

TOCON_Si7

v-lambda weighted Si based VIS photodetector with integrated amplifier
for lux measurement



Properties of the TOCON_Si7

- v-lambda weighted Si based VIS photodetector in TO5 housing with diffuser
- 0...5 V voltage output
- peak wavelength at 560 nm
- max. illuminance at peak is 80 klux,
minimum illuminance (resolution limit) is 80 lux
- Applications: daylight illuminance measurement

What is a TOCON?

A TOCON is a photodetector with integrated amplifier converting visible light into a voltage. 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. Modern electronic components and a hermetically sealed metal housing with glass window eliminate noise caused by parasitic paths inside the package and EMI. A TOCON is a perfect solution for each ambient light sensing application starting from stray light detection at mlux level up to sun light measurements at Mlux level. This ten orders of magnitude measurement range is covered by three different Si-TOCONs that differ by their sensitivity.

NOMENCLATURE

TOCON_	Si	1 ... 10
	Spectral response	Illuminance limits ($V_{supply}=5V, \lambda = \lambda_{max}$)
	Si = VIS $\lambda_{max} = 560 \text{ nm}$ $\lambda_{510\%} = 390 \text{ nm} \dots 800 \text{ nm}$	1 = 80 μlux ... 80 mlux
		7 = 80 lux ... 80 klux
		10 = 80 klux ... 80 Mlux

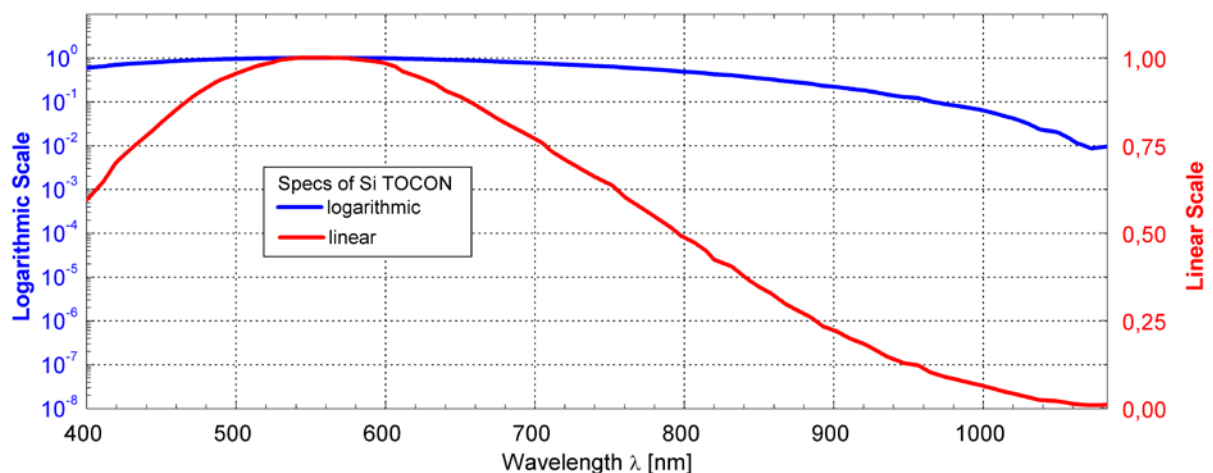
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▶ SPECIFICATIONS

Parameter	Symbol	Value	Unit
Spectral Characteristics			
Typical Responsivity at Peak Wavelength	S_{max}	62	mV/klux
Wavelength of max. Spectral Responsivity	λ_{max}	560	nm
Responsivity Range ($S=0.1 \cdot S_{max}$)	–	390 ... 800	
General Characteristics (T=25°C, V_{supply} =+5 V)			
Supply Voltage range	V_S	2.5 ... 5	V
Saturation Voltage	V_{Sat}	$V_S - 5\%$	V
Typical dark output voltage at 10 MOhm load	V_{Offset}	700	μ V
Temperature Coefficient at Peak	T_c	< +0.16	%/K
Typical Current Consumption	I	150	μ A
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
Maximum soldering temperature (for 3 seconds)	T_{sold}	300	°C

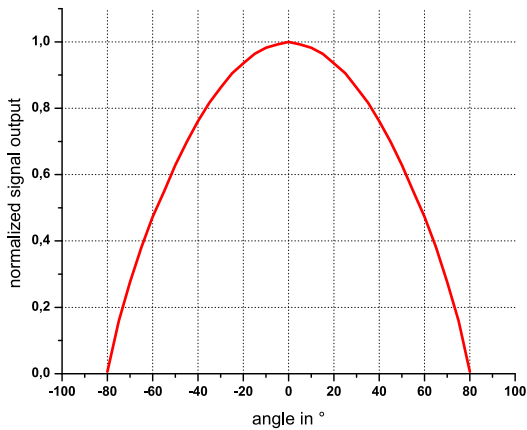
▶ NORMALIZED SPECTRAL RESPONSIVITY



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FIELD OF VIEW

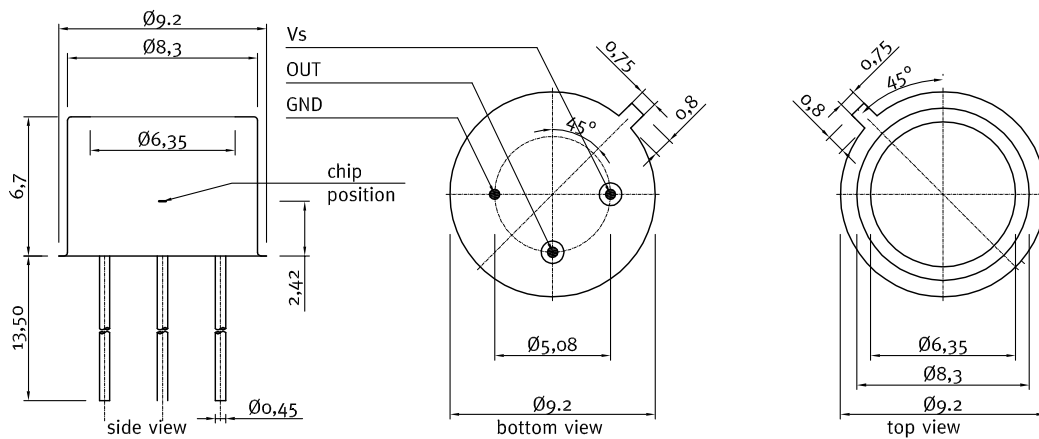


Measurement Setup:

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



TOCON_Si7

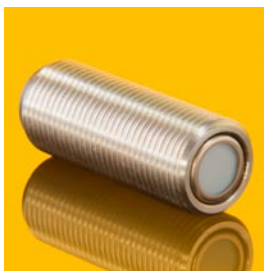
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APPLICATION NOTE FOR TOCONS

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.

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