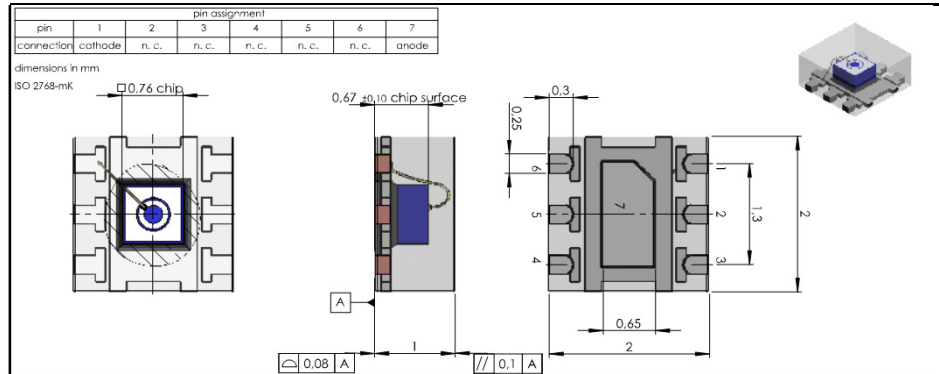
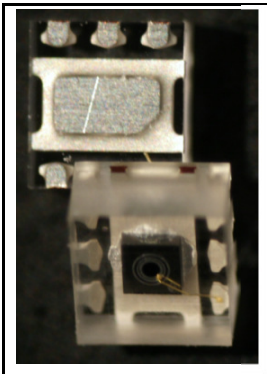




First Sensor APD Data Sheet  
 Part Description AD230-9 SMD  
 Order # 501557  
 Version 21-08-14



**Features**

- APD with 0.04 mm<sup>2</sup> active area
- Slow multiplication curve
- QE > 80% @ 750 nm-910 nm
- Fast rise time, low noise
- Optimum gain: 50-60

**Description**

Circular active area APD chip with NIR enhanced sensitivity. Clear QFN package with very compact design. Lead-free reflow solderable (MSL3).

**Application**

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

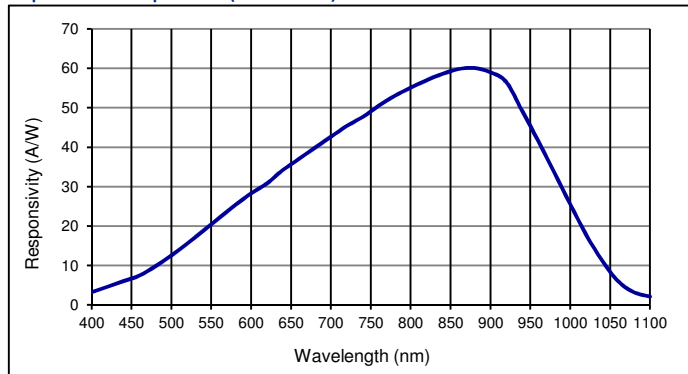
RoHS  
2002/95/EC



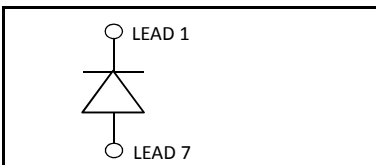
**Absolute maximum ratings**

Symbol	Parameter	Min	Max	Unit
T <sub>STG</sub>	Storage temp	-40	100	°C
T <sub>OP</sub>	Operating temp	-20	70	°C
M <sub>max</sub>	Gain (I <sub>PD</sub> = 1 nA)	200		
I <sub>PEAK</sub>	Peak DC current		0.25	mA

**Spectral response (M = 100)**



**Schematic**



**Electro-optical characteristics @ 23 °C**

Symbol	Characteristic	Test Condition	Min	Typ	Max	Unit
	Active area		diameter 230			µm
	Active area		0.04			mm <sup>2</sup>
I <sub>D</sub>	Dark current	M = 100		0.5	1.0	nA
C	Capacitance	M = 100		0.3		pF
	Responsivity	M = 100; λ = 905 nm	52	58	60	A/W
t <sub>R</sub>	Rise time	M = 100; λ = 905 nm; R <sub>L</sub> = 50 Ω		0.5		ns
	Cut-off frequency	-3dB		0.6		GHz
V <sub>BR</sub>	Breakdown voltage	I <sub>R</sub> = 2 µA, V <sub>BR</sub> - binning available	160		200	V
	Temperature coefficient	Change of V <sub>BR</sub> with temperature	1.25		1.55	V/K
	Excess noise factor	M = 100		2.5		
	Excess noise index	M = 100		0.2		

