

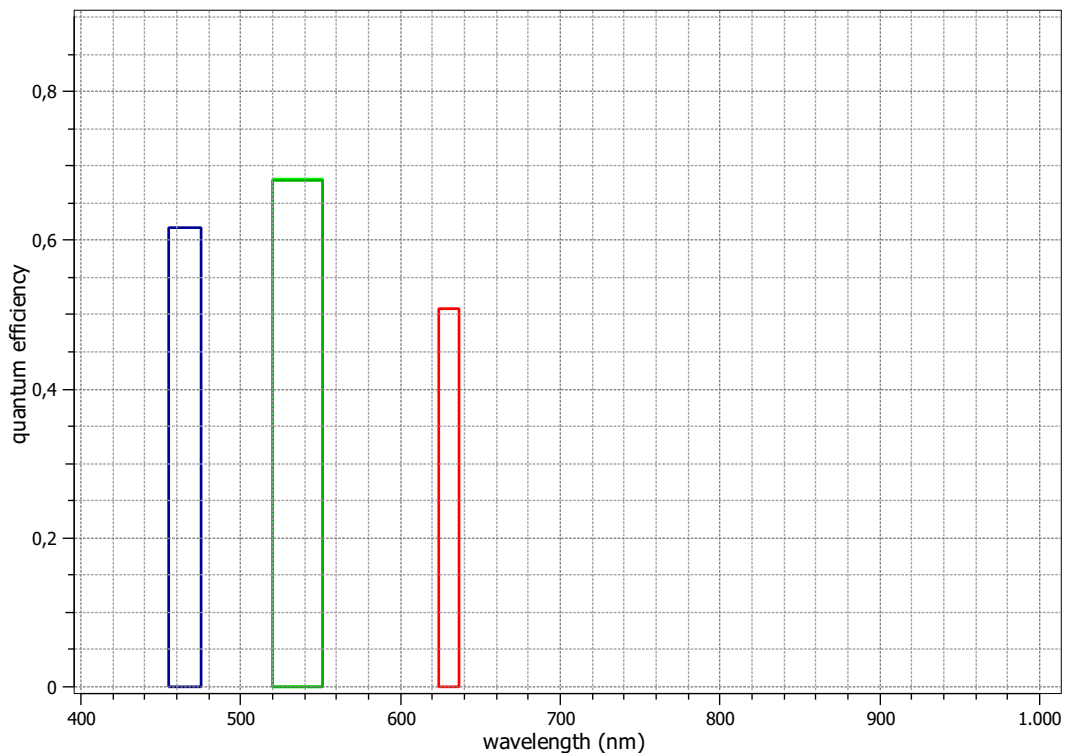


## EMVA 1288 Summary Sheet

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](http://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-201C.R.I.XT	<b>Operation point 1</b>	
Serial number	700006562034	Wavelength centroid	465.1 nm
Sensor diagonal	15.78 mm	Wavelength FWHM	20.5 nm
Lens category	C-Mount	Gain, black-level	1.0 / 43.0
Resolution	5472 × 3648, 12 bit	<b>Operation point 2</b>	
Pixel size (h×v)	2.40 μm × 2.40 μm	Wavelength centroid	535.7 nm
Sensor	Sony IMX183	Wavelength FWHM	31.9 nm
Sensor type	CMOS	Gain, black-level	1.0 / 43.0
Shutter type	Rolling shutter	<b>Operation point 3</b>	
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 / 43.0
		<b>Optional data measured</b>	
		None	



