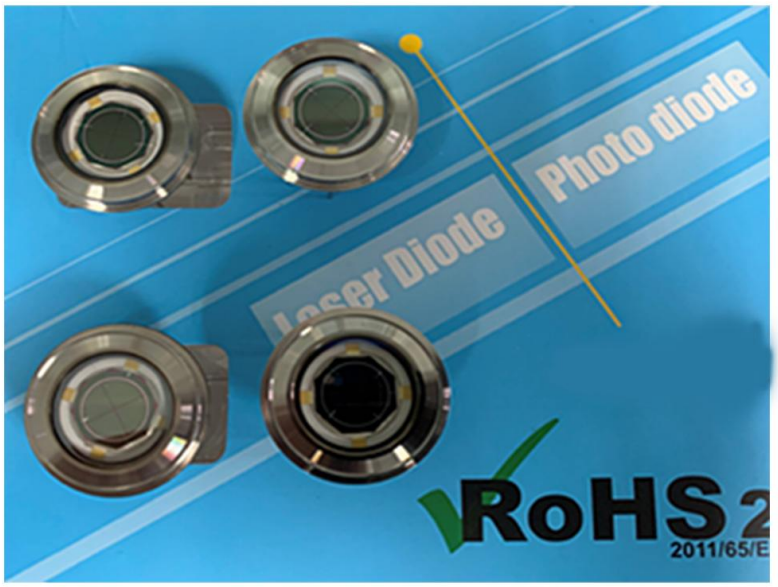
400-1100nm Four-quadrant Si photodetector (N-type silicon quadrant detector, photosensitive surface diameter 16mm, DC responsivity 0.3A/W)



Product Description

The device is an N-type silicon quadrant detector. When the radiation flux of light radiating to each quadrant of the device is equal, the photocurrent output of each quadrant is equal. When the target is offset, the change of radiation flux between quadrants causes the change of output photocurrent

of each quadrant, thereby measuring the direction of the object, thus playing the role of tracking and guiding.

Product features

Low dark current、 High uniformity and symmetry、 High reliability、 Small blind spot

Part Number

MP-QPD-B-S-4G16

Application area

Laser aiming, guidance, tracking and exploration device 、 Precision measurement system such as laser micro-positioning and displacement monitoring

Core parameters

Wavelength Range	Active area	Responsivity (DC) (quadrant)
400-1100nm	16mm	0.3A/W

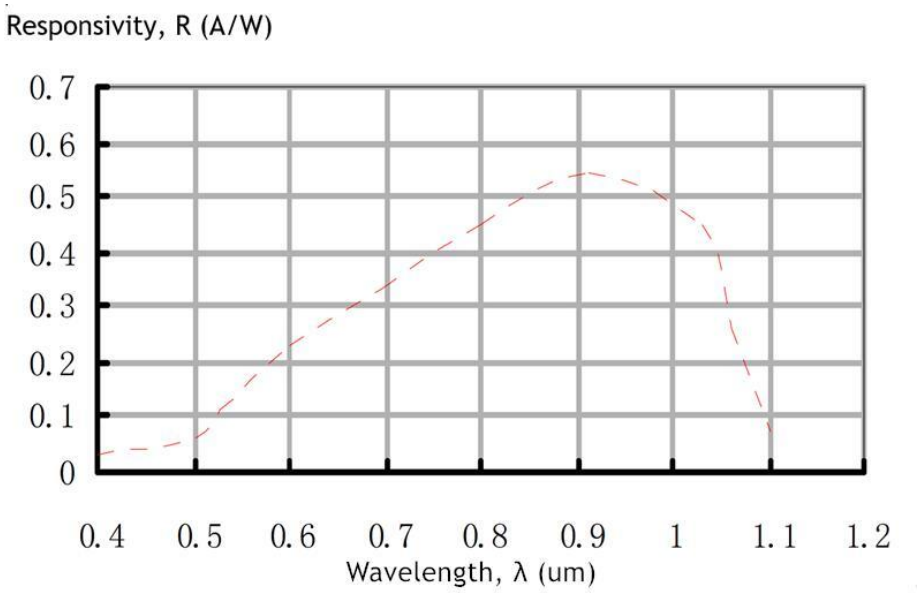
General Parameters

Parameter

Parameter	Symbol	Test condition (Unless otherwise specified, T_A = 22°C ± 3°C)		Value			Unit
				Min.	Typical	Max.	
Responsivity (AC) (quadrant)	S_{pi}	λ=1.064 μm	Pulse width 20 ns、P_{in}=2 mW	0.25	-	-	A/W
Responsivity (DC) (quadrant)	R_{ei}		DC、P_{in}=1μw	0.3	-	-	
Responsivity (AC) (quadrant)a	ΔR_{ei}	V_R=135 V	T_A=-45 °C ±2 °C	-	-	50	%
Responsivity (DC) (quadrant)a							
Dark current (quadrant)	I_{Di}	V_R=135V	T_A=22°C± 3°C	-	-	1	μA
			T_A=70°C± 3°C	-	-	10	
Dark current (ring)	I_D	P_{in}=0μw	T_A=22°C±	-	-	10	

