

Ambient Light Sensor

3mm T-1

ALS-PT204-6C/L177

Features

- Close responsively to the human eye spectrum
- Light to Current, analog output
- Good output linearity across wide illumination range
- Low sensitivity variation across various light sources
- Operating temperature performance, -40°C to 85°C
- Wide supply voltage range, 2.5V to 5.5V
- Size : 3mm Lamp
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- Compliance Halogen Free(Br < 900ppm, Cl < 900ppm, Br+Cl < 1500ppm)



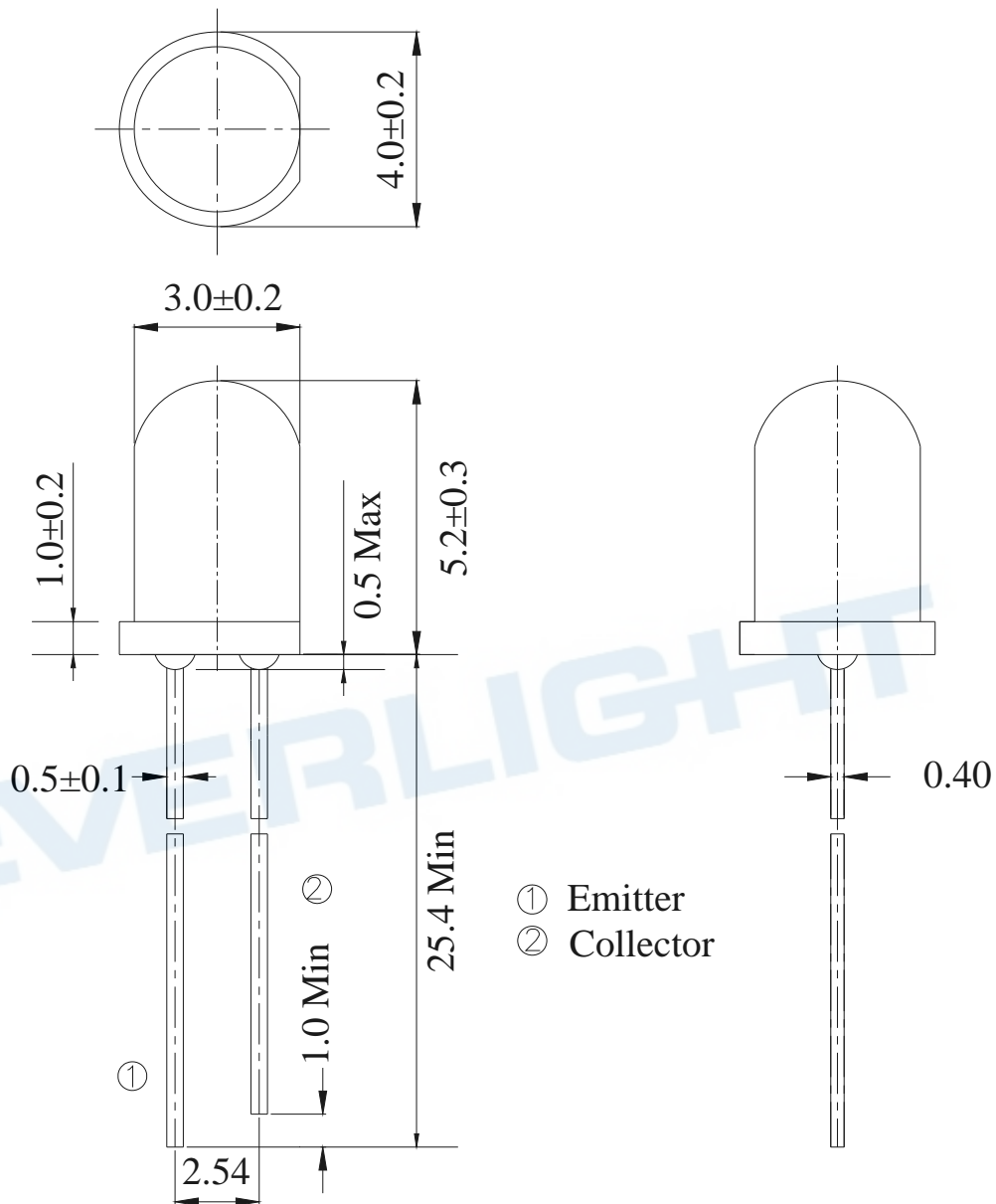
Description

The ALS-PT204-6C/L177 is an ambient light sensor; It consists of a phototransistor in 3mm lamp. EVERLIGHT ALS series products are good effective solution to the power saving of display backlighting of mobile appliances, such as the mobile phones, NB and PDAs. Due to the high rejection ratio of infrared radiation, the spectral response of the ambient light sensor is close to human eyes.

