

AD500-8 TO52S1

Avalanche Photodiode

Special characteristics:

high gain at low bias voltage
fast rise time
500 μm diameter active area
low capacitance



Parameters:	AD500-8 TO52S1
Active Area	0.196 mm ² Ø 500 μm
Dark Current ¹⁾ (M = 100)	max. 5 nA typ. 0,5 - 1 nA
Total Capacitance ¹⁾ (M = 100)	typ. 2.2 pF
Breakdown Voltage U _{BR} (at I _D = 2 μA)	90 ... 240 V typ. 120 ... 190 V
Temperature Coefficient of U _{BR}	typ. 0.45 V/K
Spectral Responsivity ¹⁾ (at 800 nm, M = 100)	min. 45 A/W typ. 50 A/W
Cut-off Frequency (-3dB)	typ. 1.6 GHz
Rise Time	typ. 220 ps
Optimum Gain	50 - 60
Max. Gain	> 200
"Excess Noise" factor (M = 100)	typ. 2.2
"Excess Noise" index (M = 100)	typ. 0.2
Noise Current (M = 100)	typ. 1 pA/Hz ^{1/2}
N.E.P. (M = 100, 800 nm)	typ. 2* 10 ⁻¹⁴ W/Hz ^{1/2}
Operating Temperature	-20 ... +70 °C
Storage Temperature	-60 ... +100 °C

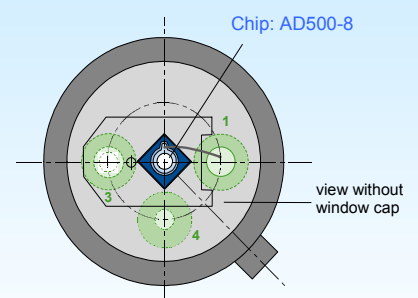
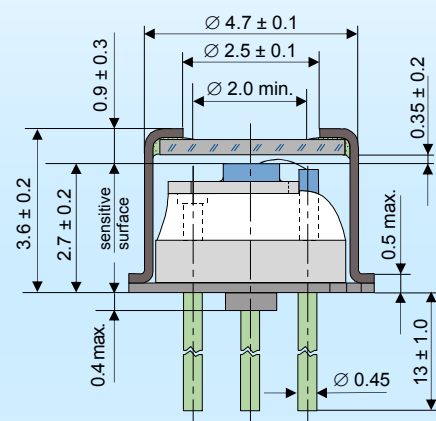
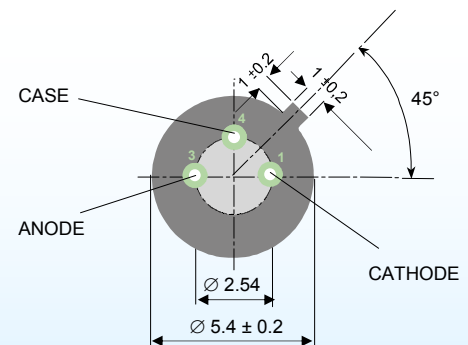
1) measurement conditions:

Setup of photo current 10 nA at M = 1 and irradiation by a LED
(680 nm, 60 nm bandwidth).

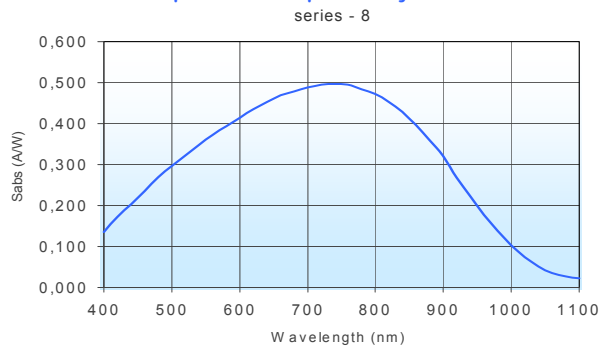
Increase the photo current up to 1 μA , (M = 100) by internal multiplication
due to an increasing bias voltage.

