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# TOKEN

## **(PT-3528) Chip Ambient Light Sensor, RoHS Compliant**

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## ▶ 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.

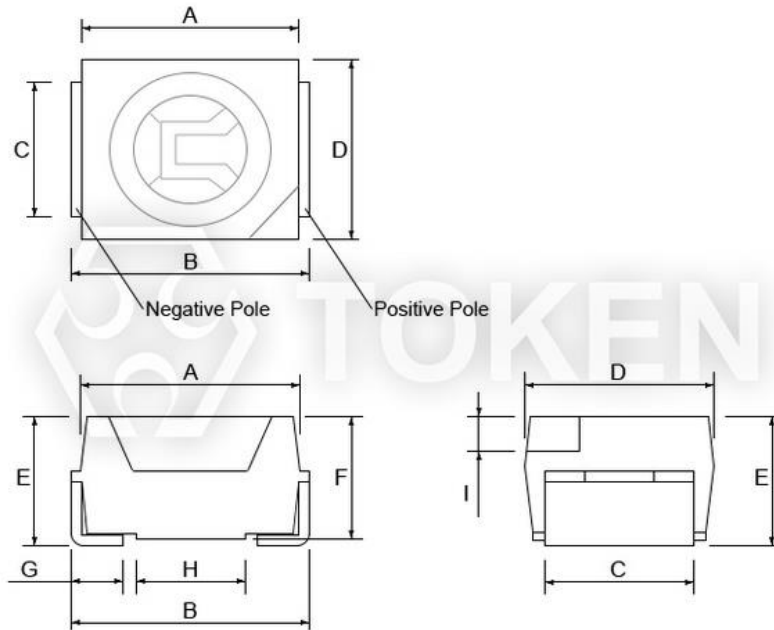
The (PT-IC-BC-3528-550) using high quality chip packaging and processing super-plated infrared filter membrane on chip surface, so this sensor can fully filter infrared interference. It is no need to add the casing and extra filter and effective filtering out the effect of light reflection due to infrared 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 Token official website "[Ambient-light-sensors](http://www.token.com.tw)" 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)
<b>PT-IC-BC-3528-550</b>	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
<b>PT-IC-AC-3528-520</b>	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**



www.token.com.tw  
**PT-IC-BC-3528-550**



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**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	$\lambda_p$	\	-	550	-	nm
Spectral Response Bandwidth	$\lambda$	\	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	$\mu A$
	$I_{L(2)}$	$V_{cc}=5V$ $E_v=30Lux$	4.5	9	13.5	$\mu A$
	$I_{L(3)}$	$V_{cc}=5V$ $E_v=100Lux$	15	30	45	$\mu A$
Collector Dark Current	$I_d$	$V_{cc}=5V$ $E_v=0Lux$	-	-	0.1	$\mu A$
IR Receiving Current	$I_{L(4)}$	$V_{cc}=5V/850nm$ IR LED $E_e=1m^W/cm^2$	-	-	0.1	$\mu A$
Rise Time	$t_r$	$V_{cc}=5V$ $E_v=30Lux$	4.5			us
Fall Time	$t_f$	$RL=1000\Omega$	4.5			

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

Parameter	Symbol	Rating Value		Unit
		Min.	Max.	
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

