

# Ultraviolet (Blue Light) TOCON Datasheets



- **UV photodiode with integrated preamplifier**
- **SiC based UV sensors with 0 to 5 V voltage output**
- **measures intensities from 1.8pW/cm<sup>2</sup> up to 18W/cm<sup>2</sup>**



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# TOCON\_BLUE4

GaP blue light detector with integrated amplifier



## GENERAL FEATURES



### Properties of the TOCON\_BLUE4

- GaP detector for blue light radiation in TO5 housing
- detection of incoherent blue light according to guideline 2006/25/EG
- 0 ... 5 V voltage output, peak wavelength at 445 nm
- max. radiation (saturation limit) at peak is 43  $\mu\text{W}/\text{cm}^2$ , minimum radiation (resolution limit) is 4,2  $\text{nW}/\text{cm}^2$
- Applications: measurement of very low blue light irradiation, occupational safety

### What is a TOCON?

A TOCON is a 5 Volt powered UV photodetector with integrated amplifier converting UV radiation into a 0 ... 5V voltage output. The  $V_{\text{out}}$  pin of the TOCON can be directly connected to a controller, a voltmeter or any other data analyzing device with voltage input. Highly modern electronic components and a hermetically sealed metal housing with UV glass window eliminates noise caused by parasitic resistance paths inside the package or EMI. A TOCON is a perfect solution for each industrial UV sensing application starting from flame detection at  $\text{pW}/\text{cm}^2$  level up to UV curing lamp control at  $\text{W}/\text{cm}^2$  level. This thirteen orders of magnitude range is covered by ten different TOCONs that differ by their sensitivity. The TOCONs are produced as UV broadband sensors or with filters for selective measurement.

## NOMENCLATURE

TOCON_	ABC, A, B, C, blue or GaP	1 ... 10
	<b>Spectral response</b>	<b>Irradiance limits (<math>V_{\text{supply}}=5\text{V}, \lambda = \lambda_{\text{peak}}</math>)</b>
	<b>ABC = broadband</b> $\lambda_{\text{max}} = 290 \text{ nm} \quad \lambda_{\text{S10\%}} = 227 \text{ nm} \dots 360 \text{ nm}$	<b>1</b> = 1,8 $\text{pW}/\text{cm}^2$ ... 18 $\text{nW}/\text{cm}^2$
	<b>A = UVA</b> $\lambda_{\text{max}} = 331 \text{ nm} \quad \lambda_{\text{S10\%}} = 309 \text{ nm} \dots 367 \text{ nm}$	<b>2</b> = 18 $\text{pW}/\text{cm}^2$ ... 180 $\text{nW}/\text{cm}^2$
	<b>B = UVB</b> $\lambda_{\text{max}} = 280 \text{ nm} \quad \lambda_{\text{S10\%}} = 243 \text{ nm} \dots 303 \text{ nm}$	<b>3</b> = 180 $\text{pW}/\text{cm}^2$ ... 1,8 $\mu\text{W}/\text{cm}^2$
	<b>C = UVC</b> $\lambda_{\text{max}} = 275 \text{ nm} \quad \lambda_{\text{S10\%}} = 225 \text{ nm} \dots 287 \text{ nm}$	<b>4</b> = 1,8 $\text{nW}/\text{cm}^2$ ... 18 $\mu\text{W}/\text{cm}^2$
	<b>Blue</b> $\lambda_{\text{max}} = 445 \text{ nm} \quad \lambda_{\text{S10\%}} = 390 \text{ nm} \dots 515 \text{ nm}$	<b>5</b> = 18 $\text{nW}/\text{cm}^2$ ... 180 $\mu\text{W}/\text{cm}^2$
	<b>Gap</b> $\lambda_{\text{max}} = 445 \text{ nm} \quad \lambda_{\text{S10\%}} = 190 \text{ nm} \dots 570 \text{ nm}$	<b>6</b> = 180 $\text{nW}/\text{cm}^2$ ... 1,8 $\text{mW}/\text{cm}^2$
	<b>E = UV-Index</b> spectral response according to CIE087	<b>7</b> = 1,8 $\mu\text{W}/\text{cm}^2$ ... 18 $\text{mW}/\text{cm}^2$
		<b>8</b> = 18 $\mu\text{W}/\text{cm}^2$ ... 180 $\text{mW}/\text{cm}^2$
		<b>9</b> = 180 $\mu\text{W}/\text{cm}^2$ ... 1,8 $\text{W}/\text{cm}^2$
		<b>10</b> = 1,8 $\text{mW}/\text{cm}^2$ ... 18 $\text{W}/\text{cm}^2$
		<b>2</b> = 0 UVI ... 30 UVI

# TOCON\_BLUE4

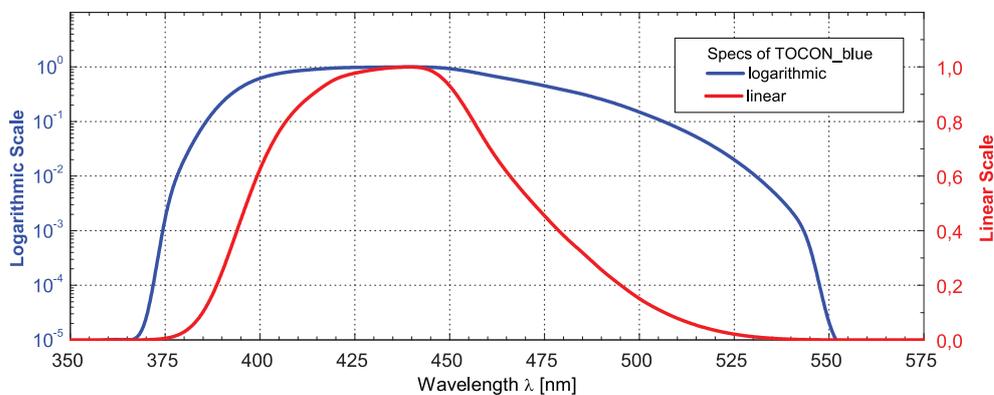
GaP blue light detector with integrated amplifier



## SPECIFICATIONS

Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{max}$	120	mV/ $\mu$ W/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{max}$	445	nm
Responsivity Range ( $S=0,1*S_{max}$ )	–	390 ... 515	nm
<b>General Characteristics (T=25°C, V<sub>supply</sub>=+5 V)</b>			
Supply Voltage	V <sub>Supply</sub>	2,5 ... 5	V
Saturation Voltage	V <sub>Sat</sub>	V <sub>Supply</sub> - 5%	V
Dark Offset Voltage	V <sub>Offset</sub>	50	$\mu$ V
Temperature Coefficient at Peak	T <sub>c</sub>	< -0,5	%/K
Current Consumption	I	150	$\mu$ A
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	t <sub>rise</sub>	0,066	s
<i>(other risetimes on request)</i>			
<b>Maximum Ratings</b>			
Operating Temperature	T <sub>opt</sub>	-25 ... +85	°C
Storage Temperature	T <sub>stor</sub>	-40 ... +100	°C
Soldering Temperature (3s)	T <sub>sold</sub>	300	°C

## NORMALIZED SPECTRAL RESPONSIVITY



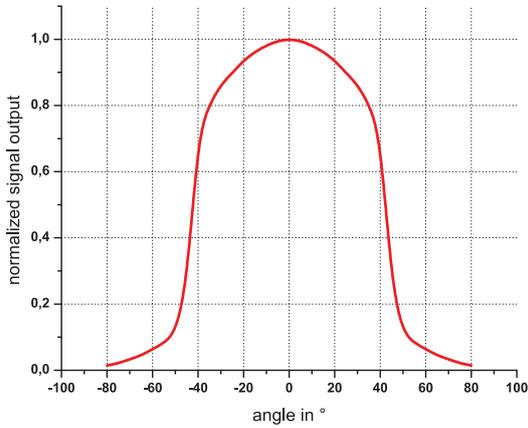
Rev. 3.1 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.

