



(PT-A6)
**Visible Light Detector
for Security Lighting**

Token Electronics Industry Co., Ltd.

Taiwan: No.137, Sec. 1, Zhongxing Rd., Wugu District,
New Taipei City, Taiwan, R.O.C. 24872
Tel: +886 2981 0109 **Fax:** +886 2988 7487

China: 12F, Zhong Xing Industry Bld., Chuang Ye Road,
Nan Shan District, Shen Zhen City,
Guang Dong, China 518054
Tel: +86 755 26055363; **Fax:** +86 755 26055365

Web: www.token.com.tw

Email: rfq@token.com.tw



▶ Product Introduction

Token Visible Light Detector for Security Lighting with Near Human Eye Photopic Response.

Features :

- Simulate the human eye, peak wavelength 520nm.
- Using super 82 layer coating process on the Chip. 100% Filter infrared interference
- Good batch consistency, completely solve the infrared light start too early.
- Fast response, stable performance, aging at +85°C/65% humidity for 1000 Hr.
- The starting point does not drift. Nice appearance.

Applications :

- Replace the traditional CDS photoresistor.
- Cadmium and lead free with RoHS compliant.
- Dedicated to infrared monitoring products.
- When control the infrared light, it is no need to add extra casing and filter on low illumination.

Customization :

- For the convenience of installation in all kinds of products in any position, different sizes are available upon request.
- Token offers various option of the bright current/dark current (bright resistance/dark resistance) to costume the most products.

Photodiodes do not react to light in the same manner as human eyes do. A persons eye is insensitive to infra-red (a wave length more than 780nm) and also to ultra-violet light (a wave length under 380nm). A typical plastic photodiode, however, senses light at any wave length between 300nm and 1100nm. This means that the designer's first challenge is to remove the IR and UV components from the sensor's output.

The (PT-A6) Visible Light Detector family using high quality chip packaging and processing super-plated infrared filter membrane on chip surface, so this sensor can fully filter infrared interference. It is no need to add the casing and extra filter and effective filtering out the effect of light reflection due to infrared emission on security products.



By selecting the accuracy of chips, under strict management of production process, (PT-A6) visible light sensors finished batch consistency uniform. The consistency is 3 to 5 times higher on comparison of similar photosensitive devices. The precision can be controlled as narrow as 10%. Fully meet the customer requirements for starting the LUX value. Token taking the advantage of temperature compensation internal process on the chip, (PT-A6) features one times higher temperature resistance than other similar products while working on high temperature environment. Please contact our sales or link to Token official website "[Visible Light Sensors](http://www.token.com.tw)" for more information.

► Dimensions

Dimensions & Configurations (Unit: mm) (PT-A6-BC-3-PE-520) Plate Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-A6-BC-3-PE-520	4.05 ± 0.20	3.00 ± 0.20	1.50 Max.	1.50 ± 0.50	2.54 ± 0.20	3.85 ± 0.20	0.75 ± 0.20	25.4 Min.	0.50 ± 0.20

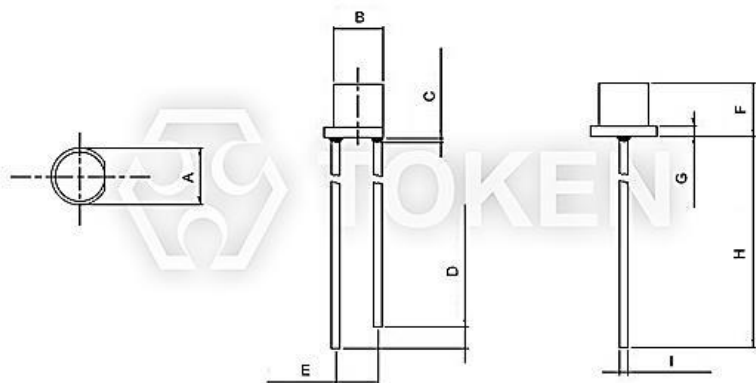


Plate Edge Visible Light Detector (PT-A6-BC-3-PE-520) Dimensions



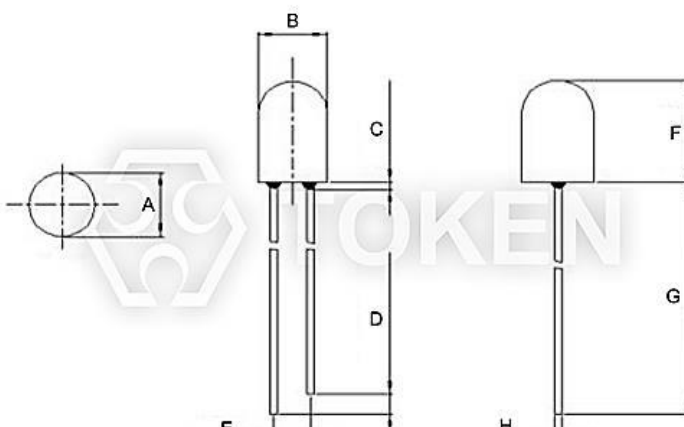
Plate Edge Visible Light Detector
(PT-A6-BC-3-PE-520)

Remark:

- The epoxy resin highest: 1.5mm max.
- Product images, plastic color of appearance, and all other information is for reference only, goods in-kind prevail.
- Short Lead—Collector Long Lead—Emitter.