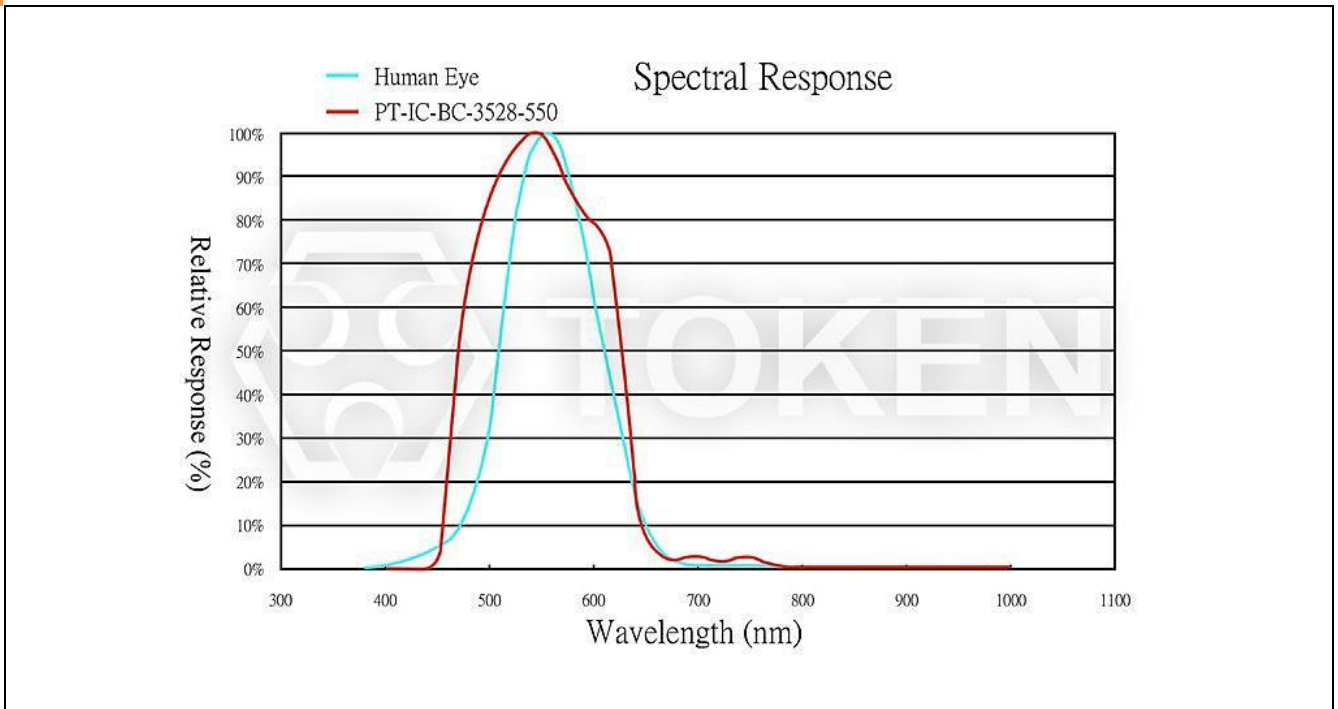
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Peak Wavelength	$\lambda_p$	\	-	520	-	nm
Spectral Response Bandwidth	$\lambda$	\	400	-	-	nm
Operating Voltage	$V_{cc}$	\	-	5	-	V
Photo Current	$I_{L(1)}$	$V_{cc}=5V$ $E_v=10Lux$	7	13	18	$\mu A$
	$I_{L(2)}$	$V_{cc}=5V$ $E_v=30Lux$	21	39	54	$\mu A$
	$I_{L(3)}$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

