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TOCON_ABC1

Broadband SiC based UV photodetector with integrated amplifier

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/cm², minimum radiation (resolution limit) is 1,8 pW/cm²
- 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_{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 pW/cm² level up to UV curing lamp control 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 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
	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 ... 1,8 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 λ_{max} = 445 nm $\lambda_{S10\%}$ = 390 nm ... 515 nm	**5** = 18 nW/cm² ... 180 µW/cm²
	Gap λ_{max} = 445 nm $\lambda_{S10\%}$ = 190 nm ... 570 nm	**6** = 180 nW/cm² ... 1,8 mW/cm²
		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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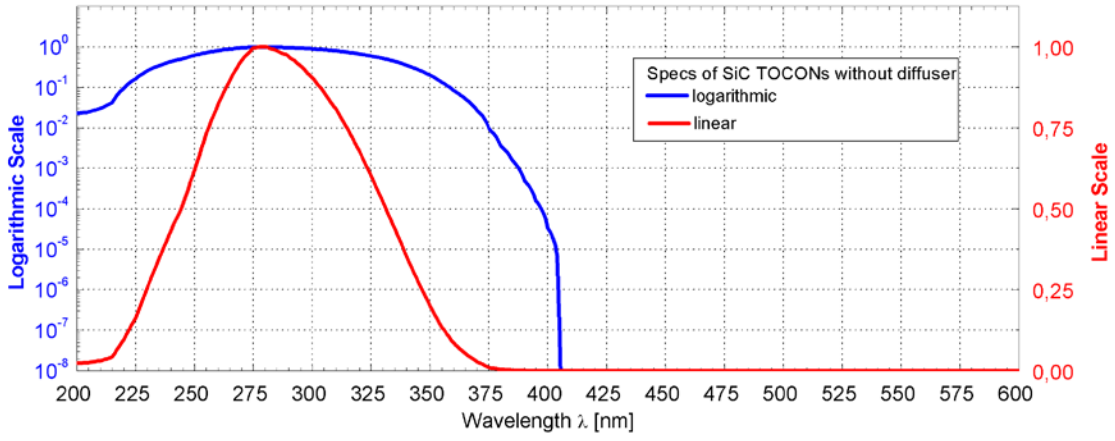
SPECIFICATIONS

Parameter	Symbol	Value	Unit
Spectral Characteristics			
Typical Responsivity at Peak Wavelength	S_{max}	280	mV/nW/cm²
Wavelength of max. Spectral Responsivity	λ_{max}	280	nm
Responsivity Range (S=0,1*S_{max})	–	221 ... 358	nm
Visible Blindness ($S_{max}/S_{>405nm}$)	VB	> 10^{10}	–
General Characteristics (T=25°C, V_{supply}=+5 V)			
Supply Voltage	V_{Supply}	2,5 ... 5	V
Saturation Voltage	V_{Sat}	V_{Supply} - 5%	V
Dark Offset Voltage	V_{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_{rise}	0,182	s
(other risetimes on request)			
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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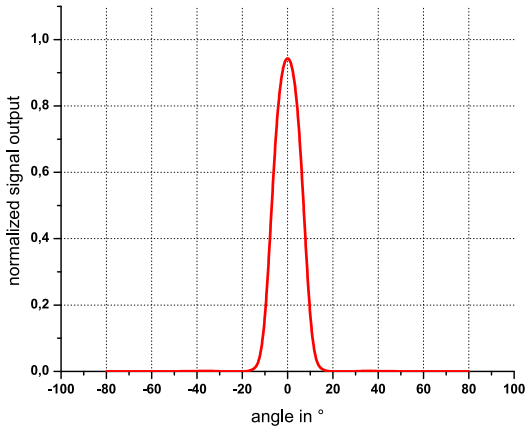
FIELD OF VIEW

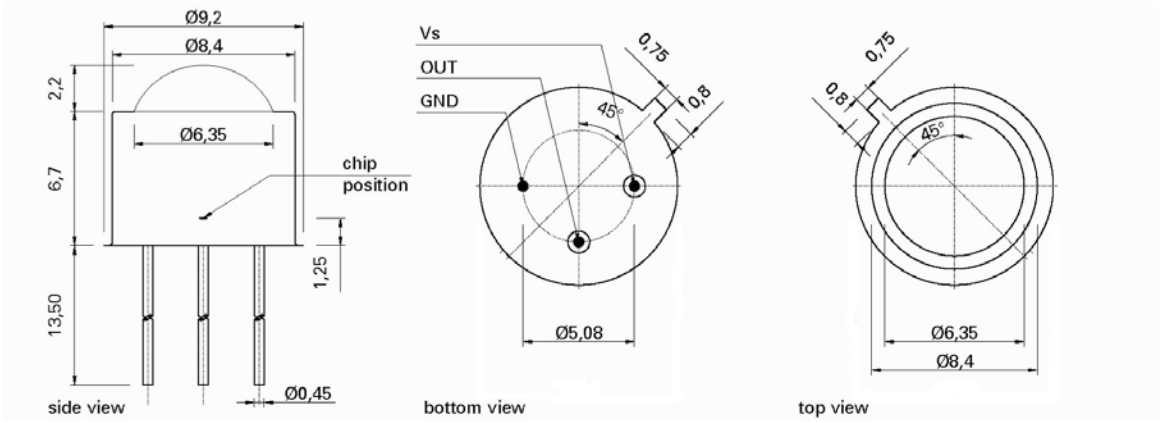


Measurement Setup:

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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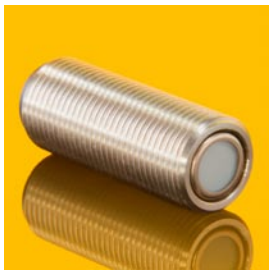
APPLICATION NOTE FOR TOCONs

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 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

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