PD49PI/PD481PI

High Speed, High Sensitivity Photodiode

■ Features

1. High sensitivity
   ($I_{SC}>=3.5\,\mu$A at $E_V=$ 100lx: **PD481PI**)
2. Peak sensitivity wavelength matching
   with infrared LED
   ($\lambda p=$ 960nm: **PD481PI**)
   ($\lambda p=$ 1000nm: **PD49PI**)
3. Built-in visible light cut-off filter

■ Applications

1. Infrared remote controllers for TVs,
   VCRs, audio equipment and air condi-
   tioners, etc.

■ Outline Dimensions　　(Unit : mm)

① Anode
② Cathode

■ 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

*For 10 seconds at the position of 2.3mm from the bottom face of resin package

■ Electro-optical Characteristics　　(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
[*2] Short circuit current	**PD49PI**	I_{SC}	$E_V=$ 100lx	2.4	3	-	μA
	PD481PI			3.5	5	-	
[*2] Short circuit current temperature coefficient		β_T	$E_V=$ 100lx	-	0.2	-	% /°C
Dark current		I_d	$V_R=$ 10V	-	1	30	nA
Dark current temperature coefficient		α_T	$V_R=$ 10V	-	3.5	5	times/10°C
Terminal capacitance		C_t	$V_R=$ 3V, f= 1MHz	-	20	50	pF
Peak sensitivity wavelength	**PD49PI**	λ_P	-	-	1 000	-	nm
	PD481PI			910	960	1 010	

*2 E_V: Illuminance by CIE standard light source A (tungsten lamp)

Fig .1 Power Dissipation vs. Ambient Temperature

Power dissipation P (mW)
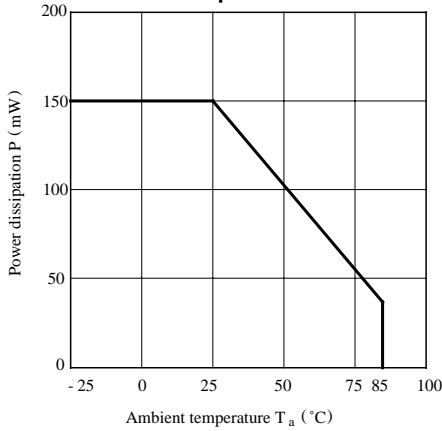
Ambient temperature T_a (°C)

Fig. 2 Spectral Sensitivity

Relative sensitivity (%)

$T_a = 25°C$

PD481PI   PD49PI

Wavelength λ (nm)
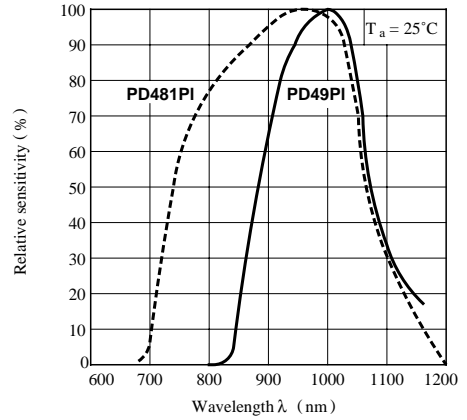
Fig. 3 Dark Current vs. Ambient Temperature

$V_R = 10V$

Dark current I_d (A)

Ambient temperature T_a (°C)
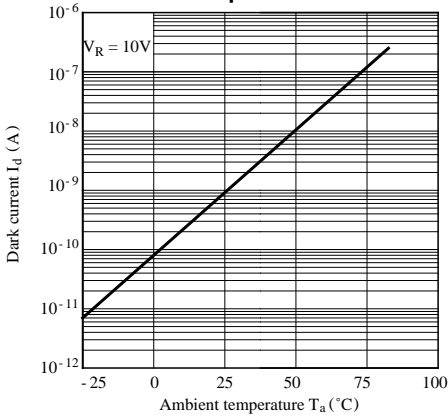
Fig. 4 Dark Current vs. Reverse Voltage

$T_a = 25°C$

Dark current I_d (A)

Reverse voltage V_R (V)
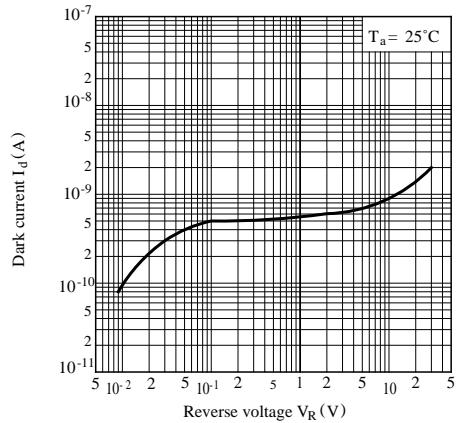
Fig. 5 Terminal Capacitance vs. Reverse Voltage

$f = 1MHz$
$T_a = 25°C$

Terminal capacitance C_t (pF)

