

### FEATURES

- $\varnothing$  100  $\mu\text{m}$  active area
- Low slope multiplication curve
- High speed, low noise
- NIR enhanced

### DESCRIPTION

0.00785  $\text{mm}^2$  High Speed, Low Noise Avalanche Photodiode with N on P construction. Hermetically packaged in a TO-52-S1 with a clear borosilicate glass window cap.

### APPLICATIONS

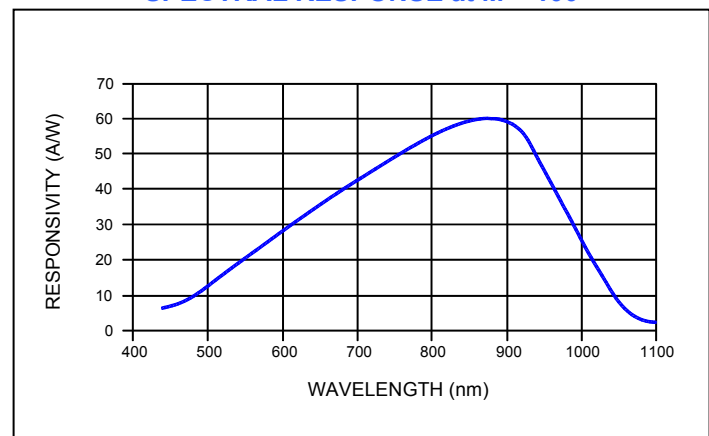
- High speed optical communications
- Laser range finder
- Medical equipment
- High speed photometry



### ABSOLUTE MAXIMUM RATING

SYMBOL	PARAMETER	MIN	MAX	UNITS
$T_{\text{STG}}$	Storage Temp	-55	+125	$^{\circ}\text{C}$
$T_{\text{OP}}$	Operating Temp	-40	+100	$^{\circ}\text{C}$
$T_{\text{SOLDERING}}$	Soldering Temp 10 seconds		+260	$^{\circ}\text{C}$
	Electrical Power Dissipation @ 22 $^{\circ}\text{C}$	-	100	mW
	Optical Peak Value, once for 1 second	-	200	mW
$I_{\text{PH}}(\text{DC})$	Continuous Optical Operation	-	250	$\mu\text{A}$
$I_{\text{PH}}(\text{AC})$	Pulsed Signal Input 50 $\mu\text{s}$ "on" / 1 ms "off"	-	1	mA

### SPECTRAL RESPONSE at M = 100



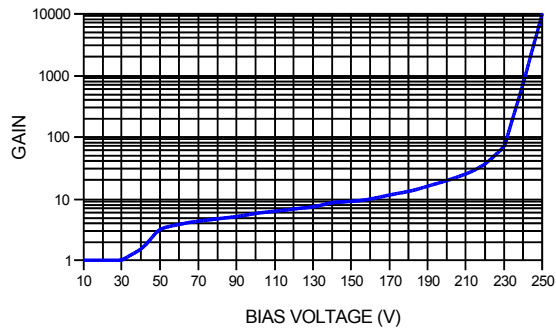
### ELECTRO-OPTICAL CHARACTERISTICS @ 22 $^{\circ}\text{C}$

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN	TYP	MAX	UNITS
$I_{\text{D}}$	Dark Current	M = 100*	---	0.1	0.5	nA
C	Capacitance	M = 100*	---	0.6	---	pF
$V_{\text{BR}}$	Breakdown Voltage	$I_{\text{D}} = 2 \mu\text{A}$	180	240	---	V
	Temperature Coefficient of $V_{\text{BR}}$		---	1.55	---	V/K
	Responsivity	M = 100; = 0 V; $\lambda = 905 \text{ nm}$	55	60	---	A/W
$\Delta f_{3\text{dB}}$	Bandwidth	-3dB	---	0.7	---	GHz
$t_{\text{r}}$	Rise Time	M = 100	---	500	---	ps
	Optimum Gain		50	60	---	
	"Excess Noise" factor	M = 100	---	2.5	---	
	"Excess Noise" index	M = 100	---	0.2	---	
	Noise Current	M = 100	---	0.3	---	$\text{pA}/\text{Hz}^{1/2}$
	Max Gain		200	---	---	
NEP	Noise Equivalent Power	M = 100; $\lambda = 905 \text{ nm}$	---	$6.0 \times 10^{-15}$	---	$\text{W}/\text{Hz}^{1/2}$

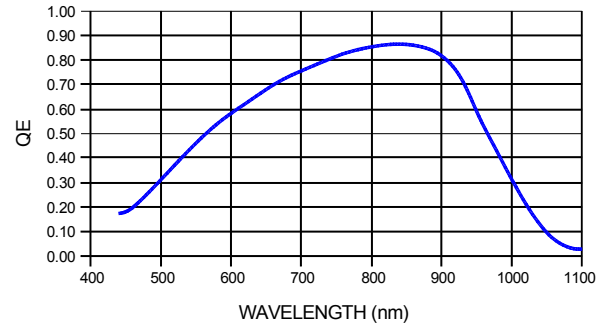
\* Measurement conditions: Setup of photo current 1 nA at M = 1 and irradiated by a 880 nm, 80 nm bandwidth LED. Increase the photo current up to 100 nA, (M = 100) by internal multiplication due to an increasing bias voltage.

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

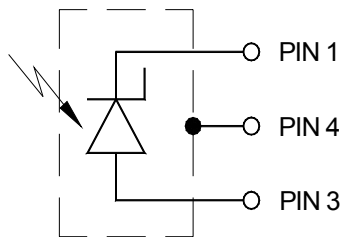
## TYPICAL GAIN vs BIAS VOLTAGE



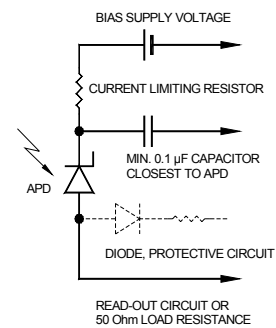
## QUANTUM EFFICIENCY for M = 100



## DEVICE SCHEMATIC



## SUGGESTED CIRCUIT SCHEMATIC



## APPLICATION NOTES

- 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 ( $M > 50$ ) 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 10 seconds max. The device must be protected against solder flux vapor.
- Minimum 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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