

Si Pigtailed Photodiodes



Description

The device is a compound Si-PIN structure. To reach high response, back side hole etching process is used for thinner I layer, when carrier go through the floating area, optical current will appear. Slow optical carrier are shorted for fast response purpose. We have our Patented package Design-“Bullet” design adopts Two optimized chips special for different wavelength.

One we called Circle Chip and the other is square Chip.

Circle chip has the peak response wavelength near 950nm. It has good response to the wavelength near 1060nm.

Square Chip has the peak response wavelength near 900nm. It has good response to the wavelength @450nm~650nm. Devices can be pigtailed with any size optical fiber that is compatible with its active area size. Pigtailed range in core size from 3μm to 100 micron. One meter is the standard length, but any length or connector termination may be specified. Pigtailed may be terminated with ST, FC, SC and LC connectors with either PC or APC polish.

Features

- Large Sensitive Area
- Low Dark Current
- High Responsivity
- High Reliability

Application

- Distance measurement
- 0.4-1.1μm Transient Process
- Fast Physical and Chemical Process Optical detection
- Light Detection, YAG Pulse Power measurement
- Fiber Optical Communication Detection

E/O Characteristics

Tsub=25°C, CW bias unless stated otherwise

Circle chip

Parameters	Sym.	Test conditions	Min	Typ		Max		Unit
Response Spectrum	λ	-	400~1100	400~1100				nm
Circle Active diameter	ϕ	-	0.2	0.5	1.0	2.0	4.0	mm
Reponsivity	Re	$\lambda=1060\text{nm},V_R=40V$	0.2	0.2	0.2	0.23	0.23	A/W
Response time	T_r	$R_L=50\Omega,V_R=40V,$	2.0	5.0	6.0	8.0	12.0	ns
Reverse breakdown voltage	V_{BR}	$I_R=10\mu A$	80	100	80	100	100	V
Dark current	I_D	$V_R=40V$	1	5	8	10	40	nA
Capacitance	C	$F=1\text{MHZ},V_R=40V$	0.5	0.8	2.0	5.0	12	PF
Operating Voltage	V_R	-		40				V

Note: Saturated optic power $\leq 0.3\text{w/cm}^2$

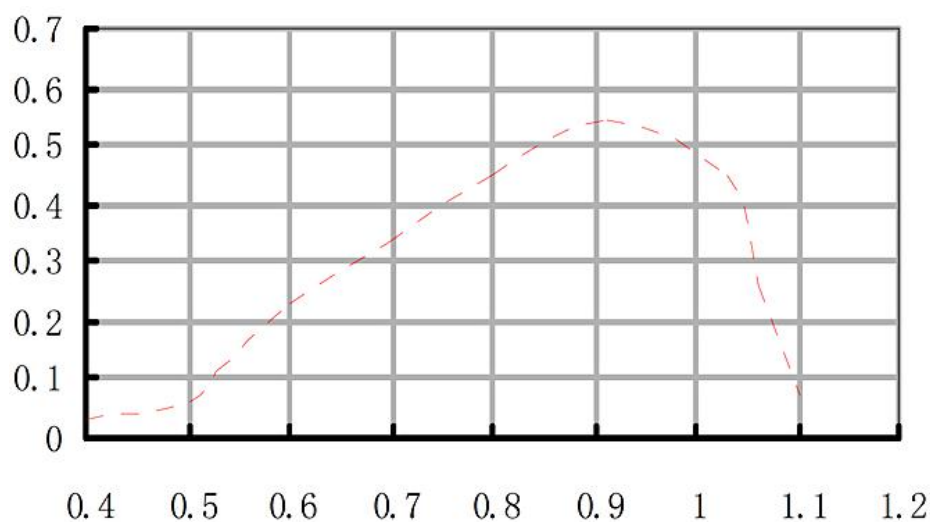
Square chip

Parameters	Sym.	Test conditions	Min		Typ	Max		Unit
Response Spectrum	λ	-	400~1100		400~1100			nm
Circle Active diameter	ϕ	-	1x1	4x4	1.3x1.3	2x2	3x3	mm
Reponsivity	Re	$\lambda=635\text{nm},V_R=10V$	0.38	0.38	0.38	0.38	0.38	A/W
Response time	T_r	$R_L=50\Omega,V_R=10V,$	25	100	45	50	50	ns
Reverse breakdown voltage	V_{BR}	$I_R=10\mu A$	50	50	50	50	50	V
Dark current	I_D	$V_R=10V$	3	15	3	5	7	nA
Capacitance	C	$F=1\text{MHZ},V_R=10V$	15	350	50	300	500	PF
Operating Voltage	V_R	-	10					V

