

SG01XL-5

Broadband SiC based UV photodiode $A = 4,00 \text{ mm}^2$



General Features



Properties of the SG01XL-5 UV photodiode

- Broadband UVA+UVB+UVC photodiode
- Active Area $A = 4,00 \text{ mm}^2$
- TO5 hermetically sealed metal housing
- $1\mu\text{W}/\text{cm}^2$ peak radiation results a current of approx. 5nA

About the material Silicon Carbide (SiC)

SiC provides the unique property of extreme radiation hardness, near-perfect visible blindness, low dark current, high speed and low noise. These features make SiC the best available material for visible blind semiconductor UV detectors. The SiC detectors can be permanently operated at up to 170°C . The temperature coefficient of signal (responsivity) is also low, $<-0,1\%/K$. Because of the low noise (dark current, in the fA range), very low UV radiation intensities can be measured reliably. Please note that this device needs an appropriate amplifier (see circuit on following page). SiC photodiodes are available as unfiltered broadband devices or with optical filters providing UV-A, UV-B, or UV-C-only sensitivity, or erythemal action curve compliance.

Specifications

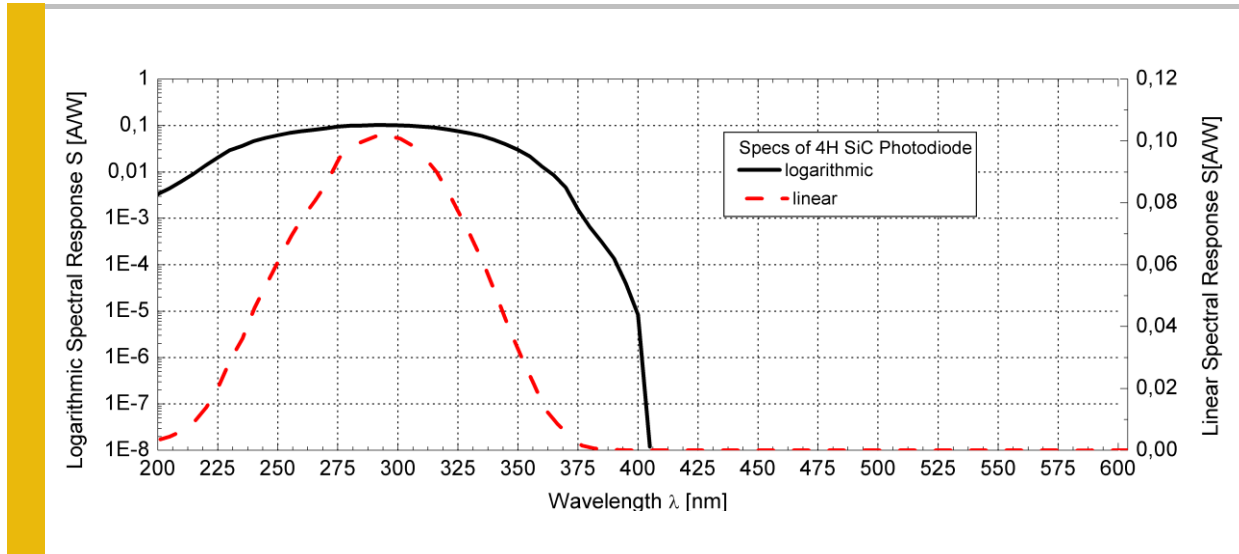
Parameter	Symbol	Value	Unit
Maximum Ratings			
Operating Temperature Range	T_{opt}	-55 ... +170	$^\circ\text{C}$
Storage Temperature Range	T_{stor}	-55 ... +170	$^\circ\text{C}$
Soldering Temperature (3s)	T_{sold}	260	$^\circ\text{C}$
Reverse voltage	V_{Rmax}	20	V
General Characteristics ($T=25^\circ\text{C}$)			
Active Area	A	4,00	mm^2
Dark current (1V reverse bias)	I_{d}	7	fA
Capacitance	C	1,5	nF
Short circuit ($1\mu\text{W}/\text{cm}^2$ at peak)	I_0	5	nA
Temperature coefficient	T_c	$<-0,1$	$\%/K$
Spectral Characteristics ($T=25^\circ\text{C}$)			
Max. spectral responsivity	S_{max}	0,100	AW^{-1}
Wavelength of max. spectral resp.	λ_{max}	300	nm
Responsivity range ($S=0,1 \cdot S_{\text{max}}$)	-	215 ... 365	nm
Visible blindness ($S_{\text{max}} / S_{>405\text{nm}}$)	VB	$>10^{10}$	-