Reverse voltage V_R (V)
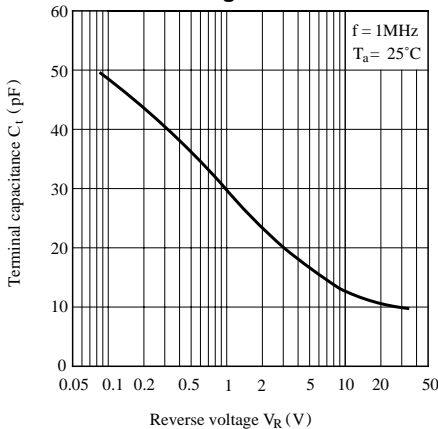
Fig. 6 Relative Output vs. Ambient Temperature
(Emitter：GL537/GL538,Detector：PD49PI/PD481PI)

Relative output (%)

(Test circuit)

GL537   PD49PI
GL538   PD481PI

Distance between infrared light emitting diode and photodiode shall be fixed I_{sc} = 100μA at I_F= 20mA and T_a= 25°C

Ambient temperature T_a (°C)
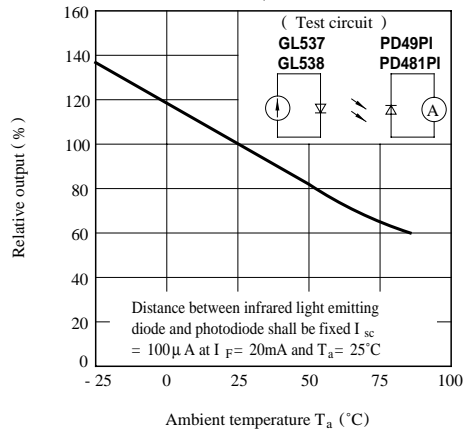
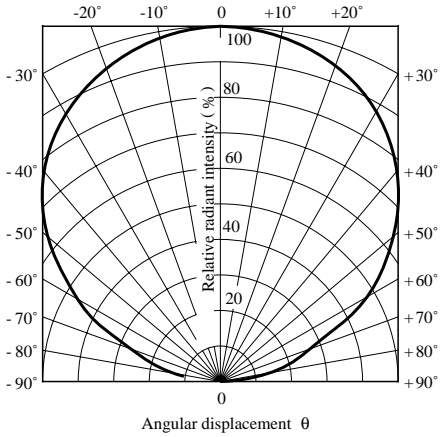**Fig. 7 Sensitivity Diagram** $(T_a = 25°C)$

Angular displacement θ

Fig. 8 Relative Output vs. Distance
（Emitter:GL537/GL538
Detector : PD49PI/ PD481PI）

GL538

GL537

$I_F = 20mA$
$T_a = 25°C$

Distance between emitter and detector
d（mm）
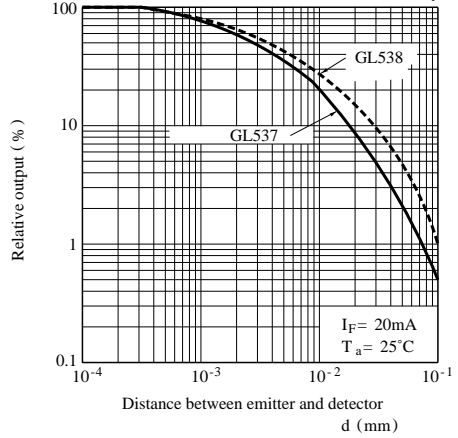
Fig. 9 Responce Time vs. Load Resistance

$V_R = 10V$
$T_a = 25°C$

Load resistance R_L（Ω）
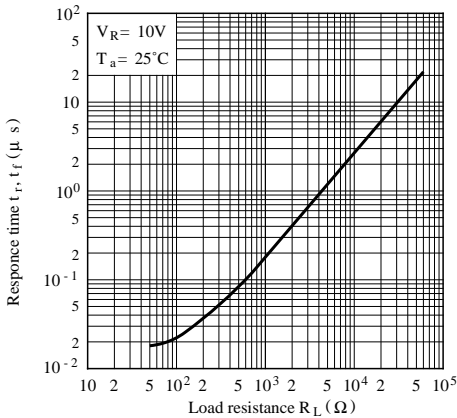
Test Circuit for Responce Time

Laser diode $I_{OUT} = 0.1mA$ Input

PD49PI/ PD481PI

10V

Output
R_L

Output

90%

10%

t_r t_f

Pulse generator
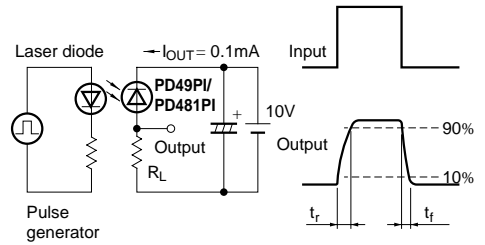
● Please refer to the chapter "Precautions for Use."