

# PD411PI

## Compact Package Type Photodiode with Condensing Lens

### ■ Features

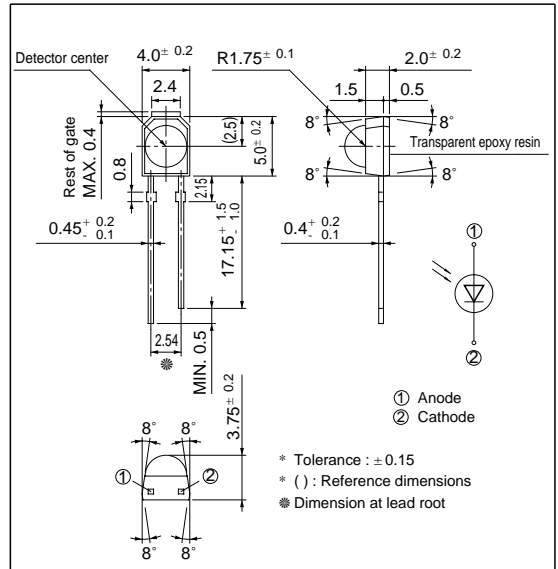
1. High sensitivity  
(TYP. 1.0A/W at  $\lambda_p=960$  nm)
2. High speed response ( $t_r, t_f$ : TYP. 200ns at  $R_L=1k\Omega$ )

### ■ Applications

1. Optoelectronic switches

### ■ Outline Dimensions

(Unit : mm)

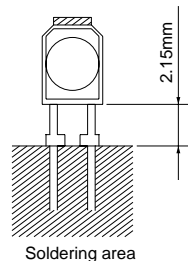


### ■ Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse voltage	$V_R$	32	V
Power dissipation	P	150	mW
Operating temperature	$T_{opr}$	-25 to +85	°C
Storage temperature	$T_{stg}$	-40 to +100	°C
*1 Soldering temperature	$T_{sol}$	260	°C

\*1 For MAX. 5 seconds at the position of 2.15 mm from the resin edge



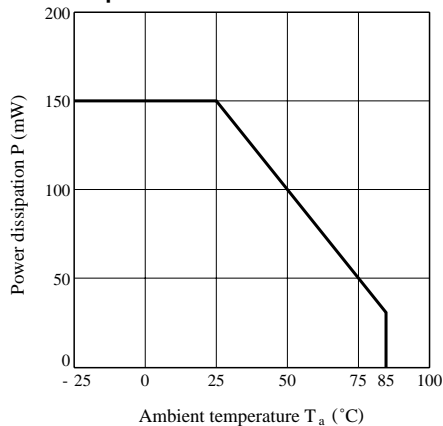
## ■ Electro-optical Characteristics

(Ta=25 °C)

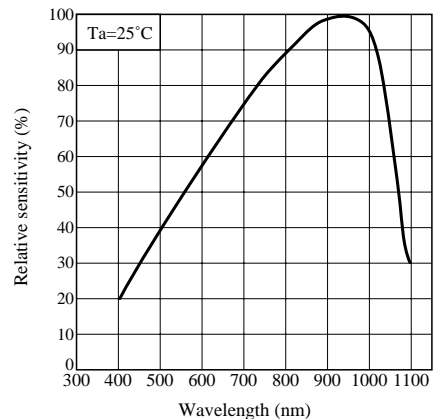
Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Shortcircuit current	I <sub>sc</sub>	*2 E <sub>V</sub> = 100 lx	5.0	7.5	9.0	μ A
Shortcircuit current temperature coefficient	β <sub>T</sub>	*2 E <sub>V</sub> = 100 lx	-	0.2	-	% /°C
Dark current	I <sub>d</sub>	V <sub>R</sub> = 10V, E <sub>e</sub> = 0	-	0.5	10	nA
Dark current temperature coefficient	α <sub>T</sub>	V <sub>R</sub> = 10V, E <sub>e</sub> = 0	-	3.5	5.0	times/10°C
Terminal capacitance	C <sub>t</sub>	V <sub>R</sub> = 3V, f= 1MHz	-	20	35	pF
Peak sensitivity wavelength	λ <sub>p</sub>		-	960	-	nm
Peak spectral sensitivity	K	l = 960nm	-	1.0	-	A/W
Response time	Rise Time	R <sub>L</sub> = 1kΩ	-	200	-	ns
	Fall Time	V <sub>R</sub> = 10V	-	200	-	
Half intensity angle	Δθ		-	± 45	-	°

\*2 E<sub>V</sub>: Illuminance by CIE standard light source A (tungsten lamp)

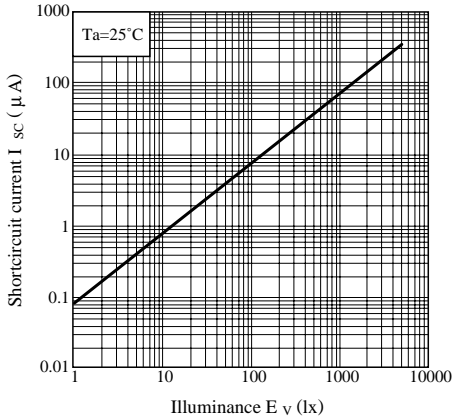
**Fig. 1 Power Dissipation vs. Ambient Temperature**



