SSO-AD-500-TO52

Avalanche Photodiode

Special characteristics:

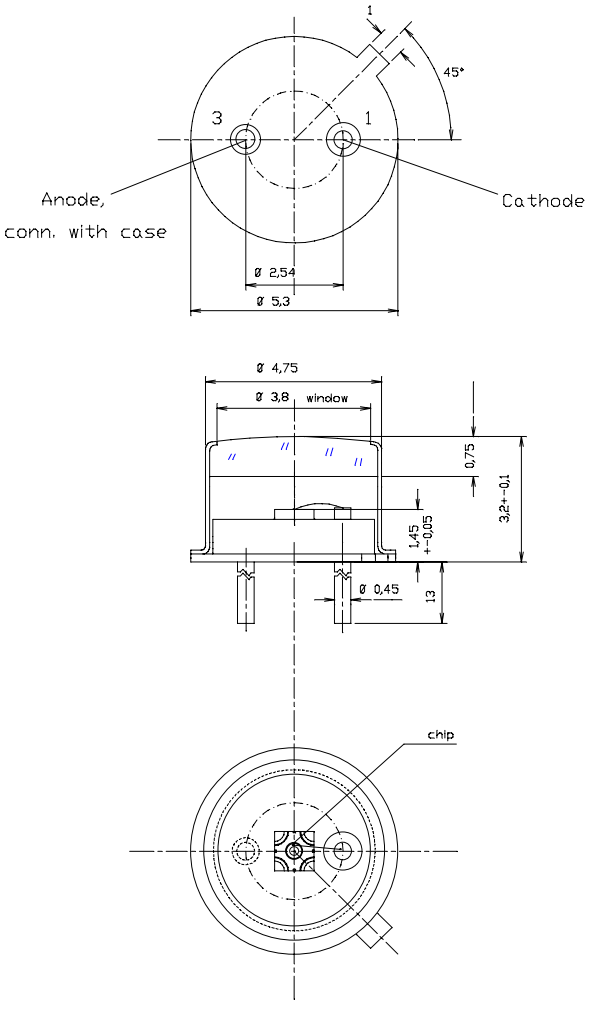
High gain at low bias voltage
Fast rise time
500 µm diameter active area
low capacitance

Parameters:	
Active area	0,196 mm^2 ∅ 500 µm
dark current 1) (M=100)	max. 5 nA typ. 0,5 - 1 nA
Total capacitance 1) (M=100)	typ. 2,5 pF
Break-down voltage U_{BR} (at I_D=2µA)	120 - 190 V
Temperature coefficient of U_{BR}	typ. 0,4 %/°C
Spectral responsivity (at 780 nm)	min. 0,40 A/W typ. 0,45 A/W
Cut-off frequency (-3dB)	typ. 1,3 GHz
Rise time	typ. 280 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. 10 $pA/Hz^{½}$
N.E.P. (M=100, 880 nm)	typ. 2 * 10^{-13} $W/Hz^{½}$
Operating temperature Storage temperature	-20 ... +70°C -60 ... +100°C

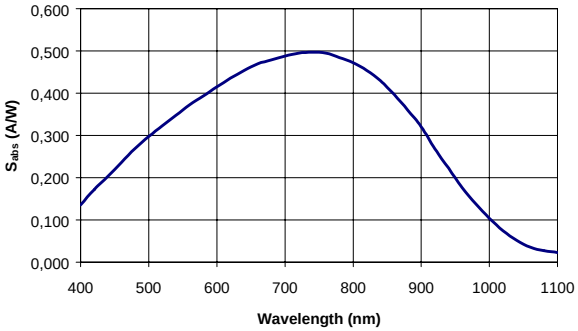
1) **measurement conditions**:
Setup of photo current 10nA at M=1 and irradiation by a NIR-LED (880 nm, 80 nm bandwith).