# TOCON\_BLUE4

GaP blue light detector with integrated amplifier



## FIELD OF VIEW

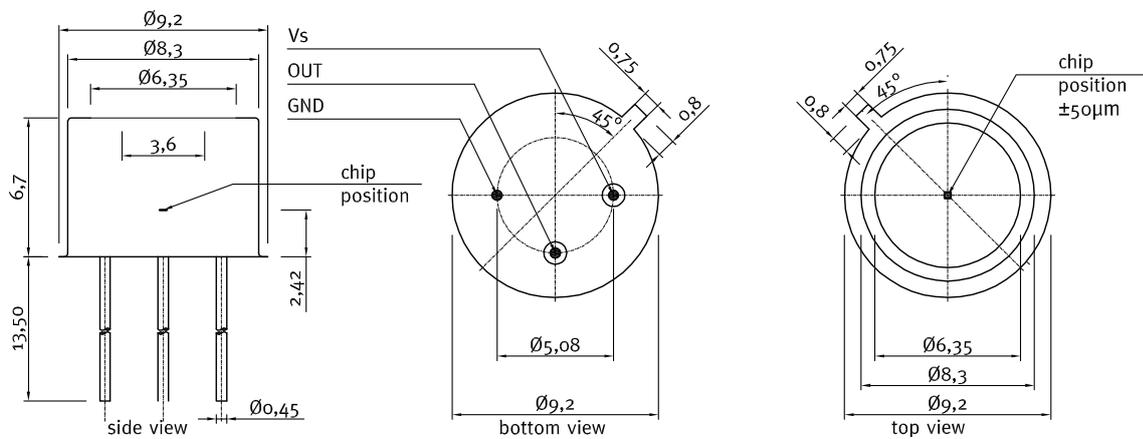


### Measurement Setup:

- lamp aperture diameter: 10 mm
- distance lamp aperture to second aperture: 17 mm
- second aperture diameter: 10 mm
- distance second aperture to detector: 93 mm

pivot level = top surface of the detector window

## DRAWING



# TOCON\_BLUE4

GaP blue light detector with integrated amplifier



## ▶ APPLICATION NOTE FOR TOCONS

The TOCONS need a supply voltage of  $V_{\text{supply}} = 2,5 \dots 5V_{\text{DC}}$  and can be directly connected to a controller or voltmeter. Please note that the theoretic maximum signal output is always a little less (approx. 5%) than the supply voltage. To learn more about perfect use of the TOCONS please refer to the TOCON FAQ list published at [www.sglux.com](http://www.sglux.com).

**CAUTION!** Wrong wiring leads to destruction of the device.

For easy setup of the device please ask for a TOCON starter kit.



### Miniature steel housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body, length 32 mm
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and to connect



### Miniature PTFE housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors without concentrator lens
- Teflon (PTFE) M12x1 thread body, length 31 mm
- Wide field of view, dirt-repellant, water proof at wet side (IP 68)
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and connect, cleanable

*The PTFE housing reduces the signal output by approx. 95%. Please consider this while selecting the TOCON's sensitivity range.*



### Plastic probes

- Optional feature for all TOCON detectors
- UV probes in small plastic housings with a TOCON inside
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 4-Pin plug)
- Cable available



### Water pressure proof TOCON housing

- Optional feature for all TOCON detectors without concentrator lens
- G1/4" thread, 10 bar water pressure proof
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 5-Pin plug)
- Cable available

# TOCON\_BLUE5

GaP blue light detector with integrated amplifier



## GENERAL FEATURES



### Properties of the TOCON\_BLUE5

- GaP detector for blue light radiation in TO5 housing
- detection of incoherent blue light according to guideline 2006/25/EG
- 0 ... 5 V voltage output, peak wavelength at 445 nm
- max. radiation (saturation limit) at peak is 430  $\mu\text{W}/\text{cm}^2$ ,  
minimum radiation (resolution limit) is 42  $\text{nW}/\text{cm}^2$
- Applications: measurement of low blue light irradiation, occupational safety

### What is a TOCON?

A TOCON is a 5 Volt powered UV photodetector with integrated amplifier converting UV radiation into a 0 ... 5V voltage output. The  $V_{\text{out}}$  pin of the TOCON can be directly connected to a controller, a voltmeter or any other data analyzing device with voltage input. Highly modern electronic components and a hermetically sealed metal housing with UV glass window eliminates noise caused by parasitic resistance paths inside the package or EMI. A TOCON is a perfect solution for each industrial UV sensing application starting from flame detection at  $\text{pW}/\text{cm}^2$  level up to UV curing lamp control at  $\text{W}/\text{cm}^2$  level. This thirteen orders of magnitude range is covered by ten different TOCONs that differ by their sensitivity. The TOCONs are produced as UV broadband sensors or with filters for selective measurement.

## NOMENCLATURE

TOCON_	ABC, A, B, C, blue or GaP	1 ... 10
	<b>Spectral response</b>	<b>Irradiance limits (<math>V_{\text{supply}}=5\text{V}, \lambda = \lambda_{\text{peak}}</math>)</b>
	<b>ABC = broadband</b> $\lambda_{\text{max}} = 290 \text{ nm}$ $\lambda_{\text{S10\%}} = 227 \text{ nm} \dots 360 \text{ nm}$	<b>1</b> = 1,8 $\text{pW}/\text{cm}^2$ ... 18 $\text{nW}/\text{cm}^2$
	<b>A = UVA</b> $\lambda_{\text{max}} = 331 \text{ nm}$ $\lambda_{\text{S10\%}} = 309 \text{ nm} \dots 367 \text{ nm}$	<b>2</b> = 18 $\text{pW}/\text{cm}^2$ ... 180 $\text{nW}/\text{cm}^2$
	<b>B = UVB</b> $\lambda_{\text{max}} = 280 \text{ nm}$ $\lambda_{\text{S10\%}} = 243 \text{ nm} \dots 303 \text{ nm}$	<b>3</b> = 180 $\text{pW}/\text{cm}^2$ ... 1,8 $\mu\text{W}/\text{cm}^2$
	<b>C = UVC</b> $\lambda_{\text{max}} = 275 \text{ nm}$ $\lambda_{\text{S10\%}} = 225 \text{ nm} \dots 287 \text{ nm}$	<b>4</b> = 1,8 $\text{nW}/\text{cm}^2$ ... 18 $\mu\text{W}/\text{cm}^2$
	<b>Blue</b> $\lambda_{\text{max}} = 445 \text{ nm}$ $\lambda_{\text{S10\%}} = 390 \text{ nm} \dots 515 \text{ nm}$	<b>5</b> = 18 $\text{nW}/\text{cm}^2$ ... 180 $\mu\text{W}/\text{cm}^2$
	<b>Gap</b> $\lambda_{\text{max}} = 445 \text{ nm}$ $\lambda_{\text{S10\%}} = 190 \text{ nm} \dots 570 \text{ nm}$	<b>6</b> = 180 $\text{nW}/\text{cm}^2$ ... 1,8 $\text{mW}/\text{cm}^2$
	<b>E = UV-Index</b> spectral response according to CIE087	<b>7</b> = 1,8 $\mu\text{W}/\text{cm}^2$ ... 18 $\text{mW}/\text{cm}^2$
		<b>8</b> = 18 $\mu\text{W}/\text{cm}^2$ ... 180 $\text{mW}/\text{cm}^2$
		<b>9</b> = 180 $\mu\text{W}/\text{cm}^2$ ... 1,8 $\text{W}/\text{cm}^2$
		<b>10</b> = 1,8 $\text{mW}/\text{cm}^2$ ... 18 $\text{W}/\text{cm}^2$
		<b>2</b> = 0 UVI ... 30 UVI

