BEE PHOTON®

PHOTODIODE SERIES SELECTION GUIDE

——From Chip to Module

COMPANY PROFILE

Beephoton Technology (Changzhou) Co. Ltd was founded in June 2017 as an advanced technology company specializing in photon detection technology. We are based in Changzhou, with an R&D center in Beijing.

BEEPHOTON is committed to developing, manufacturing and marketing high-performance photo detectors. Our products include photodiodes, X-ray detectors, X-ray detector modules and related integrated solutions, which are widely used in IVD, POCT and measuring machines, medical spiral CT, medical laboratory tests, industrial X-ray NDT, security check. The company has thousands of square meters' workshop, and equipped with a number of advanced manufacturing and testing facilities, putting in place a comprehensive supply chain management system. We have got ISO9001, ISO14001, ISO45001 certification.

By focusing on market demand, BEEPHOTON strives to supply competitive products, high-quality technical support and after-sales service for downstream system customers, thereby contributing to human health and safety.

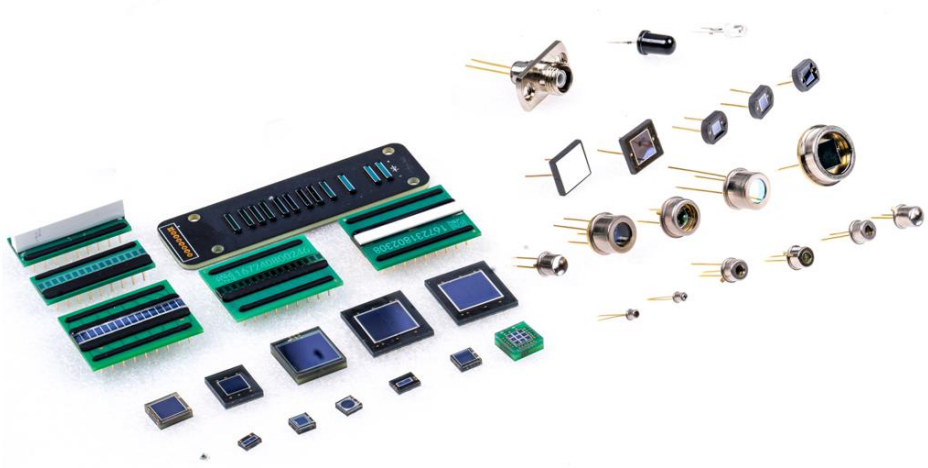
TARGET APPLICATIONS

BEEPHOTON has developed a series of photodetectors that are widely used in industrial, communication, medical, transportation, consumer electronics, environmental and other fields for human safety and health.