Dimensions & Configurations (Unit: mm) (PT-A6-AC-5-BN-520) Bullet None

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
PT-A6-AC-5-BN-520	5.00 ± 0.20	5.00 ± 0.20	1.50 Max.	2.00 ± 0.5	2.54 ± 0.20	7.00 ± 0.20	14.00 Min.	0.50 ± 0.20



Visible Light Sensor / Phototransistor (PT-A6-AC-5-BN-520) Bullet None Dimensions



Phototransistor Plate None
(PT-A6-AC-5-BN-520)

Remark:

- The epoxy resin highest: 1.5mm max.
- Product images, plastic color of appearance, and all other information is for reference only, goods in-kind prevail.
- Short Lead—Collector Long Lead—Emitter.

Electro-Optical Characteristics

Electro-Optical Characteristics (Ta=25 ° C) PT-A6-BC-3-PE-520

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	520	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	$I_{ce}=100\mu A$ $E_e=0m^w/cm^2$	60	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	$I_{ce}=100\mu A$ $E_e=0m^w/cm^2$	7	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	$I_{ce}=2mA$ $E_e=1m^w/cm^2$	-	-	1.0	V
Photo Current	$I_{L(1)}$	$V_{ce}=5V$ $E_v=10Lux$	3	7	12	μA
	$I_{L(2)}$	$V_{ce}=5V$ $E_v=30Lux$	9	21	36	μA
	$I_{L(3)}$	$V_{ce}=5V$ $E_v=100Lux$	30	70	120	μA
Collector Dark Current	I_{ceo}	$V_{ce}=5V$ $E_v=0Lux$	-	-	0.2	μA
IR Receiving Current	$I_{L(4)}$	$V_{ce}=5V/850\text{ nm IR LED}$ $E_e=1m^w/cm^2$	-	-	0.3	μA
Rise Time	t_r	$V_{ce}=5V$ $I_{ce}=1mA$	40			μs
Fall Time	t_f	$RL=1000\Omega$				

Electro-Optical Characteristics (Ta=25 ° C) PT-A6-AC-5-BN-520

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	520	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	$I_{ce}=100\mu A$ $E_e=0m^w/cm^2$	60	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	$I_{ce}=100\mu A$ $E_e=0m^w/cm^2$	7	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	$I_{ce}=2mA$ $E_e=1m^w/cm^2$	-	-	1.0	V
Photo Current	$I_{L(1)}$	$V_{cc}=5V$ $E_v=10Lux$	5	14	22	μA
	$I_{L(2)}$	$V_{cc}=5V$ $E_v=30Lux$	15	42	66	μA
	$I_{L(3)}$	$V_{cc}=5V$ $E_v=100Lux$	50	140	220	μA
Collector Dark Current	I_{ceo}	$V_{ce}=5V$ $E_v=0Lux$	-	-	0.2	μA
IR Receiving Current	$I_{L(4)}$	$V_{ce}=5V/850nm\text{ IR LED}$ $E_e=1m^w/cm^2$	-	-	0.5	μA
Rise Time	t_r	$V_{cc}=5V$ $I_{ce}=1mA$	40			μs
Fall Time	t_f	$RL=1000\Omega$				

Electro-Optical Characteristics (Ta=25 ° C) PT-A6-AC-5-PN-580

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	580	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	$I_{ce}=100\mu A$ $E_e=0m^w/cm^2$	60	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	$I_{ce}=100\mu A$ $E_e=0m^w/cm^2$	7	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	$I_{ce}=2mA$ $E_e=1m^w/cm^2$	-	-	1.0	V
Photo Current	$I_{L(1)}$	$V_{cc}=5V$ $E_v=10Lux$	2.5	6	10	μA
	$I_{L(2)}$	$V_{cc}=5V$ $E_v=30Lux$	7.5	18	30	μA
	$I_{L(3)}$	$V_{cc}=5V$ $E_v=100Lux$	25	60	100	μA
Collector Dark Current	I_{ceo}	$V_{ce}=5V$ $E_v=0Lux$	-	-	0.2	μA
IR Receiving Current	$I_{L(4)}$	$V_{ce}=5V/850nm$ IR LED $E_e=1m^w/cm^2$	-	-	0.3	μA
Rise Time	t_r	$V_{cc}=5V$ $I_{ce}=1mA$	40			μs
Fall Time	t_f	$RL=1000\Omega$				

Absolute maximum ratings (Ta=25 ° C) PT-A6

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	60	V
Emitter-Collector-Voltage	V_{ECO}	7	V
Power Dissipation	P_C	50	m^w
Operating Temperature Range	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C

