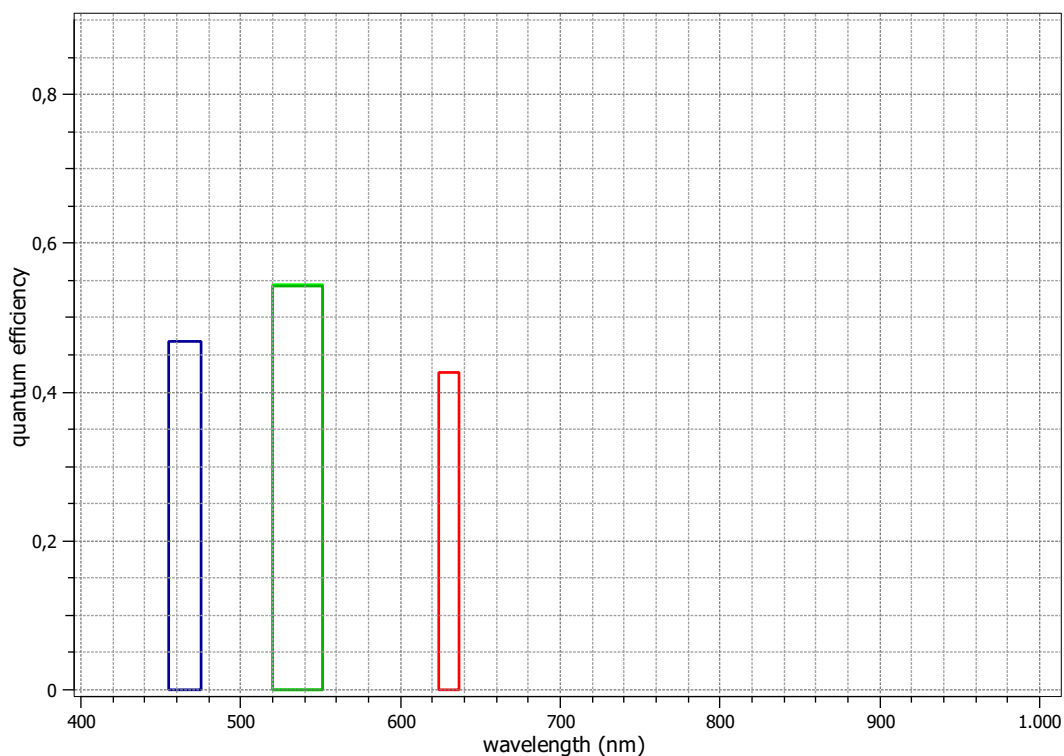


EMVA 1288 Summary Sheet

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	Type of data presented	Single
Model	VCXG-241C.I.XT	Operation point 1	
Serial number	700006780863	Wavelength centroid	465.1 nm
Sensor diagonal	17.03 mm	Wavelength FWHM	20.5 nm
Lens category	C-Mount	Gain, black-level	1.0 / 39.0
Resolution	4672 × 4100, 12 bit	Operation point 2	
Pixel size (h×v)	2.74 μm × 2.74 μm	Wavelength centroid	535.7 nm
Sensor	Sony IMX540	Wavelength FWHM	31.9 nm
Sensor type	CMOS	Gain, black-level	1.0 / 39.0
Shutter type	Global shutter	Operation point 3	
Overlap cap.	Overlapped	Wavelength centroid	630.3 nm
Max. frame rate	0.0 Hz	Wavelength FWHM	13.2 nm
Interface type	GEV	Gain, black-level	1.0 / 39.0
		Optional data measured	
		None	

