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DEMINT

Electronics Co., Ltd.

Light Sensors Series

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Production Index

Light Sensors Series

Ambient Light Sensor Glossary

Ambient Light Sensor Glossary

Light Sensors (Phototransistor, Ambient Light Sensor) Glossary

Absolute Maximum Ratings: Maximum value of limit per each item.

Operating Temperature (T_{opr}): Allowable temperature range of power application.
Usually when the operating temperature increases, the power consumption decreases. In addition, the power application is prohibited when the actual operating temperature is out of range. In the case of a phototransistor, the temperature that can be applied is not described as the surface temperature of the package, but is described as working temperature (the ambient air temperature around the device).

Storage Temperature (T_{stg}): In the stored state, allowable temperature range when power is not applied.

Power Dissipation (P_C): When the operating temperature is 25°C, the light receives the allowable power dissipation of the phototransistor. Often, as the ambient temperature increases, the allowable power consumption (PC) tends to drop.

Collector Current (I_C): When the light-receiving phototransistor conducts current at 25°C ambient temperature, the maximum allowable collector current flows through the phototransistor in the permissible power dissipation (P_C) range.

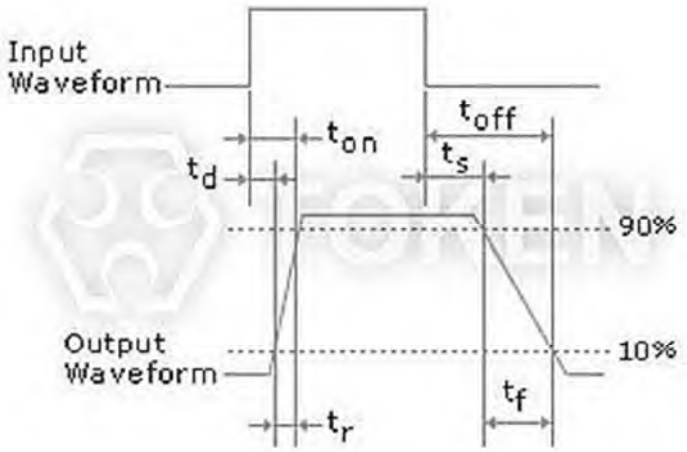
Peak wavelength (λ_p): λ_p Is the most sensitive wavelength value of the phototransistor, measured in nanometers (nm). The Phototransistor responds to the light from the wavelength range of the fluorescence or incandescent light source, and when matched with the IR LED light source, they perform optimally. This is because the phototransistor has a peak spectral response at approximately 840nm of near-infrared.

Breakdown Voltage: (V_{BR}): V_{BR} is the maximum voltage allowed between the collector and emitter. Exceeding the maximum voltage can cause permanent damage to the phototransistor. The breakdown voltages are 100% sorting parameters.

- **Collect-emitter breakdown voltage B_{vceo}:** typically ranges from 20 V to 60 V.
- **Emitter-collector breakdown voltage B_{veco}:** typically ranges from 3 V to 7 V.

Collector to Emitter Voltage: (V_{CEO}): The maximum voltage is allowed between the collector and the emitter on light-receiving side, and when no forward current flows through the led of the light emission side (the indicator light does not emit light). Under normal circumstances, when the power supply voltage close to this value, the transient operating trajectory can not be maintained at the actual maximum operating temperature of the allowable power range, in the process of switching, the device may occur over power damage. Note that the supply voltage is kept within a sufficient safe range so that no excessive power loss occurs even during this switching moment.

Emitter to Collector Voltage (V_{ECO}): The allowable reverse voltage of the phototransistor that can be applied to the light receiving side. Typically, the voltage depends on the reverse withstand voltage between the emitter and the base of the phototransistor, or below the reverse withstand voltage. Damage or irreversible damage may occur if a reverse voltage exceeding this value is applied.



Rise Time/ Fall Time

Collector Dark Current (I_{ceo}): When the phototransistor is in the dark and a voltage is applied from the collector to the emitter, a certain amount of current will flow. This current is called a dark current. The current consists of the collector-base junction leakage current and the transistor's DC current gain. The presence of this current prevents the phototransistor from being considered "off", or is ideal for "on" the switch. The dark current is specified as the maximum collector current that allows flow at a given collector-emitter test voltage. The dark current is a function of the applied collector-emitter voltage and ambient temperature. Dark current increases with increasing temperature. This value is usually specified at 25°C. The value of the load resistance must be designed with the maximum value of the current within the conditions of use.

Collector-Emitter Saturation Voltage ($V_{ce(sat)}$): Saturation is the state in which both the emitter base and the collector base of the phototransistor become forward based. From a practical point of view, the collector-emitter saturation voltage $V_{ce(sat)}$ is a factor that represents the proximity switch (closed state) of the photodetector. This is because $V_{ce(sat)}$ is the voltage that drops when the detector is in the "on" state. $V_{ce(sat)}$ is usually the maximum allowable collector emitter voltage given the specified light intensity and collector current value.

IR Receiving Current ($I_{L(4)}$): The infrared phototransistor acts as a transistor, and its basic voltage is determined by the amount of light that impinges on the transistor.Therefore, it acts as a variable current source. More IR light will cause a larger current to flow through the collector-emitter lead. $I_{L(4)}$ is specified at V_{EC} = 5V, IR LED 850nm.

Rise Time/ Fall Time:

1. Pulse Rise Time t_r: The photosensitive transistor adjusts the input pulse light under the specified working conditions, so that the photosensitive transistor output the corresponding pulse current to the specified value to output the time required for 10%-90% of the pulse front amplitude.
2. Pulse Fall Time t_f: The time required to output the pulse along the magnitude of 90%-10%.
3. Pulse Delay Time t_d: The time required to start from the input pulse to 10% of the leading edge of the output electrical pulse.
4. Pulse Storage Time t_s: The time required for the output electrical pulse to drop to 90% of the pulse amplitude after the input pulse has been completed.

Guide to Ambient Light Sensors

Guide to Ambient Light Sensors

What is Phototransistors?

The environmentally friendly phototransistor is a combination of photodiode and amplifier integrated in a single chip. This integrated combination is used to overcome the main uniform gain limits of the photodiode. Many modern applications require the output signal from the photodetector to produce even larger than the single photodiode. Although the signal from the photodiode can always be amplified by using an external op amp or other circuit, this method is generally less practical or cost effective than using a phototransistor.

The phototransistor can be viewed as a photodiode whose output photocurrent signal is fed to the base of the transistor. When the device is not required to operate as a photodetector, the base is usually connected to allow the designer to use the base current to bias the transistor. The typical gain of the phototransistor can range from 100 to 1500. The current-voltage characteristics of the phototransistor are similar to those of the NPN signal transistor. The only difference is that the incident light provides the base drive current.

The structure of environmentally friendly phototransistor is very similar to the structure of photodiode. In fact, when optimized for this mode of operation, the collector-base junction phototransistor can be used as having a fairly good photodiode, with the main structural difference being that the phototransistor is two more junctions than the photodiode.

Phototransors are suitable for detecting light or brightness in a manner similar to that of the human eye. They are most commonly found in industrial lighting, consumer electronics and automotive systems, which can be automatically adjusted according to ambient light conditions. By turning on, off or adjusting the function, ambient light sensors can save battery power and provide additional security without the need for manual adjustment. DeMint Electronics offers a wide range of ambient light sensors, with pin-type and surface-mount patches, photodiode or phototransistor outputs.

Ambient Light Sensor Product Category

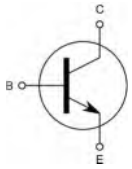
Ambient Light Sensors	Light Dependent Resistor (LDR) Photoresistor (CdS)		Advantages: similar to the human eye. Disadvantages: Cadmium, ROHS prohibited substances.
	Photodiode		Advantages: The uniformity of the photodiode between the units is relatively high. Disadvantages: low current output, the need for external amplification circuit.
	Phototransistor Photosensitive Sensor Photosensitive Triode		Advantages: with amplifier circuit, photoelectric transistor output current. Disadvantages: poor temperature characteristics.
	Photo IC		Advantages: amplification, logic control, switches and other integrated features Disadvantages: high dependence on professional products.

Why Use Environmentally Friendly Phototransistor?

Environmental protection phototransistor is known as phototransistor, photosensitive sensor, environmentally friendly photosensitive triode, ambient light sensor. The environmentally friendly phototransistor is a solid state photodetector with internal gain. This makes them more sensitive to photodiode on the same area basis and can be used to provide analog or digital output signals. Phototransistor series of detectors provide the following characteristics:

- Cost-effective photoelectric detector, detection range from visible to near infrared.
- 100 to 1500 gain.
- Moderate response time.
- Can be used for a variety of packaging, including epoxy coating, transfer molding, casting, sealed packaging and chip form.
- Replace the traditional CDS photoresistor, non-cadmium, lead and other harmful substances, in line with the EU ROHS standards.
- Can be used for almost any visible or near infrared light source, such as IRED, neon, fluorescent, incandescent bulbs, lasers, fire, sun and so on.

Source Lighting Guide

Light Source	Illumination (Lux)	ALS Circuit Symbol
Moonlight	0.1	
60W Light Bulb @1m	50	
1W MES Light Bulb @0.1m	100	
Fluorescent Light	500	
Bright Sunshine	30,000	

Filtering

Most photodiodes and phototransistors have an epoxy filter function that increases the relative spectral sensitivity and makes it closer to the human eye's sensitivity. This is sometimes called the v(λ) curve. The part number contains the letter part of the FC with this epoxy resin. Figure 1 shows an ambient light sensor without epoxy filtering, and Figure 2 shows a sensor with epoxy filter. For this epoxy filter, the bandwidth ($\lambda_{0.5}$) is reduced from 430 nm to 800 nm to 430 nm to 600 nm.

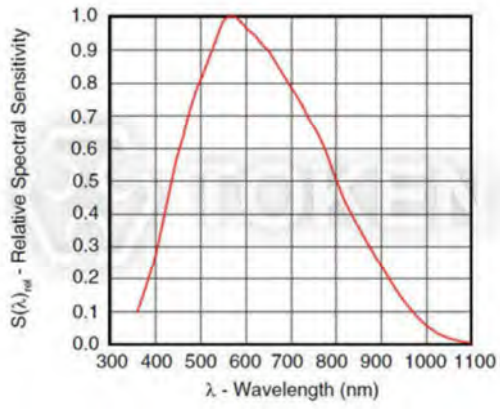


Figure 1 - No Epoxy Filter

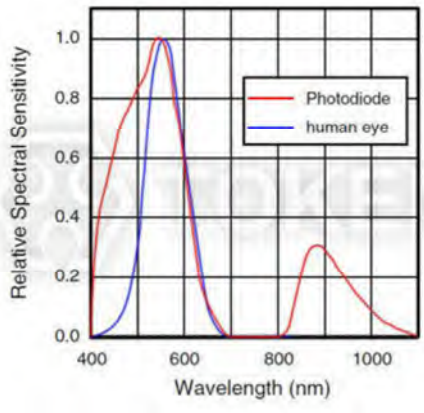


Figure 2 - Epoxy Filter

Light Sensors Summary Table

Light Sensors Summary Table

Light Sensors Summary Table

Category	Thumb Nail	Part NO.	Infrared Ray	Lens Color	Spectral Bandwidth (nm)	Photo Current			Dark Current
						10Lux	30Lux	100Lux	0Lux
Φ3 Plate Edge		PT-A6-BC-3-PE-520	IR Receiving	Dark Blue	520	3 ~ 12	9 ~ 36	30 ~ 120	0.2Max.
		PT-IC-BC-3-PE-550	IR Receiving	Dark Blue	550	1.5 ~ 5.0	4.5 ~ 15	15 ~ 50	0.8Max.
		PT-IC-GC-3-PE-520	IR Receiving	Dark Green	520	1.2 ~ 3.6	3.6 ~ 10.8	12 ~ 36	0.8Max.
		PT-IC-AC-3-PE-550	IR Receiving	Water Clear	550	7 ~ 15	21 ~ 54	70 ~ 180	0.8Max.
		PT-A1-AC-3-PE-850	IR Blocking	Water Clear	850	3 ~ 6	9 ~ 18	30 ~ 60	0.1Max.
Φ5 Plate Edge		PT-IC-GC-5-PE-520	IR Receiving	Dark Green	520	2 ~ 6	6 ~ 18	20 ~ 60	0.8Max.
		PT-IC-BC-5-PE-550	IR Receiving	Dark Blue	550	2.5 ~ 5.5	7.5 ~ 16.5	25 ~ 55	0.8Max.
		PT-IC-AC-5-PE-550	IR Receiving	Water Clear	550	7 ~ 18	21 ~ 54	70 ~ 180	0.8Max.
		PT-A2-AC-5-PE-850	IR Blocking	Water Clear	850	1.5 ~ 4.5	4.5 ~ 13.5	15 ~ 45	0.1Max.
Φ5 Helmet Edge		PT-A1-AC-5-HE-850	IR Blocking	Water Clear	850	4.5 ~ 9.0	13.5 ~ 27	45 ~ 90	0.1Max.
Φ5 Plate None		PT-A6-AC-5-PN-580	IR Receiving	Water Clear	580	2.5 ~ 10	7.5 ~ 30	25 ~ 100	0.2Max.
		PT-IC-BC-5-PN-550	IR Receiving	Dark Blue	550	2.5 ~ 5.5	7.5 ~ 16.5	25 ~ 55	0.8Max.
		PT-IC-AC-5-PN-580	IR Receiving	Water Clear	580	1.5 ~ 5.5	4.5 ~ 16.5	15 ~ 55	0.8Max.
		PT-A4-AC-5-PN-850	IR Blocking	Water Clear	850	5 ~ 12	15 ~ 36	50 ~ 120	0.1Max.
		PT-A2-AC-5-PN-850	IR Blocking	Water Clear	850	1.5 ~ 4.5	4.5 ~ 13.5	15 ~ 45	0.1Max.
Φ3 Bullet Edge		PT-A2-AC-3-BE-850	IR Blocking	Water Clear	850	15 ~ 45	45 ~ 145	150 ~ 450	0.1Max.
		PT-A2-DC-3-BE-940	IR Blocking	Dark	940	-	-	-	0.1Max.
Φ5 Bullet Edge		PT-A2-AC-5-BE-850	IR Blocking	Water Clear	850	30 ~ 90	90 ~ 270	300 ~ 900	0.1Max.
		PT-A1-FC-5-BE-940	IR Blocking	Dark	940	-	-	-	0.1Max.
Φ5 Bullet None		PT-A6-AC-5-BN-520	IR Receiving	Water Clear	520	5 ~ 22	15 ~ 66	50 ~ 220	0.2Max.

Category	Thumb Nail	Part NO.	Infrared Ray	Lens Color	Spectral Bandwidth (nm)	Photo Current			Dark Current
						10Lux	30Lux	100Lux	0Lux
		PT-IC-AC-5-BN-520	IR Receiving	Water Clear	520	4 ~ 12	12 ~ 36	40 ~ 120	0.8Max.
		PT-A1-DC-5-BN-940	IR Blocking	Dark	940	-	-	-	0.1Max.

Light Sensors Summary Table

Category	Thumb Nail	Part NO.	Infrared Ray	Lens Color	Spectral Bandwidth (nm)	Photo Current			Dark Current
						10Lux	30Lux	100Lux	0Lux
SMD		PT-B1-DC-0603-940	IR Receiving	Dark	940	-	-	-	0.1Max.
		PT-A8-AC-1206-850	IR Receiving	Water Clear	850	0.5 ~ 1.2	1.5 ~ 3.6	5 ~ 12	0.1Max.
		PT-IC-BC-3528-550	IR Blocking	Dark Blue	550	1.5 ~ 4.5	4.5 ~ 13.5	15 ~ 45	0.1Max.
		PT-IC-AC-3528-520	IR Blocking	Water Clear	520	7 ~ 18	21 ~ 54	70 ~ 180	0.8Max.
		PT-A1-AC-3528-850	IR Blocking	Water Clear	850	2.5 ~ 5.0	7.5 ~ 15	25 ~ 50	0.1Max.
CdS (PGM5)		PGM5506	IR Blocking	Epoxy Resin	540	2 ~ 6	-	-	0.15Min.
		PGM5516	IR Blocking	Epoxy Resin	540	5 ~ 10	-	-	0.2Min.
		PGM5526	IR Blocking	Epoxy Resin	540	8 ~ 20	-	-	1.0Min.
		PGM5537	IR Blocking	Epoxy Resin	540	16 ~ 50	-	-	2.0Min.
		PGM5539	IR Blocking	Epoxy Resin	540	30 ~ 90	-	-	5.0Min.
		PGM5549	IR Blocking	Epoxy Resin	540	45 ~ 140	-	-	10.0Min.
		PGM5616D	IR Blocking	Epoxy Resin	560	5 ~ 10	-	-	1.0Min.
		PGM5626D	IR Blocking	Epoxy Resin	560	8 ~ 20	-	-	2.0Min.
		PGM5637D	IR Blocking	Epoxy Resin	560	16 ~ 50	-	-	5.0Min.
		PGM5639D	IR Blocking	Epoxy Resin	560	30 ~ 90	-	-	10.0Min.
		PGM5649D	IR Blocking	Epoxy Resin	560	50 ~ 160	-	-	20.0Min.
		PGM5659D	IR Blocking	Epoxy Resin	560	150 ~ 300	-	-	20.0Min.
		PGM5506-MP	IR Blocking	Hermetical	540	2 ~ 6	-	-	0.15Min.
		PGM5516-MP	IR Blocking	Hermetical	540	5 ~ 10	-	-	0.2Min.
		PGM5526-MP	IR Blocking	Hermetical	540	8 ~ 20	-	-	1.0Min.
		PGM5537-MP	IR Blocking	Hermetical	540	16 ~ 50	-	-	2.0Min.
		PGM5539-MP	IR Blocking	Hermetical	540	30 ~ 90	-	-	5.0Min.
		PGM5549-MP	IR Blocking	Hermetical	540	45 ~ 140	-	-	10.0Min.

Light Sensors Summary Table

Category	Thumb Nail	Part NO.	Infrared Ray	Lens Color	Spectral Bandwidth (nm)	Photo Current			Dark Current
						10Lux	30Lux	100Lux	0Lux
CdS (PGM12)		PGM1200	IR Blocking	Epoxy Resin	560	2 ~ 5	-	-	1.0Min.
		PGM1201	IR Blocking	Epoxy Resin	560	4 ~ 10	-	-	2.0Min.
		PGM1202	IR Blocking	Epoxy Resin	560	8 ~ 20	-	-	5.0Min.
		PGM1203	IR Blocking	Epoxy Resin	560	18 ~ 50	-	-	10.0Min.
		PGM1204	IR Blocking	Epoxy Resin	560	45 ~ 150	-	-	20.0Min.
		PGM1205	IR Blocking	Epoxy Resin	560	140 ~ 300	-	-	20.0Min.
		PGM1200-MP	IR Blocking	Hermetical	560	2 ~ 5	-	-	1.0Min.
		PGM1201-MP	IR Blocking	Hermetical	560	4 ~ 10	-	-	2.0Min.
		PGM1202-MP	IR Blocking	Hermetical	560	8 ~ 20	-	-	5.0Min.
		PGM1203-MP	IR Blocking	Hermetical	560	18 ~ 50	-	-	10.0Min.
		PGM1204-MP	IR Blocking	Hermetical	560	45 ~ 150	-	-	20.0Min.
		PGM1205-MP	IR Blocking	Hermetical	560	140 ~ 300	-	-	20.0Min.
CdS (PGM20)		PGM2000	IR Blocking	Epoxy Resin	560	2 ~ 5	-	-	1.0Min.
		PGM2001	IR Blocking	Epoxy Resin	560	4 ~ 10	-	-	2.0Min.
		PGM2002	IR Blocking	Epoxy Resin	560	8 ~ 20	-	-	5.0Min.
		PGM2003	IR Blocking	Epoxy Resin	560	18 ~ 50	-	-	10.0Min.
		PGM2004	IR Blocking	Epoxy Resin	560	45 ~ 150	-	-	20.0Min.
		PGM2005	IR Blocking	Epoxy Resin	560	140 ~ 300	-	-	20.0Min.
		PGM2000-PP	IR Blocking	Plactic Case	560	2 ~ 5	-	-	1.0Min.
		PGM2001-PP	IR Blocking	Plactic Case	560	4 ~ 10	-	-	2.0Min.
		PGM2002-PP	IR Blocking	Plactic Case	560	8 ~ 20	-	-	5.0Min.
		PGM2003-PP	IR Blocking	Plactic Case	560	18 ~ 50	-	-	10.0Min.
		PGM2004-PP	IR Blocking	Plactic Case	560	45 ~ 150	-	-	20.0Min.
		PGM2005-PP	IR Blocking	Plactic Case	560	140 ~ 300	-	-	20.0Min.

Select The Load Resistor

Select The Load Resistor

Table 1 - Photoelectric Characteristics (Ta=25°C) PT-IC-GC-3-PE-520

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	1.2	2.5	3.6	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	3.6	7.5	10.8	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	12	25	36	μA
Collector Dark Current	I_D	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA

Binning Table 2 - PT-IC-GC-3-PE-520 Batch BINNED GROUP

Batch BINNED GROUP (T_{amb} = 25 °C, unless otherwise specified)						
Parameter	Condition	Binned Group	Symbol	Min.	Max.	Unit
Photo Current	E_V = 100 lux, CIE illuminant A, V_{CE} = 5 V	A	I_{PCE}	12	23	μA
		B	I_{PCE}	19	36	μA

DeMint provides ambient light sensor for photodiode and phototransistor. For a given irradiance, the phototransistor may show a batch change of the output current due to the susceptibility of the wafer and the variability of the transistor gain. The lot-to-lot change of the photoelectric sensor is significantly lower because it is only caused by the variability of photosensitivity. DeMint provides phototransistor output (component) for its ambient light sensor in binned groups (Table 2). These groups can not be ordered separately, but each reel is labeled A, B, or C, which allows the user to select the appropriate load resistance to compensate for these wide tolerances.

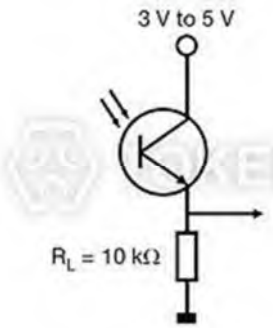


Figure 3 - Typical Optical Load Circuit

Select The Load Resistor

In order to minimize the output variability of the light sensor, the load resistance (R_L) requires the selection of the component to choose the load resistance (R_L) according to the sorted standard illuminance. The ambient light sensor and the transistor output of the typical optical circuit shown in Figure 3. For the PT-IC-GC-3-PE-520, 30 lux the typical output current is 7.5 µA. At 100 lux, the typical output current is 25 µA and the output current is in the range of 12 µA to 36µA. By the previously mentioned binning components, the range of 100 lux is divided into two bins. Each bin should use a different load resistor, and the output is relatively consistent for a given lux level.

Suppose application detection ranges from 10 lux to $1000 lux. Use a 10 KΩ load resistor to produce a voltage of 0.025 V to 2.5 V. The photocurrent of the voltage is equal to 2.5 µA to 250 µA.

Table 3 - Mean of Bin

Part Number	Bin	Photocurrent, I_{PCE} at 100 lux (µA)		
		Min.	Mean	Max.
PT-IC-GC-3-PE-520	A	12	17.5	23
	B	19	27.5	36

- **The purpose of selecting the resistance is to have the same output voltage for the average of each component, Table 3.**

Table 4 - Load Resistor of Bin

Bin A	Bin B
I_{PCE} = 17.5 µA, RL = 10 kΩ **V = 17.5 µA x 10 kΩ** **V = 175 mV**	0.175 V = 0.0000275 A x RL RL = 0.175 V/0.0000275 A RL = 6.36 kΩ

- **The PT-IC-GC-3-PE-520 overall tolerance is reduced from 12 to 36 by 12 to 23 by changing the resistance value based on the bin.**

(PT-B1-DC-0603-940)
SMD Light Sensor

Product Introduction

DeMint SMD phototransistors achieve the second generation of optical axis keyboard.

Applications :

- Replace the traditional CDS photoresistor. No Cadmium and lead free with RoHS compliant.
- Suitable for all kinds of light control lighting products, such as security monitoring machine, small night lights, lawn lights, solar lights and so on.
- Auto-adjust background light, such as LCD, mobile phone, camera, digital photo frame, GPS navigation.
- Control all kinds of optical control video products and all kinds of optical control testing equipment.

Optical axis keyboard is a new generation keyboard which join the new optical sensor recognition technology in recent years. By replacing the traditional metal contacts for the optical sensor components, use optical media as a bridge. Because there is no contact, so it will not wear.

Optical axis technology takes advantage of infrared optical induction. There is no abrasion during conduction due to no contact point. The waveform of Optical signal pulse output is clean and noise-free. The keyboard response speed only takes 1ms. Thanks to the new optical sensors - SMD phototransistors (PT-B1-DC-0603-940) is the most critical component in optical axis applications.

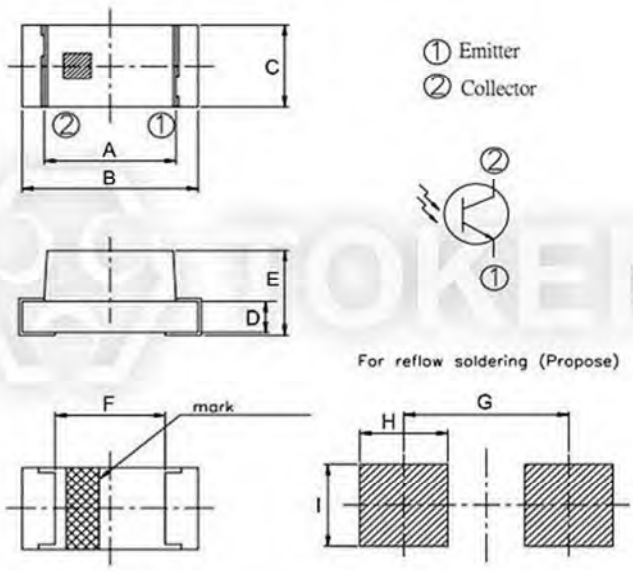
The (PT-B1-DC-0603-940) surface mounted infrared receiving light sensor features fast response speed, stable performance, low current loss in static, and anti-strong light interference. The effective control distance is greater than 1.5 meters.

For the convenience of installation in all kinds of products in any position, different sizes are available upon request. So that product consistency is better, more market competitiveness. It is also achievable to provide the bright current / dark current (bright resistance / dark resistance) for the most suitable product. Please contact our sales or link to DeMint official website “Ambient-light-sensors” for more information.

Dimensions

Dimensions & Configurations Chip (PT-B1-DC-0603-940) Unit: mm

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-B1-DC-0603-940	1.2 ± 0.2	1.6 ± 0.2	0.8 ± 0.2	0.3 ± 0.2	0.8 ± 0.2	1.0 ± 0.2	1.5 ± 0.2	0.8 ± 0.2	0.8 ± 0.2



SMD Light Sensor (PT-B1-DC-0603-940) Dimensions

Electro-Optical Characteristics

Electro-Optical Characteristics (Ta=25˚C) PT-B1-DC-0603-940

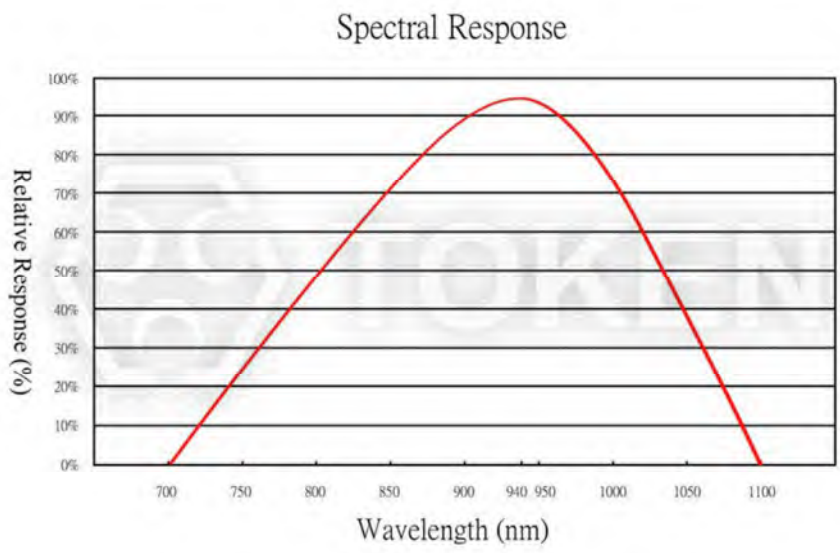
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	940	-	nm
Spectral Response Bandwidth	λ	\	700	-	1100	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0mW/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0mW/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	$I_{L(3)}$	V_{cc}=5V E_v=0Lux	-	-	0.4	V
Collector Emitter Current	I_L	V_{ce}=5V E_e=1mW/cm^2	0.2	0.3	0.4	μA
Collector Dark Current	I_d	V_{cc}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux R_L=1000Ω	15			μs
Fall Time	t_f		15			

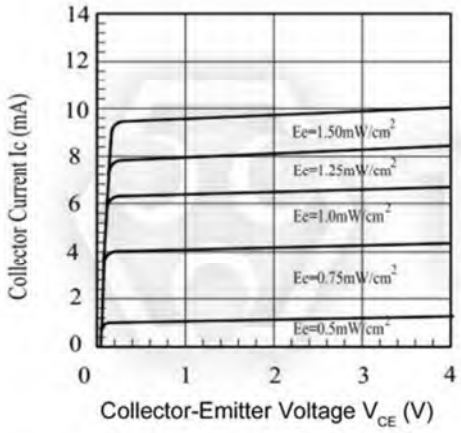
Electro-Optical Characteristics (Ta=25˚C) PT-B1-DC-0603-940

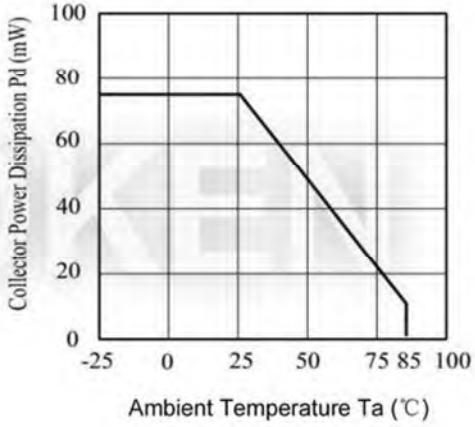
Parameter	Symbol	Rating Value	Unit
Collector - Emitter Voltage	V_{CEO}	30	V
Emitter - Collector Voltage	V_{ECO}	5	V
Power Dissipation	P_c	70	mW
Operating Temperature Range	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +85	°C

Curve

Relative Spectral Sensitivity vs. Wavelength (PT-B1-DC-0603-940)







Dark Current vs. Ambient Temperature (PT-B1-DC-0603-940)

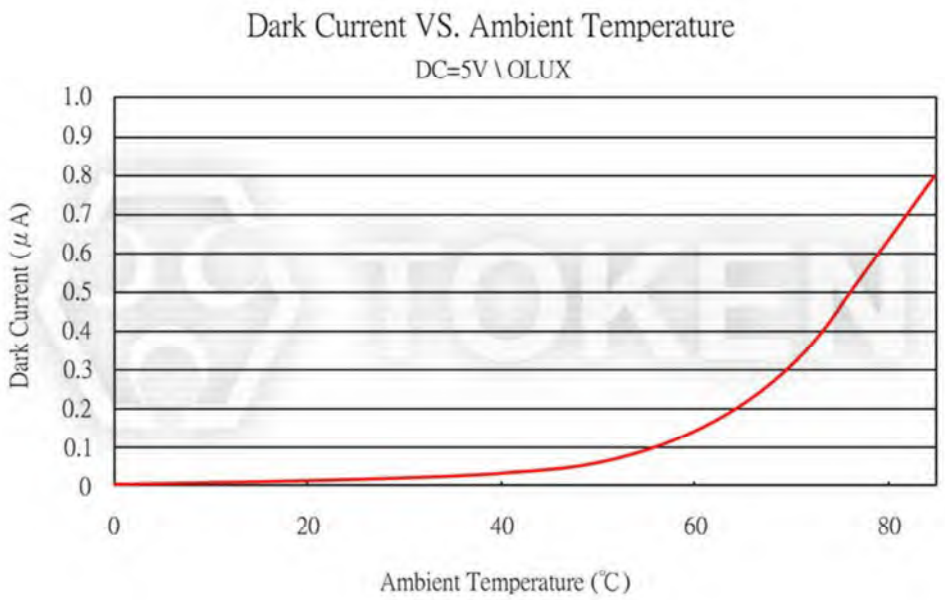
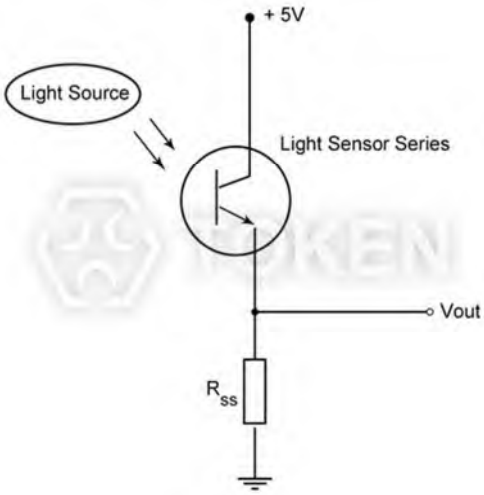


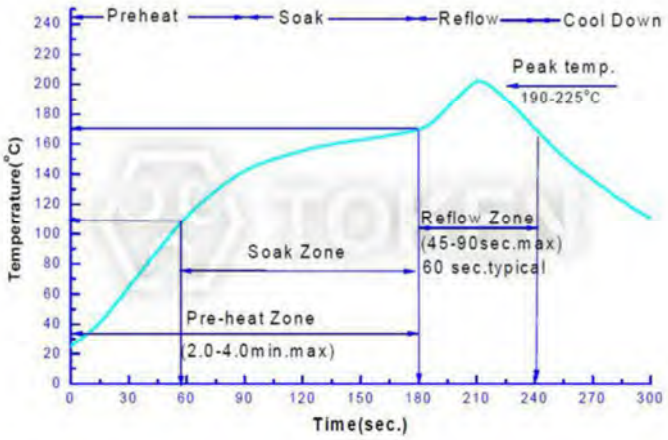
Photo Current Measurement Method (PT-B1-DC-0603-940)



Recommended Reflow

Recommended Reflow Chart (PT-B1-DC-0603-940)

Characteristic of Temperature Curve	Reference Settings
Average Heating Speed (Tsmax to Tp)	Max. 3°C / Sec
Preheating: Minimum Temperature	(TsMin.)
Preheating: Maximum Temperature (TsMax.)	150°C
Preheating: Time (tsMin. to tsMax.)	60 ~ 120 Sec
Reflow Temperature: Temperature (TL)	183°C
Period of Reflow: Time (TL)	60 ~ 150 Sec
Peaking Temperature (TP)	225°C
Within the Actual Peak Temperature (tp) 5°C	10 ~ 30 Sec
Cooling speed	Max. 6°C / Sec
25°C Time required to rise to peak temperature	Max. 6 minutes



Note

Storage :

1. Without opening the original wrapper, the recommended storage environment is: 5°C ~ 30°C, Humidity less 85%.
2. After opening the original wrapper, the recommended storage environment is: 5°C ~ 30°C, Humidity less 60%.
3. This product is humidity sensitive device. In order to avoid moisture absorption after unpackage, it is recommended that the opened packaging be stored in an airtight container with desiccant.
4. After opening the package, the original should be used within 12 hours.
5. If the desiccant fails or the device is exposed to air for more than 12 hours. Should be used for dehumidification treatment at 60°C / 24H.

Baking and dehumidification :

1. Use instructions before soldering this product. After opening the original wrapper, product exposure and humid environment. Product may be damaged during soldering.
2. Description of the storage: Products with exposure time exceeding the specified time must be baked according to the baking conditions listed below. The following downgrade table determines the maximum amount of time that this product can be exposed to the humidity and temperature conditions listed. (Unit: Day)

Temperature	Maximum Relative Humidity (%)						
	30%	40%	50%	60%	70%	80%	90%
30°C	9	5	4	3	1	1	1
25°C	12	7	5	4	2	1	1
20°C	17	9	7	6	2	2	1

3. Baking conditions: No need to bake all the products. Baking is required only if the following criteria are met:
   A: Products that have been removed from the original package;
   B: Exposure to humid environments over time which list in Relative Humidity Table.;
   C: Products that have not been soldered. Reflow soldering of parts within one hours after baking, or immediately store the part in a container of relative humidity less than 20%. The product should be baked in its original reel under 60°C for 24 hours. The exposure time of the products after this baking process is again determined by the moisture sensitivity table above.

