• Spectral sensitivity from 221 to 358 nm, peak wavelength 280 nm, different packaging, sorted by detector areas.
SG01D–5LENS
Concentrator lens SiC based UV photodiode $A_{\text{virtual}} = 27.5 \text{ mm}^2$

**GENERAL FEATURES**

**Properties of the SG01D–5LENS UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability, for flame detection
- Radiation sensitive area $A = 27.5 \text{ mm}^2$
- TO5 hermetically sealed metal housing with concentrator lens, 1 isolated pin and 1 case pin
- 10$\mu$W/cm$^2$ peak radiation results a current of approx. 350 nA

**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 (338°F). 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 typical circuit on page 3).

**Options**
SiC photodiodes are available with seven different active chip areas from 0.06 mm$^2$ up to 36 mm$^2$. Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5.5 mm diameter TO18 housing or a 9.2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

**NOMENCLATURE**

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>nothing = broadband</td>
<td>$\lambda_{\text{max}} = 280 \text{ nm}$, $\lambda_{\text{3%}} = 221 \text{ nm} ... 358 \text{ nm}$</td>
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</tr>
<tr>
<td>M</td>
<td>A = UVA</td>
<td>$\lambda_{\text{max}} = 331 \text{ nm}$, $\lambda_{\text{3%}} = 309 \text{ nm} ... 367 \text{ nm}$</td>
<td>$\lambda_{\text{max}} = 331 \text{ nm}$, $\lambda_{\text{3%}} = 309 \text{ nm} ... 367 \text{ nm}$</td>
</tr>
<tr>
<td>D</td>
<td>B = UVB</td>
<td>$\lambda_{\text{max}} = 280 \text{ nm}$, $\lambda_{\text{3%}} = 231 \text{ nm} ... 309 \text{ nm}$</td>
<td>$\lambda_{\text{max}} = 280 \text{ nm}$, $\lambda_{\text{3%}} = 231 \text{ nm} ... 309 \text{ nm}$</td>
</tr>
<tr>
<td>L</td>
<td>C = UVC</td>
<td>$\lambda_{\text{max}} = 275 \text{ nm}$, $\lambda_{\text{3%}} = 225 \text{ nm} ... 287 \text{ nm}$</td>
<td>$\lambda_{\text{max}} = 275 \text{ nm}$, $\lambda_{\text{3%}} = 225 \text{ nm} ... 287 \text{ nm}$</td>
</tr>
<tr>
<td>XL</td>
<td>E = UV-Index</td>
<td>spectral response according to CIE087</td>
<td>spectral response according to CIE087</td>
</tr>
</tbody>
</table>

| Lens with concentrating lens, TO5 only | MEGA with attenuator up to 0.5 W/cm$^2$ | GIGA with attenuator up to 7 W/cm$^2$ |

| nothing, A, B, C or E | 18, 18ISO90, 18S, 5, 5ISO90 | nothing, Lens, MEGA, GIGA |

Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
### SG01D–5LENS
Concentrator lens SiC based UV photodiode $A_{\text{virtual}} = 27.5 \text{ mm}^2$

#### SPECIFICATIONS

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<th>Unit</th>
</tr>
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<tr>
<td>Typical Responsivity at Peak Wavelength</td>
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<td>AW$^{-1}$</td>
</tr>
<tr>
<td>Wavelength of max. Spectral Responsivity</td>
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<td>nm</td>
</tr>
<tr>
<td>Responsivity Range ($S=0.1*S_{\text{max}}$)</td>
<td>–</td>
<td>221 ... 358</td>
<td>nm</td>
</tr>
<tr>
<td>Visible Blindness ($S_{\text{max}}/S_{\lambda&gt;405}$)</td>
<td>VB</td>
<td>$&gt;10^{10}$</td>
<td>–</td>
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</table>

#### General Characteristics (T=25°C)

<table>
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<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Sensitive Area (chip size = 0.50 mm$^2$)</td>
<td>$A$</td>
<td>27.5</td>
<td>mm$^2$</td>
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<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
<td>1.7</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>$C$</td>
<td>125</td>
<td>pF</td>
</tr>
<tr>
<td>Short Circuit (10µW/cm$^2$ at peak)</td>
<td>$I_o$</td>
<td>350</td>
<td>nA</td>
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<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>&lt; 0.1</td>
<td>%/K</td>
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#### Maximum Ratings

<table>
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<tr>
<th>Parameter</th>
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<th>Unit</th>
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<tr>
<td>Operating Temperature</td>
<td>$T_{\text{opt}}$</td>
<td>−55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
<td>−55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (3s)</td>
<td>$T_{\text{sold}}$</td>
<td>260</td>
<td>°C</td>
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<tr>
<td>Reverse Voltage</td>
<td>$V_{\text{Rmax}}$</td>
<td>20</td>
<td>V</td>
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</tbody>
</table>

#### NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity Graph]

Specs of 4H SiC Photodiode
- Blue: logarithmic
- Red: linear

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Rev. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**SG01D–5LENS**
Concentrator lens SiC based UV photodiode $A_{\text{virtual}} = 27.5 \text{ mm}^2$

**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 photodiode window

**TYPICAL CIRCUIT**

Calculations and Limits:
- $U_s = \frac{1}{R_i} \times I_r \times \frac{1}{C_1}$
- $U_{\text{lim}}$ depends on load and amplifier type
- $R_1 = 10 \Omega, C_1 = 3 \text{ pF}$
- Recommendation: $R_1 \times C_1 \geq 10 \text{ s}$
- $I_{\text{lim}} = U_{\text{lim}} \times R_1$

Bandwidth = DC ...

Example:
- $I_r = 20 \text{nA}, R_1 = 100 \text{k\Omega}, C_1 = 100 \text{ pF}$
- $U_s = 20 \times 10^{-9} \times 100 \times 10^{-12} = 2V$

**DRAWINGS**
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

TOCONS = UV sensors with integrated amplifier
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

Industrial UV probes
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01D–18
Broadband SiC based UV photodiode A = 0,50 mm²

GENERAL FEATURES

Properties of the SG01D–18 UV photodiode
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 0,50 mm²
- TO18 hermetically sealed metal housing, 1 isolated pin and 1 case pin
- 10µW/cm² peak radiation results a current of approx. 6,5 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

SG01

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
</table>
| S 0,06 mm² | nothing = broadband  
λ_max = 280 nm  
λ_30% = 221 nm ... 358 nm | 18 2-pin TO18 housing, h = 5,2 mm, 1 pin isolated, 1 pin grounded | nothing, Lens, MEGA, GIGA |
| M 0,20 mm² | A = UVA  
λ_max = 331 nm  
λ_30% = 309 nm ... 367 nm | 18S 3-pin TO18 housing, h = 5,2 mm, 2 pins isolated, 1 pin grounded | |
| D 0,50 mm² | B = UVB  
λ_max = 280 nm  
λ_30% = 231 nm ... 309 nm | 18ISO90 3-pin TO18 housing, h = 5,2 mm, 2 pins isolated, 1 pin grounded | |
| L 1,00 mm² | C = UVC  
λ_max = 275 nm  
λ_30% = 225 nm ... 287 nm | 18S 2-pin TO18 housing, h = 3,7 mm, 1 pin isolated, 1 pin grounded | |
| XL 7,60 mm² | E = UV-Index  
spectral response according to CIE087 | 18ISO90 3-pin TO18 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded | |

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Rev. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01D–18
Broadband SiC based UV photodiode A = 0,50 mm²

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral Characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Responsivity at Peak Wavelength</td>
<td>$S_{peak}$</td>
<td>0,130</td>
<td>AW⁻¹</td>
</tr>
<tr>
<td>Wavelength of max. Spectral Responsivity</td>
<td>$\lambda_{max}$</td>
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<td>nm</td>
</tr>
<tr>
<td>Responsivity Range ($S=0,1*S_{max}$)</td>
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</tr>
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<td>VB</td>
<td>$&gt;10^{10}$</td>
<td>–</td>
</tr>
<tr>
<td>General Characteristics (T=25°C)</td>
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<td></td>
</tr>
<tr>
<td>Active Area</td>
<td>A</td>
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<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
<td>1,7</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>125</td>
<td>pF</td>
</tr>
<tr>
<td>Short Circuit (10µW/cm² at peak)</td>
<td>$I_o$</td>
<td>6,5</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>$&lt;0,1$</td>
<td>%/K</td>
</tr>
<tr>
<td>Maximum Ratings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{opt}$</td>
<td>−55 ... +170</td>
<td>°C</td>
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<td>Reverse Voltage</td>
<td>$V_{R_{max}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity Graph]

Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01D–18
Broadband SiC based UV photodiode A = 0,50 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
\[ U_s = I_s \times R_s \sim 0 \sim V_a \]
\[ U_{v, \text{ref}} \text{ depends on load and amplifier type } \]
\[ R_s \sim 10k\Omega \sim 10G\Omega, \quad C_s \sim 3pF \]
Recommendation: \( R_s \times C_s \geq 10^3 \\text{s} \)
\[ I_{\text{meter}} = U_{\text{v,ref}} + R_s \]

Bandwidth = DC ...
\[ \frac{1}{2\pi \times R_s \times C_s} \]

Example:
\( I_s = 20\mu A, \quad R_s = 100\Omega, \quad C_s = 100 \text{ pF} \)
\[ U_s = 20 \times 10^{-6} \times 100 \times 10^{-12} \text{V} = 2V \]

DRAWINGS

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Rev. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

**TOCONs = UV sensors with integrated amplifier**
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

**Miniature housing with M12x1 thread for the TOCON series**
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

**Industrial UV probes**
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01F–5ISO90
Broadband SiC based UV photodiode $A = 1.82 \text{ mm}^2$

**GENERAL FEATURES**

**Properties of the SG01F–5ISO90 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area $A = 1.82 \text{ mm}^2$
- TO5 hermetically sealed metal housing, short cap, two isolated pins in a circle
- $1\mu W/cm^2$ peak radiation results a current of approx. $2.4 \text{ nA}$

**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 (338°F). 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 typical circuit on page 3).