# TOCON\_BLUE5

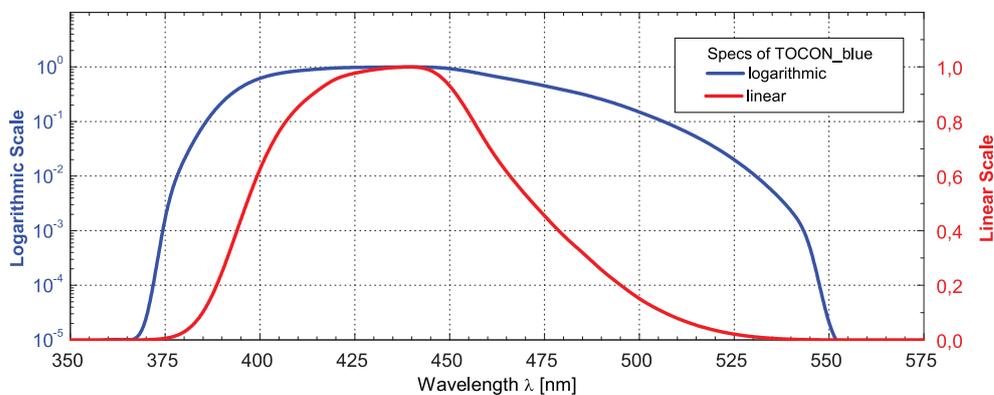
GaP blue light detector with integrated amplifier



## SPECIFICATIONS

Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{max}$	12	mV/ $\mu$ W/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{max}$	445	nm
Responsivity Range ( $S=0,1 \cdot S_{max}$ )	–	390 ... 515	nm
<b>General Characteristics (T=25°C, V<sub>supply</sub>=+5 V)</b>			
Supply Voltage	V <sub>Supply</sub>	2,5 ... 5	V
Saturation Voltage	V <sub>Sat</sub>	V <sub>Supply</sub> - 5%	V
Dark Offset Voltage	V <sub>Offset</sub>	50	$\mu$ V
Temperature Coefficient at Peak	T <sub>c</sub>	< -0,5	%/K
Current Consumption	I	150	$\mu$ A
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	t <sub>rise</sub>	0,066	s
<i>(other risetimes on request)</i>			
<b>Maximum Ratings</b>			
Operating Temperature	T <sub>opt</sub>	-25 ... +85	°C
Storage Temperature	T <sub>stor</sub>	-40 ... +100	°C
Soldering Temperature (3s)	T <sub>sold</sub>	300	°C

## NORMALIZED SPECTRAL RESPONSIVITY

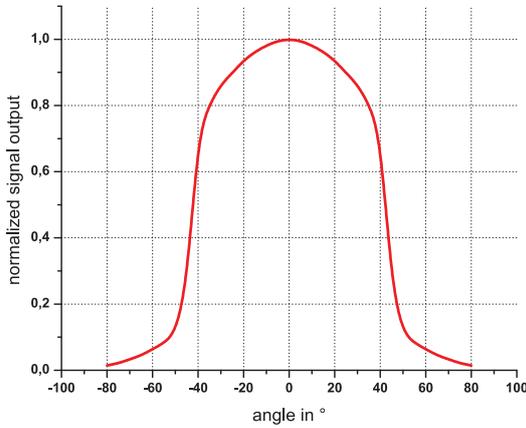


# TOCON\_BLUE5

GaP blue light detector with integrated amplifier



## FIELD OF VIEW

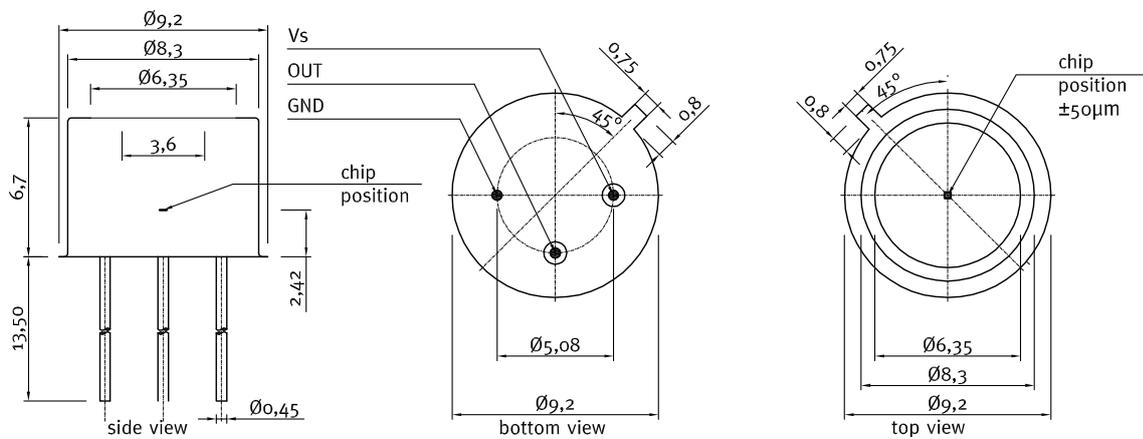


### Measurement Setup:

- lamp aperture diameter: 10 mm
- distance lamp aperture to second aperture: 17 mm
- second aperture diameter: 10 mm
- distance second aperture to detector: 93 mm

pivot level = top surface of the detector window

## DRAWING



# TOCON\_BLUE5

GaP blue light detector with integrated amplifier



## ▶ APPLICATION NOTE FOR TOCONs

The TOCONs need a supply voltage of  $V_{\text{supply}} = 2,5 \dots 5V_{\text{DC}}$  and can be directly connected to a controller or voltmeter. Please note that the theoretic maximum signal output is always a little less (approx. 5%) than the supply voltage. To learn more about perfect use of the TOCONs please refer to the TOCON FAQ list published at [www.sglux.com](http://www.sglux.com).

**CAUTION!** Wrong wiring leads to destruction of the device.

For easy setup of the device please ask for a TOCON starter kit.



### Miniature steel housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body, length 32 mm
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and to connect



### Miniature PTFE housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors without concentrator lens
- Teflon (PTFE) M12x1 thread body, length 31 mm
- Wide field of view, dirt-repellant, water proof at wet side (IP 68)
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and connect, cleanable

*The PTFE housing reduces the signal output by approx. 95%. Please consider this while selecting the TOCON's sensitivity range.*



### Plastic probes

- Optional feature for all TOCON detectors
- UV probes in small plastic housings with a TOCON inside
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 4-Pin plug)
- Cable available



### Water pressure proof TOCON housing

- Optional feature for all TOCON detectors without concentrator lens
- G1/4" thread, 10 bar water pressure proof
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 5-Pin plug)
- Cable available

# TOCON\_BLUE6

GaP blue light detector with integrated amplifier



## GENERAL FEATURES



### Properties of the TOCON\_BLUE6

- GaP detector for blue light radiation in TO5 housing
- detection of incoherent blue light according to guideline 2006/25/EG
- 0 ... 5 V voltage output, peak wavelength at 445 nm
- max. radiation (saturation limit) at peak is 4,3 mW/cm<sup>2</sup>, minimum radiation (resolution limit) is 420 nW/cm<sup>2</sup>
- Applications: measurement of blue light irradiation, occupational safety

### What is a TOCON?

A TOCON is a 5 Volt powered UV photodetector with integrated amplifier converting UV radiation into a 0 ... 5V voltage output. The V<sub>out</sub> pin of the TOCON can be directly connected to a controller, a voltmeter or any other data analyzing device with voltage input. Highly modern electronic components and a hermetically sealed metal housing with UV glass window eliminates noise caused by parasitic resistance paths inside the package or EMI. A TOCON is a perfect solution for each industrial UV sensing application starting from flame detection at pW/cm<sup>2</sup> level up to UV curing lamp control at W/cm<sup>2</sup> level. This thirteen orders of magnitude range is covered by ten different TOCONs that differ by their sensitivity. The TOCONs are produced as UV broadband sensors or with filters for selective measurement.