The Right way to bake

Wrong baking style

Service life :

It can be used for up to 100,000 hours at rated current and rated voltage.

Use and description of Humidity Monitor card :

1. The card with "Humiditor" in the bag is the humidity monitor card.
2. If there is no humidity in the bag, then the color in the black circle of the monitor card is blue as shown in Figure (1).
3. If humidity card "20%" corresponds to the black circle showing the color is pink, then bake and dehumidification the product as shown in Figure (2).
4. Humidity card indicates packaging bag humidity conditions.

Figure (1)

Figure (2)

Electrostatic Protection :

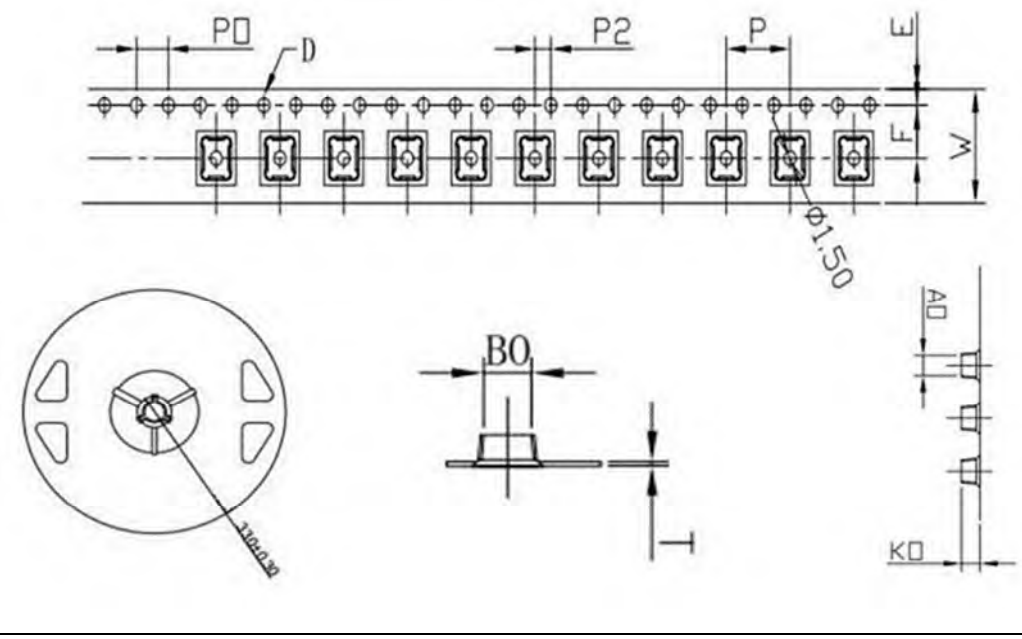
1. Electrostatic and surge will cause changes in product characteristics, such as positive voltage dropping, etc. The situation is serious, even damaging the product.
2. During the whole process (production, testing, packaging, etc.), who might contact with chip phototransistor, do measures to prevent and eliminate static electricity.
3. All relevant equipment and machines should be properly grounded. Grounding AC resistance is less than 1.0 Ω,
   the worktable needs to cushion surface resistance 106 Ω ~ 109 Ω Table Mat.
4. The ion fan must be installed on the environment and equipment that produce electrostatic easily.
5. Operation process, operators need to use anti-static bracelet, anti-static cushion, anti-static overalls, work shoes, gloves, anti-static capacitors.

Other Matters :

1. The resin package of the Chip Light Sensor product is quite fragile. Do not scrape the encapsulated resin part with a hard, sharp object.
   Should also be very careful when using tweezers to clamp the SMD Light Sensor.
2. Do not directly use the hand to take the Chip Light Sensor products.
   The direct use of hand to get the chip phototransistor will not only pollute the surface of the chip packaging resin,
   but also may be due to static factors such as chip product performance changes.
3. Do not exert excessive pressure on Chip Light Sensor, especially when Chips are in high temperature (for example, during reflow soldering).
   Excessive pressure may directly affect the inner chip and the gold wire.
4. Chip phototransistor working environment and chip adaptation of the material sulfur elements and compounds can not exceed 100PPM.
5. The module material cannot be stacked together and may damage the internal circuitry.
6. Not available in PH<7 acidic sites.

Packing format (Tape and reel) :

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	12	3.0	3.7	1.5	5.5	1.75	2.6	4.0	2.0	8.0	0.35
TOLE	±0.3	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.05



Order Codes

Order Codes (PT-B1-DC-0603-940)

PT	-	B1	-	DC	-	0603	-	940

Part Number	Chip Type	Lens Color		Dimensions		Peak Wavelength	
PT	B1	DC	Dark Transparent	0603	1.6mm × 0.8mm	940	940 nm

(PT-B1-DC-0603-940) SMD Infrared Receiving Light Sensor

Product Introduction

DeMint SMD IR phototransistors achieve the second generation of optical axis keyboard.

Applications :

- Replace the traditional CDS photoresistor. No Cadmium and lead free with RoHS compliant.
- Suitable for all kinds of light control lighting products, such as security monitoring machine, small night lights, lawn lights, solar lights and so on.
- Auto-adjust background light, such as LCD, mobile phone, camera, digital photo frame, GPS navigation.
- Control all kinds of optical control video products and all kinds of optical control testing equipment.

Optical axis keyboard is a new generation keyboard which join the new optical sensor recognition technology in recent years. By replacing the traditional metal contacts for the optical sensor components, use optical media as a bridge. Because there is no contact, so it will not wear.

Optical axis technology takes advantage of infrared optical induction. There is no abrasion during conduction due to no contact point. The waveform of Optical signal pulse output is clean and noise-free. The keyboard response speed only takes 1ms. Thanks to the new optical sensors - SMD IR phototransistors (PT-B1-DC-0603-940) is the most critical component in optical axis applications.

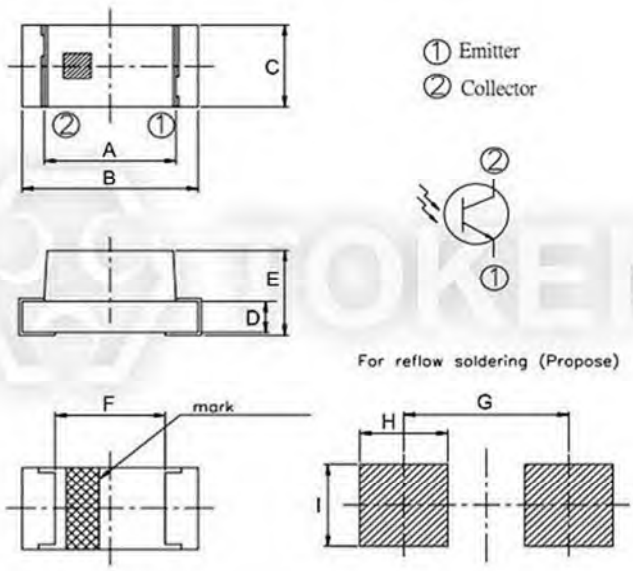
The (PT-B1-DC-0603-940) surface mounted infrared receiving light sensor features fast response speed, stable performance, low current loss in static, and anti-strong light interference. The effective control distance is greater than 1.5 meters.

For the convenience of installation in all kinds of products in any position, different sizes are available upon request. So that product consistency is better, more market competitiveness. It is also achievable to provide the bright current / dark current (bright resistance / dark resistance) for the most suitable product. Please contact our sales or link to DeMint official website “Ambient-light-sensors” for more information.

Dimensions

Dimensions & Configurations Chip (PT-B1-DC-0603-940) Unit: mm

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-B1-DC-0603-940	1.2 ± 0.2	1.6 ± 0.2	0.8 ± 0.2	0.3 ± 0.2	0.8 ± 0.2	1.0 ± 0.2	1.5 ± 0.2	0.8 ± 0.2	0.8 ± 0.2



SMD IR Light Sensor (PT-B1-DC-0603-940) Dimensions

Electro-Optical Characteristics

Electro-Optical Characteristics (Ta=25˚C) (PT-A8-AC-1206-850)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	0.5	0.8	1.2	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	1.5	2.4	3.6	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	5	8	12	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Shipping standards:

Photo Current	Test conditions	A shift	B shift	C shift	D shift	X shift	Unit
	V_{ce}=5V E_v=10Lux	/	/	/	/	0.5 ~ 1.2	μA

Absolute Maximum Ratings: (Ta=25˚C) (PT-A8-AC-1206-850)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	3	V
Power Dissipation	P_C	70	m^W
Operating Temperature Range	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C

Curve

Relative Spectral Sensitivity vs. Wavelength (PT-A8-AC-1206-850)

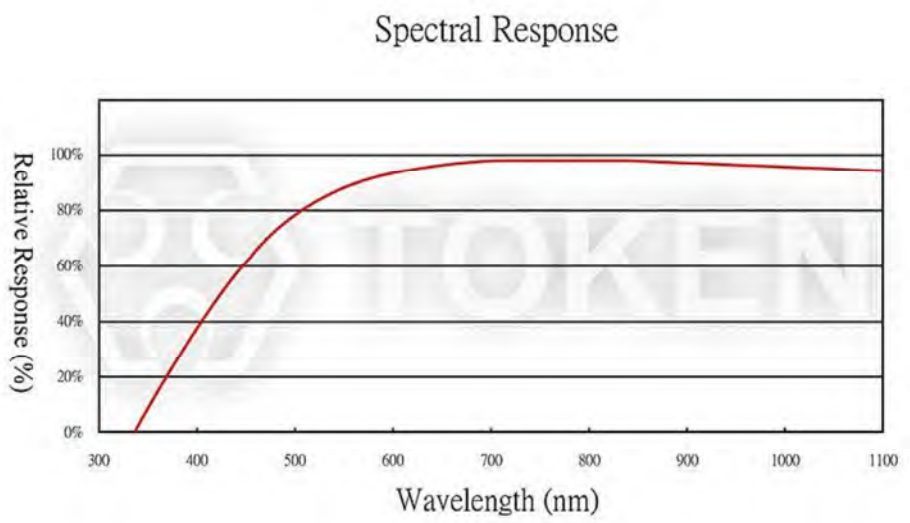
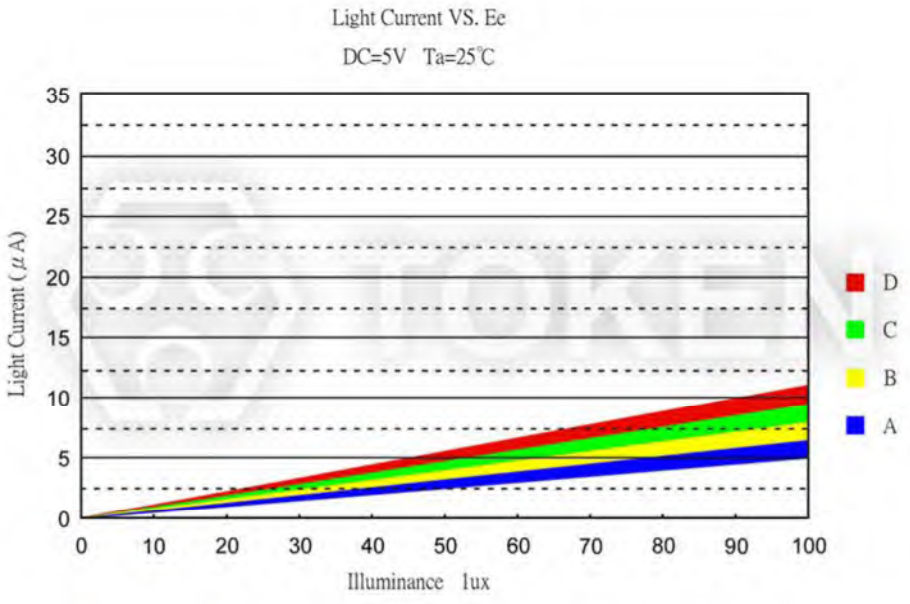
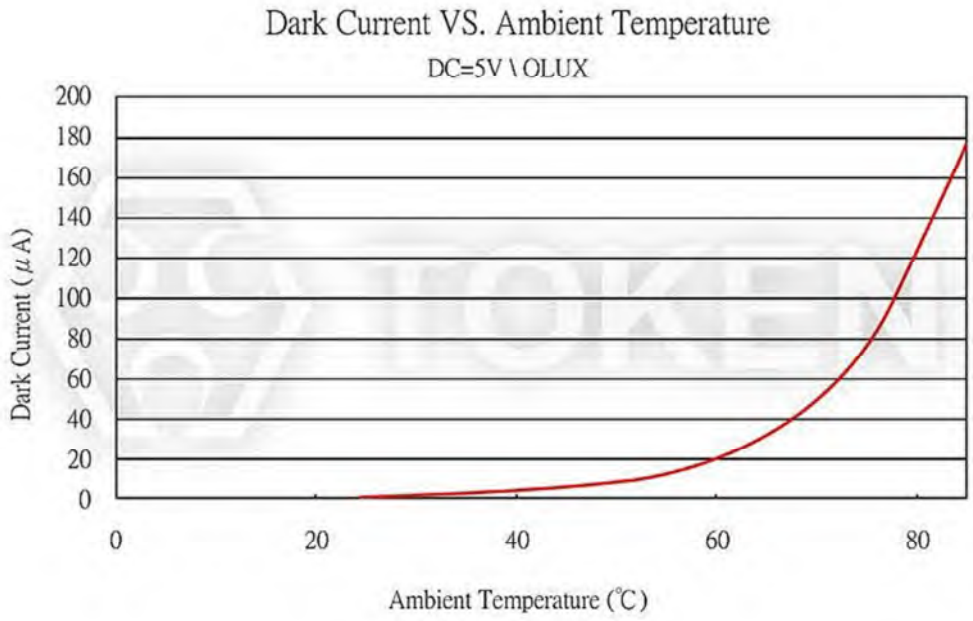


Photo Current vs. Illuminance (PT-A8-AC-1206-850)



Dark Current vs. Ambient Temperature P(PT-A8-AC-1206-850)



Note

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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

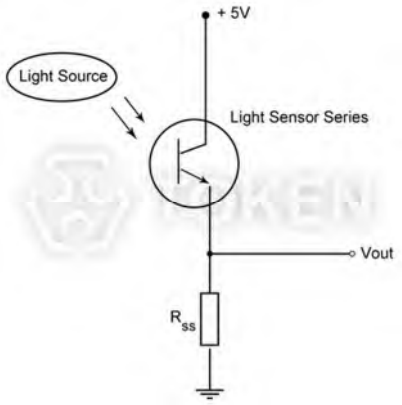


Photo Current Measurement Method - PT-A8-AC-1206-850

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 °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 freezingand 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.

Order Codes

Order Codes (PT-A8-AC-1206-850)

PT	-	A8	-	AC	-	1206	-	850

Part Number	Chip Type	Lens Color		Size		Spectral Bandwidth	
PT	A8	AC	Water Clear	1206	3.2mm × 1.5mm	850	850 nm

(PT-3528) Chip Ambient Light Sensor

Product Introduction

Chip Ambient Light Sensor IC type for security lighting with near human Eye photopic response.

Features :

- Ambient light sensors mimic the human eye with peak wavelength 520nm and 550nm, anti-infrared interference.
- Fast response speed and stable performance, Good batch consistency, Small static current.

Applications :

- No cadmium, lead free and other harmful substances, compliant with EU RoHS standards.
- Suitable for all kinds of infrared light control, infrared radiation, infrared reflection,
- applicable to all types of light control lighting products: such as small night Lights, lawn lights, solar lamps.
- Suitable for all kinds of high illumination or visible light interference strong products, automatic adjustment background light:
- such as LCD, mobile phone, camera, computer camera, installation control machine.
- Control all kinds of optical control video control toys and All kinds of optical control infrared testing equipment.

Custom Design :

- For the convenience of installation in all kinds of products in any position, different sizes are available upon request.
- Provide bright current / dark current (bright resistance / dark resistance) for the most suitable product.

Chip ambient light sensors (ALS) will also be known as photodetector, illumination sensors, photo transistor, brightness sensors, optical sensors, or simply light sensors. The ALS signal may be used to instruct the keypad LED driver to reduce keypad backlighting minimizing as much as 30% from the power within the input standby power mode. Inside a mobile phone, the ALS enables automatic charge of display backlight brightness over an array of illumination conditions from the dark atmosphere to sunlight. This control significantly improves visibility and minimizes power consumption since LCD backlighting is able to take around 51% through the power within the input standby mode.

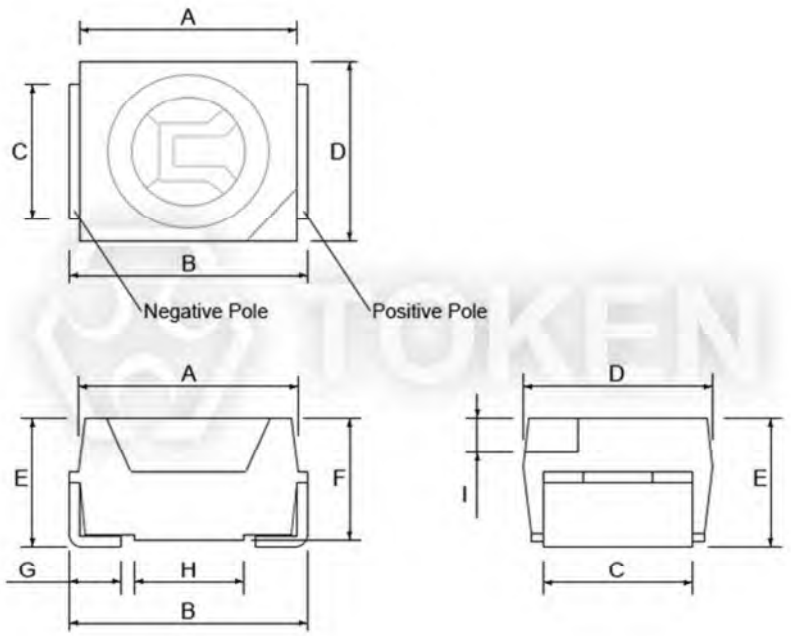
The (PT-IC-AC-3528-520) is a high-precision environment-friendly ambient light sensor. Optical IC with spectral response close to human eye sensitivity. A single chip on the photosensitive surface of the built-in current amplifier circuit is able to measure the visible light band. Compared with traditional visible light to near-infrared receiving silicon products, the light IC has a smaller output fluctuation. Parameters can be directly substituted for the most versatile Cds resistor, so this sensor can be used as an environmentally friendly substitute for cadmium sulfide resistor.

The (PT-IC-BC-3528-550) 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. This chip IC features high precision and excellent consistency, high temperature performance, working in high temperature environment, and dark current stability. Please contact our sales or link to DeMint official website "Ambient-light-sensors" for more information.

Dimensions

Dimensions & Configurations (Unit: mm) (PT-3528)

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-IC-BC-3528-550	3.20 ± 0.1	3.50 ± 0.1	2.10 ± 0.1	2.80 ± 0.1	1.90 ± 0.05	1.81 ± 0.05	0.80 ± 0.2	1.50 ± 0.2	0.50 ± 0.1
PT-IC-AC-3528-520	3.20 ± 0.1	3.50 ± 0.1	2.10 ± 0.1	2.80 ± 0.1	1.90 ± 0.05	1.81 ± 0.05	0.80 ± 0.2	1.50 ± 0.2	0.50 ± 0.1



SMD IR Light Sensor (PT-3528) Dimensions

PT-IC-BC-3528-550

PT-IC-AC-3528-520

Electro-Optical BC-550

Electro-Optical Characteristics (Ta=25˚C) PT-IC-BC-3528-550

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	550	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	1.5	3	4.5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	4.5	9	13.5	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	15	30	45	μA
Collector Dark Current	I_d	V_{cc}=5V E_v=0Lux	-	-	0.1	μA
IR Receiving Current	$I_{L(4)}$	V_{cc}=5V/850nm IR LED E_e=1m^W/cm^2	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			μs
Fall Time	t_f		4.5			

Electro-Optical Characteristics (Ta=25˚C) PT-IC-BC-3528-550

Parameter	Symbol	Rating Value		Unit
Operating Voltage	V_{cc}	Min.	Max.	V
		1	10	V
Power Dissipation	P_c	70		m^W
Operating Temperature Range	T_{opr}	-25 ~ +85		°C
Storage Temperature	T_{stg}	-40 ~ +100		°C

Electro-Optical AC-520

Electro-Optical Characteristics (Ta=25˚C) PT-IC-AC-3528-520

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	520	-	nm
Spectral Response Bandwidth	λ	\	400	-	-	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	7	13	18	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	21	39	54	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	70	130	180	μA
Collector Dark Current	I_d	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			μs
Fall Time	t_f		4.5			

Electro-Optical Characteristics (Ta=25˚C) PT-IC-AC-3528-520

Parameter	Symbol	Rating Value		Unit
Operating Voltage	V_{cc}	Min.	Max.	V
		1	10	V
Power Dissipation	P_c	70		m^W
Operating Temperature Range	T_{opr}	-25 ~ +85		°C
Storage Temperature	T_{stg}	-40 ~ +100		°C

Curve BC-550

Relative Spectral Sensitivity vs. Wavelength PT-IC-BC-3528-550

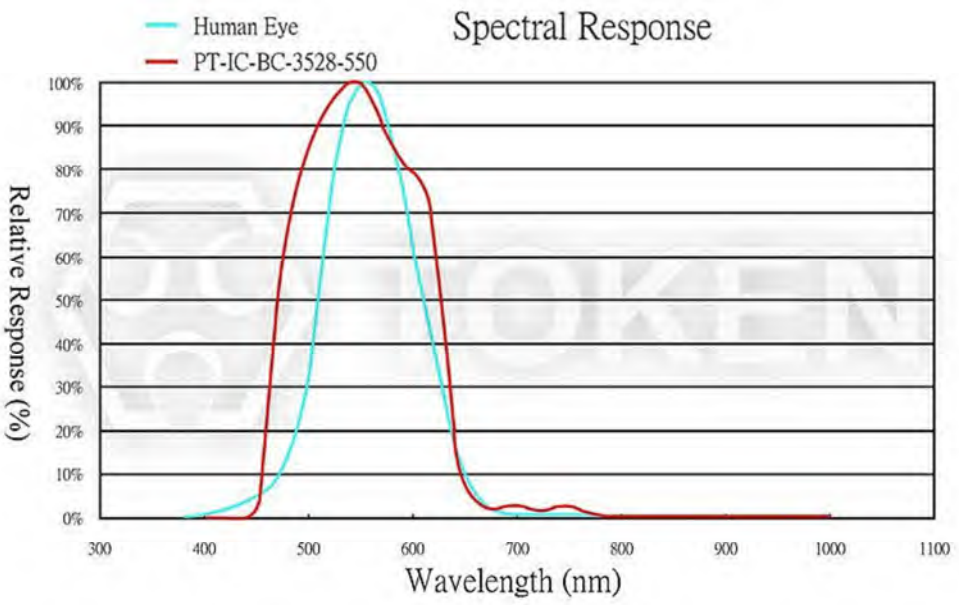
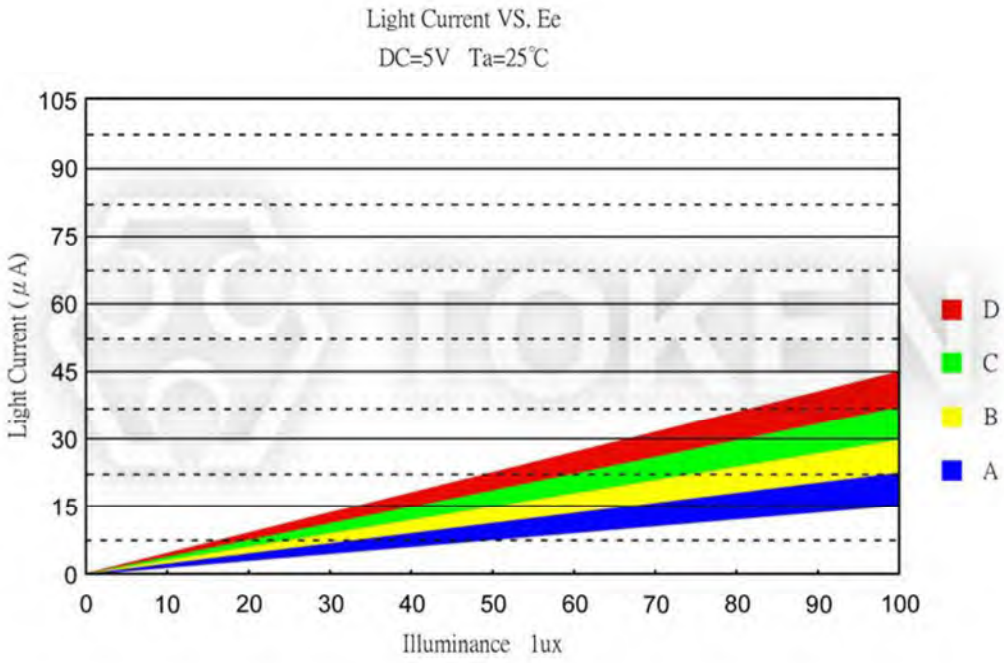


Photo Current vs. Illuminance PT-IC-BC-3528-550



Dark Current vs. Ambient Temperature PT-IC-BC-3528-550

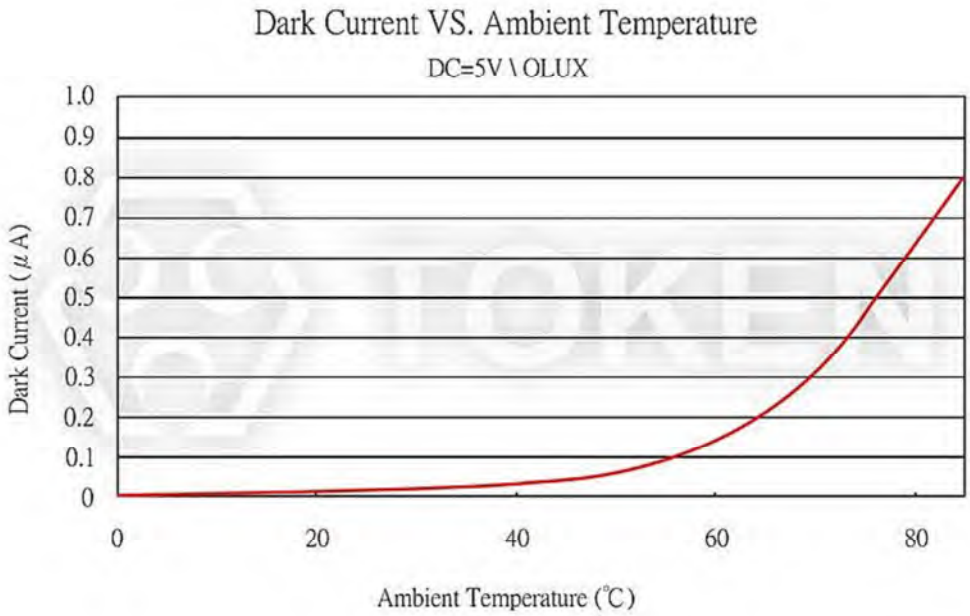
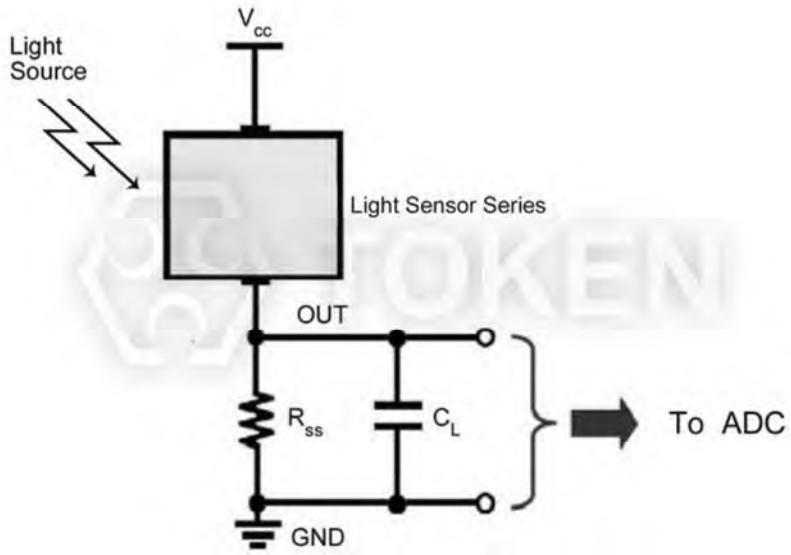


Photo Current Measurement Method PT-3528



Curve AC-520

Relative Spectral Sensitivity vs. Wavelength PT-IC-AC-3528-520

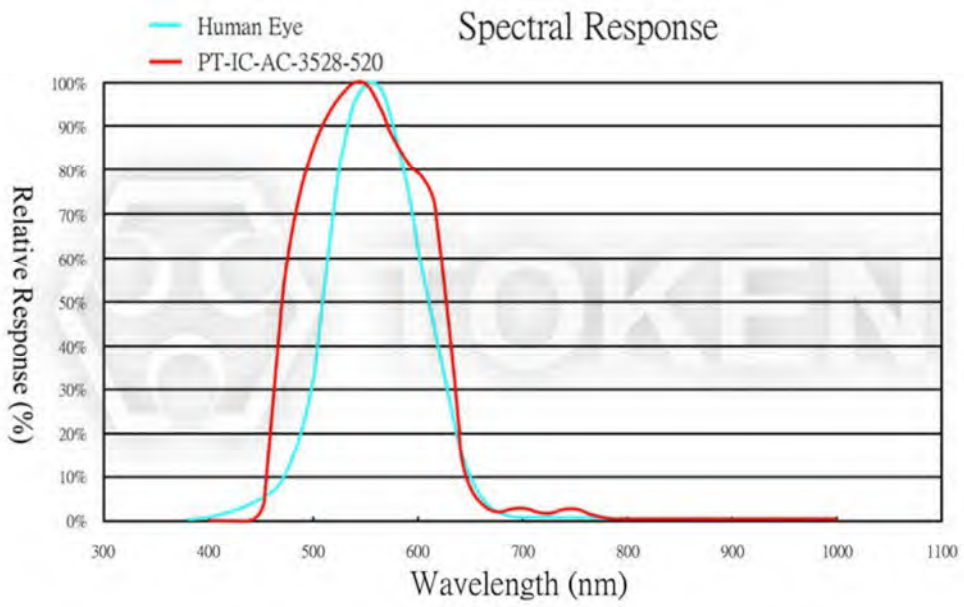
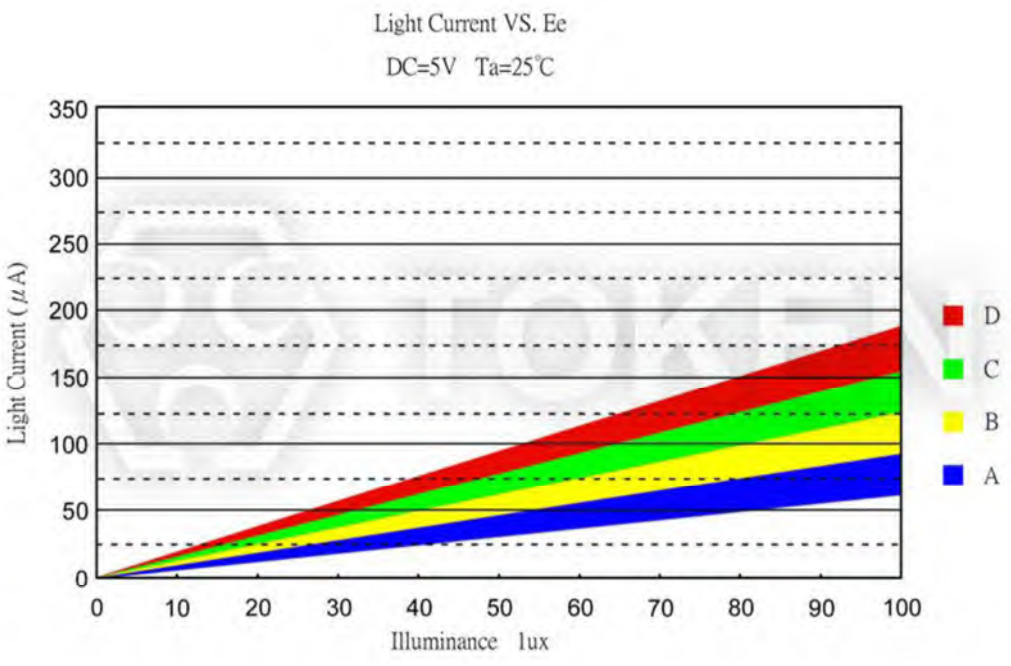


Photo Current vs. Illuminance PT-IC-AC-3528-520



Dark Current vs. Ambient Temperature PT-IC-AC-3528-520

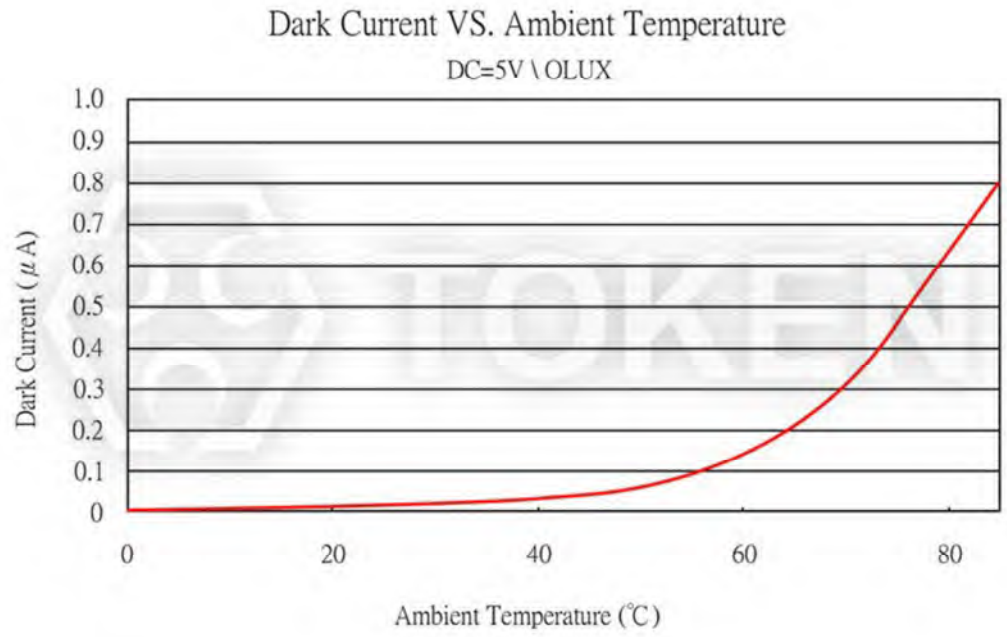
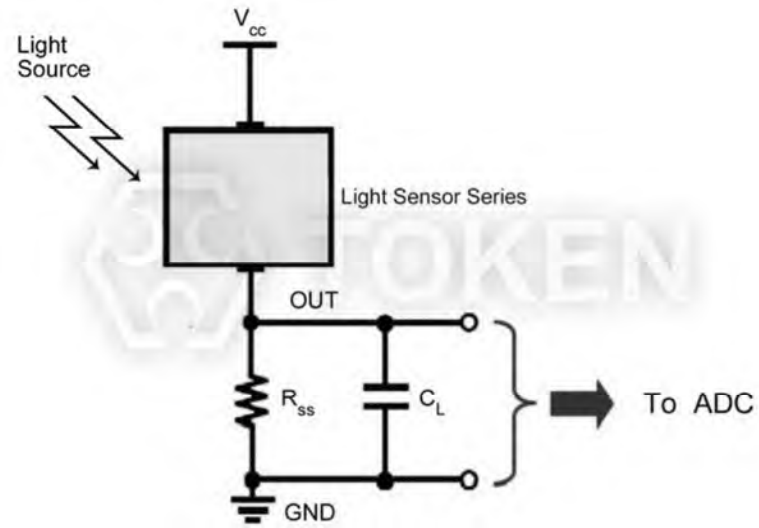


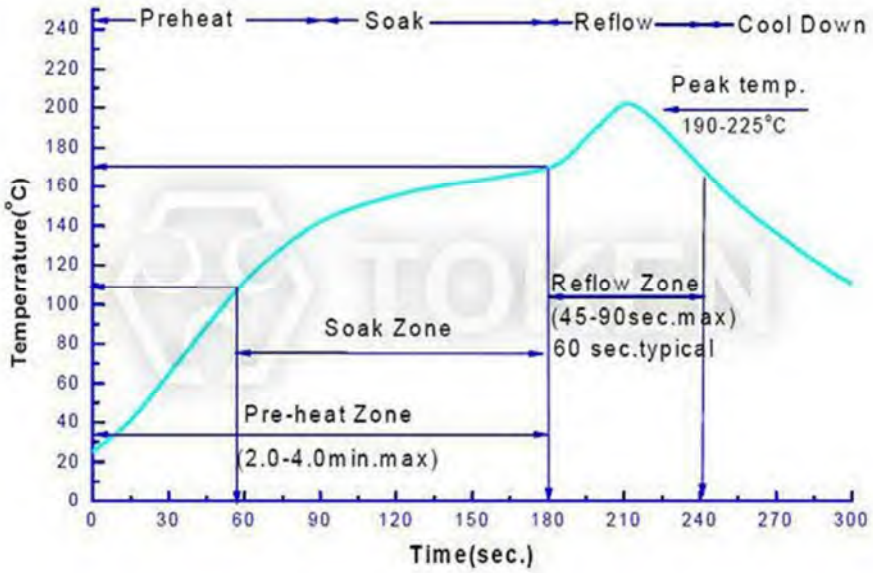
Photo Current Measurement Method PT-3528



Reflow Chart

Recommended Reflow Chart (PT-3528)

Characteristic of Temperature Curve	Reference Settings
Average Heating Speed (TsMax. to Tp)	Max. 3°C / Sec
Preheating: Minimum Temperature	(TsMin.)
Preheating: Maximum Temperature (TsMax.)	150°C
Preheating: Time (tsMin. to tsMax.)	60 ~ 120 Sec
Reflow Temperature: Temperature (TL)	183°C
Period of Reflow: Time (TL)	60 ~ 150 Sec
Peaking Temperature (TP)	225°C
Within the Actual Peak Temperature (tp) 5°C	10 ~ 30 Sec
Cooling speed	Max. 6°C / Sec
25°C Time required to rise to peak temperature	Max. 6 Min.utes



Note

Storage :

- Without opening the original wrapper, the recommended storage environment is: 5°C ~ 30°C, Humidity less 85%.
- After opening the original wrapper, the recommended storage environment is: 5°C ~ 30°C, Humidity less 60%.
- This product is humidity sensitive device. In order to avoid moisture absorption after unpackage, it is recommended that the opened packaging be stored in an airtight container with desiccant.
- After opening the package, the original should be used within 12 hours.
- If the desiccant fails or the device is exposed to air for more than 12 hours. Should be used for dehumidification treatment at 60°C / 24H.