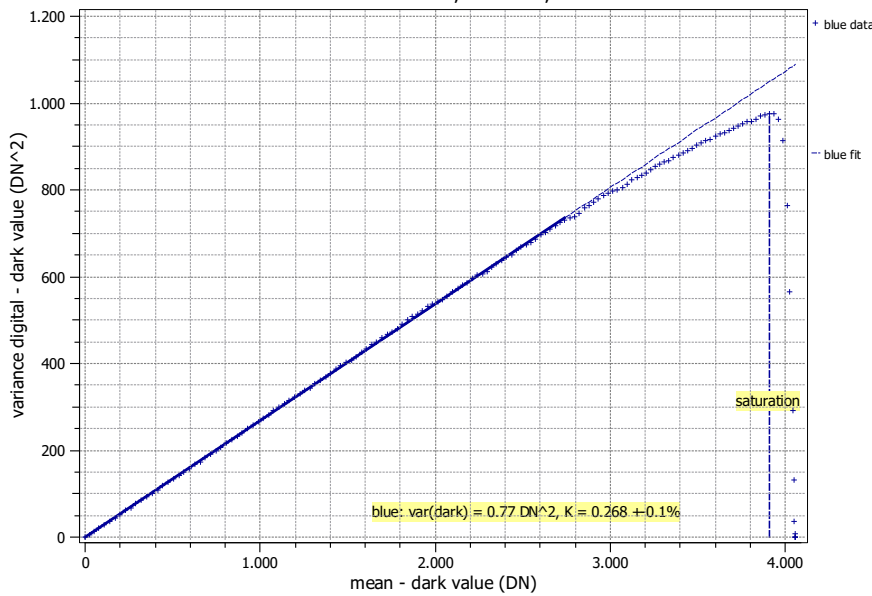


### Summary Sheet for Operation Point 1 at a Wavelength of 465 nm

Type of data	Single	Gain, black-level	1.0 / 43.0
Exposure control	By irradiance	Environmental temperature	27.6 °C
Exposure time	1.67 ms	Camera body temperature	33.8 °C
Frame rate	9.6 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	465 nm, 20.5 nm