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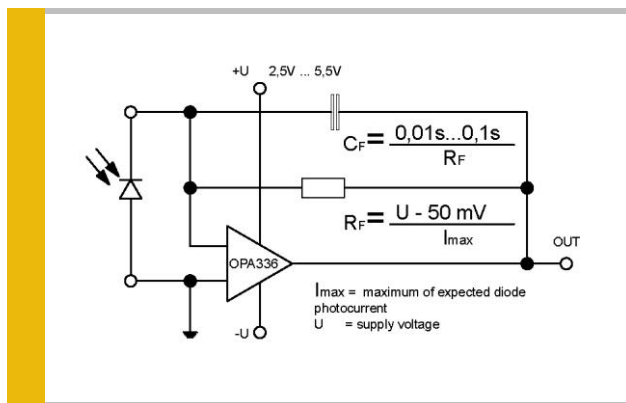
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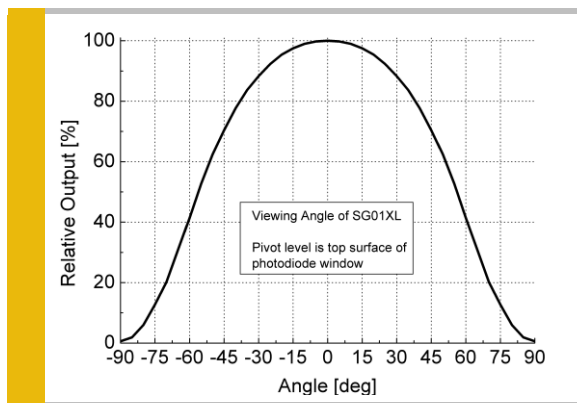
Spectral Response



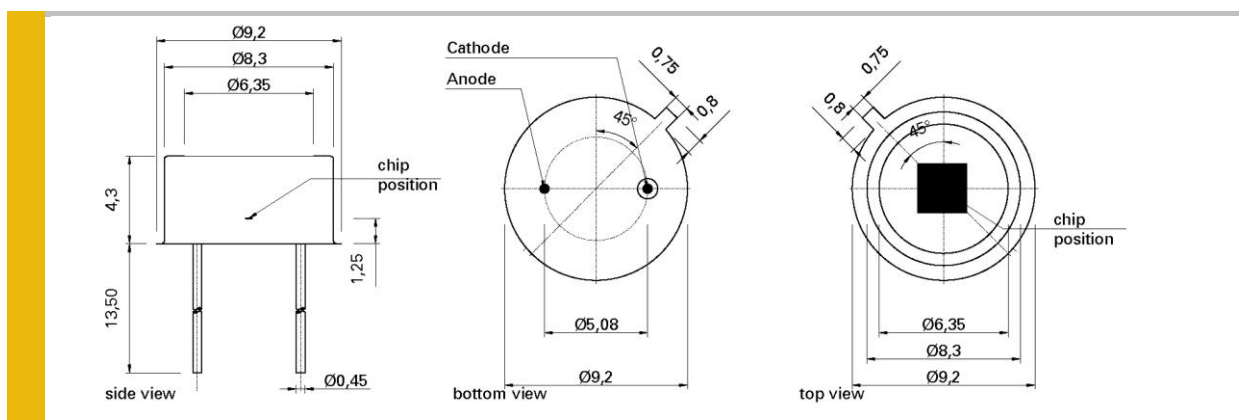
Circuit



Viewing Angle



Drawing



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Application Note for Photodiodes

For correct reading of the photodiode the current (and NOT the voltage) must be analyzed. This requires a short circuiting of the photodiode. Usual approaches are using a **Picoamperemeter** or a **transimpedance amplifier** circuit.

To make the photodiode running reliably, in particular in harsh environment, EMC compatibility and protection against dust, water and mechanical influences is needed. Below listed modules base on a SiC photodiode and guarantee this protection and safety.

TOCONs = UV Sensors with integrated amplifier



- SiC based UV hybrid detector with pre-amplifier (0-5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from $1,8 \text{ pW/cm}^2$ up to 18 W/cm^2
- UV broadband, UVA, UVB, UVC or Erythema measurements
- Upgrade to M12x1 housing with Hirschmann connector available

Industrial UV probes



- Different housings e.g. with cosine response, water pressure proof or Sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN, LAN)

Laboratory Equipment & Calibration



The below listed sglux products & services are helpful if you like to learn more about the UV radiation generated by your UV source:

- UV Radiometers for intensity check
- UV Dosimeters for dose control, e.g. curing applications
- UV Controllers to control lamps, valves etc.
- NIST and PTB traceable calibration for all sglux sensors