**Options**
SiC photodiodes are available with seven different active chip areas from 0.06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5.5 mm diameter TO18 housing or a 9.2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

**NOMENCLATURE**

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<tr>
<td><strong>$M$</strong> 0.20 mm²</td>
<td>$\lambda_{\text{max}} = 331 \text{ nm}$</td>
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<tr>
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<td>$\lambda_{\text{max}} = 280 \text{ nm}$</td>
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<td></td>
</tr>
<tr>
<td><strong>$L$</strong> 1.00 mm²</td>
<td>$\lambda_{\text{max}} = 275 \text{ nm}$</td>
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</tr>
<tr>
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**Rev. 6.3** Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**SG01F–5ISO090**

Broadband SiC based UV photodiode $A = 1.82 \text{ mm}^2$

### SPECIFICATIONS

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<td>nm</td>
</tr>
<tr>
<td>Visible Blindness ($S_{\text{max}}/S_{&gt;405\text{nm}}$)</td>
<td>VB</td>
<td>$&gt;10^{10}$</td>
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<td><strong>General Characteristics ($T=25^\circ\text{C}$)</strong></td>
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<td>Active Area</td>
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<td>nA</td>
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<tr>
<td>Temperature Coefficient</td>
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<td><strong>Maximum Ratings</strong></td>
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<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
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<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>$T_{\text{sold}}$</td>
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<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{\text{Rmax}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

### NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity](chart)

Specs of 4H SiC Photodiode
- **logarithmic**
- **linear**

---

**Rev. 6.3** Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01F–5ISO90
Broadband SiC based UV photodiode $A = 1.82 \text{ mm}^2$

**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 photodiode window

**TYPICAL CIRCUIT**

Calculations and Limits:
- $U_s = \frac{1}{2} x R_i x C_i$  
- $U_{req}$ depends on load and amplifier type
- $R_i = 10 \Omega, C_i = 3 \text{ pF}$
- Recommendation: $R_i \cdot C_i \geq 10 \text{ s}$
- $I_{req} = \frac{U_{req}}{R_i}$
- Bandwidth = DC ...

Example:
- $I_i = 20 \text{nA}$, $R_i = 100 \text{ M\Omega}$, $C_i = 100 \text{ pF}$
- $U_s = 20 \times 10^8 \times A \times 100 \times 10^8 \mu \text{s} = 2V$

**DRAWINGS**

Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
TOCONs = UV sensors with integrated amplifier

- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1,8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

Industrial UV probes

- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

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 as shown on page 3.

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01L–5
Broadband SiC based UV photodiode A = 1,0 mm²

GENERAL FEATURES

Properties of the SG01L–5 UV photodiode
• Broadband UVA+UVB+UVC, PTB reported high chip stability
• Active Area A = 1,0 mm²
• TO5 hermetically sealed metal housing, short cap, 1 isolated pin and 1 case pin
• 10µW/cm² peak radiation results a current of approx. 13 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

SG01

Chip area  | Spectral response  | Housing  | Special
--- | --- | --- | ---
nothing, A, B, C or E  | nothing = broadband  | 18, 18ISO90, 18S, 5, 5ISO90  | nothing, Lens, MEGA, GIGA
S 0,06 mm²  | λ_{max} = 280 nm  | 1 pin isolated, 1 pin grounded  | Lens with concentrating lens, TO5 only
M 0,20 mm²  | λ_{max} = 331 nm  | 2 pin isolated, 1 pin grounded  | MEGA with attenuator up to 0,5 W/cm²
D 0,50 mm²  | λ_{max} = 280 nm  | 1 pin isolated, 1 pin grounded  | GIGA with attenuator up to 7 W/cm²
L 1,00 mm²  | λ_{max} = 275 nm  | 2 pin isolated, 1 pin grounded  | 5 pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI
XL 7,60 mm²  | λ_{max} = 225 nm  | 2 pin isolated, 1 pin grounded  | 5ISO90 3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded

REV. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**SG01L–5**

Broadband SiC based UV photodiode \( A = 1,0 \text{ mm}^2 \)

**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spectral Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Responsivity at Peak Wavelength</td>
<td>( S_{\text{max}} )</td>
<td>0,130</td>
<td>AW(^{-1})</td>
</tr>
<tr>
<td>Wavelength of max. Spectral Responsivity</td>
<td>( \lambda_{\text{max}} )</td>
<td>280</td>
<td>nm</td>
</tr>
<tr>
<td>Responsivity Range ((S=0,1*S_{\text{max}}))</td>
<td>–</td>
<td>221 ... 358</td>
<td>nm</td>
</tr>
<tr>
<td>Visible Blindness ((S_{\text{max}}/S_{\text{&gt;405nm}}))</td>
<td>VB</td>
<td>&gt; 10(^{10})</td>
<td>–</td>
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<tr>
<td><strong>General Characteristics ((T=25^\circ\text{C}))</strong></td>
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</tr>
<tr>
<td>Active Area</td>
<td>( A )</td>
<td>1,0</td>
<td>mm(^2)</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>( I_d )</td>
<td>3,3</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>( C )</td>
<td>250</td>
<td>pF</td>
</tr>
<tr>
<td>Short Circuit ((10\mu\text{W/cm}^2 \text{ at peak}))</td>
<td>( I_o )</td>
<td>13</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>( T_c )</td>
<td>&lt; 0,1</td>
<td>%/K</td>
</tr>
<tr>
<td><strong>Maximum Ratings</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>( T_{\text{opt}} )</td>
<td>–55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{\text{stor}} )</td>
<td>–55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (3s)</td>
<td>( T_{\text{sold}} )</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>( V_{\text{Rmax}} )</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

**NORMALIZED SPECTRAL RESPONSIVITY**

![Normalized Spectral Responsivity](image)

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Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01L–5
Broadband SiC based UV photodiode $A = 1.0 \text{ mm}^2$

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
- $U_v = I x R_1 \Rightarrow 0 \ldots \Rightarrow V_x$
- $U_{x_{\text{max}}}$ depends on load and amplifier type
- $R_1 \approx 10 \text{k}\Omega \ldots \approx 10 G\Omega$, $C \approx 30 \text{ pF}$
- Recommendation: $R_1 \times C \approx 10^{-3}$ s
- $I_{x_{\text{max}}} = U_{x_{\text{max}}} \div R_1$
- Bandwidth = DC ...

Example:
- $I_1 = 20 \text{nA}$, $R_1 = 100 \text{ M\Omega}$, $C_1 = 100 \text{ pF}$
- $U_x = 20 \times 10^{-3} \text{A} \times 100 \times 10^{-12} \text{V} = 2 \text{V}$

DRAWINGS
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

TOCONs = UV sensors with integrated amplifier

- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series

- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

Industrial UV probes

- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity

Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01L–5ISO90
Broadband SiC based UV photodiode A = 1,00 mm²

**GENERAL FEATURES**

**Properties of the SG01L–5ISO90 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 1,00 mm²
- TO5 hermetically sealed metal housing, short cap, two isolated pins in a circle
- 10μW/cm² peak radiation results a current of approx. 13 nA

**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 (338°F). 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 typical circuit on page 3).

**Options**
SiC photodiodes are available with seven different active chip areas from 0.06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5.5 mm diameter TO18 housing or a 9.2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

**NOMENCLATURE**

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 0.06 mm²</td>
<td>nothing = broadband</td>
<td>18 2-pin TO18 housing, h = 5.2 mm, 1 pin isolated, 1 pin grounded</td>
<td>nothing, Lens, MEGA, GIGA</td>
</tr>
<tr>
<td>M 0.20 mm²</td>
<td>A = UVA</td>
<td>18ISO90 3-pin TO18 housing, h = 5.2 mm, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>D 0.50 mm²</td>
<td>B = UVB</td>
<td>18S 2-pin TO18 housing, h = 3.7 mm, 1 pin isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>L 1.00 mm²</td>
<td>C = UVC</td>
<td>5 2-pin TO5 housing, h = 4.3 mm for broadband; h = 6.7 mm for filtered UVA, UVB, UVC, UVI</td>
<td></td>
</tr>
<tr>
<td>XL 7.60 mm²</td>
<td>E = UV-Index spectral response according to CIE087</td>
<td>5ISO90 3-pin TO5 housing, h = 4.2 mm, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
</tbody>
</table>

---

**Rev. 6.3** Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01L–5ISO90
Broadband SiC based UV photodiode A = 1,00 mm²

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spectral Characteristics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Responsivity at Peak Wavelength</td>
<td>$S_{\text{max}}$</td>
<td>0,130</td>
<td>AW⁻¹</td>
</tr>
<tr>
<td>Wavelength of max. Spectral Responsivity</td>
<td>$\lambda_{\text{max}}$</td>
<td>280</td>
<td>nm</td>
</tr>
<tr>
<td>Responsivity Range (S=0,1*S$_{\text{max}}$)</td>
<td>–</td>
<td>221 ... 358</td>
<td>nm</td>
</tr>
<tr>
<td>Visible Blindness (S$<em>{\text{max}}$/S$</em>{\lambda &gt; 405\text{nm}}$)</td>
<td>VB</td>
<td>$&gt; 10^{10}$</td>
<td>–</td>
</tr>
<tr>
<td>General Characteristics (T=25°C)</td>
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<td></td>
</tr>
<tr>
<td>Active Area</td>
<td>A</td>
<td>1,00</td>
<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
<td>3,3</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>250</td>
<td>pF</td>
</tr>
<tr>
<td>Short Circuit (10µW/cm² at peak)</td>
<td>$I_o$</td>
<td>13</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>$&lt; 0,1$</td>
<td>%/K</td>
</tr>
<tr>
<td>Maximum Ratings</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{\text{opt}}$</td>
<td>$-55 ... +170$</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
<td>$-55 ... +170$</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>$T_{\text{sold}}$</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{R_{\text{max}}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

NORMAlIZED SPECTRAL RESPONSIVITY

Specs of 4H SiC Photodiode
- logarithmic
- linear

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SG01L–5|SO90
Broadband SiC based UV photodiode A = 1.00 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:

\[ U_x = I_x R_x \Rightarrow V_x \]

\[ U_{ixx} \text{ depends on load and amplifier type} \]

\[ R_x = 10k\Omega \Rightarrow 10k\Omega, \ C_x = 3pF \]

Recommendation: \( R_x \times C_x \geq 10^{-5}s \)

\[ L_{ixx} = U_{ixx} \div R_x \]

Bandwidth = DC \[ \frac{1}{2\pi \times R_x \times C_x} \]

Example:

\[ I_x = 20mA, \ R_x = 100\Omega, \ C_x = 100 \text{ pF} \]

\[ U_x = 20 \times 10^{-3} \times 100 \times 10^{-5} = 2\text{V} \]

DRAWINGS

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Rev. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

TOCONs = UV sensors with integrated amplifier
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

Industrial UV probes
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE
- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
Properties of the SG01D–5LENS UV photodiode

- Broadband UVA+UVB+UVC, PTB reported high chip stability, for flame detection
- Radiation sensitive area $A = 55 \, \text{mm}^2$
- TO5 hermetically sealed metal housing with concentrator lens, 1 isolated pin and 1 case pin
- 10µW/cm² peak radiation results a current of approx. 700 nA

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 (338°F). The temperature coefficient of signal (responsivity) is also low, $<0.1\%/\text{K}$. 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 typical circuit on page 3).