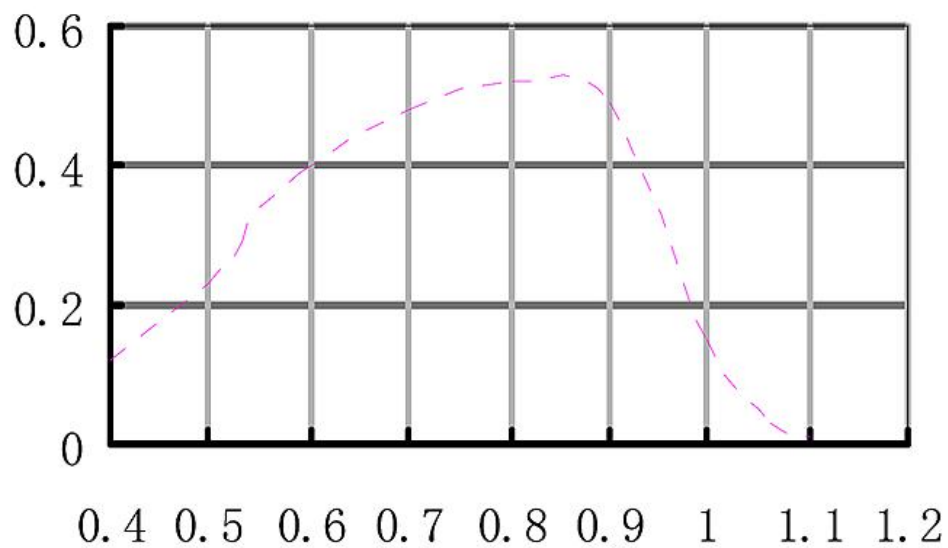
Note: Saturated optic power $\leq 0.3\text{w/cm}^2$

Typical characteristical curve

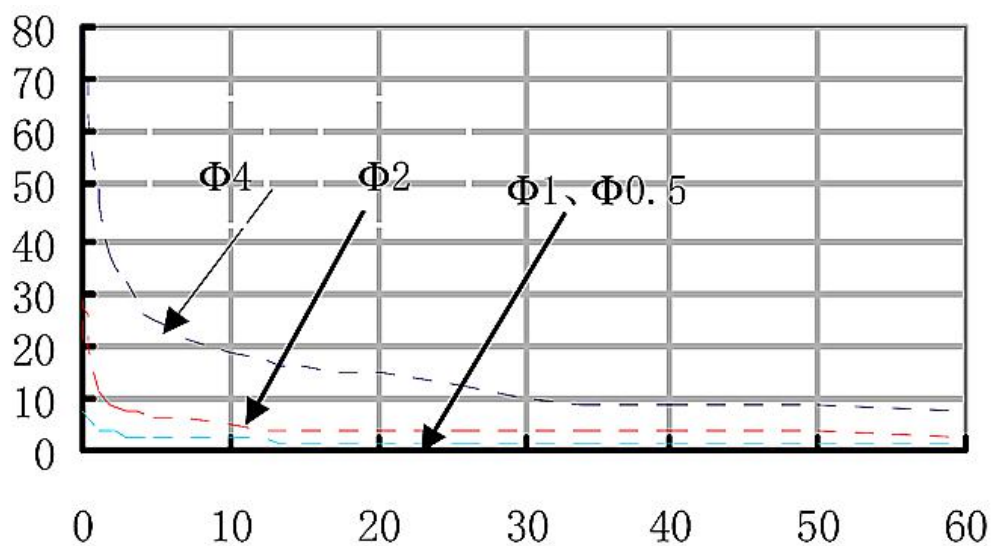
Responsivity, R (A/W)



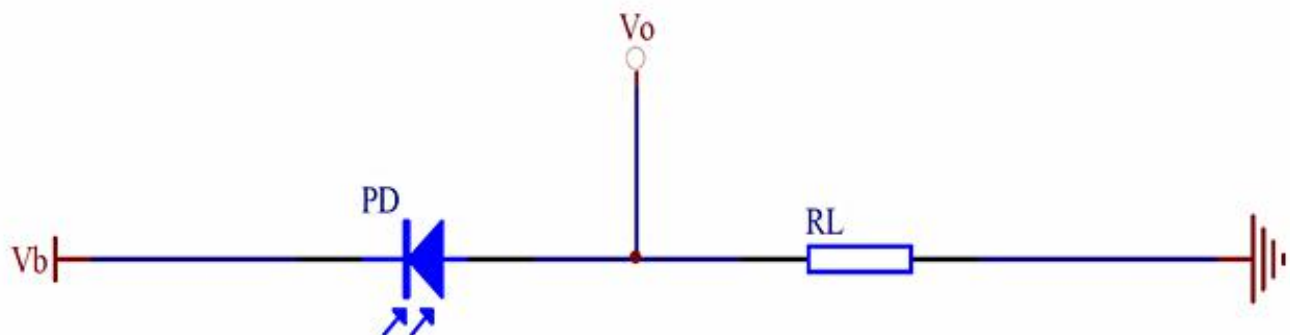
Responsivity, R (A/W)