Baking and dehumidification :

- Use instructions before soldering this product. After opening the original wrapper, product exposure and humid environment. Product may be damaged during soldering.
- Description of the storage: Products with exposure time exceeding the specified time must be baked according to the baking conditions listed below. The following downgrade table determines the maximum amount of time that this product can be exposed to the humidity and temperature conditions listed. (Unit: Day)

Temperature	Maximum Relative Humidity (%)						
	30%	40%	50%	60%	70%	80%	90%
30°C	9	5	4	3	1	1	1
25°C	12	7	5	4	2	1	1
20°C	17	9	7	6	2	2	1

- Baking conditions: No need to bake all the products. Baking is required only if the following criteria are met:
  A: Products that have been removed from the original package;
  B: Exposure to humid environments over time which list in Relative Humidity Table.;
  C: Products that have not been soldered. Reflow soldering of parts within one hours after baking, or immediately store the part in a container of relative humidity less than 20%. The product should be baked in its original reel under 60°C for 24 hours. The exposure time of the products after this baking process is again determined by the moisture sensitivity table above.

The Right way to bake

Wrong baking style

Service life :

- It can be used for up to 100,000 hours at rated current and rated voltage.

Use and description of Humidity Monitor card :

- The card with "Humiditor" in the bag is the humidity monitor card.
- If there is no humidity in the bag, then the color in the black circle of the monitor card is blue as shown in Figure (1).
- If humidity card "20%" corresponds to the black circle showing the color is pink, then bake and dehumidification the product as shown in Figure (2).
- Humidity card indicates packaging bag humidity conditions.

Figure (1)

Figure (2)

Order Codes

Order Codes (PT-3528)

PT	-	IC	-	BC	-	3528	-	550

Part Number	Chip Type	Lens Color		Dimensions		Peak Wavelength	
PT	IC	BC	Dark Blue	3528	3.5mm × 2.8mm	550	550 nm
		AC	Water Clear			520	520 nm

(PT-A1-AC-3528-850) Surface Mount Ambient Visible Light Sensor

Product Introduction

The (PTA1AC3528-850) is a sensor with near the human eye that measures the intensity of visible light.

Features :

- Fast response speed and stable performance, Good batch consistency, Small static current.

Applications :

- No cadmium, lead free and other harmful substances, compliant with EU RoHS standards.
- Suitable for all kinds of infrared light control, infrared radiation, infrared reflection,
- applicable to all types of light control lighting products: such as small night Lights, lawn lights, solar lamps.
- Suitable for all kinds of high illumination or visible light interference strong products, automatic adjustment background light:
- such as LCD, mobile phone, camera, computer camera, installation control machine.
- Control all kinds of optical control video control toys and All kinds of optical control infrared testing equipment.

Custom Design :

- For the convenience of installation in all kinds of products in any position, different sizes are available upon request.
- Provide bright current / dark current (bright resistance / dark resistance) for the most suitable product.

Light sensors are most commonly present in industrial lighting, electronic devices, and automotive systems, where they provide settings to be adjusted automatically in response to changing ambient light conditions. By activating, switching off, or modifying features, ambient light sensors can conserve electric batteries and supply extra safety while eliminating the requirement for manual adjustments. DeMint offers a wide variety of ambient light sensors in leaded and surface mount packages, with photodiode or phototransistor outputs.

In portable electronic products, lowering the power consumption to supply the consumer with elevated battery existence is among today's critical design factors. The liquid crystal display (LCD) which is connected backlighting are the more power hungry loads in portable products. Consequently, using an ambient light sensor (ALS) to optimize the whole process of the backlight LEDs under a number of ecological lighting situations is growing while, simultaneously, the most well-liked technology choices open to designers for sensing have shifted towards more integrated solutions.

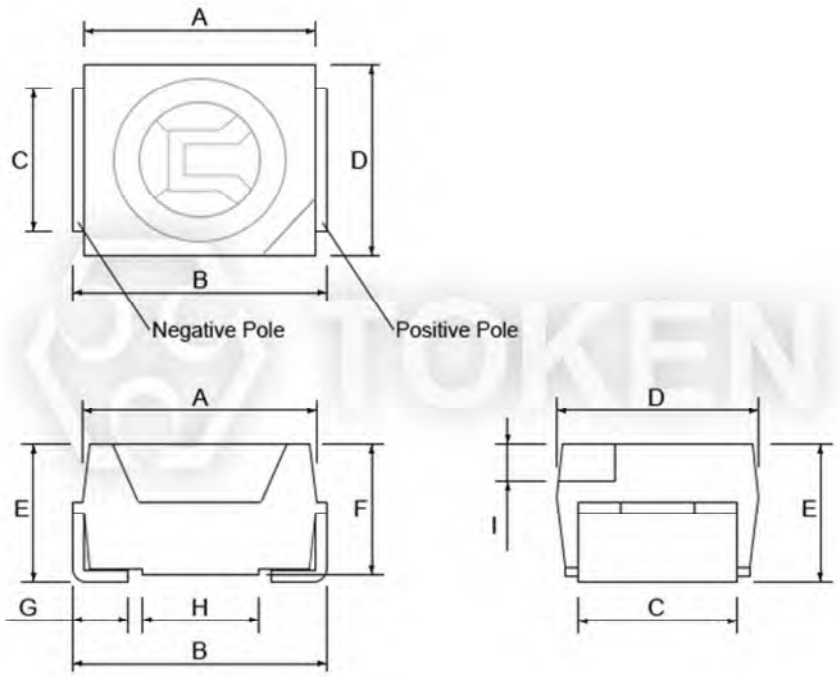
DeMint chip ambient light sensors can be used in a variety of LCD-equipped portable products including PDAs, notebook PCs, digital cameras, video players, GPS-based navigation systems, and more. Any portable product by having an LCD is really a candidate for ALS technology to lessen power consumption.

DeMint taking the advantage of temperature compensation internal process on the chip, (PTA1AC3528-850) features one times higher temperature resistance than other similar products while working on high temperature environment. By selecting the accuracy of chips, under strict management of production process, chip visible light sensors finished batch consistency uniform. The consistency is 3 to 5 times higher on comparison of similar photosensitive devices. Please contact our sales or link to DeMint official website "Ambient-light-sensors" for more information.

Dimensions

Dimensions & Configurations (Unit: mm) (PT-A1-AC-3528-850)

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-A1-AC-3528-850	3.20 ± 0.1	3.50 ± 0.1	2.10 ± 0.1	2.80 ± 0.1	1.90 ± 0.05	1.81 ± 0.05	0.80 ± 0.2	1.50 ± 0.2	0.50 ± 0.1



SMD IR Light Sensor (PT-A1-AC-3528-850) Dimensions

Electro-Optical Characteristics

Electro-Optical Characteristics: (Ta=25˚C) (PT-A1-AC-3528-850)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4*	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	2.5	3.5	5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	7.5	10.5	15	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	25	35	50	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Absolute Maximum Ratings: (Ta=25˚C) PT-A1-AC-3528-850

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	3	V
Power Dissipation	P_C	70	m^W
Operating Temperature Range	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C

Curve

Relative Spectral Sensitivity vs. Wavelength (PT-A1-AC-3528-850)

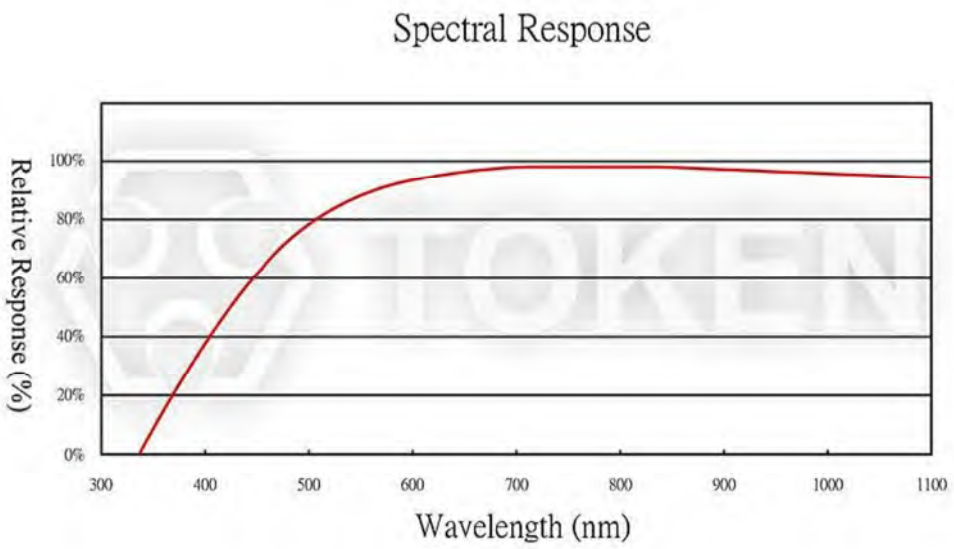
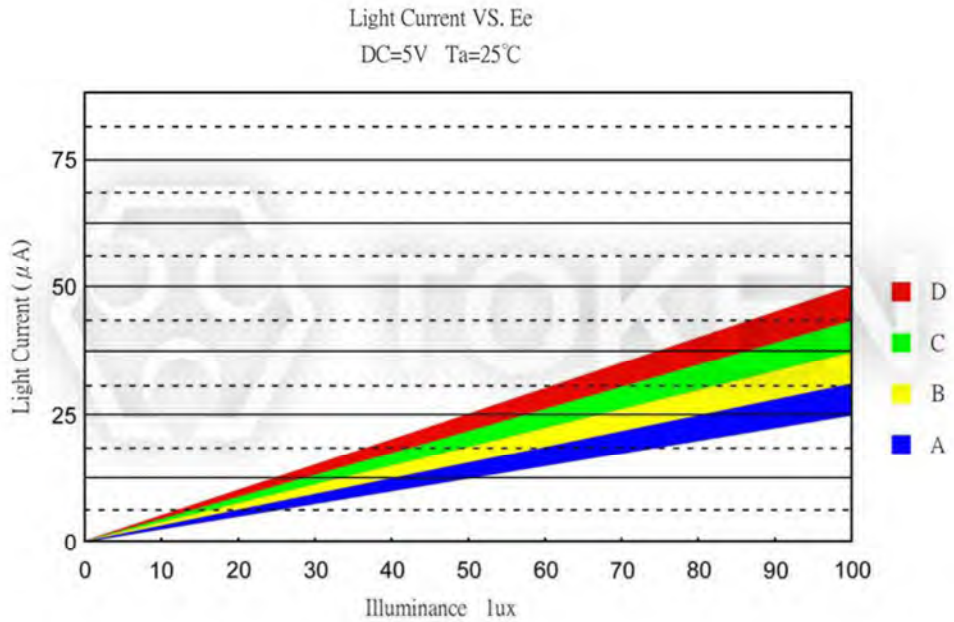
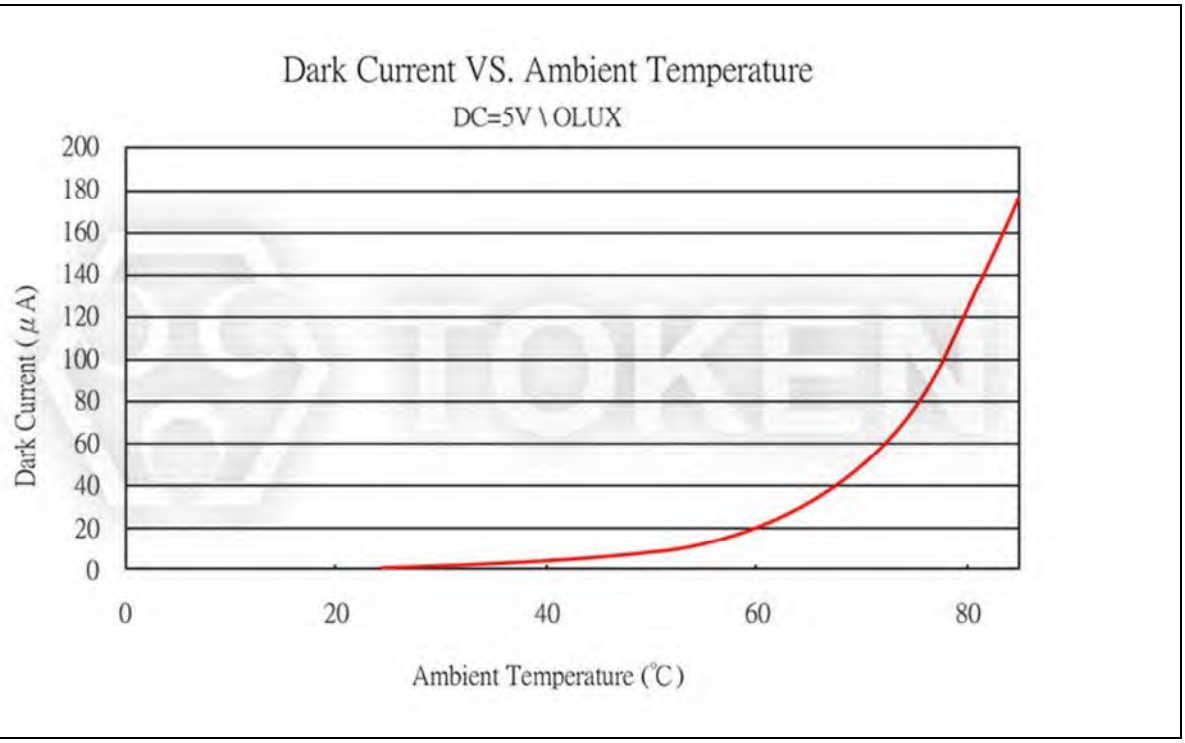


Photo Current vs. Illuminance (PT-A1-AC-3528-850)



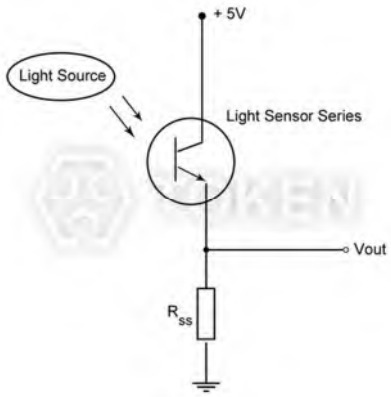
Dark Current vs. Ambient Temperature (PT-A1-AC-3528-850)



Note

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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

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 °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 freezingand 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.

Order Codes

Order Codes (PT-A1-AC-3528-850)

PT	-	A1	-	AC	-	3528	-	850

Part Number	Chip Type	Lens Color		Size		Spectral Bandwidth	
PT	A1	AC	Water Clear	3528	3.5mm × 2.8mm	850	850 nm

(PGM) CdS Photoresistors

Product Introduction

Light-Dependent Photoresistors for Sensor Applications.

Features :

- Quick Response
- Reliable Performance
- Epoxy or hermetical package
- Good Characteristic of Spectrum

Applications :

- Photoswitch
- Photoelectric Control
- Auto Flash for Camera
- Electronic Toys, Industrial Control

The cadmium sulfide (CdS) or light dependent resistor (LDR) whose resistance is inversely dependent on the amount of light falling on it is known by many names including the photo resistor, photoresistor, photoconductor, photoconductive cell, or simply the photocell.

A typical structure for a photoresistor uses an active semiconductor layer that is deposited on an insulating substrate. The semiconductor is normally lightly doped to enable it to have the required level of conductivity. Contacts are then placed either side of the exposed area.

The photo-resistor, CdS, or LDR finds many uses as a low cost photo sensitive element and was used for many years in photographic light meters as well as in other applications such as smoke, flame and burglar detectors, card readers and lighting controls for street lamps.

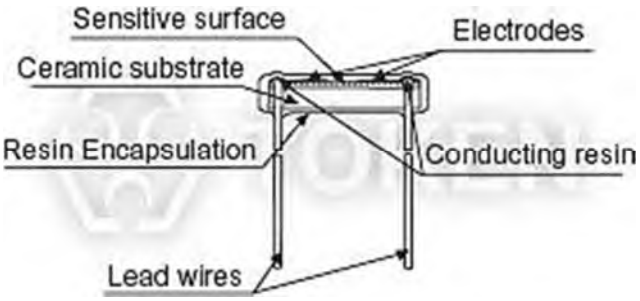
Providing design engineers with an economical CdS or LDR with high quality performance, DeMint Electronics now offers commercial grade PGM photoresistor. Designated the PGM Series, the photoresistors are available in 5mm, 12mm and 20mm sizes, the conformal epoxy or hermetical package offer high quality performance for applications that require quick response and good characteristic of spectrum.

DeMint has been designing and manufacturing high performance light dependent resistors for decades. Our product offerings are extensive and our experience with custom photoresistor is equally extensive. Contact us with your specific needs. For more information, please link to DeMint official website "CdS Photoresistors".

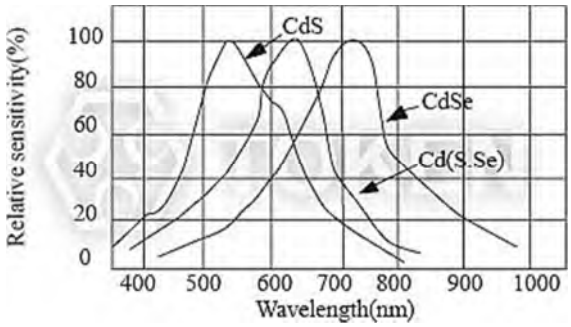
Terminology

Terminology (PGM)

- **Light Resistance** :
  Measured at 10 lux with standard light A (2854K-color temperature) and 2hr. preillumination at 400-600 lux prior testing.
- **Dark Resistance** :
  Measured at 10th seconds after closing 10 lux.
- **Gamma characteristic** :
  Under 10 lux and 100 lux and given by
  $\gamma = \log(R10/R100) / \log(100/10) = \log(R10/R100)$
  R10, R100: resistance at 10 lux and 100 lux.
  The tolerance of γ is ±0.1.
- **PMax.** :
  Max. power dissipation at ambient temperature of 25℃.At higher ambient temperature,the maximum power permissible may be lowered.
- **VMax.** :
  Max. voltage in darkness that may be applied to the device continuously.
- **Spectral peak** :
  Spectral sensitivity of photoresistors depends on the wavelength of light they are exposed to and in accordance with figure 'Spectral Response'. The tolerance of spectral peak is ±50nm.



CdS Photoresistor (Light Dependent Resistors) - PGM Series



CdS Photoresistors (PGM) Spectral Response

Physical and Environmental Characteristics

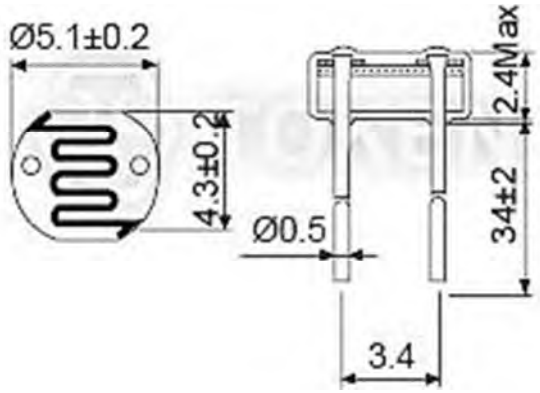
Physical and Environmental Characteristics (PGM)

ITEM	CONDITIONS	PERFORMANCE
Solderability	Put the terminals into welding tank at temp. 230±5℃ for 2±0.5s (terminal roots are 5mm away from the tin surface).	wetting>95%
Temperature Changing	Change of temperature in accordance with: TA: -40℃ TB: +60℃ Number of cycles: 5 Exposure duration: 30min	Drift of R10 = ± 20% No visible damage
Constant humidity and heat	1. Put the device in test box at Temperature: 60±5℃ Humidity: 90-95% Illumination: 0lux Duration: 100h 2. Take the device and measure after24h at normal temperature and humidity.	Drift of R10= ± 30% No visible damage
Constant load Temperature	At 25±5℃ Illumination: 150lux at rated power Duration: 600h	No visible damage
Wire Terminals Strength	Bend the wire terminal at its root to 90 degree, and then bend it to a opposite direction.	No visible damage
Vibration	Frequency: 50Hz Swing: 1.5mm with Directions: parallel to ceramic substrate normal to ceramic substrate. Duration:2h	No visible damage

Configurations & Dimensions

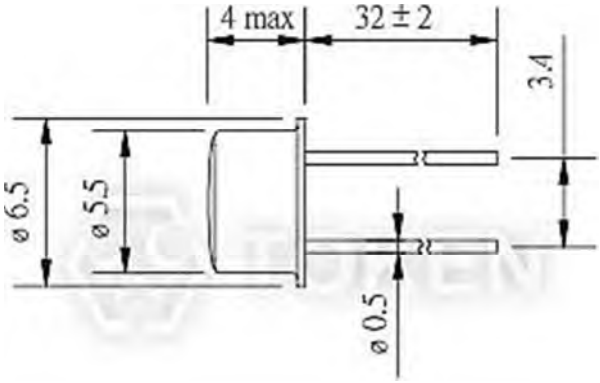
5mm CdS Photo Resistors (PGM) Configurations & Dimensions

Epoxy resin package
5mm CdS Photoresistors
Appearance PGM5** series**



Epoxy resin package
5mm PGM5** series**
Dimensions (Unit: mm)

Hermetical package
5mm CdS Photoresistors
Appearance PGM55-MP series**



Hermetical package
5mm PGM55-MP series**
Dimensions (Unit: mm)

- **Note: All dimensions are in mm and NTS.**

PGM5**** Electronics Characteristics

Epoxy resin package 5mm CdS (PGM5****) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)min	γ min	Response Time (ms)	
								Rise	Decay
PGM5506	100	90	-30 ~ +70	540	2 ~ 6	0.15	0.6	30	40
PGM5516	100	90	-30 ~ +70	540	5 ~ 10	0.2	0.6	30	40
PGM5526	150	100	-30 ~ +70	540	8 ~ 20	1.0	0.6	20	30
PGM5537	150	100	-30 ~ +70	540	16 ~ 50	2.0	0.7	20	30
PGM5539	150	100	-30 ~ +70	540	30 ~ 90	5.0	0.8	20	30
PGM5549	150	100	-30 ~ +70	540	45 ~ 140	10.0	0.8	20	30
PGM5616D	150	100	-30 ~ +70	560	5 ~ 10	1.0	0.6	20	30
PGM5626D	150	100	-30 ~ +70	560	8 ~ 20	2.0	0.6	20	30
PGM5637D	150	100	-30 ~ +70	560	16 ~ 50	5.0	0.7	20	30
PGM5639D	150	100	-30 ~ +70	560	30 ~ 90	10.0	0.8	20	30
PGM5649D	150	100	-30 ~ +70	560	50 ~ 160	20.0	0.8	20	30
PGM5659D	150	100	-30 ~ +70	560	150 ~ 300	20.0	0.8	20	30

PGM55** Electronics Characteristics

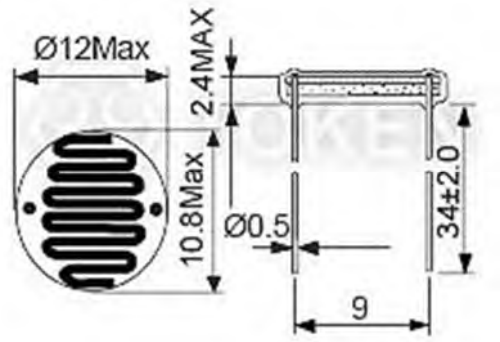
Hermetical package 5mm CdS (PGM55**-MP) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)min	γ min	Response Time (ms)	
								Rise	Decay
PGM5506-MP	100	90	-30 ~ +70	540	2 ~ 6	0.15	0.6	30	40
PGM5516-MP	100	90	-30 ~ +70	540	5 ~ 10	0.2	0.6	30	40
PGM5526-MP	150	100	-30 ~ +70	540	8 ~ 20	1.0	0.6	20	30
PGM5537-MP	150	100	-30 ~ +70	540	16 ~ 50	2.0	0.7	20	30
PGM5539-MP	150	100	-30 ~ +70	540	30 ~ 90	5.0	0.8	20	30
PGM5549-MP	150	100	-30 ~ +70	540	45 ~ 140	10.0	0.8	20	30

Configurations & Dimensions

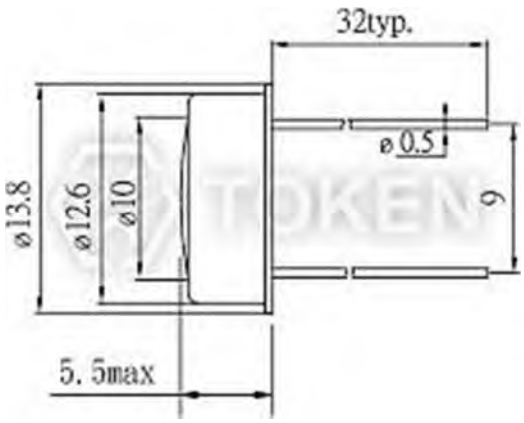
12mm Cds Photo Resistors (PGM) Configurations & Dimensions

Epoxy resin package
12mm CdS Photo Resistors Appearance PGM12 series**



Epoxy resin package
12mm Cds PGM12 series Dimensions (Unit: mm)**

Hermetical package
12mm CdS Photo Resistors Appearance PGM12-MP series**



Hermetical package
12mm Cds PGM12-MP series Dimensions (Unit: mm)**

- **Note : All dimensions are in mm and NTS.**

PGM12** Electronics Characteristics

Cds - (PGM12**) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)min	γ min	Response Time (ms)	
								Rise	Decay
PGM1200	250	250	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM1201	250	250	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM1202	250	250	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM1203	250	250	-30 ~ +70	560	18~50	10	0.8	30	30
PGM1204	250	250	-30 ~ +70	560	45~150	20	0.8	30	30
PGM1205	250	250	-30 ~ +70	560	140~300	20	0.8	30	30

PGM12**-MP Electronics Characteristics

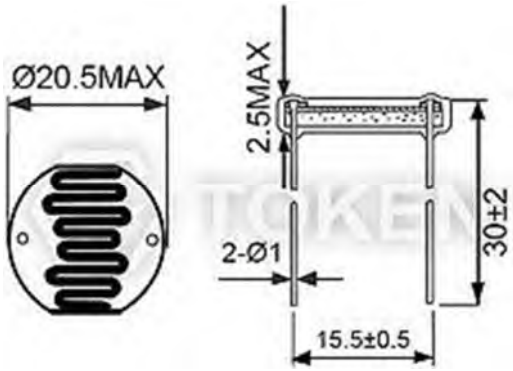
Cds - (PGM12**-MP) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)min	γ min	Response Time (ms)	
								Rise	Decay
PGM1200-MP	250	250	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM1201-MP	250	250	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM1202-MP	250	250	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM1203-MP	250	250	-30 ~ +70	560	18~50	10	0.8	30	30
PGM1204-MP	250	250	-30 ~ +70	560	45~150	20	0.8	30	30
PGM1205-MP	250	250	-30 ~ +70	560	140~300	20	0.8	30	30

Configurations & Dimensions

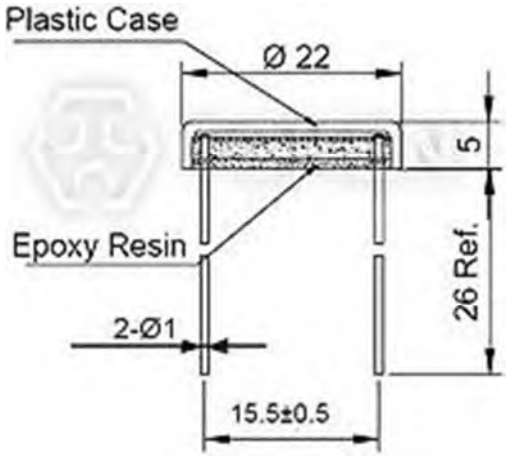
20mm CDS Photo Resistors (PGM) Configurations & Dimensions

Epoxy resin package
20mm CDS Photo Resistors Appearance PGM20** series



Epoxy resin package
20mm CdS PGM20** series Dimensions (Unit: mm)

Plactic Case package
20mm CDS Photo Resistors Appearance PGM20**-PP series



Plactic Case package package
20mm CdS PGM20**-PP series Dimensions (Unit: mm)

- Note: All dimensions are in mm and NTS.

