

PIN Photodiode
Technical Data Sheet

Part No.: PD438B

Features:

- ◇ Fast response times.
- ◇ High photo sensitivity.
- ◇ Small junction capacitance.
- ◇ Pb free.
- ◇ The product itself will remain within RoHS compliant Version.

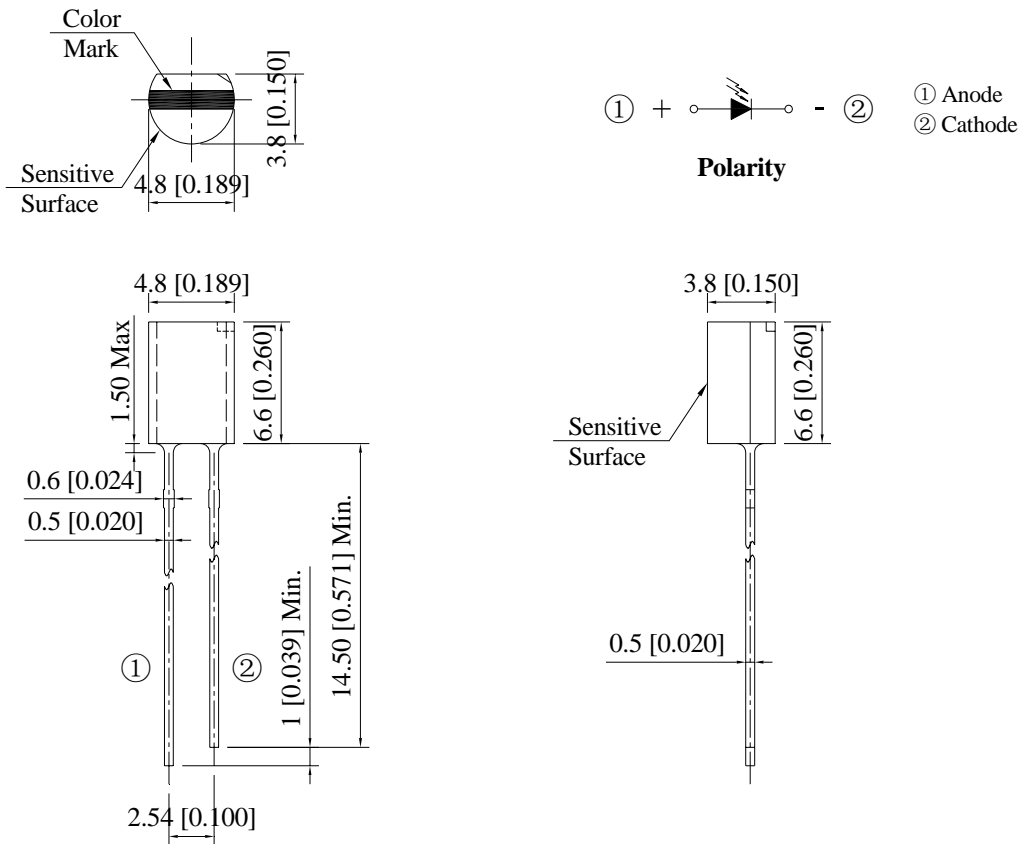
Descriptions:

- ◇ The PD438B is a high speed and sensitive side view PIN photodiode.
- ◇ The epoxy package itself is an IR filter, spectrally matched to IR emitter.

Applications:

- ◇ High speed photo detector.
- ◇ Camera.
- ◇ Infrared remote controller for TVs VCR, audio equipment, air conditioner, etc.

Package Dimension:



Part No.	Chip Material	Lens Color	Source Color
PD438B	Silicon	Black	Photodiode

Notes:

1. All dimensions are in millimeters.
2. Tolerance is $\pm 0.25\text{mm}$ (.010") unless otherwise specified.
3. Specifications are subject to change without notice.