Options

SiC photodiodes are available with seven different active chip areas from 0.06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).
SG01L–5LENS
Concentrator lens SiC based UV photodiode $A_{virtual} = 55 \, \text{mm}^2$

SPECIFICATIONS

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<th>Symbol</th>
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<td>$&gt; 10^{10}$</td>
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<tr>
<td>**General Characteristics ($T=25^\circ\text{C}$)</td>
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<tr>
<td>Sensitive Area (chip size = 1.0 mm$^2$)</td>
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<td>55</td>
<td>mm$^2$</td>
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<td>fA</td>
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<td>Capacitance</td>
<td>C</td>
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<td>pF</td>
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<tr>
<td>Short Circuit (10µW/cm$^2$ at peak)</td>
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<td>nA</td>
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<td>Temperature Coefficient</td>
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<td>%/K</td>
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<td><strong>Maximum Ratings</strong></td>
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<tr>
<td>Operating Temperature</td>
<td>$T_{opt}$</td>
<td>$-55 \ldots +170$</td>
<td>°C</td>
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<td>Storage Temperature</td>
<td>$T_{stor}$</td>
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<td>Soldering Temperature (3s)</td>
<td>$T_{sold}$</td>
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<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{Rmax}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

NORMALIZED SPECTRAL RESPONSIVITY

Rev. 6.0 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.

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**SG01L–5LENS**

Concentrator lens SiC based UV photodiode $A_{virtual} = 55 \text{ mm}^2$

### 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 photodiode window

### TYPICAL CIRCUIT

- Calculations and Limits:
  - $U_s = I x R_s \Rightarrow 0 \Rightarrow V_x$
  - $U_{ref}$ depends on load and amplifier type
  - $R_s = 10k\Omega \Rightarrow 10G\Omega, C \approx 3pF$
  - Recommendation: $R_s \times C \geq 10^{-2}$
  - $I_{ref} = U_{ref} \div R_f$
  - Bandwidth = DC ...
  - $\frac{1}{2\pi \times R_f \times C_f}$

Example:
- $I_s = 20nA, R_s = 100M\Omega, C_f = 100 \mu F$
- $U_s = 20 \times 10^5 \times 100 \times 10^5 \Rightarrow 2V$

### DRAWINGS

- [Diagram of Photodiode Dimensions and Views]
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 as shown on page 3.

UGRADE TO A TOCON OR A PROBE

**TOCONs = UV sensors with integrated amplifier**
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

**Miniature housing with M12x1 thread for the TOCON series**
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

**Industrial UV probes**
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity

**SG01L–5LENS**

Concentrator lens SiC based UV photodiode $A_{\text{virtual}} = 55 \text{ mm}^2$
SG01L–18
Broadband SiC based UV photodiode A = 1,00 mm²

GENERAL FEATURES

**Properties of the SG01L–18 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 1,00 mm²
- TO18 hermetically sealed metal housing, 1 isolated pin and 1 case pin
- 100µW/cm² peak radiation results a current of approx. 1 nA

**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 (338°F). 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 typical circuit on page 3).

**Options**
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

**NOMENCLATURE**

<table>
<thead>
<tr>
<th>(S), (M), (D), (L), (XL)</th>
<th>nothing, A, B, C or E</th>
<th>(S), (SISO90), (S5), (SISO90)</th>
<th>nothing, Lens, MEGA, GIGA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip area</td>
<td>Spectral response</td>
<td>Housing</td>
<td>Special</td>
</tr>
<tr>
<td>(S)</td>
<td>nothing = broadband</td>
<td>(S) 2-pin TO18 housing, h = 5,2 mm, 1 pin isolated, 1 pin grounded</td>
<td>Lens with concentrating lens, TO5 only</td>
</tr>
<tr>
<td>(S)</td>
<td>(\lambda_{\text{max}} = 280) nm (\lambda_{S10%} = 221) nm ... 358 nm</td>
<td>(SISO90) 3-pin TO18 housing, h = 5,2 mm, 2 pins isolated, 1 pin grounded</td>
<td>MEGA with attenuator up to 0,5 W/cm²</td>
</tr>
<tr>
<td>(S)</td>
<td>(\lambda_{\text{max}} = 331) nm (\lambda_{S10%} = 309) nm ... 367 nm</td>
<td>(S5) 2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
<td>GIGA with attenuator up to 7 W/cm²</td>
</tr>
</tbody>
</table>

**SG01**

- \(S\), \(M\), \(D\), \(L\), \(XL\) nothing, A, B, C or E
- \(S\), \(SISO90\), \(S5\), \(SISO90\) nothing, Lens, MEGA, GIGA
SG01L–18
Broadband SiC based UV photodiode A = 1,0 mm²

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spectral Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Responsivity at Peak Wavelength</td>
<td>$S_{\text{max}}$</td>
<td>0,130</td>
<td>AW$^{-1}$</td>
</tr>
<tr>
<td>Wavelength of max. Spectral Responsivity</td>
<td>$\lambda_{\text{max}}$</td>
<td>280</td>
<td>nm</td>
</tr>
<tr>
<td>Responsivity Range ($S=0,1*S_{\text{max}}$)</td>
<td>–</td>
<td>221 ... 358</td>
<td>nm</td>
</tr>
<tr>
<td>Visible Blindness ($S_{\text{max}}/S_{&gt;405nm}$)</td>
<td>VB</td>
<td>$&gt; 10^{10}$</td>
<td>–</td>
</tr>
<tr>
<td><strong>General Characteristics (T=25°C)</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Active Area</td>
<td>A</td>
<td>1,00</td>
<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
<td>3,3</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>250</td>
<td>pF</td>
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<tr>
<td>Short Circuit (10µW/cm² at peak)</td>
<td>$I_o$</td>
<td>13</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>&lt; 0,1</td>
<td>%/K</td>
</tr>
<tr>
<td><strong>Maximum Ratings</strong></td>
<td></td>
<td></td>
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<tr>
<td>Operating Temperature</td>
<td>$T_{\text{opt}}$</td>
<td>-55 ... +170</td>
<td>°C</td>
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<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
<td>-55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>$T_{\text{Sold}}$</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{R_{\text{max}}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

NORMALIZED SPECTRAL RESPONSIVITY

---

Rev. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01L–18
Broadband SiC based UV photodiode $A = 1.0 \text{ mm}^2$

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
- $U_i = \frac{1}{2} R \cdot R_i \cdot \sin \theta \approx V_x$
- $U_{\text{sigma}}$ depends on load and amplifier type
- $R_i = 10 \Omega \ldots 10 \text{ M}\Omega$, $C_i = 3 \text{ pF}$
- Recommendation: $R_i \cdot C_i \geq 10^2 \text{s}$
- Bandwidth = DC ... $\frac{1}{2 \pi \cdot R_i \cdot C_i}$
- Example:
  - $I_i = 20 \text{nA}$, $R_i = 100 \text{M}\Omega$, $C_i = 100 \text{ pF}$
  - $U_i = 20 \times 10^3 \text{A} \times 100 \times 10^6 \text{s} = 2 \text{V}$

DRAWINGS

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Rev. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
TOCONs = UV sensors with integrated amplifier
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

Industrial UV probes
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

CALIBRATION SERVICE
- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01L–18ISO90
Broadband SiC based UV photodiode A = 1,0 mm²

GENERAL FEATURES

Properties of the SG01L–18ISO90 UV photodiode
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 1,0 mm²
- TO18 hermetically sealed metal housing, two isolated pins in a circle
- 10µW/cm² peak radiation results a current of approx. 13 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S = 0,06 mm²</td>
<td>nothing = broadband</td>
<td>2-pin TO18 housing, h = 5,2 mm, 1 pin isolated, 1 pin grounded</td>
<td>nothing, Lens, MEGA, GIGA</td>
</tr>
<tr>
<td>M = 0,20 mm²</td>
<td>A = UVA</td>
<td>3-pin TO18 housing, h = 5,2 mm, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>D = 0,50 mm²</td>
<td>B = UVB</td>
<td>2-pin TO18 housing, h = 3,7 mm, 1 pin isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>L = 1,00 mm²</td>
<td>C = UVC</td>
<td>2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
<td></td>
</tr>
<tr>
<td>XL = 7,60 mm²</td>
<td>E = UV-Index</td>
<td>3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
</tbody>
</table>

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Rev. 6.4 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
## SG01L–18ISO90

Broadband SiC based UV photodiode $A = 1.0 \text{ mm}^2$

### SPECIFICATIONS

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<th>Parameter</th>
<th>Symbol</th>
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<td>nm</td>
</tr>
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<td>Responsivity Range ($S=0.1*S_{\text{max}}$)</td>
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<td>221 ... 358</td>
<td>nm</td>
</tr>
<tr>
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<td>–</td>
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<tr>
<td><strong>General Characteristics (T=25°C)</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Active Area</td>
<td>A</td>
<td>1.0</td>
<td>mm$^2$</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
<td>3.3</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
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<td>pF</td>
</tr>
<tr>
<td>Short Circuit (10µW/cm$^2$ at peak)</td>
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<td>nA</td>
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<tr>
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<td><strong>Maximum Ratings</strong></td>
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<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
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<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>$T_{\text{sold}}$</td>
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<tr>
<td>Reverse Voltage</td>
<td>$V_{R_{\text{max}}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

### NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity](image)

Specs of 4H SiC Photodiode
- logarithmic
- linear

Rev. 6.4  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**SG01L–18ISO90**

Broadband SiC based UV photodiode $A = 1.0 \text{ mm}^2$

**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 photodiode window

**TYPICAL CIRCUIT**

Calculations and Limits:
- $U_o = \frac{1}{2} \times R_1 \times V_o$
- $U_{bias}$ depends on load and amplifier type
- $R_1 = 10 \times C_2 \times 3 \text{ pF}$
- Recommendation: $R_1 \times C_2 \geq 10 \times \mu\text{s}$
- $I_{bias} = U_{bias} + R_1$
- Bandwidth = DC ...

Example:
- $I_0 = 20 \times A$, $R_1 = 100 \text{ M} \Omega$, $C_2 = 100 \text{ pF}$
- $U_o = 20 \times 10^5 \times 100 \times 10^{-12} = 2V$

**DRAWINGS**
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

**TOCONs = UV sensors with integrated amplifier**
- SiC based UV hybrid detector with amplifier (0–5 V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

**Miniature housing with M12x1 thread for the TOCON series**
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

**Industrial UV probes**
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity

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SG01L–18S
Broadband SiC based UV photodiode A = 1,0 mm²

GENERAL FEATURES

Properties of the SG01L–18S UV photodiode
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 1,0 mm²
- TO18 hermetically sealed metal housing, short cap, 1 isolated pin and 1 case pin
- 10µW/cm² peak radiation results a current of approx. 13 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 7,60 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 0,06 mm²</td>
<td>nothing = broadband</td>
<td>18 2-pin TO18 housing, h = 5,2 mm, 1 pin isolated, 1 pin grounded</td>
<td>nothing, Lens, MEGA, GIGA</td>
</tr>
<tr>
<td>M 0,20 mm²</td>
<td>A = UVA ( \lambda_{\text{max}} = 331 \text{ nm} ) ( \lambda_{\text{S10%}} = 309 \text{ nm} ... 367 \text{ nm} )</td>
<td>18S 3-pin TO18 housing, h = 7 mm, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>D 0,50 mm²</td>
<td>B = UVB ( \lambda_{\text{max}} = 280 \text{ nm} ) ( \lambda_{\text{S10%}} = 231 \text{ nm} ... 309 \text{ nm} )</td>
<td>18S090 2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
<td></td>
</tr>
<tr>
<td>L 1,00 mm²</td>
<td>C = UVC ( \lambda_{\text{max}} = 275 \text{ nm} ) ( \lambda_{\text{S10%}} = 225 \text{ nm} ... 287 \text{ nm} )</td>
<td>5 2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
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<tr>
<td>XL 7,60 mm²</td>
<td>E = UV-Index spectral response according to CIE087</td>
<td>5ISO90 3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded</td>
<td></td>
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</table>

