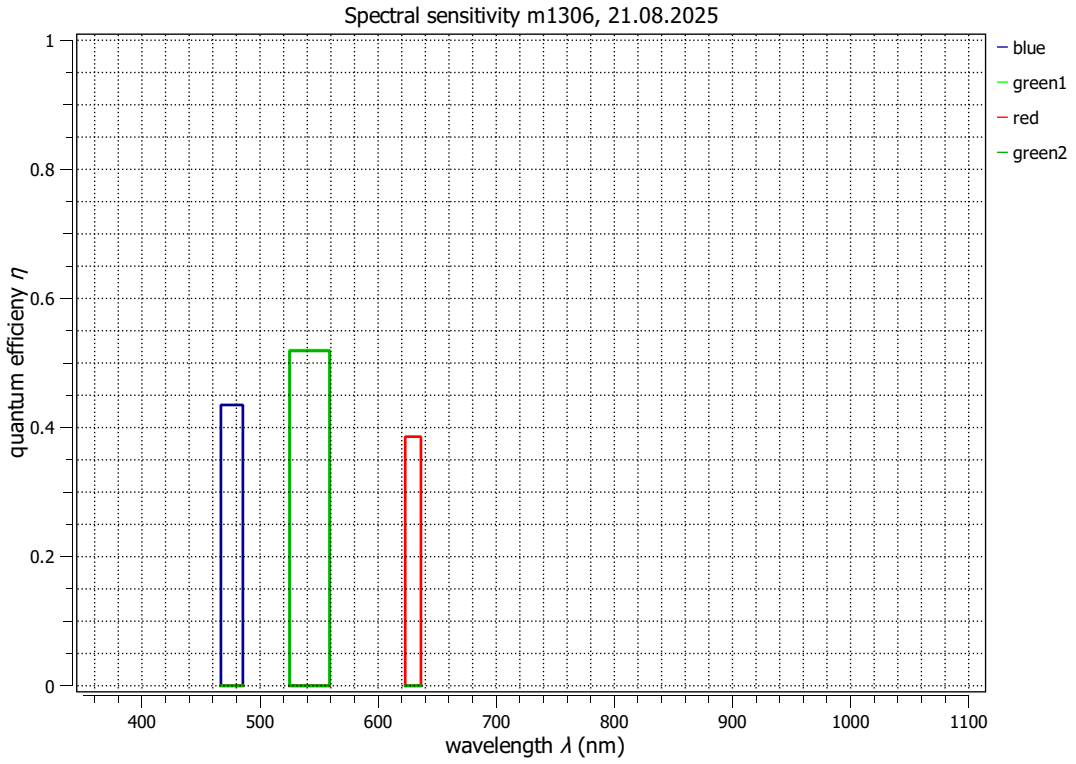
This data sheet describes the specification according to the standard 1288 Release 4.0 Linear issued on 21 June 2021 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras" by the European Machine Vision Association (EMVA), published at `https://www.emva.org/standards-technology/emva-1288/` with proprietary extensions from AEON. The measurements were performed with the AEON ACC2b 14x1 color, Release 9, 13.11.2020, SN 0066(Balluff), software version 3.2.

Measurements performed by Product Development Vision, Balluff GmbH

Type of data presented	Single
Vendor	Balluff GmbH
Model	BVS CA-GV1-0162AC
Serial number	GV000102
Sensor diagonal	16.81 mm
Lens category	C-Mount
Resolution	5328 × 3040, 12 bit
Offset/size channels	0 × 0/ 2664 × 1520
Pixel size (h×v)	2.74 μm × 2.74 μm
Sensor	IMX542
Sensor type	CMOS
Shutter type	Global
Overlap cap.	Overlapping
Max. frame rate	0.0 Hz
Interface type	GigEVision

Nr.	Centroid/FWHM	Gain, blacklevel	t_{exp} (ms)
1	476.2/18.6 nm	0.0dB, 0.1	2.00
2	542.0/33.9 nm	0.0dB, 0.1	3.00
3	629.6/13.3 nm	0.0dB, 0.1	2.00

