
**FEATURES**

- $\varnothing$  1.13 mm active area
- Low slope multiplication curve
- High speed, low noise
- NIR enhanced

**DESCRIPTION**

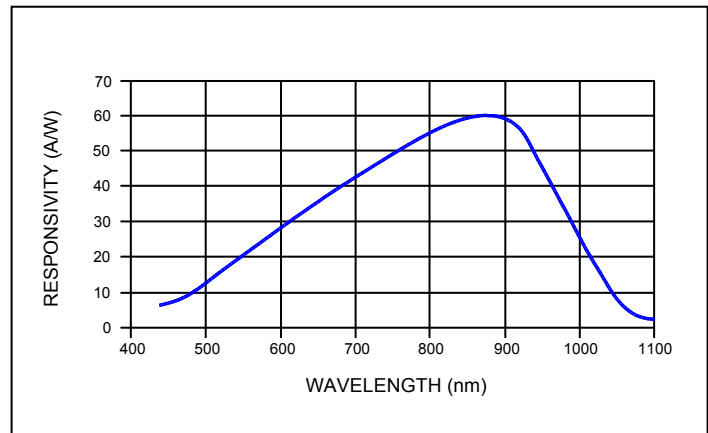
1.0 mm<sup>2</sup> High Speed, Low Noise Avalanche Photodiode with N on P construction. Hermetically packaged in a TO-52-S1 with a clear borosilicate glass window cap.

**APPLICATIONS**

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


**ABSOLUTE MAXIMUM RATING**

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

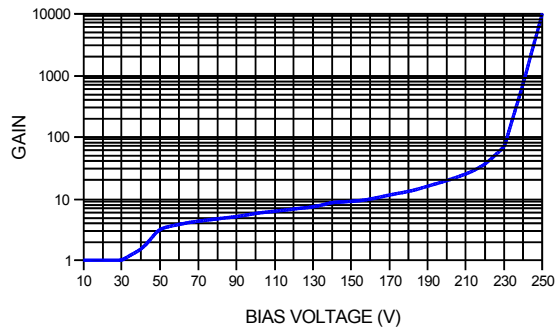
**SPECTRAL RESPONSE at M = 100**

**ELECTRO-OPTICAL CHARACTERISTICS @ 22 °C**

| SYMBOL            | CHARACTERISTIC                             | TEST CONDITIONS            | MIN | TYP                     | MAX | UNITS                |
|-------------------|--|----------------------------|-----|-------------------------|-----|----------------------|
| I <sub>D</sub>    | Dark Current                               | M = 100*                   | --- | 4.0                     | 10  | nA                   |
| C                 | Capacitance                                | M = 100*                   | --- | 3.0                     | --- | pF                   |
| V <sub>BR</sub>   | Breakdown Voltage                          | I <sub>D</sub> = 2 μA      | 180 | 240                     | --- | V                    |
|                   | Temperature Coefficient of V <sub>BR</sub> |                            | --- | 1.55                    | --- | V/K                  |
|                   | Responsivity                               | M = 100; = 0 V; λ = 905 nm | 55  | 60                      | --- | A/W                  |
| Δf <sub>3dB</sub> | Bandwidth                                  | -3dB                       | --- | 0.3                     | --- | GHz                  |
| t <sub>r</sub>    | Rise Time                                  | M = 100                    | --- | 1300                    | --- | ps                   |
|                   | Optimum Gain                               |                            | 40  | 60                      | --- |                      |
|                   | "Excess Noise" factor                      | M = 100                    | --- | 2.5                     | --- |                      |
|                   | "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 = 905 nm        | --- | 8.0 X 10 <sup>-14</sup> | --- | W/Hz <sup>1/2</sup>  |

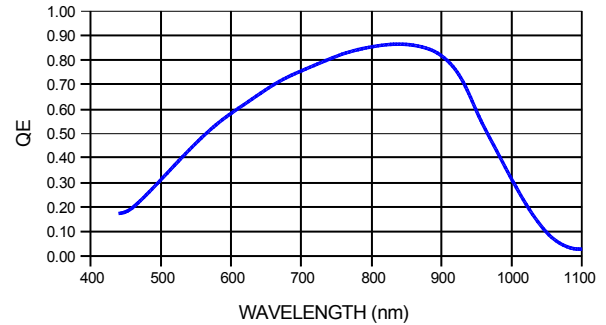
\* Measurement conditions: Setup of photo current 10 nA at M = 1 and irradiated by a 880 nm, 80 nm bandwidth LED. Increase the photo current up to 1 μA, (M = 100) by internal multiplication due to an increasing bias voltage.

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

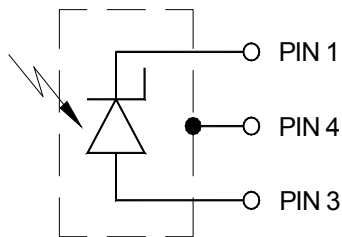
## TYPICAL GAIN vs BIAS VOLTAGE



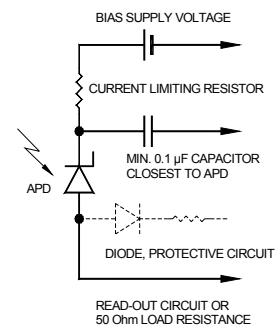
## QUANTUM EFFICIENCY for M = 100



## 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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