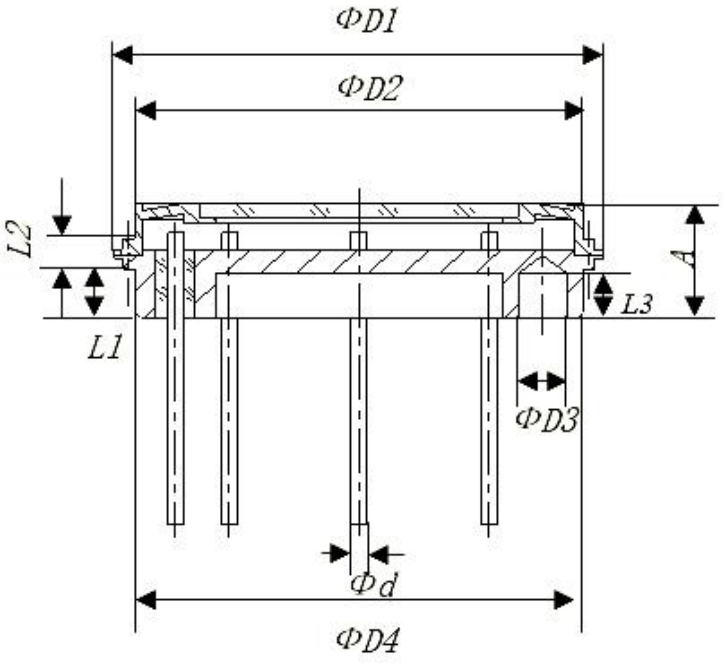
			3℃				
			T_A=70℃± 3℃	-	-	100	
Junction capacitance (quadrant)	C_{ji}	V_R=135V，f=1MHz		-	-	15	pF
Active area	ϕ			10	-	16	mm
Equivalent noise power	NEP_i	λ=1.064 μm，V_R=135 V ,pulse width 20 ns		-	-	5× 10^{-12}	W/H $Z^{1/2}$
Breakdown voltage (quadrant, ring)	V_{BR}	I_R=10μA		200	-	-	V
Inter-pixel sensitivity non-uniformity	R_f	λ=1.064 μm，V_R=135 V, pulse width 20 ns; P_{in}=2mW		-	-	5	%
Intra-pixel sensitivity non-uniformity	R_{fn}	λ=1.064 μm，V_R=135 V, pulse width 20 ns; P_{in}=2mW		-	-	5	%
Inter-pixel crosstalk factor	S_{Li}	λ=1.064 μm，V_R=135 V, pulse width 20 ns; P_{in}=2mW		-	-	5	%
element gap	-	-		-	0.2	-	mm

Spectrum responsivity curve



Appearance and structure

TO type airtight package. The appearance and structure are shown in Figure 1, and the dimensions are shown in Table 1.



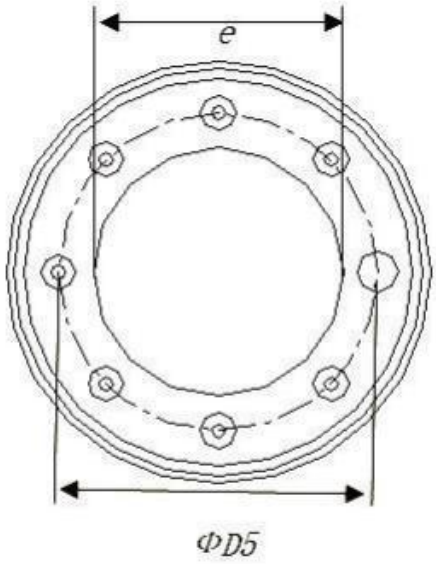


Figure 1 Appearance structure

Table 1 appearance dimension (unit mm)

Dimension symbol	ϕ D_1	Φ D_2	Φ D_3	Φ D_4	Φ D_5	Φ d	A	L1	L2	L3	e
Min.	30. 55	27. 80	3. 00	27. 915	22. 60	0. 98	7. 03	3. 02	1. 85	2. 70	18. 00
Max.	30. 65	28. 00	3. 06	27. 94	23. 40	1. 02	7. 20	3. 10	1. 95	3. 00	18. 05

Pin arrangement

The pin arrangement of the device is shown in Figure 2. The pin functions should comply with the requirements of Table 2.

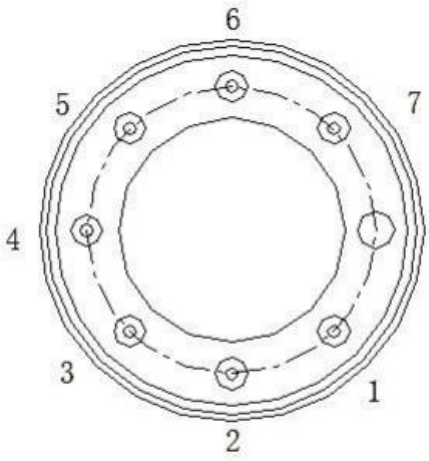


Figure 2 Pin arrangement (pin up)

Table 2 Pin Function Table

Pin	Function	Voltage polarity
1	Quadrant 1	Positive
2	Public P level	Negative
3	Quadrant 4	Positive
4	Ring level	Positive
5	Quadrant 3	Positive
6	Case	Ground
7	Quadrant 2	Positive