► Curve PTA6BC3PE520

Relative Spectral Sensitivity vs. Wavelength PT-A6-BC-3-PE-520

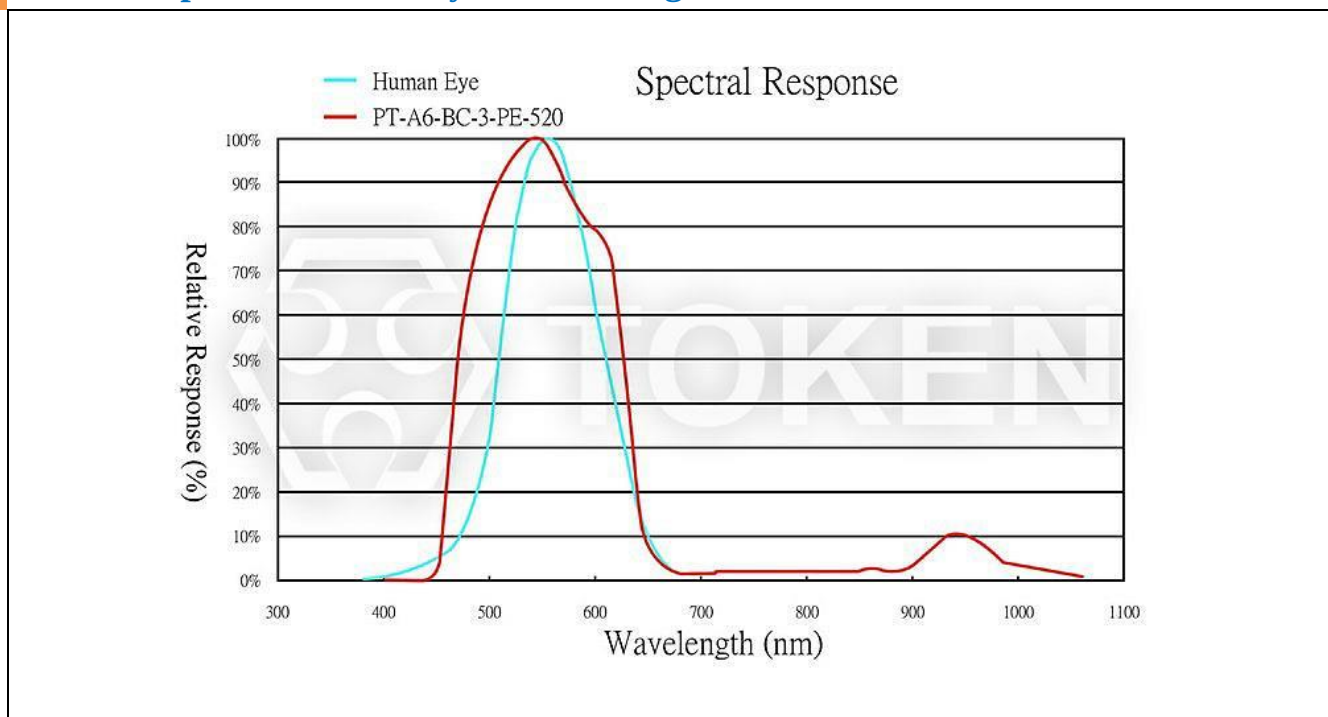
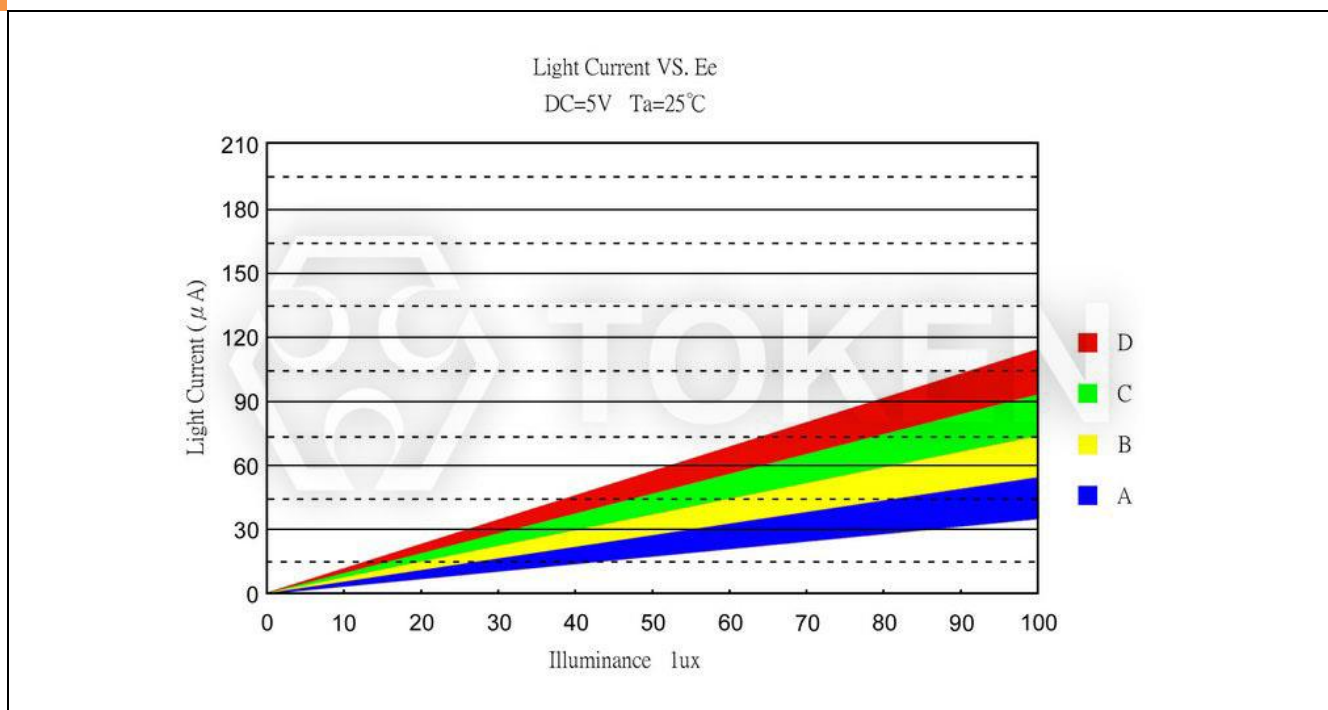
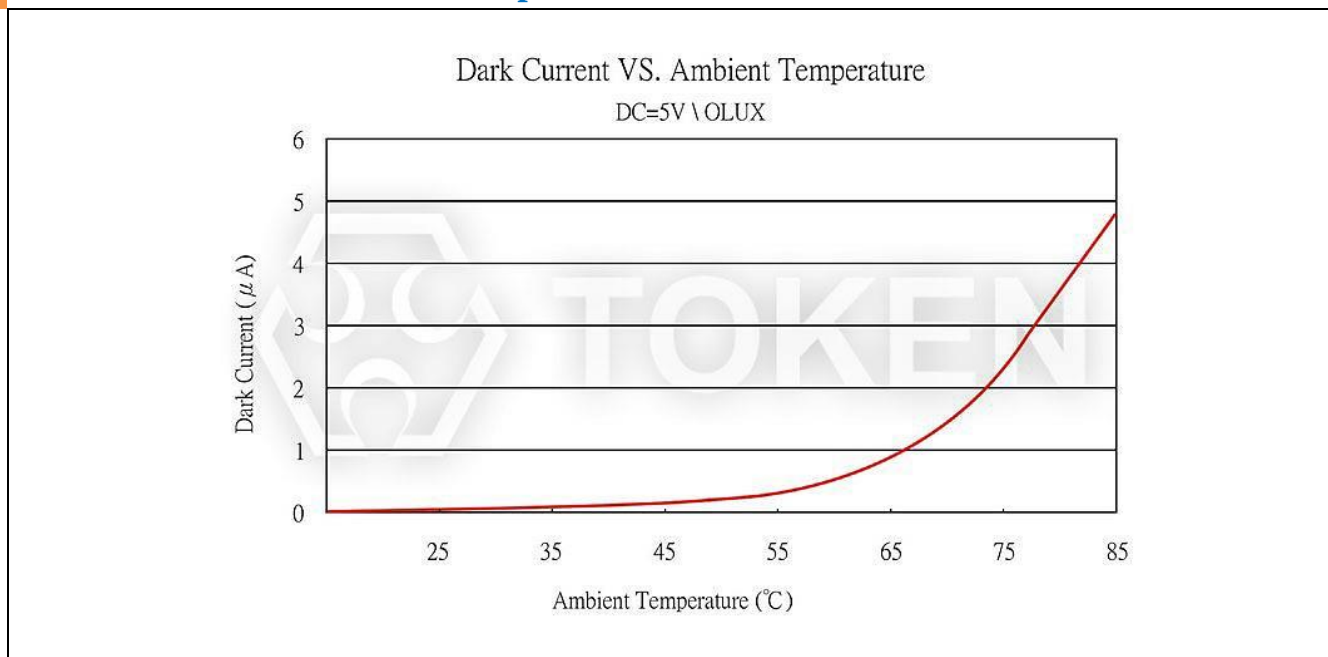