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Rev. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01L–18S
Broadband SiC based UV photodiode A = 1.0 mm²

SPECIFICATIONS

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<td>nm</td>
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<td>nm</td>
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<td>Visible Blindness $(S_{max}/S_{\lambda=405nm})$</td>
<td>VB</td>
<td>$&gt;10^{10}$</td>
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</table>

General Characteristics (T=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
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<tbody>
<tr>
<td>Active Area</td>
<td>A</td>
<td>1.0</td>
<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>Id</td>
<td>3.3</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>250</td>
<td>pF</td>
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<td>Short Circuit (10µW/cm² at peak)</td>
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<td>13</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>&lt; 0.1</td>
<td>%/K</td>
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</tbody>
</table>

Maximum Ratings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
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<td>°C</td>
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<tr>
<td>Storage Temperature</td>
<td>$T_{stor}$</td>
<td>-55 ... 170</td>
<td>°C</td>
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<tr>
<td>Soldering Temperature (35)</td>
<td>$T_{sold}$</td>
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<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{Rmax}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

NORMALIZED SPECTRAL RESPONSIVITY

Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01L–18S
Broadband SiC based UV photodiode A = 1.0 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
\[ U_o = \frac{1}{2} \cdot R \cdot L \cdot C \]
\[ U_{max} \text{ depends on load and amplifier type} \]
\[ R = 10 \Omega \quad L = 100 \mu A, C = 3 \mu F \]
Recommendation: \( R \cdot C \geq 10 \times 10^{-6} \text{s} \)
\[ I_{max} = U_{max} + \frac{1}{R} \]
Bandwidth = DC ...

Example:
\[ I = 2 \times 10 \mu A, R = 100 \Omega, C = 100 \mu F \]
\[ U = 2 \times 10^{-6} \times 100 \times 10^{-6} = 2 V \]

DRAWINGS

chip position ± 50µm

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Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01L–18S
Broadband SiC based UV photodiode A = 1.0 mm²

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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

TOCONS = UV sensors with integrated amplifier
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
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- Easy to mount and connect

Industrial UV probes
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01M–5LENS
Concentrator lens SiC based UV photodiode $A_{\text{virtual}} = 11,0 \text{ mm}^2$

GENERAL FEATURES

Properties of the SG01M–5LENS UV photodiode
- Broadband UV-A+UV-B+UVC, PTB reported high chip stability, for very weak radiation
- Radiation sensitive area $A = 11,0 \text{ mm}^2$
- TO5 hermetically sealed metal housing with concentrator lens, 1 isolated pin and 1 case pin
- 10µW/cm² peak radiation results a current of approx. 140 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UV-A-UV-B-UV-C. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

<table>
<thead>
<tr>
<th>S</th>
<th>nothing, A, B, C or E</th>
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<tbody>
<tr>
<td>M</td>
<td>Spectral response</td>
</tr>
<tr>
<td>D</td>
<td>nothing = broadband</td>
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<tr>
<td>L</td>
<td>$\lambda_{\text{max}} = 280 \text{ nm}$  $\lambda_{\text{5%}} = 221 \text{ nm} ... 358 \text{ nm}$</td>
</tr>
<tr>
<td>XL</td>
<td>$\lambda_{\text{max}} = 275 \text{ nm}$  $\lambda_{\text{5%}} = 225 \text{ nm} ... 287 \text{ nm}$</td>
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</tbody>
</table>

Chip area
- nothing, A, B, C or E
- $\lambda_{\text{max}} = 280 \text{ nm}$  $\lambda_{\text{5%}} = 221 \text{ nm} ... 358 \text{ nm}$

Housing
- 2-pin TO18 housing, $h = 5,2 \text{ mm}$, 1 isolated pin and 1 case pin
- 2-pin TO18 housing, $h = 5,2 \text{ mm}$, 2 isolated pins, 1 grounded
- 2-pin TO18 housing, $h = 3,7 \text{ mm}$, 1 isolated pin, 1 grounded
- 3-pin TO5 housing, $h = 4,3 \text{ mm}$ for broadband; $h = 6,7 \text{ mm}$ for filtered UVA, UVB, UVC, UVI
- 3-pin TO5 housing, $h = 4,2 \text{ mm}$, 2 isolated pins, 1 grounded

Special
- Lens with concentrating lens, TO5 only
- MEGA with attenuator up to 0.5 W/cm²
- GIGA with attenuator up to 7 W/cm²

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Rev. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
## SPECIFICATIONS

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<td><strong>Spectral Characteristics</strong></td>
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<td>**General Characteristics ($T=25{}^\circ\text{C}$)</td>
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<td>V</td>
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## NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity Graph](image)

**Specs of 4H SiC Photodiode**
- **Logarithmic**
- **Linear**

**Wavelength $\lambda$ [nm]**

**Logarithmic Scale**

**Linear Scale**

---

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SG01M–5LENS
Concentrator lens SiC based UV photodiode $A_{\text{virtual}} = 11.0 \text{ mm}^2$

**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 photodiode window

**TYPICAL CIRCUIT**

![Typical Circuit Diagram]

Calculations and Limits:
- $U_e = \frac{L x R_e}{R_i} \approx V_x$
- $U_{\text{cross}}$ depends on load and amplifier type
- $R_e = 10 \text{k}\Omega \quad R_i \approx 10 \text{G}\Omega, C_i \approx 3 \text{pF}$
- Recommendation: $R_i x C_i \geq 10^{-3}$
- $I_{\text{cross}} = \frac{U_{\text{cross}}}{R_i}$
- Bandwidth $= \frac{1}{2\pi x R_i x C_i}$
- Example:
  - $I_0 = 20 \text{nA}, R_i = 100 \text{M}\Omega, C_i = 100 \text{ pF}$
  - $U_e = 20 \times 10^{-9} \times 100 \times 10^{-15} = 2V$

**DRAWINGS**

![Photodiode Drawings]
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 as shown on page 3.

**APPLICATION NOTE FOR PHOTODIODES**

**UPTADE TO A TOCON OR A PROBE**

**TOCONs = UV sensors with integrated amplifier**
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
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- UV broadband, UVA, UVB, UVC or Erythema measurements

**Miniature housing with M12x1 thread for the TOCON series**
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

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- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
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- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01M6H–5
Boradband SiC based UV photodiode A = 0,20 mm², 6H SiC chip

GENERAL FEATURES

Properties of the SG01M6H–5 UV photodiode
• Broadband UVA+UVB+UVC
• 6H SiC chip for enhanced UVA sensitivity, e.g. UVA LED control
• Acitve area A = 0,20 mm²
• TO5 hermetically sealed metal housing, short cap, 1 isolated pin and 1 case pin
• 10µW/cm² peak radiation results a current of approx. 2600 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

SG01

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<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>nothing = broadband</td>
<td>2-pin TO18 housing, h = 5,2 mm, 1 pin isolated, 1 pin grounded</td>
<td>nothing, Lens, MEGA, GIGA</td>
</tr>
<tr>
<td>M</td>
<td>A = UVA, λmax = 331 nm, λS10% = 309 nm ... 367 nm</td>
<td>3-pin TO18 housing, h = 5,2 mm, 2 pins isolated, 1 pin grounded</td>
<td>Lens with concentrating lens, TO5 only</td>
</tr>
<tr>
<td>D</td>
<td>B = UVB, λmax = 280 nm, λS10% = 231 nm ... 309 nm</td>
<td>2-pin TO18 housing, h = 3,7 mm, 1 pin isolated, 1 pin grounded</td>
<td>MEGA with attenuator up to 0,5 W/cm²</td>
</tr>
<tr>
<td>L</td>
<td>C = UVC, λmax = 275 nm, λS10% = 225 nm ... 287 nm</td>
<td>2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
<td>GIGA with attenuator up to 7 W/cm²</td>
</tr>
<tr>
<td>XL</td>
<td>E = UV-Index, spectral response according to CIE087</td>
<td>3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded</td>
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Rev. 6.0 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01M6H–5
Boradband SiC based UV photodiode A = 0,20 mm², 6H SiC chip

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<td><strong>General Characteristics (T=25°C)</strong></td>
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<tr>
<td>Active Area</td>
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<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_D$</td>
<td>0,7</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>$C$</td>
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<td>pF</td>
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<tr>
<td>Short Circuit (10µW/cm² at peak)</td>
<td>$I_O$</td>
<td>2600</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>$T_C$</td>
<td>&lt; 0,1</td>
<td>%/K</td>
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<tr>
<td><strong>Maximum Ratings</strong></td>
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<td>Operating Temperature</td>
<td>$T_{\text{opt}}$</td>
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</table>

### NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity](image)

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**Rev. 6.0** Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**FIELD OF VIEW**

![Field of View Diagram](image)

**TYPICAL CIRCUIT**

![Typical Circuit Diagram](image)

**DRAWINGS**

![Drawing Diagrams](image)

**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 photodiode window

**Calculations and Limits:**
- \[ U_x = \frac{1}{2 \pi R_1 C_2} \]
- \[ U_{x,\text{max}} \text{ depends on load and amplifier type} \]
- \( R_1 = 10 \Omega \) ... \( 10G \), \( C_2 = 3 \pi F \)
- Recommendation: \( R_1 \times C_2 \geq 10^{-2} \) s
- \[ I_{\text{avg}} = \frac{U_{x,\text{max}}}{R_1} \]

**Example:**
- \( I_1 = 20\pi A \), \( R_1 = 100M \), \( C_2 = 100 \) pF
- \( U_x = 20 \times 10^{9}A \times 100 \times 10^{-5} \) \( = 2V \)
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 as shown on page 3.