PGM20** Electronics Characteristics

CdS - (PGM20**) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)min	γ min	Response Time (ms)	
								Rise	Decay
PGM2000	500	500	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM2001	500	500	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM2002	500	500	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM2003	500	500	-30 ~ +70	560	18~50	10	0.8	30	30
PGM2004	500	500	-30 ~ +70	560	45~150	20	0.8	30	30
PGM2005	500	500	-30 ~ +70	560	140~300	20	0.8	30	30

PGM20**-PP Electronics Characteristics

CdS - (PGM20**-PP) Electronics Characteristics

Model	VMax. (VDC)	PMax. (mW)	Ambient Temp (℃)	Spectral Peak (nm)	Photo Resistance (10Lx) (KΩ)	Dark Resistance (MΩ)min	γ min	Response Time (ms)	
								Rise	Decay
PGM2000-PP	500	500	-30 ~ +70	560	2~5	1.0	0.6	30	40
PGM2001-PP	500	500	-30 ~ +70	560	4~10	2.0	0.7	30	30
PGM2002-PP	500	500	-30 ~ +70	560	8~20	5.0	0.7	30	30
PGM2003-PP	500	500	-30 ~ +70	560	18~50	10	0.8	30	30
PGM2004-PP	500	500	-30 ~ +70	560	45~150	20	0.8	30	30
PGM2005-PP	500	500	-30 ~ +70	560	140~300	20	0.8	30	30

Order Codes

Order Codes (PGM)

PGM5516	P
Part Number	Package

(PT-A6) Visible Light Detector for Security Lighting

Product Introduction

DeMint 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.
- DeMint 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. DeMint 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 DeMint official website "Visible Light Sensors" 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

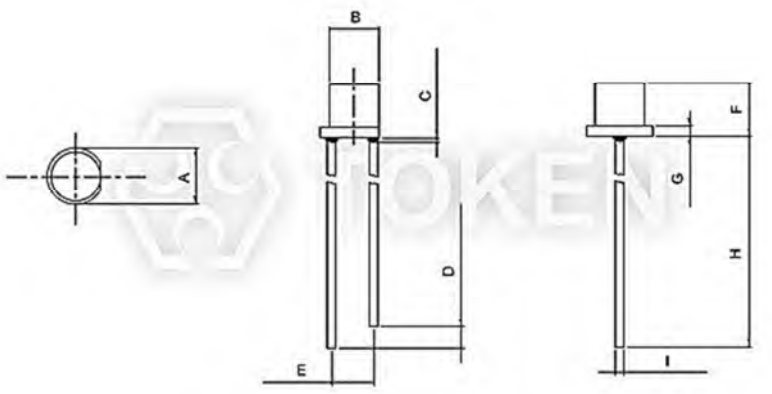


Plate Edge Visible Light Detector (PT-A6-BC-3-PE-520) Dimensions

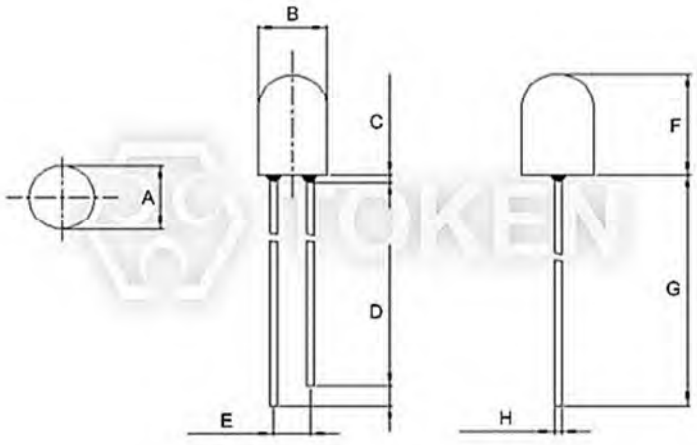
Plate Edge Visible Light Detector (PT-A6-BC-3-PE-520)

Remark:

- **The epoxy resin highest: 1.5mm Max..**
- **Product images, plastic color of apperence, 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 apperence, 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}=100μA E_e=0m^W/cm^2	60	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA 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 nm IR LED E_e=1m^W/cm^2	-	-	0.3	μA
Rise Time	t_r	V_{ce}=5V I_{ce}=1mA RL=1000Ω	40			μs
Fall Time	t_f		60			

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}=100μA E_e=0m^W/cm^2	60	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA 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 IR LED E_e=1m^W/cm^2	-	-	0.5	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	40			μs
Fall Time	t_f		60			

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}=100μA E_e=0m^W/cm^2	60	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA 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 RL=1000Ω	40			μs
Fall Time	t_f		60			

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

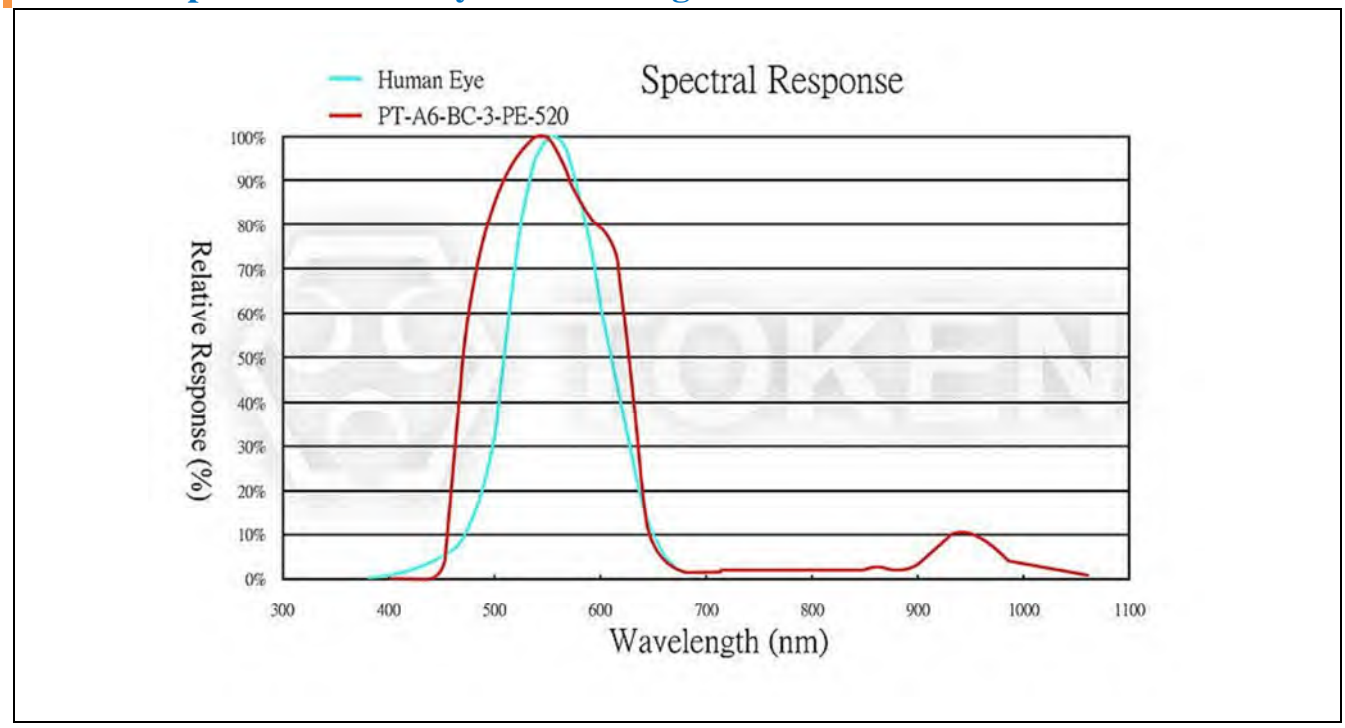
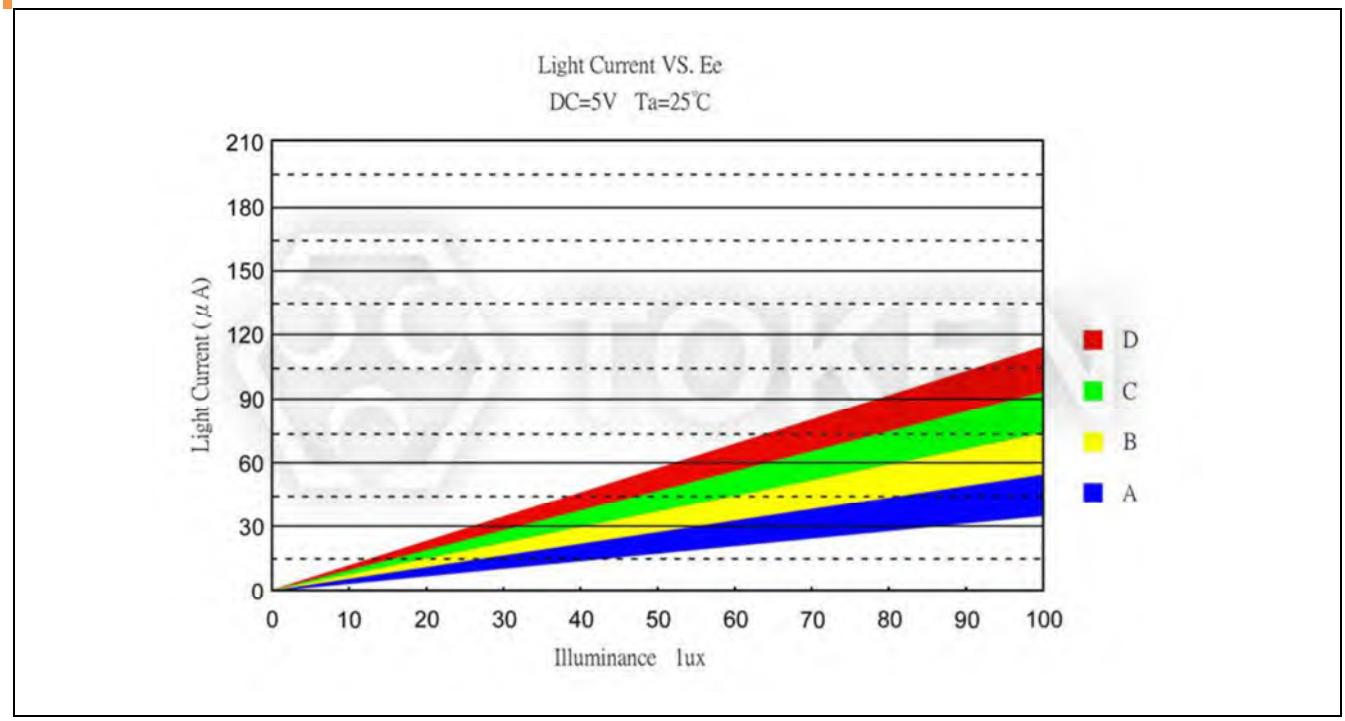
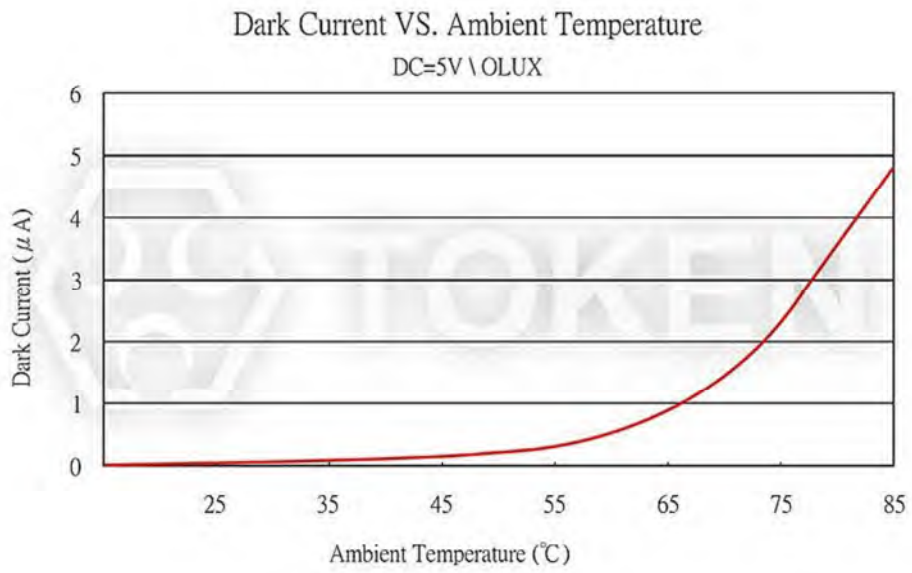


Photo Current vs. Illuminance PT-A6-BC-3-PE-520



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

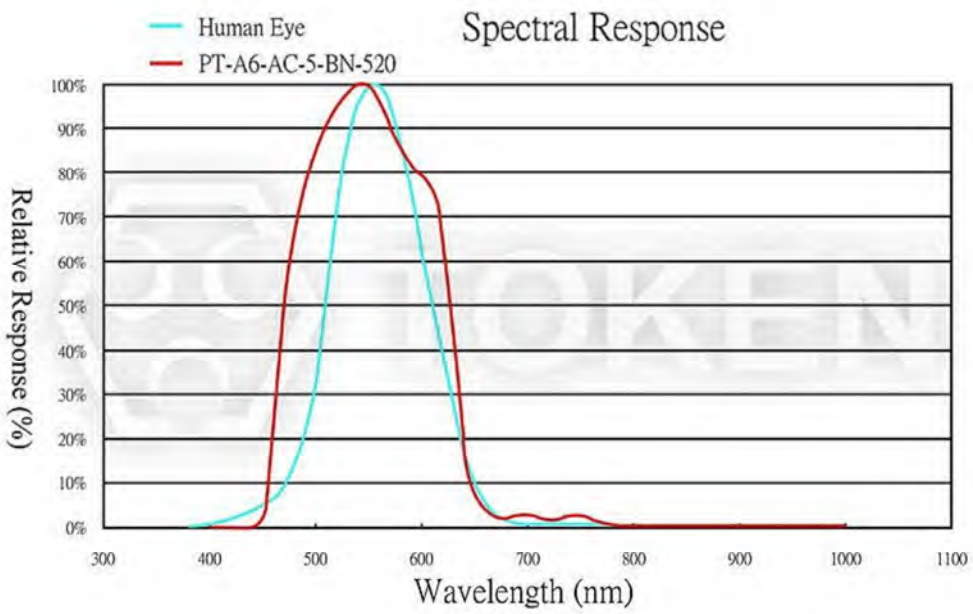
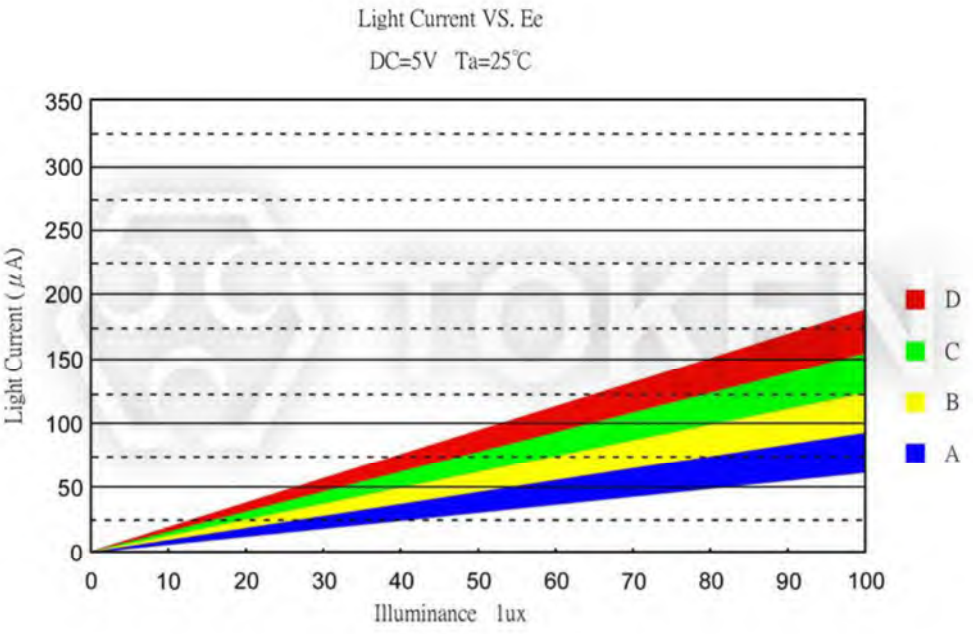
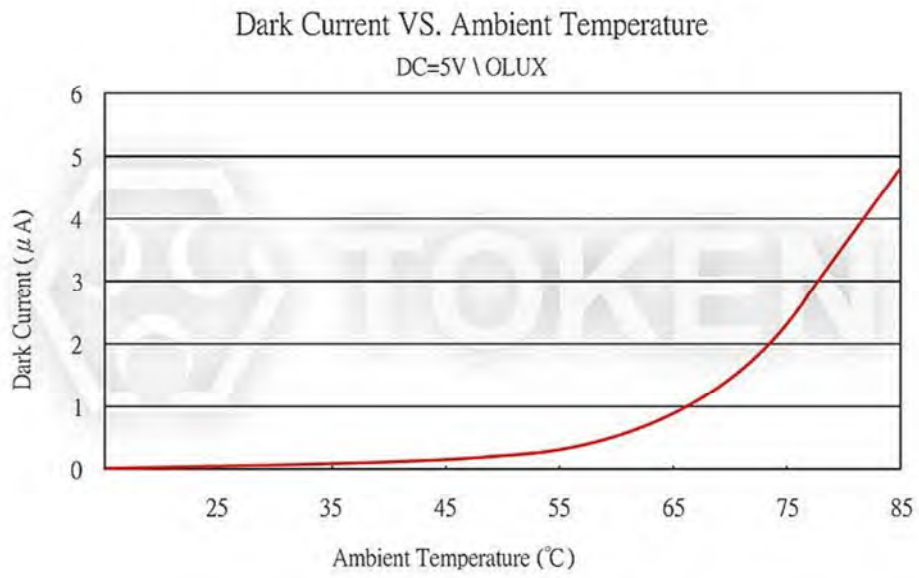


Photo Current vs. Illuminance (PT-A6-AC-5-BN-520) Bullet None



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

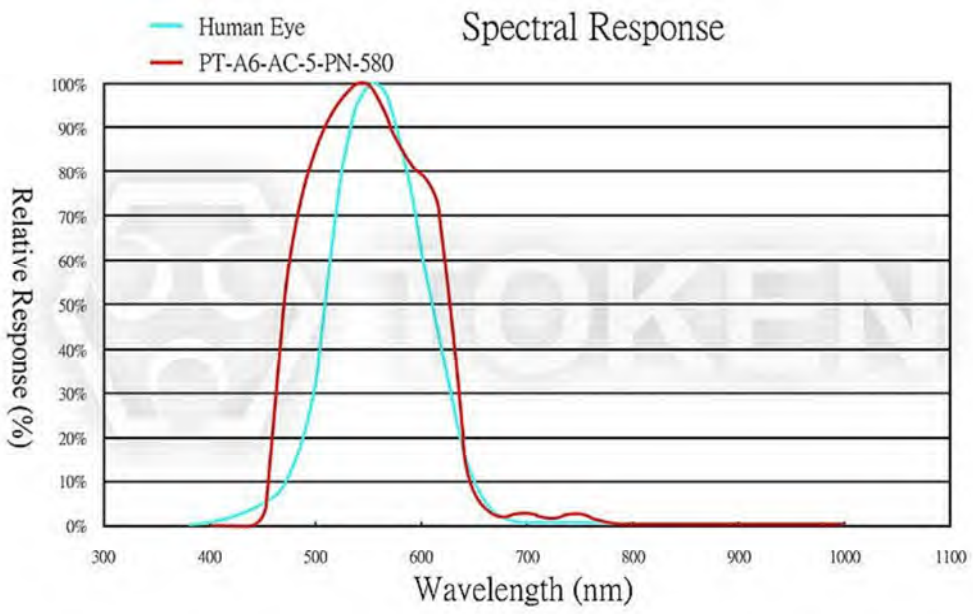
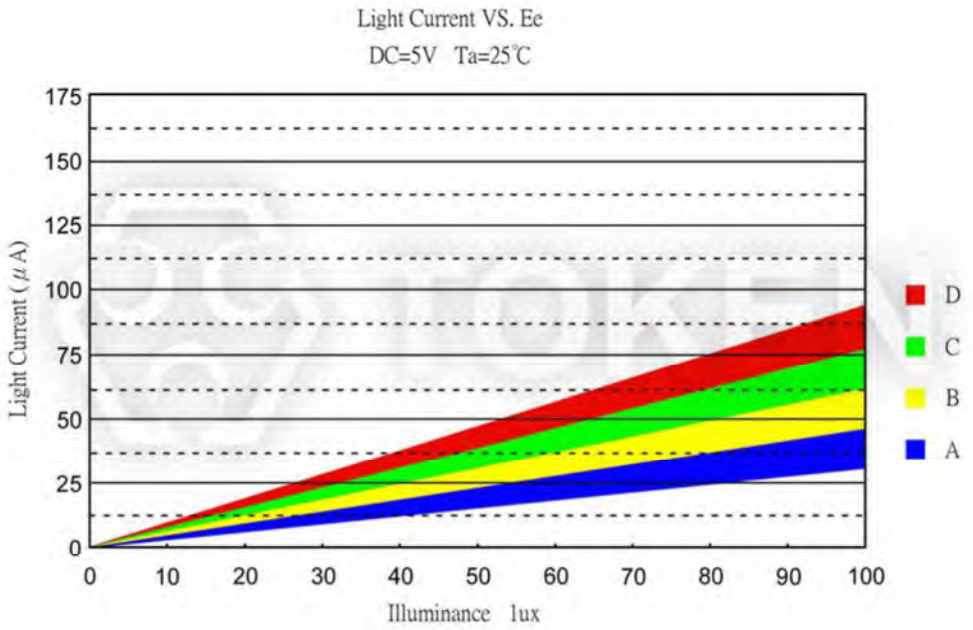
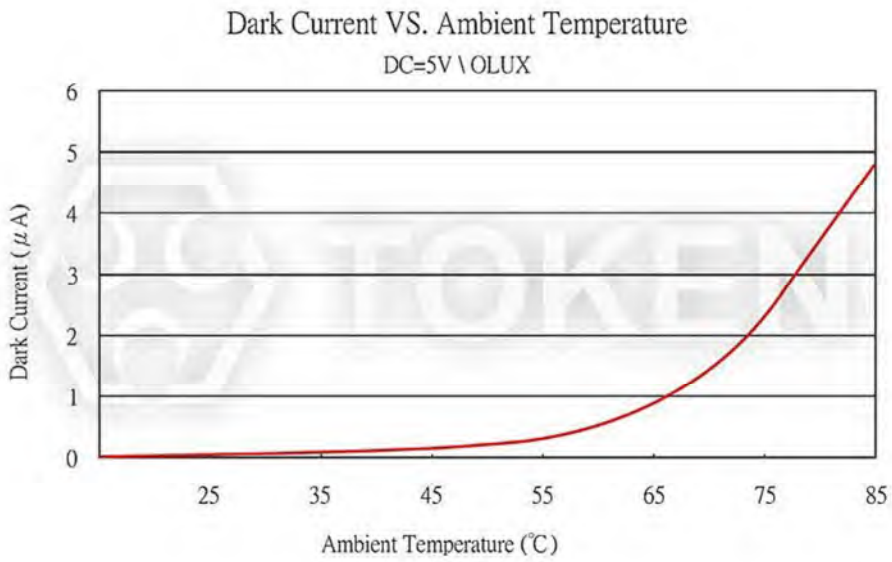


Photo Current vs. Illuminance (PT-A6-AC-5-PN-580) Plate None



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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

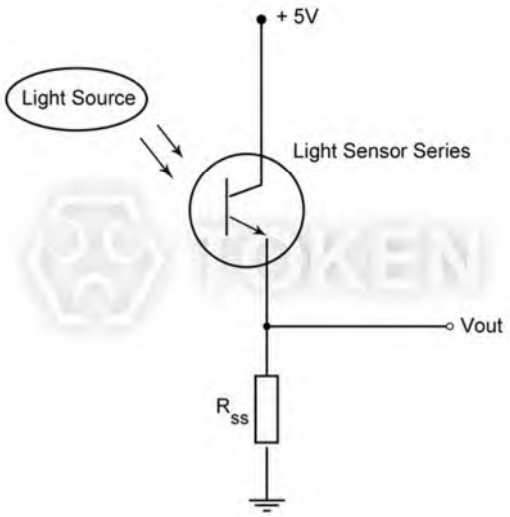


Photo Current Measurement Method - 3PE520BCA6

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 °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 freezingand 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.

Order Codes

Order Codes (PT-A6)

PT	-	A6	-	BC	-	3	-	PE	-	560

Part Number
PT

Chip Type
A6

Lens Color	
BC	Dark Blue
AC	Water Clear

Size	
3	3 mm
5	5 mm

Shape	
PE	Plate Edge
PN	Plate None
BN	Bullet None

Spectral Bandwidth	
560	560 nm
580	580 nm

(PT-IC-AC) Visible Light Sensor

Product Introduction

DeMint providing optimized light sensing solutions to enhance system efficiency and ease-of-design.

Features :

- Simulate the human eye, peak wavelength 550nm.
- Built-in infrared filter, can be anti-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.
- DeMint offers various option of the bright current/dark current (bright resistance/dark resistance) to costume the most products.

(PT-IC-AC) visible light sensor is a silicon NPN epitaxial planar phototransistor in a T-1 package. It is sensitive to visible light much like the human eye and has peak sensitivity at 520nm ~ 580nm.

The spectral response of the integrated light sensor with a very low dark current that are optimized for sensing low level light signals. So it ignores light such as infrared which emits energy but does not aid vision. This eliminates the need for an Infrared filter required with competitor light sensors.

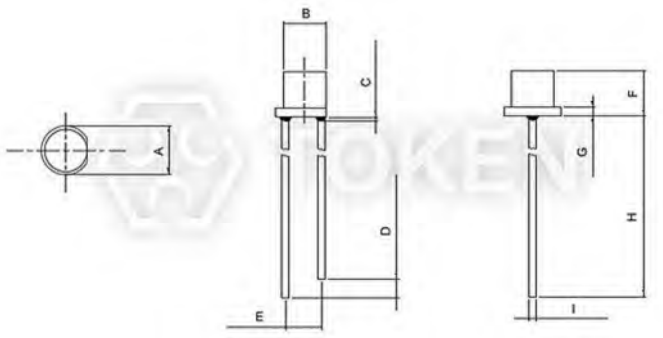
The (PT-IC-AC) Plate Edge IR visible light detector using high quality chip packaging and processing super-plated infrared filter membrane on chip surface, so this sensor can fully filter infrared interference. It is no need to add the casing and extra filter and effective filtering out the effect of light reflection due to infrared emission on security products.

By selecting the accuracy of chips, under strict management of production process, (PT-IC-AC) 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. DeMint taking the advantage of temperature compensation internal process on the chip, (PT-IC-AC) features one times higher temperature resistance than other similar products while working on high temperature environment. Please contact our sales or link to DeMint official website "Visible Light Sensors" for more information.

Dimensions

Dimensions & Configurations (Unit: mm) (PT-IC-AC-PE-550) Plate Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-IC-AC-3-PE-550	4.05 ± 0.20	3.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	3.85 ± 0.20	0.75 ± 0.20	25.4 Min.	0.50 ± 0.20
PT-IC-AC-5-PE-550	5.80 ± 0.20	5.00 ± 0.20	1.50 Max.	1.50 ± 0.50	2.54 ± 0.20	5.30 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.50



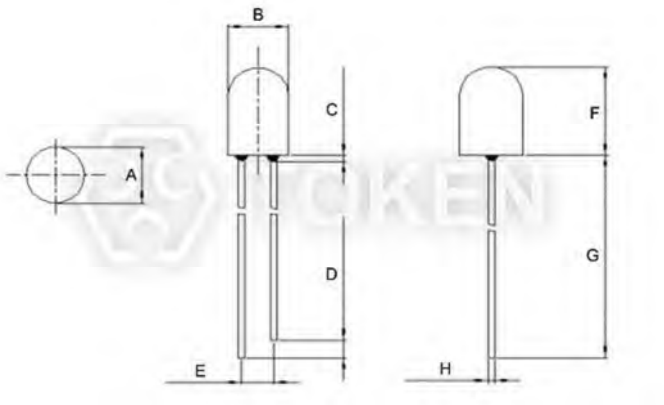
Visible Light Sensor RoHS Compliant (PT-IC-AC-PE-550) Dimensions

Visible Light Sensor RoHS Compliant (PT-IC-AC-PE-550)

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

Dimensions & Configurations (Unit: mm) (PT-IC-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-IC-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



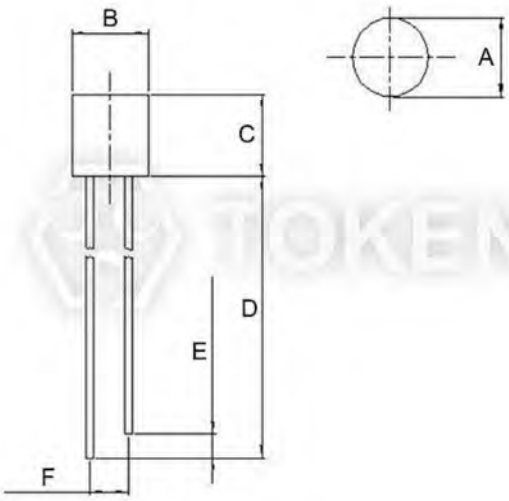
Visible Light Sensor RoHS Compliant (PT-IC-AC-5-BN-520) Dimensions

Visible Light Sensor RoHS Compliant (PT-IC-AC-5-PN-580)

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

Dimensions & Configurations (Unit: mm) (PT-IC-AC-5-PN-580) Plate None

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
PT-IC-AC-5-PN-580	5.00 ± 0.20	5.00 ± 0.20	5.30 ± 0.20	14.0 Min.	2.00 ± 0.50	2.54 ± 0.20



Visible Light Sensor RoHS Compliant (PT-IC-AC-5-PN-580) Dimensions

Visible Light Sensor RoHS Compliant (PT-IC-AC-5-PN-580)

Remark:

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

PE Electro-Optical

Electro-Optical Characteristics (Ta=25˚C) (PT-IC-AC-3-PE-550) Plate Edge

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	550	-	nm
Spectral Response Range	λ	\	400	-	-	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	7	13	18	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	21	39	54	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	70	130	180	μA
Collector Dark Current	I_d	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Electro-Optical Characteristics (Ta=25˚C) (PT-IC-AC-5-PE-550) Plate Edge

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	550	-	nm
Spectral Response Range	λ	\	400	-	-	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	7	13	18	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	20	39	54	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	70	130	180	μA
Collector Dark Current	I_d	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Absolute maximum ratings (Ta=25˚C) (PT-IC-AC-3-PE-550) & (PT-IC-AC-5-PE-550) Plate Edge

Parameter	Symbol	Value		Unit
Operating Voltage	V_{cc}	Min.	Max.	V
		1	10	V
Power Dissipation	P_c	70		m^W
Operating Temperature Range	T_{opr}	-25 ~ +85		°C
Storage Temperature	T_{stg}	-40 ~ +100		°C

BN Electro-Optical

Electro-Optical Characteristics (Ta=25˚C) (PT-IC-AC-5-BN-520) Bullet None

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	520	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10L_{ux}	4	8	12	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30L_{ux}	12	24	36	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100L_{ux}	40	80	120	μA
Collector Dark Current	I_d	V_{cc}=5V/85°C E_v=0L_{ux}	-	-	0.8	μA
IR Receiving Current	$I_{L(4)}$	V_{ce}=5V/850nm IR LED E_e=1m^W/cm^2	-	-	0.05	μA
Rise Time	t_r	V_{cc}=5V RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Absolute maximum ratings (Ta=25˚C) (PT-IC-AC-5-BN-520) Bullet None

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CEO}	60	V
Emitter-Base Breakdown 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

PN Electro-Optical

Electro-Optical Characteristics (Ta=25˚C) (PT-IC-AC-5-PN-580) Plate None

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	580	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10L_{ux}	1.5	3.5	5.5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30L_{ux}	4.5	10.5	16.5	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100L_{ux}	15	35	55	μA
Collector Dark Current	I_D	V_{cc}=5V/85°C E_v=0L_{ux}	-	-	0.8	μA
IR Receiving Current	$I_{L(4)}$	V_{cc}=5V/850nm ir LED E_e=1m^W/cm^2	-	-	0.05	μA
Rise Time	t_r	V_{cc}=5V RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Absolute maximum ratings (Ta=25˚C) (PT-IC-AC-5-PN-580) Plate None

Parameter	Symbol	Value		Unit
Operating Voltage	V_{cc}	Min.	Max.	V
		1	10	V
Operating Temperature Range	T_{opr}	-25 ~ +85		°C
Storage Temperature	T_{stg}	-40 ~ +100		°C
Soldering Temperature	T_{sol}	260		°C

3-PE Curve

Relative Spectral Sensitivity vs. Wavelength (PT-IC-AC-3-PE-550)

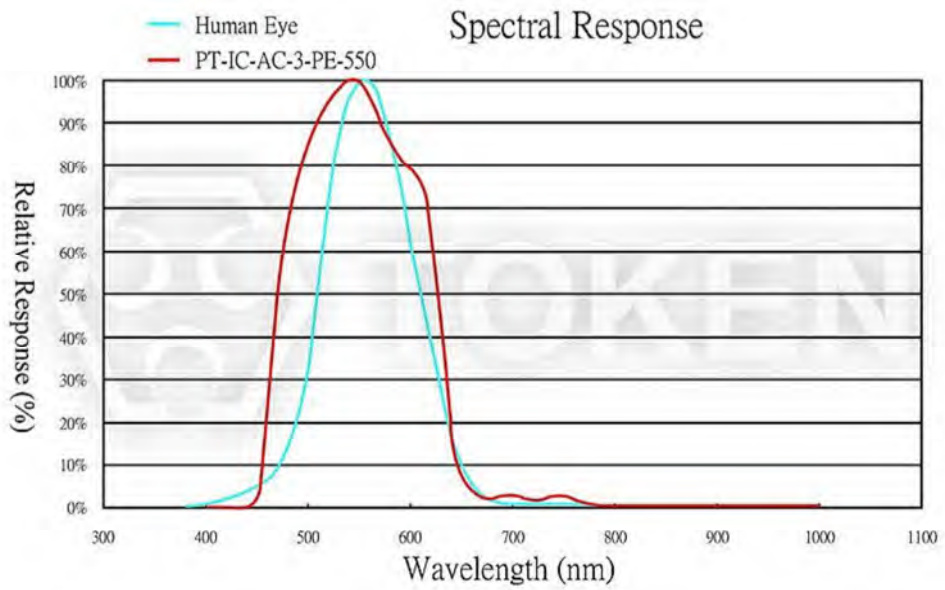
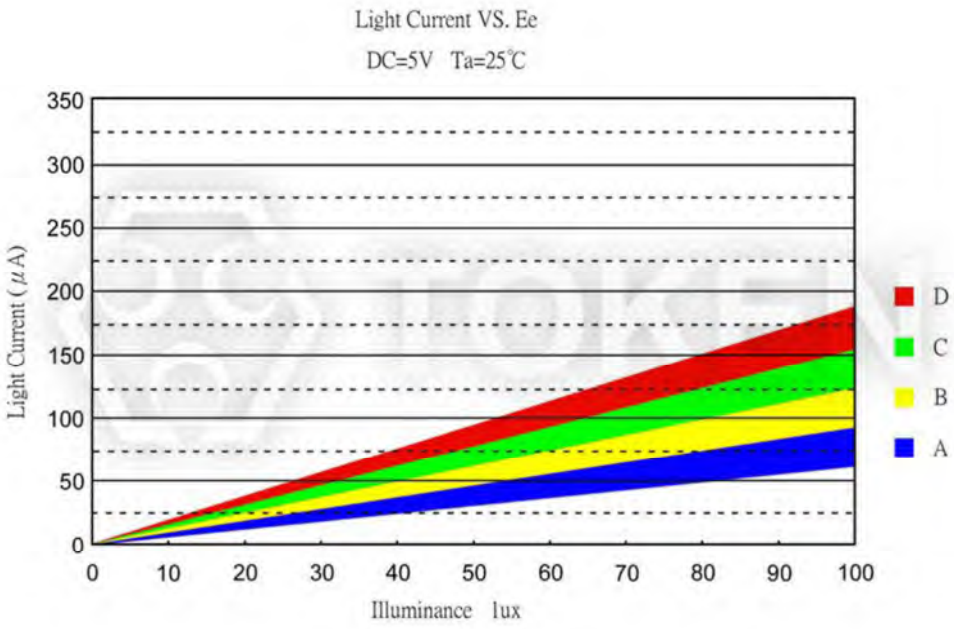
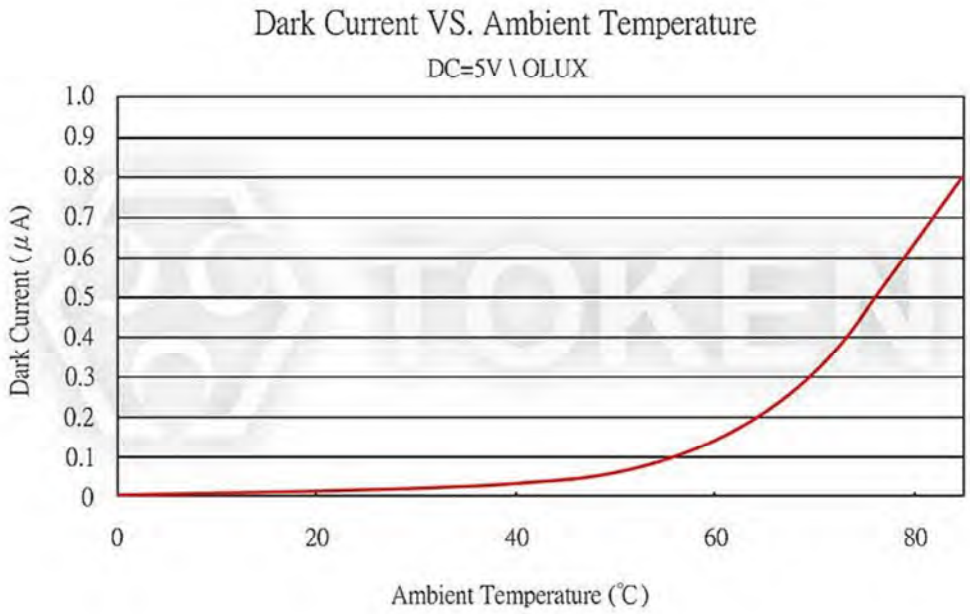


Photo Current vs. Illuminance (PT-IC-AC-3-PE-550)



Dark Current vs. Ambient Temperature (PT-IC-AC-3-PE-550)



5-PE Curve

Relative Spectral Sensitivity vs. Wavelength (PT-IC-AC-5-PE-550)

