

# TOCON\_ABC1

Broadband SiC based UV photodetector with integrated amplifier

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## GENERAL FEATURES



### Properties of the TOCON\_ABC1

- Broadband SiC based UV photodetector in TO5 housing with concentrator lens cap
- 0...5 V voltage output
- peak wavelength at 280 nm
- max. radiation (saturation limit) at peak is 18 nW/cm<sup>2</sup>,  
minimum radiation (resolution limit) is 1,8 pW/cm<sup>2</sup>
- Applications: very low UV radiation, flame detection

### 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.

### Silicon Carbide (SiC) detector chip inside

Sophisticated electronics make a TOCON a reliable component in harsh environments as well as for extremely low or extremely high UV radiation. But what makes the TOCON a quasi eternally living sensor is the sglux in-house produced SiC detector chip featured by a PTB-reported extreme radiation hardness.

## 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> ... 1,8 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

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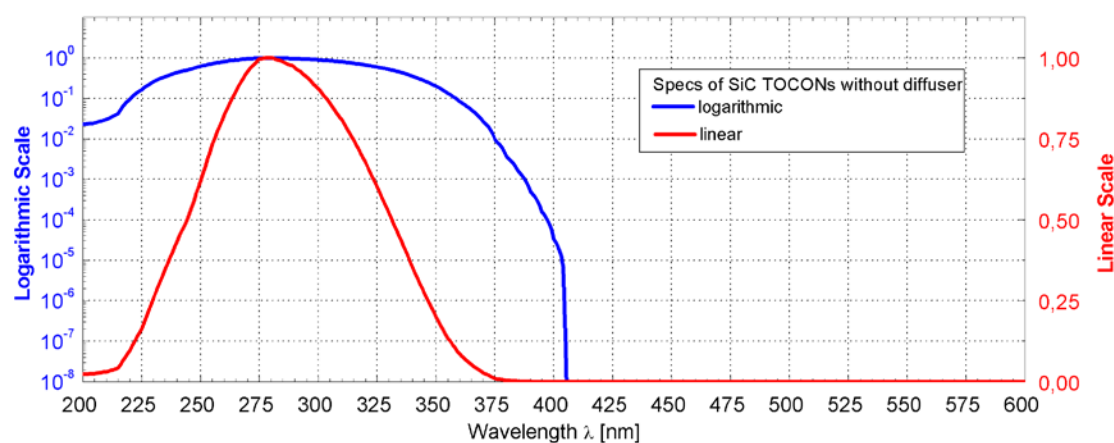
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## SPECIFICATIONS

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Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{\max}$	280	mV/nW/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{\max}$	280	nm
Responsivity Range ( $S=0,1*S_{\max}$ )	–	221 ... 358	nm
Visible Blindness ( $S_{\max}/S_{>405\text{nm}}$ )	VB	$> 10^{10}$	–
<b>General Characteristics (T=25°C, <math>V_{\text{supply}}=+5\text{ V}</math>)</b>			
Supply Voltage	$V_{\text{Supply}}$	2,5 ... 5	V
Saturation Voltage	$V_{\text{Sat}}$	$V_{\text{Supply}} - 5\%$	V
Dark Offset Voltage	$V_{\text{Offset}}$	700	μV
Temperature Coefficient at Peak	$T_c$	$< -0,3$	%/K
Current Consumption	I	150	μA
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	$t_{\text{rise}}$	0,182	s
<i>(other risetimes on request)</i>			
<b>Maximum Ratings</b>			
Operating Temperature	$T_{\text{opt}}$	-25 ... +85	°C
Storage Temperature	$T_{\text{stor}}$	-40 ... +100	°C
Soldering Temperature (3s)	$T_{\text{sold}}$	300	°C

## NORMALIZED SPECTRAL RESPONSIVITY

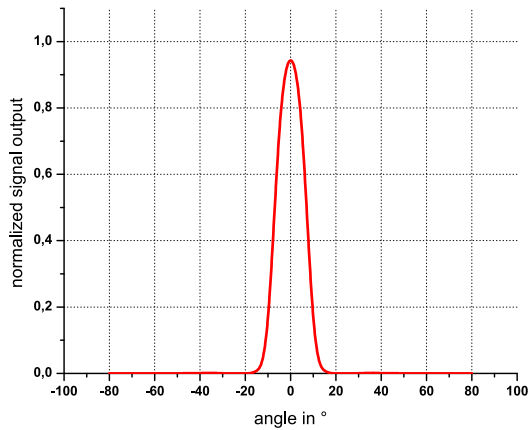


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## FIELD OF VIEW

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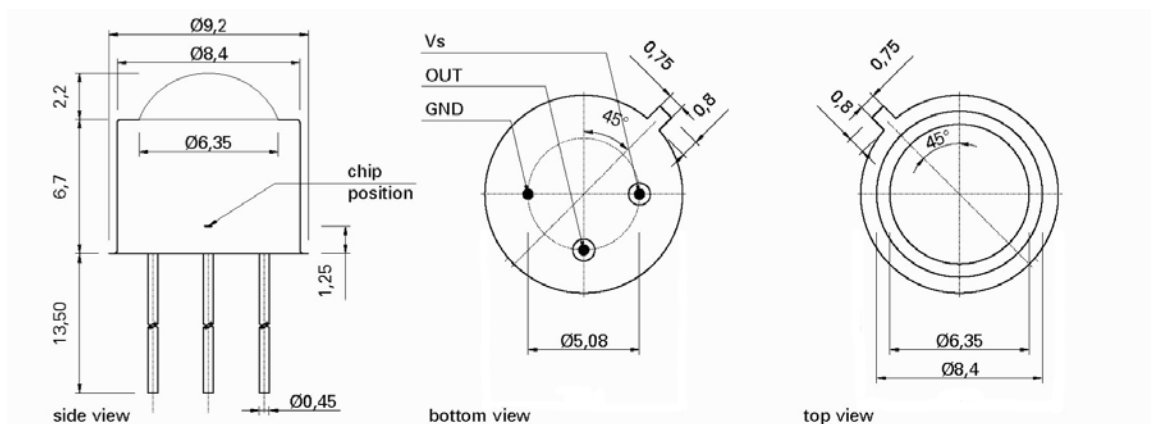


Measurement Setup:

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



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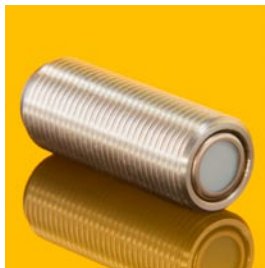
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## APPLICATION NOTE FOR TOCONS

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 5-Pin plug) with 2m connector cable
- Easy to mount and to connect



### 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 5-Pin plug)
- Cable available