# Technical Data Sheet 1.9mm Round Subminiature Lead Photodiode

## PD95-21B



- Fast response time
- High photo sensitivity
- Small junction capacitance
- Compatible with infrared and vapor phase reflow solder process.
- Pb-free.
- The product itself will remain within RoHS compliant version.

#### Descriptions

• PD95-21B is a high speed and high sensitive PIN photodiode in miniature top view lens SMD package and it is molded in a black plastic .The device is spectrally matched with the infrared emitting diode.

#### Applications

- Infrared applied system
- Copier
- Sensor in automotive project

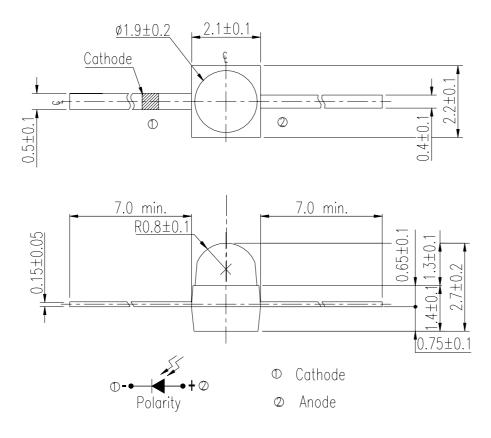
#### **Device Selection Guide**

LED Part No.	Chip Material	Lens Color	
PD	Silicon	Black	





### **Package Dimensions**



**Notes:** 1.All dimensions are in millimeters 2.Tolerances unless dimensions ±0.1mm

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Units	
Reverse Voltage	V <sub>R</sub>	32	V	
Operating Temperature	T <sub>opr</sub>	-25 ~ +85	°C	
Storage Temperature	T <sub>stg</sub>	-40 ~ +85	°C	
Soldering Temperature	T <sub>sol</sub>	260	°C	
Power Dissipation at(or below)	P <sub>c</sub>	150	mW	
25°C Free Air Temperature				

**Notes:** \*1:Soldering time  $\leq$  5 seconds.

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### Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min	Тур	Max	Unit
Rang Of Spectral Bandwidth	λ 0.5		730		1100	nm
Wavelength Of Peak Sensitivity	λp			940		nm
Open-Circuit Voltage	V <sub>OC</sub>	$Ee=5mW/cm^{2}$ $\lambda p=940nm$		0.42		V
Short- Circuit Current	I <sub>SC</sub>	$Ee=1mW/cm^{2}$ $\lambda p=870nm$		4		μA
Reverse Light Current	IL	$Ee=1mW/cm^{2}$ $\lambda p=870nm$ $V_{R}=5V$		4		μA
Reverse Dark Current	I <sub>D</sub>	Ee=0mW/cm <sup>2</sup> V <sub>R</sub> =10V			10	nA
Reverse Breakdown Voltage	B <sub>VR</sub>	$Ee=0mW/cm^{2}$ $I_{R}=100 \ \mu A$	32	170		v
Total Capacitance	Ct	$\begin{array}{c} \text{Ee=0mW/cm}^2\\ \text{V}_{\text{R}}=5\text{V}\\ \text{f=1MHz} \end{array}$		5		pF
Rise Time	t <sub>r</sub>	V <sub>R</sub> =10V		6		
Fall Time	t <sub>f</sub>	$R_L=1000 \Omega$		6		nS

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### **Typical Electro-Optical Characteristics Curves**

Fig.1 Power Dissipation vs.

Fig.2 Spectral Sensitivity

Ta=25°C

1.0

0.8

0.6

0.4

0.2

0

Ee

600

700

Fig. 4 Reverse Light Current vs.

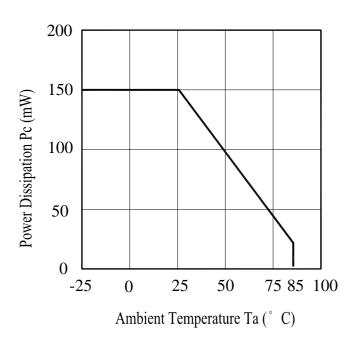
800

Wavelength  $\lambda$  (nm)

