

## SiC-Photodiode 0,1 mm<sup>2</sup> with Voltage-Output JIC227 · JIC228 · JIC229

### Characteristics :

- ◆ SiC photodiode with built-in transimpedance-amplifier
- ◆ voltage output  $U_{out}$  up to 5 V
- ◆ spectral range: 210 ... 355 nm
- ◆ active area: 0,1 mm<sup>2</sup>
- ◆ standard versions available in three transimpedance values:  
 $R_F = 10 \text{ M}\Omega / 100 \text{ M}\Omega / 1000 \text{ M}\Omega$
- ◆ external adjustment of gain and bandwidth possible via sensor-pin
- ◆ dynamic range: 4 orders of magnitude
- ◆ single supply voltage
- ◆ sensor assembly isolated from case
- ◆ hermetically sealed TO5-package
- ◆ RoHS, REACH and WEEE conform



### Applications :

- ◆ optical measurements in UV-range
- ◆ control of sterilization lamps
- ◆ flame control

### Absolute Maximum Ratings :

- ◆ supply voltage  $U_s$  5,5 V
- ◆ working temperature - 25 °C ... 85 °C
- ◆ storage temperature - 40 °C ... 100 °C
- ◆ soldering temperature (5s) 300 °C

### Technical Specifications :

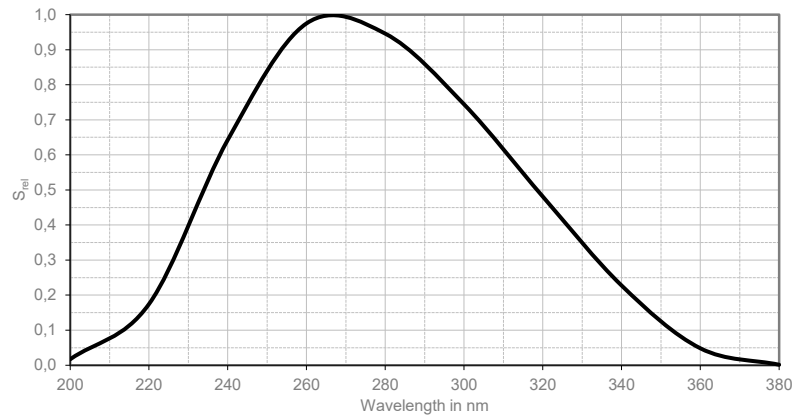
Parameter	Test-conditions	JIC227	JIC228	JIC229	Unit
transimpedance $R_F$		10	100	1.000	M $\Omega$
dark offset voltage	$E = 0 \text{ lx}$	$\pm 1$	$\pm 2$	$\pm 3$	mV
noise voltage	$B = 1 \text{ kHz}$	1			mV <sub>rms</sub>
max. spectral responsivity $S_{max}$	$\lambda = 272 \text{ nm}$	1,8	18	180	mV/nW
min. irradiance (sensitivity)	$U_{out} = 0,5 \text{ mV}$ $\lambda = 272 \text{ nm}$	2,77	0,277	0,0277	mW/m <sup>2</sup>
max. irradiance (saturation)	$U_{out, max} = 5 \text{ V}$ $\lambda = 272 \text{ nm}$	27,7	2,77	0,277	W/m <sup>2</sup>
rise time	10% / 90%	30	200	1100	$\mu\text{s}$
bandwidth	- 3 dB	10	1,5	0,3	kHz
saturation voltage $U_{out, max}$	$R_L = 2 \text{ k}\Omega$	+ 4,95 (+ 4,8)			V
short circuit current $I_{out, max}$		$\pm 50$			mA
supply voltage $U_s$		+ 2,7 ... + 5,25			V
current consumption $I_s$		750 (1100)			$\mu\text{A}$

common test conditions, if not specified otherwise:  $T_A = 25 \text{ }^\circ\text{C}$ ,  $U_s = +5 \text{ V}$   
 typical values, maximum values in brackets

