# AD500-9 TO52S1F2

## Avalanche Photodiode for NIR with bandpass filter for 905 nm

### Special characteristics:

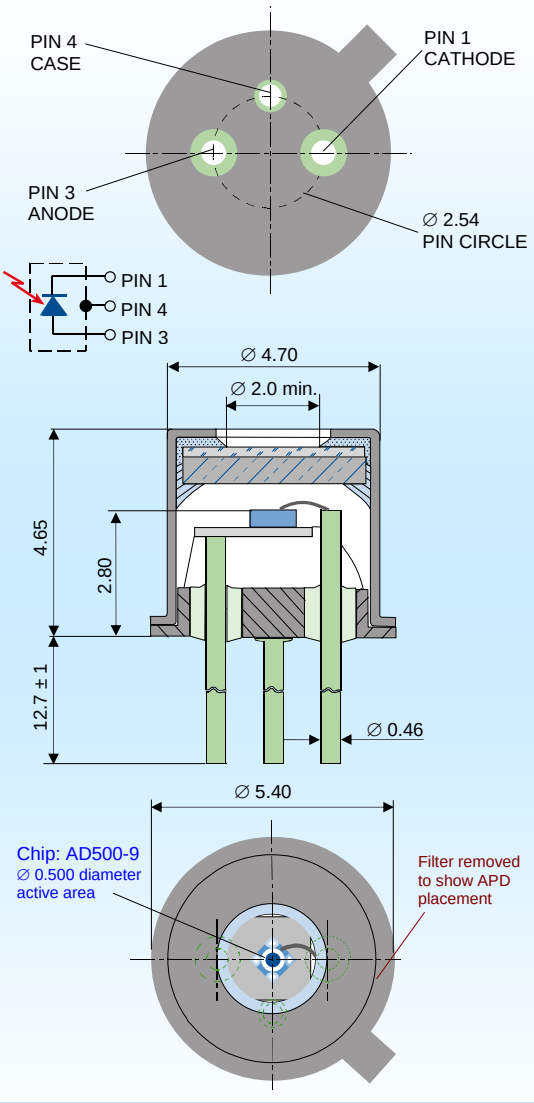
**quantum efficiency > 70 % at λ 890 - 915 nm**
**high speed, low noise**
**500 µm diameter active area**
**low slope multiplication curve**

| **Parameters**: | | |
|---|---|---|
| Active Area | | 0.196 mm$^2$<br>∅ 500 µm |
| Dark Current [1]<br>(M = 100) | | max. 5 nA<br>typ. 0.5 - 1 nA |
| Total Capacitance [1]<br>(M = 100) | | typ. 1.2 pF |
| Breakdown Voltage $U_{BR}$<br>(at $I_D$ = 2µA) | | 120 - 300 V<br>typ. > 200 V |
| Temperature Coefficient of $U_{BR}$ | | typ. 1.55 V/K |
| Spectral Responsivity<br>(at 905 nm; M = 100) | | min. 48 A/W<br>typ. 52 A/W |
| Cut-off Frequency<br>(-3dB; M = 100) | 905 nm | typ. 0.5 GHz |
| Rise Time<br>(M = 100; 50 Ω) | 905 nm | 550 ps |
| Optimum Gain | | 50 - 60 |
| "Excess Noise" factor<br>(M = 100) | | typ. 2.5 |
| "Excess Noise" index<br>(M = 100) | | typ. 0.2 |
| Noise Current<br>(M = 100) | | max. 1 pA/Hz$^{½}$ |
| N.E.P.<br>(M = 100, 905 nm) | | max. 2 * 10$^{-14}$ W/Hz$^{½}$ |
| Operating Temperature<br>Storage Temperature | | -20 ... +70 °C<br>-55 ... +100 °C |

1) ***measurement conditions***:
*Setup of photo current 10 nA at M = 1 and irradiation by an IRED (905 nm, 80 nm bandwidth).*
*Increase the photo current up to 1 µA, (M = 100) by internal multiplication due to an increasing bias voltage.*