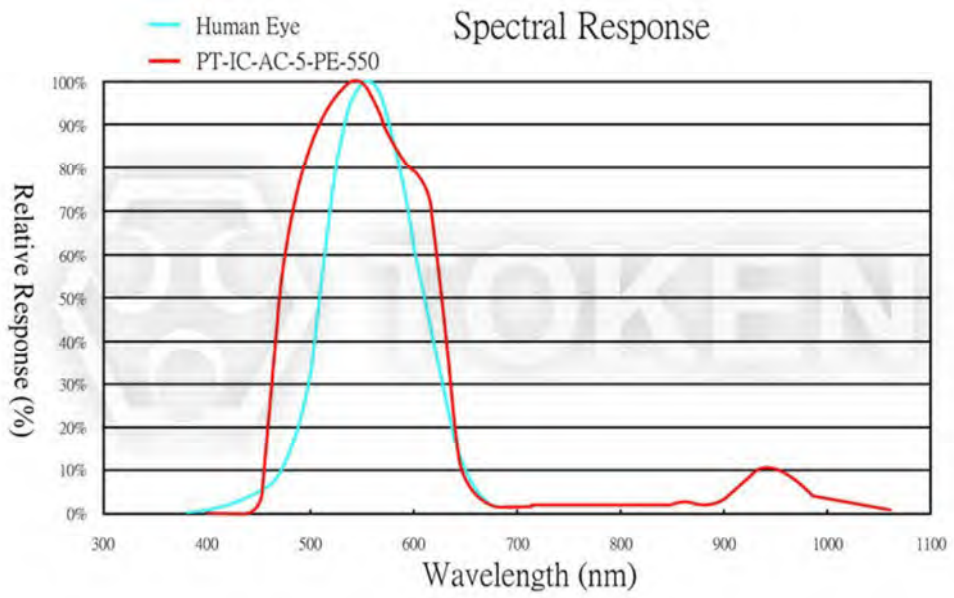
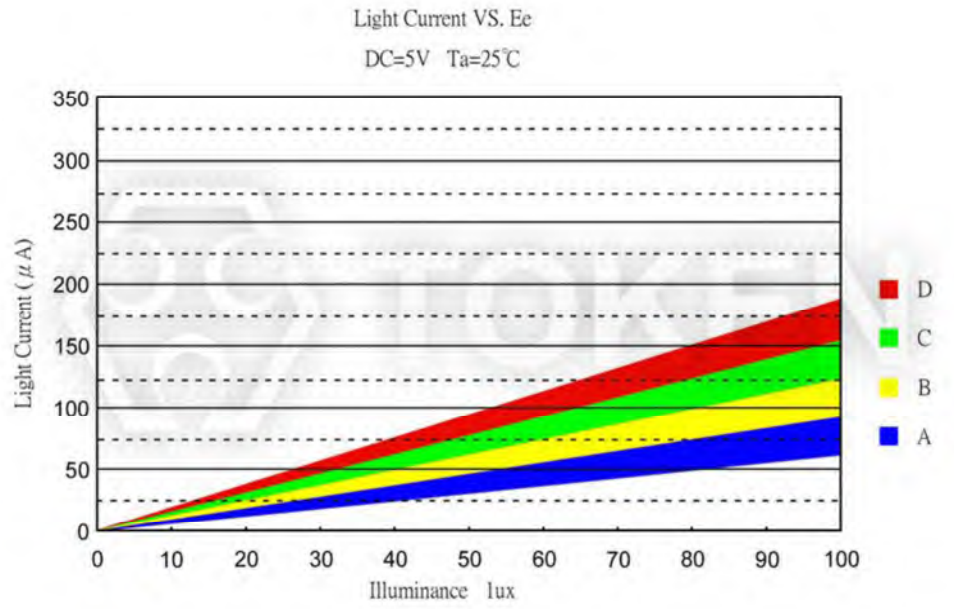
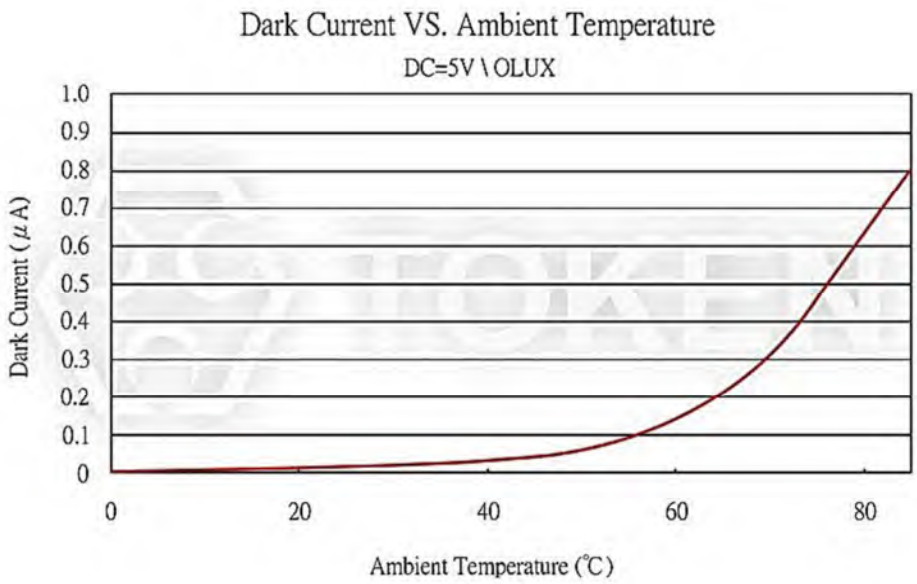


Photo Current vs. Illuminance (PT-IC-AC-5-PE-550)



Dark Current vs. Ambient Temperature (PT-IC-AC-5-PE-550)



BN Curve

Relative Spectral Sensitivity vs. Wavelength (PT-IC-AC-5-BN-520)

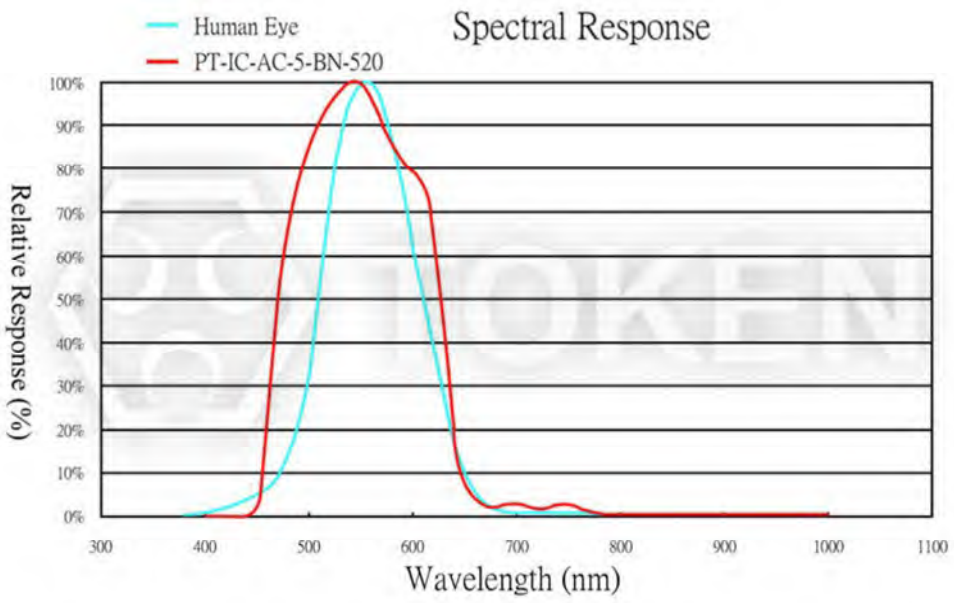
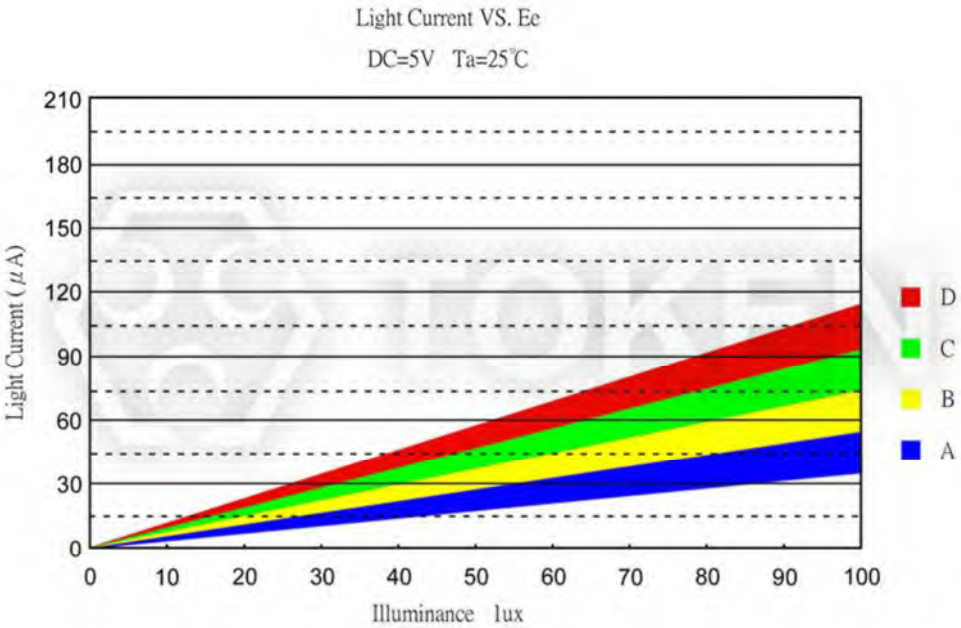
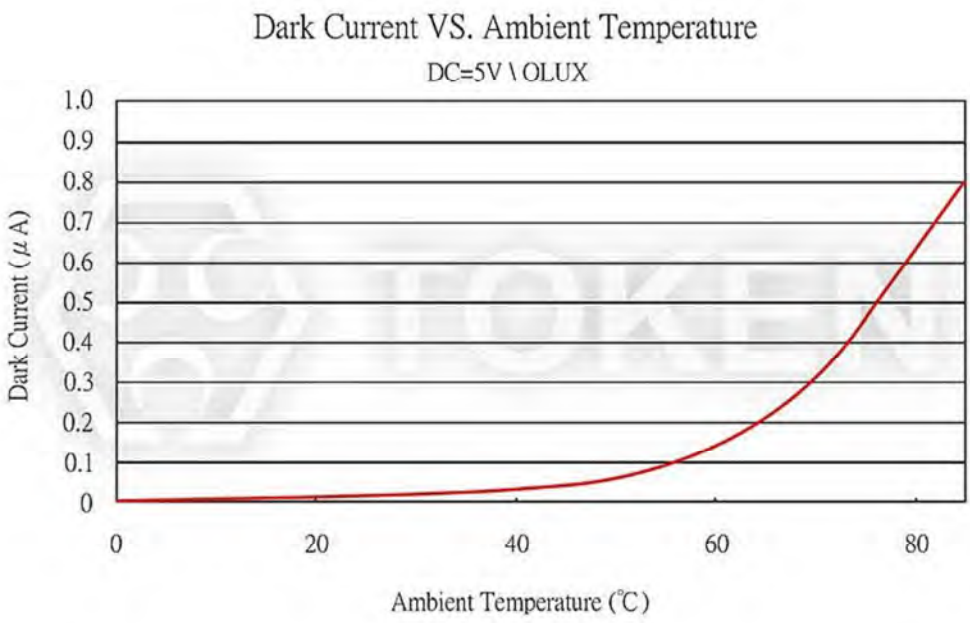


Photo Current vs. Illuminance (PT-IC-AC-5-BN-520)



Dark Current vs. Ambient Temperature (PT-IC-AC-5-BN-520)



PN Curve

Relative Spectral Sensitivity vs. Wavelength (PT-IC-AC-5-PN-580)

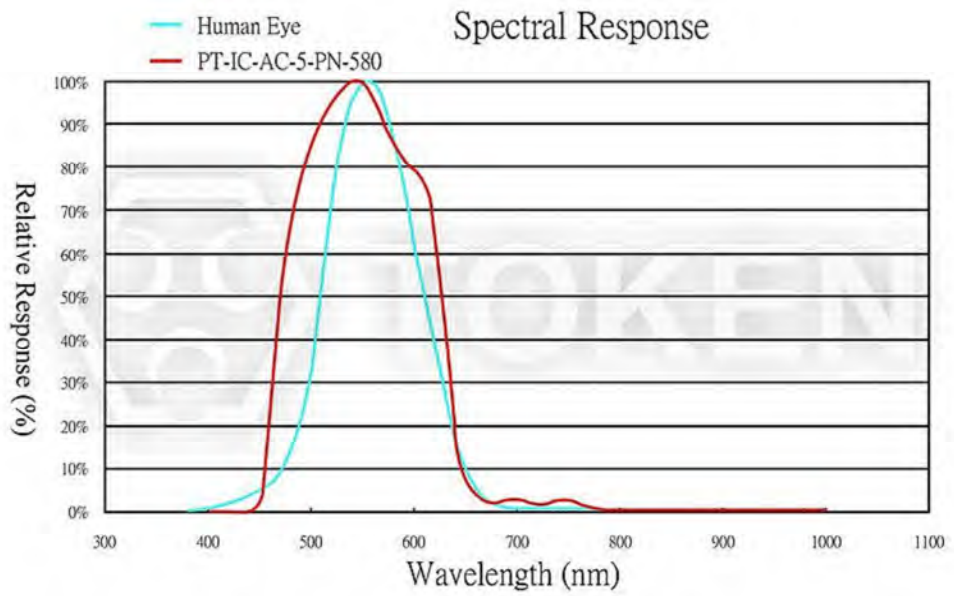
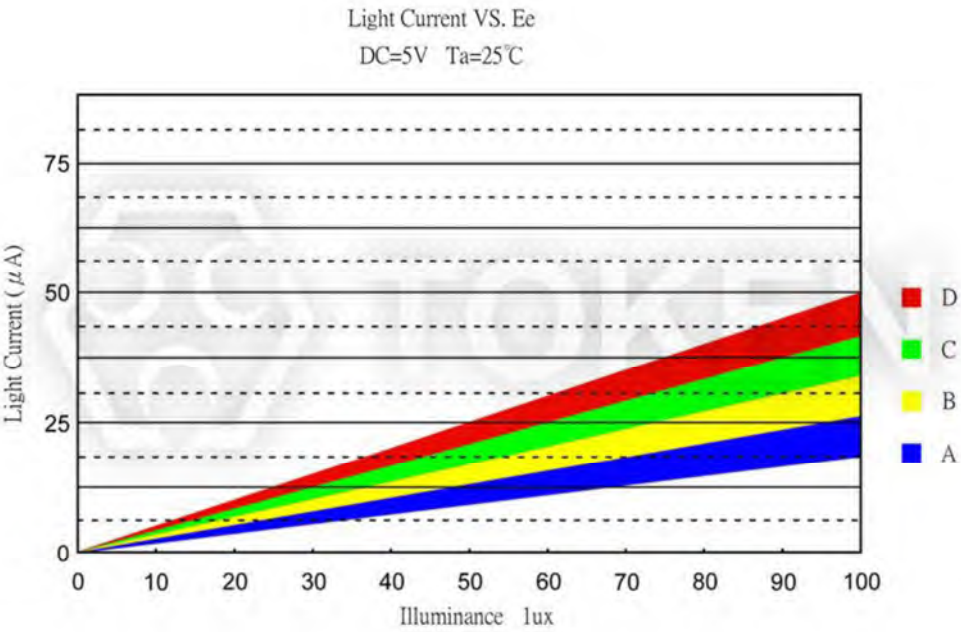
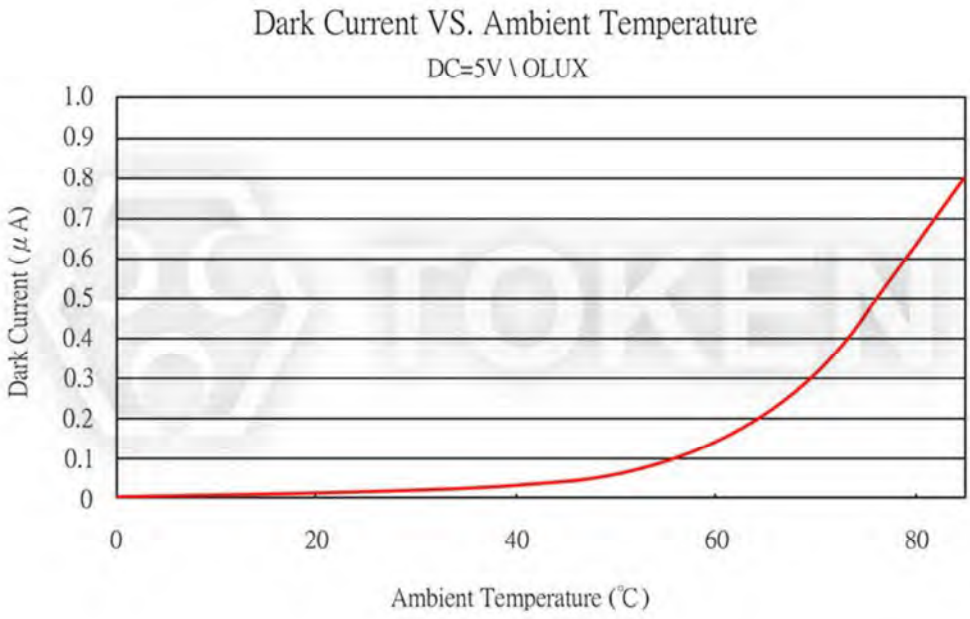


Photo Current vs. Illuminance (PT-IC-AC-5-PN-580)



Dark Current vs. Ambient Temperature (PT-IC-AC-5-PN-580)



Note

Visible Light Detector (PT-IC-AC) 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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

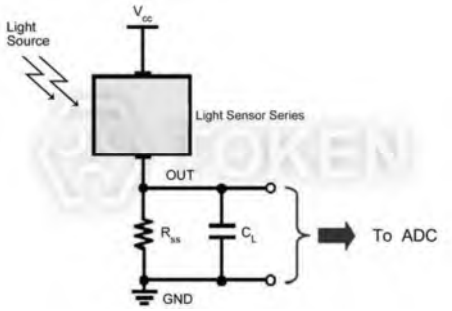


Photo Current Measurement Method - (PT-IC-AC)

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 °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 freezingand 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.

Order Codes

Order Codes (PT-IC-AC)

PT	-	IC	-	AC	-	3	-	PE	-	550

Part Number
PT

Chip Type
IC

Lens Color	
AC	Water Clear

Size	
3	3 mm
5	5 mm

Shape	
PE	Plate Edge
BN	Bullet None
PN	Plate None

Spectral Bandwidth	
520	520 nm
550	550 nm
580	580 nm

(PT-IC-BC) IR Visible Light Sensor

Product Introduction

DeMint IR visible light sensors precise light measurement across a wide spectrum of wavelengths.

Features :

- Simulate the human eye, peak wavelength 550nm.
- 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.
- DeMint offers various option of the bright current/dark current (bright resistance/dark resistance) to costume the most products.

The (PT-IC-BC) series is the only visible light sensor family available in the market links in a cost effective package with the IR characteristic designed in a plastic epoxy package. The spectral response is similar to the human eye and a photocell, making it ideal for applications where the response should only be influenced by the visible light.

As part of the IR family of visible light sensor, the (PT-IC-BC) is silicon phototransistors in a standard Plate Edge 3.00 mm end-looking package. They provide the time-proven DeMint silicon phototransistor chip that users have come to count on through the years, with the more IR function incorporated in the plastic epoxy package. As such they give an excellent response in the visible spectral range, giving a RoHS-compliant alternative to Cadmium Sulphide photocells.

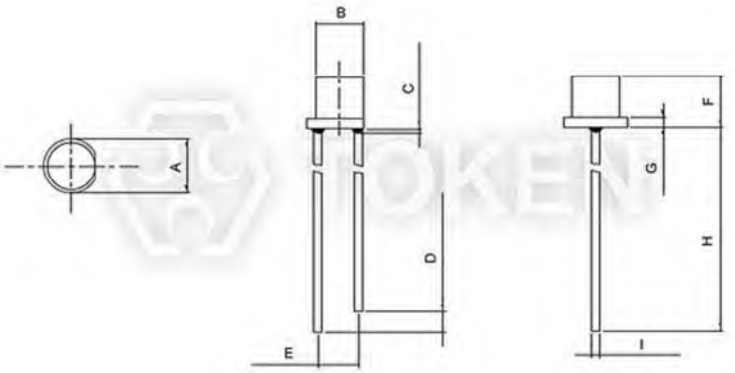
The (PT-IC-BC) Visible Light Detector family using high quality chip packaging and processing super-plated infrared filter membrane on chip surface, so this sensor can fully filter infrared interference. It is no need to add the casing and extra filter and effective filtering out the effect of light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

By selecting the accuracy of chips, under strict management of production process, (PT-IC-BC) 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. DeMint taking the advantage of temperature compensation internal process on the chip, (PT-IC-BC) features one times higher temperature resistance than other similar products while working on high temperature environment. Please contact our sales or link to DeMint official website "Visible Light Sensors" for more information.

Dimensions

Dimensions & Configurations (Unit: mm) (PT-IC-BC) Plate Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-IC-BC-3-PE-550	4.05 ± 0.20	3.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	3.85 ± 0.20	0.75 ± 0.20	25.4 Min.	0.50 ± 0.20
PT-IC-BC-5-PE-550	5.80 ± 0.20	5.00 ± 0.20	1.50 Max.	1.50 ± 0.50	2.54 ± 0.20	5.30 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.50



IR-blocking Visible Light Sensor (PT-IC-BC) Plate Edge Dimensions

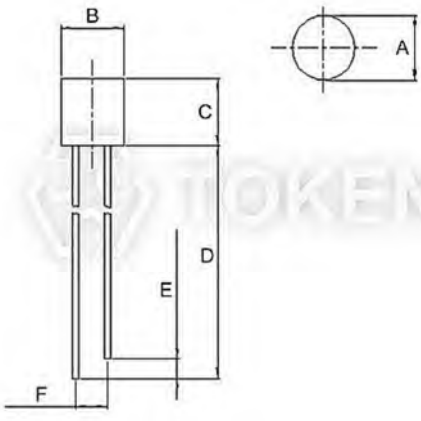
Plate Edge IR-blocking Visible Light Sensor (PT-IC-BC-5-PE-550)

Remark:

- **The epoxy resin highest: 1.5mm Max..**
- **Product images, plastic color of apperence, and all other information is for reference only, goods in-kind prevail.**
- **Short Lead—Positive Electrode Long Lead—Negative Electrode.**

Dimensions & Configurations (Unit: mm) (PT-IC-BC) Plate None

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
PT-IC-BC-5-PN-550	5.00 ± 0.20	5.00 ± 0.20	5.30 ± 0.20	25.4 Min.	1.50 ± 0.50	2.54 ± 0.20



IR-blocking Visible Light Sensor (PT-IC-BC) Plate None Dimensions

Plate None IR-blocking Visible Light Sensor (PT-IC-BC-5-PN-550)

Remark:

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

Electro-Optical Characteristics

Electro-Optical Characteristics (Ta=25˚C) (PT-IC-BC-3-PE-550)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	550	-	nm
Spectral Response Bandwidth	λ	\	400	-	-	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	1.5	3.0	5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	4.5	9.0	15	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	15	30	50	μA
Collector Dark Current	I_d	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
IR Receiving Current	$I_{L(4)}$	V_{cc}=5V/850nm ir LED E_e=1m^W/cm^2	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Electro-Optical Characteristics (Ta=25˚C) (PT-IC-BC-5-PE-550)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	550	-	nm
Spectral Response Bandwidth	λ	\	400	-	-	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	2.5	4.0	5.5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	7.5	12	16.5	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	25	40	55	μA
Collector Dark Current	I_D	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
IR Receiving Current	$I_{L(4)}$	Vcc=5V/850nm ir LED Ee=1m^W/cm^2	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Electro-Optical Characteristics (Ta=25˚C) (PT-IC-BC-5-PN-550)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	550	-	nm
Spectral Response Bandwidth	λ	\	400	-	-	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	2.5	4.0	5.5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	7.5	12	16.5	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	25	40	55	μA
Collector Dark Current	I_d	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
IR Receiving Current	$I_{L(4)}$	V_{cc}=5V/850nm ir LED E_e=1m^W/cm^2	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Absolute maximum ratings (Ta=25˚C) (PT-IC-BC)

Parameter	Symbol	Value		Unit
Operating Voltage	V_{cc}	Min.	Max.	V
		1	10	V
Power Dissipation	P_c	70		mW
Operating Temperature Range	T_{opr}	-25 ~ +85		°C
Storage Temperature	T_{stg}	-40 ~ +100		°C

Curve PTICBC3PE550

Relative Spectral Sensitivity vs. Wavelength (PT-IC-BC-3-PE-550)

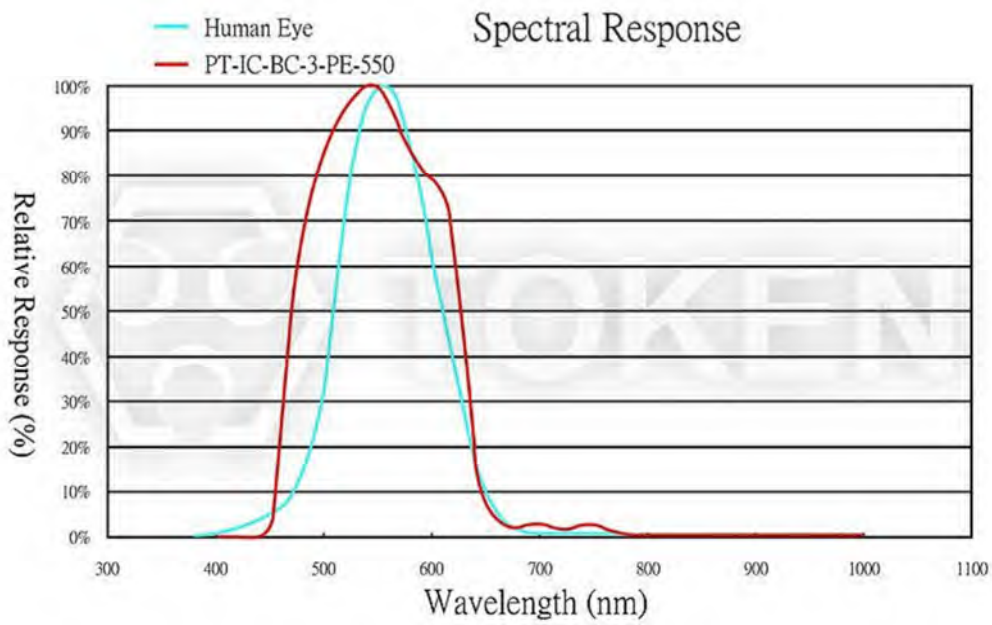
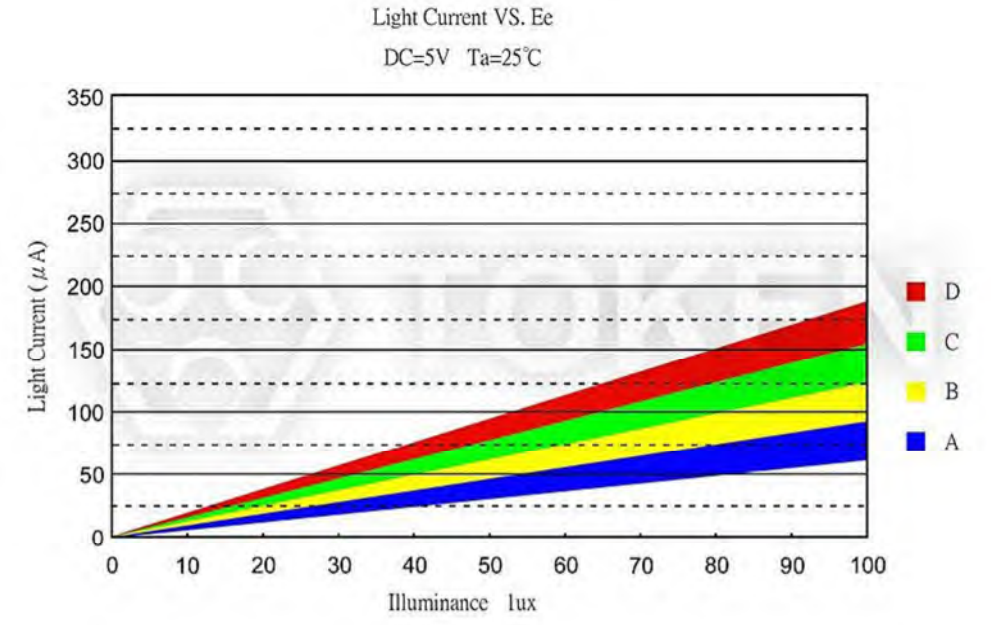
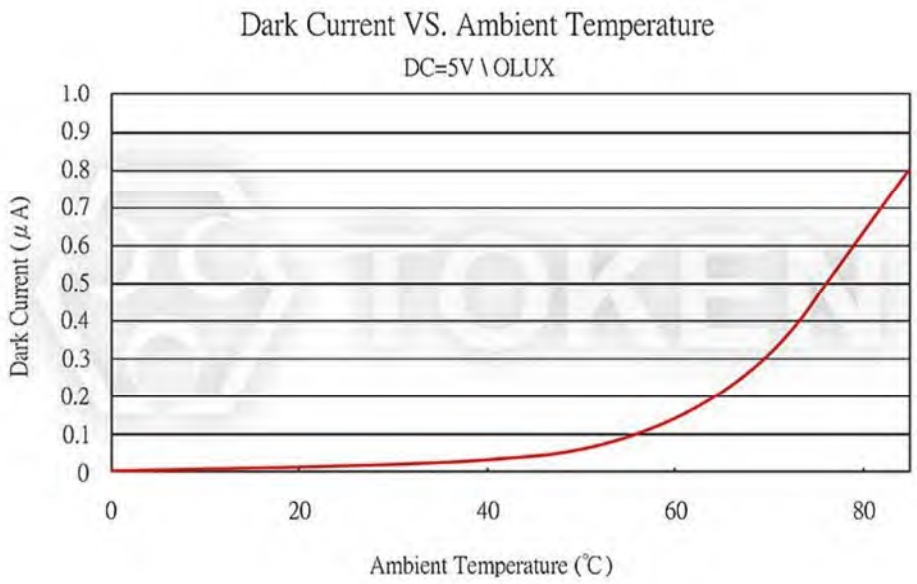


Photo Current vs. Illuminance (PT-IC-BC-3-PE-550)



Dark Current vs. Ambient Temperature (PT-IC-BC-3-PE-550)



Curve PTICBC5PE550

Relative Spectral Sensitivity vs. Wavelength (PT-IC-BC-5-PE-550)

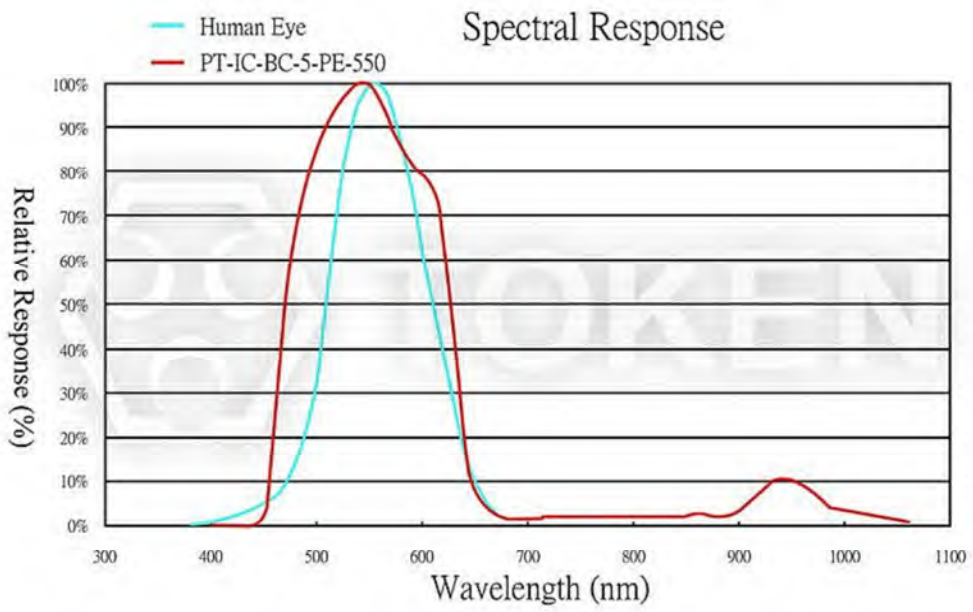
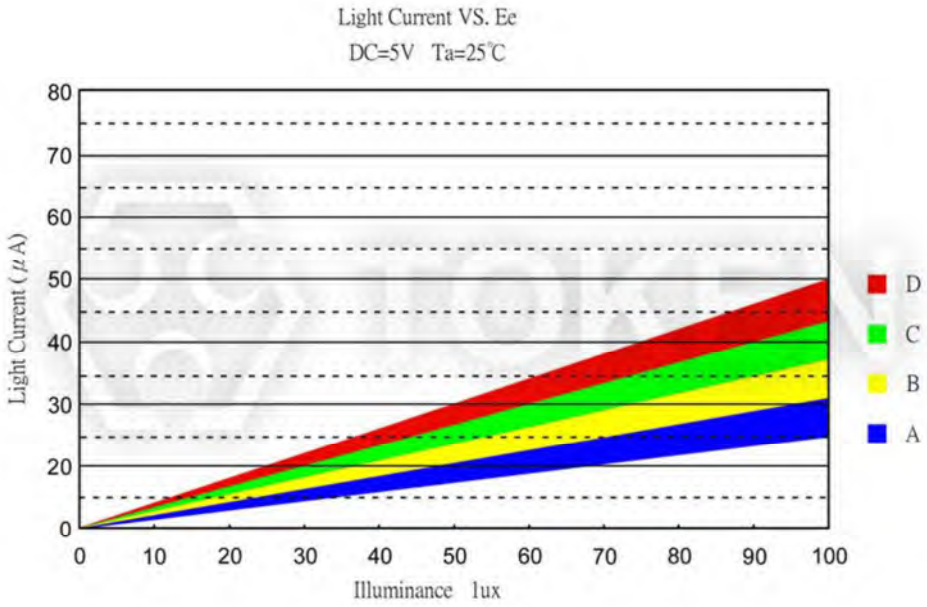
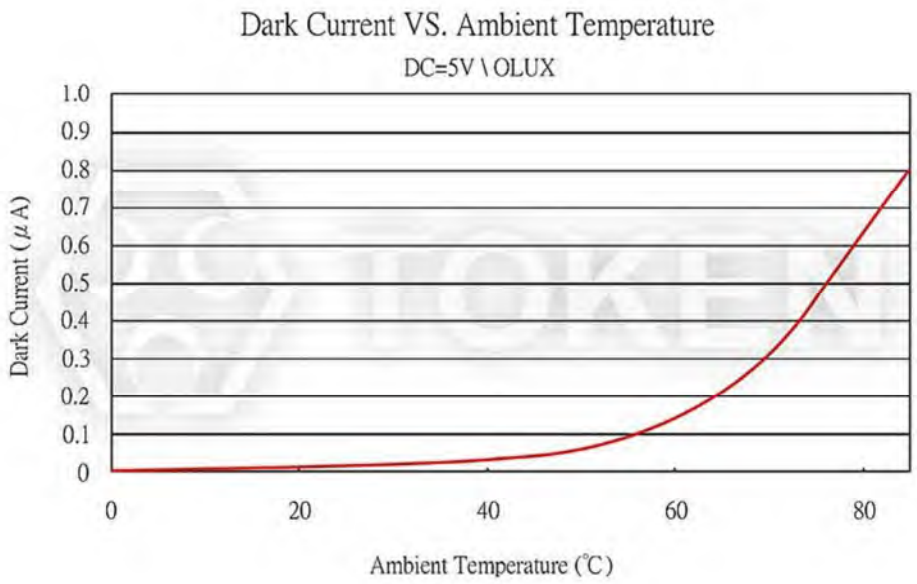


Photo Current vs. Illuminance (PT-IC-BC-5-PE-550)



Dark Current vs. Ambient Temperature (PT-IC-BC-5-PE-550)



Curve PTICBC5PN550

Relative Spectral Sensitivity vs. Wavelength (PT-IC-BC-5-PN-550)

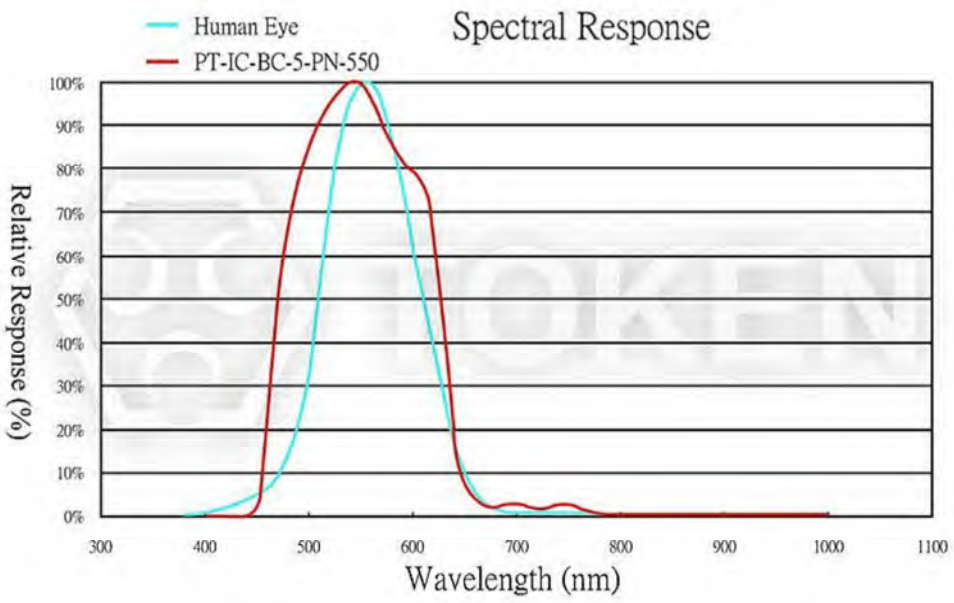
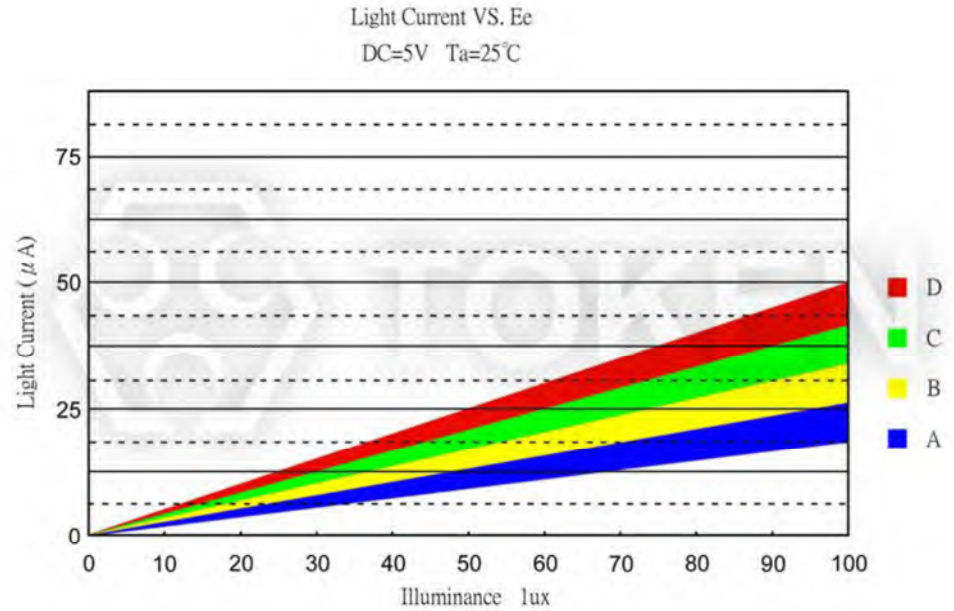
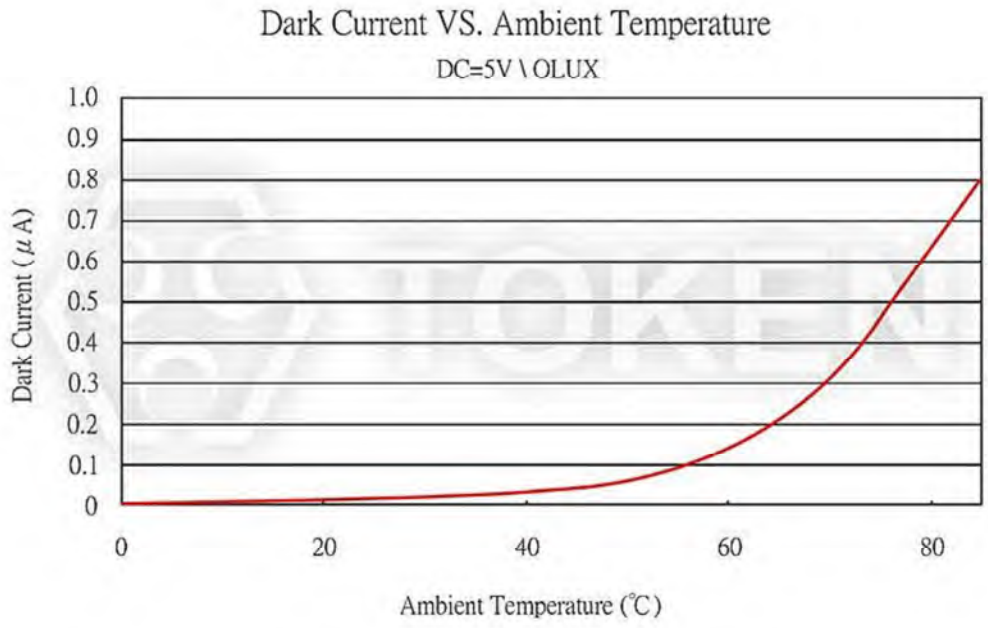


Photo Current vs. Illuminance (PT-IC-BC-5-PN-550)



Dark Current vs. Ambient Temperature (PT-IC-BC-5-PN-550)



Note

Visible Light Detector (3PE550BCIC) Precaution Usage :

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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

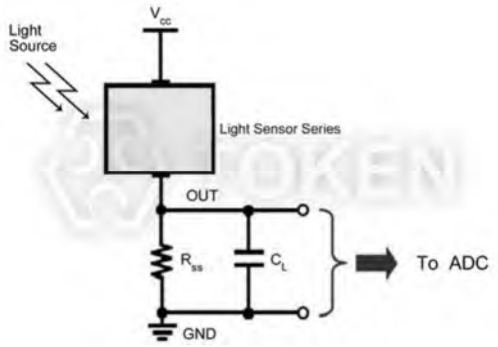


Photo Current Measurement Method - 3PE550BCIC

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 °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 freezingand 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.