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Relativ Spectral Responsivity  $S_{rel}$ :



Spectral Specifications :

Parameter	Test Conditions	JIC227	JIC228	JIC229	Unit
spectral range	$\lambda_{short}$	210			nm
	$\lambda_{long}$	355			nm
wavelength of max. responsivity $\lambda_{Smax}$	$S = S_{max}$	272			nm
max. spectral sensitivity $S_{max}$	$\lambda = 272$ nm	1,8	18	180	mV/nW
sensitivity for Hg-LP-lamps	$\lambda = 254$ nm	1,6	16	160	mV/nW
FOV	$S = 0,5 * S_{max}$	±48			degree

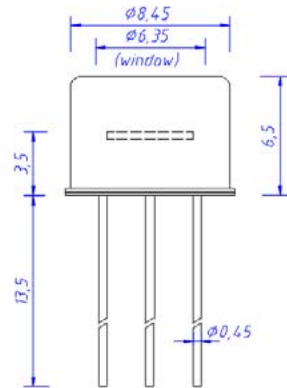
common test conditions, if not specified otherwise:  $T_A = 25$  °C, typical values

Further Available Versions:

Feature	Specification	ifw optronics parts	datasheet
extended wavelength range	spectral range 220-390 nm	JIC217/218/219	on request
wavelength range limitation	UV-A, UV-B, UV-C, etc...	JIC21xA, JIC22xB/C	on request
larger active area	1 mm <sup>2</sup>	JIC267/268/269	on request
high radiation damping filters	ND1, ND2	JIC227-ND1/-ND2	on request
lens-caps (ball lens)	increased signal, reduced FOV	JIC229L	on request
diffusor optics	cosine-corrected signal reponse	JIC22xD	on request

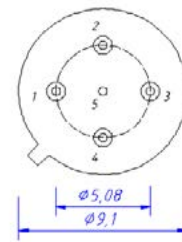
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### Case Dimensions



### Pin Configuration:

- 1 R<sub>F</sub>
- 2 Out
- 3 U<sub>S</sub>
- 4 GND
- 5 Case



bottom view

### Application Notes:

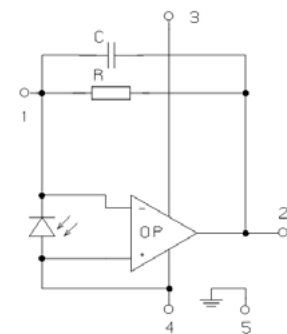
#### Gain and Bandwidth Adjustment

The transimpedance (voltage gain) can be reduced by paralleling the internal feedback resistor with external resistance over pin 1 "R<sub>F</sub>" and pin 2 "Out"

In a similar way the bandwidth of the amplifier can be decreased by paralleling additional feedback-capacitance over pin 1 "R<sub>F</sub>" and pin 2 "Out". Bandwidth limitation can be useful to decrease signal noise, or to guarantee amplifier stability when reducing the feedback resistance.

If an external resistor for gain reduction between pin 1 "R<sub>F</sub>" and pin 2 "Out" is used, it is good practice to keep the connector-length as short as possible to reduce noise incoupling and capacative interference.

If the internally adjusted gain is used only, it is good practice to cut pin 1 to omit noise incoupling.



Schematic: Internal circuit with pinout

#### Power-Supply

A well regulated supply voltage U<sub>S</sub> should be used. There is no internal protection to prevent damage from voltage spikes or overvoltage situations.

It is good practice to use a decoupling capacitor (ca. 100nF, ceramic-type) between pin 3 "U<sub>S</sub>" and pin 4 "GND" in proximity to the photodiode package.

#### Grounding

Depending on the application, the case pin 5 can be connected to the ground potential of the circuit or the shielding environment. It is good practice to connect pin 5 "Case" to pin 4 "GND" if in doubt. Pin 5 should not be left floating.