## NOMENCLATURE

TOCON_	ABC, A, B, C, blue or GaP	1 ... 10
	<b>Spectral response</b>	<b>Irradiance limits (V<sub>supply</sub>=5V, λ = λ<sub>peak</sub>)</b>
	<b>ABC = broadband</b> λ <sub>max</sub> = 290 nm λ <sub>S10%</sub> = 227 nm ... 360 nm	<b>1</b> = 1,8 pW/cm <sup>2</sup> ... 18 nW/cm <sup>2</sup>
	<b>A = UVA</b> λ <sub>max</sub> = 331 nm λ <sub>S10%</sub> = 309 nm ... 367 nm	<b>2</b> = 18 pW/cm <sup>2</sup> ... 180 nW/cm <sup>2</sup>
	<b>B = UVB</b> λ <sub>max</sub> = 280 nm λ <sub>S10%</sub> = 243 nm ... 303 nm	<b>3</b> = 180 pW/cm <sup>2</sup> ... 1,8 μW/cm <sup>2</sup>
	<b>C = UVC</b> λ <sub>max</sub> = 275 nm λ <sub>S10%</sub> = 225 nm ... 287 nm	<b>4</b> = 1,8 nW/cm <sup>2</sup> ... 18 μW/cm <sup>2</sup>
	<b>Blue</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 390 nm ... 515 nm	<b>5</b> = 18 nW/cm <sup>2</sup> ... 180 μW/cm <sup>2</sup>
	<b>Gap</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 190 nm ... 570 nm	<b>6</b> = 180 nW/cm <sup>2</sup> ... 1,8 mW/cm <sup>2</sup>
	<b>E = UV-Index</b> spectral response according to CIE087	<b>7</b> = 1,8 μW/cm <sup>2</sup> ... 18 mW/cm <sup>2</sup>
		<b>8</b> = 18 μW/cm <sup>2</sup> ... 180 mW/cm <sup>2</sup>
		<b>9</b> = 180 μW/cm <sup>2</sup> ... 1,8 W/cm <sup>2</sup>
		<b>10</b> = 1,8 mW/cm <sup>2</sup> ... 18 W/cm <sup>2</sup>
		<b>2</b> = 0 UVI ... 30 UVI

# TOCON\_BLUE6

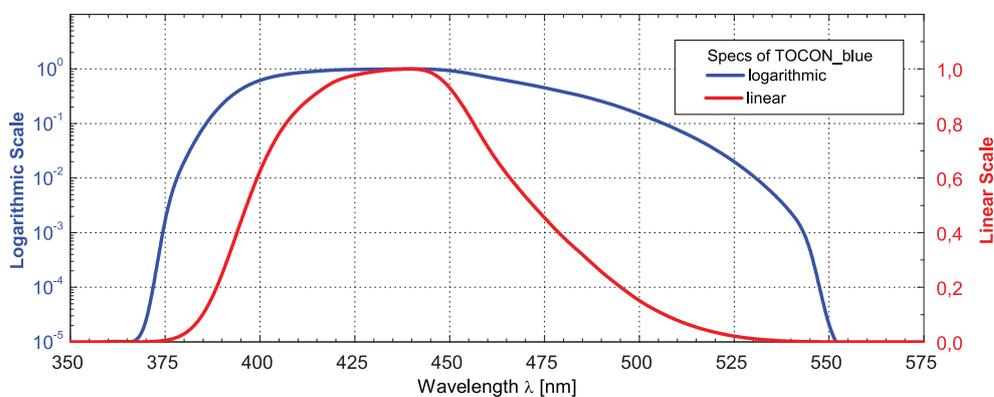
GaP blue light detector with integrated amplifier



## SPECIFICATIONS

Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{max}$	1,2	mV/ $\mu$ W/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{max}$	445	nm
Responsivity Range ( $S=0,1 \cdot S_{max}$ )	–	390 ... 515	nm
<b>General Characteristics (T=25°C, V<sub>supply</sub>=+5 V)</b>			
Supply Voltage	$V_{Supply}$	2,5 ... 5	V
Saturation Voltage	$V_{Sat}$	$V_{Supply} - 5\%$	V
Dark Offset Voltage	$V_{Offset}$	50	$\mu$ V
Temperature Coefficient at Peak	$T_c$	< -0,5	%/K
Current Consumption	I	150	$\mu$ A
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	$t_{rise}$	0,059	s
<i>(other risetimes on request)</i>			
<b>Maximum Ratings</b>			
Operating Temperature	$T_{opt}$	-25 ... +85	°C
Storage Temperature	$T_{stor}$	-40 ... +100	°C
Soldering Temperature (3s)	$T_{sold}$	300	°C

## NORMALIZED SPECTRAL RESPONSIVITY

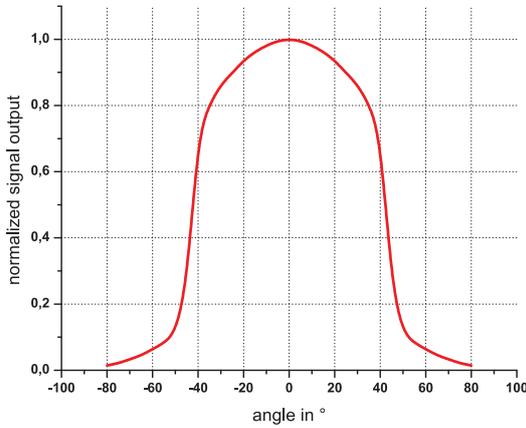


# TOCON\_BLUE6

GaP blue light detector with integrated amplifier



## FIELD OF VIEW

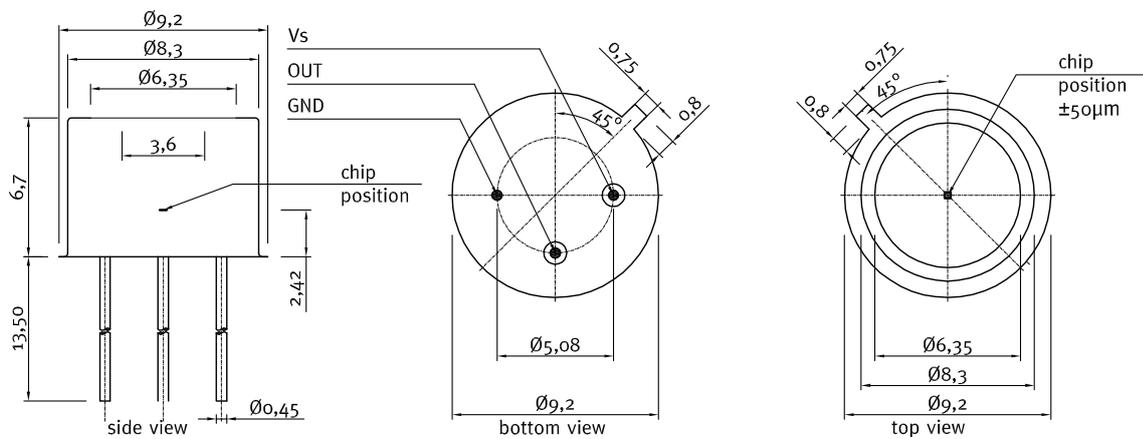


### Measurement Setup:

- lamp aperture diameter: 10 mm
- distance lamp aperture to second aperture: 17 mm
- second aperture diameter: 10 mm
- distance second aperture to detector: 93 mm

pivot level = top surface of the detector window

## DRAWING



# TOCON\_BLUE6

GaP blue light detector with integrated amplifier



## ▶ APPLICATION NOTE FOR TOCONs

The TOCONs need a supply voltage of  $V_{\text{supply}} = 2,5 \dots 5V_{\text{DC}}$  and can be directly connected to a controller or voltmeter. Please note that the theoretic maximum signal output is always a little less (approx. 5%) than the supply voltage. To learn more about perfect use of the TOCONs please refer to the TOCON FAQ list published at [www.sglux.com](http://www.sglux.com).

