



Silicon Avalanche Photodiode

P/N:YB-SIAPD-X

❖ Features & Applications

- High-speed response, high gain, low junction capacitance, low noise
- Positively illuminated planar type chip structure
- 800 μm , 500 μm , 230 μm photosensitive surface
- Laser distance measurement, laser warning, LIDAR and other applications

❖ Absolute Maximum Rating

Parameter	Symbol	Min.	Max.	Unit
Operating Voltage	Vop	—	$0.9 \times V_{BR}$	V
Operating Temperature	Top	-20	+80	°C
Storage Temperature	T _{STG}	-40	+100	°C
Welding temperature	S _{temp}	—	260	°C
Power dissipation			1	mW
Forward current			1	mA

❖ Electro-Optical Characteristics (@ Tc=22±3C)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Response Spectrum	λ	—	400~1100			nm
Photosensitive diameter	\varnothing	—	230 (1) 、 500 (2) 、 800 (3)			μm

Responsivity	R_e	$\lambda=905\text{nm}, \phi_e=1\mu\text{W}, M=100$	—	50	—	A/W
Dark Current	I_D	M=100	0.02 (1)	0.05 (1)	0.2 (1)	nA
			0.05 (2)	0.1 (2)	0.4 (2)	
			0.1 (3)	0.2 (3)	0.8 (3)	
Response time	t_s	f=1MHz, RL=50Ω, $\lambda=905\text{nm}$		0.3		ns
Total capacitance	C_{tot}	M=100, f=1MHz		1.5 (1)		pF
				3 (2)		
				5 (3)		
Optimal magnification	M			100		
Reverse Breakdown Voltage	V_{BR}	IR=10uA	80	—	200	V
Temperature coefficient of VBR	δ	$T_c=-40^\circ\text{C}\sim 85^\circ\text{C}$		0.5 (1)		V/°C
				0.5 (2)		
				0.5 (3)		

Note:

(1) is the parameter of photosensitive surface $\phi 230\mu\text{m}$ device

(2) is the parameter of photosensitive surface $\phi 500\mu\text{m}$ device

(3) is the parameter of photosensitive surface $\phi 800\mu\text{m}$ device

❖ The application electric circuit

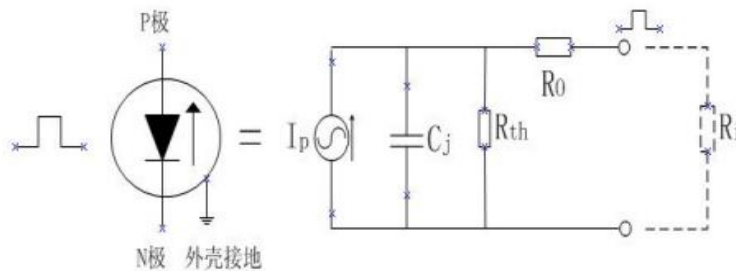


Figure1 Equivalent Circuit Diagram

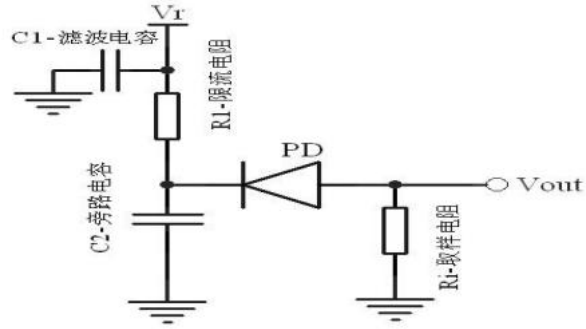


Figure2 optical Drawing

Note:

C1-filter capacitor, which mainly filters out noise from the bias operating voltage VR.

C2-bypass capacitor, mainly to provide a circuit to ground for the AC signal.

R1-current limiting resistor, mainly to protect the detector from damage when the bias operating voltage VR is too high.

Ri-sampling resistor, which converts the photocurrent into a voltage signal.