Order Codes

Order Codes (PT-IC-BC)

PT	-	IC	-	BC	-	3	-	PE	-	550

Part Number	Chip Type	Lens Color		Size		Shape		Spectral Bandwidth	
PT	IC	BC	Dark Blue	3	3 mm	PE	Plate Edge	550	550 nm
				5	5 mm	PN	Plate None		

(PT-IC-GC) Visible Light Sensor of Security Infrared Filter

Product Introduction

Infrared filtration film for advanced plating technology on DeMint Visible Security Light Sensor.

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.
- DeMint offers various option of the bright current/dark current (bright resistance/dark resistance) to costume the most products.

Visible light sensors are used to detect light or illumination using a manner similar to the human eye. They are typically used in industrial lighting, consumer electronics, and vehicle systems, where they allow settings to be adjusted automatically in response to changing ambient light conditions. By turning on, turning off, or adjusting features, visible light sensors can conserve battery power or provide extra safety while eliminating the need for manual adjustments.

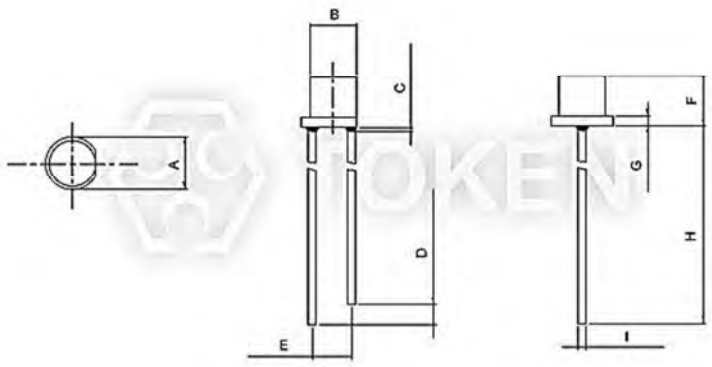
The (PT-IC-GC) family using high quality chip packaging and processing super-plated infrared filter membrane on chip surface, so this sensor can fully filter infrared interference. It is no need to add the casing and extra filter and effective filtering out the effect of light reflection due to infrared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

By selecting the accuracy of chips, under strict management of production process, (PT-IC-GC) 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. DeMint taking the advantage of temperature compensation internal process on the chip, (PT-IC-GC) features one times higher temperature resistance than other similar products while working on high temperature environment. Please contact our sales or link to DeMint official website "Visible Light Sensors" for more information.

Dimensions

Dimensions & Configurations (Unit: mm) PT-IC-GC Plate Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-IC-GC-3-PE-520	4.00 ± 0.20	3.00 ± 0.20	1.50 Max.	1.50 ± 0.50	2.54 ± 0.20	4.20 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.20
PT-IC-GC-5-PE-520	5.80 ± 0.20	5.00 ± 0.20	1.50 Max.	1.50 ± 0.50	2.54 ± 0.20	5.30 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.50



Visible Light Sensor (TPT-3-PE) Dimensions

Remark:

- **The epoxy resin highest: 1.5mm Max..**
- **Product images, plastic color of apperence, 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-IC-GC-3-PE-520

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	520	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	1.2	2.5	3.6	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	3.6	7.5	10.8	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	12	25	36	μA
Collector Dark Current	I_D	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
IR Receiving Current	$I_{L(4)}$	V_{cc}=5V/850nm IR LED E_e=1m^W/cm^2	-	-	0.2	μA
Rise Time	t_r	V_{cc}=5V RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Electro-Optical Characteristics (Ta=25˚C) PT-IC-GC-5-PE-520

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	520	-	nm
Spectral Response Bandwidth	λ	\	400	-	700	nm
Operating Voltage	V_{cc}	\	-	5	-	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	2	3.5	6	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	6	10.5	18	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	20	35	60	μA
Collector Dark Current	I_D	V_{cc}=5V/85°C E_v=0Lux	-	-	0.8	μA
IR Receiving Current	$I_{L(4)}$	V_{cc}=5V/850nm IR LED E_e=1m^W/cm^2	-	-	0.3	μA
Rise Time	t_r	V_{cc}=5V E_v=30Lux RL=1000Ω	4.5			ms
Fall Time	t_f		4.5			

Absolute maximum ratings (Ta=25˚C) PT-IC-GC

Parameter	Symbol	Value		Unit
Operating Voltage	V_{cc}	Min.	Max.	V
		1	10	V
Operating Temperature Range	T_{opr}	-25 ~ +85		°C
Storage Temperature	T_{stg}	-40 ~ +100		°C
Soldering Temperature	T_{sol}	260		°C

φ3 Curve Characteristics

Relative Spectral Sensitivity vs. Wavelength PT-IC-GC-3-PE-520

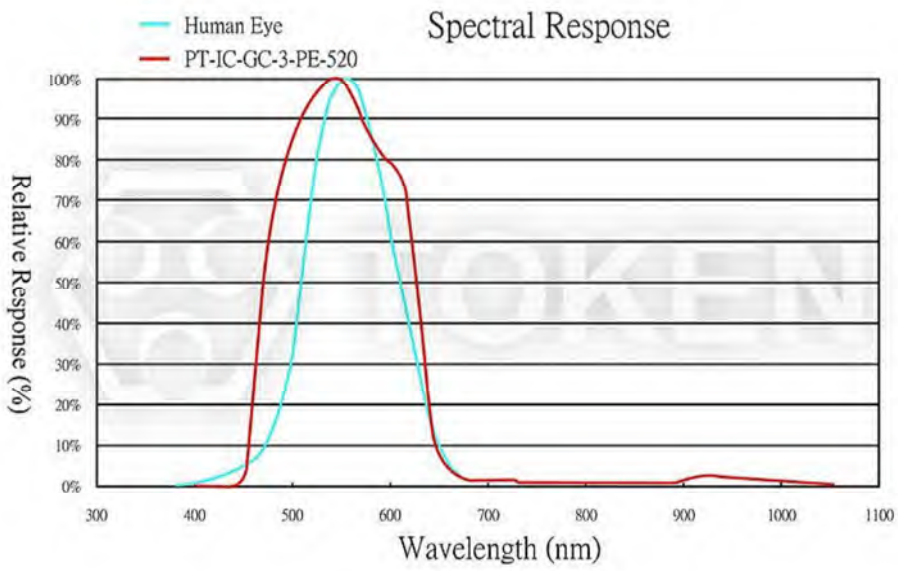
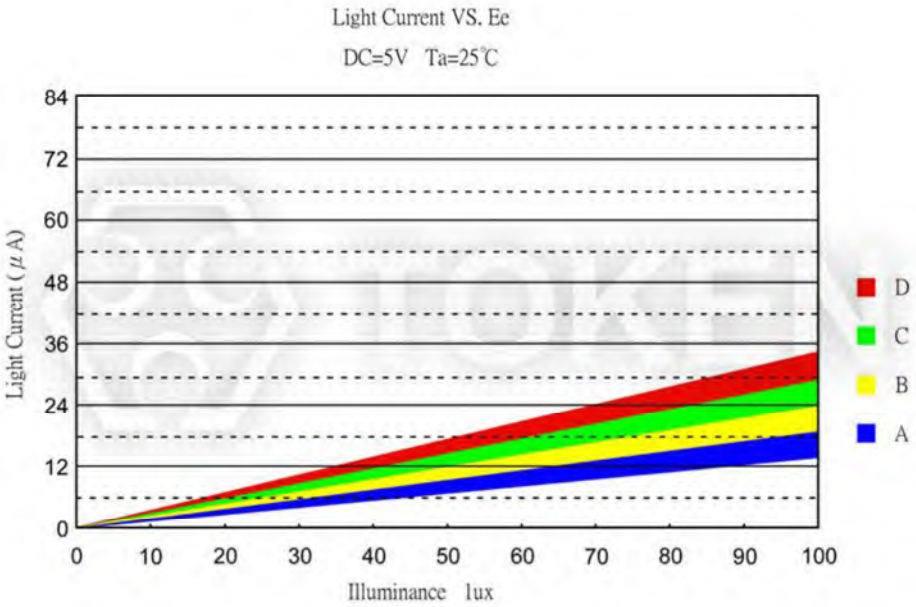
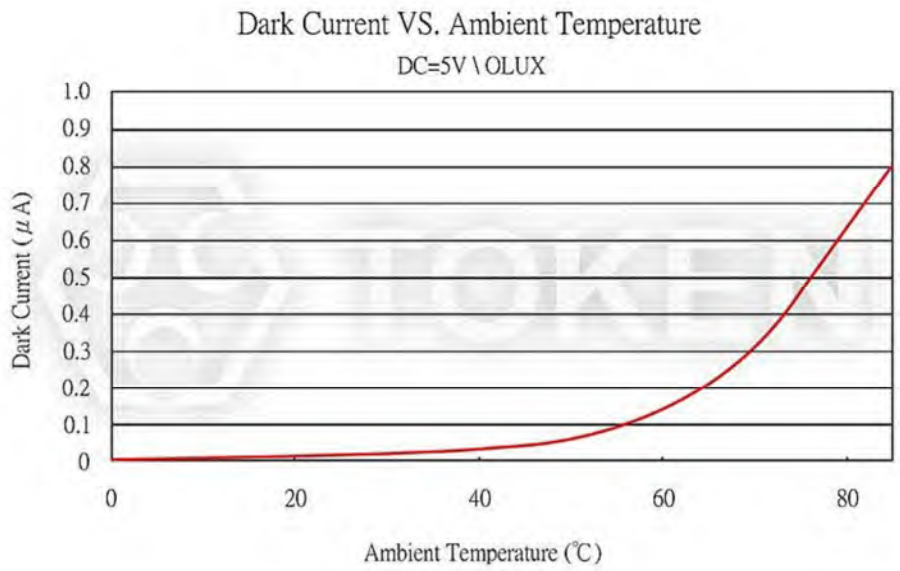


Photo Current vs. Illuminance PT-IC-GC-3-PE-520



Dark Current vs. Ambient Temperature PT-IC-GC-3-PE-520



φ5 Curve Characteristics

Relative Spectral Sensitivity vs. Wavelength PT-IC-GC-5-PE-520

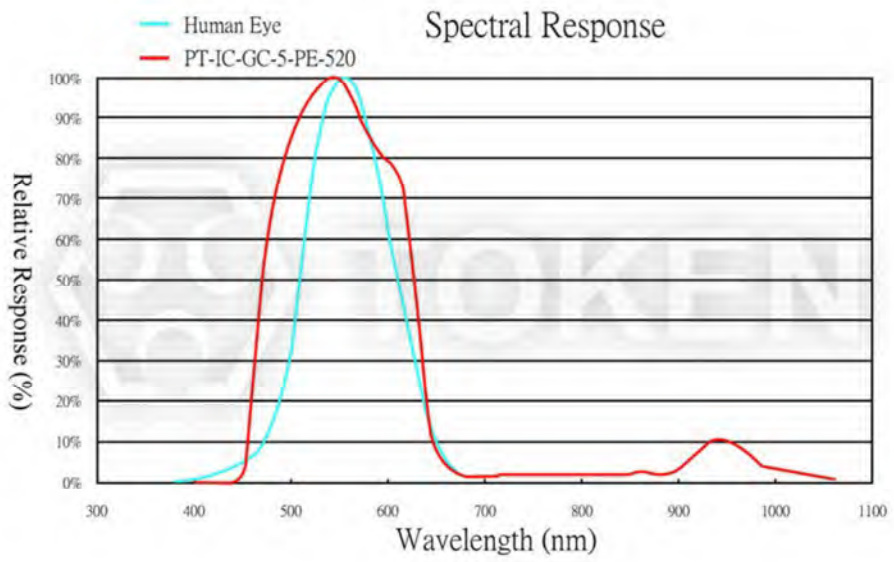
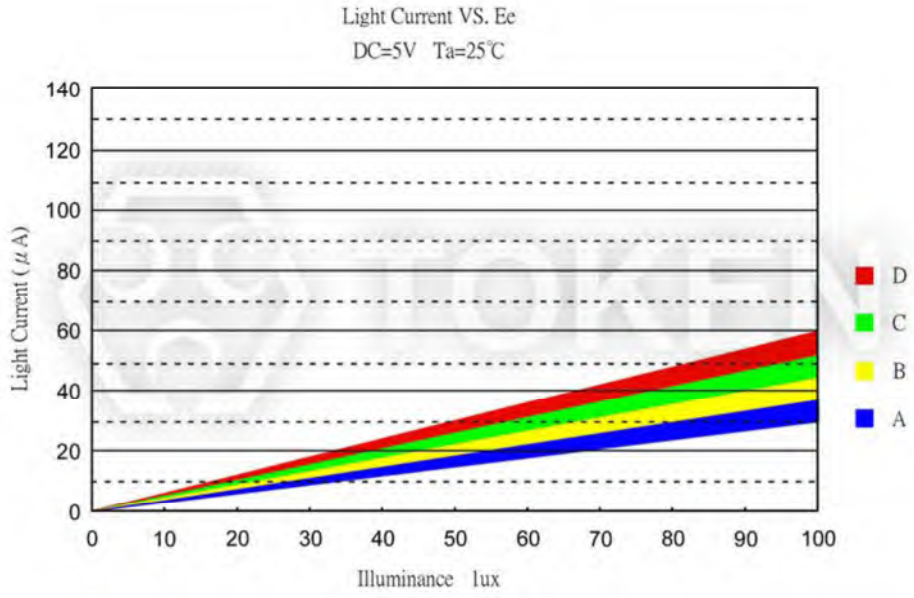
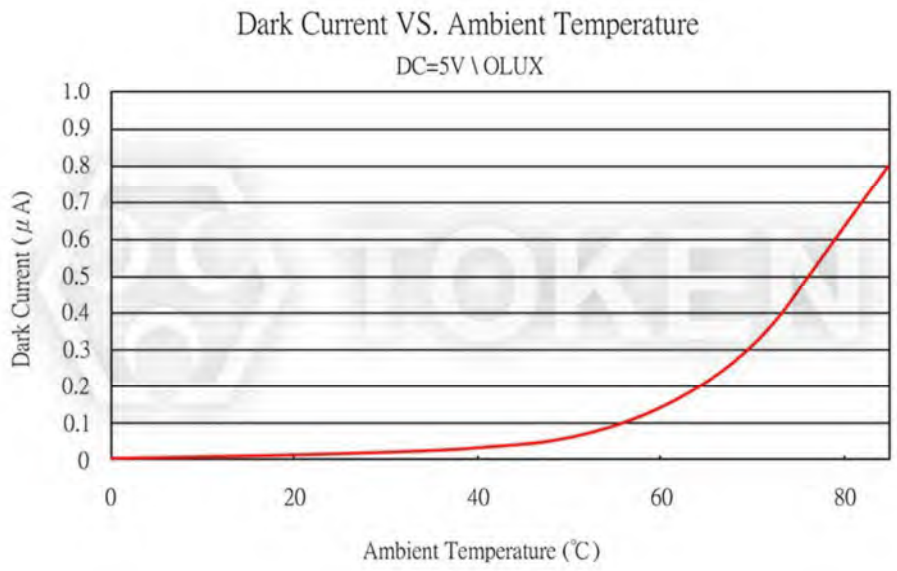


Photo Current vs. Illuminance PT-IC-GC-5-PE-520



Dark Current vs. Ambient Temperature PT-IC-GC-5-PE-520



Note

Visible Light Sensor (PT-IC-GC) 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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

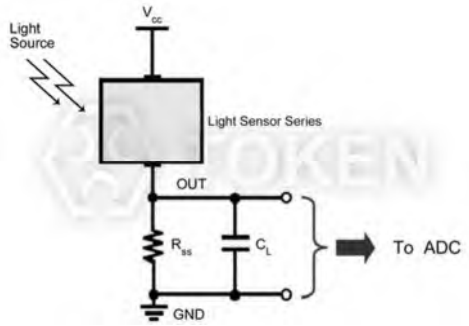


Photo Current Measurement Method - 3PE520GCIC

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 °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 freezingand 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.

Order Codes

Order Codes (PT-IC-GC)

PT	-	IC	-	GC	-	3	-	PE	-	520

Part Number	Chip Type	Lens Color		Size	Shape	Spectral Bandwidth	
PT	IC	GC	Dark Green	3 mm	Plate Edge	520	520 nm
				5 mm			

(Bullet Shape 940) Infrared Ambient Light Sensors

Product Introduction

With RoHS compliant, DeMint IR phototransistors are available in a wide range of packages.

Features :

- Good batch consistency, small static current.
- Fast response speed, stable performance, beautiful appearance.
- The effective control distance is greater than 1.5 meters.
- Low current loss in the static.

Applications :

- Replace the traditional CDS photoresistor.
- Cadmium and lead free with RoHS compliant.
- Applicable to control all kinds of light control toys and Infrared testing equipment.

A phototransistor is known as a device in which turns light source energy into electric energy. Phototransistors are very close to photoresistors but produce both current and voltage, while photoresistors simply produce current. The reason is a phototransistor includes a bipolar semiconductor and targets the energy this can be transmitted via it.

Phototransistors are light-sensitive transistors. A common type of phototransistor resembles a bipolar transistor with its base lead removed and replaced with a light-sensitive area. This is why a phototransistor has only 2 terminals instead of the usual 3. However, when the light-sensitive region is exposed to light, a small base current is generated that controls a much larger collector-to-emitter current.

DeMint (Bullet Shape 940) with environmentally friendly photosensitive sensor, control sensitivity under low illumination, stable current signal output under strong light source. Multiple light at the same time can be used to ensure consistent photosensitive effect, not false trigger. Meet the latest environmental requirements of toys. Applicable to all kinds of light control lighting products (such as night lights, lawn lamps, solar lights, etc.), automatically adjust the background light (such as LCD, mobile phones, cameras, computer cameras, security monitoring machines, etc.).

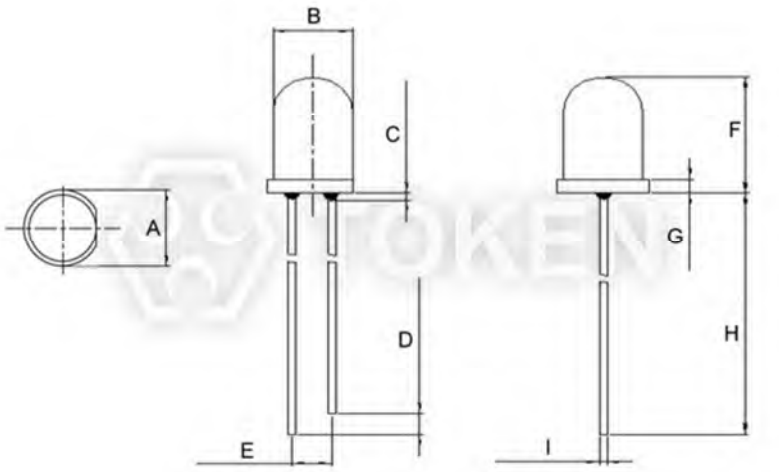
The (Bullet Shape 940) ambient light sensors, commonly used in infrared reception, Ultra-thin multi-point infrared touch screen, and all kinds of high-light or visible light interference strong products, such as various types of infrared light control, infrared on the radio, infrared reflection and other electronic products.

For the convenience of installation in all kinds of products in any position, different sizes are available upon request. So that product consistency is better, more market competitiveness. It is also achievable to provide the bright current / dark current (bright resistance / dark resistance) for the most suitable product. Please contact our sales or link to DeMint official website “Light Sensors” for more information.

Dimensions

Dimensions & Configurations (Unit: mm) (PT-A2-DC-3-BE-940) & (PT-A1-FC-5-BE-940) Bullet Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-A2-DC-3-BE-940	4.05 ± 0.20	3.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	5.30 ± 0.20	1.00 ± 0.20	14.0 Min.	0.50 ± 0.20
PT-A1-FC-5-BE-940	5.80 ± 0.20	5.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	8.70 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.20



IR Phototransistor Bullet Edge Dimensions

IR Phototransistor
PT-A1-FC-5-BE-940

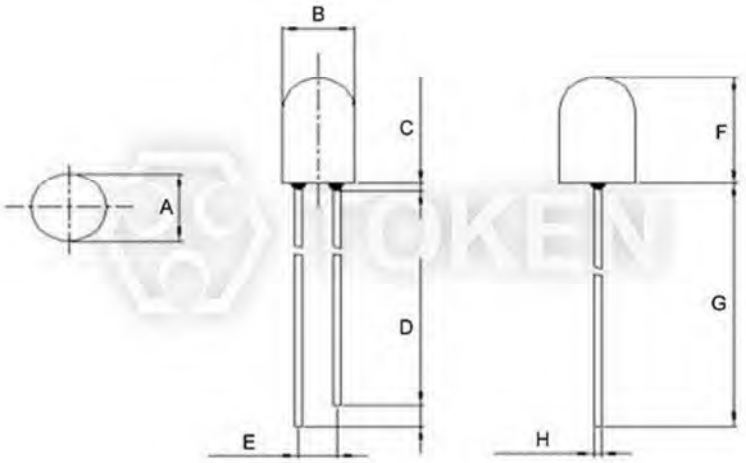
IR Phototransistor
PT-A2-DC-3-BE-940

Remark:

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

Dimensions & Configurations (Unit: mm) (PT-A1-DC-5-BN-940) Bullet None

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
PT-A1-DC-5-BN-940	4.80 ± 0.20	4.80 ± 0.20	1.50 Max.	2.00 ± 0.5	2.54 ± 0.20	8.60 ± 0.20	14.00 Min.	0.50 ± 0.20



IR Ambient Light Sensor (PT-A1-DC-5-BN-940) Dimensions

IR Ambient Light Sensor
PT-A1-DC-5-BN-940

Remark:

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

Electro-Optical φ3-940

Electro-Optical Characteristics (Ta=25˚C) (PT-A2-DC-3-BE-940) Bullet Edge

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	940	-	nm
Spectral Response Bandwidth	λ	\	700	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	6	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Collector-Emitter Current	I_{ce}	V_{ce}=5V E_e=1m^W/cm^2	0.5	0.8	1.2	mA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Absolute maximum ratings (Ta=25˚C) (PT-A2-DC-3-BE-940) Bullet Edge

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	6	V
Power Dissipation	P_C	70	m^W
Operating Temperature Range	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C

Electro-Optical φ5-940

Electro-Optical Characteristics (Ta=25˚C) (PT-A1-FC-5-BE-940) Bullet Edge

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	940	-	nm
Spectral Response Bandwidth	λ	\	860	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Collector-Emitter Current	I_{ce}	V_{ce}=5V E_e=1m^W/cm^2	1.0	1.6	2.4	mA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Electro-Optical Characteristics (Ta=25˚C) (PT-A1-DC-5-BN-940) Bullet None

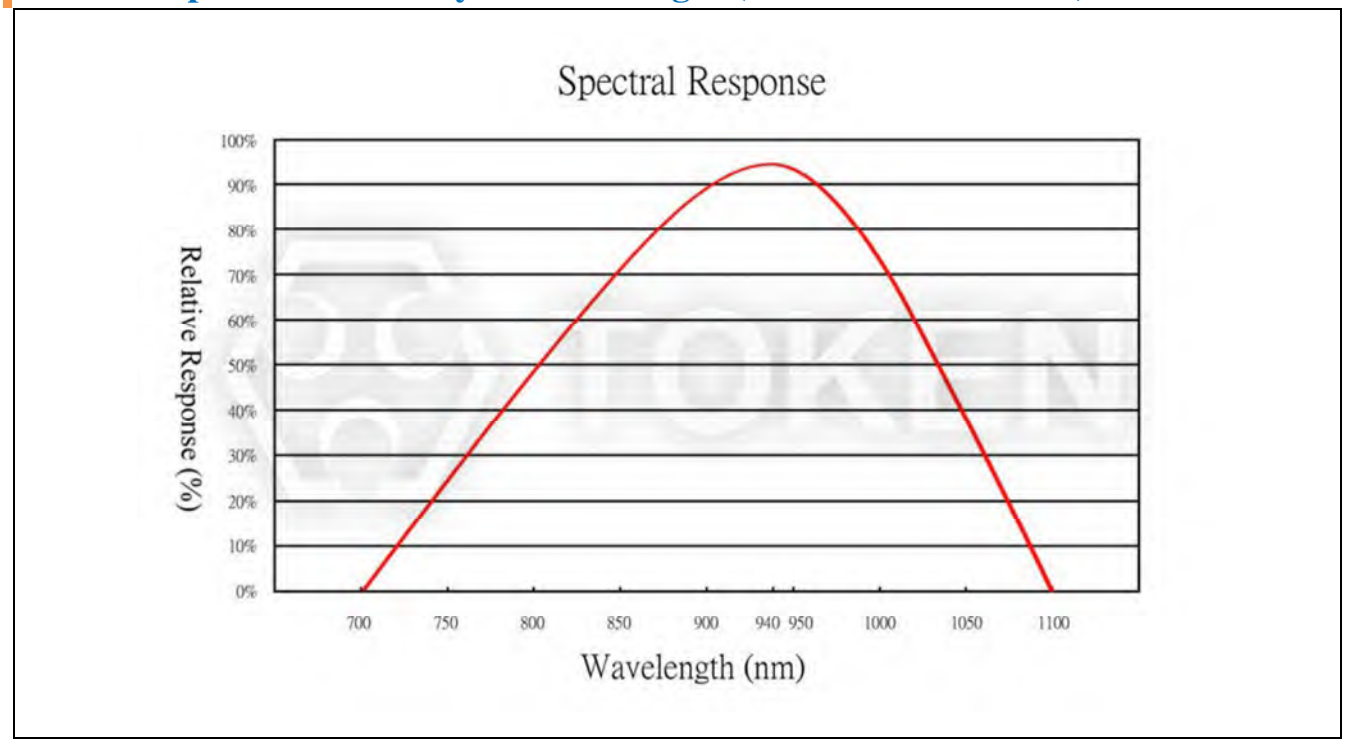
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	940	-	nm
Spectral Response Bandwidth	λ	\	700	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Collector-Emitter Current	I_{ce}	V_{ce}=5V E_e=1m^W/cm^2	1.0	1.6	2.4	mA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Absolute maximum ratings (Ta=25˚C) (φ 5-940)

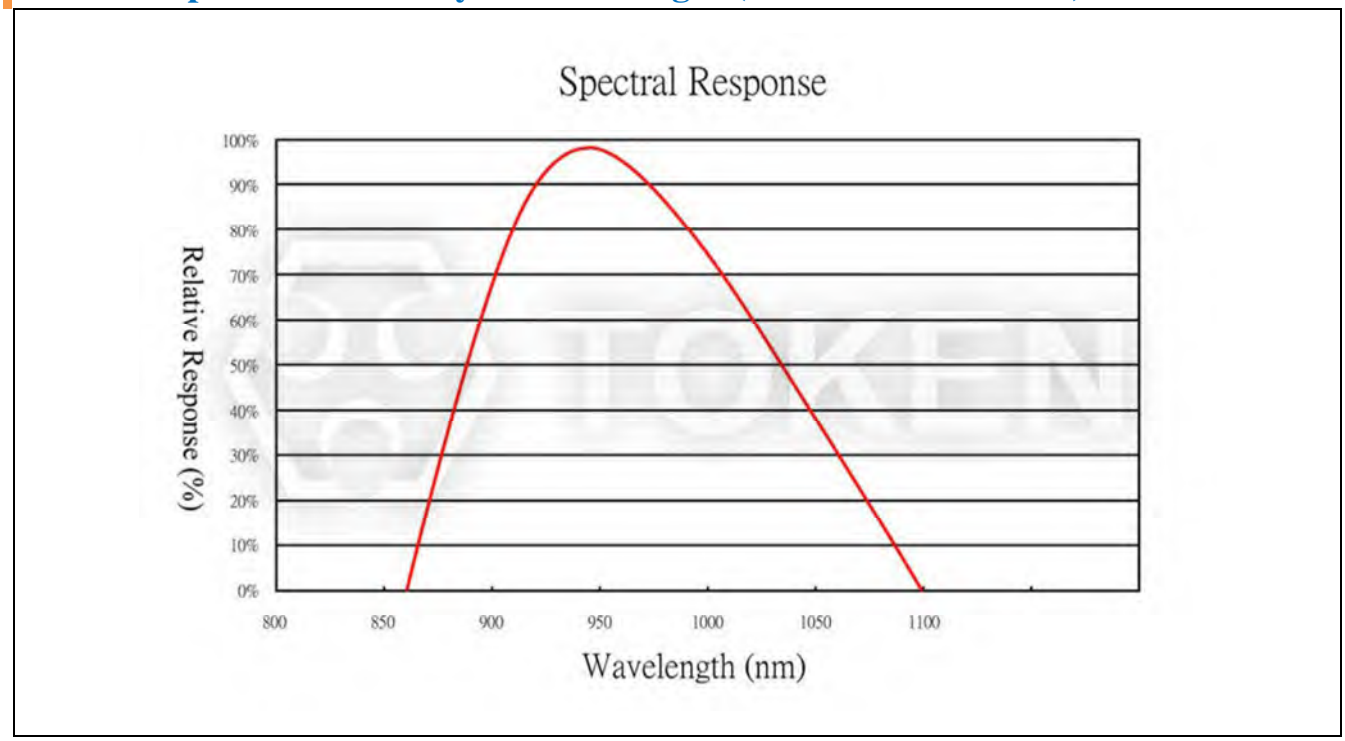
Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	3	V
Power Dissipation	P_C	70	m^W
Operating Temperature Range	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C

Curve

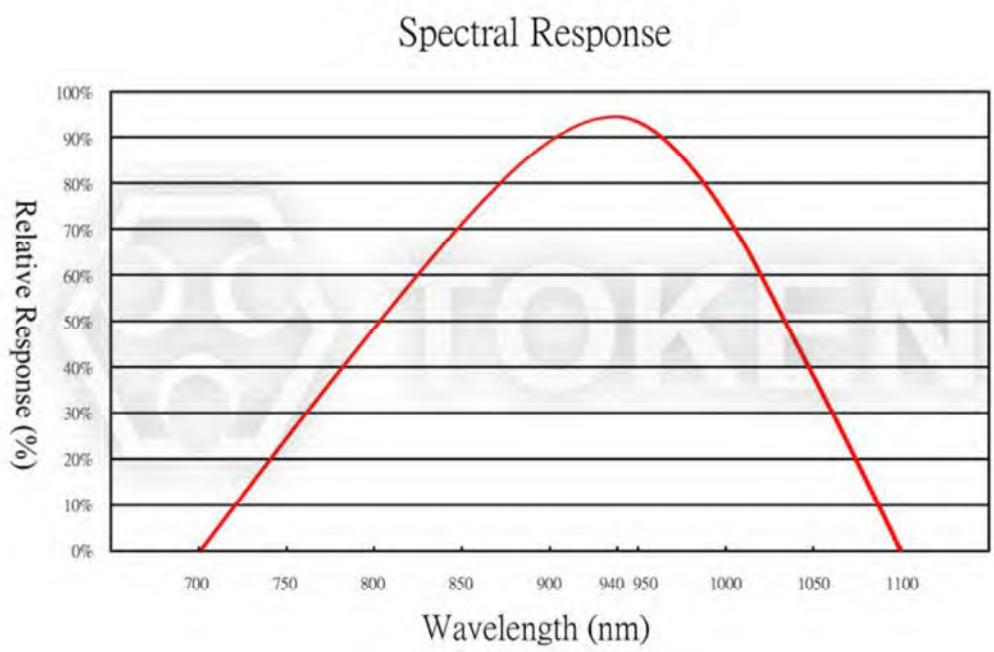
Relative Spectral Sensitivity vs. Wavelength (PT-A2-DC-3-BE-940)



Relative Spectral Sensitivity vs. Wavelength (PT-A1-FC-5-BE-940)



Relative Spectral Sensitivity vs. Wavelength (PT-A1-DC-5-BN-940)



Note

Infrared Phototransistor (Peak Wavelength 940) Precaution Usage

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.

