

# PD3151F

## Position Sensitive Detector with Location Hole (PSD \*)

### ■ Features

1. Easy high accuracy positioning owing to location hole  
Detecting portion pattern positional accuracy :  $\pm 0.1$  mm
2. Thin, compact package
3. Visible light cut-off type

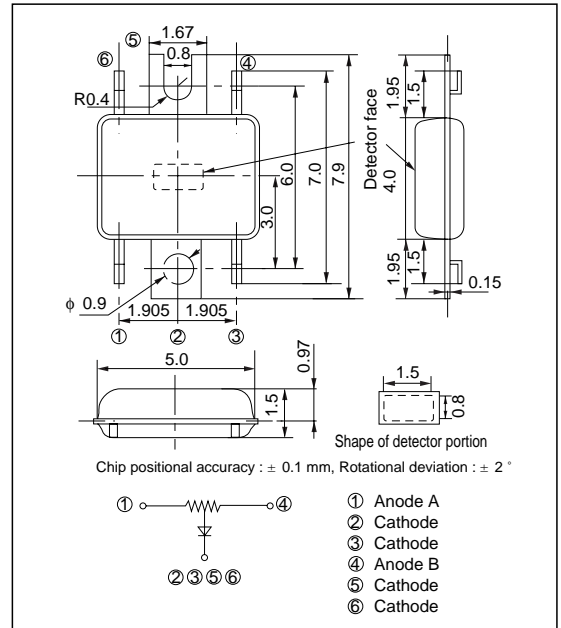
### ■ Applications

1. Cameras

\* PSD: Position Sensitive Detector

### ■ Outline Dimensions

(Unit : mm)

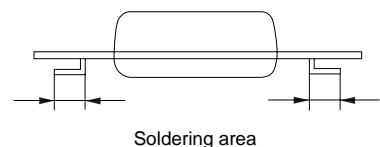


### ■ Absolute Maximum Ratings

( $T_a=25^\circ\text{C}$ )

Parameter	Symbol	Rating	Unit
Reverse voltage	$V_R$	30	V
Operating temperature	$T_{opr}$	- 25 to + 85	$^\circ\text{C}$
Storage temperature	$T_{stg}$	- 40 to + 85	$^\circ\text{C}$
*1 Soldering temperature	$T_{sol}$	+ 260	$^\circ\text{C}$

\*1 For MAX. 3 seconds in the soldering area



**Electro-optical Characteristics**

(Ta=25 °C)

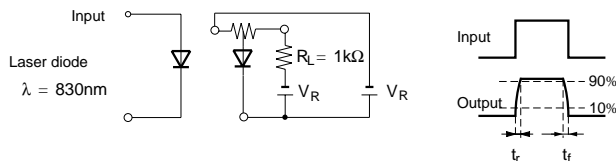
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Reverse voltage	V <sub>R</sub>	I <sub>R</sub> = 10μ A	30	-	-	V
Dark current	I <sub>d</sub>	V <sub>R</sub> = 1V	-	-	1.5	nA
Collector current	*2 I <sub>L</sub>	V <sub>R</sub> = 1V, E <sub>v</sub> = 1000 lx	6	10	-	μ A
Terminal capacitance	C <sub>t</sub>	V <sub>R</sub> = 1V, f = 10kHz	-	10	30	pF
Peak sensitivity wavelength	λ <sub>P</sub>	-	-	940	-	nm
Sensitivity wavelength range	λ	-	770	-	1130	nm
Response time	*3 t <sub>r</sub> , t <sub>f</sub>	V <sub>R</sub> = 1V, R <sub>L</sub> = 1kΩ	-	5	30	μ s
Resistance between electrodes	R <sub>ie</sub>	V <sub>R</sub> = 1V, V <sub>a</sub> = 0.5V	320	400	480	kΩ
Error of position detection	*4 -	-	-	-	±25	μ m
Sensitivity	R	-	-	0.5	-	A/W
Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 1mA	-	-	1.0	V

\*2 I<sub>L</sub> = I<sub>1</sub> + I<sub>2</sub>

where, I<sub>1</sub> and I<sub>2</sub> are collector current of A1 and A2 respectively.

E<sub>v</sub>: Illuminance by CIE standard light source A (tungsten lamp)

\*3 Test circuit for response time is shown below.



