

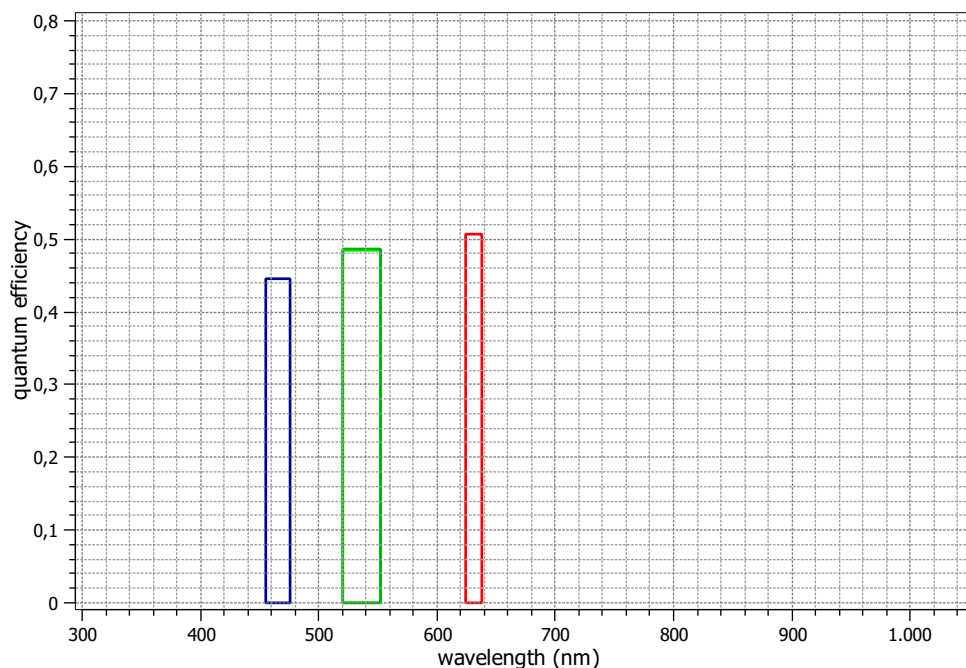
## EMVA 1288 Summary Sheet

This datasheet describes the specification according to the standard 1288 for "Characterization and Presentation of Specification Data for Image Sensors and Cameras of the European Machine Vision Association (EMVA)" (see [www.standard1288.org](http://www.standard1288.org) or the *Zenodo EMVA 1288 community*) release 3.0 with proprietary extensions from AEON. The measurements were performed with the AEON ACC3 RGB Release 3, 15.08.2015, SN 0001(Baumer) . The performance parameters and estimated accuracy of the measurements are described in the technical report for the instrument, its calibration in the corresponding specification and calibration report.

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

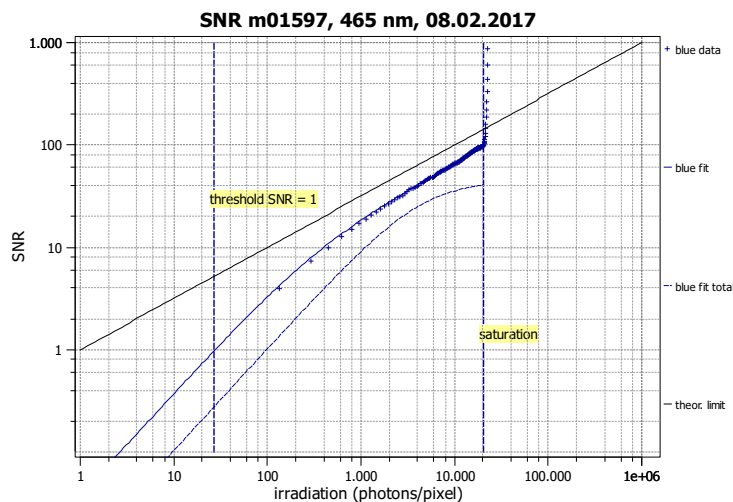
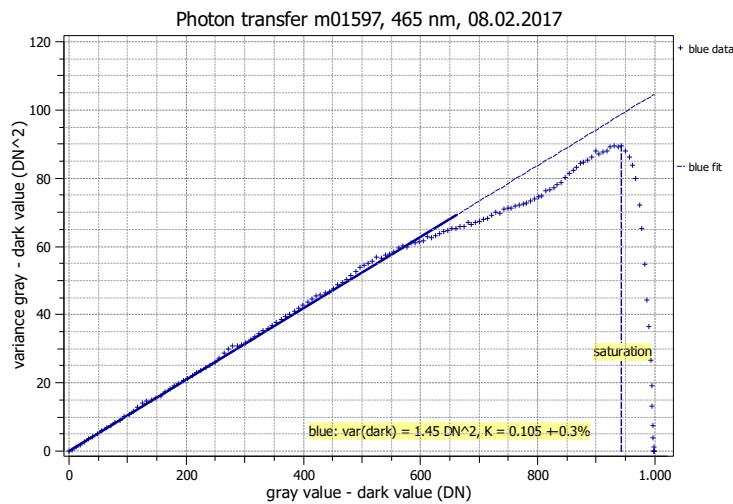
Vendor	Baumer
Model	VCXG-53C
Serial number	700001831365
Sensor diagonal	15.86 mm
Lens category	C-Mount
Resolution	2592 × 2048, 10 bit
Pixel size	4.80 μm × 4.80 μm
Sensor	OnSemi PYTHON5000
Sensor type	CMOS
Shutter type	Global shutter
Overlap capabilities	Overlapped
Maximum frame rate	0.0 Hz
Interface type	GEV