Industry

Communication

In vitro diagnostic



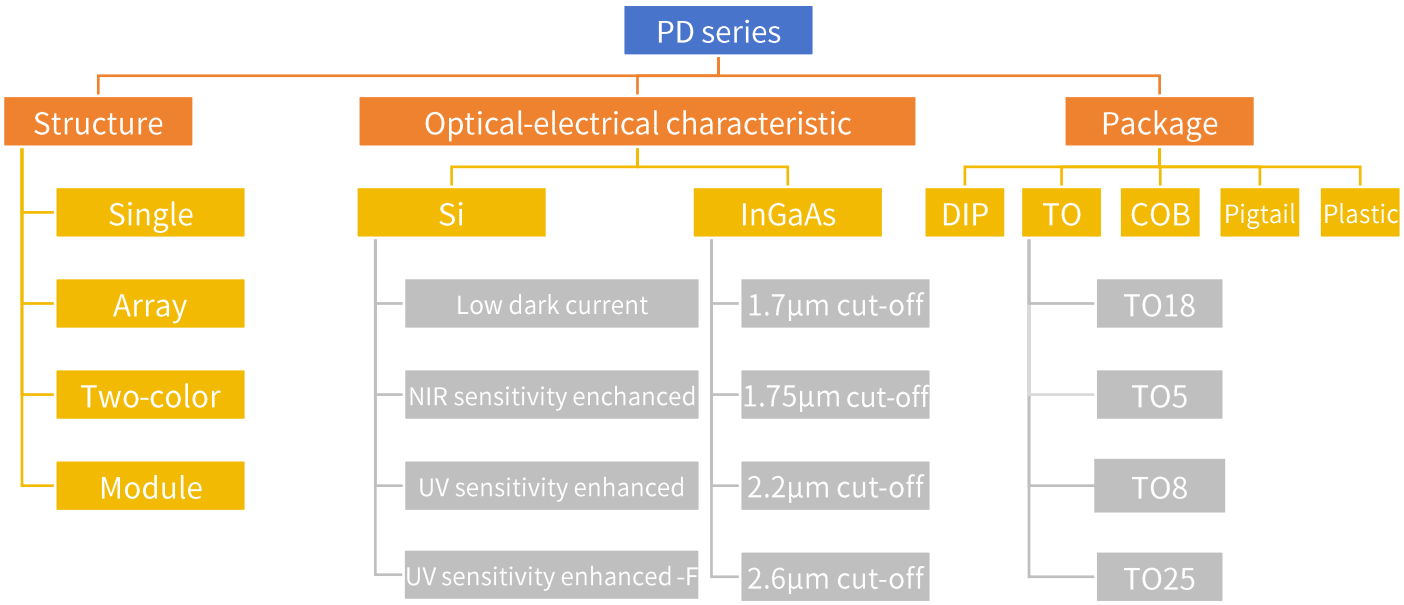
Vehicle

Consumer electronics

Environment

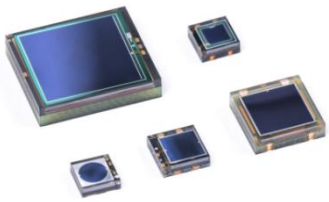
PRODUCT CATEGORY

BEEPHOTON photodiodes spectral response range covers near-infrared, visible light, ultraviolet to X-ray, and provides various package forms, such as metal, ceramic, SMT, array and module. It has the advantages of low noise, high response, high linearity, high reliability and e.t.c. The overall performance reaches the first-rate level, and supports customized design.

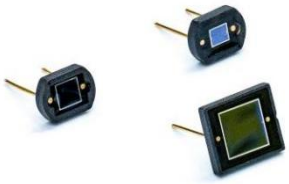


TO package

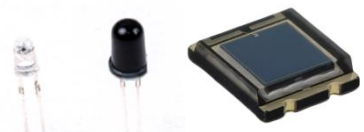
COB package



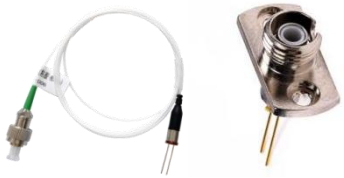
DIP package



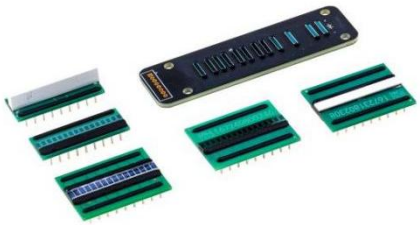
Plastic package



Pigtail package



Array



CONTENT

Si PIN Photodiode

Features

- Wide Spectral response range
- Ultra low dark current
- High consistency, high stability
- Low junction capacitance
- High linearity

Applications

- Optical measurement equipment
- Analytical equipment
- Laser detection
- X-RAY detection

Si PD with low dark current

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current	Junction capacitance	Rise time	Photosensitive area size	Window material	Package
				V_R=10mV	V_R=0V	V_R=0V; R_L=1kΩ			
	[nm]	[nm]	[A/W]	[pA]	[pF]	[μs]	[mm]		
PDCT01-201	350-1060	720	0.37@560nm 0.44@633nm 0.52@720nm	0.5	15	0.05	1.1×1.1	Borosilicate	TO18 /
PDCT01-202								Ball lens	2PIN
PDCT07-001				2	70	0.16	2.6×2.6	Borosilicate	TO5 / 2PIN
PDCT14-001				4.5	160	0.35	3.7×3.7		
PDCT34-101				6	370	0.81	5.8×5.8		TO8 / 2PIN
PDCD07-001	350-1060	780	0.35@560nm 0.42@633nm 0.52@780nm	2	70	0.16	2.6×2.6	Resin	DIP
PDCD07-201									
PDCD10-001				3.5	115	0.25	3.2×3.2		
PDCD34-101				6	370	0.81	5.8×5.8		
PDCD100-101				15	800	1.76	10×10		
PDCC07-003				2	70	0.16	2.6×2.6		COB
PDCC07-101				2	85	0.19	Φ3.0		
PDCC14-001				4.5	160	0.35	3.7×3.7		
PDCC34-001				6	370	0.81	5.8×5.8		
PDCC100-001				15	800	1.76	10×10		