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### Miniature steel housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body, length 32 mm
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and to connect



### Miniature PTFE housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors without concentrator lens
- Teflon (PTFE) M12x1 thread body, length 31 mm
- Wide field of view, dirt-repellant, water proof at wet side (IP 68)
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and connect, cleanable

*The PTFE housing reduces the signal output by approx. 95%. Please consider this while selecting the TOCON's sensitivity range.*



### Plastic probes

- Optional feature for all TOCON detectors
- UV probes in small plastic housings with a TOCON inside
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 4-Pin plug)
- Cable available



### Water pressure proof TOCON housing

- Optional feature for all TOCON detectors without concentrator lens
- G1/4" thread, 10 bar water pressure proof
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 5-Pin plug)
- Cable available

# TOCON\_BLUE7

GaP blue light detector with integrated amplifier



## GENERAL FEATURES



### Properties of the TOCON\_BLUE7

- GaP detector for blue light radiation in TO5 housing
- detection of incoherent blue light according to guideline 2006/25/EG
- 0 ... 5 V voltage output, peak wavelength at 445 nm
- max. radiation (saturation limit) at peak is 43 mW/cm<sup>2</sup>, minimum radiation (resolution limit) is 4,2 μW/cm<sup>2</sup>
- Applications: measurement of blue light irradiation, occupational safety

### What is a TOCON?

A TOCON is a 5 Volt powered UV photodetector with integrated amplifier converting UV radiation into a 0 ... 5V voltage output. The V<sub>out</sub> pin of the TOCON can be directly connected to a controller, a voltmeter or any other data analyzing device with voltage input. Highly modern electronic components and a hermetically sealed metal housing with UV glass window eliminates noise caused by parasitic resistance paths inside the package or EMI. A TOCON is a perfect solution for each industrial UV sensing application starting from flame detection at pW/cm<sup>2</sup> level up to UV curing lamp control at W/cm<sup>2</sup> level. This thirteen orders of magnitude range is covered by ten different TOCONs that differ by their sensitivity. The TOCONs are produced as UV broadband sensors or with filters for selective measurement.

## NOMENCLATURE

TOCON_	ABC, A, B, C, blue or GaP	1 ... 10
	<b>Spectral response</b>	<b>Irradiance limits (V<sub>supply</sub>=5V, λ = λ<sub>peak</sub>)</b>
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	<b>A = UVA</b> λ <sub>max</sub> = 331 nm λ <sub>S10%</sub> = 309 nm ... 367 nm	<b>2</b> = 18 pW/cm <sup>2</sup> ... 180 nW/cm <sup>2</sup>
	<b>B = UVB</b> λ <sub>max</sub> = 280 nm λ <sub>S10%</sub> = 243 nm ... 303 nm	<b>3</b> = 180 pW/cm <sup>2</sup> ... 1,8 μW/cm <sup>2</sup>
	<b>C = UVC</b> λ <sub>max</sub> = 275 nm λ <sub>S10%</sub> = 225 nm ... 287 nm	<b>4</b> = 1,8 nW/cm <sup>2</sup> ... 18 μW/cm <sup>2</sup>
	<b>Blue</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 390 nm ... 515 nm	<b>5</b> = 18 nW/cm <sup>2</sup> ... 180 μW/cm <sup>2</sup>
	<b>Gap</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 190 nm ... 570 nm	<b>6</b> = 180 nW/cm <sup>2</sup> ... 1,8 mW/cm <sup>2</sup>
	<b>E = UV-Index</b> spectral response according to CIE087	<b>7</b> = 1,8 μW/cm <sup>2</sup> ... 18 mW/cm <sup>2</sup>
		<b>8</b> = 18 μW/cm <sup>2</sup> ... 180 mW/cm <sup>2</sup>
		<b>9</b> = 180 μW/cm <sup>2</sup> ... 1,8 W/cm <sup>2</sup>
		<b>10</b> = 1,8 mW/cm <sup>2</sup> ... 18 W/cm <sup>2</sup>
		<b>2</b> = 0 UVI ... 30 UVI

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Rev. 3.1 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.

# TOCON\_BLUE7

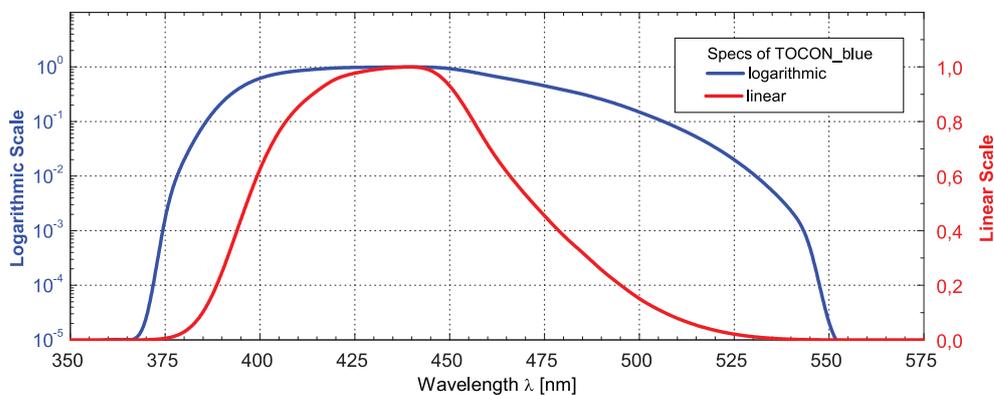
GaP blue light detector with integrated amplifier



## SPECIFICATIONS

Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{max}$	120	mV/mW/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{max}$	445	nm
Responsivity Range ( $S=0,1*S_{max}$ )	–	390 ... 515	nm
<b>General Characteristics (T=25°C, V<sub>supply</sub>=+5 V)</b>			
Supply Voltage	$V_{Supply}$	2,5 ... 5	V
Saturation Voltage	$V_{Sat}$	$V_{Supply} - 5\%$	V
Dark Offset Voltage	$V_{Offset}$	50	μV
Temperature Coefficient at Peak	$T_c$	< -0,5	%/K
Current Consumption	I	150	μA
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	$t_{rise}$	0,059	s
<i>(other risetimes on request)</i>			
<b>Maximum Ratings</b>			
Operating Temperature	$T_{opt}$	-25 ... +85	°C
Storage Temperature	$T_{stor}$	-40 ... +100	°C
Soldering Temperature (3s)	$T_{sold}$	300	°C