Absolute Maximum Ratings (Ta=25°C)

Parameters	Symbol	Rating	Unit
Power Dissipation at (or below) 25°C free Air Temperature	PD	150	mW
Reverse Voltage	VR	32	V
Operating Temperature	Topr	-25 to +80	°C
Storage Temperature	Tstg	-40 to +85	°C
Lead Soldering Temperature	Tsol	260°C for 5 Seconds	

Electrical Optical Characteristics at Ta=25°C

Parameters	Symbol	Min.	Typ.	Max.	Unit	Condition
Open-Circuit Voltage	V _{OC}	---	0.35	---	V	Ee=5mW/cm ² , λ _p =940nm
Short-Circuit Current	I _{SC}	---	18	---	μA	Ee=1mW/cm ² , λ _p =940nm
Reverse Light Current	I _L	10.2	18	---	μA	Ee=1mW/cm ² , λ _p =940nm, V _R =5V
Dark Current	I _D	---	5	30	nA	Ee=1mW/cm ² , V _{CE} =10V
Reverse Breakdown Voltage	BV _R	32	170	---	V	E _c =0mW/cm ² , I _R =100μA
Total Capacitance	C _t	---	25	---	pF	E _c =0mW/cm ² f=1MHz, V _R =3V
Rise Time	T _r	---	50	---	ns	RL=1000Ω V _R =10V
Fall Time	T _f	---	50	---		
Wavelength of Peak Sensitivity	λ _P	---	940	---	nm	
Rang of Spectral Bandwidth	λ _{0.5}	840	---	1100	nm	

Typical Electrical / Optical Characteristics Curves (25°C Ambient Temperature Unless Otherwise Noted)