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Si PIN Photodiode

Si PD with NIR sensitivity enchanced

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current V_R=10mV	Junction capacitance V_R=0V	Rise time V_R=0V; R_L=1kΩ	Photosensitive area size	Window material	Package
	[nm]	[nm]	[A/W]	[pA]	[pF]	[μs]	[mm]		
PDCT001-301	430-1100	940	0.58@940nm	1	1.5	0.004	0.26×0.26	Lens	TO18 / Type B 3PIN
PDCT003-304				1	5	0.01	0.54×0.54		
PDCT01-302	350-1100	920	0.43@633nm 0.62@920nm 0.25@1064nm	1	20	0.04	1.1×1.1	Borosilicate	TO18 / 2PIN
PDCT34-501				80	420	0.9	5.8×5.8	Resin	DIP
PDCD100-501				150	1000	2.2	10×10		
PDCC34-501				80	420	0.9	5.8×5.8		COB
PDCC100-501				150	1000	2.2	10×10		
PDCF001-301FC-SMN-A	430-1100	940	0.58@940nm	1	1.5	0.004	0.26×0.26	Lens	Fiber coupling FC / APC connector

Si PD with NIR sensitivity enchanced

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity		Dark current V_R=10V	Junction capacitance V_R=3V	Rise time V_R=10V; R_L=50Ω	Photosensitive area size	Window material	Package
			@λ_p	@1064nm						
	[nm]	[nm]	[A/W]		[nA]	[pF]	[ns]	[mm]		
PDCP003-201	430-1100	940	0.58	0.25	5	-	-	0.54×0.54	Resin(CR)	Plastic(SMD)
PDCP08-201			0.70	0.25	10	30	3.3	2.86×2.86		
PDCP08-301										Plastic / sde-look/ DIP
PDCP08-302	850-1100		0.56	0.20					Resin(BK)	
PDCP08-401	430-1100		0.70	0.25					Resin(CR)	Plastic /side-look ball lens / DIP
PDCP08-402	850-1100		0.56	0.20					Resin(BK)	
PDCP08-403	430-1100		0.70	0.25					Resin(CR)	

Si PIN Photodiode

Si PD with UV sensitivity enchanced

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current V_R=10mV	Junction capacitance V_R=0V	Rise time V_R=0V; R_L=1kΩ	Photosensitive area size	Window material	Package
	[nm]	[nm]	[A/W]	[pA]	[pF]	[μs]	[mm]		
PDCT01-801	320-1060	820	0.16@365nm 0.43@633nm 0.53@820nm	0.5	15	0.05	1.1×1.1	Borosilicate	TO18 / 2PIN
PDCT01-802	250-1060							Quartz	
PDCT07-601	320-1060			5	60	0.13	2.6×2.6	Borosilicate	TO5 / 2PIN
PDCT07-602	250-1060							Quartz	
PDCT14-601	320-1060			8	140	0.3	3.7×3.7	Borosilicate	
PDCT14-602	250-1060							Quartz	
PDCT16-601	320-1060			10	160	0.35	4.0×4.0	Borosilicate	
PDCT16-602	250-1060							Quartz	
PDCT34-701	320-1060			13	280	0.6	5.8×5.8	Borosilicate	TO8 / 2PIN
PDCT34-702	250-1060							Quartz	
PDCD07-601	320-1060	820	0.16@365nm 0.43@633nm 0.48@820nm	8	60	0.13	2.6×2.6	Resin	DIP
PDCD07-801									
PDCD07-802	250-1060							Quartz	
PDCD10-801	320-1060			10	90	0.2	3.2×3.2	Resin	
PDCD34-701	320-1060			13	280	0.6	5.8×5.8		
PDCD34-703	250-1060							Quartz	
PDCD100-701	320-1060			20	800	1.8	10×10	Resin	
PDCD100-702	250-1060							Quartz	
PDCC07-601	320-1060			1	60	0.13	2.6×2.6	Resin	COB
PDCC14-601				5	140	0.3	3.7×3.7		
PDCC34-601				13	280	0.6	5.8×5.8		
PDCC100-701				20	800	1.8	10×10		