❖ **The typical characteristic curve (@Tc=22±3°C)**

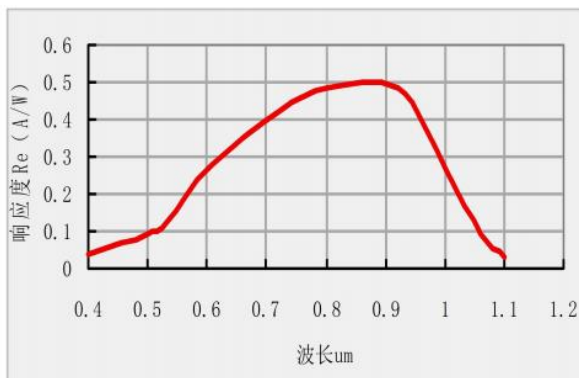


Figure3 Responsivity vs.Wavelength at 0v

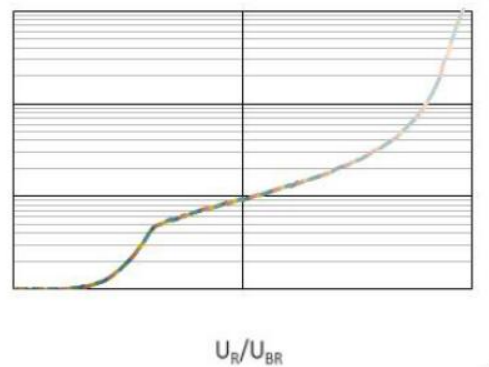


Figure4 Gain vs.UR/UBR

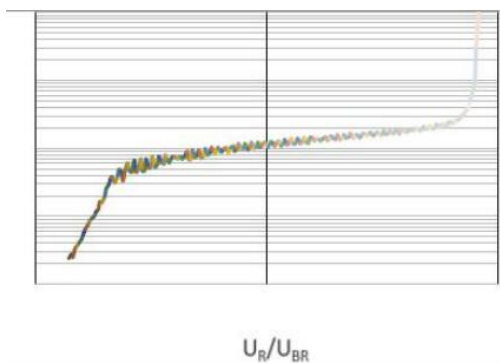


Figure5 Dark Current vs. UR/UBR

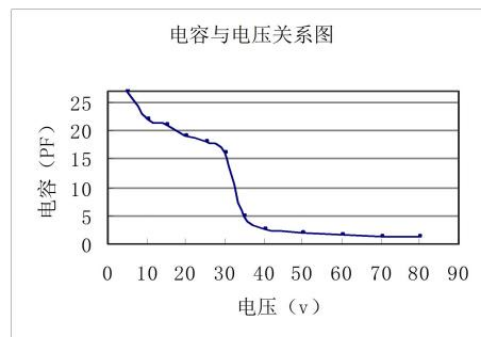


Figure6 Capacitance vs. Operating voltage

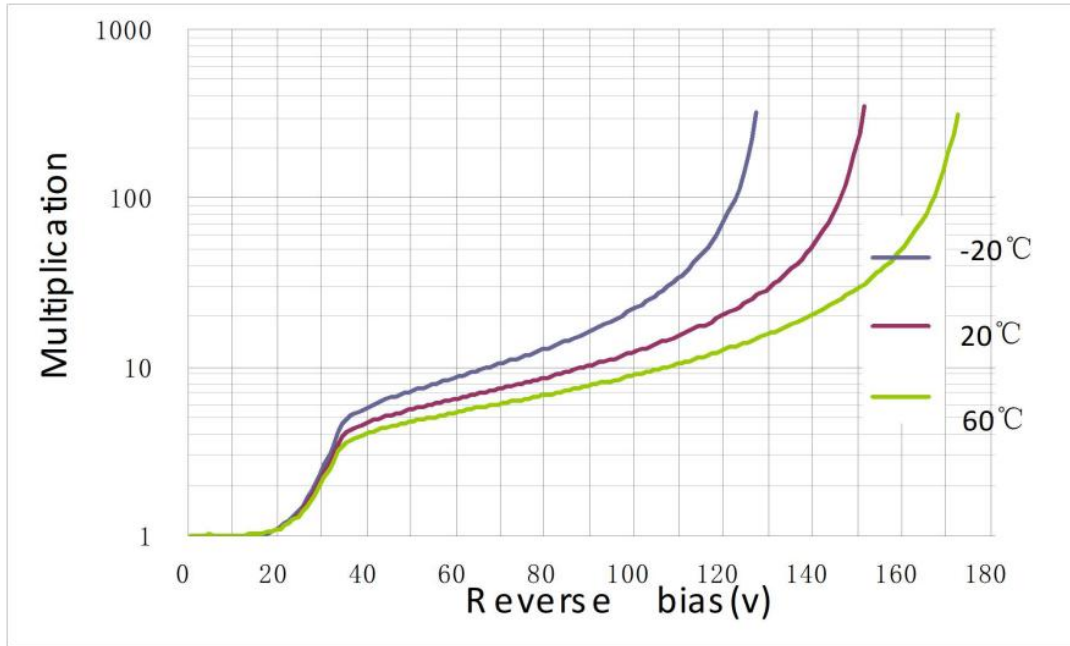


Figure8 Gain vs. Reverse Voltage

❖ The package and lead

T0-46 Flat Window Package