900 1000 1100 1200

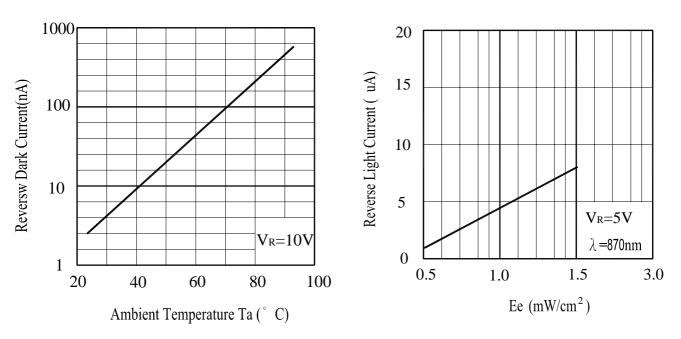
Relative Spectral Sensitivity

Ambient Temperature





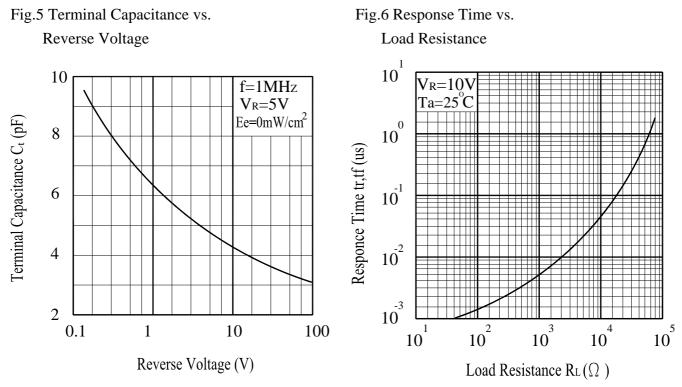
Ambient Temperature



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#### **Typical Electro-Optical Characteristics Curves**



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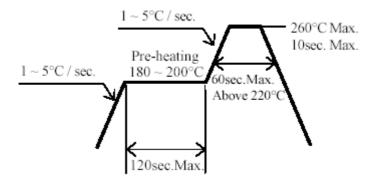


#### **Precautions For Use**

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 LEDs should be kept at  $30^{\circ}$ C or less and 90% RH or less.
  - 2.3 The LEDs should be used within a year.
  - 2.4 After opening the package, the LEDs should be kept at  $30^{\circ}$ C or less and 60%RH or less.
  - 2.5 The LEDs should be used within 168 hours (7 days) after opening the package.
  - 2.6 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.
    Baking treatment : 60±5°C for 24 hours.
- 3. Soldering Condition
- 3.1 Pb-free solder temperature profile



- 3.2 Reflow soldering should not be done more than two times.
- 3.3 When soldering, do not put stress on the LEDs during heating.
- 3.4 After soldering, do not warp the circuit board.

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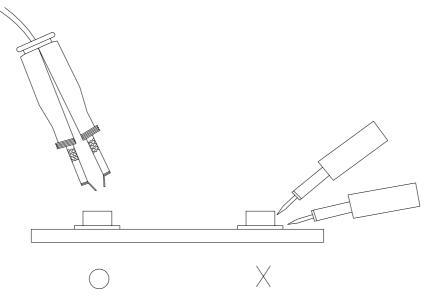


#### 4.Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than  $350^{\circ}$ C for 3 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.

#### 5.Repairing

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



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PD95-21B



#### **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/	Sample	Failure	Ac/Re
			Cycles	Sizes	Judgement	
					Criteria	
1	REFLOW	TEMP. : $260^{\circ}C\pm 5^{\circ}C$	6Mins	22pcs		0/1
		5secs				
2	Temperature Cycle	H : 100°C 15mins	50Cycles	22pcs	$I_L \leq L \times 0.8$	0/1
		5mins				
		$L:-40^{\circ}C$ 15mins			L: Lower	
3	Thermal Shock	H :+100°C $\checkmark$ 5mins	50Cycles	22pcs	Specification	0/1
		▼ 10secs	-		Limit	
		$L:-10^{\circ}C$ 5mins				
4	High Temperature	<b>TEMP.</b> ∶ +100°C	1000hrs	22pcs	-	0/1
	Storage			-		
5	Low Temperature	<b>ТЕМР.</b> : -40°С	1000hrs	22pcs		0/1
	Storage					
6	DC Operating Life	V <sub>R</sub> =5V	1000hrs	22pcs	]	0/1
7	High Temperature/	85°C / 85% R.H	1000hrs	22pcs		0/1
	High Humidity					

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### **Packing Quantity Specification**

1. 1000Pcs/1 Bag , 20 Bags /1 Box

### Label Form Specification



CPN: Customer's Production Number P/N : Production Number QTY: Packing Quantity CAT: Ranks HUE: Peak Wavelength REF: Reference LOT No: Lot Number MADE IN TAIWAN: Production Place

### Notes

- 1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
- 2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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