**APPLICATION NOTE FOR PHOTODIODES**

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- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity

**REV. 6.0** Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01M6H–18
Broadband SiC based UV photodiode A = 0,20 mm², 6H SiC chip

GENERAL FEATURES

Properties of the SG01M6H–18 UV photodiode
- Broadband UVA+UVB+UVC
- 6H SiC chip for enhanced UVA sensitivity, e.g. UVA LED control
- Active Area A = 0,20 mm²
- TO18 hermetically sealed metal housing, 1 isolated pin and 1 case pin
- 10mW/cm² peak radiation results a current of approx. 2600 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

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<td>18 2-pin TO18 housing, h = 5,2 mm, 1 pin isolated, 1 pin grounded</td>
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<td>A = UVA</td>
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SG01M6H–18
Broadband SiC based UV photodiode A = 0,20 mm², 6H SiC chip

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NORMIALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity](image)

**SpeciFicationS**

norMalized Spectral reSponSivity

SG01M6H–18
Broadband SiC based UV photodiode A = 0,20 mm², 6H SiC chip

Spectral Characteristics
- Typical Responsivity at Peak Wavelength: $S_{\text{max}} = 0.130$ AW$^{-1}$
- Wavelength of max. Spectral Responsivity: $\lambda_{\text{max}} = 290$ nm
- Responsivity Range: $S=0.1*S_{\text{max}}$ - 226 ... 385 nm
- Visible Blindness: $S_{\text{max}}/S_{>405\text{nm}} > 10^3$

General Characteristics (T=25°C)
- Active Area: $A = 0.20$ mm²
- Dark Current (1V reverse bias): $I_d = 0.7$ fA
- Capacitance: $C = 50$ pF
- Short Circuit (10mW/cm² at peak): $I_o = 2600$ nA
- Temperature Coefficient: $T_c < 0.1$ %/K

Maximum Ratings
- Operating Temperature: $T_{\text{opt}} = -55 ... 170$ °C
- Storage Temperature: $T_{\text{stor}} = -55 ... 170$ °C
- Soldering Temperature (35): $T_{\text{sold}} = 260$ °C
- Reverse Voltage: $V_{R_{\text{max}}} = 20$ V

NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity](image)

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SG01M6H–18
Broadband SiC based UV photodiode A = 0.20 mm², 6H SiC chip

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:

\[ U_s = I_x R_i = 0 \ldots \sim V_x \]

\[ U_{\text{res}} \text{ depends on load and amplifier type} \]

\[ R_i = 10k \Omega \ldots \sim 10G\Omega, C = 3pF \]

Recommendation: \( R_i \times C \geq 10 \text{s} \)

\[ I_x = U_{\text{res}} \div R_i \]

Bandwidth = DC ...

\[ \frac{1}{2\pi \times R_i \times C} \]

Example:

\( I_x = 20nA, R_i = 100M\Omega, C = 100 \text{ pF} \)

\( U_s = 20 \times 10^{-9} \times 100 \times 10^{-10} = 2V \)

DRAWINGS

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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 as shown on page 3.

**APPLICATION NOTE FOR PHOTODIODES**

**UPGRADE TO A TOCON OR A PROBE**

**TOCONs = UV sensors with integrated amplifier**
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

**Miniature housing with M12x1 thread for the TOCON series**
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

**Industrial UV probes**
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

**CALIBRATION SERVICE**
- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
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- Determination of a specific spectral sensor responsivity

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SG01M–18
Broadband SiC based UV photodiode A = 0.20 mm²

GENERAL FEATURES

Properties of the SG01M–18 UV photodiode
• Broadband UVA+UVB+UVC, PTB reported high chip stability
• Active Area A = 0.20 mm²
• TO18 hermetically sealed metal housing, 1 isolated pin and 1 case pin
• 10mW/cm² peak radiation results a current of approx. 2600 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0.06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

SG01

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 0.06 mm²</td>
<td>nothing = broadband</td>
<td>2-pin TO18 housing, h = 5.2 mm, 1 pin isolated, 1 pin grounded</td>
<td>Lens with concentrating lens, TO5 only</td>
</tr>
<tr>
<td>M 0.20 mm²</td>
<td>A = UVA λₘₐₓ = 331 nm λ₃₀% = 309 nm ... 367 nm</td>
<td>3-pin TO18 housing, h = 5.2 mm, 2 pins isolated, 1 pin grounded</td>
<td>MEGA with attenuator up to 0.5 W/cm²</td>
</tr>
<tr>
<td>D 0.50 mm²</td>
<td>B = UVB λₘₐₓ = 280 nm λ₃₀% = 231 nm ... 309 nm</td>
<td>2-pin TO18 housing, h = 3.7 mm, 1 pin isolated, 1 pin grounded</td>
<td>GIGA with attenuator up to 7 W/cm²</td>
</tr>
<tr>
<td>L 1.00 mm²</td>
<td>C = UVC λₘₐₓ = 275 nm λ₃₀% = 225 nm ... 287 nm</td>
<td>2-pin TO5 housing, h = 4.3 mm for broadband; h = 6.7 mm for filtered UVA, UVB, UVC, UVI</td>
<td></td>
</tr>
<tr>
<td>XL 7.60 mm²</td>
<td>E = UV-Index spectral response according to CIE087</td>
<td>3-pin TO5 housing, h = 4.2 mm, 2 pins isolated, 1 pin grounded</td>
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Rev. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01M–18
Broadband SiC based UV photodiode A = 0,20 mm²

SPECIFICATIONS

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<td>AW⁻¹</td>
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<td>nm</td>
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<td>Responsivity Range (( S=0,1*S_{\text{max}} ))</td>
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<td>nm</td>
</tr>
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<td>VB</td>
<td>( &gt;10^{10} )</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>A</td>
<td>0,20</td>
<td>mm²</td>
</tr>
<tr>
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<td>fA</td>
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<td>C</td>
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<td>pF</td>
</tr>
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<td>Short Circuit (10mW/cm² at peak)</td>
<td>( I_{o} )</td>
<td>2600</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>( T_{c} )</td>
<td>&lt; 0,1</td>
<td>%/K</td>
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Maximum Ratings

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<tbody>
<tr>
<td>Operating Temperature</td>
<td>( T_{\text{opt}} )</td>
<td>(-55 \ldots +170)</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{\text{stor}} )</td>
<td>(-55 \ldots +170)</td>
</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>( T_{\text{Solder}} )</td>
<td>260</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>( V_{\text{Rmax}} )</td>
<td>20</td>
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NORMALIZED SPECTRAL RESPONSIVITY

Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01M–18
Broadband SiC based UV photodiode A = 0,20 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
\[ U_i = I_x R_i \approx 0 \quad \sim \quad V_x \]
\[ U_{\text{in}} \text{ depends on load and amplifier type} \]
\[ R_i = 10kΩ \quad \sim \quad 10GΩ, C_i = 3pF \]
Recommendation: \( R_i x C_i \geq 10^{-2} \) s
\[ I_{\text{in}} = U_{\text{in}} \div R_i \]
Bandwidth = DC \( \frac{1}{2\pi \times R_i \times C_i} \)
Example:
\[ I_i = 20mA, R_i = 100MΩ, C_i = 100 \text{ pF} \]
\[ U_i = 20 \times 10^3A \times 100 \times 10^3[] = 2V \]

DRAWINGS

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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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

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• SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
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CALIBRATION SERVICE

• Different NIST and PTB traceable calibrations and measurements for all sglux sensors
• Calibration of sensors for irradiation measurements
• Calibration of UV sensors on discrete wavelengths
• Determination of a specific spectral sensor responsivity
**SG01M–18ISO90**

Broadband SiC based UV photodiode $A = 0.20 \text{ mm}^2$

---

**GENERAL FEATURES**

**Properties of the SG01M–18ISO90 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area $A = 0.20 \text{ mm}^2$
- TO18 hermetically sealed metal housing, two isolated pins in a circle
- 10mW/cm² peak radiation results a current of approx. 2600 nA

**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 (338°F). 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 typical circuit on page 3).

**Options**

SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

---

**NOMENCLATURE**

- **SG01**
- **S, M, D, L, XL**
  - nothing, A, B, C or E
  - **Chip area**
  - **S**
    - nothing = broadband
    - $\lambda_{\text{max}} = 280 \text{ nm}$
    - $\lambda_{10\%} = 221 \text{ nm ... 358 nm}$
  - **M**
    - $\lambda_{\text{max}} = 331 \text{ nm}$
    - $\lambda_{10\%} = 309 \text{ nm ... 367 nm}$
  - **D**
    - $\lambda_{\text{max}} = 280 \text{ nm}$
    - $\lambda_{10\%} = 231 \text{ nm ... 309 nm}$
  - **L**
    - $\lambda_{\text{max}} = 275 \text{ nm}$
    - $\lambda_{10\%} = 225 \text{ nm ... 287 nm}$
  - **XL**
    - $\lambda_{\text{max}} = 257 \text{ nm}$
    - $\lambda_{10\%} = 225 \text{ nm ... 287 nm}$
  - **nothing**
  - **A**
    - $\lambda_{\text{max}} = 331 \text{ nm}$
    - $\lambda_{10\%} = 309 \text{ nm ... 367 nm}$
  - **B**
    - $\lambda_{\text{max}} = 280 \text{ nm}$
    - $\lambda_{10\%} = 231 \text{ nm ... 309 nm}$
  - **C**
    - $\lambda_{\text{max}} = 275 \text{ nm}$
    - $\lambda_{10\%} = 225 \text{ nm ... 287 nm}$
  - **E**
    - $\lambda_{\text{max}} = 257 \text{ nm}$
    - $\lambda_{10\%} = 225 \text{ nm ... 287 nm}$
  - **nothing = broadband**
  - **A**
    - $\lambda_{\text{max}} = 331 \text{ nm}$
    - $\lambda_{10\%} = 309 \text{ nm ... 367 nm}$
  - **B**
    - $\lambda_{\text{max}} = 280 \text{ nm}$
    - $\lambda_{10\%} = 231 \text{ nm ... 309 nm}$
  - **C**
    - $\lambda_{\text{max}} = 275 \text{ nm}$
    - $\lambda_{10\%} = 225 \text{ nm ... 287 nm}$
  - **nothing**
  - **E**
    - spectral response according to CIE087

**Housing**
- **18**
  - 2-pin TO18 housing, $h = 5.2 \text{ mm}$
  - 1 pin isolated, 1 pin grounded
- **18ISO90**
  - 3-pin TO18 housing, $h = 5.2 \text{ mm}$
  - 2 pins isolated, 1 pin grounded
- **18S**
  - 2-pin TO18 housing, $h = 3.7 \text{ mm}$
  - 1 pin isolated, 1 pin grounded
- **18ISO90**
  - 3-pin TO18 housing, $h = 4.2 \text{ mm}$
  - 2 pins isolated, 1 pin grounded
- **5**
  - 2-pin TO5 housing, $h = 4.3 \text{ mm}$
  - for broadband
  - $h = 6.7 \text{ mm}$ for filtered UVA, UVB, UVC, UVI
- **5ISO90**
  - 3-pin TO5 housing, $h = 4.2 \text{ mm}$
  - 2 pins isolated, 1 pin grounded

**Special**
- **Lens**
  - with concentrating lens, TO5 only
- **MEGA**
  - with attenuator up to 0.5 W/cm²
- **GIGA**
  - with attenuator up to 7 W/cm²

---

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**SG01M–18ISO90**
Broadband SiC based UV photodiode A = 0,20 mm²

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<td>$V_{R_{\text{max}}}$</td>
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<td>V</td>
</tr>
</tbody>
</table>

---

**NORMALIZED SPECTRAL RESPONSIVITY**

---

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SG01M–18ISO90
Broadband SiC based UV photodiode A = 0,20 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
- \( U_x = \frac{1}{I_x R_x} \rightarrow O ... \sim V_x \)
- \( U_{x_{\text{max}}} \) depends on load and amplifier type
- \( R_x = 1 \Omega \rightarrow 10^6 \Omega, C_x = 3 \mu F \)
- Recommendation: \( R_x C_x \geq 10^{-9} \) s
- \( I_{x_{\text{max}}} = U_{x_{\text{max}}} \div R_x \)

Bandwidth = DC ...

\[ \frac{1}{2 \pi R_x C_x} \]

Example:
- \( I_x = 2 \mu A, R_x = 100 \Omega, C_x = 100 \mu F \)
- \( U_x = 2 \times 10^{-6} A \times 100 \times 10^{-6} \) s = 2 V

DRAWINGS

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Industrial UV probes
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
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- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01M–18S
Broadband SiC based UV photodiode A = 0,20 mm²

GENERAL FEATURES

Properties of the SG01M–18S UV photodiode
• Broadband UVA+UVB+UVC, PTB reported high chip stability
• Active Area A = 0,20 mm²
• TO18 hermetically sealed metal housing, short cap, 1 isolated pin and 1 case pin
• 10mW/cm² peak radiation results a current of approx. 2600 nA

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 (338°F). 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 typical circuit on page 3).