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

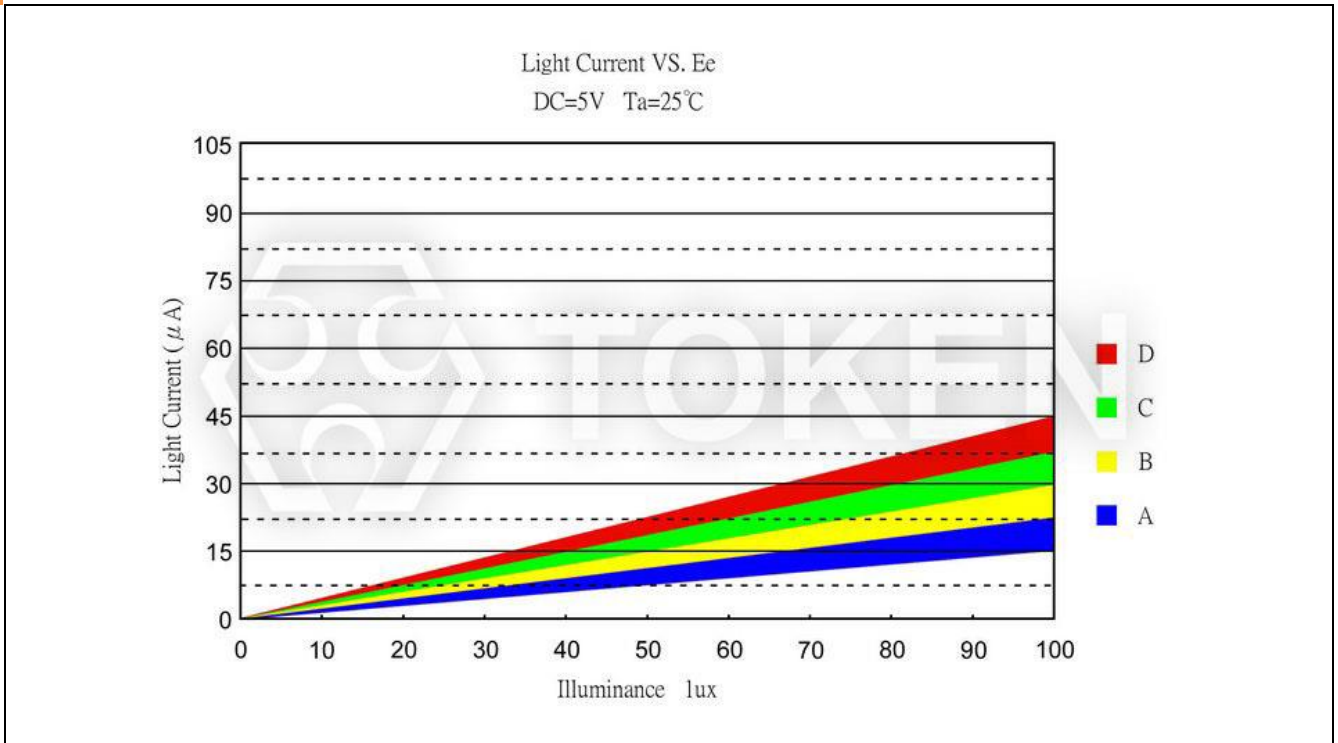
Parameter	Symbol	Rating Value		Unit
		Min.	Max.	
Operating Voltage	$V_{cc}$	Min.	Max.	V
		1	10	V
Power Dissipation	$P_c$	70		$m^w$
Operating Temperature Range	$T_{opr}$	-25 ~ +85		$^\circ C$
Storage Temperature	$T_{stg}$	-40 ~ +100		$^\circ C$

