

# AD500-9 TO52S3

## Avalanche Photodiode

### Special characteristics:

quantum efficiency > 80 % at  $\lambda$  760 - 910 nm  
 high speed, low noise  
 500  $\mu$ m diameter active area  
 low slope multiplication curve



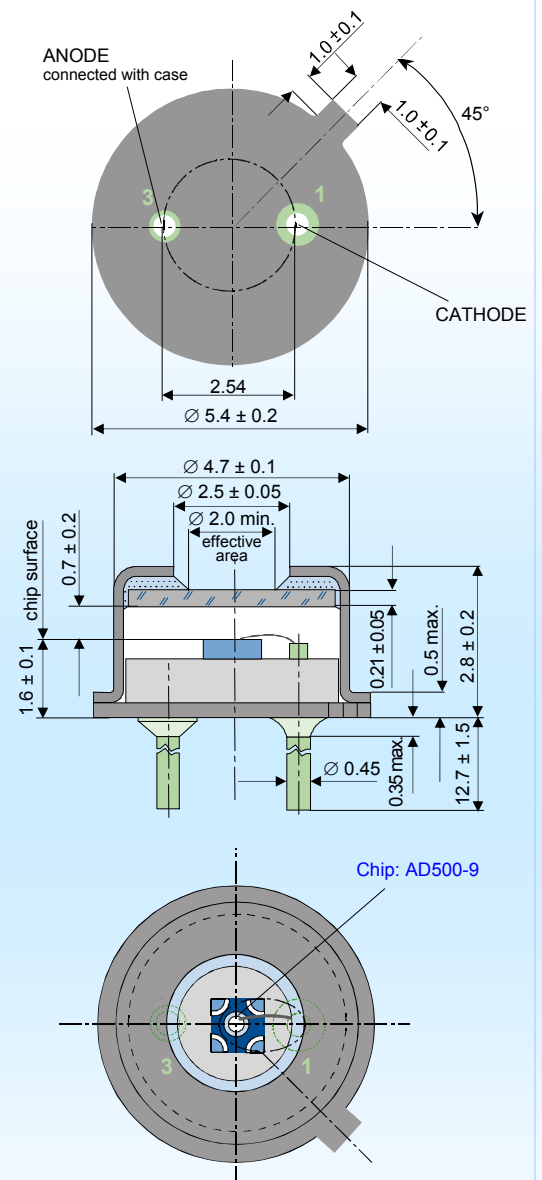
Parameters:	AD500-9 TO52S3
Active Area	0.196 mm <sup>2</sup> Ø 500 $\mu$ m
Dark Current <sup>1)</sup> (M = 100)	max. 5 nA typ. 0,5 - 1 nA
Total Capacitance <sup>1)</sup> (M = 100)	typ. 1.2 pF
Breakdown Voltage U <sub>BR</sub> (at I <sub>D</sub> = 2 $\mu$ A)	120 ... 300 V typ. > 200 V
Temperature Coefficient of U <sub>BR</sub>	typ. 1.55 V/K
Spectral Responsivity <sup>1)</sup> (at 905 nm, M = 100)	min. 55 A/W typ. 60 A/W
Cut-off Frequency (-3dB)	typ. 0.5 GHz
Rise Time	typ. 550 ps
Optimum Gain	50 - 60
Max. Gain	> 200
"Excess Noise" factor (M = 100)	typ. 2.5
"Excess Noise" index (M = 100)	typ. 0.2
Noise Current (M = 100)	typ. 1 pA/Hz <sup>1/2</sup>
N.E.P. (M = 100, 905 nm)	typ. 2* 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 10 nA at M = 1 and irradiation by an IRED (880 nm, 80 nm bandwidth).

