

# EPIGAP Optronik GmbH

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## Data Sheet

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### Si Avalanche Photodiode

### EOAPD-905-1-13

Rev. 01, 2017

Spectral range	Type	Case
visible-near IR	Si	LCC3 SMD

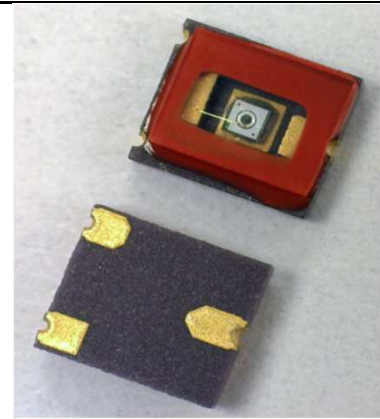
Circular ( $\varnothing 500 \mu\text{m}$ )  $0.2 \text{ mm}^2$  active area avalanche photodiode optimized sensitivity at 905 nm, housed in a LCC3 SMD package. It is well suited for applications requiring high speed and low noise in visible-near IR applications. Operating voltages: 120...160 V.

#### Features:

- > Fast Rise Time
- > Ultra Low Noise
- > Low Capacitance
- > High Gain
- > Optimum Gain M100

#### Applications:

- > Optical rangefinders
- > High speed optical communications
- > Medical Equipment
- > Bar Code Readers



#### Absolute maximum ratings

Parameters	Symbol	Rating	Unit
Operating temperature range	$T_{\text{OPR}}$	-20...+85	$^{\circ}\text{C}$
Storage temperature range	$T_{\text{STG}}$	-55...+125	$^{\circ}\text{C}$
Power dissipation	$P_{\text{D}}$	1	mW
Storage temperature range	$I_{\text{F}}$	1	mA
Operating voltage	$V_{\text{OP}}$	$0.95 \times V_{\text{BR}}$	V
Lead soldering temperature*	$T_{\text{LS}}$	260	$^{\circ}\text{C}$

\*Time 10 sec max



#### Electro-optical characteristics:

$T_{\text{amb}} = 25^{\circ}\text{C}$ , unless otherwise specified

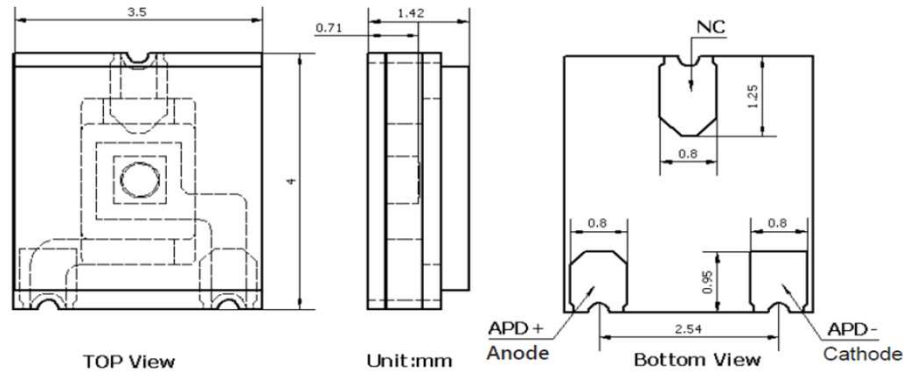
Parameters	Symbol	Min	Typ	Max	Unit	Test conditions
Sensitivity range	$\lambda$	400		1100	nm	
Active area	$I_{\text{PH}}$		$\varnothing 500$		$\mu\text{m}$	
Responsivity	$S_{\lambda}$	50	55		A/W	$\Phi_{\text{e}} = 1 \mu\text{W}$ , M=100, $\lambda = 905 \text{ nm}$
Rise time	$t_{\text{R}}$		0.6		ns	f=1 MHz, $R_{\text{L}} = 50 \Omega$ , $\lambda = 905 \text{ nm}$
Dark current	$I_{\text{D}}$	0.1	0.4	1	nA	M=100
Capacitance	$C_{\text{j}}$		1.2		pF	M=100, 1 MHz
Optimal gain	M		100			
Breakdown voltage	$V_{\text{BR}}$	80		200	V	$I_{\text{R}} = 2 \mu\text{A}$
Temperature coefficient	TKV		0.9		V/K	$T = -40 \dots +85$

We reserve the right to make changes to improve technical design and may do so without further notice. Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer.

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Unit: mm, Tolerance: ±0.2

Package dimensions in mm

Fig 1 Responsivity, Vr=0V

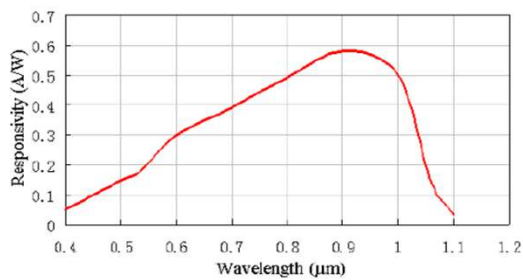


Fig 2 Dark Current

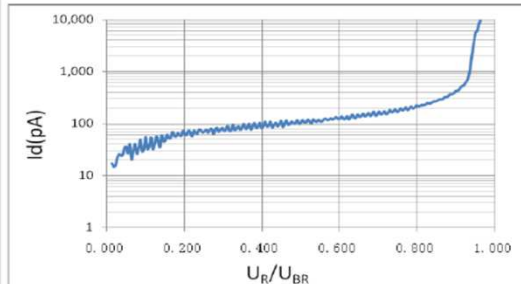


Fig 3 Multiplication

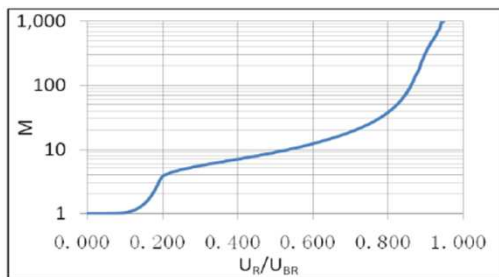
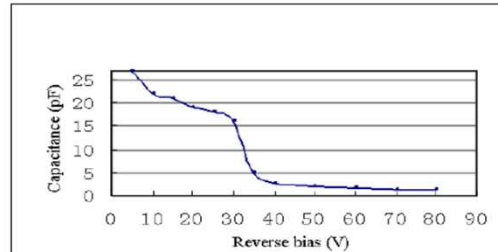


Fig 4 Capacitance

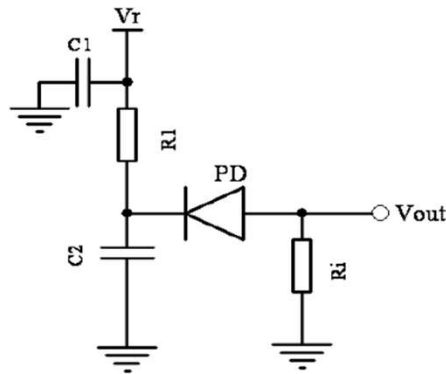


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Applications Diagram



Notes: C1 - Filter capacitor, filter noise from Vr.

C2 - bypass capacitor, the loop to ground for AC signal.

R1 - current-limiting resistor, protect APD from higher voltage.

Ri - sampling resistor, convert the current signal into a voltage signal.