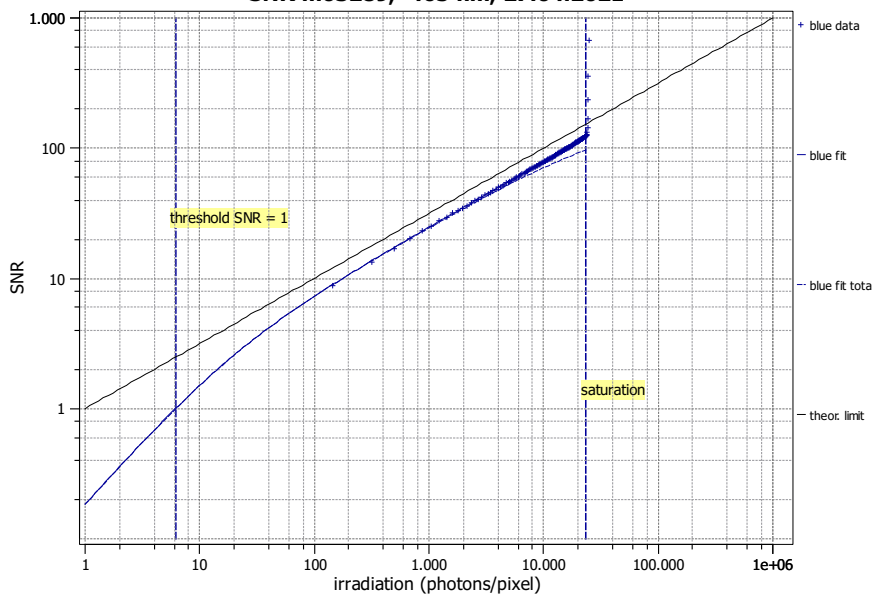
#### Photon Transfer

Photon transfer m03289, 465 nm, 27.04.2021

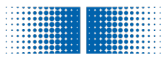


#### Signal-to-Noise Ratio

SNR m03289, 465 nm, 27.04.2021



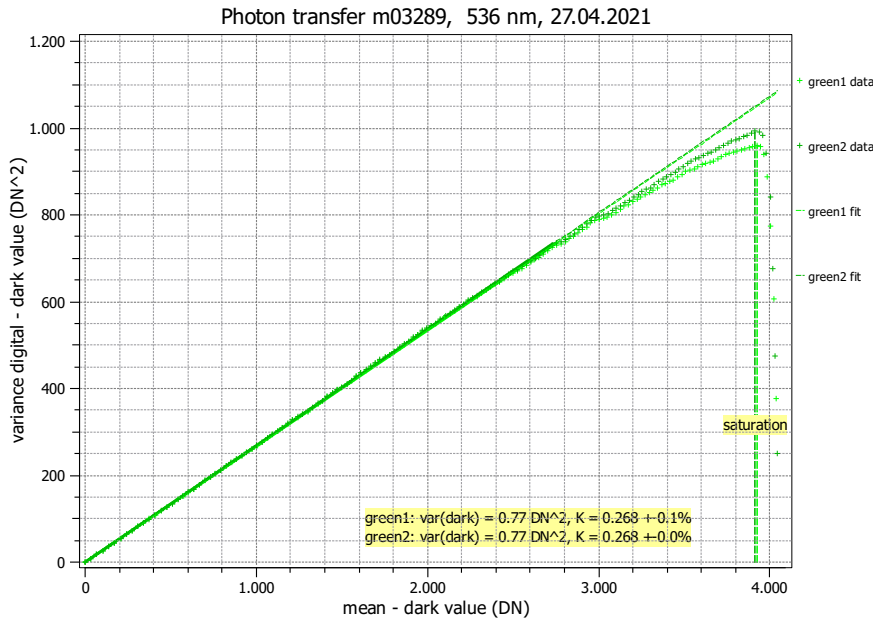
<b>Quantum efficiency</b>	$\eta$	61.8%
<b>Overall system gain</b>	$K$	0.268 DN/e <sup>-</sup>
	1/K	3.726 e <sup>-</sup> /DN
<b>Temporal dark noise</b>	$\sigma_d$	3.08 e <sup>-</sup>
	$\sigma_{y,\text{dark}}$	0.88 DN
<b>Signal-to-noise ratio</b>	SNR <sub>max</sub>	121
		41.6 dB
		6.9 bit
	1/SNR <sub>max</sub>	0.83 %
<b>Absolute sensitivity threshold</b>	$\mu_{p,\text{min}}$	6.16 p
	$\mu_{p,\text{min,area}}$	1.069 p/ $\mu\text{m}^2$
	$\mu_{e,\text{min}}$	3.80 e <sup>-</sup>
	$\mu_{e,\text{min,area}}$	0.660 e <sup>-</sup> / $\mu\text{m}^2$
<b>Saturation capacity</b>	$\mu_{p,\text{sat}}$	23575 p
	$\mu_{p,\text{sat,area}}$	4093 p/ $\mu\text{m}^2$
	$\mu_{e,\text{sat}}$	14566 e <sup>-</sup>
	$\mu_{e,\text{sat,area}}$	2529 e <sup>-</sup> / $\mu\text{m}^2$
<b>Dynamic range</b>	DR	3829
		71.7 dB
		11.9 bit
<b>Spatial nonuniformities</b>	DSNU <sub>1288</sub>	0.22 e <sup>-</sup>
		0.06 DN
	PRNU <sub>1288</sub>	0.62 %
<b>Linearity error</b>	LE <sub>min</sub>	-0.48%
	LE <sub>max</sub>	1.27%
<b>Dark current</b>	$\mu_{c,\text{mean}}$	0.67 ± 0.00 e <sup>-</sup> /s
		0.18 DN/s
	$\mu_{c,\text{var}}$	0.70 ± 0.01 e <sup>-</sup> /s
	$T_d$	— °C



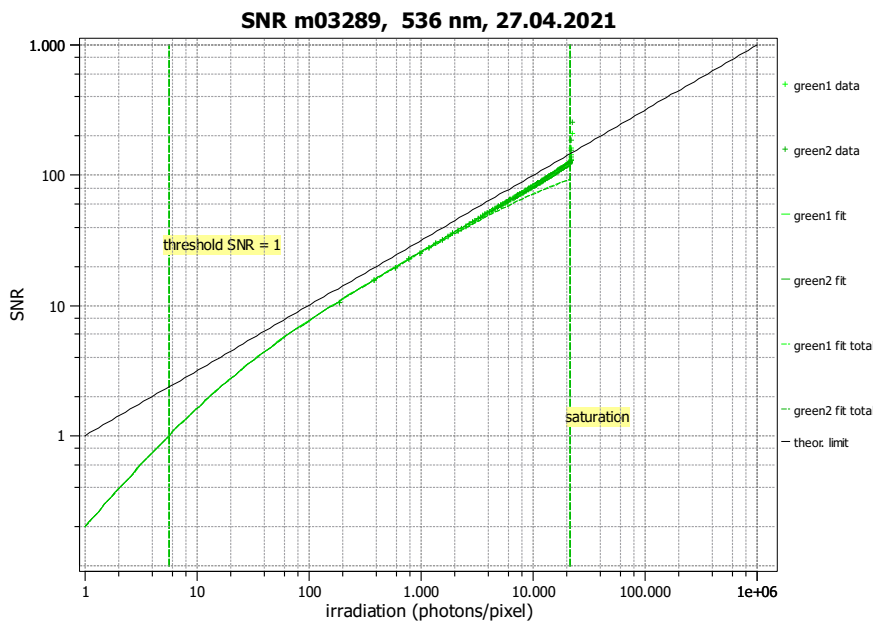
### Summary Sheet for Operation Point 2 at a Wavelength of 536 nm