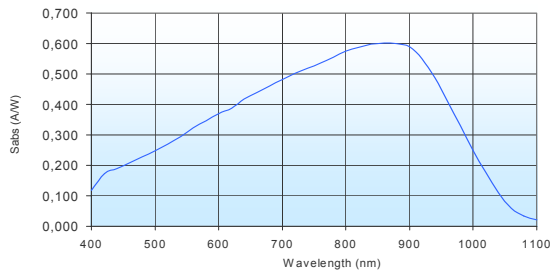
Increase the photo current up to 1  $\mu$ A, (M = 100) by internal multiplication due to an increasing bias voltage.

### Package (TO52S3):



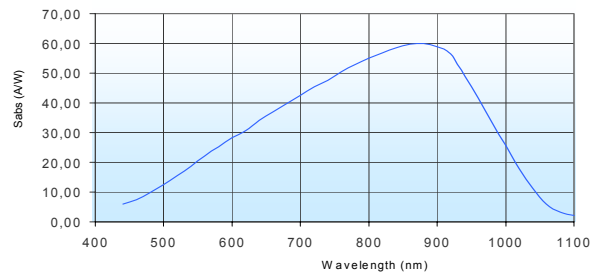
### Spectral Responsivity at M = 1

series - 9



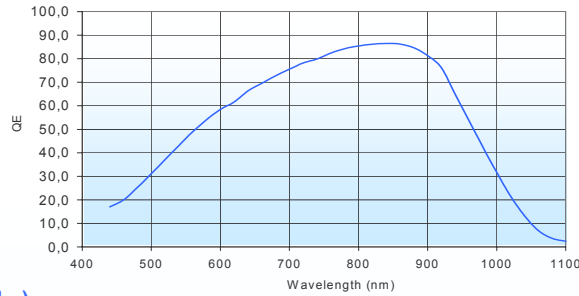
### Spectral Responsivity at M = 100

series - 9



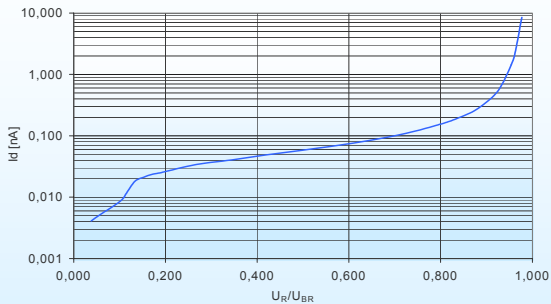
### QE for M = 1

series - 9



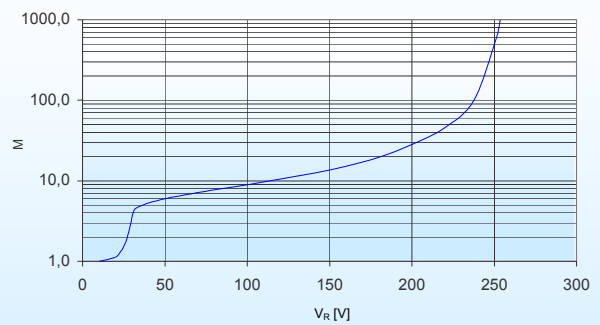
### $I_D = f(U_R/U_{BR})$

AD500-9



### Gain = f(V\_R)

AD500-9



### Maximum Ratings:

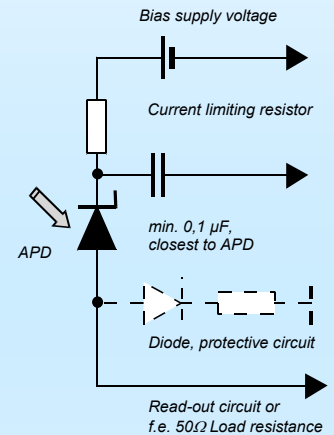
- max. electrical power dissipation 100 mW at 22°C
- max. optical peak value, once 200 mW for 1 s
- max. continuous optical operation  $I_{Ph} (DC) \leq 250 \mu A$   
 $\leq 1 \text{ mA}$  for signal 50  $\mu s$  "on" / 1 ms "off"
- $(P_{electr.} = P_{opt.} * S_{abs} * M * U_R)$

### 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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