Si PD with UV sensitivity enchanced -- F series

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current V_R=10mV	Junction capacitance V_R=0V	Rise time V_R=0V; R_L=1kΩ	Photosensitive area size	Window material	Package
	[nm]	[nm]	[A/W]	[pA]	[pF]	[μs]	[mm]		
PDCT01-F01	190-1100	1010	0.20@200nm 0.50@633nm 0.72@905nm 0.80@1010nm	5	20	0.04	1.0×1.0	Quartz	TO18 / 2PIN
PDCT06-F01				10	85	0.19	2.4×2.4		TO5 / 2PIN
PDCT25-F01				20	350	0.77	5.0×5.0		TO8 / 2PIN
PDCD100-F01				50	1150	2.53	10×10		DIP

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Si PIN Photodiode

Si PD with optical filter

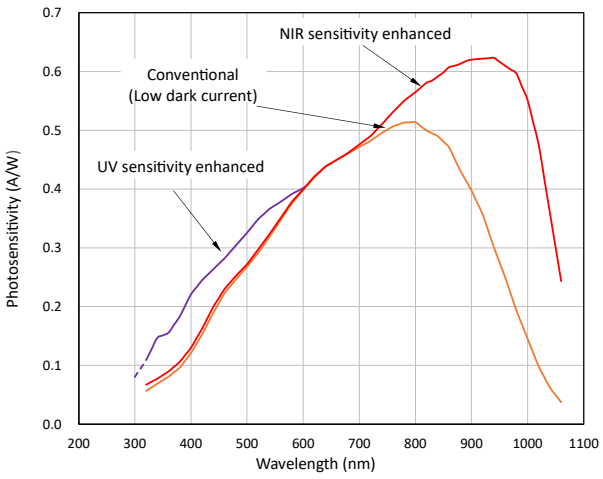
Type no.	Photosensitivity	Dark current V_R=10mV	Junction capacitance V_R=0V	Rise time V_R=0V;R_L=1kΩ	Photosensitive area size	Window material	Package
	[A/W]	[pA]	[pF]	[μs]	[mm]		
PDCT01-204	0.42@628nm	0.5	15	0.05	1.1×1.1	628nm filter	TO18 / 2PIN
PDCT16-604	0.015@254nm	10	160	0.35	4.0×4.0	254nm filter	TO5 / 2PIN
PDCD10-202	0.34@532nm	3.5	115	0.25	3.2×3.2	532nm filter	DIP

Si PD with scintillantor

Type no.	Photosensitivity	X-ray sensitivity[1]	Dark current V_R=10mV	Junction capacitance V_R=0V	Rise time V_R=0V;R_L=1kΩ	Photosensitive area size	Scintillator	Package
	[A/W]	[nA]	[pA]	[pF]	[μs]	[mm]		
PDCD34-102	0.40@560nm	34	5	400	0.9	5.8×5.8	GOS	DIP

Test conditions: Tube voltage 120kv, tube current 1.0mA, SOD 800mm.

Comparison of spectral response in different PD (COB package)



Note: The above parameters/curves are the performance of typical PD models, and the actual parameters are subject to the date sheet of each model.

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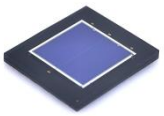
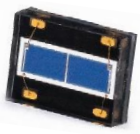
Si PIN Photodiode Array

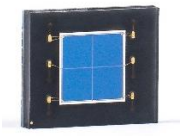
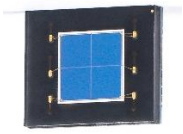
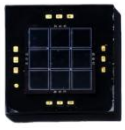
Features

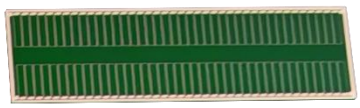
- Wide Spectral response range
- Low Junction capacitance
- High linearity, high consistency, high stability
- Ultra low dark current

Applications

- Optical measurement equipment
- Optoelectronic switch

Dual PD					
Type no.	PDCA02-101	PDCA02-102	PDCA02-103	PDCA02-104	PDCA02-201
Schematic diagram					
Package size (mm)	9.2×4.0×2.0	4×3×1.1	16.5×14.5×1.5	5.4×4.1×1.1	TO5
Photosensitive area size (mm)	4.5×2.5、2.5×2.5	2 - 1.6×0.9	2 – 10×5	2 – 1.5×1	2 – 3×1.5

Four-quadrant PD			3×3 pixel PD
Type no.	PDCA04-101	PDCA04-102	PDCA09-101
Schematic diagram			
Package size (mm)	10.6×8.8×1.5	16.5×14.5×1.5	7.2×7.2×1.5
Photosensitive area size (mm)	4 – 2.5×2.5	4 – 5×5	9 – 1.1×1.1

