

# SSO-AD-800-TO5i

## Avalanche Photodiode

### Special characteristics

High gain at low bias voltage  
Fast rise time  
800  $\mu\text{m}$  diameter active area  
low capacitance



<b>Parameters:</b>	
active area	0,5 mm <sup>2</sup> Ø 800 $\mu\text{m}$
dark current <sup>1)</sup> (M=100)	max. 6 nA typ. 4 nA
Total capacitance <sup>1)</sup> (M=100)	typ. 5 pF
Break down U <sub>BR</sub> <sup>2)</sup> (at I <sub>D</sub> =2 $\mu\text{A}$ )	100 - 220 V
Temperature coefficient of U <sub>BR</sub>	typ. 0,4 %/°C
Spectral responsivity at 780 nm	min. 0,40 A/W typ. 0,45 A/W
Cut-off frequency (-3dB)	typ. 0,5 GHz
Rise time	typ. 700 ps
Optimum gain	50 - 60
Gain M	min 200
"Excess Noise" factor (M=100)	typ. 2,2
"Excess Noise" index (M=100)	typ. 0,2
Noise current (M=100)	typ. 3 pA/Hz <sup>1/2</sup>
N.E.P. (M=100, 880 nm)	typ. 4 * 10 <sup>-14</sup> W/Hz <sup>1/2</sup>
Operating temperature	-20 ... +70°C
Storage temperature	-60 ... +100°C

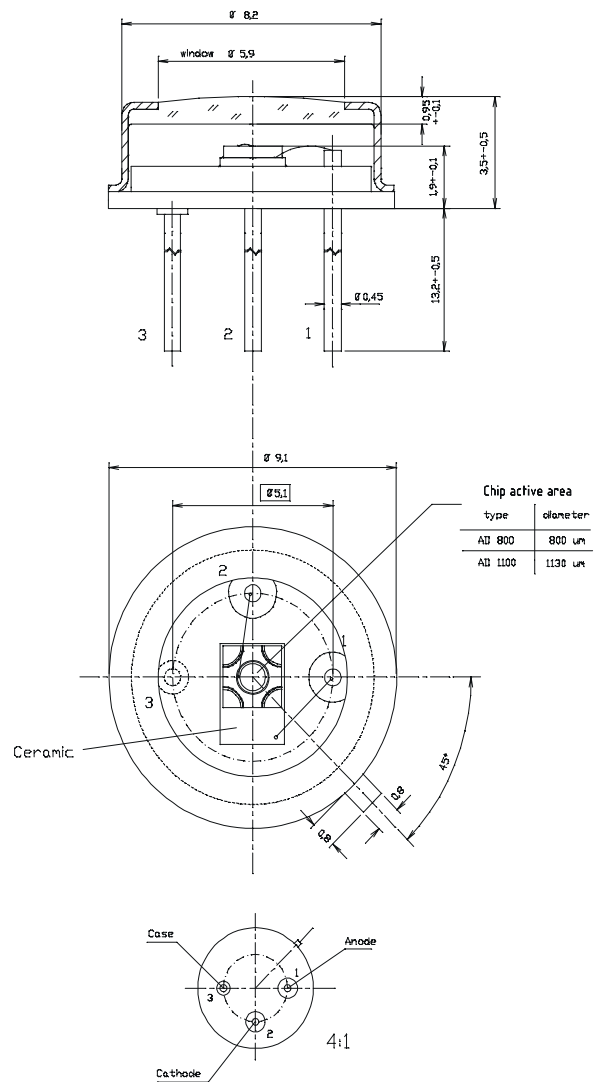
1) measurement conditions:

Setup of photo current 10nA at M=1 and irradiation by a NIR-LED (880nm, 80nm bandwidth).

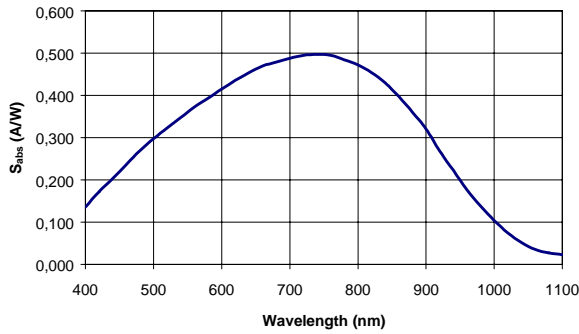
Rise of the photo current up to 1  $\mu\text{A}$ , (M=100) by internal multiplication due to an increasing bias voltage.