Photo Current vs. Illuminance PT-A6-BC-3-PE-520



Dark Current vs. Ambient Temperature PT-A6-BC-3-PE-520



► Curve PTA6AC5BN520

Relative Spectral Sensitivity vs. Wavelength (PT-A6-AC-5-BN-520) Bullet None

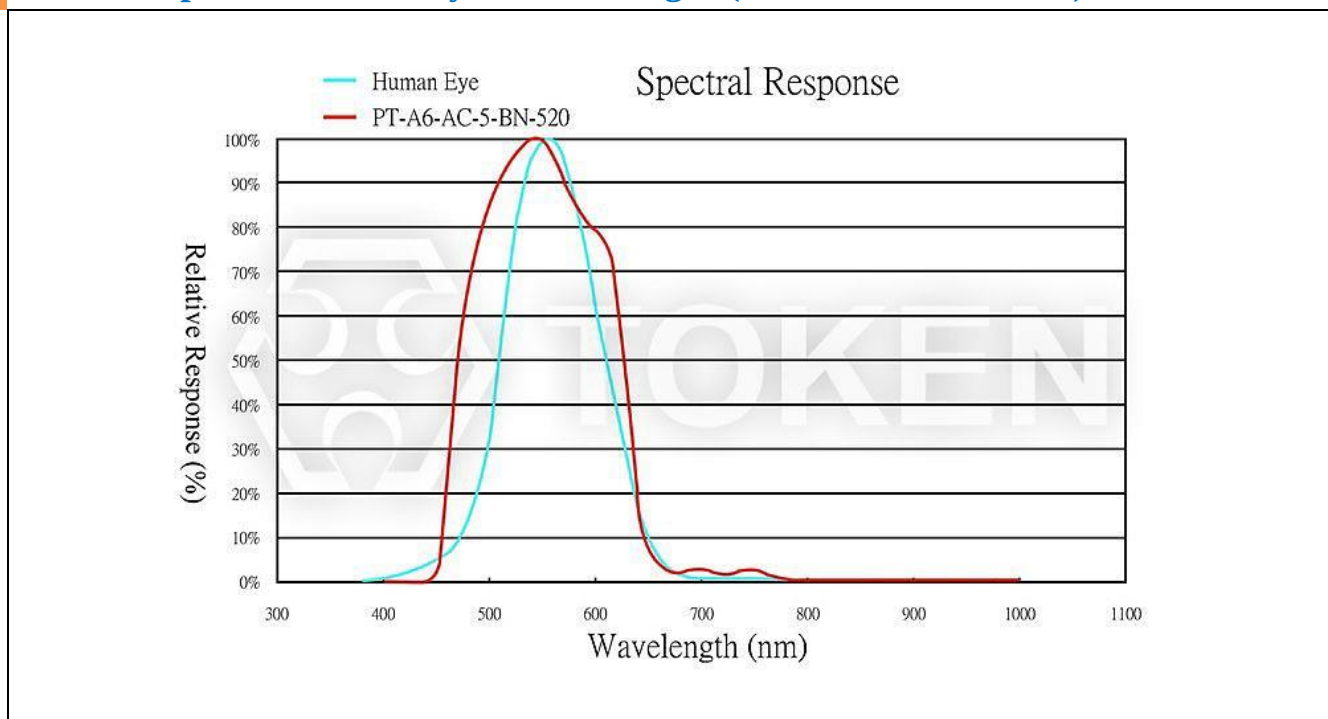
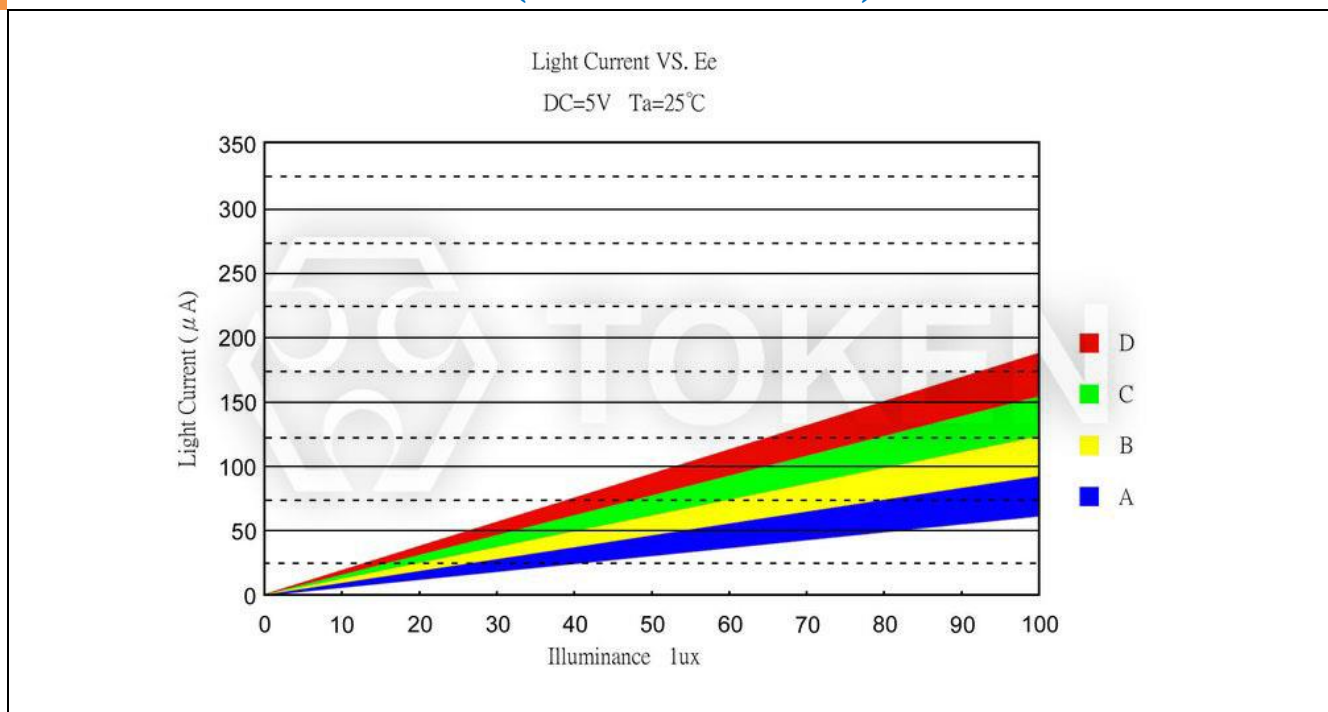
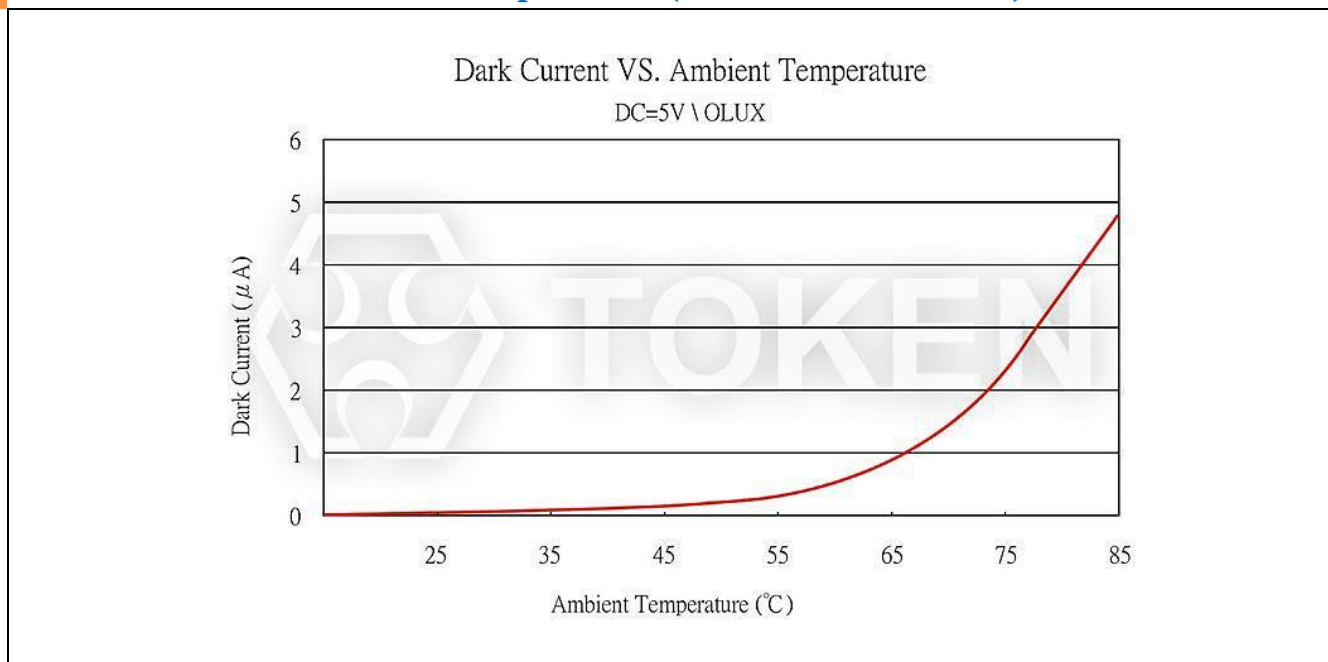


