

SiC-Photodiode 0,1 mm² with Voltage-Output JIC217 · JIC218 · JIC219

Characteristics :

- ◆ SiC photodiode with built-in transimpedance-amplifier
- ◆ voltage output U_{out} up to 5 V
- ◆ spectral range: 220 ... 390 nm
- ◆ active area: 0,1 mm²
- ◆ 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 :

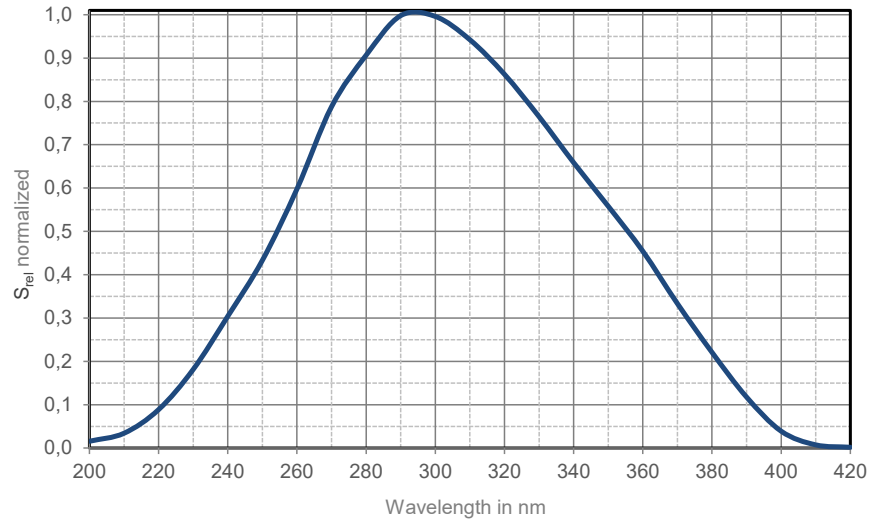
Parameter	Test-conditions	JIC217	JIC218	JIC219	Unit
transimpedance R_F		10	100	1.000	M Ω
dark offset voltage	$E = 0 \text{ lx}$	± 1	± 2	± 3	mV
noise voltage	$B = 1 \text{ kHz}$	1			mV _{rms}
max. spectral responsivity S_{max}	$\lambda = 292 \text{ nm}$	1,9	19	190	mV/nW
min. irradiance (sensitivity)	$U_{out} = 0,5 \text{ mV}$ $\lambda = 292 \text{ nm}$	2,6	0,26	0,026	mW/m ²
max. irradiance (saturation)	$U_{out, max} = 5 \text{ V}$ $\lambda = 292 \text{ nm}$	26	2,6	0,26	W/m ²
rise time	10% / 90%	30	200	1100	μs
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 $I_{out, max}$		± 50			mA
supply voltage U_s		+ 2,7 ... + 5			V
current consumption I_s		750 (1100)			μA

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	JIC217	JIC218	JIC219	Unit
spectral range	λ_{short}	222			nm
	λ_{long}	392			nm
wavelength of max. responsivity λ_{Smax}	$S = S_{max}$	292			nm
max. spectral sensitivity S_{max}	$\lambda = 292$ nm	1,9	19	190	mV/nW
sensitivity for Hg-LP-lamps	$\lambda = 254$ nm	0,95	9,5	95	mV/nW
FOV	$S = 0,5 * S_{max}$	±48			degree

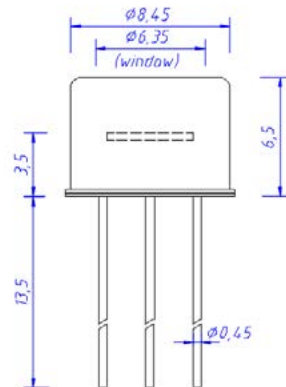
common test conditions, if not specified otherwise: $T_A = 25$ °C, typical values

Further Available Version:

Feature	Specification	ifw optronics parts	datasheet
increased visible blindness	spectral range 215-355 nm	JIC227/228/229	on request
wavelength range limitation	UV-A, UV-B, UV-C, etc...	JIC21xA, JIC22xB/C	on request
larger active area	1 mm ²	JIC267/268/269	on request
high radiation damping filters	ND1, ND2	JIC217-ND1/-ND2	on request
lens-caps (ball lens)	increased signal, reduced FOV	JIC219L	on request
diffusor optics	cosine-corrected signal reponse	JIC21xD	on request
custom transimpedance	R_F up to 22 Gohm possible	JIC21xyy	on request

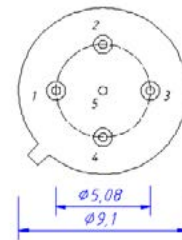
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Case Dimensions:



Pin Configuration:

- 1 R_F
- 2 Out
- 3 U_S
- 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_F" 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_F" 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_F" and pin 2 "Out" is used, it is good practice to keep the connector-length as short as possible to reduce noise incoupling and capacitive interference.

If the internally adjusted gain is used only, it is good practice to cut pin 1 to omit noise incoupling and/or leave pin 1 floating in the PCB layout.

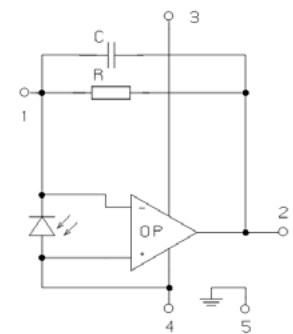
Power-Supply

A well regulated supply voltage U_S 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_S" and pin 4 "GND" in proximity to the photodiode package.

Grounding

Depending on the application, the "Case" pin 5 can be connected to 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.



Schematic: Internal circuit with pinout