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NOMENCLATURE

SG01

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<td>18S</td>
</tr>
<tr>
<td></td>
<td>λ_max = 280 nm λ_S10% = 231 nm ... 309 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L</td>
<td>C = UVC</td>
<td>2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
<td>18ISO90</td>
</tr>
<tr>
<td></td>
<td>λ_max = 275 nm λ_S10% = 225 nm ... 287 nm</td>
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<tr>
<td>XL</td>
<td>E = UV-Index</td>
<td>3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded</td>
<td>18ISO90</td>
</tr>
<tr>
<td></td>
<td>spectral response according to CIE087</td>
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Rev. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01M–18S
Broadband SiC based UV photodiode A = 0,20 mm²

SPECIFICATIONS

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<tr>
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<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spectral Characteristics</strong></td>
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<td></td>
<td></td>
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<tr>
<td>Typical Responsivity at Peak Wavelength</td>
<td>S_{\text{max}}</td>
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<td>AW^{-1}</td>
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<td>Wavelength of max. Spectral Responsivity</td>
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<td>nm</td>
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<td>V_{\text{B}}</td>
<td>&gt; 10^{10}</td>
<td>–</td>
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<tr>
<td><strong>General Characteristics (T=25°C)</strong></td>
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<tr>
<td>Active Area</td>
<td>A</td>
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<td>mm²</td>
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<tr>
<td>Dark Current (1V reverse bias)</td>
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<td>fA</td>
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<tr>
<td>Capacitance</td>
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<td>pF</td>
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<td>Short Circuit (10mW/cm² at peak)</td>
<td>I_o</td>
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<td>nA</td>
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<td>Temperature Coefficient</td>
<td>T_c</td>
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<td>%/K</td>
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<tr>
<td><strong>Maximum Ratings</strong></td>
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<tr>
<td>Operating Temperature</td>
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<td>°C</td>
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<td>Storage Temperature</td>
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</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>T_{\text{sold}}</td>
<td>260</td>
<td>°C</td>
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<tr>
<td>Reverse Voltage</td>
<td>V_{\text{Rmax}}</td>
<td>20</td>
<td>V</td>
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NORMALIZED SPECTRAL RESPONSIVITY

Specs of 4H SiC Photodiode
- logarithmic
- linear

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SG01M–18S
Broadband SiC based UV photodiode A = 0.20 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
- \( U_s = \frac{1}{2} \times R_1 \times R_2 \times V_a \)
- \( U_{\text{env}} \) depends on load and amplifier type
  - \( R_1 = 10k\Omega \) ...
  - \( R_2, C \leq 10\Omega \)
  - \( \text{Recommendation: } R_1 \times C \geq 10^{-3} \) s
  - \( \text{Example: } U_s = 0.2 \times 10^{-3} \times 100 \times 100 \times 10^{-3} \) = 2 V

DRAWINGS

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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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

**TOCONs = UV sensors with integrated amplifier**
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1,8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

**Miniature housing with M12x1 thread for the TOCON series**
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

**Industrial UV probes**
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity

---

**SG01M–18S**
Wideband SiC based UV photodiode A = 0.20 mm²
SG01S–5
Broadband SiC based UV photodiode A = 0,06 mm²

GENERAL FEATURES

Properties of the SG01S–5 UV photodiode
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 0,06 mm²
- TO5 hermetically sealed metal housing, short cap, 1 isolated pin and 1 case pin
- 10mW/cm² peak radiation results a current of approx. 780 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>nothing = broadband</td>
<td>λ_{max} = 280 nm, λ_{S10%} = 221 nm ... 358 nm</td>
<td>18</td>
</tr>
<tr>
<td>M</td>
<td>A = UVA</td>
<td>λ_{max} = 331 nm, λ_{S10%} = 309 nm ... 367 nm</td>
<td>18ISO90</td>
</tr>
<tr>
<td>D</td>
<td>B = UVB</td>
<td>λ_{max} = 280 nm, λ_{S10%} = 231 nm ... 309 nm</td>
<td>18S</td>
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<td>L</td>
<td>C = UVC</td>
<td>λ_{max} = 275 nm, λ_{S10%} = 225 nm ... 287 nm</td>
<td>ISO90</td>
</tr>
<tr>
<td>XL</td>
<td>E = UV-Index</td>
<td>spectral response according to CIE087</td>
<td>ISO90</td>
</tr>
</tbody>
</table>

Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**SG01S–5**

Broadband SiC based UV photodiode $A = 0.06$ mm$^2$

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**SPECIFICATIONS**

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</tr>
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<td></td>
<td></td>
</tr>
<tr>
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<td>AW$^{-1}$</td>
</tr>
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<td>nm</td>
</tr>
<tr>
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<td>nm</td>
</tr>
<tr>
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<td>VB</td>
<td>$&gt;10^{10}$</td>
<td>–</td>
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<tr>
<td><strong>General Characteristics ($T=25°C$)</strong></td>
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<td></td>
</tr>
<tr>
<td>Active Area</td>
<td>$A$</td>
<td>0.06</td>
<td>mm$^2$</td>
</tr>
<tr>
<td>Dark Current ($1\text{V}$ reverse bias)</td>
<td>$I_d$</td>
<td>0.2</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>$C$</td>
<td>15</td>
<td>pF</td>
</tr>
<tr>
<td>Short Circuit ($10\text{mW/cm}^2$ at peak)</td>
<td>$I_o$</td>
<td>780</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>&lt; 0.1</td>
<td>%/K</td>
</tr>
<tr>
<td><strong>Maximum Ratings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>$T_{\text{opt}}$</td>
<td>-55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
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<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature ($35$)</td>
<td>$T_{\text{sold}}$</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{R_{\text{max}}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

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**NORMAlIZED SPECTRAL RESPONSIVITY**

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Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**SG01S–5**

Broadband SiC based UV photodiode $A = 0.06 \text{ mm}^2$

---

**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 photodiode window

---

**TYPICAL CIRCUIT**

Calculations and Limits:
- $U_s = I_x R_1 + V_x$
- $U_{s\text{ref}}$ depends on load and amplifier type

- $R_1 = 10 \text{k}\Omega \ldots 10 \text{G}\Omega$, $C_x = 3 \text{pF}$
- Recommendation: $R_1 C_x \geq 10^{-3}$
- $I_{s\text{ref}} = \frac{U_{s\text{ref}}}{R_1}$

- Bandwidth = DC ... $\frac{1}{2 \pi R_1 C_x}$

Example:
- $I_s = 20 \text{nA}$, $R_1 = 100 \text{M}\Omega$, $C_x = 100 \text{ pF}$
- $U_s = 20 \times 10^{-3} \times 100 \times 10^{-4} = 2 \text{V}$

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**DRAWINGS**

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**REV. 6.2** Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
TOCONs = UV sensors with integrated amplifier
• SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
• Measures intensities from 1.8 pW/cm² up to 18 W/cm²
• UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series
• Optional feature for all TOCON detectors
• Robust stainless steel M12x1 thread body
• Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
• Easy to mount and connect

Industrial UV probes
• Different housings e.g. with cosine response, water pressure proof or sapphire windows
• Different electronic outputs configurable (voltage, current, USB, CAN)
• Good EMC safety for industrial applications

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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

CALIBRATION SERVICE
• Different NIST and PTB traceable calibrations and measurements for all sglux sensors
• Calibration of sensors for irradiation measurements
• Calibration of UV sensors on discrete wavelengths
• Determination of a specific spectral sensor responsivity
**SG01S–18**

Broadband SiC based UV photodiode A = 0.06 mm²

### GENERAL FEATURES

**Properties of the SG01S–18 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 0.06 mm²
- TO18 hermetically sealed metal housing, 1 isolated pin and 1 case pin
- 10 mW/cm² peak radiation results a current of approx. 780 nA

**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 (338°F). 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 typical circuit on page 3).

**Options**
SiC photodiodes are available with seven different active chip areas from 0.06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5.5 mm diameter TO18 housing or a 9.2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

### NOMENCLATURE

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</table>
| **S** 0.06 mm² | nothing = broadband  
\( \lambda_{\text{max}} = 280 \text{ nm} \)  
\( \lambda_{\text{S10\%}} = 221 \text{ nm} ... 358 \text{ nm} \) | 2-pin TO18 housing, h = 5.2 mm, 1 pin isolated, 1 pin grounded | Lens with concentrating lens, TO5 only |
| **M** 0.20 mm² | A = UVA  
\( \lambda_{\text{max}} = 331 \text{ nm} \)  
\( \lambda_{\text{S10\%}} = 309 \text{ nm} ... 367 \text{ nm} \) | 3-pin TO18 housing, h = 5.2 mm, 2 pins isolated, 1 pin grounded | MEGA with attenuator up to 0.5 W/cm² |
| **D** 0.50 mm² | B = UVB  
\( \lambda_{\text{max}} = 280 \text{ nm} \)  
\( \lambda_{\text{S10\%}} = 231 \text{ nm} ... 309 \text{ nm} \) | 2-pin TO18 housing, h = 3.7 mm, 1 pin isolated, 1 pin grounded | GIGA with attenuator up to 7 W/cm² |
| **L** 1.00 mm² | C = UVC  
\( \lambda_{\text{max}} = 275 \text{ nm} \)  
\( \lambda_{\text{S10\%}} = 225 \text{ nm} ... 287 \text{ nm} \) | 3-pin TO5 housing, h = 4.3 mm for broadband; h = 6.7 mm for filtered UVA, UVB, UVC, UVI | |
| **XL** 7.60 mm² | E = UV-Index  
Spectral response according to CIE087 | 3-pin TO5 housing, h = 4.2 mm, 2 pins isolated, 1 pin grounded | |

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Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01S–18
Broadband SiC based UV photodiode A = 0,06 mm²

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NORMAlIZED SPECTRAL RESPONSIVITY

Specs of 4H SiC Photodiode
- logarithmic
- linear

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Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01S–18
Broadband SiC based UV photodiode $A = 0.06 \text{ mm}^2$

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
$U_o = \frac{1}{2} x R_1 x C_1$
$U_{x_{\text{var}}} \text{ depends on load and amplifier type}$
$R_2 = 10k\Omega \cdots \sim 10G\Omega$, $C = 3\text{ pF}$
Recommendation: $R_2 \times C \geq 10^5 \text{s}$
$L_{\text{var}} = U_{x_{\text{var}}} \div R_1$

Bandwidth = DC ...
$\frac{1}{2x \times R_2 \times C_1}$

Example:
$I_2 = 20\text{nA}$, $R_2 = 100\text{M}\Omega$, $C_1 = 100 \text{ pF}$
$U_o = 20 \times 10^{-6} \text{A} \times 100 \times 10^5 \text{s} = 2\text{V}$

DRAWINGS

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- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01S–18ISO90

Broadband SiC based UV photodiode A = 0,06 mm²

**GENERAL FEATURES**

**Properties of the SG01S–18ISO90 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area A = 0,06 mm²
- TO18 hermetically sealed metal housing, two isolated pins in a circle
- 10mW/cm² peak radiation results a current of approx. 780 nA

**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 (338°F). 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 typical circuit on page 3).