Type of data	Single	Gain, black-level	1.0 / 43.0
Exposure control	By irradiance	Environmental temperature	27.4 °C
Exposure time	3.23 ms	Camera body temperature	33.3 °C
Frame rate	9.6 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	536 nm, 31.9 nm

#### Photon Transfer



#### Signal-to-Noise Ratio



<b>Quantum efficiency</b>	$\eta$	68.2%
<b>Overall system gain</b>	$K$	0.268 DN/e <sup>-</sup>
	$1/K$	3.738 e <sup>-</sup> /DN
<b>Temporal dark noise</b>	$\sigma_d$	3.10 e <sup>-</sup>
	$\sigma_{y,dark}$	0.88 DN
<b>Signal-to-noise ratio</b>	$SNR_{max}$	121
		41.6 dB
		6.9 bit
	$1/SNR_{max}$	0.83 %
<b>Absolute sensitivity threshold</b>	$\mu_{p,min}$	5.61 p
	$\mu_{p,min,area}$	0.973 p/ $\mu m^2$
	$\mu_{e,min}$	3.82 e <sup>-</sup>
	$\mu_{e,min,area}$	0.664 e <sup>-</sup> / $\mu m^2$
<b>Saturation capacity</b>	$\mu_{p,sat}$	21431 p
	$\mu_{p,sat,area}$	3721 p/ $\mu m^2$
	$\mu_{e,sat}$	14612 e <sup>-</sup>
	$\mu_{e,sat,area}$	2537 e <sup>-</sup> / $\mu m^2$
<b>Dynamic range</b>	DR	3822
		71.6 dB
		11.9 bit
<b>Spatial nonuniformities</b>	$DSNU_{1288}$	0.23 e <sup>-</sup>
		0.06 DN
	$PRNU_{1288}$	0.67 %
<b>Linearity error</b>	$LE_{min}$	-0.70%
	$LE_{max}$	1.72%
<b>Dark current</b>	$\mu_{c,mean}$	0.71 ± 0.00 e <sup>-</sup> /s
		0.19 DN/s
	$\mu_{c,var}$	0.72 ± 0.00 e <sup>-</sup> /s
	$T_d$	— °C

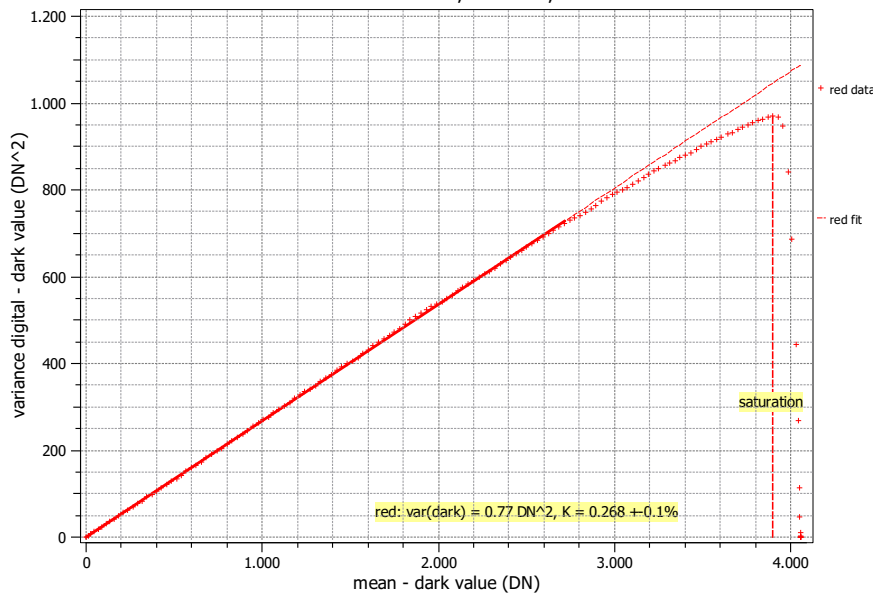


### Summary Sheet for Operation Point 3 at a Wavelength of 630 nm

Type of data	Single	Gain, black-level	1.0 / 43.0
Exposure control	By irradiance	Environmental temperature	26.5°C
Exposure time	3.23 ms	Camera body temperature	32.6°C
Frame rate	9.6 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG12	Wavelength, centr., FWHM	630 nm, 13.2 nm