Fig.1 Power Dissipation vs. Ambient Temperature

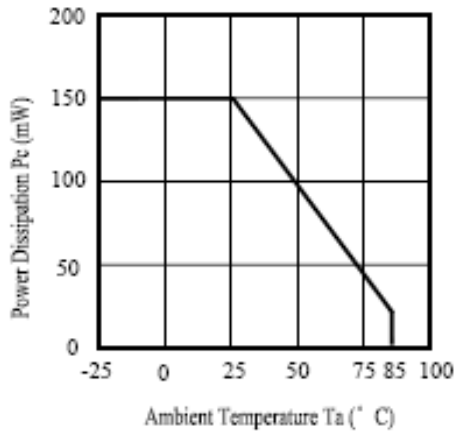


Fig.2 Spectral Sensitivity

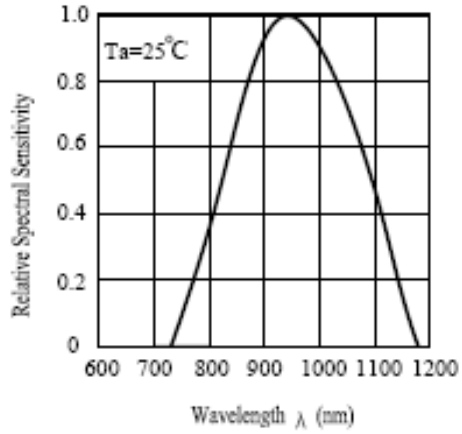


Fig.3 Dark Current vs. Ambient Temperature

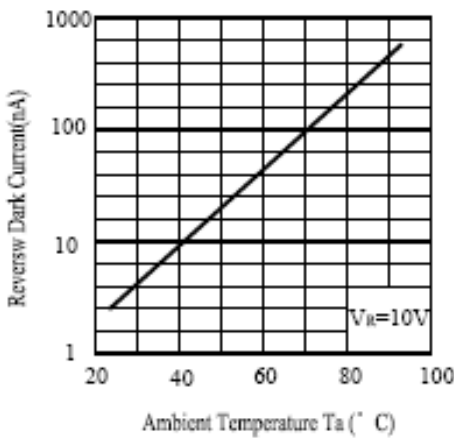


Fig.4 Reverse Light Current vs. E_e

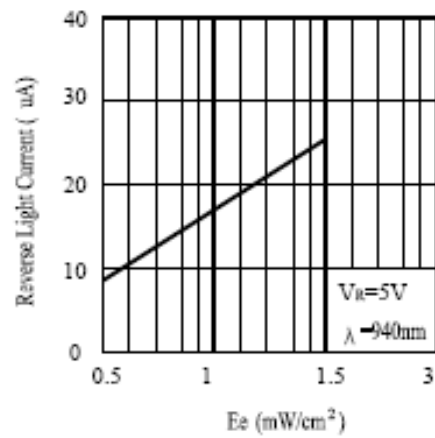


Fig.5 Terminal Capacitance vs. Reverse Voltage

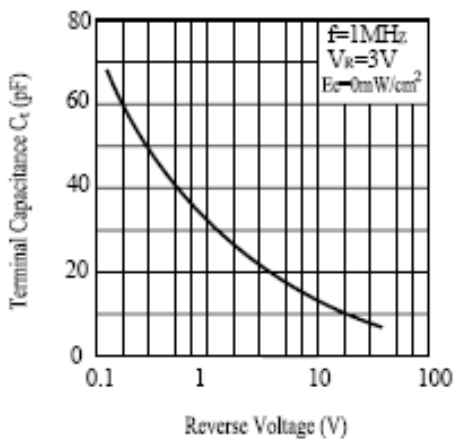
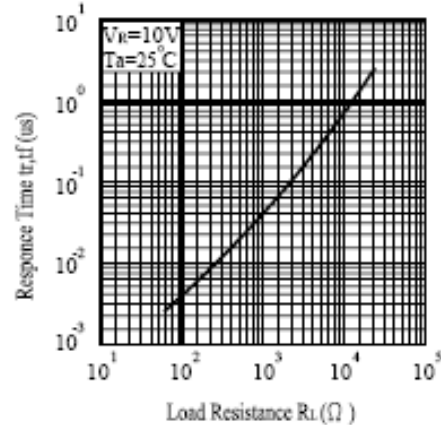


Fig.6 Response Time vs. Load Resistance

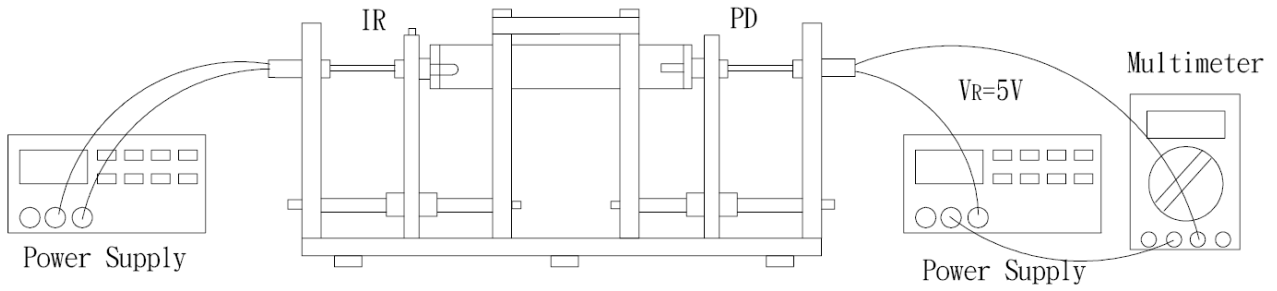


Test Method For Reverse Light Current:

Condition: $E_e=5\text{mW}/\text{cm}^2$, $V_R=5\text{V}$.

Test Item: Reverse Light Current.

Unit: μA .



Reliability Test Item And Condition:

The reliability of products shall be satisfied with items listed below:

Confidence level: 90%.

LTPD: 10%.

No.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgment Criteria	Ac/ Re
1	Reflow Soldering	TEMP.: 260°C±5°C 5secs	6mins	22pcs	$I_L \cong L * 0.8$ L: Lower Specification Limit	0/1
2	Temperature Cycle	H: +85°C 30mins ↑ 5 mins ↓ L: -55°C 30mins	50Cycles	22pcs		0/1
3	Thermal Shock	H: +100°C 5mins ↑ 10secs ↓ L: -10°C 30mins	50Cycles	22pcs		0/1
4	High Temperature Storage	TEMP.: +100°C	1000hrs	22pcs		0/1
5	Lower Temperature Storage	TEMP.: -55°C	1000hrs	22pcs		0/1
6	DC Operating Life	$V_R = 5V$	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	85°C / 85% R.H	1000hrs	22pcs		0/1

Please read the following notes before using the product:

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the PHOTODIODE should be kept at 30°C or less and 90%RH or less.

2.3 The PHOTODIODE should be used within a year.

2.4 After opening the package, the PHOTODIODE should be kept at 30°C or less and 70%RH or less.

2.5 The PHOTODIODE should be used within 168 hours (7 days) after opening the package.

3. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 260°C for 5 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

4. Repairing

Repair should not be done after the PHOTODIODE have been soldered. When repairing is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the PHOTODIODE will or will not be damaged by repairing.

5. Caution in ESD

Static Electricity and surge damages the PHOTODIODE. It is recommended to use a wrist band or anti-electrostatic glove when handling the PHOTODIODE. All devices, equipment and machinery must be properly grounded.