

## FEATURES

- $\varnothing$  1.13 mm active area
- High gain at low bias voltage
- Fast rise time
- Low capacitance

## DESCRIPTION

1.00 mm<sup>2</sup> High Speed, High Gain Avalanche Photodiode with N on P construction. Hermetically packaged in a TO-52-S1 with a clear borosilicate glass window cap.

## APPLICATIONS

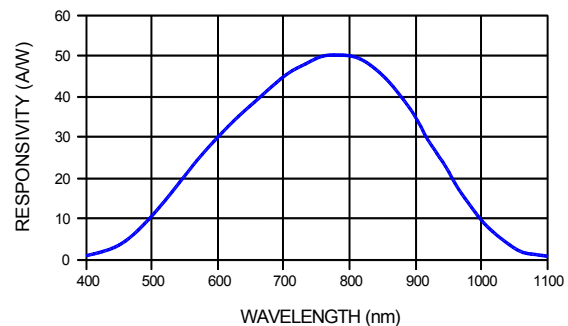
- High speed optical communications
- Laser range finder
- Medical equipment
- High speed photometry



## ABSOLUTE MAXIMUM RATING

SYMBOL	PARAMETER	MIN	MAX	UNITS
T <sub>STG</sub>	Storage Temp	-55	+125	°C
T <sub>OP</sub>	Operating Temp	-40	+100	°C
T <sub>SOLDERING</sub>	Soldering Temp 10 seconds		+260	°C
	Electrical Power Dissipation @ 22°C	-	100	mW
	Optical Peak Value, once for 1 second	-	200	mW
I <sub>PH</sub> (DC)	Continuous Optical Operation	-	250	μA
I <sub>PH</sub> (AC)	Pulsed Signal Input 50 μs "on" / 1 ms "off"	-	1	mA

## SPECTRAL RESPONSE at M = 100



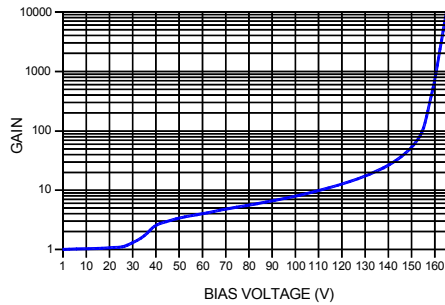
## ELECTRO-OPTICAL CHARACTERISTICS @ 22 °C

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	MIN	TYP	MAX	UNITS
I <sub>D</sub>	Dark Current	M = 100*	---	4.0	8.0	nA
C	Capacitance	M = 100*	---	8.0	---	pF
V <sub>BR</sub>	Breakdown Voltage	I <sub>D</sub> = 2 μA	90	120-190	240	V
	Temperature Coefficient of V <sub>BR</sub>		0.35	0.45	0.55	V/K
	Responsivity	M = 100; = 0 V; λ = 800 nm	45	50	---	A/W
Δf <sub>3dB</sub>	Bandwidth	-3dB	---	0.35	---	GHz
t <sub>r</sub>	Rise Time		---	1000	---	ps
	Optimum Gain		40	60	---	
	"Excess Noise" factor	M = 100	---	2.2	---	
	"Excess Noise" index	M = 100	---	0.2	---	
	Noise Current	M = 100	---	0.15	---	pA/Hz <sup>1/2</sup>
	Max Gain		200	---	---	
NEP	Noise Equivalent Power	M = 100; λ = 800 nm	---	8.0 X 10 <sup>-14</sup>	---	W/Hz <sup>1/2</sup>

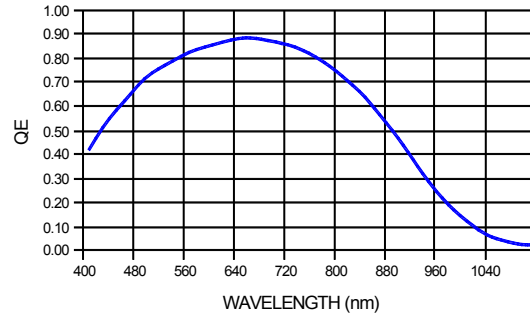
\* Measurement conditions: Setup of photo current 10 nA at M = 1 and irradiated by a 680 nm, 60 nm bandwidth LED. Increase the photo current up to 1 μA, (M = 100) by internal multiplication due to an increasing bias voltage.

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

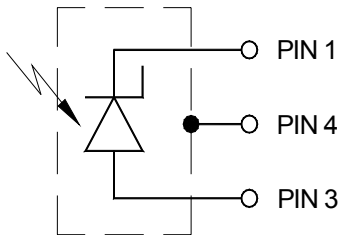
### TYPICAL GAIN vs BIAS VOLTAGE



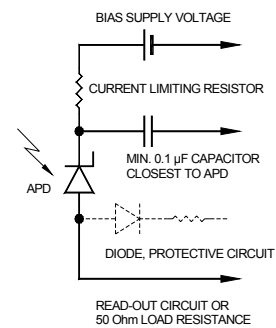
### QUANTUM EFFICIENCY for M = 1



### 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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