► **Curve BC-550**

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

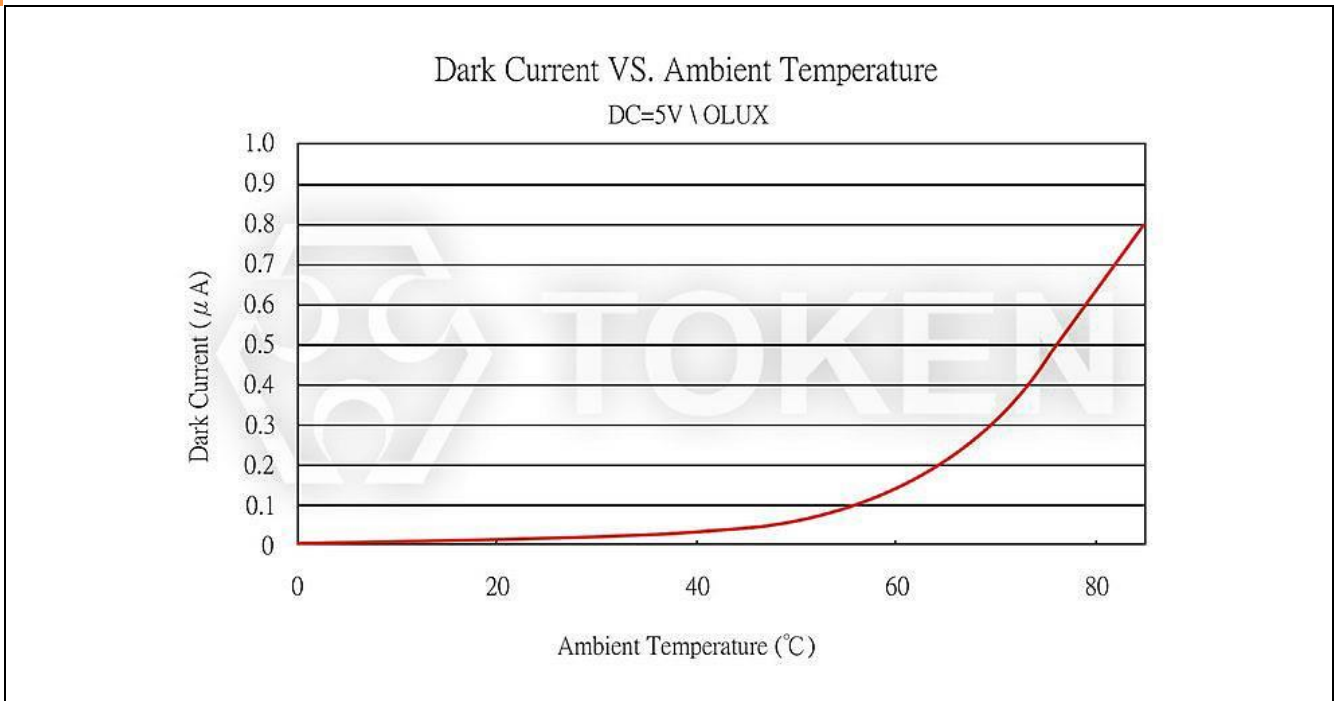


**Photo Current vs. Illuminance PT-IC-BC-3528-550**

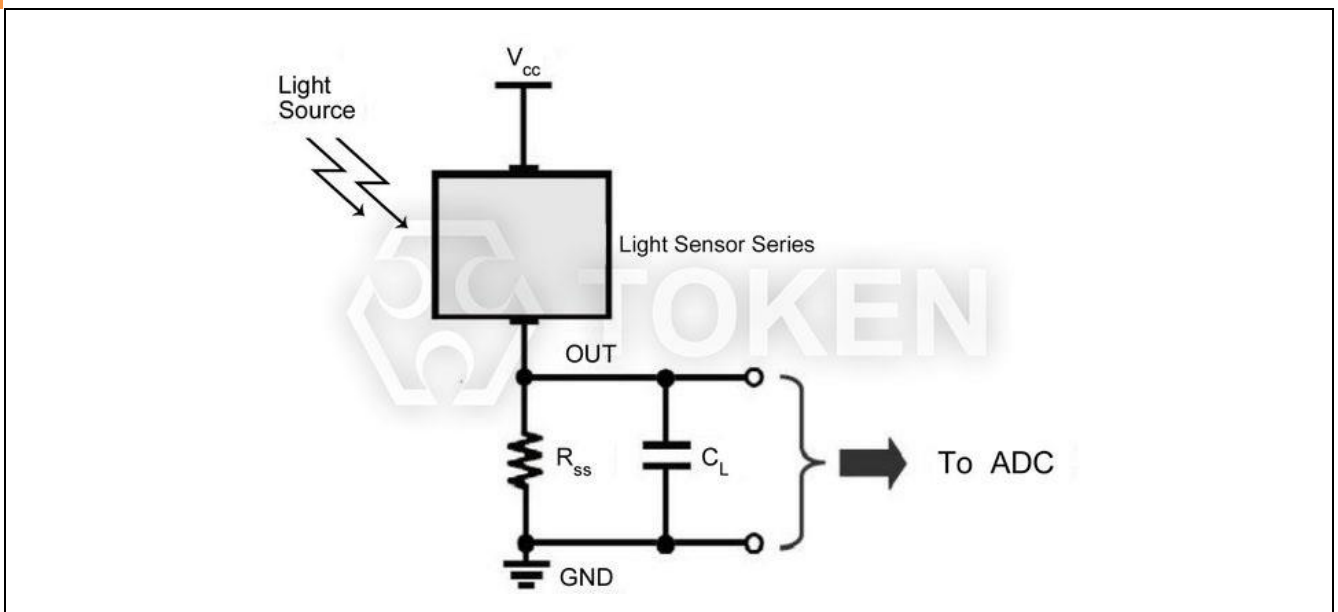




### Dark Current vs. Ambient Temperature PT-IC-BC-3528-550

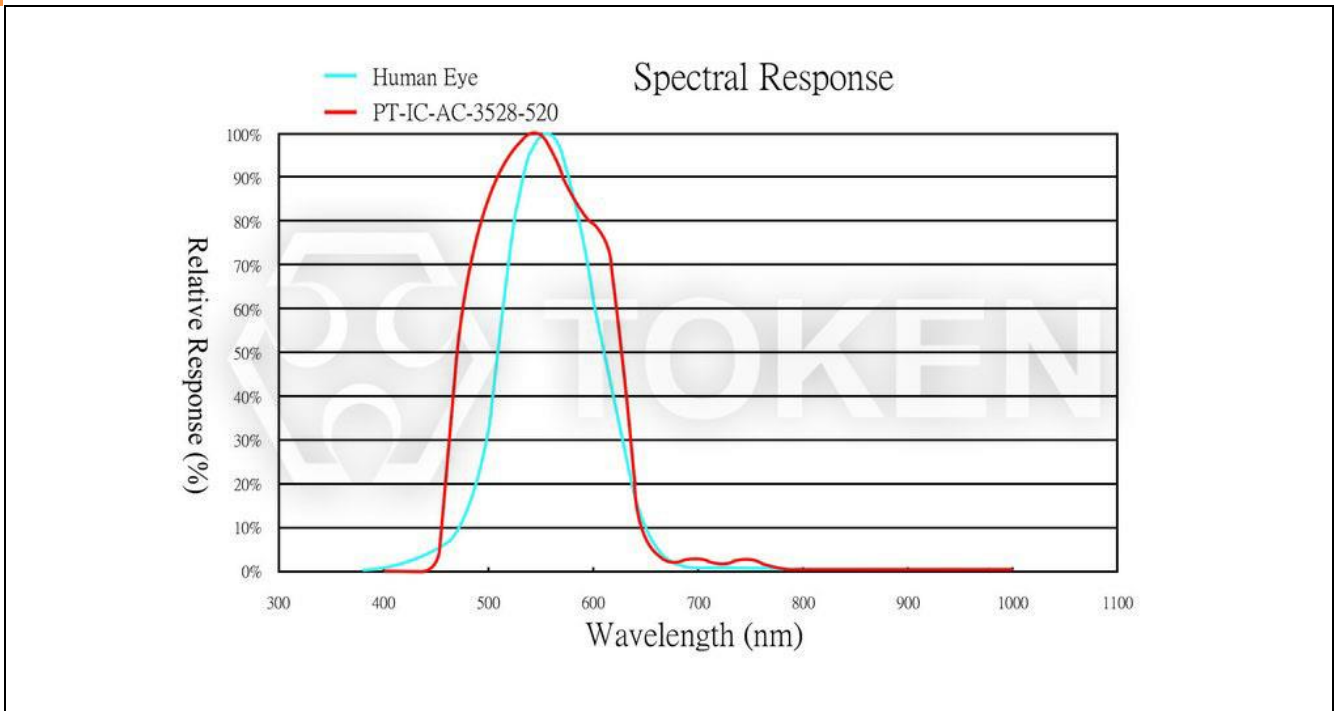


