

TOCON_E_inside

SiC based UV-Index photodetector with integrated amplifier
designed to work with customer's cosine correcting dome

GENERAL FEATURES



Properties of the TOCON_E_inside

- SiC based UV-Index photodetector in TO5 housing
- spectral response compliant to CIE087 / DIN5050
- **designed to work with customer's cosine correcting dome**
- 0...5 V voltage output
- 1 UVI results a voltage of approx. 0,5 V
- Applications: UV-Index measurement with very small error $\pm 3\%$

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.

Information about the UV-Index (UVI)

The UV-Index is an international standard measurement of how strong the ultraviolet (UV) radiation from the sun is at a particular place on a particular day. It is a scale primarily used in daily forecasts aimed at the general public. The UV-Index is calculated by integrating the sun's UV spectrum multiplied with the Erythema action curve (see spectral responsivity). That integral is divided by 25 mW/m^2 to generate a convenient index value, which becomes essentially a scale of 0 to 10. The Erythema action curve is a wavelength resolved measure of the sunburn danger. It is maximised at 297nm (UVB) and then strongly decreases towards UVA radiation.

Literature: A. F. McKinlay and B. L. Diffey, "A reference action spectrum for ultraviolet induced erythema in human skin" CIE Journal, 6-1, 17-22 (1987)

NOMENCLATURE

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

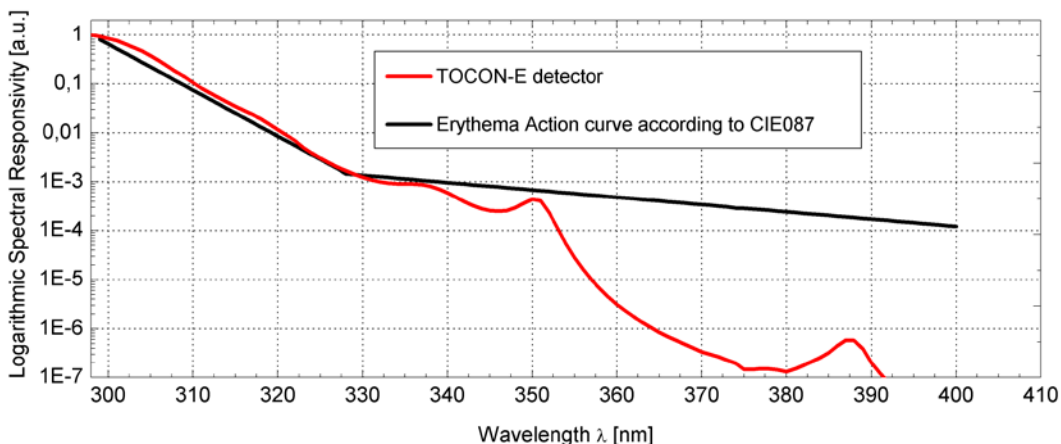
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SPECIFICATIONS

Parameter	Symbol	Value	Unit
Spectral Characteristics			
Approx. Sensitivity (<i>unit is not calibrated</i>)	S_{max}	0,5	V/UVI
Visible Blindness ($S_{max}/S_{>405nm}$)	VB	$> 10^{10}$	-
General Characteristics (T=25°C, $V_{supply}=+5V$)			
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	$< -0,3$	%/K
Current Consumption	I	150	μA
Bandwidth (-3 dB)	B	15	Hz
Risetime (10-90%)	t_{rise}	0,182	s
<i>(other risetimes on request)</i>			
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

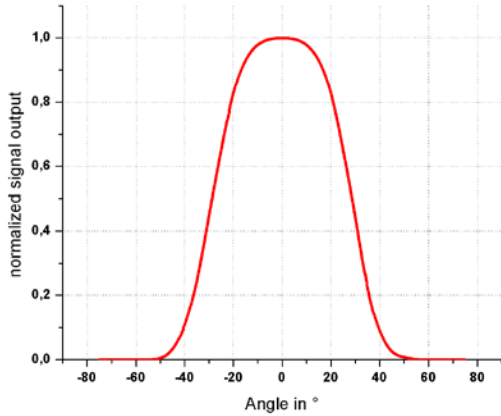


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FIELD OF VIEW

▶ 3/3



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

