TOCON_Si7

Broadband Si based UV photodetector with integrated amplifier

sglux
The UV Experts

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/cm², minimum radiation (resolution limit) is 1,8 µW/cm²
- 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_{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 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/cm² level up to sun light measurements at W/cm² 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
	Spectral response	**Irradiance limits (V_{supply}=5V, $\lambda = \lambda_{peak}$)**
	ABC = broadband λ_{max} = 290 nm $\lambda_{S10\%}$ = 227 nm ... 360 nm	**1** = 1,8 pW/cm² ... 18 nW/cm²
	A = UVA λ_{max} = 331 nm $\lambda_{S10\%}$ = 309 nm ... 367 nm	**2** = 18 pW/cm² ... 180 nW/cm²
	B = UVB λ_{max} = 280 nm $\lambda_{S10\%}$ = 243 nm ... 303 nm	**3** = 180 pW/cm² ... 1,8 µW/cm²
	C = UVC λ_{max} = 275 nm $\lambda_{S10\%}$ = 225 nm ... 287 nm	**4** = 1,8 nW/cm² ... 18 µW/cm²
	Blue = blue light λ_{max} = 445 nm $\lambda_{S10\%}$ = 390 nm ... 515 nm	**5** = 18 nW/cm² ... 180 µW/cm²
	GaP = UV + VIS λ_{max} = 445 nm $\lambda_{S10\%}$ = 190 nm ... 570 nm	**6** = 180 nW/cm² ... 1,8 mW/cm²
	Si = VIS λ_{max} = 626 nm $\lambda_{S10\%}$ = 290 nm ... 1010 nm	**7** = 1,8 µW/cm² ... 18 mW/cm²
		8 = 18 µW/cm² ... 180 mW/cm²
		9 = 180 µW/cm² ... 1,8 W/cm²
		10 = 1,8 mW/cm² ... 18 W/cm²
	E = UV-Index spectral response according to CIE087	**2** = 0 UVI ... 30 UVI

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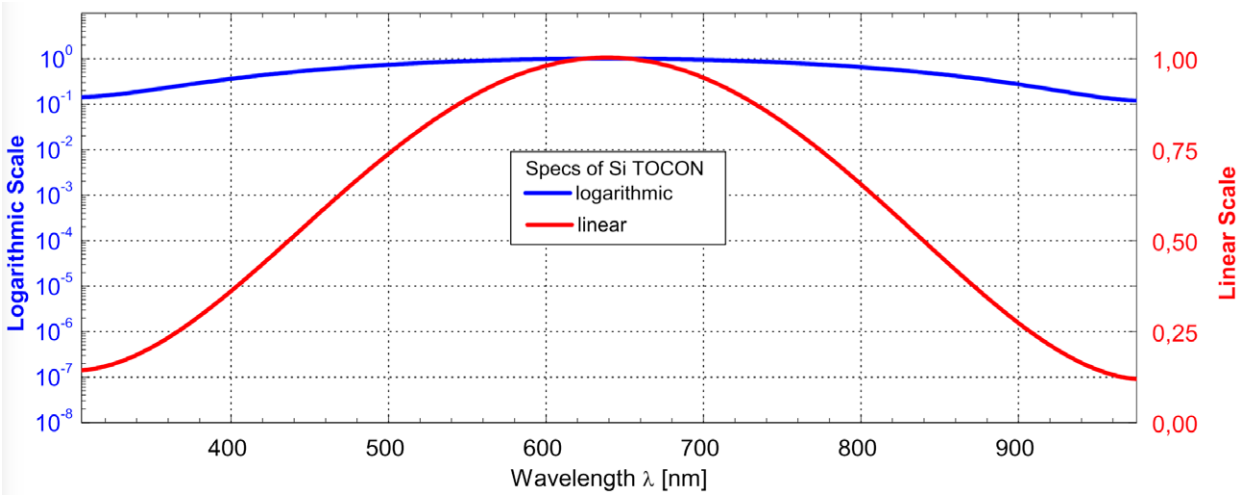
SPECIFICATIONS

Parameter	Symbol	Value	Unit
Spectral Characteristics			
Typical Responsivity at Peak Wavelength	S_{max}	2,8E+02	V/W/cm²
Wavelength of max. Spectral Responsivity	λ_{max}	626	nm
Responsivity Range (S=0,1*S_{max})	–	290 ... 1010	nm
General Characteristics (T=25°C, V_{supply}=+5 V)			
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
Maximum Ratings			
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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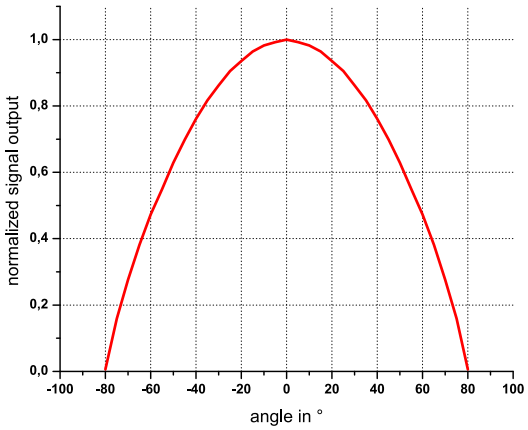
FIELD OF VIEW

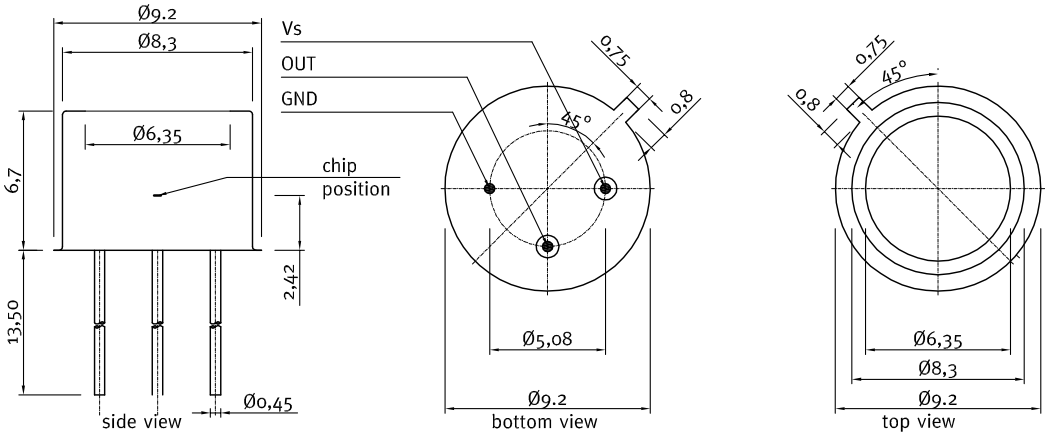


Measurement Setup:

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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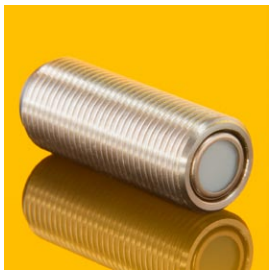
APPLICATION NOTE FOR TOCONs

The TOCONs need a supply voltage of V_{supply}=2,5 ... 5V_{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.

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