

HIGH SPEED PIN PHOTO DIODE

■ GENERAL DESCRIPTION

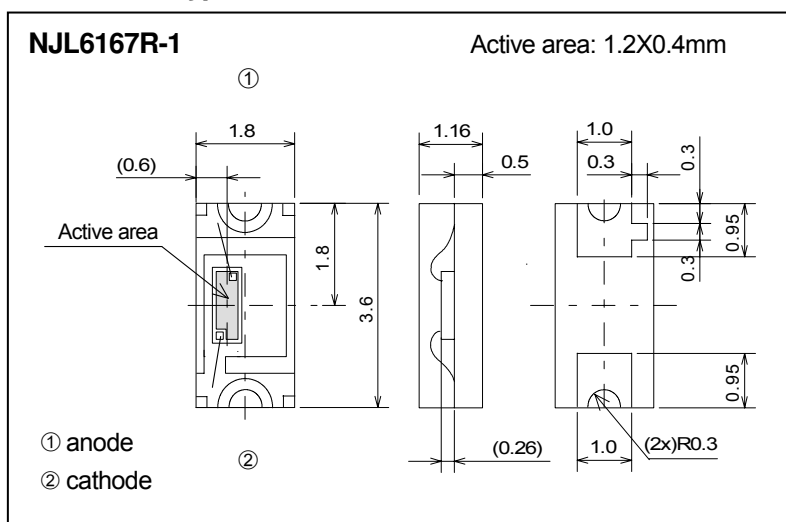
The NJL6167R-1 are the high speed PIN photo diode (fc : 450MHz at $\lambda=780\text{nm}$, 500MHz at $\lambda=650\text{nm}$).

It shrinks the outline by COBP(Chip on Board Package), and attain under half package volume compared with lead frame type.

■ FEATURES

- High speed
450MHz at $\lambda=780\text{nm}$
500MHz at $\lambda=650\text{nm}$
- Miniature, thin type
1.8mmX3.6mmX1.16mm

■ OUTLINE (typ.) Unit : mm



■ APPLICATIONS

- Laser monitor for CD-R/RW, DVD+/-R/RW/-RAM, recordable MD etc.
- Reading the signal for optical communication etc.

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Reverse Voltage	VR	35	V
Operating Temperature	Topr	-30 to +85	°C
Storage Temperature	Tstg	-40 to +100	°C
Reflow Soldering Temperature	Tsol	260	°C

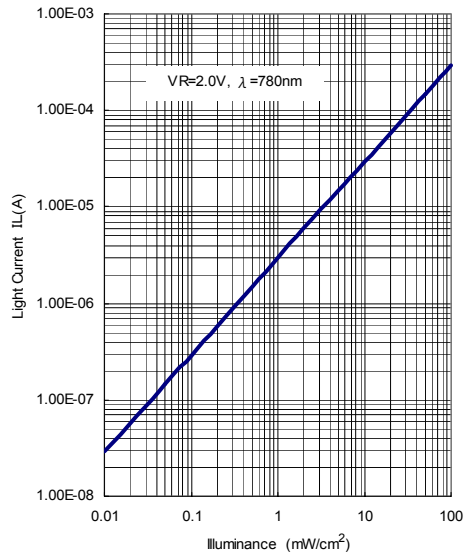
■ ELECTRO-OPTICAL CHARACTERISTICS (Ta=25°C)

PARAMETER	SYMBOL	TEST CONDITION	MIN	TYP	MAX	UNIT
Dark Current	ID	VR=10V	—	0.1	2.0	nA
Forward Voltage	VF	IF=1mA	—	—	1.0	V
Capacitance	Ct	VR=2.0V, f=1MHz	—	4	—	pF
Peak Wavelength	λ_P	—	—	800	—	nm
Sensitivity	S	VR=2.0V, $\lambda=780\text{nm}$	0.38	0.47	—	A/W
		VR=2.0V, $\lambda=650\text{nm}$	0.32	0.40	—	A/W
Cut off Frequency	fc	VR=2.0V, $\lambda=780\text{nm}$, RL=50 Ω , -3dB	—	450	—	MHz
		VR=2.0V, $\lambda=650\text{nm}$, RL=50 Ω , -3dB	—	500	—	MHz