Photo Current vs. Illuminance (PT-A6-AC-5-BN-520) Bullet None



Dark Current vs. Ambient Temperature (PT-A6-AC-5-BN-520) Bullet None



► Curve PTA6AC5PN580

Relative Spectral Sensitivity vs. Wavelength (PT-A6-AC-5-PN-580) Plate None

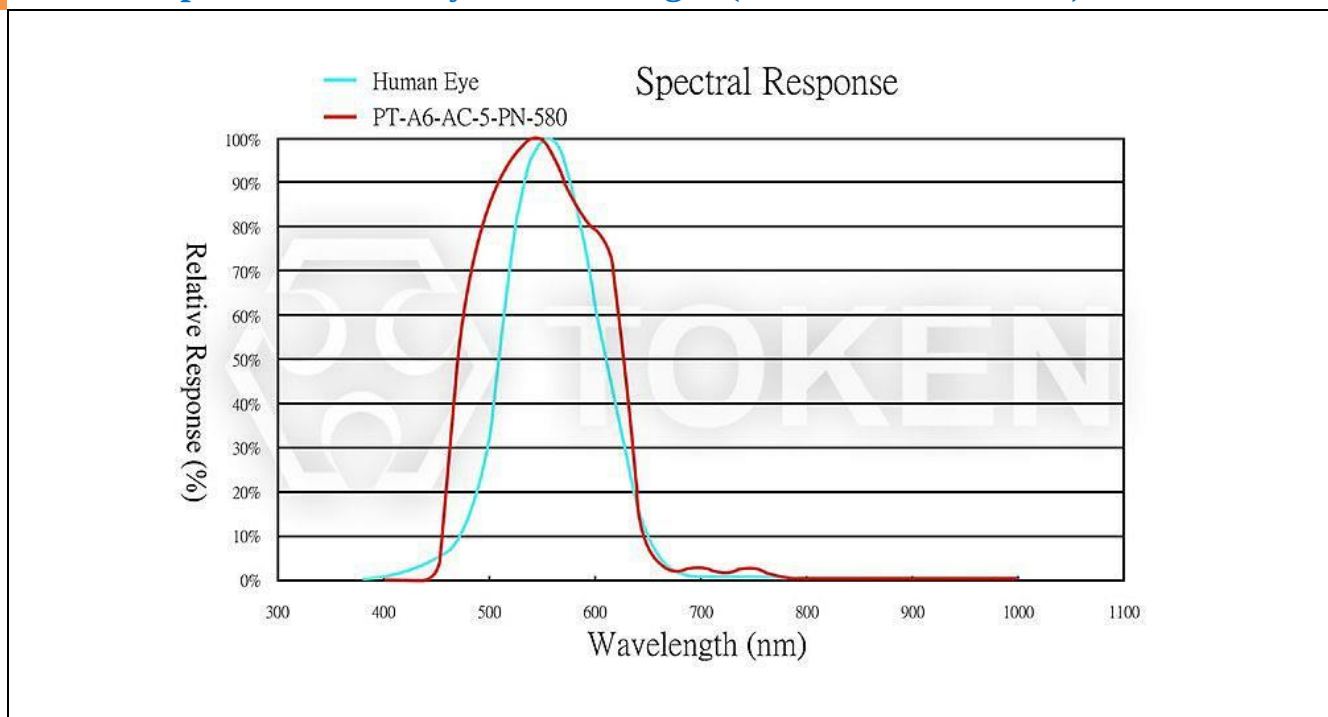
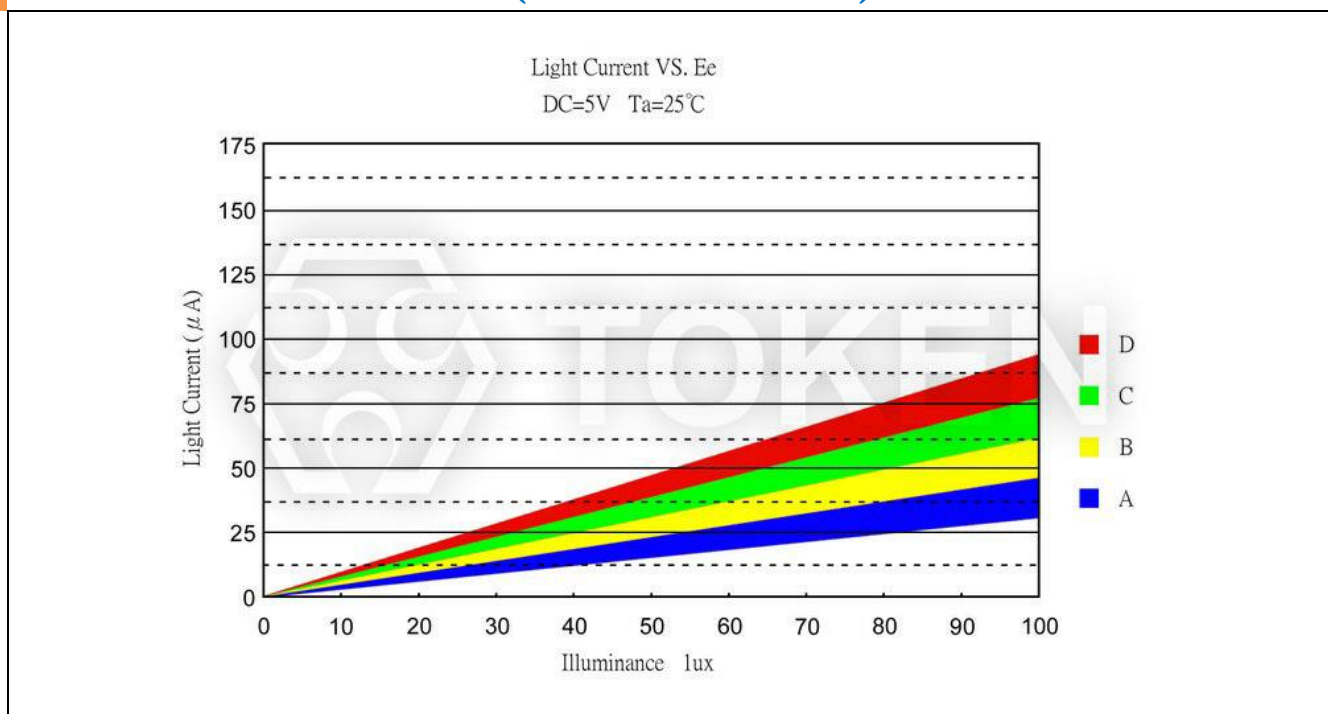
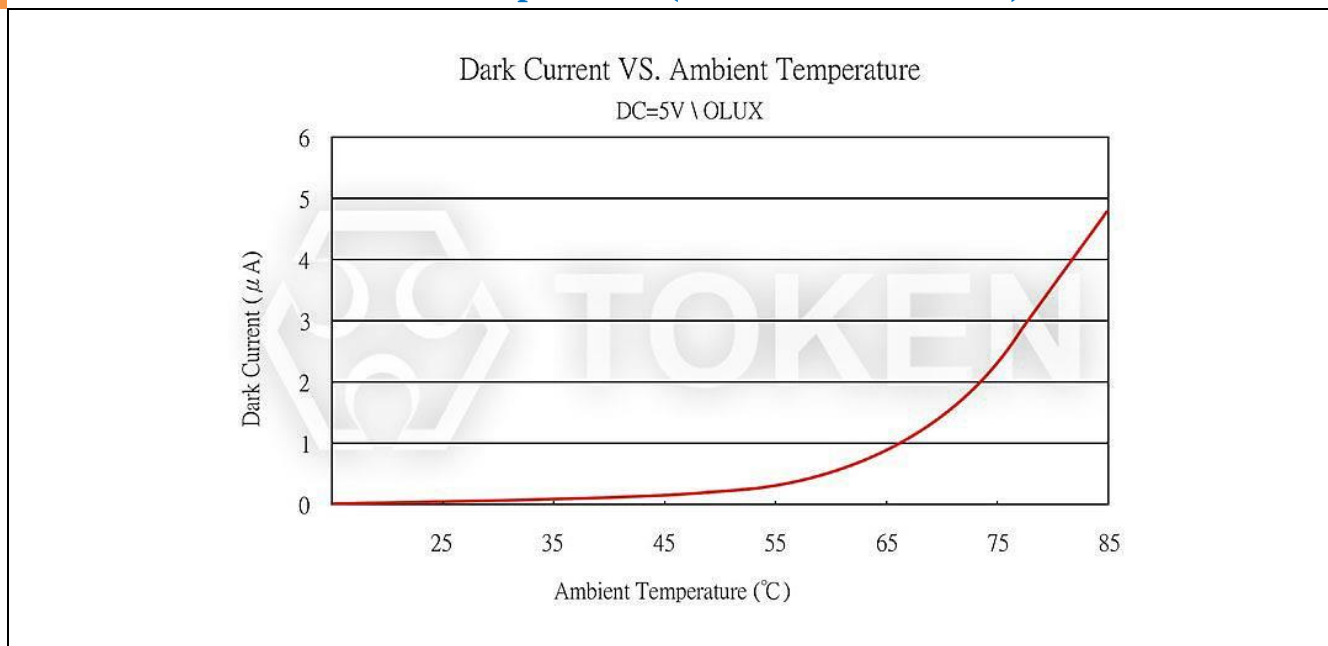