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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

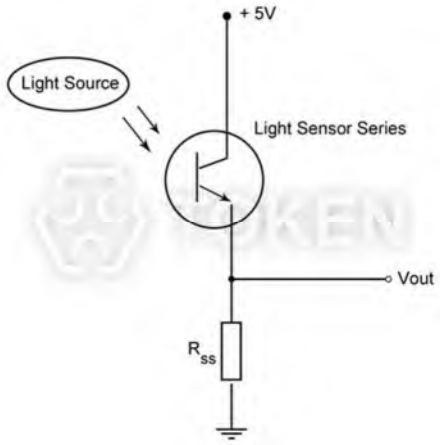


Photo Current Measurement Method (IR Peak Wavelength 940)

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 °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 freezingand 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.

Order Codes

Order Codes (PT-BE/BN-940)

PT	-	A2	-	AC	-	3	-	BE	-	940

Part Number
PT

Chip Type
A1
A2

Lens Color	
DC	Dark Transparent
FC	Dark Transparent Anti Visible Light Interference

Size	
3	3mm
5	5mm

Shape	
BE	Bullet Edge
BN	Bullet None

Spectral Bandwidth	
940	940 nm

(PT-IC-AC) Visible Light Sensor RoHS Compliant

Product Introduction

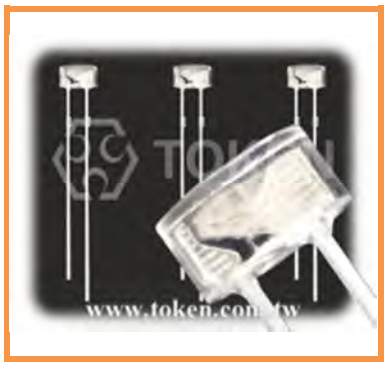
New fourth generation A4 chip for phototransistors provide fast response speed, stable performance, and excellent consistency.

Features :

- Good batch consistency, small static current.
- Fast response speed, stable performance, beautiful appearance.
- The effective control distance is greater than 1.5 meters.
- Low current loss in the static.

Applications :

- Replace the traditional CDS photoresistor.
- Cadmium and lead free with RoHS compliant.
- Applicable to control all kinds of light control toys and Infrared testing equipment.



DeMint's new fourth generation A4 chip gives characteristics of ambient light sensor (ALS) faster response speed, lower dark current, more consistency in good batch, and smaller static current. When an ambient light sensor is required for portable and many other applications, DeMint A4 chip has the right solution. Ambient Light Sensor A4 chips enhance performance in saving energy, automatic sensitivity to light, automatic sensitivity to light, LED-backlighted, LCD displays code product, instrument ,industry device etc.

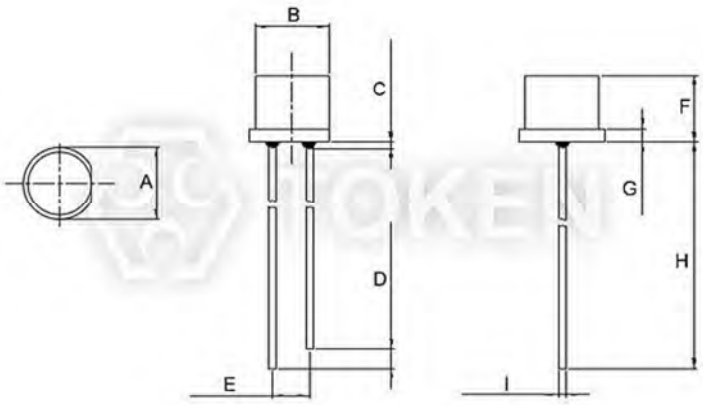
The A1 & A4 Chips enabling environmentally friendly photosensitive sensors feature sensitive control under low illumination, stable current signal output under strong light source. Multiple light sources at the same time can be used to ensure consistent photosensitive effect, not false trigger. Meet the latest environmental requirements of toys. Applicable to all kinds of light control lighting products (such as night lights, lawn lamps, solar lights, etc.), automatically adjust the background light (such as LCD, mobile phones, cameras, computer cameras, security monitoring machines, etc.).

For the convenience of installation in all kinds of products in any position, different sizes are available upon request. So that product consistency is better, more market competitiveness. It is also achievable to provide the bright current / dark current (bright resistance / dark resistance) for the most suitable product. Please contact our sales or link to DeMint official website "Light Sensors" for more information.

Dimensions

Dimensions & Configurations (Unit: mm) (PT-A1-AC-3-PE-850) Plate Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-A1-AC-3-PE-850	4.05 ± 0.20	3.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	3.85 ± 0.20	0.75 ± 0.20	25.4 Min.	0.50 ± 0.20



Ambient light sensor (PT-A1-AC-3-PE-850) Plate Edge Dimensions

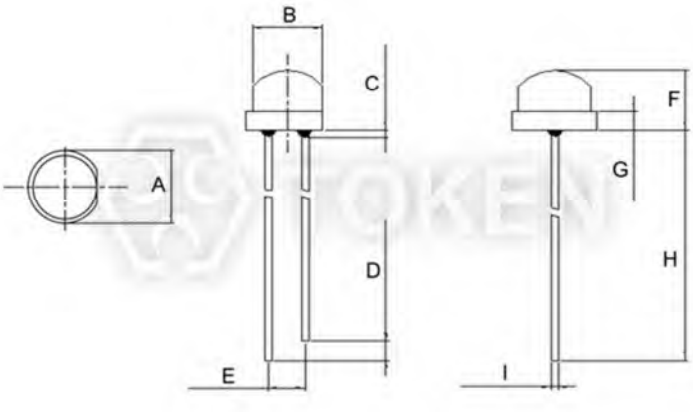
Plate Edge Ambient light sensor (PT-A1-AC-3-PE-850)

Remark:

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

Dimensions & Configurations (Unit: mm) (PT-A1-AC-5-HE-850) Helmet Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-A1-AC-5-HE-850	5.80 ± 0.20	4.80 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	5.00 ± 0.20	1.50 ± 0.20	25.4 Min.	0.50 ± 0.20



Ambient Light Sensor (PT-A1-AC-5-HE-850) Helmet Edge Dimensions

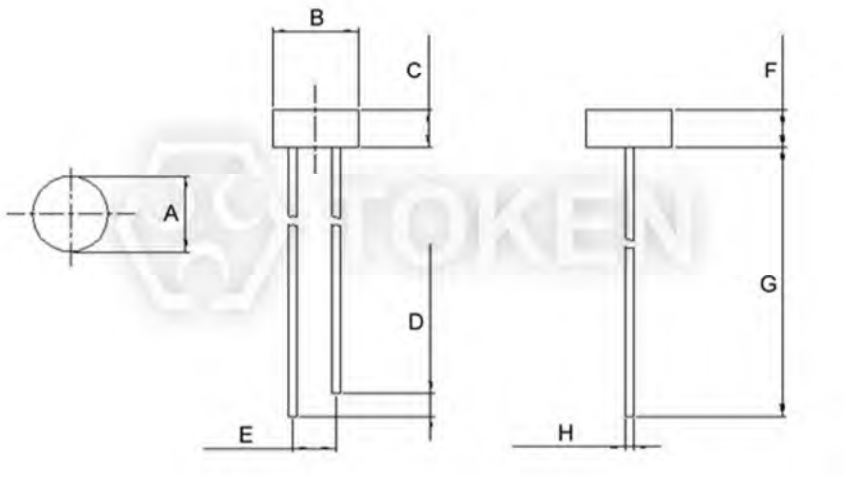
Helmet Edge Photosensitive Transistor (PT-A1-AC-5-HE-850)

Remark:

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

Dimensions & Configurations (Unit: mm) (PT-A4-AC-5-PN-850) Plate None

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)
PT-A4-AC-5-PN-850	5.00 ± 0.20	5.00 ± 0.20	2.50 ± 0.20	1.50 ± 0.5	2.54 ± 0.20	2.50 ± 0.20	25.4 Min.	0.50 ± 0.20



Ambient light sensor (PT-A4-AC-5-PN-850) Plate None Dimensions

Plate None Phototransistor (PT-A4-AC-5-PN-850)

Remark:

- **The epoxy resin highest: 1.5mm Max..**
- **Product images, plastic color of apperence, 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-A1-AC-3-PE-850)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	3	4.5	6	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	9	13.5	18	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	30	45	60	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Electro-Optical Characteristics (Ta=25˚C) (PT-A1-AC-5-HE-850)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	4.5	6.5	9.0	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	13.5	19.5	27	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	45	65	90	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Electro-Optical Characteristics (Ta=25˚C) (PT-A4-AC-5-PN-850)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	3	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4*	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	5	8	12	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	15	24	36	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	50	80	120	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

*** Remark:**

- **Vce must be greater than 0.4V to enable the product function and can not exceed its maximum rating 30V. The working volatge: 0.4V ~ 30V.**

Absolute maximum ratings (Ta=25˚C) (A1 & A4 Chip)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	3	V
Power Dissipation	P_C	70	m^W
Operating Temperature Range	T_{opr}	-25 ~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C

Curve φ3 PE-850

Relative Spectral Sensitivity vs. Wavelength (PT-A1-AC-3-PE-850)

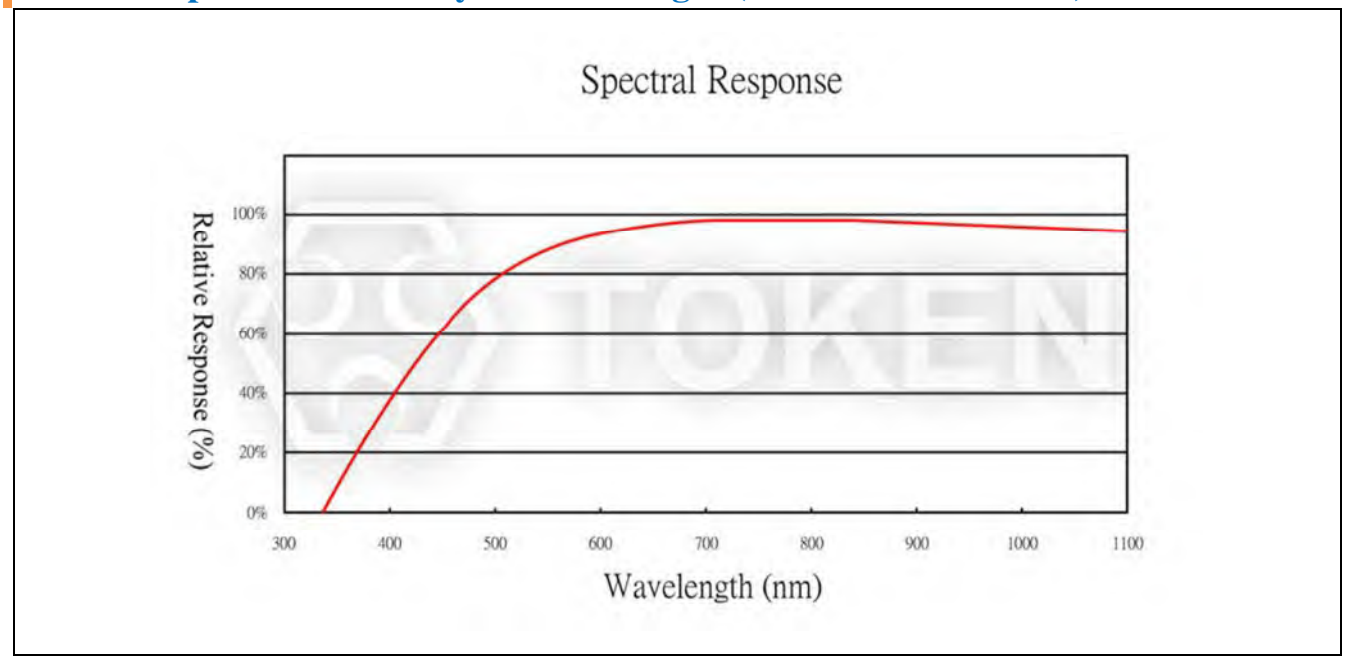
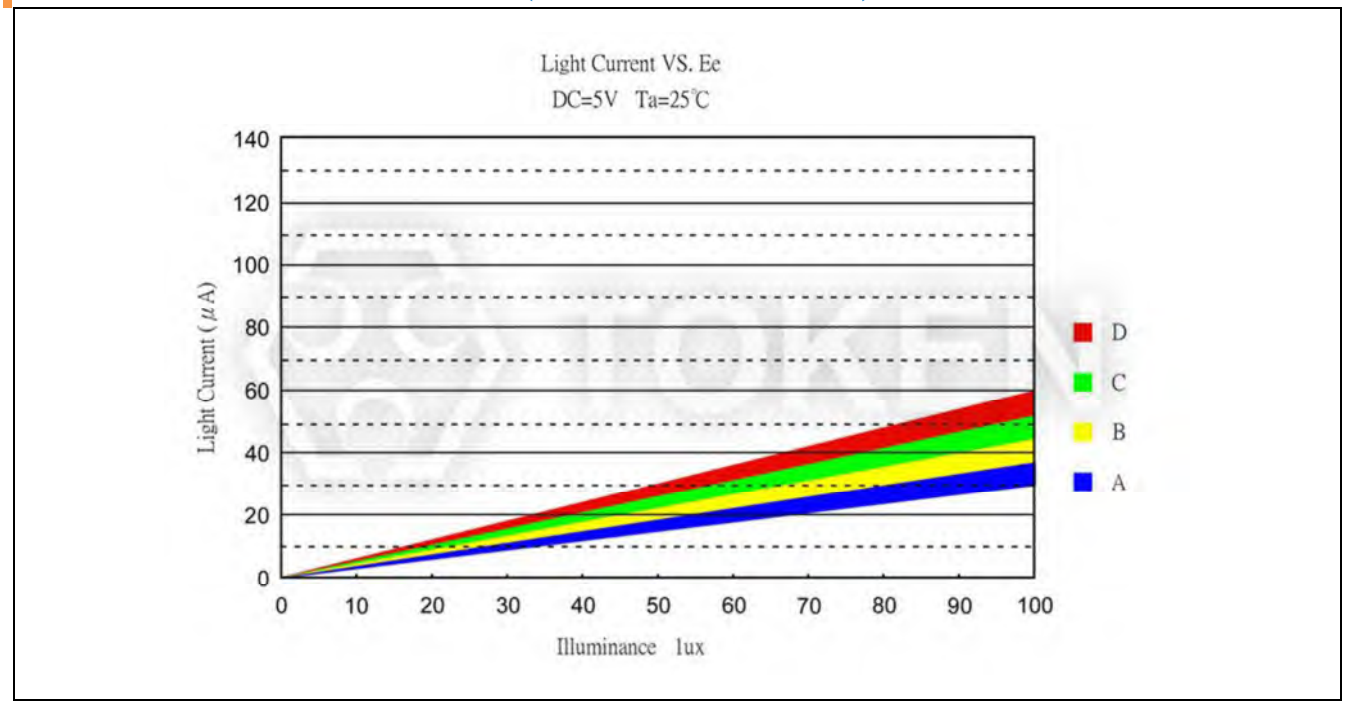
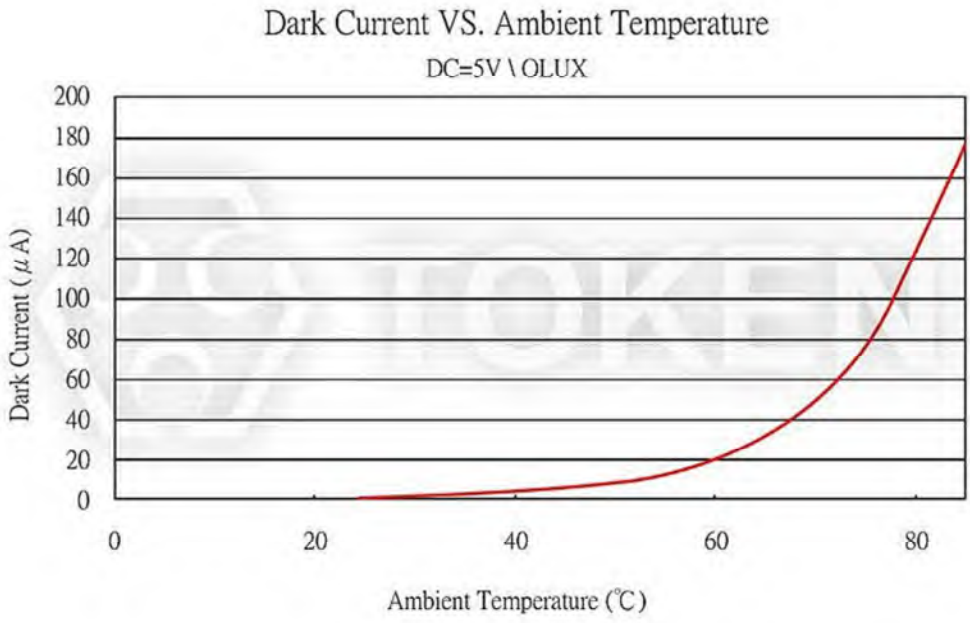


Photo Current vs. Illuminance (PT-A1-AC-3-PE-850)



Dark Current vs. Ambient Temperature (PT-A1-AC-3-PE-850)



Curve φ5 HE-850

Relative Spectral Sensitivity vs. Wavelength (PT-A1-AC-5-HE-850)

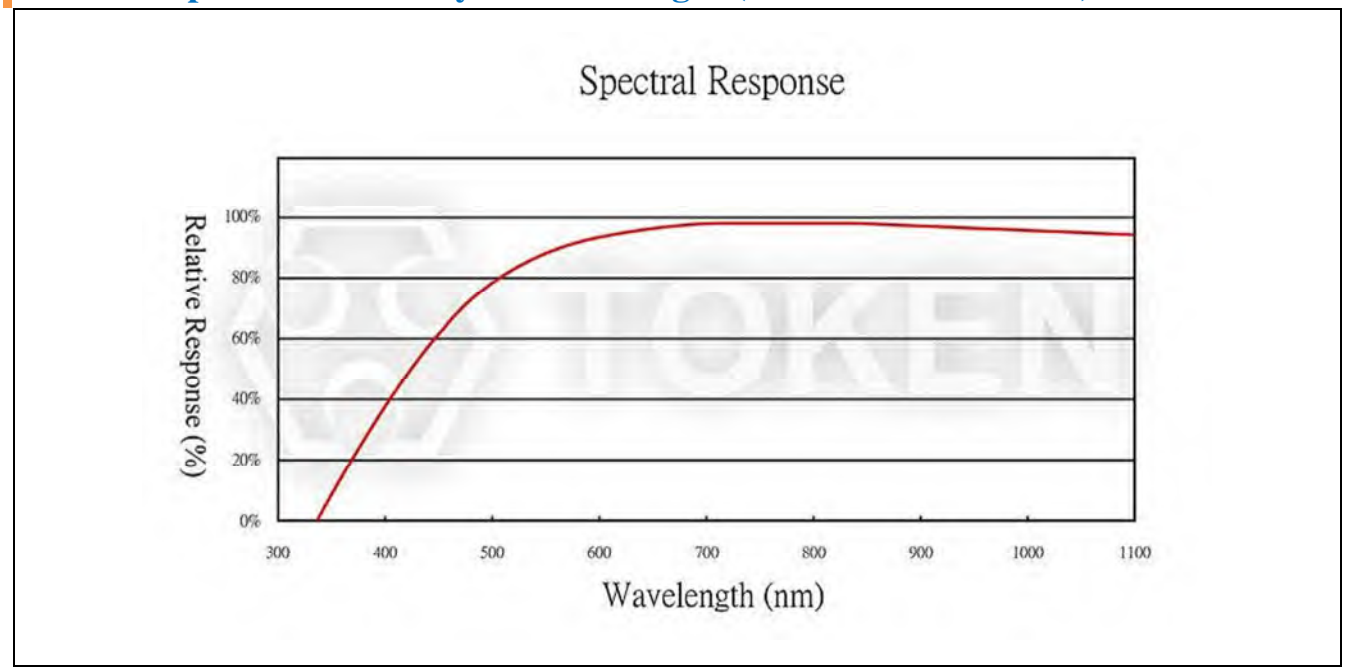
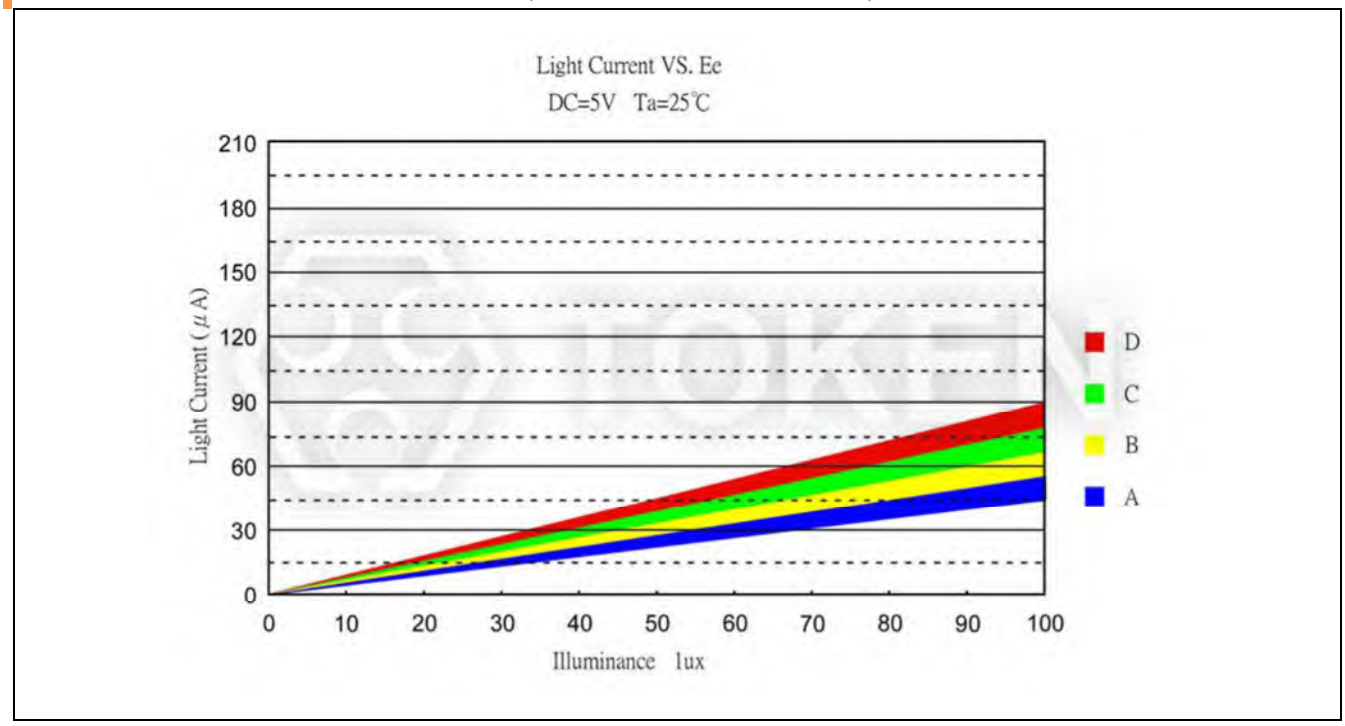
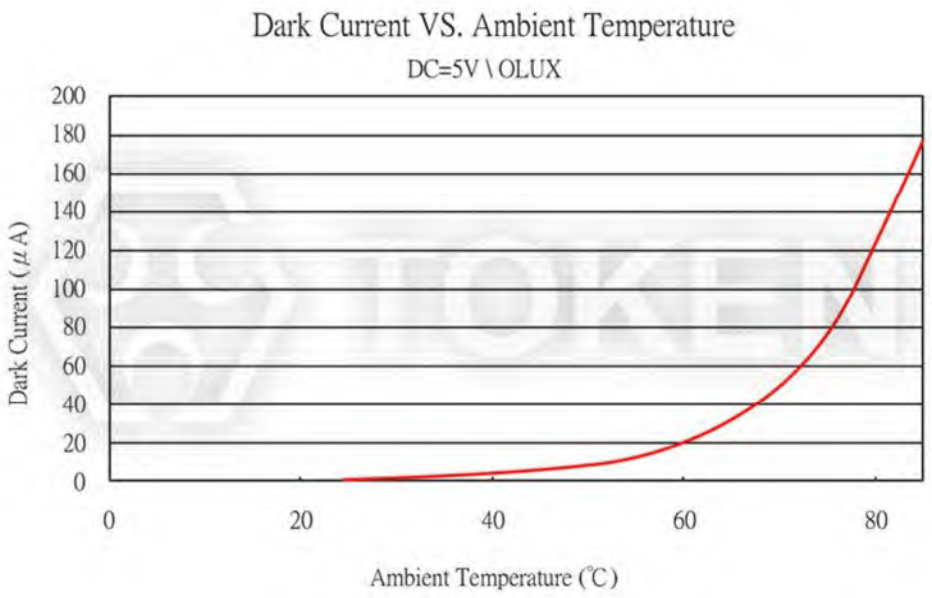


Photo Current vs. Illuminance (PT-A1-AC-5-HE-850)



Dark Current vs. Ambient Temperature (PT-A1-AC-5-HE-850)



Curve φ5 PN-850

Relative Spectral Sensitivity vs. Wavelength (PT-A4-AC-5-PN-850)

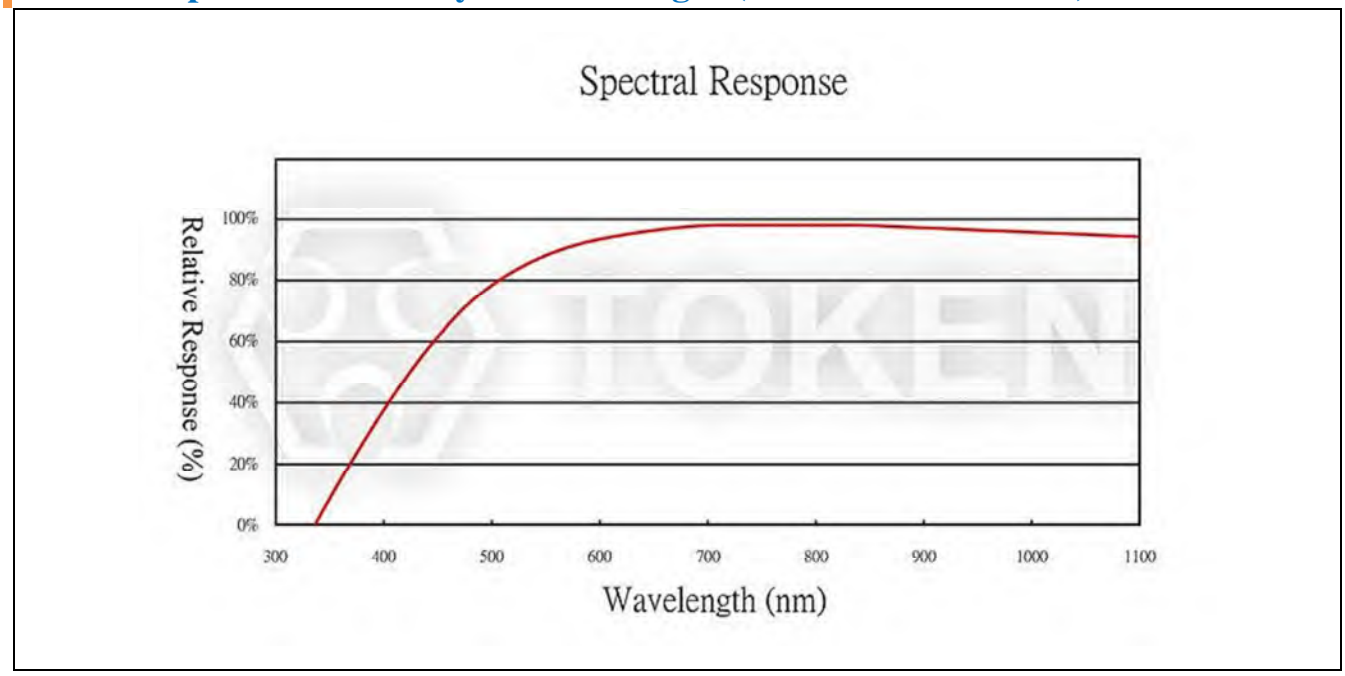
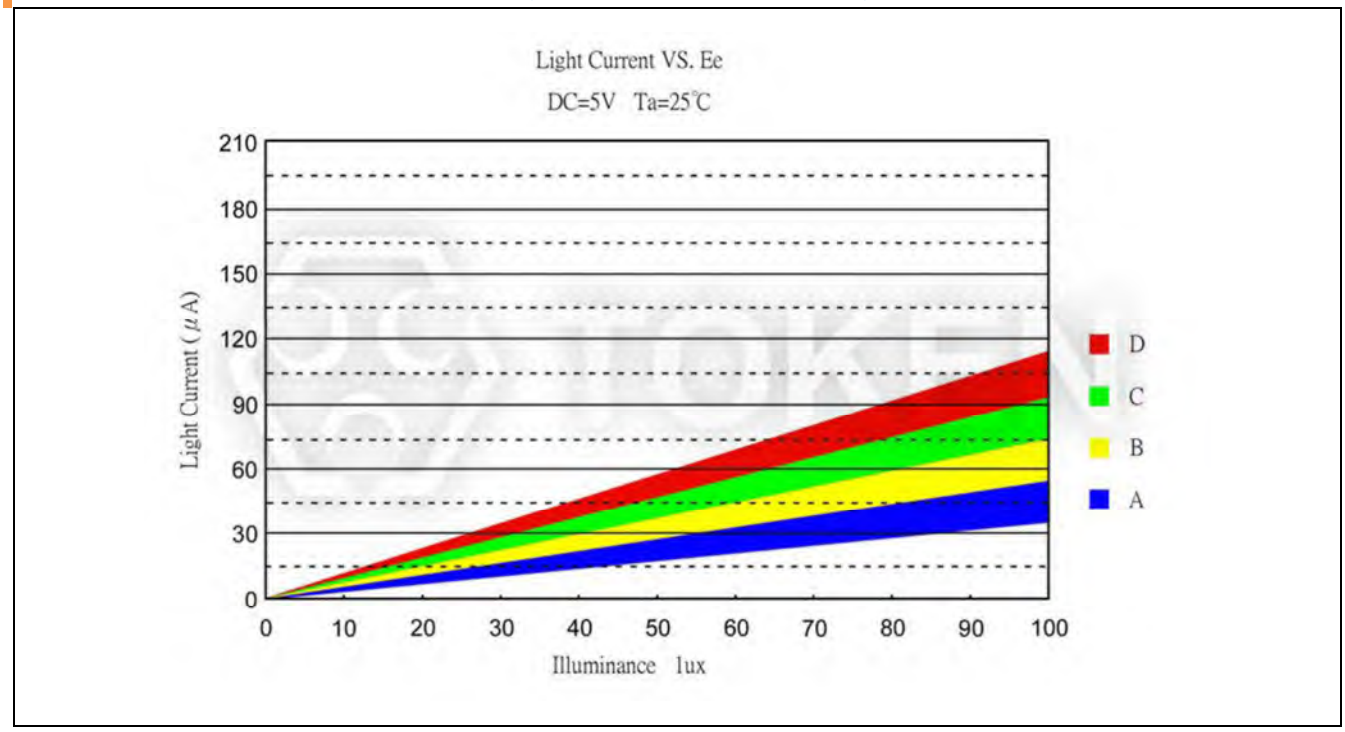
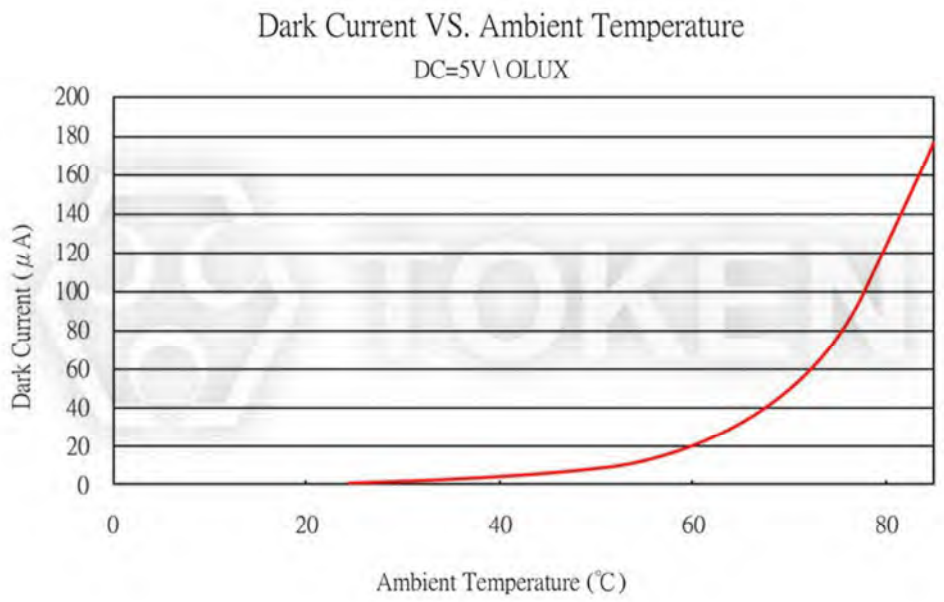


Photo Current vs. Illuminance (PT-A4-AC-5-PN-850)



Dark Current vs. Ambient Temperature (PT-A4-AC-5-PN-850)



Note

Ambient Light Sensor (A1 & A4 Chip) Precaution Usage

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.

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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

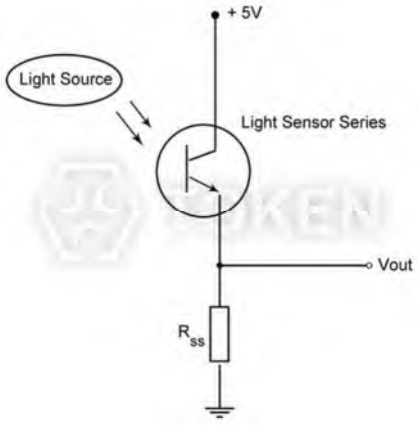


Photo Current Measurement Method (A1 & A4 Chip)

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 °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 freezingand 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.

Order Codes

Order Codes (A1 & A4 Chip)

PT	-	A1	-	AC	-	3	-	BE	-	850

Part Number
PT

Chip Type
A1
A4

Lens Color	
AC	Water Clear

Size	
3	3mm
5	5mm

Shape	
PE	Plate Edge
HE	Helmet Edge
PN	Plate None

Spectral Bandwidth	
850	850 nm

(PT-A2-AC-850) Ambient Light Sensing Phototransistors IR

Product Introduction

With RoHS compliant, DeMint phototransistors are available in a wide range of packages.

Features :

- Good batch consistency, small static current.
- Fast response speed, stable performance, beautiful appearance.
- The effective control distance is greater than 1.5 meters.
- Low current loss in the static.

Applications :

- Replace the traditional CDS photoresistor.
- Cadmium and lead free with RoHS compliant.
- Applicable to control all kinds of light control toys and Infrared testing equipment.

A phototransistor is known as a device in which turns light source energy into electric energy. Phototransistors are very close to photoresistors but produce both current and voltage, while photoresistors simply produce current. The reason is a phototransistor includes a bipolar semiconductor and targets the energy this can be transmitted via it.

Phototransistors are light-sensitive transistors. A common type of phototransistor resembles a bipolar transistor with its base lead removed and replaced with a light-sensitive area. This is why a phototransistor has only 2 terminals instead of the usual 3. However, when the light-sensitive region is exposed to light, a small base current is generated that controls a much larger collector-to-emitter current.

DeMint PT-A2-AC-850 family with environmentally friendly photosensitive sensors, control sensitivity under low illumination, stable current signal output under strong light source. Multiple light at the same time can be used to ensure consistent photosensitive effect, not false trigger. Meet the latest environmental requirements of toys. Applicable to all kinds of light control lighting products (such as night lights, lawn lamps, solar lights, etc.), automatically adjust the background light (such as LCD, mobile phones, cameras, computer cameras, security monitoring machines, etc.).