PD Array				
Type no.	PDCA16-003	PDCA16-004	PDCA16-007	PDCA80-001
Schematic diagram				
Channel number	16			80 (2 rows)
Package size (mm)	25.4×20	25.4×20	25.4×20	20.8×5.89×0.3
Photosensitive area size (mm)	1.4×2.8	0.77×2.5	1.175×2	2.03×0.4
Photosensitive area size (mm)	1.575	1.17	1.575	0.5

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InGaAs PIN Photodiode

800-1700nm InGaAs PD

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current	Junction capacitance	Cut-off frequency	Photosensitive area size	Window material	Package
				V_R=5V	V_R=5V	V_R=5V;R_L=50Ω			
	[nm]	[nm]	[A/W]	[nA]	[pF]	[hz]	[mm]		
PDIT005-202	800-1700	1550	1.0@1310nm 1.05@1550nm	0.05	0.18	6G	Φ0.05	Lens	TO18 / Type B 3PIN
PDIT007-201				0.06	0.32	4G	Φ0.075		TO18 / Type B 3PIN
PDIT03-201				0.2	8	400M	Φ0.3	Borosilicate	TO18 / 2PIN
PDIT03-202								Lens	TO25 / 2PIN
PDIT03-203								Borosilicate	
PDIT03-204								Lens	TO18 / Type B 3PIN
PDIT05-201				0.5	20	150M	Φ0.5	Borosilicate	TO18 / 2PIN
PDIT05-202								Ball Lens	TO18 / Type B 3PIN
PDIT05-204								Borosilicate	
PDIT10-202				1	75	40M	Φ1.0	Ball Lens	
PDIT10-203								Borosilicate	
PDIT20-001				2	210	15M	2		TO5 / 2PIN
PDIT30-001				3	510	6M	3		
PDIP03-103				0.2	8	400M	0.2	Resin	Plastic / DIP
PDIP005-201				0.05	0.18	6G	0.05		Plastic / SMD
PDIP03-201				0.2	8	400M	0.2		
PDIP05-201				0.5	20	150M	0.5		

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InGaAs PIN Photodiode

900-1700nm high speed InGaAs PD

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current	Junction capacitance	Cut-off frequency	Photosensitive area size	Window material	Package
				V_R=5V	V_R=5V	V_R=5V; R_L=50Ω			
	[nm]	[nm]	[A/W]	[nA]	[pF]	[hz]	[mm]		
PDIF005-202FC-SMN-A	900~1700	1550	0.9@1310nm 0.95@1550nm	0.05	0.18	6G	Φ0.05	Lens	9μm fiber FC/APC connector
PDIF007-201FC-SMN-A				0.06	0.32	4G	Φ0.075		
PDIF007-201LC-SMN-A-TAP02									2/98 TAP PD 9μm fiber FC / APC connector
PDIF03-202NC-BSM-TAP02				0.2	8	400M	Φ0.3		
PDIF03-202FC-BSM-A									9μm bare fiber FC/APC connector
PDIF05-204FC-SMN-A-10				0.5	20	150M	Φ0.5	Borosilicate	10dB attenuation
PDIF10-203FC-4F				1	75	40M	Φ1.0		9μm bare fiber FC/APC connector
PDIF20-002FC-4F-M				2	210	15M	Φ2.0		FC connector

800-1750nm InGaAs PD

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current	Junction capacitance	Cut-off frequency	Photosensitive area size	Window material	Package
				V_R=5V	V_R=5V	V_R=5V;R_L=50Ω			
	[nm]	[nm]	[A/W]	[nA]	[pF]	[hz]	[mm]		
PDIT05-301	800-1750	1550	1.05@1654nm	0.2	16	200M	Φ0.5	Glass / Lens	TO18
PDIT10-301				0.5	55	53M	Φ1.0		
PDIT10-302								Glass/ Borosilicate	

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InGaAs PIN Photodiode

900-2200nm InGaAs PD

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current	Junction capacitance	Photosensitive area size	Window material	Package
				V_R=0V	V_R=0V			
	[nm]	[nm]	[A/W]	[nA]	[pF]	[mm]		
PDIT03-513	900-2200	1750	1.1@1550nm 1.03@2004nm	0.05	60	Φ0.3	Borosilicate	TO18 / Type C 3PIN
PDIT03-514							Lens	
PDIT05-513				0.5	140	Φ0.5	Borosilicate	
PDIT05-512							Ball Lens	
PDIT10-513				5	400	Φ1.0	Borosilicate	
PDIT10-512							Ball Lens	