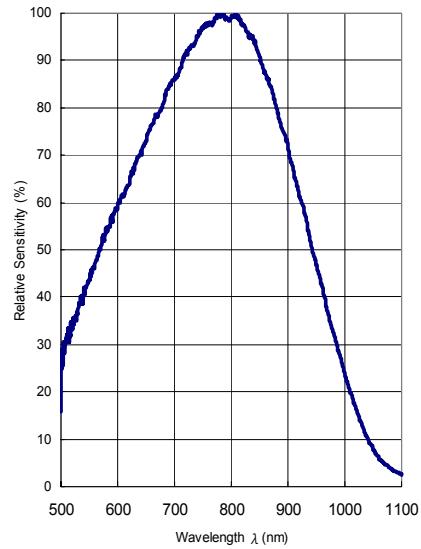
NJL6167R-1

■ TYPICAL CHARACTERISTICS

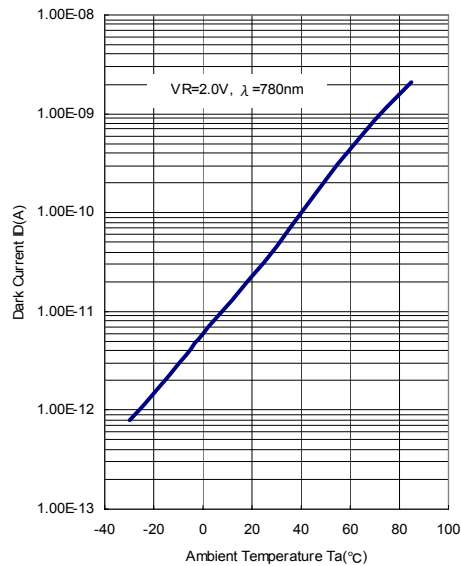
Relative Sensitivity vs. Illuminance (Ta=25 °C)



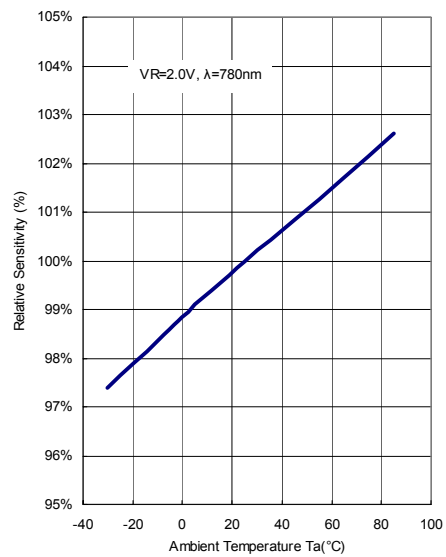
Spectral Response (Ta=25°C)



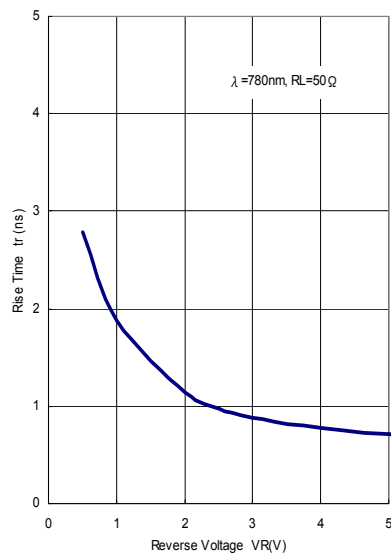
Dark Current vs. Temperature



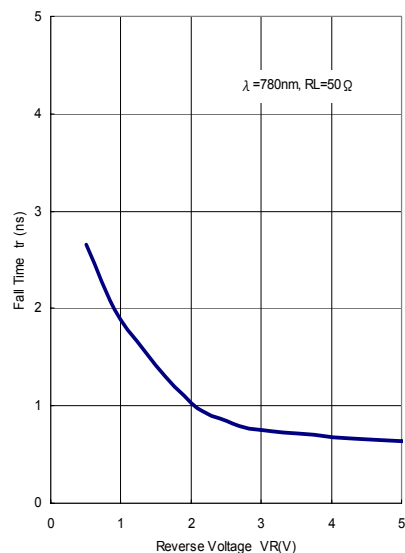
Relative Sensitivity vs. Temperature



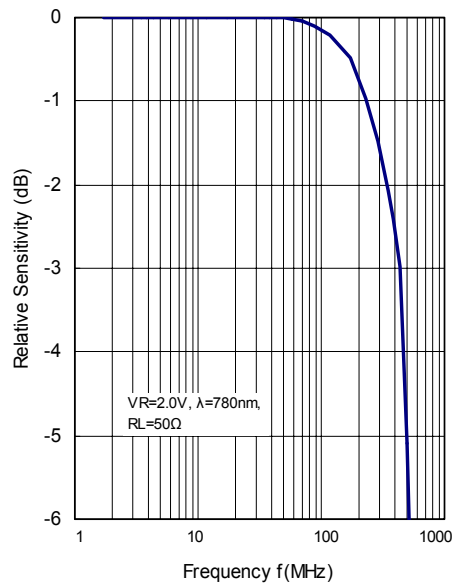
Rise Time vs. Reverse Voltage (Ta=25°C)