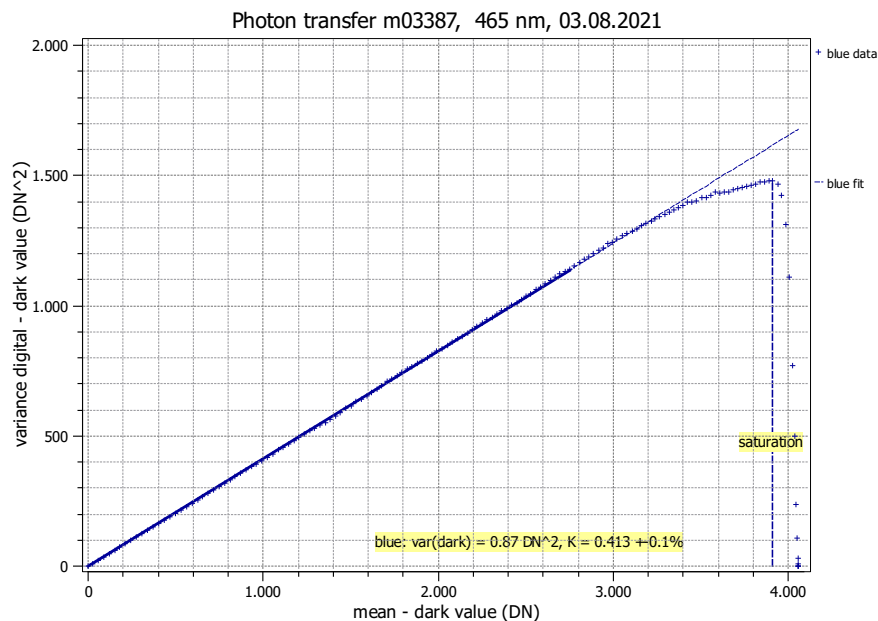




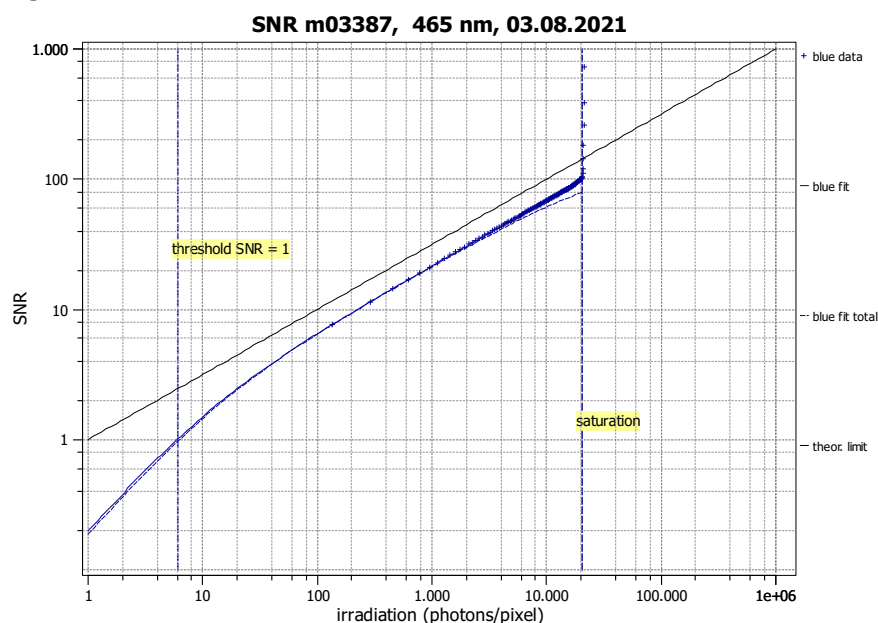
Summary Sheet for Operation Point 1 at a Wavelength of 465 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	26.1 °C
Exposure time	820.00 μ s	Camera body temperature	28.1 °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 46.9%

Overall system gain

 K 0.413 DN/e⁻
 $1/K$ 2.419 e⁻/DN

Temporal dark noise

 σ_d 2.14 e⁻
 $\sigma_{y,\text{dark}}$ 0.93 DN

Signal-to-noise ratio

 SNR_{max} 97

39.8 dB

6.6 bit

 $1/\text{SNR}_{\text{max}}$ 1.03 %

Absolute sensitivity threshold

 $\mu_{p,\text{min}}$ 5.99 p

 $\mu_{p,\text{min,area}}$ 0.798 p/ μm^2
 $\mu_{e,\text{min}}$ 2.81 e⁻
 $\mu_{e,\text{min,area}}$ 0.374 e⁻/ μm^2