**European, International Sales:**



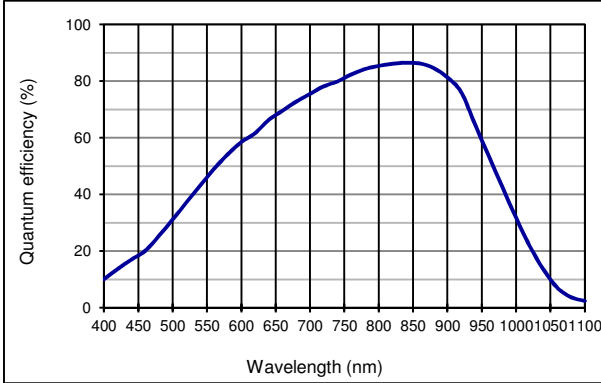
First Sensor AG  
 Peter-Behrens-Strasse 15  
 12459 Berlin  
 Germany  
 T +49 30 6399 2399  
 F +49 30 639923-752  
 sales.opto@first-sensor.com

**USA:**

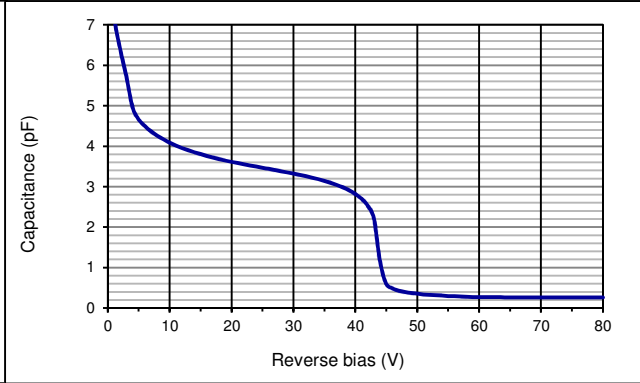


First Sensor Inc.  
 5700 Corsa Avenue #105  
 Westlake Village  
 CA 91362 USA  
 T +1 818 706 3400  
 F +1 818 889 7053  
 sales.us@first-sensor.com

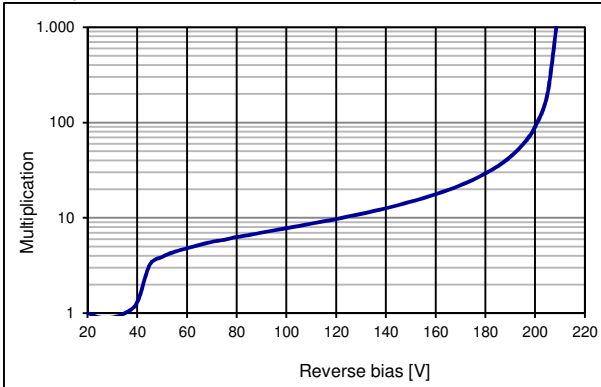
Quantum efficiency (23 °C)



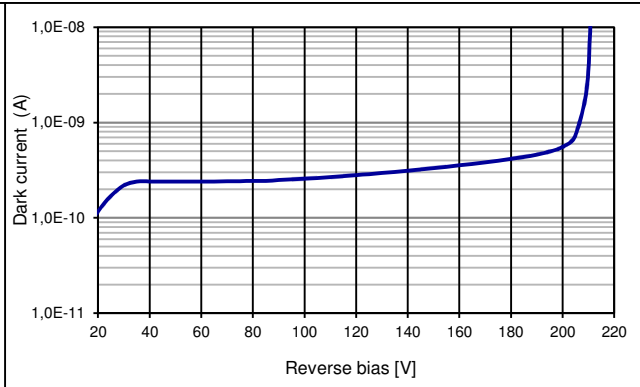
Capacitance as fct of reverse bias (23 °C)



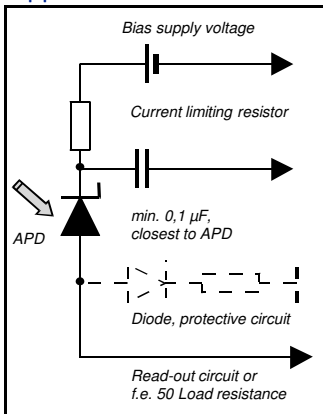
Multiplication as fct of bias (23 °C)



Dark current as fct of bias (23 °C)



Application hints:



- Current should be limited by a protecting resistor or current limiting - IC inside the power supply
- For low light level applications blocking of ambient light should be used
- For high gain applications bias voltage should be temperature compensated
- Please consider basic ESD protection while handling
- Use low noise read-out - IC
- For further questions please refer to document "Instructions for handling and processing"
- Optimum gain: 50-60

European, International Sales:



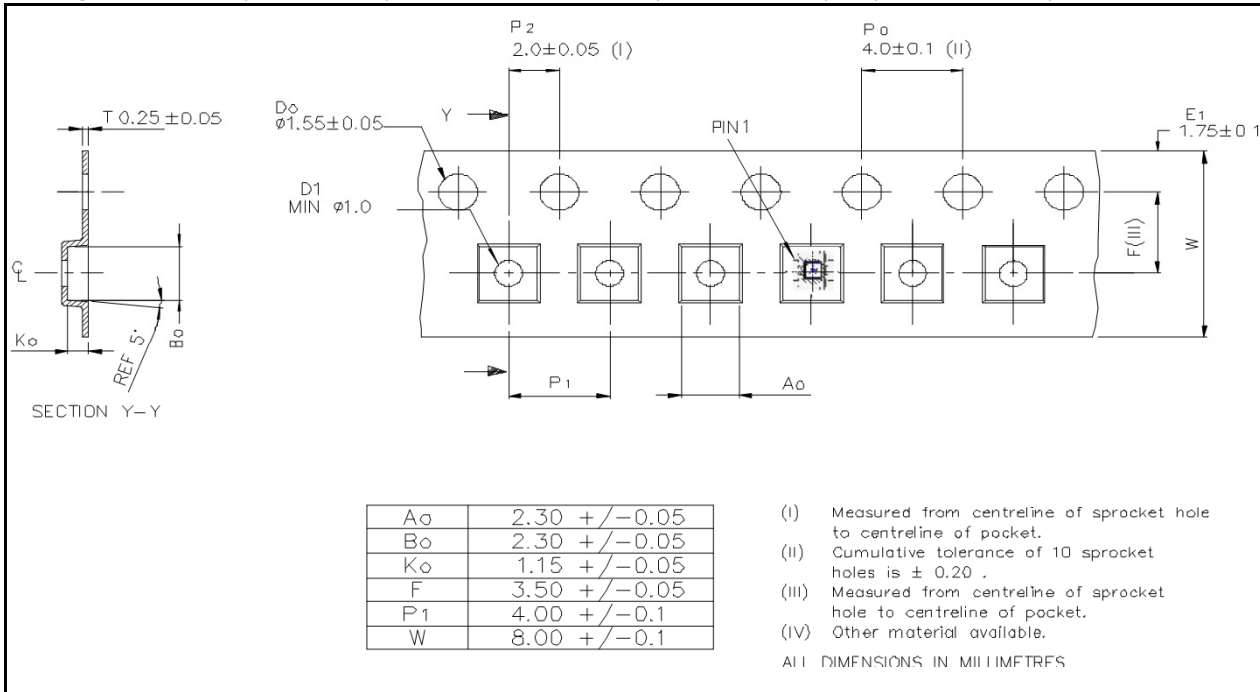
First Sensor AG  
 Peter-Behrens-Strasse 15  
 12459 Berlin  
 Germany  
 T +49 30 6399 2399  
 F +49 30 639923-752  
 sales.opto@first-sensor.com

USA:



First Sensor Inc.  
 5700 Corsa Avenue #105  
 Westlake Village  
 CA 91362 USA  
 T +1 818 706 3400  
 F +1 818 889 7053  
 sales.us@first-sensor.com

Package dimension: production quantities on reel (3000 pcs/ reel), sample quantities in tray



Application hints moisture sensitivity:

- This product has MSL 3 according to JEDEC, i.e. a floor life of 168h at 30°C and 60% relative humidity.
- The reels are shipped in dry packs. Once dry packs are opened or damaged the floor life has to be considered.
- Reflow soldering after floor life is exceeded might cause damage to the component.
- After floor life is exceeded the reel has to be baked or dried before reflow soldering to avoid failures.
- The recommended baking condition according to JEDEC STD-033C is 13 days at 40°C and 5% relative humidity. Alternatively, 8 days @ 25°C/1% r.h.; 3 days @ 40°C/1%r.h.; 12 days @ 25°C/2% r.h. or 5 days @ 40°C/2% r.h. can be applied.

Disclaimer: Due to our strive for continuous improvement, specifications are subject to change within our PCN policy according to JESD46C.

European, International Sales:



First Sensor AG  
 Peter-Behrens-Strasse 15  
 12459 Berlin  
 Germany  
 T +49 30 6399 2399  
 F +49 30 639923-752  
 sales.opto@first-sensor.com

USA:



First Sensor Inc.  
 5700 Corsa Avenue #105  
 Westlake Village  
 CA 91362 USA  
 T +1 818 706 3400  
 F +1 818 889 7053  
 sales.us@first-sensor.com