### Photo Current Measurement Method PT-3528

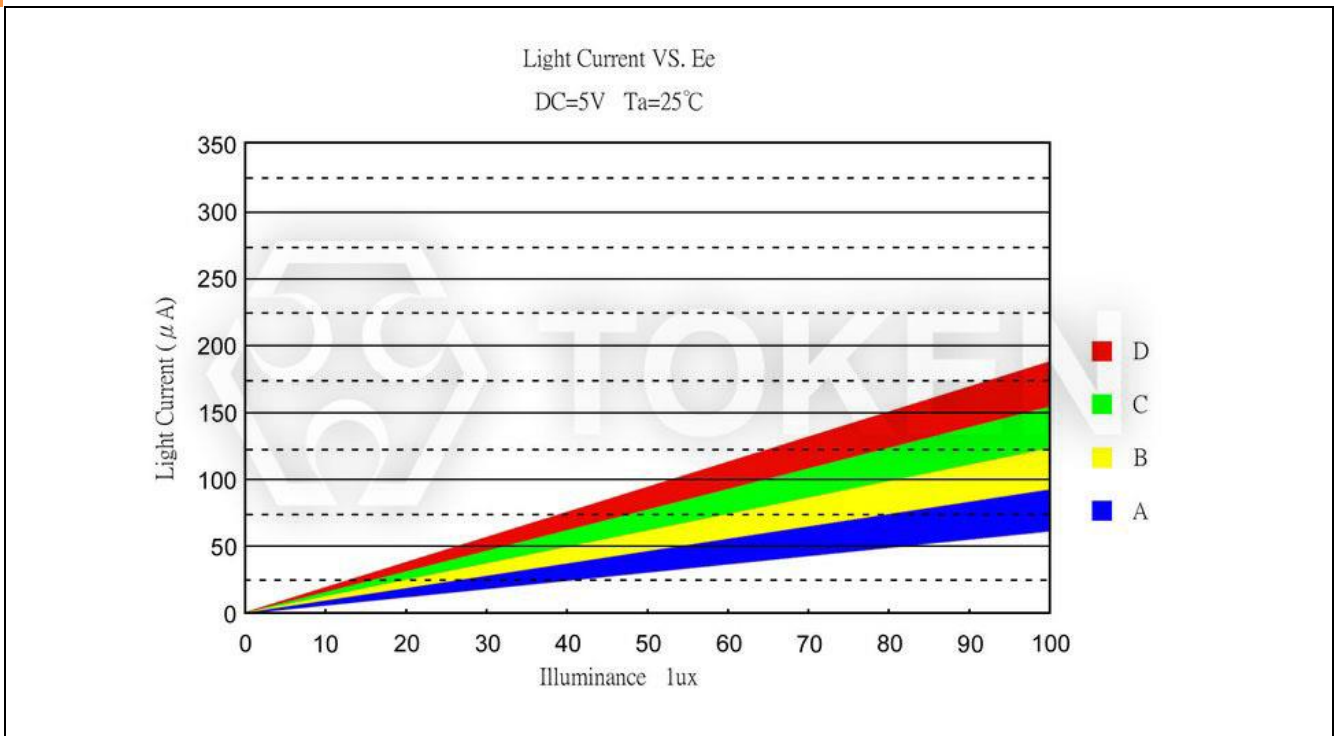


► **Curve AC-520**

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

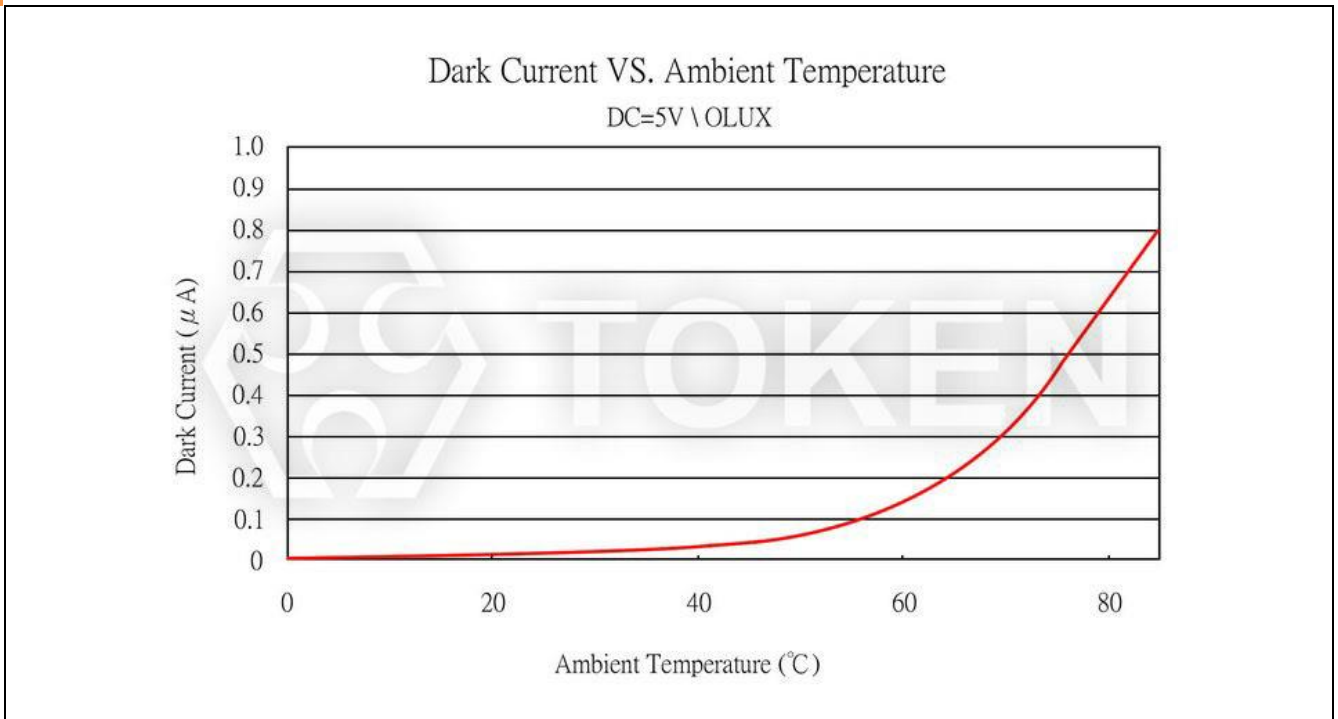


**Photo Current vs. Illuminance PT-IC-AC-3528-520**

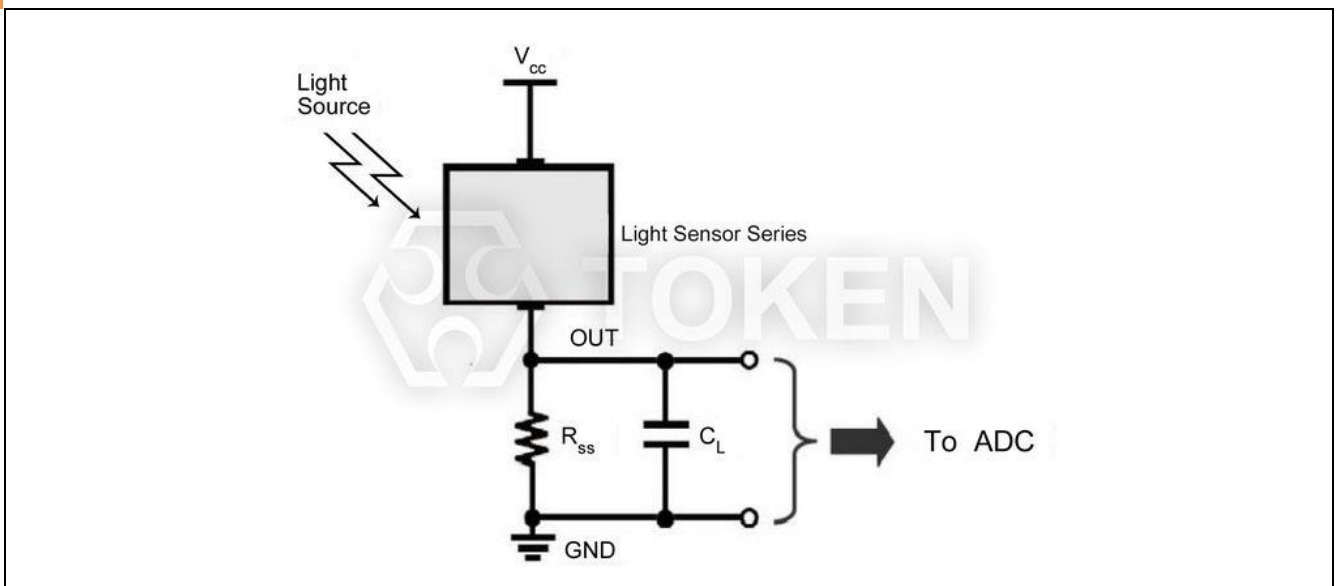