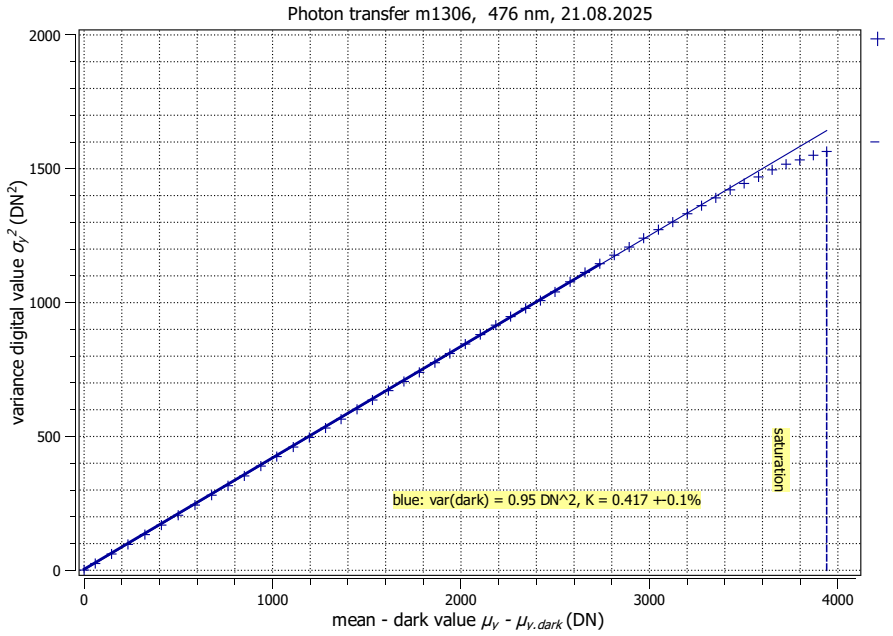
Optional data measured: None



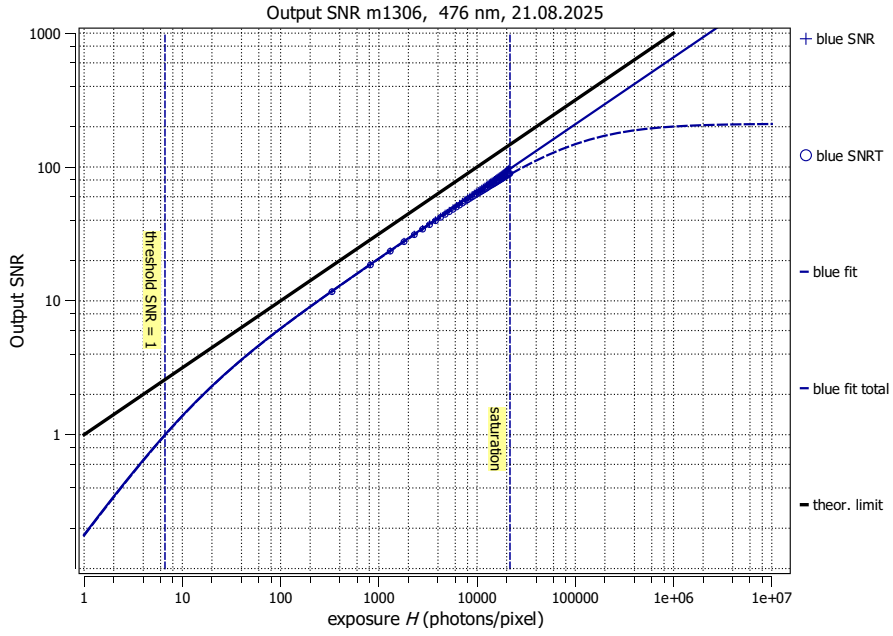
Summary Sheet for Operation Point 1 at a Wavelength of 476 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	23.3°C
Exposure time	2.000 ms	Camera body temperature	33.2°C
Frame rate	22.7 Hz	Internal temperature(s)	47.0°C, 36.9°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	476 nm, 18.6 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	43.5%