RoHS compliant

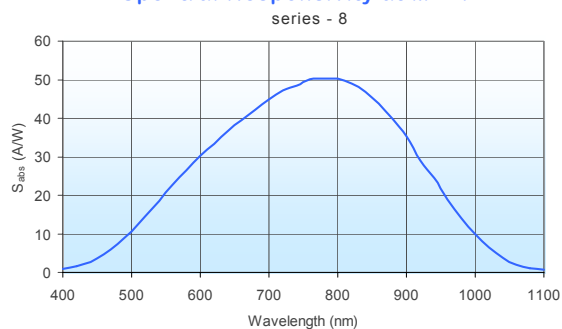
Package (TO52S1):



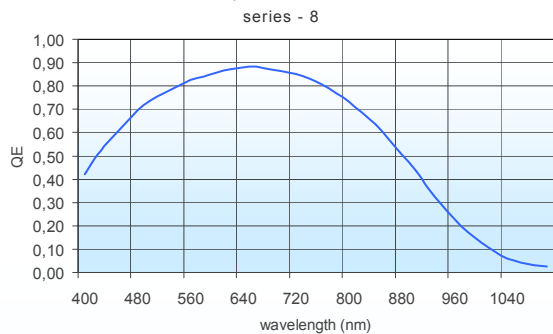
Spectral Responsivity at M = 1



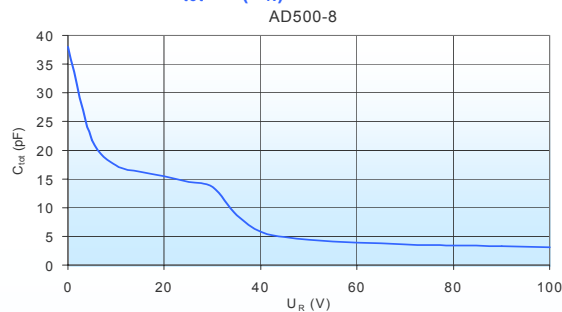
Spectral Responsivity at M = 100



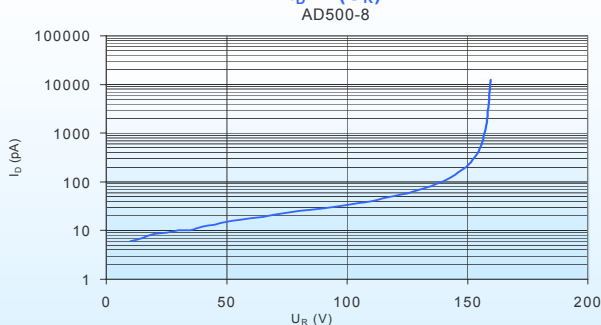
QE for M = 1



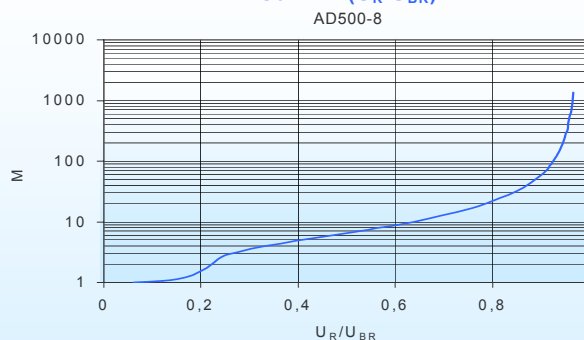
C_{tot} = f(U_R) at f = 100kHz



I₀ = f(U_R)



Gain = f(U_R/U_{BR})



Maximum Ratings:

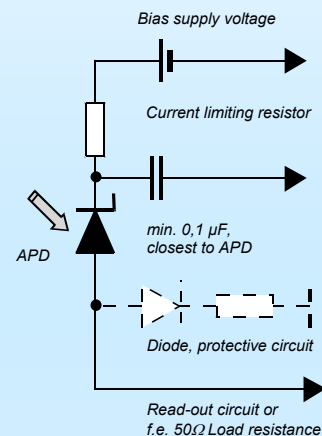
- max. electrical power dissipation 100 mW at 22°C
- max. optical peak value, once 200 mW for 1 s
- max. continuous optical operation $I_{Ph} (DC) \leq 250 \mu A$
 $\leq 1 \text{ mA}$ for signal 50 μs "on" / 1 ms "off"
- $(P_{electr.} = P_{opt.} * S_{abs} * M * U_R)$

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.



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