900-2600nm InGaAs PD

Type no.	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current	Junction capacitance	Photosensitive area size	Window material	Package
				V_R=0.1V	V_R=0.1V			
	[nm]	[nm]	[A/W]	[μA]	[pF]	[mm]		
PDIT03-413	900-2600	2200	0.8@1550nm 1.06@2327nm	1	40	Φ0.3	Borosilicate	TO18 / Type C 3PIN
PDIT03-414							Lens	
PDIT05-413				10	100	Φ0.5	Borosilicate	
PDIT05-412							Ball Lens	
PDIT10-413				45	330	Φ1.0	Borosilicate	
PDIT10-412							Ball Lens	
PDIT20-401				150	1800	Φ2.0	Borosilicate	TO5 / 2PIN

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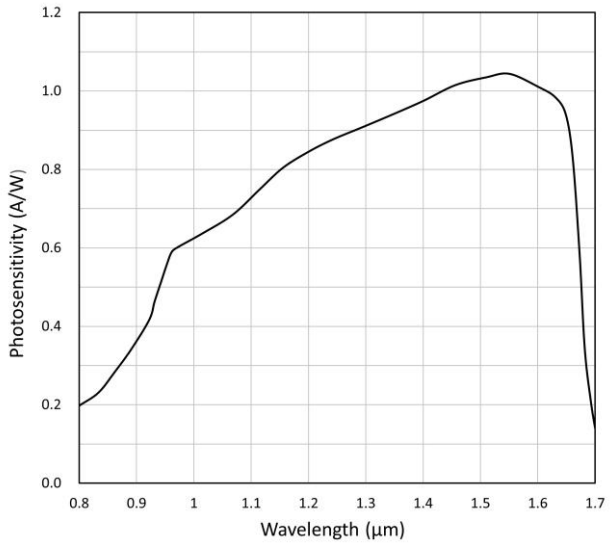
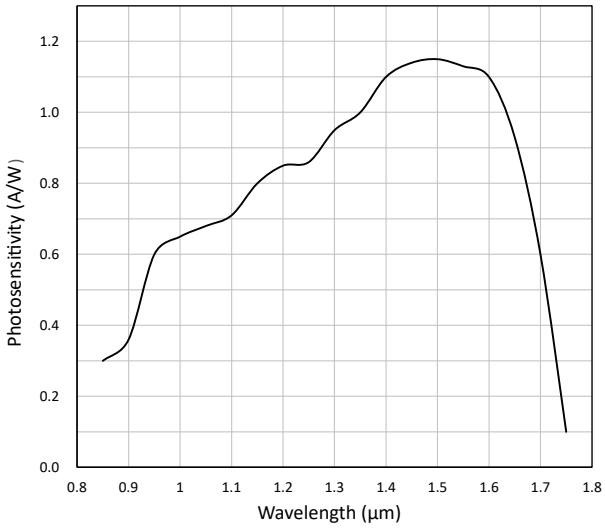
InGaAs PIN Photodiode