Overall system gain

K	0.4166 DN/e$^-$
$1/K$	2.400 e$^-$/DN

Temporal dark noise

σ_d	2.24 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.976 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	97.0
	39.7 dB
$1/\mathrm{SNR}_{\max}$	1.031 %

Absolute sensitivity threshold

$\mu_{e.\mathrm{min}}$	2.90 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.386 e$^-/\mu$m^2

Saturation capacity

$\mu_{e.\mathrm{sat}}$	9410 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1253 e$^-/\mu$m^2

Dynamic range

DR	3250
	70.24 dB

Spatial nonuniformities

DSNU_{1288}	0.377 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{col}}$	0.038 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{row}}$	0.033 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{pix}}$	0.374 e$^-$
PRNU_{1288}	0.475 %
$\mathrm{PRNU}_{1288.\mathrm{col}}$	0.036 %
$\mathrm{PRNU}_{1288.\mathrm{row}}$	0.014 %
$\mathrm{PRNU}_{1288.\mathrm{pix}}$	0.473 %

Linearity error

LE	0.27%

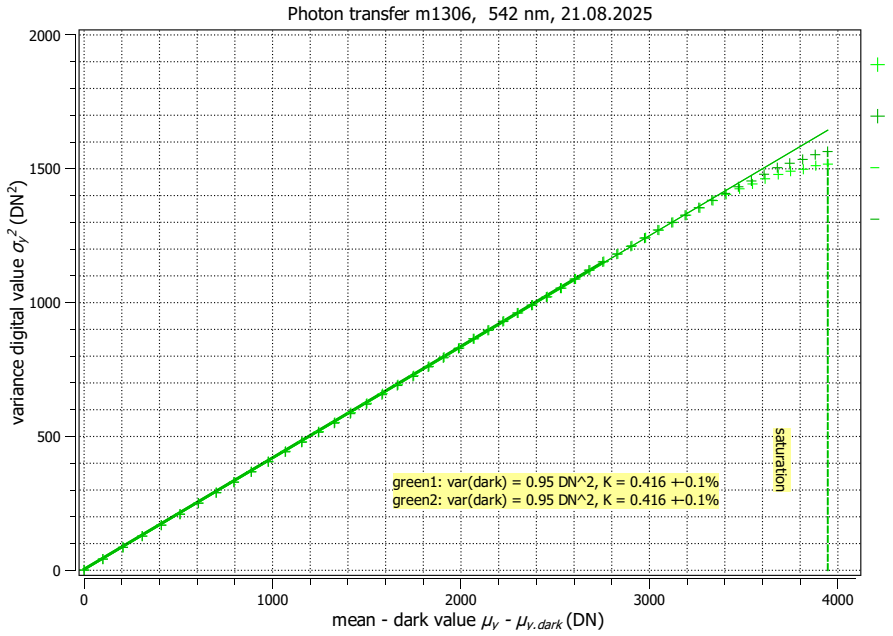
Dark current

$\mu_{c.\mathrm{mean}}$	6.19E-01 e$^-$/s
$\mu_{c.\mathrm{var}}$	6.87E-01 e$^-$/s

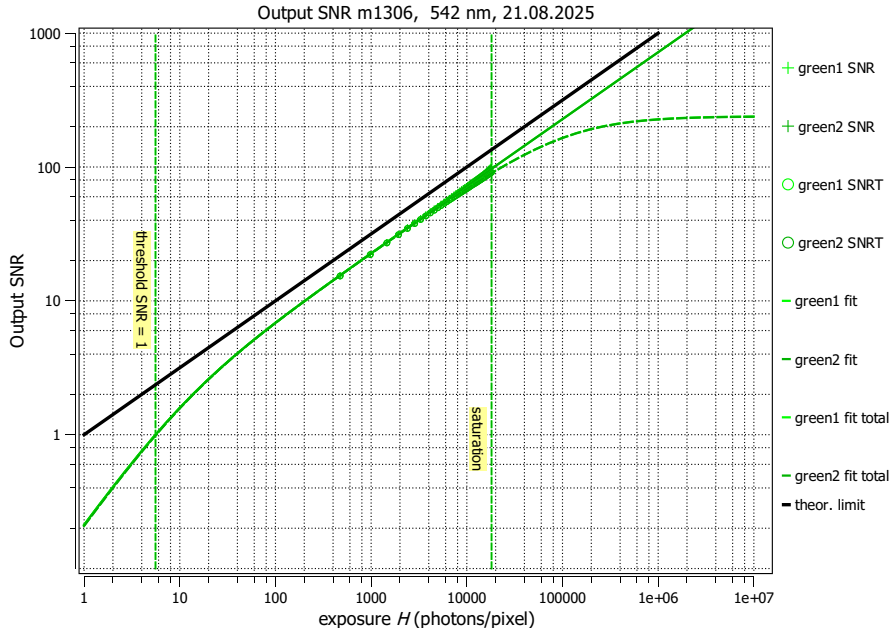
Summary Sheet for Operation Point 2 at a Wavelength of 542 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	23.3°C
Exposure time	3.000 ms	Camera body temperature	33.4°C
Frame rate	22.7 Hz	Internal temperature(s)	47.1°C, 37.0°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	542 nm, 33.9 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	52.0%

Overall system gain

K	0.4164 DN/e$^-$
$1/K$	2.402 e$^-$/DN

Temporal dark noise

σ_d	2.23 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.974 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	97.1
	39.7 dB
$1/\mathrm{SNR}_{\max}$	1.030 %

Absolute sensitivity threshold

$\mu_{e.\mathrm{min}}$	2.89 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.385 e$^-$/μm^2

Saturation capacity

$\mu_{e.\mathrm{sat}}$	9423 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1255 e$^-$/μm^2

Dynamic range

DR	3259
	70.26 dB

Spatial nonuniformities

DSNU_{1288}	0.378 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{col}}$	0.037 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{row}}$	0.033 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{pix}}$	0.374 e$^-$
PRNU_{1288}	0.417 %
$\mathrm{PRNU}_{1288.\mathrm{col}}$	0.077 %
$\mathrm{PRNU}_{1288.\mathrm{row}}$	0.014 %
$\mathrm{PRNU}_{1288.\mathrm{pix}}$	0.410 %