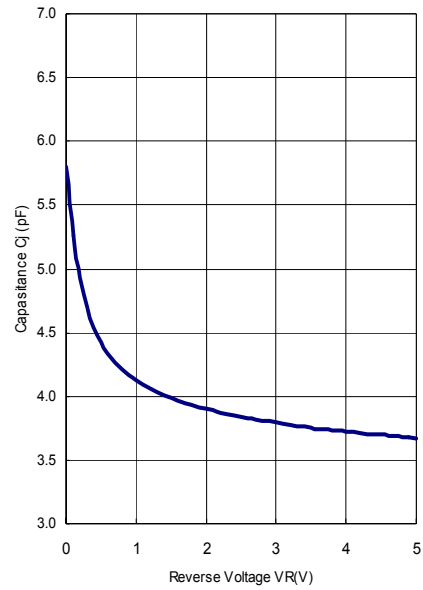
Fall Time vs. Reverse Voltage (Ta=25°C)



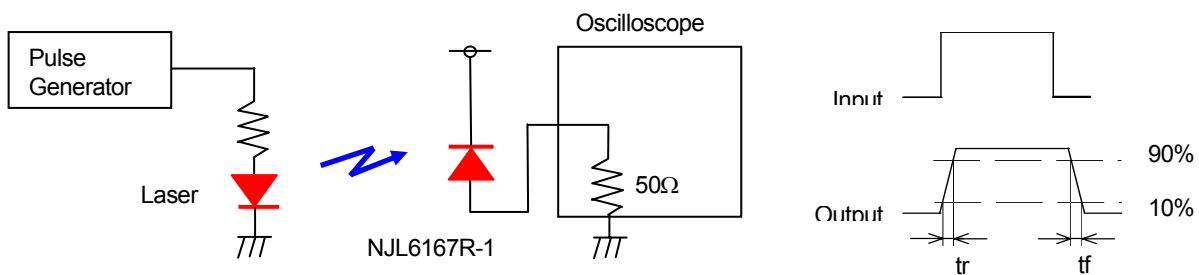
Relative Sensitivity vs. Frequency ($T_a=25^\circ\text{C}$)



Capacitance vs. Reverse Voltage ($T_a=25^\circ\text{C}$)



■ MEASURING CIRCUIT FOR RESPONSE TIME



PRECAUTION FOR HANDLING

1. Soldering to actual circuit board

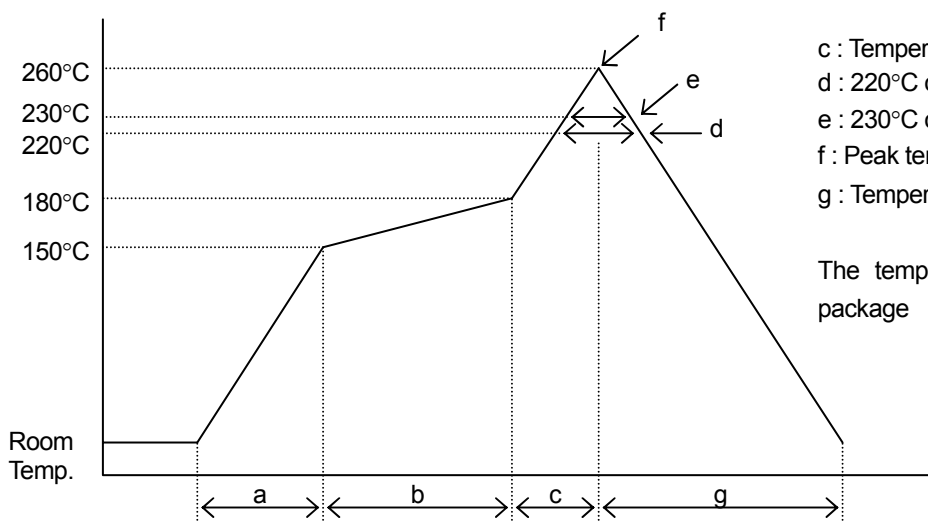
Soldering condition

- Heated condition of plastic package.
- Lower than 260 °C of maximum surface temperature