**Options**

SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

**NOMENCLATURE**

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 0,06 mm²</td>
<td>nothing = broadband</td>
<td>18, 18ISO90, 18S, 5ISO90</td>
<td>nothing, Lens, MEGA, GIGA</td>
</tr>
<tr>
<td>M 0,20 mm²</td>
<td>A = UVA</td>
<td>18ISO90</td>
<td>3-pin TO18 housing, h = 5,2 mm, 2 pins isolated, 1 pin grounded</td>
</tr>
<tr>
<td>D 0,50 mm²</td>
<td>B = UVB</td>
<td>18S</td>
<td>2-pin TO18 housing, h = 3,7 mm, 1 pin isolated, 1 pin grounded</td>
</tr>
<tr>
<td>L 1,00 mm²</td>
<td>C = UVC</td>
<td>5</td>
<td>2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
</tr>
<tr>
<td>XL 7,60 mm²</td>
<td>E = UV-Index</td>
<td>5ISO90</td>
<td>3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded</td>
</tr>
</tbody>
</table>

*Rev. 6.3* Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01S–18ISO90
Broadband SiC based UV photodiode A = 0,06 mm²

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Responsivity at Peak Wavelength</td>
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<td>AW$^{-1}$</td>
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<td>Wavelength of max. Spectral Responsivity</td>
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<td>$&gt;10^{10}$</td>
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<tr>
<th>General Characteristics (T=25°C)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Area</td>
<td>A</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
</tr>
<tr>
<td>Short Circuit (10mW/cm² at peak)</td>
<td>$I_0$</td>
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<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
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<table>
<thead>
<tr>
<th>Maximum Ratings</th>
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<tbody>
<tr>
<td>Operating Temperature</td>
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<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>$T_{\text{sold}}$</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{\text{Rmax}}$</td>
</tr>
</tbody>
</table>

NORMAlIZED SPECTRAL RESPONSIVITY

---

Rev. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01S–18ISO90
Broadband SiC based UV photodiode A = 0,06 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
\[ V_u = I_x R_i \Rightarrow 0 \cdots V_u \]
\[ U_{-\text{amp}} \text{ depends on load and amplifier type} \]
\[ R_i = 10k\Omega \cdots 10G\Omega, C = 3\ pF \]
Recommendation: \[ R_i \cdot C \geq 10^{-3}\ s \]
\[ I_{\text{amp}} = U_{\text{amp}} \div R_i \]
Bandwidth = DC ... \[ \frac{1}{2\pi \times R_i \times C} \]
Example:
\[ I_x = 20mA, R_i = 100M\Omega, C = 100\ pF \]
\[ U_u = 20 \times 10^3 A \times 100 \times 10^{-5} = 2V \]

DRAWINGS

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Rev. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
TOCONs = UV sensors with integrated amplifier
• SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
• Measures intensities from 1.8 pW/cm² up to 18 W/cm²
• UV broadband, UVA, UVB, UVC or Erythema measurements

Miniature housing with M12x1 thread for the TOCON series
• Optional feature for all TOCON detectors
• Robust stainless steel M12x1 thread body
• Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
• Easy to mount and connect

Industrial UV probes
• Different housings e.g. with cosine response, water pressure proof or sapphire windows
• Different electronic outputs configurable (voltage, current, USB, CAN)
• Good EMC safety for industrial applications

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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

CALIBRATION SERVICE
• Different NIST and PTB traceable calibrations and measurements for all sglux sensors
• Calibration of sensors for irradiation measurements
• Calibration of UV sensors on discrete wavelengths
• Determination of a specific spectral sensor responsivity
SG01S–18S
Broadband SiC based UV photodiode A = 0,06 mm²

GENERAL FEATURES

Properties of the SG01S–18S UV photodiode
• Broadband UVA+UVB+UVC, PTB reported high chip stability
• Active Area A = 0,06 mm²
• TO18 hermetically sealed metal housing, short cap, 1 isolated pin and 1 case pin
• 10mW/cm² peak radiation results a current of approx. 780 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

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<td></td>
</tr>
<tr>
<td>L 1,00 mm²</td>
<td>C = UVC λ_max = 275 nm λ_S10% = 225 nm ... 287 nm</td>
<td>5ISO90 = 3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>XL 7,60 mm²</td>
<td>E = UV-Index spectral response according to CIEo87</td>
<td>5 = 2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
<td></td>
</tr>
</tbody>
</table>

REV. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01S–18S
Broadband SiC based UV photodiode A = 0,06 mm²

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<td></td>
</tr>
<tr>
<td>Active Area</td>
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<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
<td>0,2</td>
<td>fA</td>
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<tr>
<td>Capacitance</td>
<td>C</td>
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<td>pF</td>
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<tr>
<td>Short Circuit (10mW/cm² at peak)</td>
<td>$I_o$</td>
<td>780</td>
<td>nA</td>
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<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>&lt;0,1</td>
<td>%/K</td>
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<tr>
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<td></td>
</tr>
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<td>Reverse Voltage</td>
<td>$V_{\text{Rmax}}$</td>
<td>20</td>
<td>V</td>
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</table>

NORMALIZED SPECTRAL RESPONSIVITY

---

**Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.**
SG01S–18S
Broadband SiC based UV photodiode A = 0.06 mm²

**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 photodiode window

**TYPICAL CIRCUIT**

Calculations and Limits:

\[ U_a = V_a R_a \sim V_a \]

\[ U_{\text{max}} \text{ depends on load and amplifier type} \]

\[ R_i = 10k \Omega \quad \sim 10G \Omega, C_i \approx 3pF \]
Recommendation: \[ R_i \times C_i \geq 10^{-6}s \]

\[ I_{\text{max}} = I_{\text{inj}} + R_i \]

Bandwidth = DC ...

\[ \frac{1}{2\pi \times R_i \times C_i} \]

Example:

\[ I_i = 20nA, R_i = 100M\Omega, C_i = 100 \text{ pF} \]

\[ U_i = 20 \times 10^5 A \times 100 \times 10^{-12} \text{V} = 2V \]

**DRAWINGS**

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Rev. 6.2  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JEDEC.
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

TOCONs = UV sensors with integrated amplifier
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
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- Robust stainless steel M12x1 thread body
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- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

CALIBRATION SERVICE

- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
SG01XL–5
Broadband SiC based UV photodiode $A = 7,6 \text{ mm}^2$

**GENERAL FEATURES**

**Properties of the SG01XL–5 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area $A = 7,6 \text{ mm}^2$
- TO5 hermetically sealed metal housing, short cap, 1 isolated pin and 1 case pin
- $10\mu\text{W/cm}^2$ peak radiation results a current of approx. 99 nA

**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 (338°F). 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 typical circuit on page 3).

**Options**
SiC photodiodes are available with seven different active chip areas from 0,06 mm² up to 36 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

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<th>Special</th>
</tr>
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<tbody>
<tr>
<td><strong>S</strong></td>
<td>nothing = broadband</td>
<td>$\lambda_{\text{max}} = 280 \text{ nm}$, $\lambda_{\text{50%}} = 221 \text{ nm} ... 358 \text{ nm}$</td>
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<tr>
<td><strong>M</strong></td>
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<td>$\lambda_{\text{max}} = 331 \text{ nm}$, $\lambda_{\text{50%}} = 309 \text{ nm} ... 367 \text{ nm}$</td>
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<td><strong>D</strong></td>
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<td>spectral response according to CIE087</td>
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<td><strong>S</strong></td>
<td>2-pin TO18 housing, $h = 5,2 \text{ mm}$, 1 pin isolated, 1 pin grounded</td>
</tr>
<tr>
<td><strong>M</strong></td>
<td>3-pin TO18 housing, $h = 5,2 \text{ mm}$, 2 pins isolated, 1 pin grounded</td>
</tr>
<tr>
<td><strong>D</strong></td>
<td>2-pin TO18 housing, $h = 3,7 \text{ mm}$, 1 pin isolated, 1 pin grounded</td>
</tr>
<tr>
<td><strong>L</strong></td>
<td>3-pin TO5 housing, $h = 4,3 \text{ mm}$ for broadband; $h = 6,7 \text{ mm}$ for filtered UVA, UVB, UVC, UVI</td>
</tr>
<tr>
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<td>3-pin TO5 housing, $h = 4,2 \text{ mm}$, 2 pins isolated, 1 pin grounded</td>
</tr>
</tbody>
</table>

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Rev. 6.2 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
**SG01XL-5**
Broadband SiC based UV photodiode A = 7.6 mm²

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<td><strong>General Characteristics (T=25°C)</strong></td>
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</tr>
<tr>
<td>Active Area</td>
<td>A</td>
<td>7.6</td>
<td>mm²</td>
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<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
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<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>1900</td>
<td>pF</td>
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<td>Short Circuit (10µW/cm² at peak)</td>
<td>$I_o$</td>
<td>99</td>
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<td>Reverse Voltage</td>
<td>$V_{R_{\text{max}}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

## NORMALIZED SPECTRAL RESPONSIVITY

![Normalized Spectral Responsivity](image)

**Specs of 4H SiC Photodiode**
- **logarithmic**
- **linear**

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**Rev. 6.2** Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01XL–5
Broadband SiC based UV photodiode A = 7.6 mm²

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 photodiode window

TYPICAL CIRCUIT
Calculations and Limits:
\[ V_u = I_x R_s \Rightarrow V \Rightarrow V_x \]
\[ U_{x,\text{max}} \text{ depends on load and amplifier type} \]
\[ R_s = 10\Omega \Rightarrow 10G \Omega \times C \approx 3pF \]
Recommendation: \[ R_s \times C_2 \geq 10^{-3}s \]
\[ I_{x,\text{max}} \approx U_{x,\text{max}} \div R_s \]
Bandwidth = \[ \text{DC} \ldots \frac{1}{2\pi \times R_s \times C_2} \]
Example:
\[ I_s = 20nA, R_s = 100M\Omega, C_2 = 100 pF \]
\[ U_s = 20 \times 10^{-9} A \times 100 \times 10^{-12} s = 2V \]

DRAWINGS
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

**TOCONs = UV sensors with integrated amplifier**
- SiC based UV hybrid detector with amplifier (0–5V output), no additional amplifier needed, direct connection to controller, voltmeter, etc.
- Measures intensities from 1.8 pW/cm² up to 18 W/cm²
- UV broadband, UVA, UVB, UVC or Erythema measurements

**Miniature housing with M12x1 thread for the TOCON series**
- Optional feature for all TOCON detectors
- Robust stainless steel M12x1 thread body
- Integrated sensor connector (Binder 5-Pin plug) with 2m connector cable
- Easy to mount and connect

**Industrial UV probes**
- Different housings e.g. with cosine response, water pressure proof or sapphire windows
- Different electronic outputs configurable (voltage, current, USB, CAN)
- Good EMC safety for industrial applications

**CALIBRATION SERVICE**
- Different NIST and PTB traceable calibrations and measurements for all sglux sensors
- Calibration of sensors for irradiation measurements
- Calibration of UV sensors on discrete wavelengths
- Determination of a specific spectral sensor responsivity
### General Features

**Properties of the SG01XL–5ISO90 UV photodiode**
- Broadband UVA+UVB+UVC, PTB reported high chip stability
- Active Area $A = 7.6 \text{ mm}^2$
- TO5 hermetically sealed metal housing, short cap, two isolated pins in a circle
- $10\mu W/cm^2$ peak radiation results a current of approx. $99 \text{ nA}$

**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 (338°F). 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 typical circuit on page 3).