Linearity error

LE	0.37%

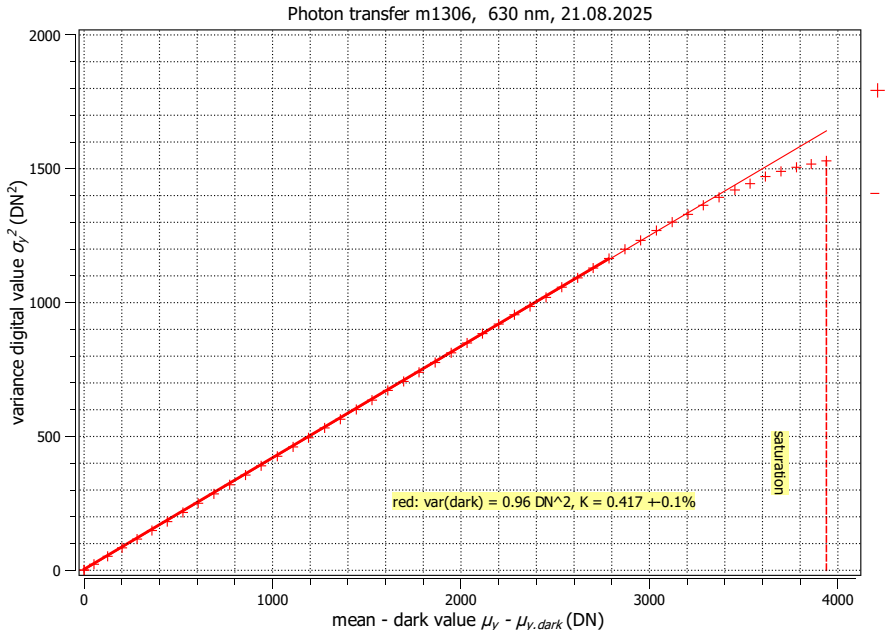
Dark current

$\mu_{c.\mathrm{mean}}$	6.80E-01 e$^-$/s
$\mu_{c.\mathrm{var}}$	7.28E-01 e$^-$/s

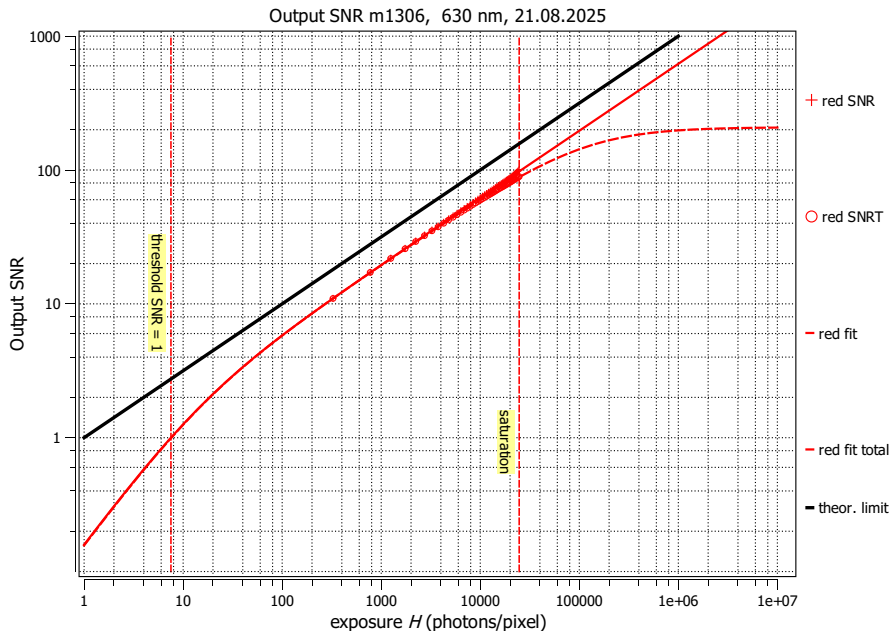
Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	0.0dB, 0.1
Exposure control	By irradiance	Environmental temperature	23.3°C
Exposure time	2.000 ms	Camera body temperature	33.7°C
Frame rate	22.7 Hz	Internal temperature(s)	48.0°C, 37.2°C
Data transfer mode	BayerRG12p	Wavelength, centr., FWHM	630 nm, 13.3 nm

Photon Transfer



Signal-to-Noise Ratio



Quantum efficiency

η	38.6%

Overall system gain

K	0.4165 DN/e$^-$
$1/K$	2.401 e$^-$/DN

Temporal dark noise

σ_d	2.25 e$^-$
$\sigma_{y.\mathrm{dark}}$	0.980 DN

Signal-to-noise ratio

$\mathrm{SNR}_{\max}$	97.7
	39.8 dB
$1/\mathrm{SNR}_{\max}$	1.024 %

Absolute sensitivity threshold

$\mu_{e.\mathrm{min}}$	2.91 e$^-$
$\mu_{e.\mathrm{min.area}}$	0.387 e$^-$/μm^2

Saturation capacity

$\mu_{e.\mathrm{sat}}$	9537 e$^-$
$\mu_{e.\mathrm{sat.area}}$	1270 e$^-$/μm^2

Dynamic range

DR	3283
	70.32 dB

Spatial nonuniformities

DSNU_{1288}	0.364 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{col}}$	0.038 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{row}}$	0.033 e$^-$
$\mathrm{DSNU}_{1288.\mathrm{pix}}$	0.361 e$^-$
PRNU_{1288}	0.479 %
$\mathrm{PRNU}_{1288.\mathrm{col}}$	0.126 %
$\mathrm{PRNU}_{1288.\mathrm{row}}$	0.015 %
$\mathrm{PRNU}_{1288.\mathrm{pix}}$	0.462 %

Linearity error

LE	0.20%

Dark current

$\mu_{c.\mathrm{mean}}$	5.92E-01 e$^-$/s
$\mu_{c.\mathrm{var}}$	6.02E-01 e$^-$/s