Photo Current vs. Illuminance (PT-A6-AC-5-PN-580) Plate None



Dark Current vs. Ambient Temperature (PT-A6-AC-5-PN-580) Plate None



► Note

Visible Light Detector (TPT3PE) Precaution Usage :

- The light source : Select 590nm LED Surface light source.

Mounting :

- While packages are on one circuit board, avoid mismatching in the thermal expansion of each component, generate cracks in the package and break the bonding wire.

Soldering :

- Do not immerse plastic parts in tin tank.
- During soldering, when adding thermal stress in a moisture absorbing state, moisture evaporates, swells and generates stress to the internal package.
- To avoid swellings and cracks in the surface of the package, followsoldering conditions below.
- Wave soldering method: $120^{\circ}\text{C} < 60\text{s}$ 、 $260^{\circ}\text{C} < 5\text{s}$.
- Manual soldering: $260^{\circ}\text{C} < 5\text{s}$ 、 $340^{\circ}\text{C} < 3\text{s}$.

Lead-forming and cuttings :

- Before soldering, perform lead forming at normal temperature.
- While forming or cutting the lead, stay the area at a distance of 5 mm or greater from the root of the lead.
- Avoid mounting which may cause force on the root of the lead.

Storage :

The sensor is incorporated in the transparent resin package. Because of its sensitivity to humidity, the package is moisture-proof. When storing the sensor, do as instructed below.

- Quickly use after opening. (within 2 days, below $30^{\circ}\text{C}/60\%$ R.H.).
- Once unpacked, use within three months, or keeping within a moisture-proof method, which include maintaining within a moisture-proof container with silica gels, is suggested for longterm safe-keeping.
- Very bad storage conditions may deteriorate solderability or characteristics, and defect the appearance. Recommended conditions of the storage place, temperature 0°C to 30°C , humidity below 60% R.H. (Avoid freezing and dew condensation).

Cleaning :

- Do not wash with water to avoid corrosion.
- Under any circumstance, the cleaning time should be within 1 minute of normal temperature.
- Alcohol is recommended as a cleaning agent when cleaning products.
- If you use other cleaning agents, you need to confirm whether the cleaning agent will corrode the epoxy body.
- Freon can not be used as a cleaning agent.
- When cleaning products with ultrasonic cleaning, ultrasonic power and time should be less than 300W and 30 seconds, respectively.
- PCB and product can not touch the oscillator. Can not make the product on the PCB resonance.
- This model is static sensitive devices, so static electricity and surges can damage the product.
- To all the equipment, machines, tables, and the ground must be anti-static ground.
- Requires the use of anti-static wrist strap wear.

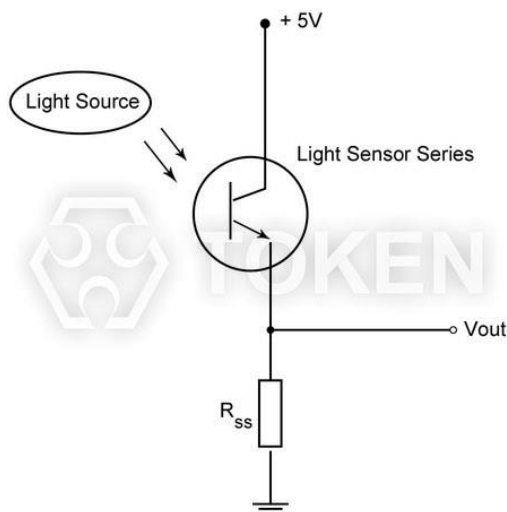


Photo Current Measurement Method -
3PE520BCA6

Order Codes

Order Codes (PT-A6)

PT		-	A6		-	BC		-	3		-	PE		-	560	
Part Number			Chip Type			Lens Color			Size			Shape			Spectral Bandwidth	
PT			A6			BC	Dark Blue		3	3 mm		PE	Plate Edge		560	560 nm
						AC	Water Clear		5	5 mm		PN	Plate None		580	580 nm
												BN	Bullet None			