Saturation capacity

 $\mu_{p,\text{sat}}$ 20229 p

 $\mu_{p,\text{sat,area}}$ 2694 p/ μm^2
 $\mu_{e,\text{sat}}$ 9488 e⁻
 $\mu_{e,\text{sat,area}}$ 1264 e⁻/ μm^2

Dynamic range

 DR 3376

70.6 dB

11.7 bit

Spatial nonuniformities

 DSNU_{1288} 0.81 e⁻

0.33 DN

 PRNU_{1288} 0.74 %

Linearity error

 LE_{min} -0.25%

 LE_{max} 0.63%

Dark current

 $\mu_{c,\text{mean}}$ 0.1 ± 0.0 e⁻/s

0.03 DN/s

 $\mu_{c,\text{var}}$ 8.1 ± 0.5 e⁻/s

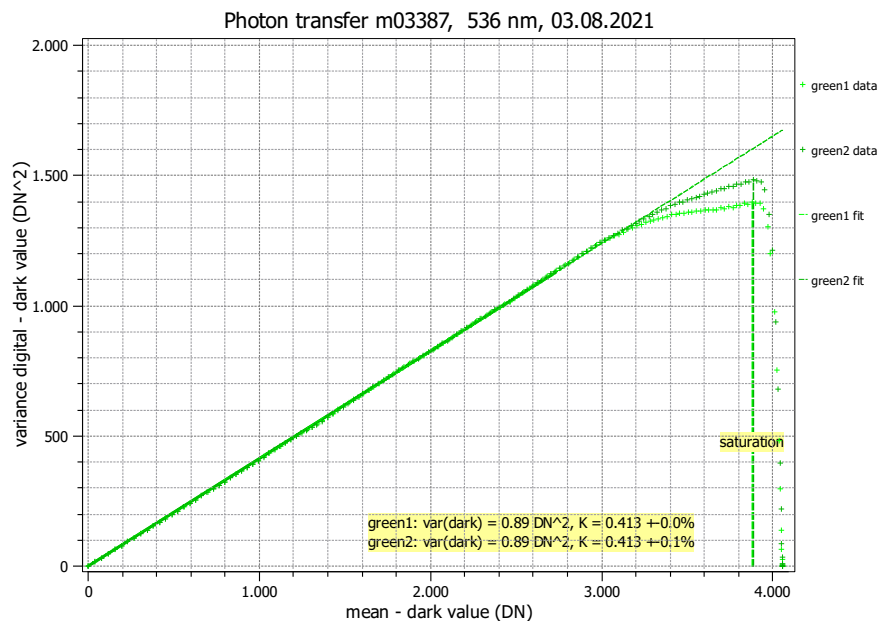
 T_d — °C



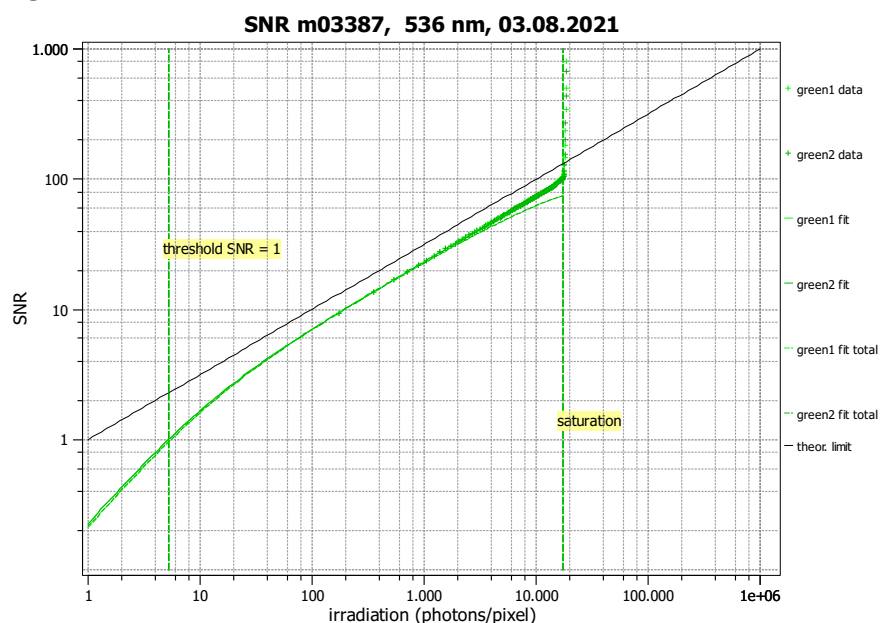
Summary Sheet for Operation Point 2 at a Wavelength of 536 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	26.4 °C
Exposure time	1.60 ms	Camera body temperature	33.0 °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 54.4%