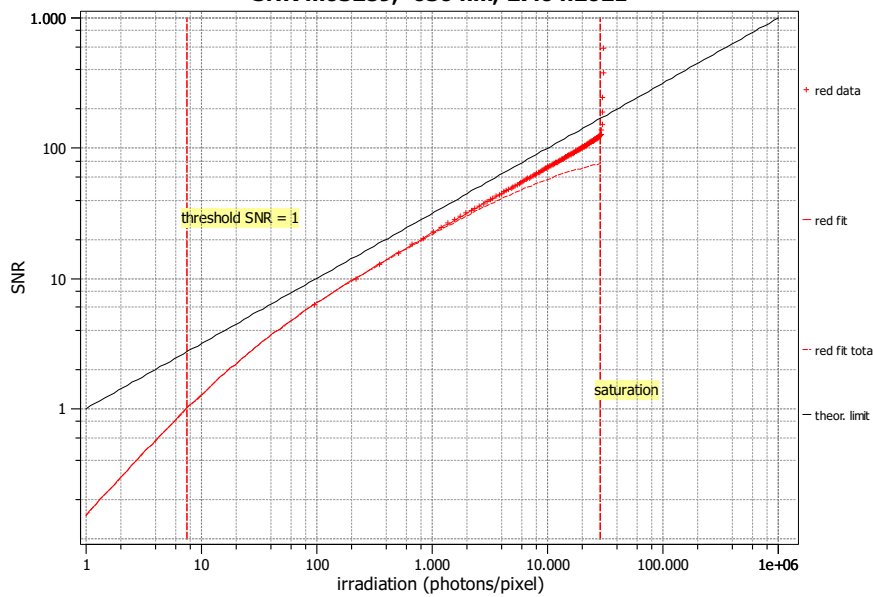
#### Photon Transfer

Photon transfer m03289, 630 nm, 27.04.2021



#### Signal-to-Noise Ratio

SNR m03289, 630 nm, 27.04.2021



<b>Quantum efficiency</b>	$\eta$	50.9%
<b>Overall system gain</b>	$K$	0.268 DN/e <sup>-</sup>
	1/K	3.729 e <sup>-</sup> /DN
<b>Temporal dark noise</b>	$\sigma_d$	3.09 e <sup>-</sup>
	$\sigma_{y,\text{dark}}$	0.88 DN
<b>Signal-to-noise ratio</b>	SNR <sub>max</sub>	121
		41.6 dB
		6.9 bit
	1/SNR <sub>max</sub>	0.83 %
<b>Absolute sensitivity threshold</b>	$\mu_{p,\text{min}}$	7.48 p
	$\mu_{p,\text{min,area}}$	1.299 p/ $\mu\text{m}^2$
	$\mu_{e,\text{min}}$	3.81 e <sup>-</sup>
	$\mu_{e,\text{min,area}}$	0.661 e <sup>-</sup> / $\mu\text{m}^2$
<b>Saturation capacity</b>	$\mu_{p,\text{sat}}$	28695 p
	$\mu_{p,\text{sat,area}}$	4982 p/ $\mu\text{m}^2$
	$\mu_{e,\text{sat}}$	14603 e <sup>-</sup>
	$\mu_{e,\text{sat,area}}$	2535 e <sup>-</sup> / $\mu\text{m}^2$
<b>Dynamic range</b>	DR	3836
		71.7 dB
		11.9 bit
<b>Spatial nonuniformities</b>	DSNU <sub>1288</sub>	0.25 e <sup>-</sup>
		0.07 DN
	PRNU <sub>1288</sub>	1.02 %
<b>Linearity error</b>	LE <sub>min</sub>	-0.27%
	LE <sub>max</sub>	0.65%
<b>Dark current</b>	$\mu_{c,\text{mean}}$	0.68 ± 0.00 e <sup>-</sup> /s
		0.18 DN/s
	$\mu_{c,\text{var}}$	0.69 ± 0.00 e <sup>-</sup> /s
	$T_d$	— °C