*RoHS compliant*

### Package (TO52S1F2):



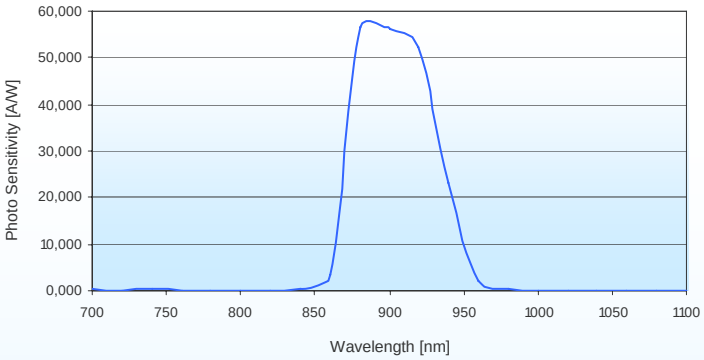




*Version: 09-08-31*
*Order number: 500590*

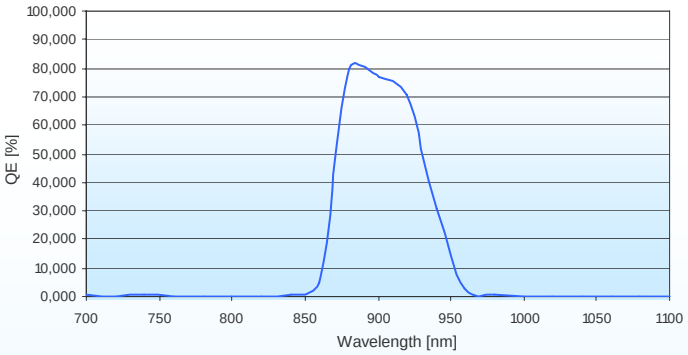
## Spectral Responsivity; Gain: 100

Series - 9



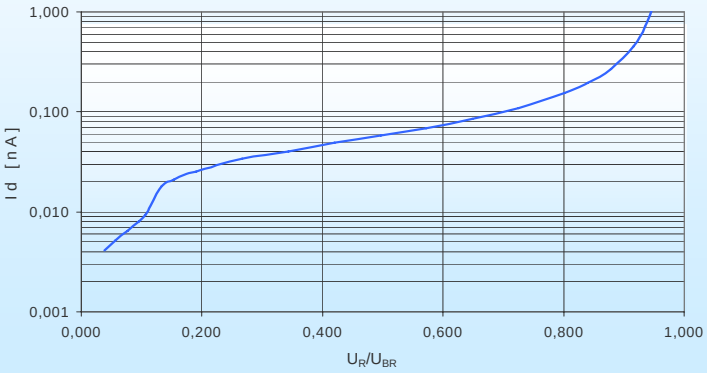

## Quantum Efficiency; Gain: 100

Series -9



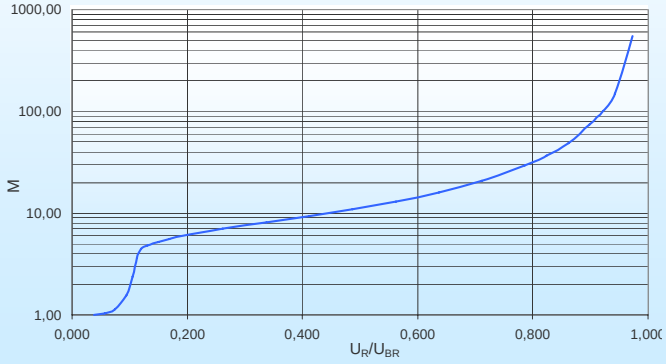

## $I_D = f (U_R/U_{BR})$

AD500-9 with bandpass filter for 905 nm



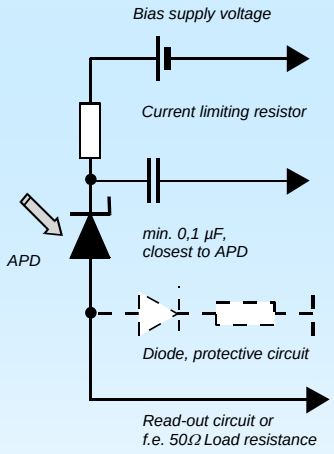

## Gain = f ($U_R/U_{BR}$)

AD500-9 with bandpass filter for 905 nm




## Maximum Ratings:

- max. electrical power dissipation — 100 mW at 22 °C
- max. optical peak value, once — 200 mW for 1 s
- max. continous optical operation — $I_{Ph}$ (DC) ≤ 250 µA ≤ 1 mA for signal 50 µs "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.

*Disclaimer: Due to our policy of continued development, specifications are subject to change without notice.*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