## NORMALIZED SPECTRAL RESPONSIVITY

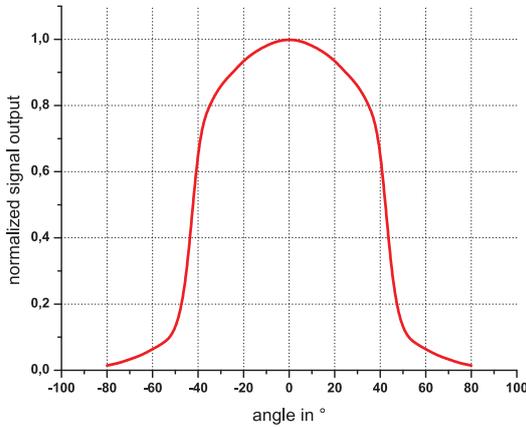


# TOCON\_BLUE7

GaP blue light detector with integrated amplifier



## FIELD OF VIEW

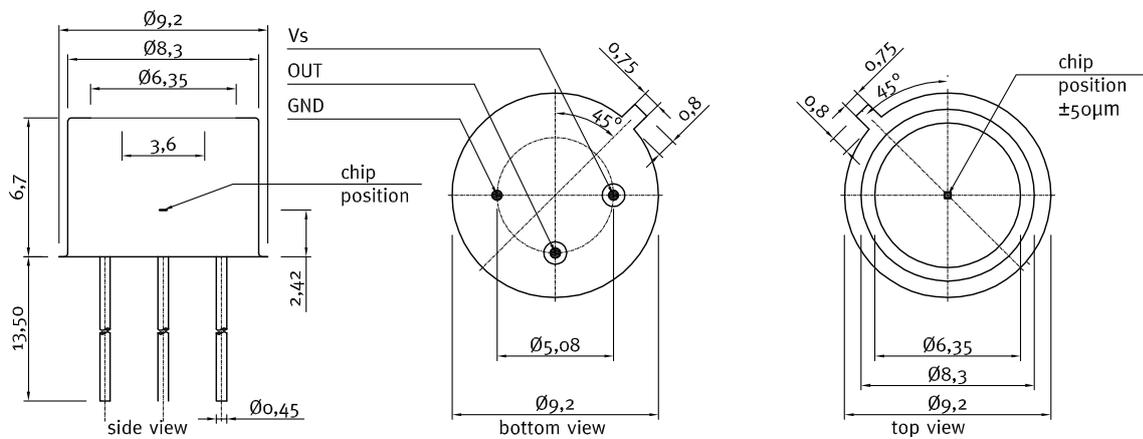


### Measurement Setup:

- lamp aperture diameter: 10 mm
- distance lamp aperture to second aperture: 17 mm
- second aperture diameter: 10 mm
- distance second aperture to detector: 93 mm

pivot level = top surface of the detector window

## DRAWING



# TOCON\_BLUE7

GaP blue light detector with integrated amplifier

## APPLICATION NOTE FOR TOCONs

The TOCONs need a supply voltage of  $V_{\text{supply}} = 2,5 \dots 5V_{\text{DC}}$  and can be directly connected to a controller or voltmeter. Please note that the theoretic maximum signal output is always a little less (approx. 5%) than the supply voltage. To learn more about perfect use of the TOCONs please refer to the TOCON FAQ list published at [www.sglux.com](http://www.sglux.com).

**CAUTION!** Wrong wiring leads to destruction of the device.

For easy setup of the device please ask for a TOCON starter kit.



### Miniature steel housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body, length 32 mm
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and to connect



### Miniature PTFE housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors without concentrator lens
- Teflon (PTFE) M12x1 thread body, length 31 mm
- Wide field of view, dirt-repellant, water proof at wet side (IP 68)
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and connect, cleanable

*The PTFE housing reduces the signal output by approx. 95%. Please consider this while selecting the TOCON's sensitivity range.*



### Plastic probes

- Optional feature for all TOCON detectors
- UV probes in small plastic housings with a TOCON inside
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 4-Pin plug)
- Cable available



### Water pressure proof TOCON housing

- Optional feature for all TOCON detectors without concentrator lens
- G1/4" thread, 10 bar water pressure proof
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 5-Pin plug)
- Cable available

# TOCON\_BLUE8

GaP blue light detector with integrated amplifier



## GENERAL FEATURES



### Properties of the TOCON\_BLUE8

- GaP detector for blue light radiation in TO5 housing
- detection of incoherent blue light according to guideline 2006/25/EG
- 0 ... 5 V voltage output, peak wavelength at 445 nm
- max. radiation (saturation limit) at peak is 430 mW/cm<sup>2</sup>, minimum radiation (resolution limit) is 42 μW/cm<sup>2</sup>
- Applications: measurement of high blue light irradiation, occupational safety

### What is a TOCON?

A TOCON is a 5 Volt powered UV photodetector with integrated amplifier converting UV radiation into a 0 ... 5V voltage output. The V<sub>out</sub> pin of the TOCON can be directly connected to a controller, a voltmeter or any other data analyzing device with voltage input. Highly modern electronic components and a hermetically sealed metal housing with UV glass window eliminates noise caused by parasitic resistance paths inside the package or EMI. A TOCON is a perfect solution for each industrial UV sensing application starting from flame detection at pW/cm<sup>2</sup> level up to UV curing lamp control at W/cm<sup>2</sup> level. This thirteen orders of magnitude range is covered by ten different TOCONs that differ by their sensitivity. The TOCONs are produced as UV broadband sensors or with filters for selective measurement.

## NOMENCLATURE

TOCON_	ABC, A, B, C, blue or GaP	1 ... 10
	<b>Spectral response</b>	<b>Irradiance limits (V<sub>supply</sub>=5V, λ = λ<sub>peak</sub>)</b>
	<b>ABC = broadband</b> λ <sub>max</sub> = 290 nm λ <sub>S10%</sub> = 227 nm ... 360 nm	<b>1</b> = 1,8 pW/cm <sup>2</sup> ... 18 nW/cm <sup>2</sup>
	<b>A = UVA</b> λ <sub>max</sub> = 331 nm λ <sub>S10%</sub> = 309 nm ... 367 nm	<b>2</b> = 18 pW/cm <sup>2</sup> ... 180 nW/cm <sup>2</sup>
	<b>B = UVB</b> λ <sub>max</sub> = 280 nm λ <sub>S10%</sub> = 243 nm ... 303 nm	<b>3</b> = 180 pW/cm <sup>2</sup> ... 1,8 μW/cm <sup>2</sup>
	<b>C = UVC</b> λ <sub>max</sub> = 275 nm λ <sub>S10%</sub> = 225 nm ... 287 nm	<b>4</b> = 1,8 nW/cm <sup>2</sup> ... 18 μW/cm <sup>2</sup>
	<b>Blue</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 390 nm ... 515 nm	<b>5</b> = 18 nW/cm <sup>2</sup> ... 180 μW/cm <sup>2</sup>
	<b>Gap</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 190 nm ... 570 nm	<b>6</b> = 180 nW/cm <sup>2</sup> ... 1,8 mW/cm <sup>2</sup>
	<b>E = UV-Index</b> spectral response according to CIE087	<b>7</b> = 1,8 μW/cm <sup>2</sup> ... 18 mW/cm <sup>2</sup>
		<b>8</b> = 18 μW/cm <sup>2</sup> ... 180 mW/cm <sup>2</sup>
		<b>9</b> = 180 μW/cm <sup>2</sup> ... 1,8 W/cm <sup>2</sup>
		<b>10</b> = 1,8 mW/cm <sup>2</sup> ... 18 W/cm <sup>2</sup>
		<b>2</b> = 0 UVI ... 30 UVI

# TOCON\_BLUE8

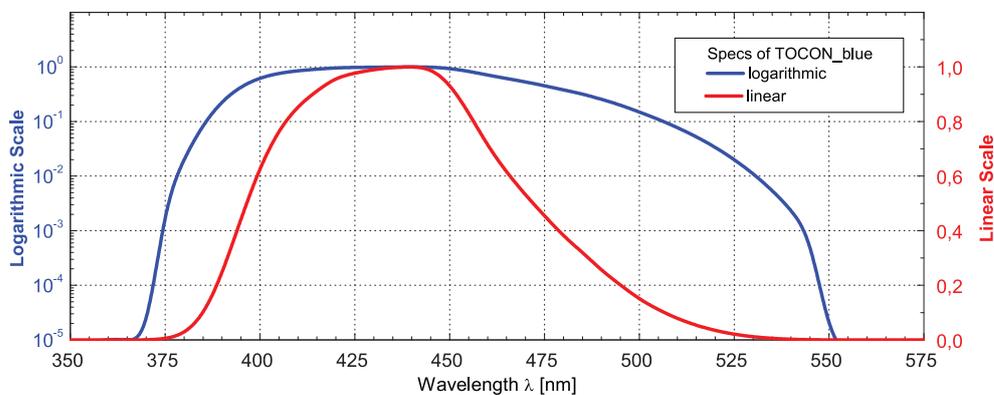
GaP blue light detector with integrated amplifier



