

# TOCON\_Si7

Broadband Si based UV photodetector with integrated amplifier



### Properties of the TOCON\_Si7

- Broadband Si based UV photodetector in TO5 housing with diffusor
- 0...5 V voltage output
- peak wavelength at 626 nm
- max. radiation (saturation limit) at peak is 18 mW/cm<sup>2</sup>, minimum radiation (resolution limit) is 1,8 μW/cm<sup>2</sup>
- Applications: UV irradiation measurement

### What is a TOCON?

A TOCON is a 5 Volt powered photodetector with integrated amplifier converting visible light 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 glass window eliminates noise caused by parasitic resistance paths inside the package or EMI. A TOCON is a perfect solution for each industrial light sensing application starting from stray light detection at pW/cm<sup>2</sup> level up to sun light measurements 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 broadband sensors or with filters for selective measurement.

### NOMENCLATURE

TOCON_	ABC, A, B, C, blue, GaP or Si	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 = blue light</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 = UV + VIS</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>Si = VIS</b> λ <sub>max</sub> = 626 nm λ <sub>S10%</sub> = 290 nm ... 1010 nm	<b>7</b> = 1,8 μW/cm <sup>2</sup> ... 18 mW/cm <sup>2</sup>
	<b>E = UV-Index</b> spectral response according to CIE087	<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\_Si7

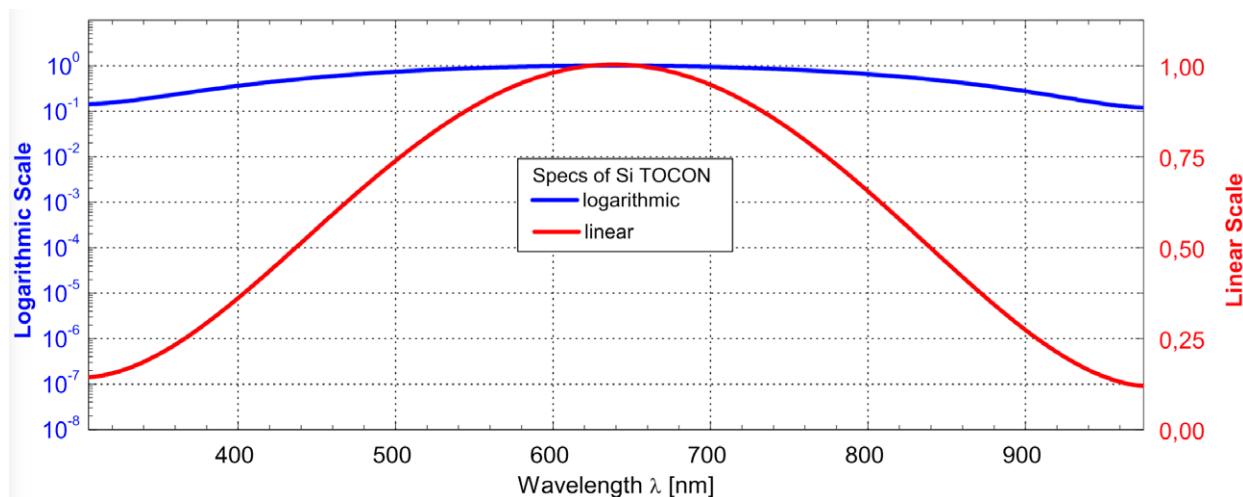
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## SPECIFICATIONS

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Parameter	Symbol	Value	Unit
<b>Spectral Characteristics</b>			
Typical Responsivity at Peak Wavelength	$S_{max}$	2,8E+02	V/W/cm <sup>2</sup>
Wavelength of max. Spectral Responsivity	$\lambda_{max}$	626	nm
Responsivity Range ( $S=0,1*S_{max}$ )	–	290 ... 1010	nm
<b>General Characteristics (T=25°C, V<sub>supply</sub>=+5 V)</b>			
Supply Voltage	$V_S$	2,5 ... 5	V
Saturation Voltage	$V_{Sat}$	$V_S - 5\%$	V
Dark Offset Voltage	$V_{Offset}$	50	μV
Temperature Coefficient at Peak	$T_c$	< -0,3	%/K
Current Consumption	I	150	μA
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	$t_{rise}$	0,073	s
<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

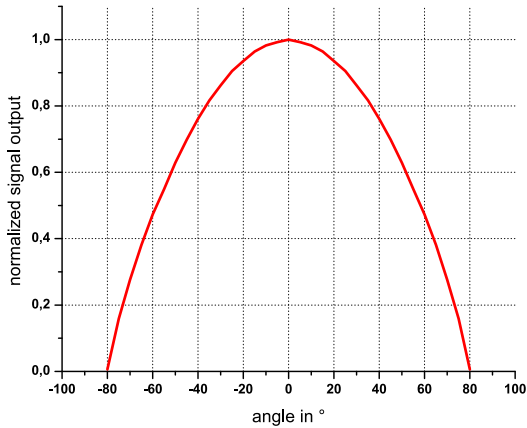


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## FIELD OF VIEW

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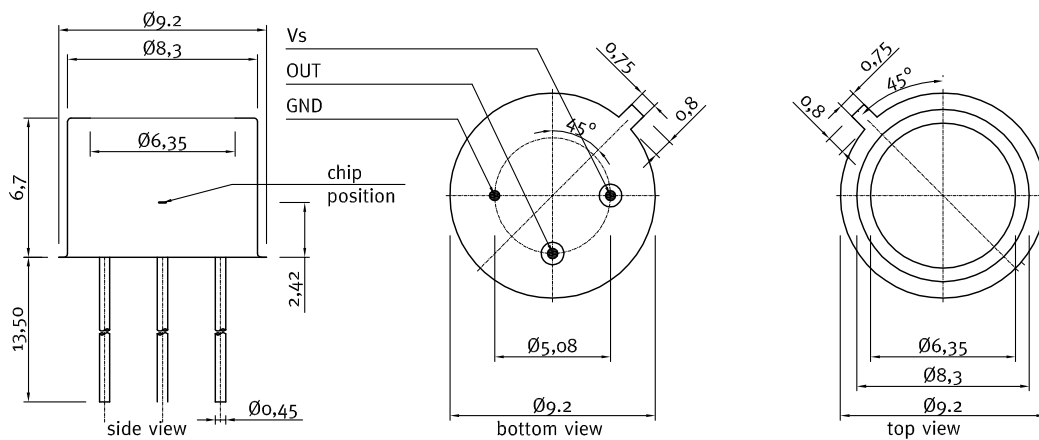


### Measurement Setup:

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



# TOCON\_Si7

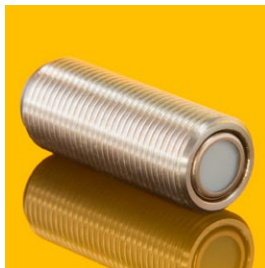
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## APPLICATION NOTE FOR TOCONs

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 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
- 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