2) limited U<sub>BR</sub> range possible to agree

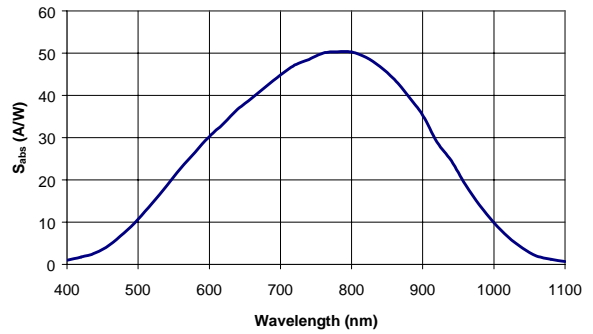
### Package 3 (TO5i) :



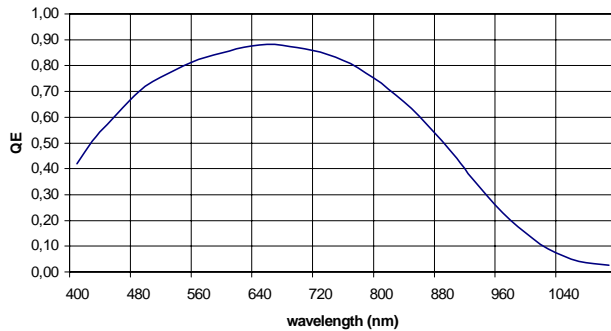
SSO - AD - serie  
Spectral Responsivity at M=1



SSO - AD - serie  
Spectral Responsivity at M=100

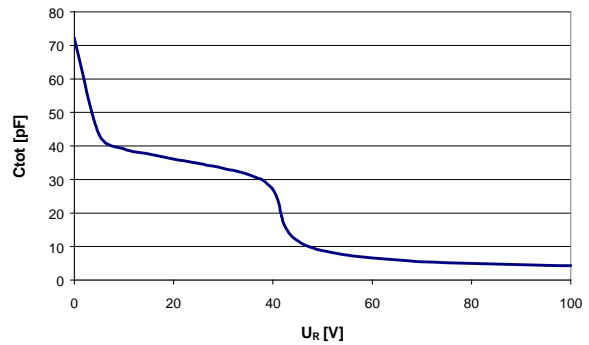


SSO - AD - serie  
quantum efficiency for M=1



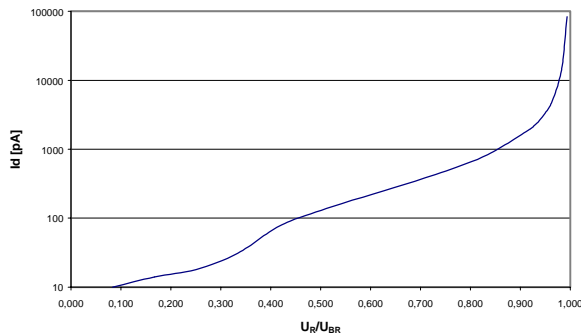
C<sub>tot</sub>=f(U<sub>R</sub>)

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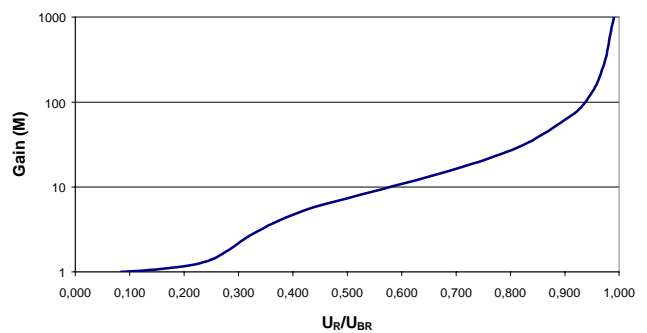
I<sub>D</sub>=f(U<sub>R</sub>/U<sub>BR</sub>)

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Gain=f(U<sub>R</sub>/U<sub>BR</sub>)

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### Maximum Ratings:

- max. electrical power dissipation 200 mW at 22°C
- max. optical peak value, once 400 mW for 1 s
- max. continuous optical operation I<sub>Ph</sub> (DC) ≤ 500 μA  
≤ 2 mA for signal 50 μs "on" / 1 ms "out"
- ( P<sub>electr.</sub> = P<sub>opt.</sub> \* S<sub>abs</sub> \* M \* U<sub>R</sub> )

### Application hints:

- Current limit is to be realized via protecting resistor or current limiting - IC inside the supply voltage.
- Use of low noise read-out - IC.
- For higher gain a regulation of bias voltage due to the temperature is to be realized.
- For very small signals stray light (noise source) is to be excluded by filters in order to improve the signal-noise relation.
- Avoid touching the window with fingers!
- Careful cleaning with Ethyl alcohol possible.
- Avoid use of pointed and scratching tools!

### Handling precautions:

- Soldering temperature 260°C for max. 10 s. The device must be protected against solder flux vapour!
- min. Pin - length 2mm
- ESD - protection Only small danger for the device. Standard precautionary measures are sufficient.
- Storage Store devices in conductive foam.