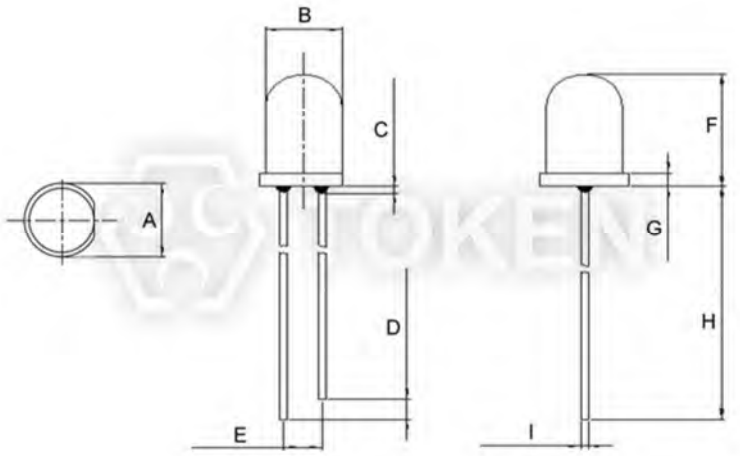
The PT-A2-AC-850 ambient light sensor, commonly used in infrared reception, Ultra-thin multi-point infrared touch screen, and all kinds of high-light or visible light interference strong products, such as various types of infrared light control, infrared on the radio, infrared reflection and other electronic products.

For the convenience of installation in all kinds of products in any position, different sizes are available upon request. So that product consistency is better, more market competitiveness. It is also achievable to provide the bright current / dark current (bright resistance / dark resistance) for the most suitable product. Please contact our sales or link to DeMint official website "Light Sensors" for more information.

Dimensions

Dimensions & Configurations (Unit: mm) (PT-A2-AC-3-BE-850) & (PT-A2-AC-5-BE-850) Bullet Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-A2-AC-3-BE-850	3.85 ± 0.20	3.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	5.30 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.20
PT-A2-AC-5-BE-850	5.80 ± 0.20	5.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	8.70 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.20



Phototransistor (PT-A2-AC-3-BE-850) & (PT-A2-AC-5-BE-850) Dimensions

Bullet Edge Photosensitive Transistor
PT-A2-AC-3-BE-850

Remark:

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

Dimensions & Configurations (Unit: mm) (PT-A2-AC-5-PE-850) Plate Edge

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)	G (mm)	H (mm)	I (mm)
PT-A2-AC-5-PE-850	5.80 ± 0.20	5.00 ± 0.20	1.50 Max.	1.50 ± 0.5	2.54 ± 0.20	5.30 ± 0.20	1.00 ± 0.20	25.4 Min.	0.50 ± 0.20

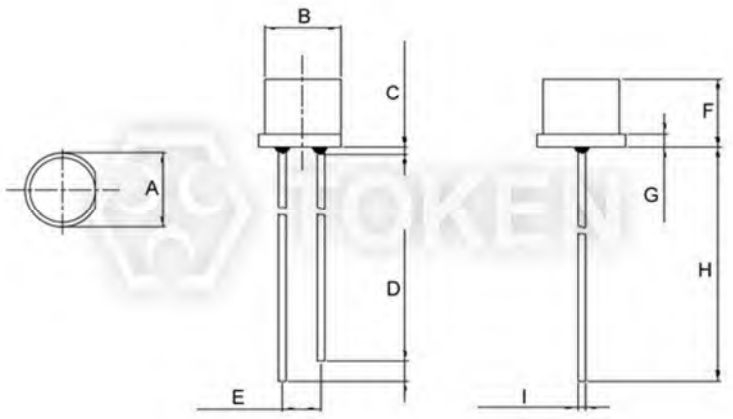


Plate Edge Photosensitive Transistor (PT-PE-850-AC-A6) Dimensions

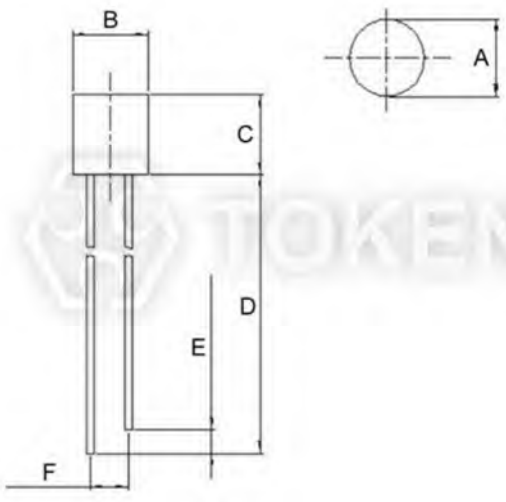
Plate Edge Photosensitive Transistor PT-A2-AC-5-PE-850

Remark:

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

Dimensions & Configurations (Unit: mm) (PT-A2-AC-5-PN-850) Plate None

Part NO.	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)
PT-A2-AC-5-PN-850	5.00 ± 0.20	5.00 ± 0.20	5.30 ± 0.20	25.4 Min.	1.50 ± 0.50	2.54 ± 0.20



Visible Light Sensor Plate None (PT-A2-AC-5-PN-850) Dimensions

Phototransistor Plate None (PT-A2-AC-5-PN-850)

Remark:

- **The epoxy resin highest: 1.5mm Max..**
- **Product images, plastic color of apperence, 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-A2-AC-3-BE-850) Bullet Edge

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	6	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	15	30	45	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	45	90	145	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	150	300	450	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Electro-Optical Characteristics (Ta=25˚C) (PT-A2-AC-5-BE-850) Bullet Edge

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	6	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	30	50	90	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	90	150	270	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	300	500	900	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V I_{ce}=1mA RL=1000Ω	15			μs
Fall Time	t_f		15			

Electro-Optical Characteristics (Ta=25˚C) (PT-A2-AC-5-PE-850) Plate Edge

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	6	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	1.5	3	4.5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	4.5	9	13.5	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	15	30	45	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V	15			μs
Fall Time	t_f	I_{ce}=1mA RL=1000Ω	15			

Electro-Optical Characteristics (Ta=25˚C) (PT-A4-AC-5-PN-850) Plate None

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	λ_p	\	-	850	-	nm
Spectral Response Bandwidth	λ	\	400	-	1100	nm
Collector-Emitter Breakdown Voltage	B_{vceo}	I_{ce}=100μA E_e=0m^W/cm^2	30	-	-	V
Emitter-Base Breakdown Voltage	B_{veco}	I_{ce}=100μA E_e=0m^W/cm^2	6	-	-	V
Collector-Emitter Saturation Voltage	V_{ce} (sat)	I_{ce}=2mA E_e=1m^W/cm^2	-	-	0.4	V
Photo Current	$I_{L(1)}$	V_{cc}=5V E_v=10Lux	1.5	3	4.5	μA
	$I_{L(2)}$	V_{cc}=5V E_v=30Lux	4.5	9	13.5	μA
	$I_{L(3)}$	V_{cc}=5V E_v=100Lux	15	30	45	μA
Collector Dark Current	I_{ceo}	V_{ce}=5V E_v=0Lux	-	-	0.1	μA
Rise Time	t_r	V_{cc}=5V	15			μs
Fall Time	t_f	I_{ce}=1mA RL=1000Ω	15			

Absolute maximum ratings (Ta=25˚C) (PT-A2-AC)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector-Voltage	V_{ECO}	6	V
Power Dissipation	P_C	70	m^W
Operating Temperature Range	T_{opr}	-25 ~ +85	˚C
Storage Temperature	T_{stg}	-40 ~ +100	˚C

Curve φ3 BE-850

Relative Spectral Sensitivity vs. Wavelength (PT-A2-AC-3-BE-850)

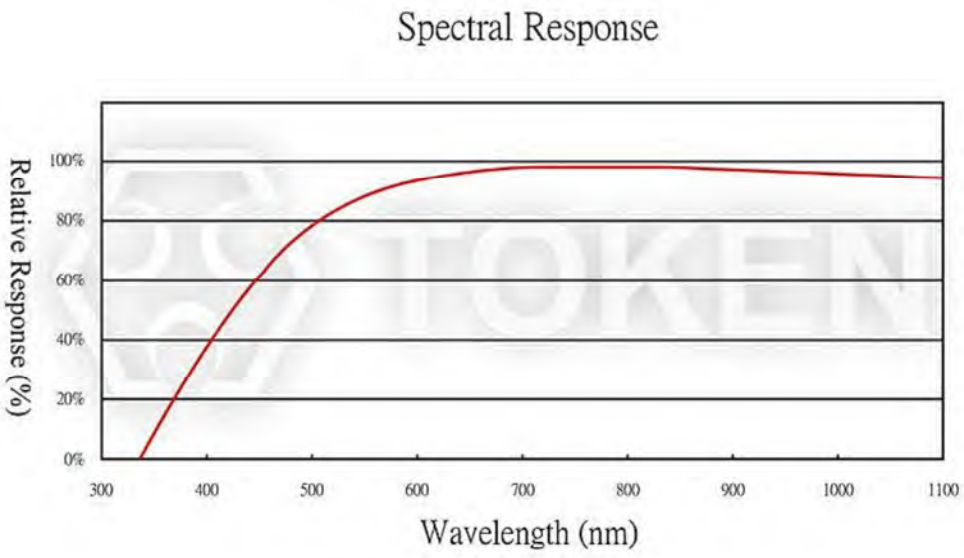
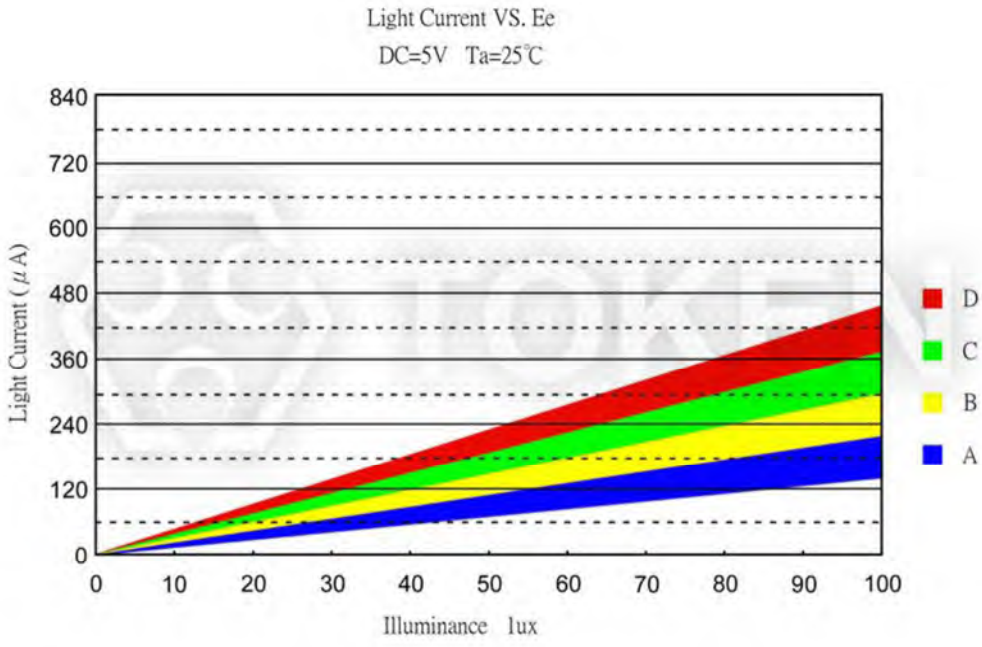
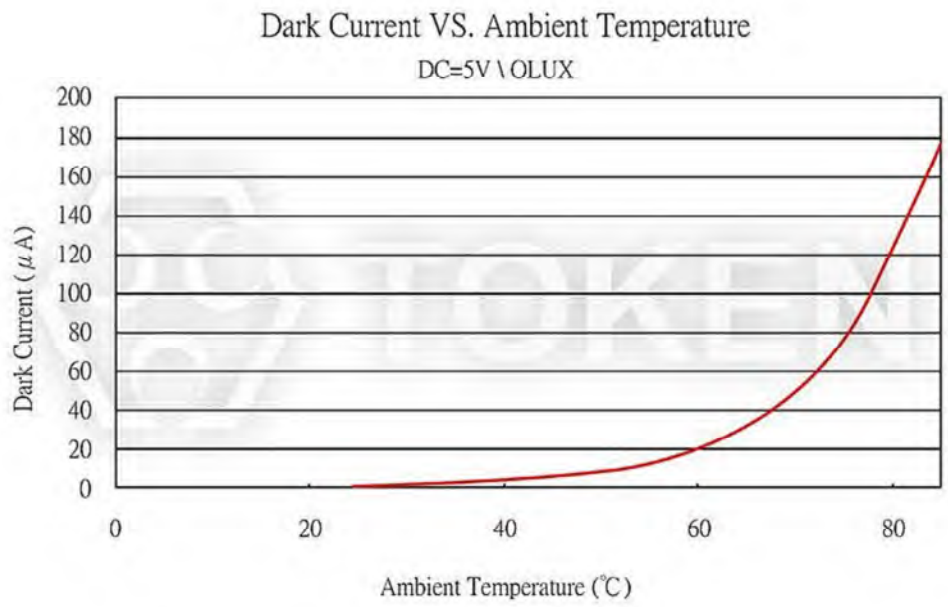


Photo Current vs. Illuminance (PT-A2-AC-3-BE-850)



Dark Current vs. Ambient Temperature (PT-A2-AC-3-BE-850)



Curve φ5 BE-850

Relative Spectral Sensitivity vs. Wavelength (PT-A2-AC-5-BE-850)

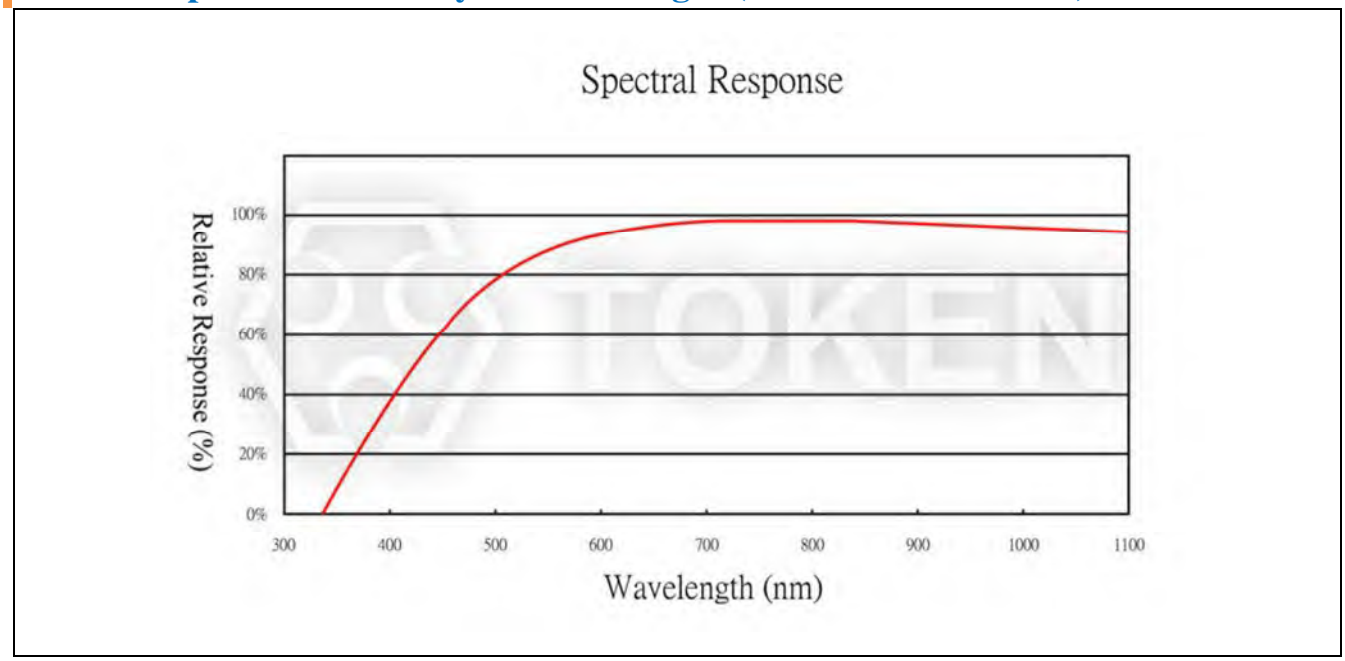
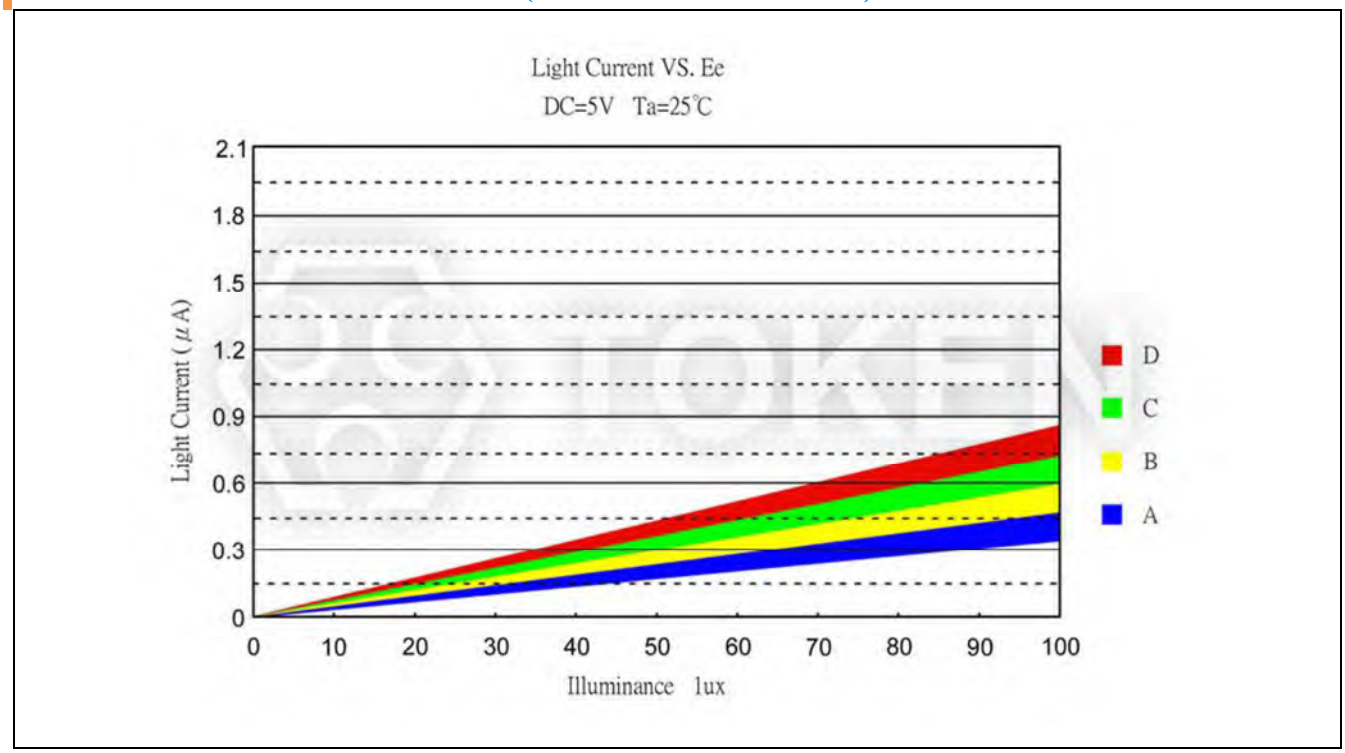
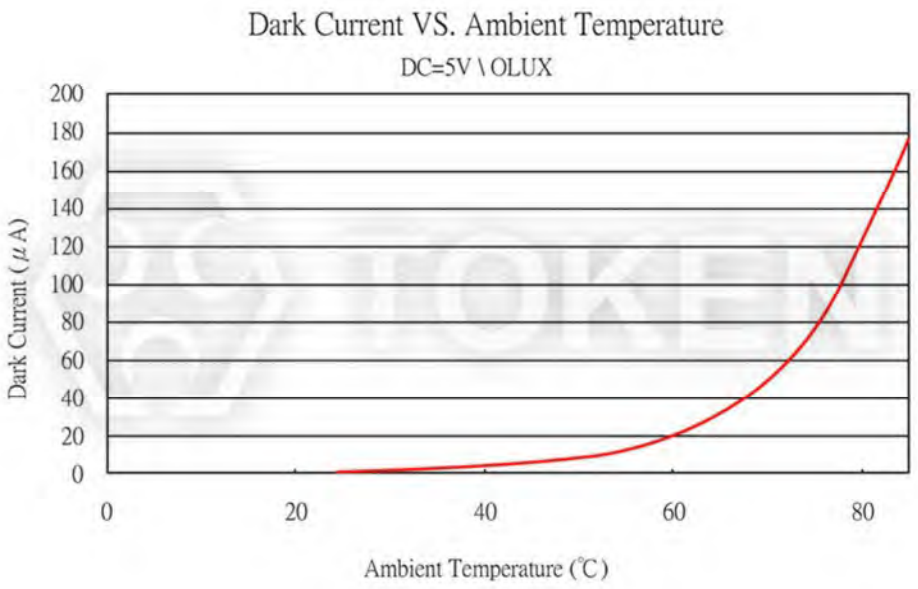


Photo Current vs. Illuminance (PT-A2-AC-5-BE-850)



Dark Current vs. Ambient Temperature (PT-A2-AC-5-BE-850)



Curve φ5 PE-850

Relative Spectral Sensitivity vs. Wavelength (PT-A2-AC-5-PE-850)

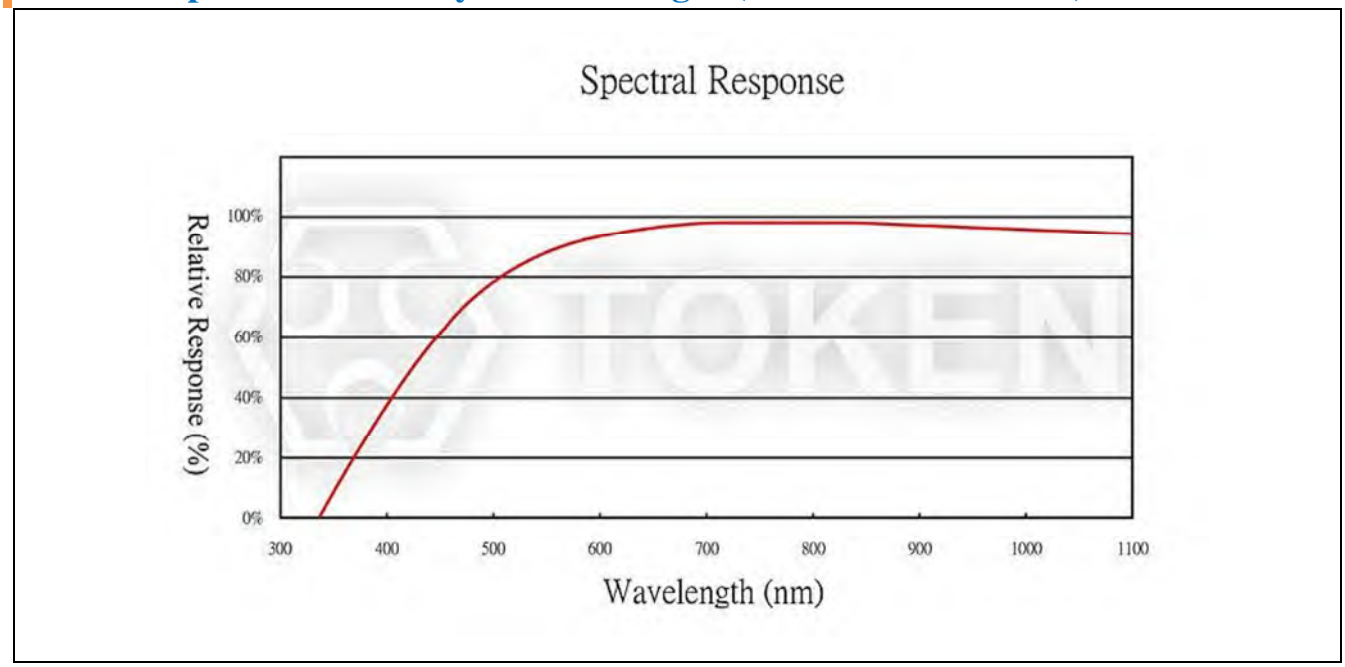
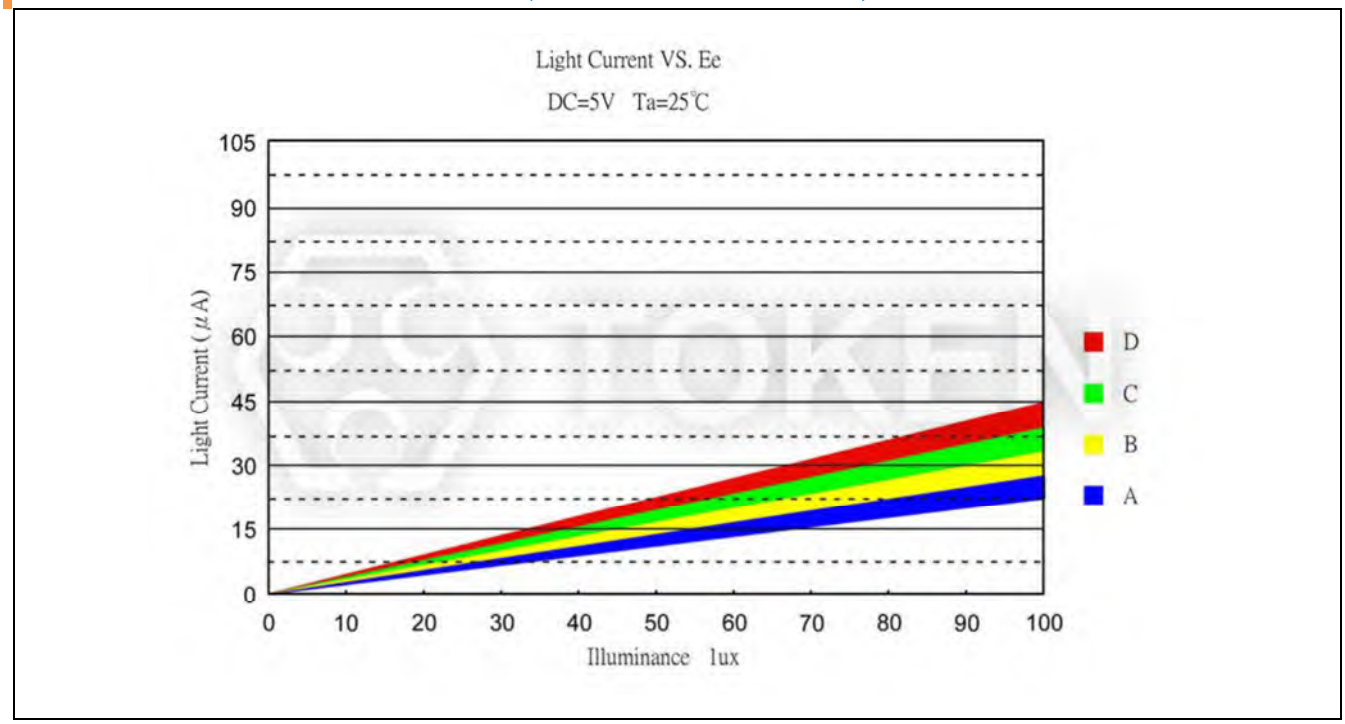
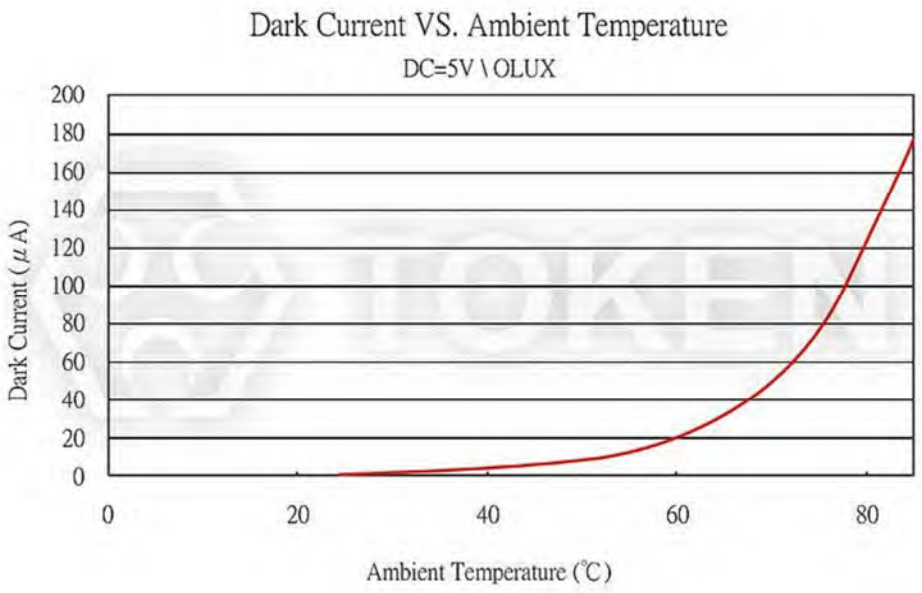


Photo Current vs. Illuminance (PT-A2-AC-5-PE-850)



Dark Current vs. Ambient Temperature (PT-A2-AC-5-PE-850)



Curve φ5 PN-850

Relative Spectral Sensitivity vs. Wavelength (PT-A2-AC-5-PN-850)

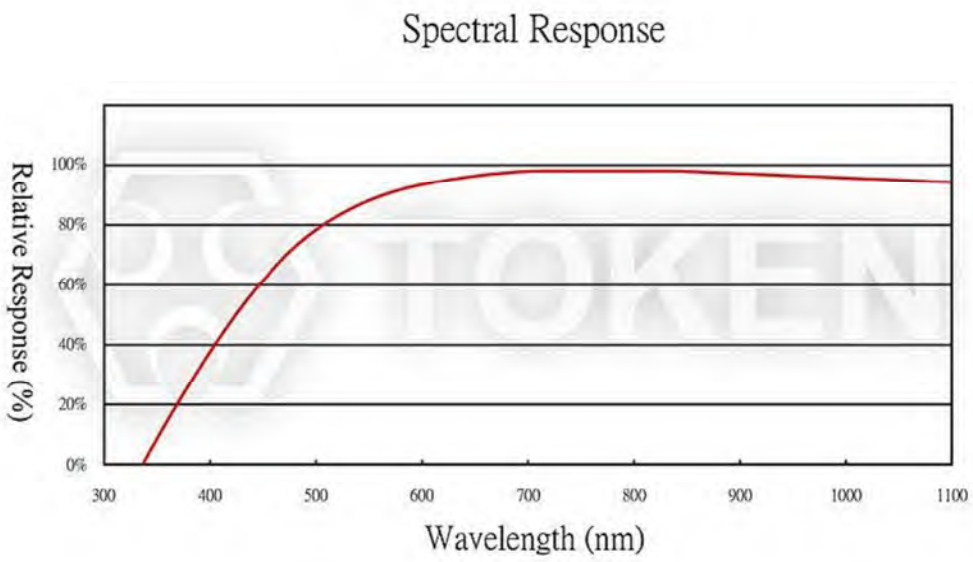
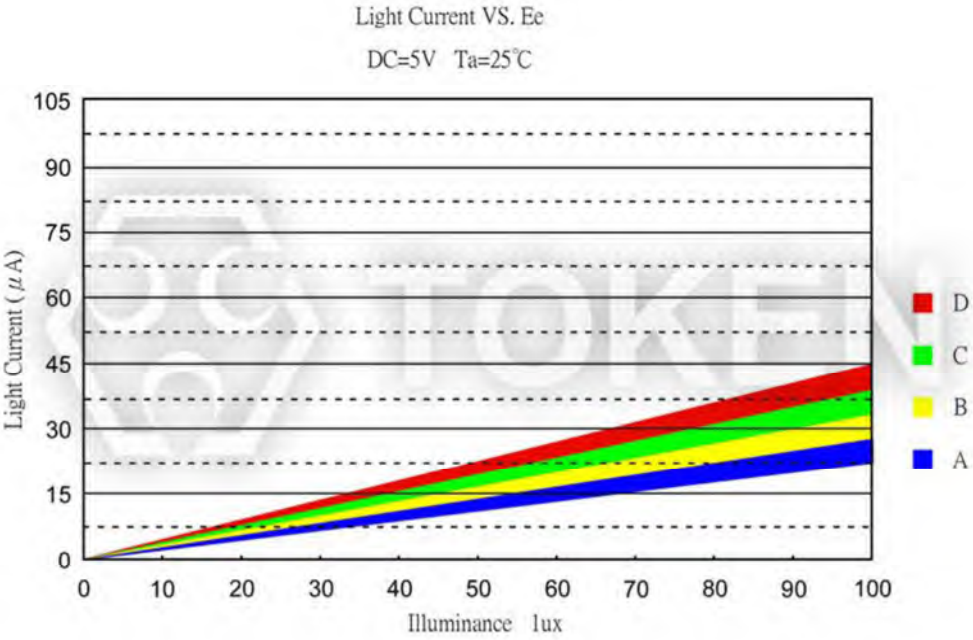
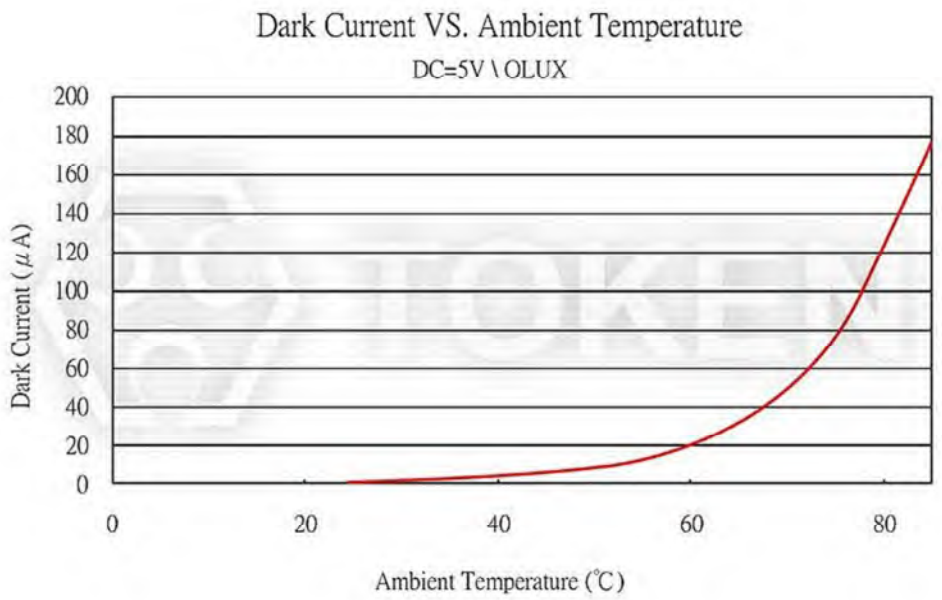


Photo Current vs. Illuminance (PT-A2-AC-5-PN-850)



Dark Current vs. Ambient Temperature (PT-A2-AC-5-PN-850)



Note

Bullet Edge Phototransistor (PT-BE) Precaution Usage

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.

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°C < 60s、260°C < 5s.
- Manual soldering: 260°C < 5s、340°C < 3s.

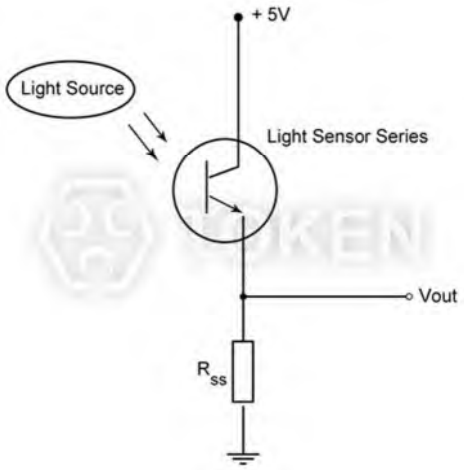


Photo Current Measurement Method (PT-BE)

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 °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 freezingand 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.

Order Codes

Order Codes (PT-BE)

PT	-	A2	-	AC	-	3	-	BE	-	850

Part Number
PT

Chip Type
A2

Lens Color	
AC	Water Clear

Size	
3	3mm
5	5mm

Shape	
BE	Bullet Edge
PE	Plate Edge
PN	Plate None

Spectral Bandwidth	
850	850 mm