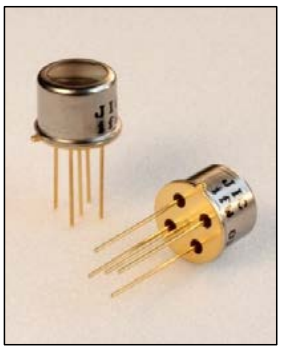
1,0 mm² SiC-Photodiode with Spectral Filter and Voltage Output
JIC267A · JIC267B · JIC267C



Characteristics :

- SiC photodiode with built-in transimpedance-amplifier
- integrated spectral filter for UV-A-, UV-B- or UV-C-range
- further filter characteristics available
- active area: 1,0 mm²
- standard versions available in three transimpedance values: R_F = 10 MΩ / 100 MΩ / 1000 MΩ
- voltage output U_{out} up to 5 V
- 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 :

- selective measurement of the UV region with spectral restriction
- optical measurements in UV-range
- control of sterilization lamps
- flame control

Absolute Maximum Ratings :

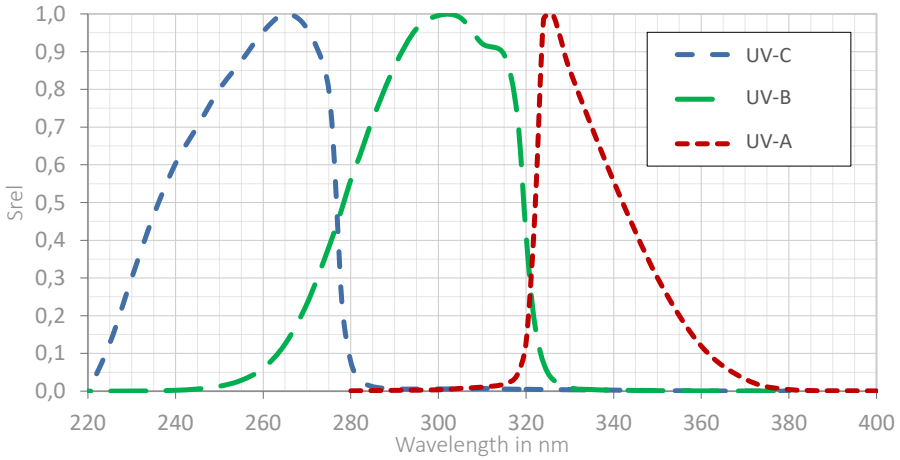
♦ supply voltage U_S	5,5 V
♦ working temperature	- 25 °C ... 85 °C
♦ storage temperature	- 40 °C ... 100 °C
♦ soldering temperature (5s)	300 °C

More Available Standard Filter Options 220 nm – 360 nm:

Filter	Spectral-range
UV-AB	280-360 nm
UV-BC	228-322 nm
UV-DVGW	240-290 nm
Erythema	CIE 87

Further options on request

Relativ Spectral Responsivity S_{rel}:



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Technical Specifications :

Parameter	Test-conditions		JIC267A JIC267B JIC267C	JIC268A JIC268B JIC268C	JIC269A JIC269B JIC269C	Unit
transimpendance R_F			10	100	1.000	MΩ
dark offset voltage	E = 0 lx		± 1	± 2	± 3	mV
noise voltage	B = 1 kHz		1			mV_{rms}
max. spectral responsivity S_{max}	$\lambda = \lambda_p$	UV-A	1,0	10	100	mV/nW
		UV-B	1,3	13	130	
		UV-C	1,7	17	170	
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 kΩ		+ 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 °C, U_S = +5 V
typical values, maximum values in brackets

Spectral Specifications :

Parameter	Test Conditions		UV-A	UV-B	UV-C	Unit
spectral range λ_{short}	S = 0,1 * S_{max}		318	265	225	nm
spectral range λ_{long}			360	322	280	nm
wavelength of max. responsivity λ_p	S = S_{max}		325	300	265	nm
max. spectral responsivity S_{max}	$\lambda = \lambda_p$	R_F = 10 MΩ	1,0	1,3	1,6	mV/nW
		R_F = 100 MΩ	10	13	16	
		R_F = 1.000 MΩ	100	130	160	
responsivity for Hg-LP-lamps	λ = 254 nm, R_F = 100 MΩ		<0,01	<0,03	14,5	mV/nW
min. irradiance (sensitivity)	U_{out} = 0,5 mV, λ = λ_p	R_F = 10 MΩ	0,5	0,38	0,31	mW/m²
		R_F = 100 MΩ	0,05	0,038	0,031	
		R_F = 1.000 MΩ	0,005	0,0038	0,0031	
max. irradiance (saturation)	U_{out} = 5 V, λ = λ_p	R_F = 10 MΩ	5	3,8	3,1	W/m²
		R_F = 100 MΩ	0,5	0,38	0,31	
		R_F = 1.000 MΩ	0,05	0,038	0,031	
FOV	S = 0,5 * S_{max}		±48			degree

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

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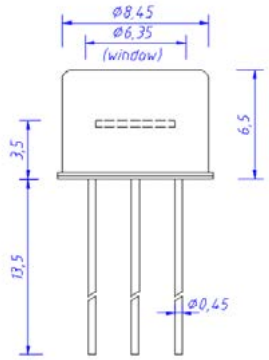
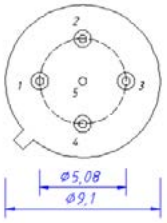
Case Dimensions:



Pin Configuration:

1 R_F
2 Out
3 U_S
4 GND
5 Case



bottom view

Application Notes:

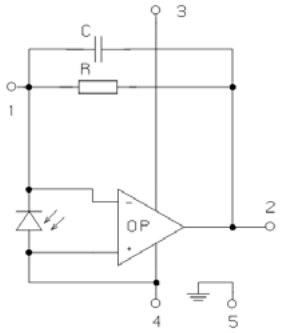
Gain and Bandwidth Adjustment

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 bandwith of the amplifier can be decreased by paralleling additional feedback-capacitance over pin 1 "R_F" and pin 2 "Out". Bandwidth limitation can be usefull 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 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_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.

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