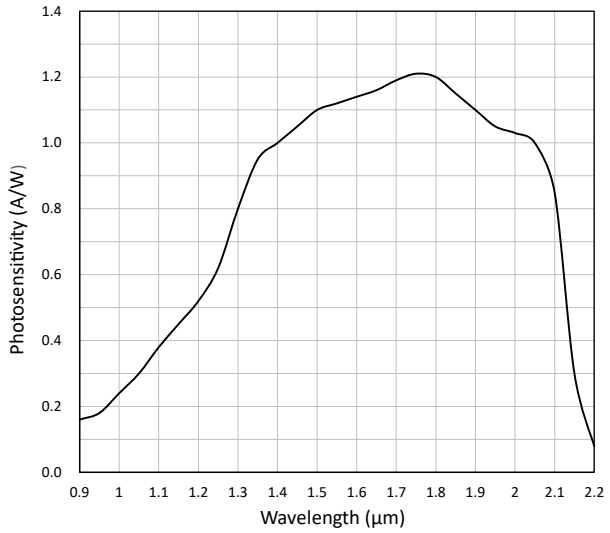
- 800-1700nm high speed InGaAs PD



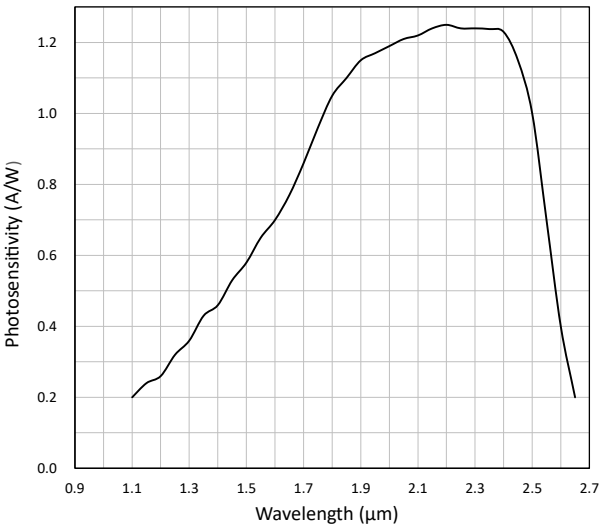
- 800-1750nm InGaAs PD



- 900-2200nm InGaAs PD



- 900-2600nm InGaAs PD



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Two-color detector

Features

- Two elements(Si+InGaAs/Si+Si)
- High photosensitivity
- Low dark current, low Junction capacitance

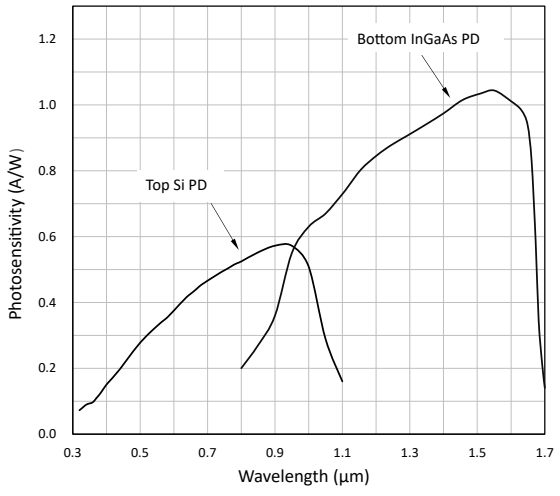
Applications

- Analytical equipment
- Infrared temperature
- Spectrophotometer

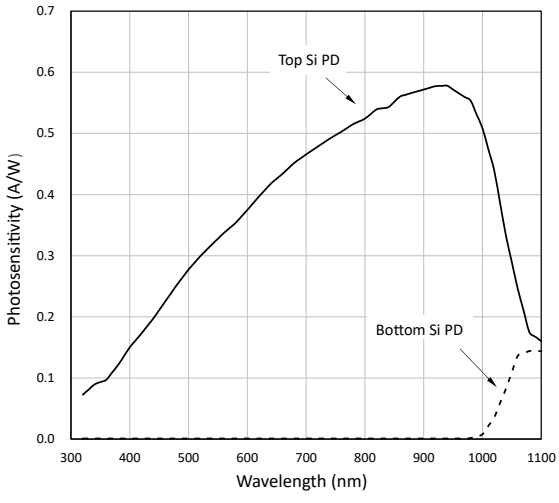
Two-color detector

Type no.	Element	Spectral response range	Peak sensitivity wavelength	Photosensitivity	Dark current	Junction capacitance	Photosensitive area size	Window material	Package
		[nm]	[nm]	[A/W]	[pA]	[pF]	[mm]		
PDDT1410-101	Si (Top)	320-1100	920	0.58@920nm	17@0.01V	140@0V	3.7×3.7	Borosilicate	TO5 / 4PIN
	InGaAs (Bottom)	800-1700	1550	1.1@1550nm	500@5V	60@5V	Φ1.0		
PDDT1630-101	Si (Top)	400-1000	920	0.68@920nm	100@5V	100@5V	4×4		
	InGaAs (Bottom)	800-1700	1550	1.1@1550nm	3000@5V	450@5V	Φ3.0		
PDDT1514-001	Si (Top)	320-1100	920	0.58@920nm	20@0.01V	170@0V	3.9×3.9		
	Si (Bottom)			0.15@1064nm	17@0.01V	140@0V	3.7×3.7		

Spectral response(Si+InGaAs)



Spectral response(Si+Si)



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Photodiode Module

Features

- High-precision and low noise ASIC
- Simple connection and easy developing process
- Suitable for a variety of high-perfommance photodiodes

Applications

- Analytical equipment
- Water quality monitoring
- Fluorometric analysis
- Invitro diagnosis