Type of data presented	Single
<b>Operation point 1</b>	
Wavelength centroid	465.3 nm
Wavelength FWHM	20.7 nm
Gain / BlackLevel	1.0 / 21
<b>Operation point 2</b>	
Wavelength centroid	535.8 nm
Wavelength FWHM	32.0 nm
Gain / BlackLevel	1.0 / 21
<b>Operation point 3</b>	
Wavelength centroid	631.0 nm
Wavelength FWHM	13.4 nm
Gain / BlackLevel	1.0 / 21
<b>Optional data measured</b>	
None	



## EMVA 1288 Summary Sheet for Operating Point 1

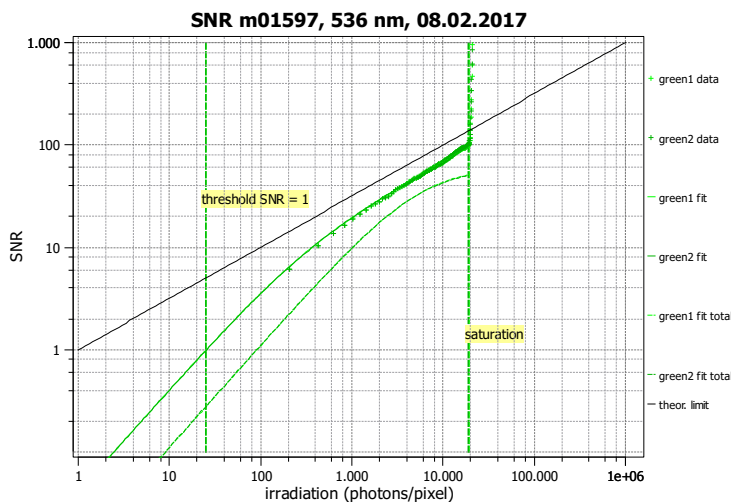
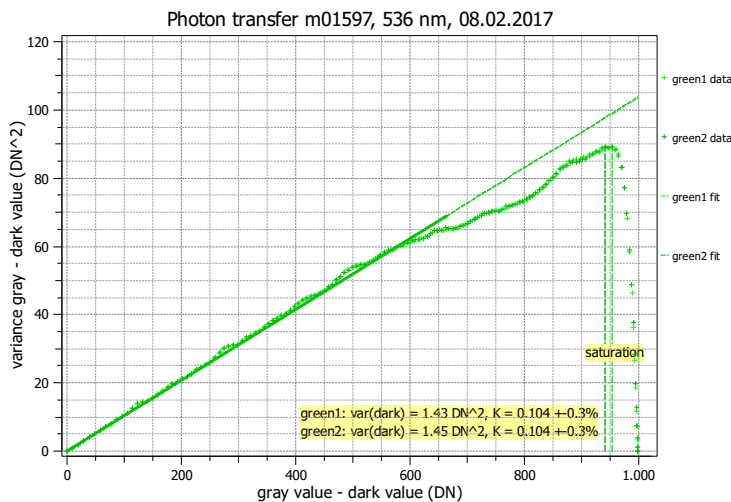
Type of data	Single	Gain / BlackLevel	1.0 / 21
Exposure control	By irradiance	Environmental temperature	24.9°C
Exposure time	410.00 $\mu$ s	Camera body temperature	38.4°C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG10	Wavelength, centr., FWHM	465 nm, 20.7 nm