**Dark Current vs. Ambient Temperature PT-IC-AC-3528-520**



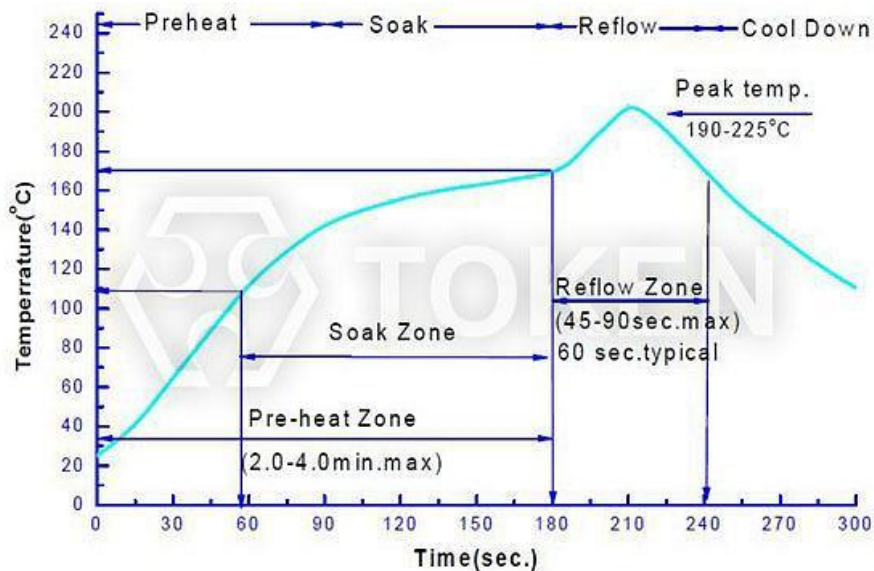
**Photo Current Measurement Method PT-3528**



► Reflow Chart

Recommended Reflow Chart (PT-3528)

Characteristic of Temperature Curve	Reference Settings
Average Heating Speed (T <sub>smax</sub> to T <sub>p</sub> )	Max. 3°C / Sec
Preheating: Minimum Temperature	(T <sub>smin</sub> )
Preheating: Maximum Temperature (T <sub>smax</sub> )	150°C
Preheating: Time (t <sub>smin</sub> to t <sub>smax</sub> )	60 ~ 120 Sec
Reflow Temperature: Temperature (T <sub>L</sub> )	183°C
Period of Reflow: Time (T <sub>L</sub> )	60 ~ 150 Sec
Peaking Temperature (T <sub>P</sub> )	225°C
Within the Actual Peak Temperature (t <sub>p</sub> ) 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 :**

- 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)**

<b>PT</b>	<b>-</b>	<b>IC</b>	<b>-</b>	<b>BC</b>	<b>-</b>	<b>3528</b>	<b>-</b>	<b>550</b>	
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