Photodiode module（Digital signal output）

Type no.	PDMM	PDTM-D
Incident direction	Top / Lateral	
PD performance	Customized	
Input voltage	7-12V	6-12V
Power dessipation	<1.2W	
Interface type	SPI	
ADC type	Integral	TIA
AD date width	16bit	24bit
Max sample frequency	10K	60K
Range	0.5pF-25pF	-
Dimensional outlines (mm)	51×25.5×24	
Operating temperature	0~50℃	
Storage temperature	-10~60℃	

Photodiode module（Analog output）

Type no.	PDTM-A			
PD performance	Customized			
Input voltage	6-12V			
Impedance Zt (V/A)	1.5×10^4	4.5×10^4	2×10^5	1×10^8
Cut-off frequency fc-3Db	100khz			1khz
Dimensional outlines (mm)	51×25.5×24			
Operating temperature	0~50℃			
Storage temperature	-10~60℃			

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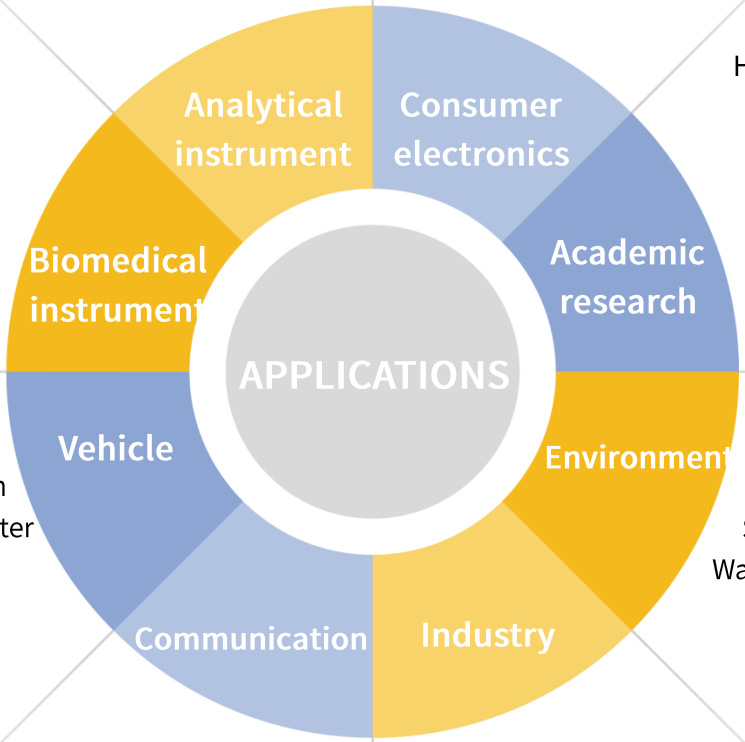
Light source

- Features
  - High brightness
  - High reliability
  - Excellent uniformity
- Applications
  - Optical switch
  - Galvanometer Scanner
  - Photoelectric encoder

LED

Type no.	Peak sensitivity wavelength	Forward voltage	Luminous intensity	Angle of half intensity	Window material	Package
	[nm]	[V]	[mW]	[deg]		
E660-10-001	650	2	10	120	Resin	Plastic / SMD
E850-15-301	850	1.5	15	100		TO18 / 2PIN
E940-15-301	940	1.2	15	100		TO18 / 2PIN
E850-15-202	850	1.5	15	10	Ball lens	TO18 / 2PIN
E850-30-101	850	1.4	30	20	Resin	3mm Plastic / DIP



Emission Spectrometer
Particle size analyzer
Atomic magnetometer
Optical power meter
Spectrophotometer
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Heart rate and blood oxygen monitoring
Infrared remote control equipment
Water quality detection
PM2.5 monitoring
Distance sensing
Smoke detector
Flame detection
Sweeping robot
.....

Blood detection
Flow cytometer
PCR
FIA
LIA
.....

High-energy physics
Biological imaging
Material analysis
.....

Camera
Rain transmitter
Ambient light detection
Photoelectric velocimeter
.....

Gas analysis
Hydroxide analyzer
Radiation detection
Sulfur oxide analyzer
Water quality detection
.....

Fiber optical communication
Optical wireless communication
Optical communication instrument
.....

Liquid detection
Laser monitoring
Laser level
Laser rangefinder
Photoelectric switch
Fiber optical sensing
Film thickness gauge
Process gas detection
Photoelectric encoder
Defectinspection device
Infrared temperature measurement
.....

NOTE

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