Soldering Method

1) Reflow Method

Recommended temperature profile of its method.
Soldering to be done within twice under this condition.



a : Temperature ramping rate	: 1 to 4°C/s
b : Pre-heating temperature	: 150 to 180°C
time	: 60 to 120s
c : Temperature ramping rate	: 1 to 4°C /s
d : 220°C or higher time	: Shorter than 60s
e : 230°C or higher time	: Shorter than 40s
f : Peak temperature	: Lower than 260°C
g : Temperature ramping rate	: 1 to 6°C /s

The temperature indicates at the surface of mold package

2) Reflow Method (In case of infrared heating)

- Temperature profile: Same to the above
- Avoid direct irradiation to the plastic package because it is mold resin, absorbs the Infrared Radiation and its surface temperature will be higher than lead itself.

3) The other method

Avoid rapid heating up like dipping the devices directly into the melting solder or vapor phase method (VPS).
If the device is heated to high temperature and kept in its condition for longer time, it would affect to its reliability.
It is necessary to solder in short time as soon as possible.

2. Cleaning

Avoid washing of the device after soldering by reflow method.

3. Attention in handling

- 1) Treat not to touch the lens surface.
- 2) Avoid dust and any other foreign materials (paint, bonding material, etc.) on the lens surface.

4. Storage

In order to prevent from degradation of this device in moisturing at reflow method, so that this device is contained in deaeration packaging. So that mount the device as short as possible after opening the envelope.

NJL6167R-1 Taping Specification

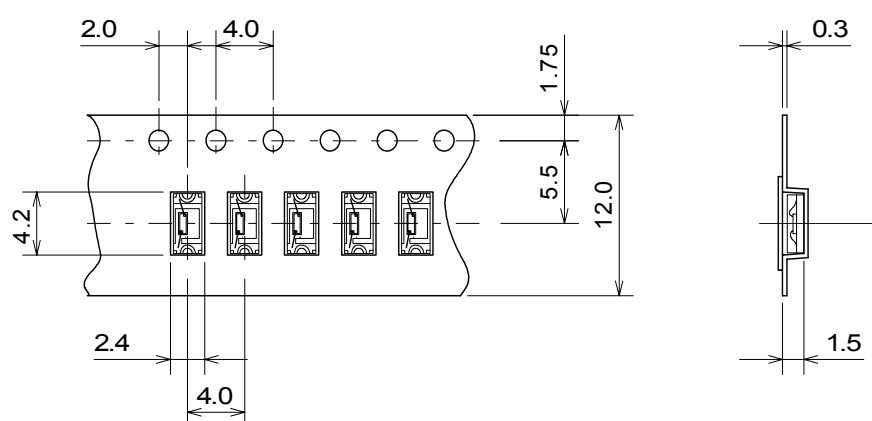
(TE1)

1. Taping Size

- 1) Carrier tape is used with Styrene type Carbonated Plastic.
- 2) Cover tape is used with electro statistically prevention treated Polyester type tape.
- 3) Product taping direction is to place the index mark against the pull out direction of the tape as in the drawing.

Pull out direction of tape →

Unit:mm



Carrier tape

Cover tape

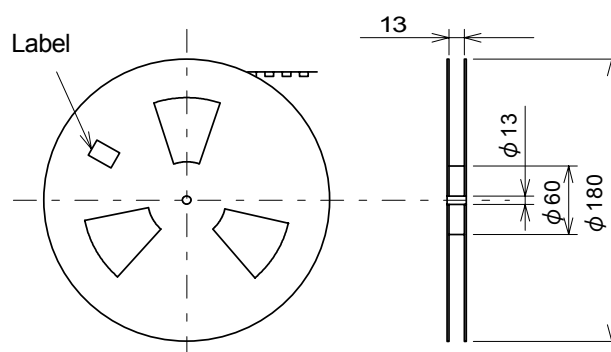
2. Taping Strength

Pull up the cover tape from the carrier tape, and when the opening angle comes around 10 to 15°, and the peeling-off strength is to be within the power of 20 to 70g.

3. Packaging

- 1) The taped products are to be rolled up on the taping reel as on the drawing.
- 2) Rolling up specification
 - 2-1) Start Rolling: Carrier tape open space more than 20 Pieces.
 - 2-2) End of Rolling: Carrier tape open space more than 20 Pieces, and 2 round of reel space at the cover tape only.
- 3) Taping quantity: 2,000 Pieces
- 4) Seal off after putting each reels in a damp proof bag with Silica gel (3 bags).

Unit:mm



MEMO

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