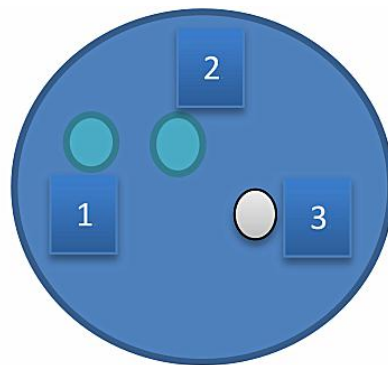
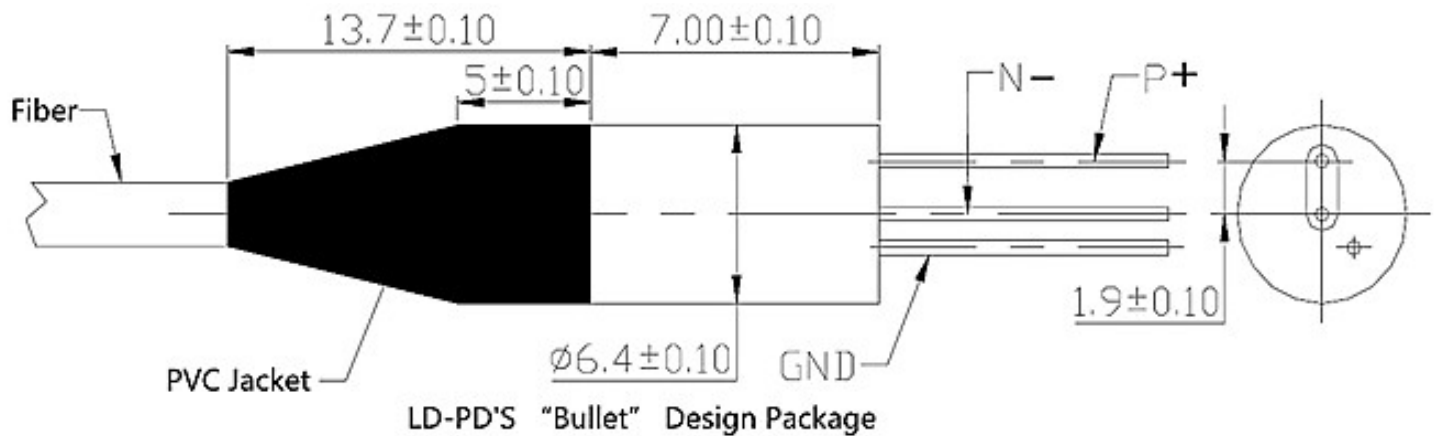
Capacitance vs voltage Curve capacitance



Application electric circuit



Dimensions and Pin definitions



Bottom View

1	P +
2	N-
3	GND

SMF-28E Fiber Nominal Characteristics and Tolerances

Parameters	Specification
Cut off wavelength	920nm
Max Attenuation	2.1dB/km
Cladding Diameter	125um
Coating Diameter	250um
Core Cladding Concentricity	$\leq 0.5\mu\text{m}$
Mode Field diameter	9.5um

Absolute Maximum Ratings

Item	Symbol	Unit	Min	Typ	Max	Testing Condition
Case Temperature	T_{OP}	°C	-5	25	70	
Forward Voltage	V_R	V	5	10	15	
Axial Pull Force		N	-	-	5N	3x10s
Side Pull Force		N	-	-	2.5N	3x10s
Fiber Bend Radius			16mm			-
Reverse Voltage(PD)	V_{PD}	V	-	-	10	C=100pF,R=1.5KΩ,HBM
PD electrostatic Discharge	V_{ESD-PD}	V		-	500	
PD Forward Current	I_{PF}	mA		-	10	
Lead Soldering time		S		-	10s	260°C
Store Temperature	T_{STG}	°C	-40	-	+85	2000hr
Operating Temperature	T_{OP}	°C	-55	-	+125	
Relative Humidity	RH		5%	-	95%	Noncondensing

Ordering Info

PL-□□□□-☆-AR▽-FXX-TO

□□□□: Cut off Wavelength

0400:400nm

0900:900nm

1700:1700nm

2100:2100nm

2400:2400nm

2700:2700nm

☆ :Material

IG:InGaAs

Si:Si

▽:Active Area

1:1mm

2:2mm

....

5:5mm

XX: Package/Fiber and Connector Type

TO:TO46 Package

FSA=SMF-28E Fiber coupled+ FC/APC

FSP=SMF-28E Fiber coupled + FC/PC

FPP=PM Fiber Fiber coupled + FC/PC

FPA=PM Fiber Fiber coupled + FC/APC

User Safety

Safety and Operating Considerations

This device operates under reverse bias voltage, and the polarity of the device can't be reversed.

Operating the Photodiode outside of its maximum ratings may cause device failure or a safety hazard. Power supplies used with this component cannot exceed maximum peak optical power.

ESD PROTECTION—Electrostatic discharge (ESD) is the primary cause of unexpected laser diode failure. Take extreme precaution to prevent ESD. Use wrist straps, grounded work surfaces, and rigorous antistatic techniques when handling Photodiodes.