Overall system gain

 K 0.413 DN/e⁻
 $1/K$ 2.422 e⁻/DN

Temporal dark noise

 σ_d 2.17 e⁻
 $\sigma_{y,\text{dark}}$ 0.94 DN

Signal-to-noise ratio

 SNR_{max} 97

39.7 dB

6.6 bit

 $1/\text{SNR}_{\text{max}}$ 1.03 %

Absolute sensitivity threshold

 $\mu_{p,\text{min}}$ 5.21 p

 $\mu_{p,\text{min,area}}$ 0.694 p/μm²
 $\mu_{e,\text{min}}$ 2.84 e⁻
 $\mu_{e,\text{min,area}}$ 0.378 e⁻/μm²

Saturation capacity

 $\mu_{p,\text{sat}}$ 17329 p

 $\mu_{p,\text{sat,area}}$ 2308 p/μm²
 $\mu_{e,\text{sat}}$ 9428 e⁻
 $\mu_{e,\text{sat,area}}$ 1256 e⁻/μm²

Dynamic range

 DR 3324

70.4 dB

11.7 bit

Spatial nonuniformities

 DSNU_{1288} 0.91 e⁻

0.37 DN

 PRNU_{1288} 0.85 %

Linearity error

 LE_{min} -0.42%

 LE_{max} 0.96%

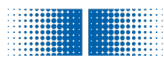
Dark current

 $\mu_{c,\text{mean}}$ 0.1 ± 0.0 e⁻/s

0.04 DN/s

 $\mu_{c,\text{var}}$ 8.6 ± 0.6 e⁻/s

 T_d — °C

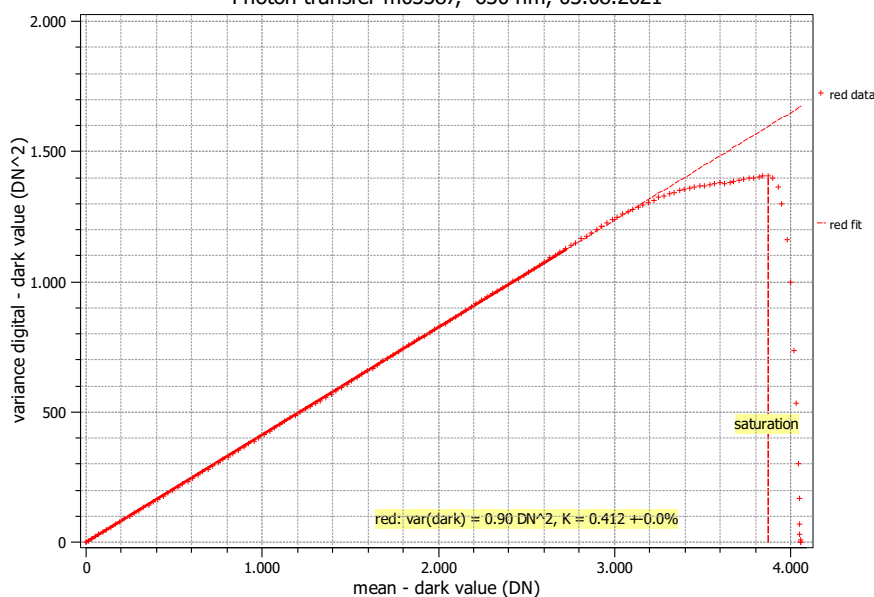


Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	1.0 / 39.0
Exposure control	By irradiance	Environmental temperature	27.4 °C
Exposure time	1.60 ms	Camera body temperature	35.0 °C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	630 nm, 13.2 nm