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

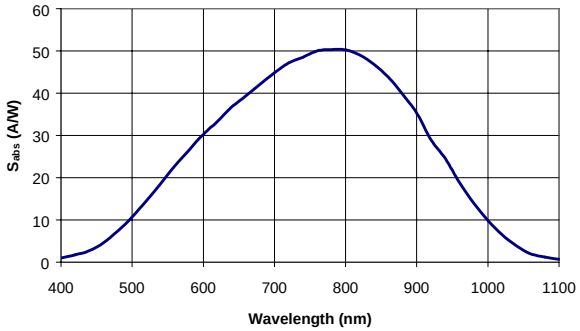
Package 1 (TO52) :



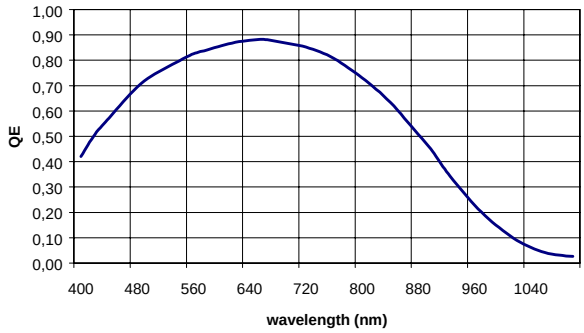
SSO - AD - serie
Spectral Responsivity at M=1



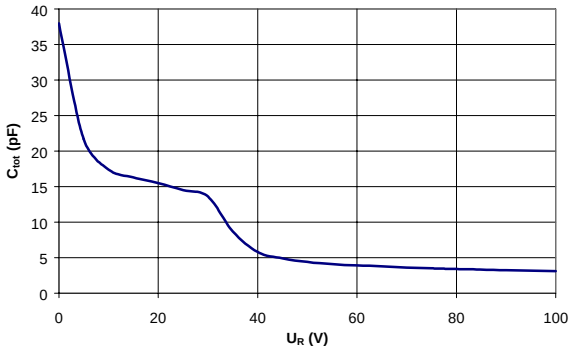
SSO - AD - serie
Spectral Responsivity at M=100



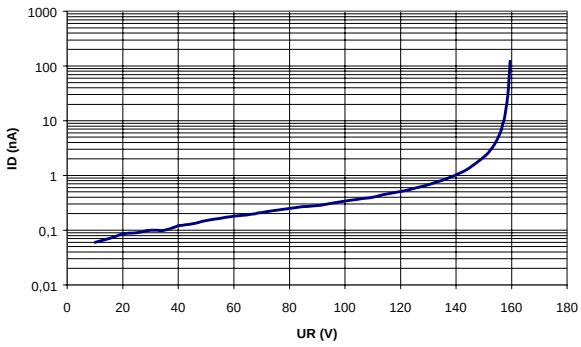
SSO - AD - serie
quantum efficiency for M=1



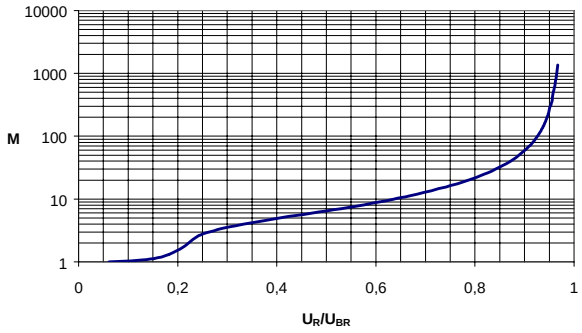
SSO-AD 500
$C_{tot} = f(U_R)$ at f=100kHz



SSO-AD 500 LC
dark current = f(UR)



SSO - AD - serie (versions 500, 800, 1100, 2500)
gain = $f(U_R/U_{BR})$ at λ=880 nm

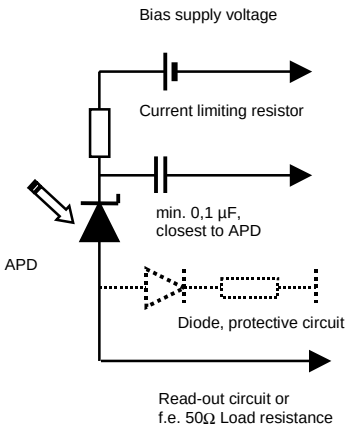


Maximum Ratings:

- 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 "out"
- ($P_{electr.} = P_{opt.} * S_{abs} * M * U_R$)

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.