<b>Quantum efficiency</b>	
$\eta$	44.5%
<b>Overall system gain</b>	
$K$	0.105 DN/e <sup>-</sup>
1/ $K$	9.552 e <sup>-</sup> /DN
<b>Temporal dark noise &amp; DSNU</b>	
$\sigma_{y,\text{dark}}$	1.20 DN
DSNU <sub>1288</sub>	4.35 DN
$\sigma_d$	11.16 e <sup>-</sup>
DSNU <sub>1288</sub>	41.51 e <sup>-</sup>
<b>Signal-to-noise ratio &amp; PRNU</b>	
SNR <sub>max</sub>	95
	39.6 dB
	6.6 bit
1/SNR <sub>max</sub>	1.05 %
PRNU <sub>1288</sub>	2.18 %
<b>Nonlinearity</b>	
LE	0.57%
LE <sub>min</sub>	-0.70%
LE <sub>max</sub>	0.44%
<b>Sensitivity &amp; saturation</b>	
$\mu_{p,\text{min}}$	27.0 p
	1.17 p/ $\mu\text{m}^2$
$\mu_{p,\text{sat}}$	20419 p
	886 p/ $\mu\text{m}^2$
$\mu_{e,\text{min}}$	12.0 e <sup>-</sup>
	0.52 e <sup>-</sup> / $\mu\text{m}^2$
$\mu_{e,\text{sat}}$	9085 e <sup>-</sup>
	394 e <sup>-</sup> / $\mu\text{m}^2$
<b>Dynamic range</b>	
DR	757
	57.6 dB
	9.6 bit
<b>Dark current</b>	
$\mu_{c,\text{mean}}$	93.9 DN/s
$\mu_{c,\text{mean}}$	897.1 e <sup>-</sup> /s
$\mu_{c,\text{var}}$	462.8 e <sup>-</sup> /s

## EMVA 1288 Summary Sheet for Operating Point 2

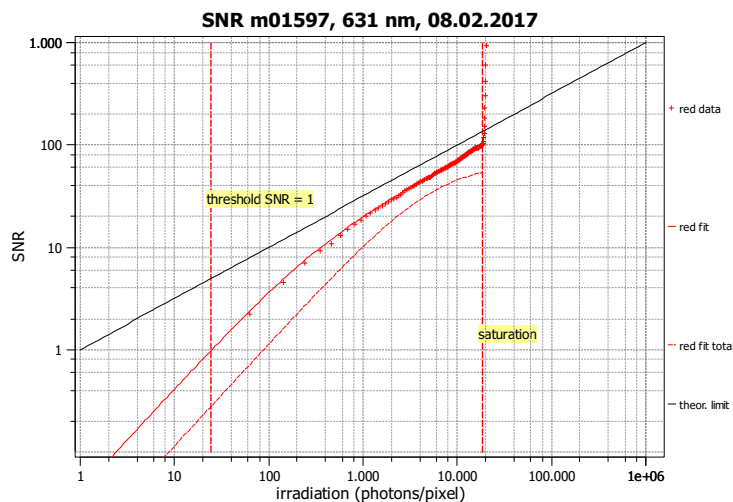
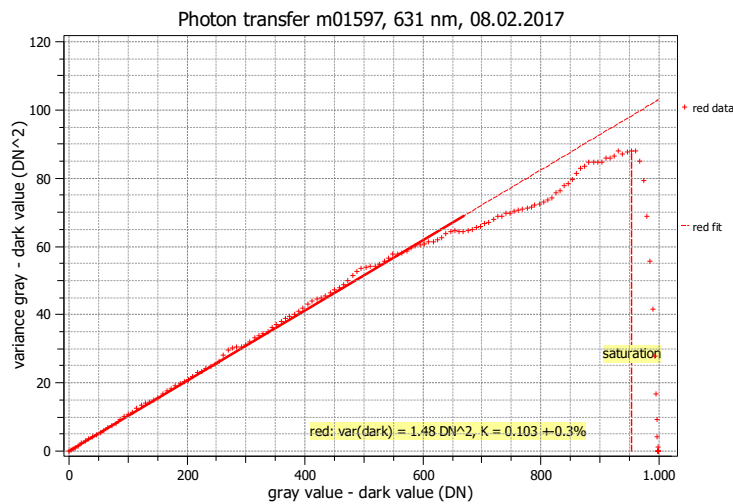
Type of data	Single	Gain / BlackLevel	1.0 / 21
Exposure control	By irradiance	Environmental temperature	24.9°C
Exposure time	410.00 $\mu$ s	Camera body temperature	38.4°C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG10	Wavelength, centr., FWHM	536 nm, 32.0 nm