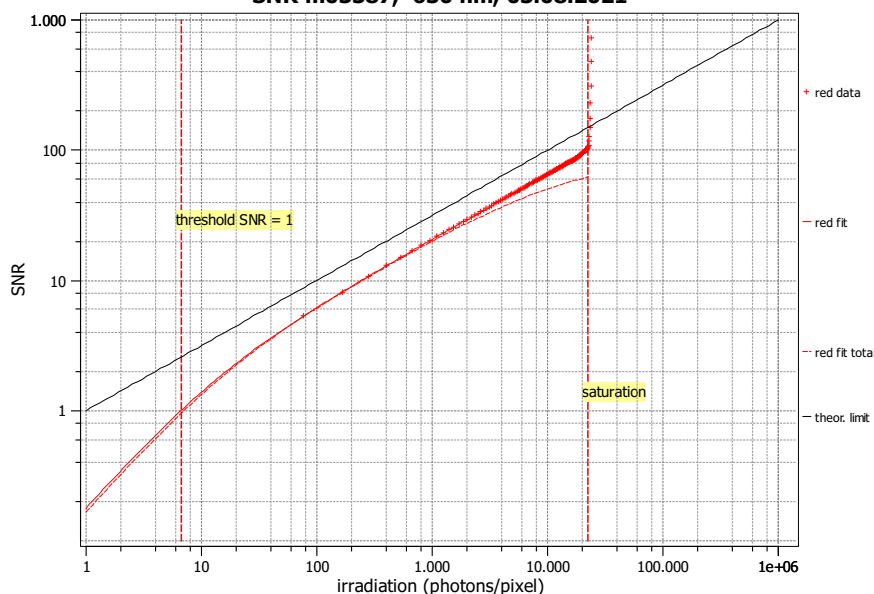
Photon Transfer

Photon transfer m03387, 630 nm, 03.08.2021



Signal-to-Noise Ratio

SNR m03387, 630 nm, 03.08.2021



Quantum efficiency

 η 42.7%

Overall system gain

 K 0.412 DN/e⁻
 $1/K$ 2.425 e⁻/DN

Temporal dark noise

 σ_d 2.19 e⁻
 $\sigma_{y,\text{dark}}$ 0.95 DN

Signal-to-noise ratio

 SNR_{max} 97

39.8 dB

6.6 bit

 $1/\text{SNR}_{\text{max}}$ 1.03 %

Absolute sensitivity threshold

 $\mu_{p,\text{min}}$ 6.68 p

 $\mu_{p,\text{min,area}}$ 0.889 p/μm²
 $\mu_{e,\text{min}}$ 2.85 e⁻
 $\mu_{e,\text{min,area}}$ 0.380 e⁻/μm²

Saturation capacity

 $\mu_{p,\text{sat}}$ 22193 p

 $\mu_{p,\text{sat,area}}$ 2956 p/μm²
 $\mu_{e,\text{sat}}$ 9481 e⁻
 $\mu_{e,\text{sat,area}}$ 1263 e⁻/μm²

Dynamic range

DR 3324

70.4 dB

11.7 bit

Spatial nonuniformities

 DSNU_{1288} 0.91 e⁻

0.38 DN

 PRNU_{1288} 1.24 %

Linearity error

 LE_{min} -0.43%

 LE_{max} 0.12%

Dark current

 $\mu_{c,\text{mean}}$ 0.0 ± 0.0 e⁻/s

0.02 DN/s

 $\mu_{c,\text{var}}$ 8.2 ± 0.5 e⁻/s

 T_d — °C