

# AD100-8 TO52S1

## Avalanche Photodiode

### Special characteristics:

high gain at low bias voltage  
fast rise time  
100  $\mu\text{m}$  diameter active area  
low capacitance



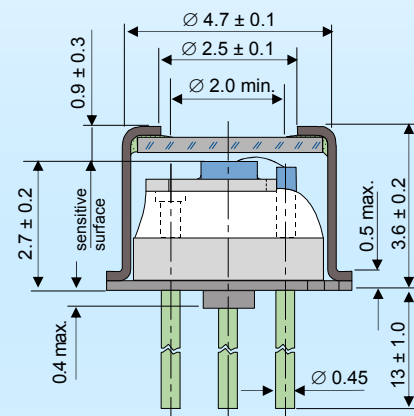
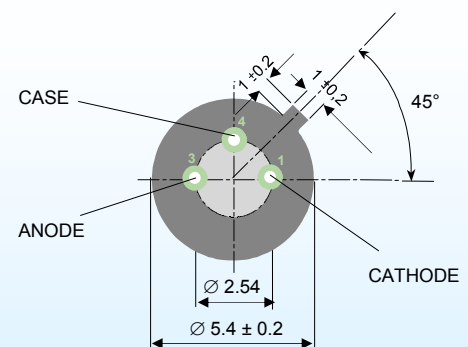
| Parameters: (at 20 $\pm$ 2°C)                                       |  |
|---|--|
| Active Area   | 0.00785 mm <sup>2</sup><br>$\varnothing$ 100 $\mu\text{m}$ |
| Dark Current <sup>1)</sup><br>(M=100)                               | max. 0.1 nA<br>typ. 50 pA                                  |
| Total Capacitance <sup>1)</sup><br>(M=100)                          | typ. 0.8 pF  |
| Breakdown Voltage U <sub>BR</sub><br>(at I <sub>D</sub> =2 $\mu$ A) | 120 - 190 V  |
| Temperature Coefficient of U <sub>BR</sub>                          | 0.35 ... 0.55 V/K<br>typ. 0.45 V/K                         |
| Spectral Responsivity<br>(at 800 nm, at M=100)                      | min. 45 A/W<br>typ. 50 A/W                                 |
| Cut-off Frequency<br>(-3dB)   | > 2 GHz  |
| Rise Time   | < 180 ps   |
| Optimum Gain  | 50 - 60  |
| Max. Gain   | > 200  |
| "Excess Noise" factor<br>(M=100)                                    | typ. 2.2   |
| "Excess Noise" index<br>(M=100)                                     | typ. 0.2   |
| Noise Current<br>(M=100)  | typ. 0.15 pA/Hz <sup>1/2</sup>                             |
| N.E.P.<br>(M=100, 800 nm)   | typ. 3 * 10 <sup>-15</sup> W/Hz <sup>1/2</sup>             |
| Operating Temperature   | -20 ... +70 °C   |
| Storage Temperature   | -60 ... +100 °C  |

#### 1) measurement conditions:

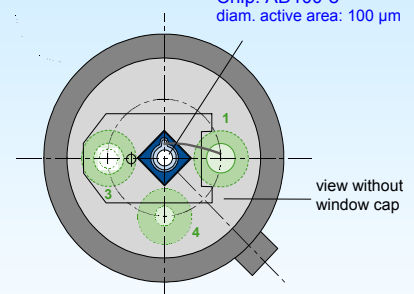
Setup of photo current 50 pA at M = 1 and irradiation by a LED (680 nm, 60 nm bandwidth).

Increase the photo current up to 5.0 nA, (M = 100) by internal multiplication due to an increasing bias voltage.

### Package (TO52S1):

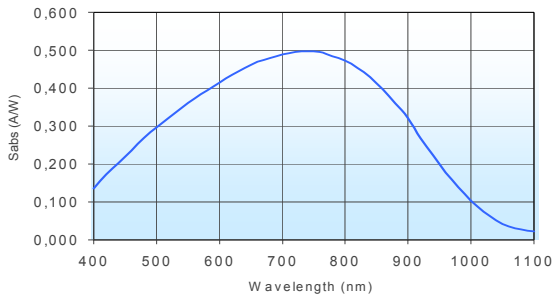


Chip: AD100-8  
diam. active area: 100  $\mu\text{m}$



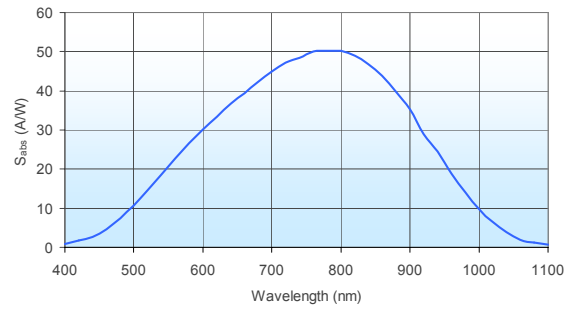
### Spectral Responsivity at M=1

series - 8



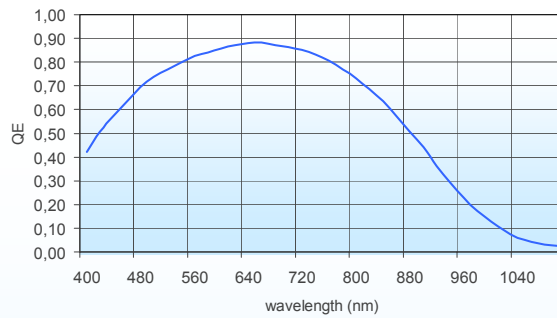
### Spectral Responsivity at M=100

series - 8



### quantum efficiency for M=1

series - 8



#### Maximum Ratings:

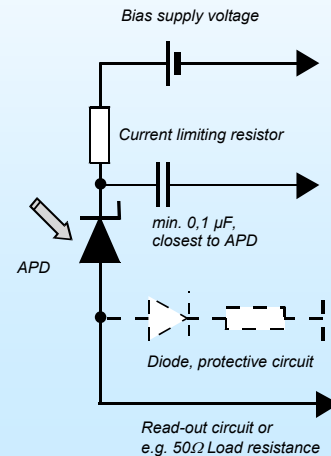
- max. electrical power dissipation 100 mW at 22°C
- max. optical peak value, once 200 mW for 1 s
- max. continuous optical operation  $I_{Ph} (DC) \leq 250 \mu A$   
 $\leq 1 \text{ mA}$  for signal 50  $\mu s$  "on" / 1 ms "off"
- $( P_{electr.} = P_{opt.} * S_{abs} * M * U_R )$

#### Application Hints:

- Current should be limited by a protecting resistor or current limiting - IC inside the power supply.
- Use of low noise read-out - IC.
- For high gain applications bias voltage should be temperature compensated.
- For low light level applications, blocking of ambient light should be used.

#### Handling Precautions:

- Soldering temperature 260 °C for max. 10 s. The device must be protected against solder flux vapour!
- min. Pin - length 2 mm
- ESD - protection Standard precautionary measures are sufficient.
- Storage Store devices in conductive foam.
- Avoid skin contact with window!
- Clean window with Ethyl alcohol if necessary.
- Do not scratch or abrade window.



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