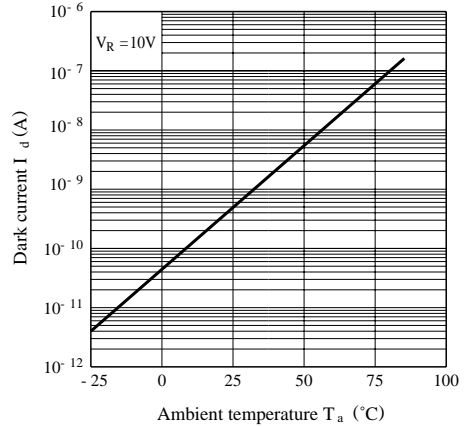
**Fig. 2 Spectral Sensitivity**



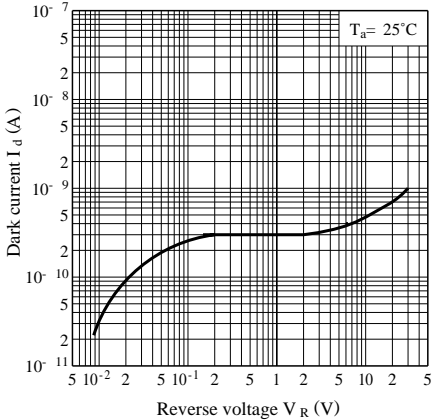
**Fig. 3 Shortcircuit Current vs. Illuminance**



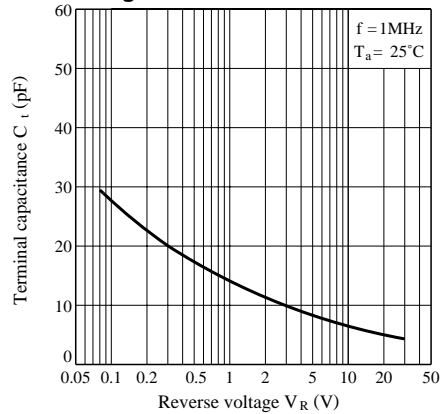
**Fig. 4 Dark Current vs. Ambient Temperature**



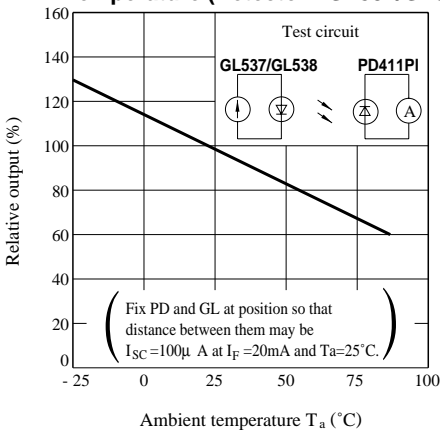
**Fig. 5 Dark Current vs. Reverse Voltage**



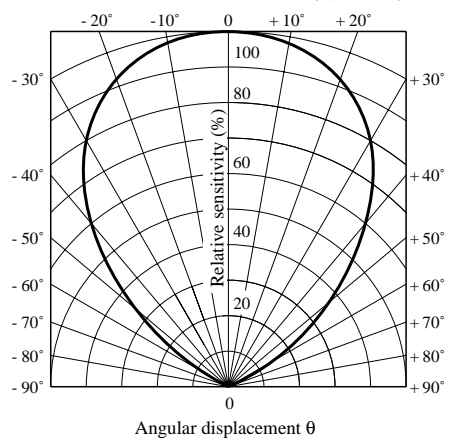
**Fig. 6 Terminal Capacitance vs. Reverse Voltage**



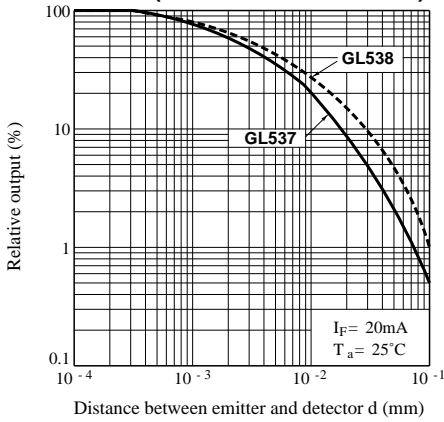
**Fig. 7 Relative Output vs. Ambient Temperature (Detector : GL537/GL538)**



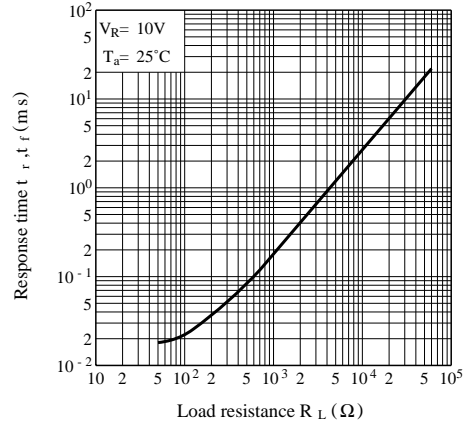
**Fig. 8 Radiation Diagram ( $T_a = 25^\circ C$ )**



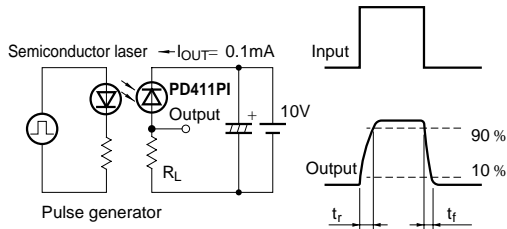
**Fig. 9 Relative Output vs. Distance**  
(Detector : GL537/GL538)



**Fig. 10 Response Time vs. Load Resistance**



**Test Circuit for Response Time**



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