\*4 75% area from detecting portion center to the edge of detecting portion

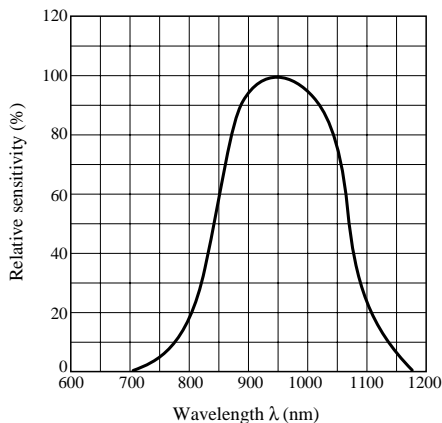
Definition of error of position detection

: Error of position detection of each incident light position is defined by the following formula, if electrical center position is I<sub>1</sub> = I<sub>2</sub>.

$$\text{Error of position detection } (\mu\text{m}) = \frac{L}{2} \times \frac{I_1 - I_2}{I_1 + I_2} - \text{Incident light position } (\mu\text{m})$$

L: Length of light detector surface = 1.5mm

**Fig. 1 Spectral Sensitivity**



**Fig. 2 Dark Current vs. Ambient Temperature**

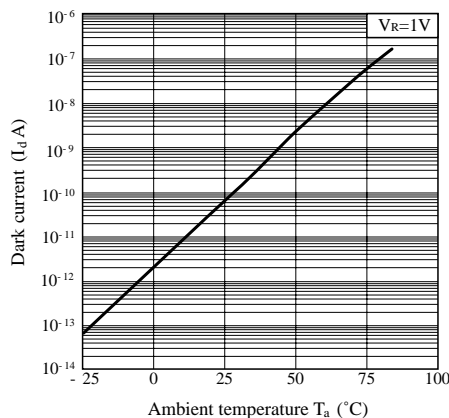


Fig. 3 Dark Current vs. Reverse Voltage

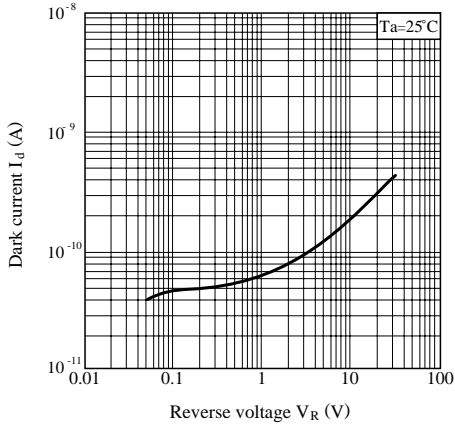


Fig. 4 Terminal Capacitance vs. Reverse Voltage

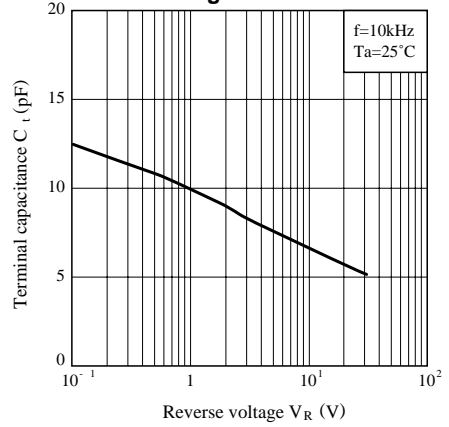


Fig. 5 Relative Output vs. Ambient Temperature

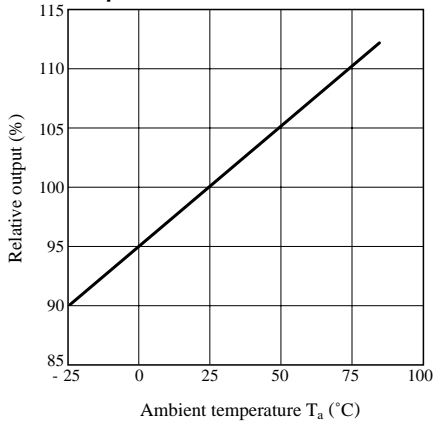
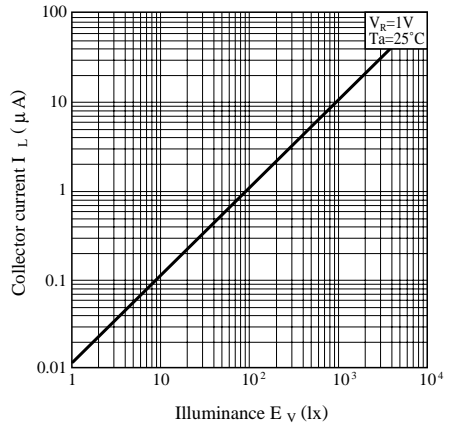


Fig. 6 Collector Current vs. Illuminance



● Please refer to the chapter "Precautions for Use". (Page 78 to 93)