## SPECIFICATIONS

Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{max}$	12	mV/mW/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{max}$	445	nm
Responsivity Range ( $S=0,1*S_{max}$ )	–	390 ... 515	nm
<b>General Characteristics (T=25°C, V<sub>supply</sub>=+5 V)</b>			
Supply Voltage	V <sub>Supply</sub>	2,5 ... 5	V
Saturation Voltage	V <sub>Sat</sub>	V <sub>Supply</sub> - 5%	V
Dark Offset Voltage	V <sub>Offset</sub>	50	μV
Temperature Coefficient at Peak	T <sub>c</sub>	< -0,5	%/K
Current Consumption	I	150	μA
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	t <sub>rise</sub>	0,071	s
<i>(other risetimes on request)</i>			
<b>Maximum Ratings</b>			
Operating Temperature	T <sub>opt</sub>	-25 ... +85	°C
Storage Temperature	T <sub>stor</sub>	-40 ... +100	°C
Soldering Temperature (3s)	T <sub>sold</sub>	300	°C

## NORMALIZED SPECTRAL RESPONSIVITY

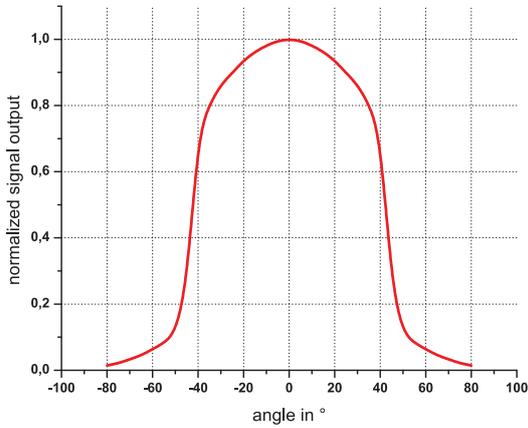


# TOCON\_BLUE8

GaP blue light detector with integrated amplifier



## FIELD OF VIEW

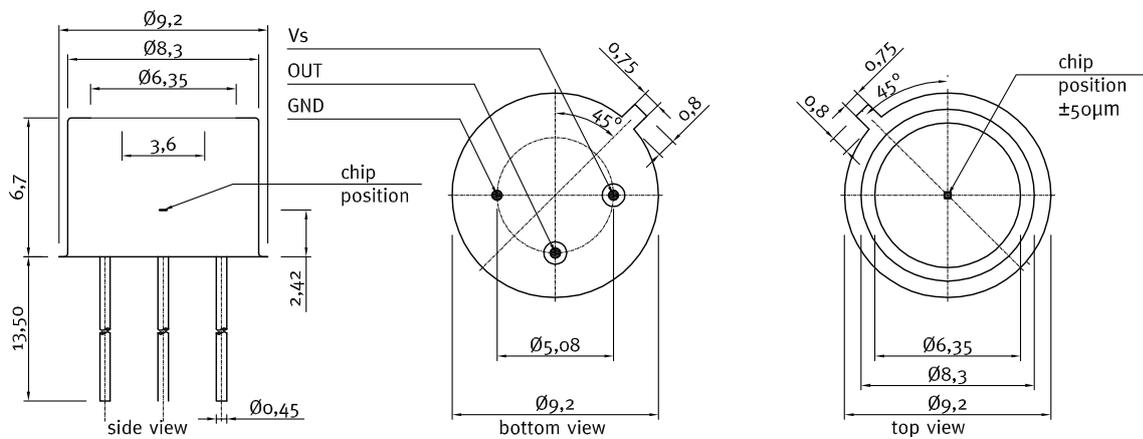


### Measurement Setup:

- lamp aperture diameter: 10 mm
- distance lamp aperture to second aperture: 17 mm
- second aperture diameter: 10 mm
- distance second aperture to detector: 93 mm

pivot level = top surface of the detector window

## DRAWING



# TOCON\_BLUE8

GaP blue light detector with integrated amplifier



## ▶ APPLICATION NOTE FOR TOCONs

The TOCONs need a supply voltage of  $V_{\text{supply}} = 2,5 \dots 5V_{\text{DC}}$  and can be directly connected to a controller or voltmeter. Please note that the theoretic maximum signal output is always a little less (approx. 5%) than the supply voltage. To learn more about perfect use of the TOCONs please refer to the TOCON FAQ list published at [www.sglux.com](http://www.sglux.com).

**CAUTION!** Wrong wiring leads to destruction of the device.

For easy setup of the device please ask for a TOCON starter kit.



### Miniature steel housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body, length 32 mm
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and to connect



### Miniature PTFE housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors without concentrator lens
- Teflon (PTFE) M12x1 thread body, length 31 mm
- Wide field of view, dirt-repellant, water proof at wet side (IP 68)
- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and connect, cleanable

*The PTFE housing reduces the signal output by approx. 95%. Please consider this while selecting the TOCON's sensitivity range.*



### Plastic probes

- Optional feature for all TOCON detectors
- UV probes in small plastic housings with a TOCON inside
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 4-Pin plug)
- Cable available



### Water pressure proof TOCON housing

- Optional feature for all TOCON detectors without concentrator lens
- G1/4" thread, 10 bar water pressure proof
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 5-Pin plug)
- Cable available

# TOCON\_BLUE9

GaP blue light detector with integrated amplifier



## GENERAL FEATURES



### Properties of the TOCON\_BLUE9

- GaP detector for blue light radiation in TO5 housing
- detection of incoherent blue light according to guideline 2006/25/EG
- 0 ... 5 V voltage output, peak wavelength at 445 nm
- max. radiation (saturation limit) at peak is 4,3 W/cm<sup>2</sup>, minimum radiation (resolution limit) is 420 μW/cm<sup>2</sup>
- Applications: measurement of very high blue light irradiation, occupational safety

### What is a TOCON?

A TOCON is a 5 Volt powered UV photodetector with integrated amplifier converting UV radiation into a 0 ... 5V voltage output. The V<sub>out</sub> pin of the TOCON can be directly connected to a controller, a voltmeter or any other data analyzing device with voltage input. Highly modern electronic components and a hermetically sealed metal housing with UV glass window eliminates noise caused by parasitic resistance paths inside the package or EMI. A TOCON is a perfect solution for each industrial UV sensing application starting from flame detection at pW/cm<sup>2</sup> level up to UV curing lamp control at W/cm<sup>2</sup> level. This thirteen orders of magnitude range is covered by ten different TOCONs that differ by their sensitivity. The TOCONs are produced as UV broadband sensors or with filters for selective measurement.