<b>Quantum efficiency</b>	
$\eta$	48.5%
<b>Overall system gain</b>	
$K$	0.104 DN/e <sup>-</sup>
$1/K$	9.647 e <sup>-</sup> /DN
<b>Temporal dark noise &amp; DSNU</b>	
$\sigma_{y,\text{dark}}$	1.19 DN
DSNU <sub>1288</sub>	4.38 DN
$\sigma_d$	11.18 e <sup>-</sup>
DSNU <sub>1288</sub>	42.24 e <sup>-</sup>
<b>Signal-to-noise ratio &amp; PRNU</b>	
SNR <sub>max</sub>	97
	39.7 dB
	6.6 bit
$1/\text{SNR}_{\text{max}}$	1.04 %
PRNU <sub>1288</sub>	1.58 %
<b>Nonlinearity</b>	
LE	0.69%
LE <sub>min</sub>	-0.84%
LE <sub>max</sub>	0.54%
<b>Sensitivity &amp; saturation</b>	
$\mu_{p,\text{min}}$	24.8 p
	1.08 p/ $\mu\text{m}^2$
$\mu_{p,\text{sat}}$	19204 p
	834 p/ $\mu\text{m}^2$
$\mu_{e,\text{min}}$	12.0 e <sup>-</sup>
	0.52 e <sup>-</sup> / $\mu\text{m}^2$
$\mu_{e,\text{sat}}$	9319 e <sup>-</sup>
	404 e <sup>-</sup> / $\mu\text{m}^2$
<b>Dynamic range</b>	
DR	775
	57.8 dB
	9.6 bit
<b>Dark current</b>	
$\mu_{c,\text{mean}}$	93.5 DN/s
$\mu_{c,\text{mean}}$	902.3 e <sup>-</sup> /s
$\mu_{c,\text{var}}$	465.1 e <sup>-</sup> /s

## EMVA 1288 Summary Sheet for Operating Point 3

Type of data	Single	Gain / BlackLevel	1.0 / 21
Exposure control	By irradiance	Environmental temperature	24.9°C
Exposure time	410.00 $\mu$ s	Camera body temperature	38.4°C
Frame rate	10.0 Hz	Internal temperature(s)	—
Data transfer mode	BayerRG10	Wavelength, centr., FWHM	631 nm, 13.4 nm



### Quantum efficiency

$\eta$  50.7%

### Overall system gain

$K$  0.103 DN/e<sup>-</sup>  
 $1/K$  9.703 e<sup>-</sup>/DN

### Temporal dark noise & DSNU

$\sigma_{y,\text{dark}}$  1.22 DN  
 $\text{DSNU}_{1288}$  4.38 DN  
 $\sigma_d$  11.46 e<sup>-</sup>  
 $\text{DSNU}_{1288}$  42.55 e<sup>-</sup>

### Signal-to-noise ratio & PRNU

$\text{SNR}_{\text{max}}$  97  
 39.7 dB  
 6.6 bit  
 $1/\text{SNR}_{\text{max}}$  1.03 %  
 $\text{PRNU}_{1288}$  1.46 %

### Nonlinearity

LE 0.74%  
 $\text{LE}_{\text{min}}$  -0.93%  
 $\text{LE}_{\text{max}}$  0.55%

### Sensitivity & saturation

$\mu_{p,\text{min}}$  24.3 p  
 1.05 p/ $\mu\text{m}^2$   
 $\mu_{p,\text{sat}}$  18507 p  
 803 p/ $\mu\text{m}^2$   
 $\mu_{e,\text{min}}$  12.3 e<sup>-</sup>  
 0.53 e<sup>-</sup>/ $\mu\text{m}^2$   
 $\mu_{e,\text{sat}}$  9389 e<sup>-</sup>  
 408 e<sup>-</sup>/ $\mu\text{m}^2$

### Dynamic range

DR 763  
 57.7 dB  
 9.6 bit

### Dark current

$\mu_{c,\text{mean}}$  93.5 DN/s  
 $\mu_{c,\text{mean}}$  907.5 e<sup>-</sup>/s  
 $\mu_{c,\text{var}}$  474.9 e<sup>-</sup>/s