### Options
SiC photodiodes are available with seven different active chip areas from $0.06 \text{ mm}^2$ up to $36 \text{ mm}^2$. Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5.5 mm diameter TO18 housing or a 9.2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

### Nomenclature

<table>
<thead>
<tr>
<th>Chip area</th>
<th>Spectral response</th>
<th>Housing</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>S 0.06 mm²</td>
<td>nothing = broadband</td>
<td>2-pin TO18 housing, $h = 5.2 \text{ mm}$, 1 pin isolated, 1 pin grounded</td>
<td>nothing, Lens, MEGA, GIGA</td>
</tr>
<tr>
<td>M 0.20 mm²</td>
<td>$A = \text{UVA}$</td>
<td>3-pin TO18 housing, $h = 5.2 \text{ mm}$, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>D 0.50 mm²</td>
<td>$B = \text{UVB}$</td>
<td>2-pin TO5 housing, $h = 4.3 \text{ mm}$ for broadband; $h = 6.7 \text{ mm}$ for filtered UVA, UVB, UVC, UVI</td>
<td></td>
</tr>
<tr>
<td>L 1.00 mm²</td>
<td>$C = \text{UVC}$</td>
<td>3-pin TO5 housing, $h = 4.3 \text{ mm}$, 2 pins isolated, 1 pin grounded</td>
<td></td>
</tr>
<tr>
<td>XL 7.60 mm²</td>
<td>$E = \text{UV-Index}$</td>
<td>spectral response according to CIE087</td>
<td></td>
</tr>
</tbody>
</table>

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**SG01XL–5ISO90**
Broadband SiC based UV photodiode $A = 7.6 \text{ mm}^2$

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**Notes:**
- Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01XL–5ISO90
Broadband SiC based UV photodiode A = 7,6 mm²

SPECIFICATIONS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spectral Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical Responsivity at Peak Wavelength</td>
<td>S_{\text{max}}</td>
<td>0,130</td>
<td>AW^{-1}</td>
</tr>
<tr>
<td>Wavelength of max. Spectral Responsivity</td>
<td>\lambda_{\text{max}}</td>
<td>280</td>
<td>nm</td>
</tr>
<tr>
<td>Responsivity Range (S=0,1\times S_{\text{max}})</td>
<td>–</td>
<td>221 ... 358</td>
<td>nm</td>
</tr>
<tr>
<td>Visible Blindness (S_{\text{max}}/S_{\lambda&gt;405})</td>
<td>VB</td>
<td>&gt; 10^{10}</td>
<td>–</td>
</tr>
<tr>
<td><strong>General Characteristics (T=25°C)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active Area</td>
<td>A</td>
<td>7,6</td>
<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>I_d</td>
<td>25,3</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>1900</td>
<td>pF</td>
</tr>
<tr>
<td>Short Circuit (10µW/cm² at peak)</td>
<td>I_o</td>
<td>99</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>T_c</td>
<td>&lt; 0,1</td>
<td>%/K</td>
</tr>
<tr>
<td><strong>Maximum Ratings</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>T_{\text{opt}}</td>
<td>-55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_{\text{stor}}</td>
<td>-55 ... +170</td>
<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (35)</td>
<td>T_{\text{sold}}</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>V_{\text{Rmax}}</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

NORMAlIZED SPECTRAL RESPONSIVITY

Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01XL-5ISO90
Broadband SiC based UV photodiode A = 7.6 mm²

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 photodiode window

TYPICAL CIRCUIT

Calculations and Limits:
\[ U_i = \frac{1}{2} x \frac{I_i}{R_i} \cdot V_a \]
\[ U_{vref} \] depends on load and amplifier type
\[ R_i = 10 \Omega \] … \[ \approx 10 \text{G} \Omega \], \[ C_i = 3 \text{pF} \]
Recommendation: \[ R_i \cdot C_i \geq 100 \text{ ms} \]
\[ V_{ref} = \frac{U_{vref}}{R_i} \]

Bandwidth = DC … \[ \frac{1}{2 \pi \cdot R_i \cdot C_i} \]

Example:
\[ I_i = 20 \text{mA}, R_i = 100 \text{MS}, C_i = 100 \text{ pF} \]
\[ U_i = 20 \times 10^{-3} \times 100 \times 10^{-12} = 2 \text{V} \]

DRAWINGS

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Rev. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
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 as shown on page 3.

UPGRADE TO A TOCON OR A PROBE

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REV. 6.3 Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01XXL–8ISO90
Broadband SiC based UV photodiode A = 36 mm²

GENERAL FEATURES

Properties of the SG01XXL–8ISO90 UV photodiode
• Broadband UVA+UVB+UVC, PTB reported high chip stability
• Active Area A = 36 mm²
• TO8 hermetically sealed metal housing, two isolated pins in a circle
• 10µW/cm² peak radiation results a current of approx. 468 nA

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 (338°F). 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 typical circuit on page 3).

Options
SiC photodiodes are available with five different active chip areas from 0,06 mm² up to 4,00 mm². Standard version is broadband UVA-UVB-UVC. Four filtered versions lead to a tighter sensitivity range. All photodiodes have a hermetically sealed metal housing (TO type), either a 5,5 mm diameter TO18 housing or a 9,2 mm TO5 housing. Further option is either a 2 pin header (1 isolated, 1 grounded) or a 3 pin header (2 isolated, 1 grounded).

NOMENCLATURE

<table>
<thead>
<tr>
<th>S, M, D, L, XL</th>
<th>nothing, A, B, C or E</th>
<th>18, 18ISO90, 18S, 5, 5ISO90</th>
<th>nothing, Lens, MEGA, GIGA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip area</td>
<td><strong>nothing = broadband</strong></td>
<td><strong>18</strong> 2-pin TO18 housing, h = 5,2 mm, 1 pin isolated, 1 pin grounded</td>
<td><strong>18ISO90</strong> 3-pin TO18 housing, h = 5,2 mm, 2 pins isolated, 1 pin grounded</td>
</tr>
<tr>
<td></td>
<td>λ_max = 280 nm   λ_S10% = 221 nm ... 358 nm</td>
<td>λ_max = 331 nm   λ_S10% = 309 nm ... 367 nm</td>
<td>λ_max = 318 nm   λ_S10% = 309 nm ... 367 nm</td>
</tr>
<tr>
<td>S 0,06 mm²</td>
<td></td>
<td><strong>18S</strong> 2-pin TO18 housing, h = 3,7 mm, 1 pin isolated, 1 pin grounded</td>
<td><strong>5ISO90</strong> 3-pin TO5 housing, h = 4,2 mm, 2 pins isolated, 1 pin grounded</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>5</strong> 2-pin TO5 housing, h = 4,3 mm for broadband; h = 6,7 mm for filtered UVA, UVB, UVC, UVI</td>
<td><strong>GIGA</strong> with attenuator up to 7 W/cm²</td>
</tr>
<tr>
<td>M 0,20 mm²</td>
<td>A = UVA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>λ_max = 331 nm   λ_S10% = 309 nm ... 367 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D 0,50 mm²</td>
<td>B = UVB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>λ_max = 280 nm   λ_S10% = 231 nm ... 309 nm</td>
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<td></td>
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<tr>
<td>L 1,00 mm²</td>
<td>C = UVC</td>
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<tr>
<td></td>
<td>λ_max = 275 nm   λ_S10% = 225 nm ... 287 nm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XL 4,00 mm²</td>
<td>E = UV-Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>spectral response according to CIE087</td>
<td></td>
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Rev. 6.0  Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
SG01XXL–8ISO90
Broadband SiC based UV photodiode A = 36 mm²

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<td>AW⁻¹</td>
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<td>nm</td>
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<td>VB</td>
<td>$&gt;10^{10}$</td>
<td>–</td>
</tr>
<tr>
<td><strong>General Characteristics (T=25°C)</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Active Area</td>
<td>A</td>
<td>36</td>
<td>mm²</td>
</tr>
<tr>
<td>Dark Current (1V reverse bias)</td>
<td>$I_d$</td>
<td>120</td>
<td>fA</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>9000</td>
<td>pF</td>
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<tr>
<td>Short Circuit (10µW/cm² at peak)</td>
<td>$I_0$</td>
<td>468</td>
<td>nA</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td>$T_c$</td>
<td>&lt; 0,1</td>
<td>%/K</td>
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<td><strong>Maximum Ratings</strong></td>
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<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stor}}$</td>
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<td>°C</td>
</tr>
<tr>
<td>Soldering Temperature (3s)</td>
<td>$T_{\text{sold}}$</td>
<td>260</td>
<td>°C</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_{\text{Rmax}}$</td>
<td>20</td>
<td>V</td>
</tr>
</tbody>
</table>

NORMAlIZED SPECTRAL RESPONSIVITY

Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.
### 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 photodiode window

### TYPICAL CIRCUIT

Calculations and Limits:
- \( U_s = I_I R_I \Rightarrow V_s \)
- \( U_{x,\text{max}} \) depends on load and amplifier type
- \( R_L = 10 \Omega \ldots \approx 10^6 \Omega, \ C_s = 30 \text{pF} \)
- Recommendation: \( R_L C_s \geq 10^{-5} \) s
- \( L_{\text{max}} = \frac{1}{2 \pi R_L C_s} \)

Example:
- \( I_L = 20 \text{nA}, R_L = 100 \text{M}\Omega, \ C_s = 100 \text{pF} \)
- \( U_s = 2 \times 10^{-7} \times 100 \times 10^{-3} \) = 2 V