## NOMENCLATURE

TOCON_	ABC, A, B, C, blue or GaP	1 ... 10
	<b>Spectral response</b>	<b>Irradiance limits (V<sub>supply</sub>=5V, λ = λ<sub>peak</sub>)</b>
	<b>ABC = broadband</b> λ <sub>max</sub> = 290 nm λ <sub>S10%</sub> = 227 nm ... 360 nm	<b>1</b> = 1,8 pW/cm <sup>2</sup> ... 18 nW/cm <sup>2</sup>
	<b>A = UVA</b> λ <sub>max</sub> = 331 nm λ <sub>S10%</sub> = 309 nm ... 367 nm	<b>2</b> = 18 pW/cm <sup>2</sup> ... 180 nW/cm <sup>2</sup>
	<b>B = UVB</b> λ <sub>max</sub> = 280 nm λ <sub>S10%</sub> = 243 nm ... 303 nm	<b>3</b> = 180 pW/cm <sup>2</sup> ... 1,8 μW/cm <sup>2</sup>
	<b>C = UVC</b> λ <sub>max</sub> = 275 nm λ <sub>S10%</sub> = 225 nm ... 287 nm	<b>4</b> = 1,8 nW/cm <sup>2</sup> ... 18 μW/cm <sup>2</sup>
	<b>Blue</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 390 nm ... 515 nm	<b>5</b> = 18 nW/cm <sup>2</sup> ... 180 μW/cm <sup>2</sup>
	<b>Gap</b> λ <sub>max</sub> = 445 nm λ <sub>S10%</sub> = 190 nm ... 570 nm	<b>6</b> = 180 nW/cm <sup>2</sup> ... 1,8 mW/cm <sup>2</sup>
	<b>E = UV-Index</b> spectral response according to CIE087	<b>7</b> = 1,8 μW/cm <sup>2</sup> ... 18 mW/cm <sup>2</sup>
		<b>8</b> = 18 μW/cm <sup>2</sup> ... 180 mW/cm <sup>2</sup>
		<b>9</b> = 180 μW/cm <sup>2</sup> ... 1,8 W/cm <sup>2</sup>
		<b>10</b> = 1,8 mW/cm <sup>2</sup> ... 18 W/cm <sup>2</sup>
		<b>2</b> = 0 UVI ... 30 UVI

# TOCON\_BLUE9

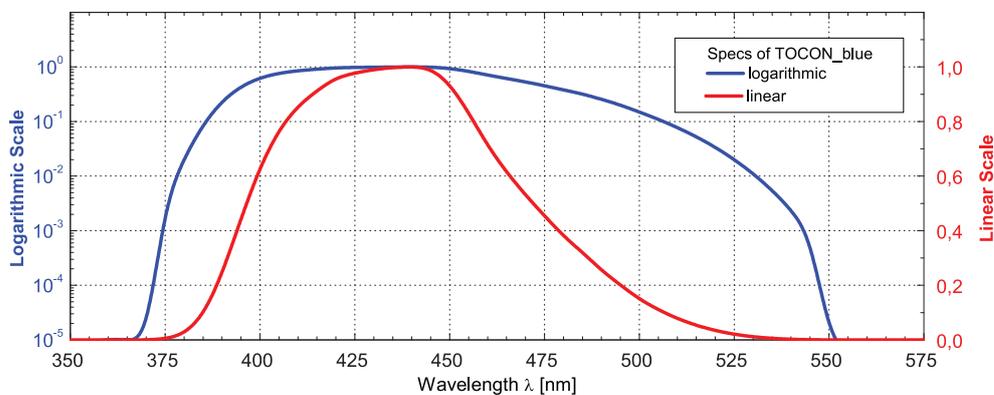
GaP blue light detector with integrated amplifier



## SPECIFICATIONS

Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{max}$	1,2	mV/mW/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{max}$	445	nm
Responsivity Range ( $S=0,1*S_{max}$ )	–	390 ... 515	nm
<b>General Characteristics (T=25°C, V<sub>supply</sub>=+5 V)</b>			
Supply Voltage	V <sub>Supply</sub>	2,5 ... 5	V
Saturation Voltage	V <sub>Sat</sub>	V <sub>Supply</sub> - 5%	V
Dark Offset Voltage	V <sub>Offset</sub>	50	µV
Temperature Coefficient at Peak	T <sub>c</sub>	< -0,5	%/K
Current Consumption	I	150	µA
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	t <sub>rise</sub>	0,059	s
<i>(other risetimes on request)</i>			
<b>Maximum Ratings</b>			
Operating Temperature	T <sub>opt</sub>	-25 ... +85	°C
Storage Temperature	T <sub>stor</sub>	-40 ... +100	°C
Soldering Temperature (3s)	T <sub>sold</sub>	300	°C

## NORMALIZED SPECTRAL RESPONSIVITY

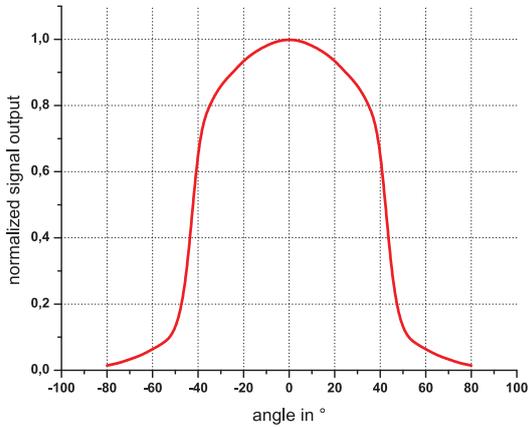


# TOCON\_BLUE9

GaP blue light detector with integrated amplifier



## FIELD OF VIEW

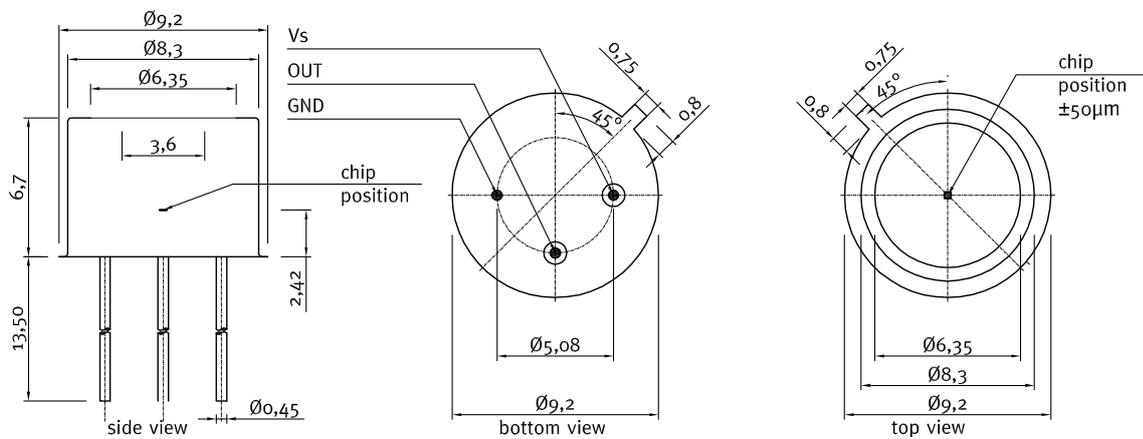


### Measurement Setup:

- lamp aperture diameter: 10 mm
- distance lamp aperture to second aperture: 17 mm
- second aperture diameter: 10 mm
- distance second aperture to detector: 93 mm

pivot level = top surface of the detector window

## DRAWING



# TOCON\_BLUE9

GaP blue light detector with integrated amplifier

## APPLICATION NOTE FOR TOCONs

The TOCONs need a supply voltage of  $V_{\text{supply}} = 2,5 \dots 5V_{\text{DC}}$  and can be directly connected to a controller or voltmeter. Please note that the theoretic maximum signal output is always a little less (approx. 5%) than the supply voltage. To learn more about perfect use of the TOCONs please refer to the TOCON FAQ list published at [www.sglux.com](http://www.sglux.com).

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### Miniature steel housing with M12x1 thread for the TOCON series

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- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
- Easy to mount and to connect



### Miniature PTFE housing with M12x1 thread for the TOCON series

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- Integrated sensor connector (Binder 4-Pin plug) with 2m connector cable
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*The PTFE housing reduces the signal output by approx. 95%. Please consider this while selecting the TOCON's sensitivity range.*



### Plastic probes

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### Water pressure proof TOCON housing

- Optional feature for all TOCON detectors without concentrator lens
- G1/4" thread, 10 bar water pressure proof
- Customized housings available
- Easy to mount and to connect
- Integrated sensor connector (Binder 5-Pin plug)
- Cable available