Applications

- Detection of ambient light to control display backlighting
 - Mobile devices – mobile phones, PDAs
 - Computing device – TFT LCD monitor for Notebook computer
 - Consumer device – TFT LCD TV, video camera, digital camera, toys
- Automatic residential and commercial management
- Automatic contrast enhancement for electronic signboard
- Ambient light monitoring device for daylight and artificial light
 - Street light, CCD/CCTV

Package Dimensions



Notes: 1.All dimensions are in millimeters
2.Tolerances unless dimensions ± 0.1 mm

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{cc}	-0.5~6.0	V
Operating Temperature Range	T _{opr}	-40 ~ +85	°C
Storage Temperature Range	T _{stg}	-40 ~ +100	°C

Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Unit
Operating Temperature	T _{opr}	-40	+85	°C
Supply Voltage	V _{cc}	2.5	5.5	V

Rankings

Bin	Symbol	Min	Max	Unit	Test Condition
1	I _{PH} (ON)	15	45	μA	V _{CE} =5V Ev=100Lux
2		35	70		
3		60	100		
4		81	127		
5		104	150		

Electrical and Optical Characteristics ($T_a=25^{\circ}\text{C}$)

Parameter	Symbol	MIN	TYP	MAX.	Unit	Test Condition
Dark Current	I_{CEO}	---	---	0.1	μA	$V_{CE}=10\text{V}$, $E_v=0\text{Lux}$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	---	---	0.4	V	$I_C=0.5\text{mA}$, $E_v=1000\text{Lux}$
Light Current	I_{PH1}	15	---	150	μA	$V_{CE}=5\text{V}$, $E_v=100\text{Lux}$ [Note1]
	I_{PH2}	150	---	1500	μA	$V_{CE}=5\text{V}$, $E_v=1000\text{Lux}$ [Note1]
	I_{PH3}	180	690	---	μA	$V_{CE}=5\text{V}$, $E_v=1000\text{Lux}$ [Note2]
Photocurrent Ratio	I_{PH3} / I_{PH2}	---	1.2	---	---	$V_{CE}=5\text{V}$, $E_v=1000\text{Lux}$
Saturation Output Voltage	V_o	4.5	4.6	---	V	$V_{CC}=5\text{V}$, $E_v=1000\text{Lux}$ $R_L=75\text{K}\Omega$ [Note2]
Peak Sensitivity Wavelength	λ_p	---	630	---	nm	---
Sensitivity Wavelength Range	λ	370	---	670	nm	---
Rise time	t_r	---	0.11	---	ms	$V_{CC}=5\text{V}$ $R_L=7.5\text{K}\Omega$
Fall time	t_f	---	0.12	---	ms	
Angle of half Sensitivity	$2\theta_{1/2}$	---	30	---	Deg.	$I_F=20\text{mA}$

Note:

1. White Fluorescent light (Color Temperature = 6500K) is used as light source. However, White LED is substituted in mass production.
2. Illuminance by CIE standard illuminant-A / 2856K, incandescent lamp.

Typical Electrical and Optical Characteristics Curves

Fig.1 Light Current vs. illuminance

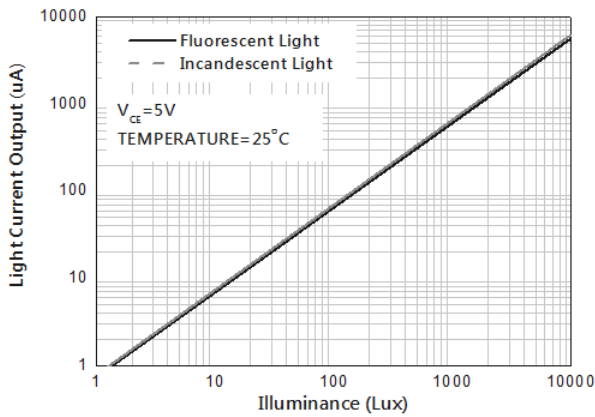


Fig.2 Output Voltage vs. illuminance

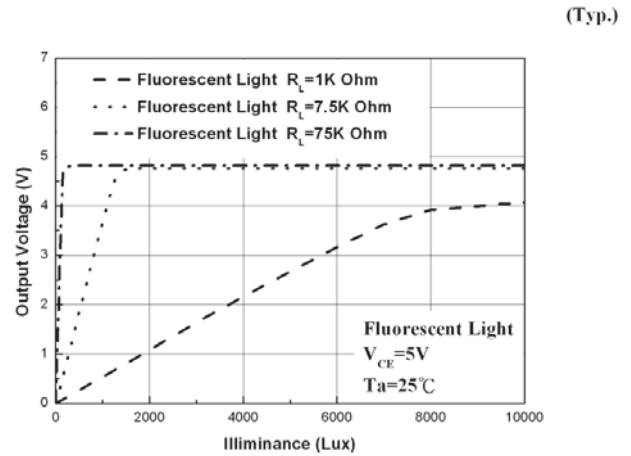


Fig.3 Spectral Response

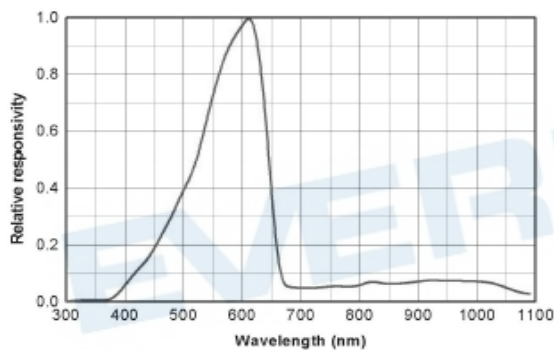


Fig.4 Light current vs. Supply Voltage

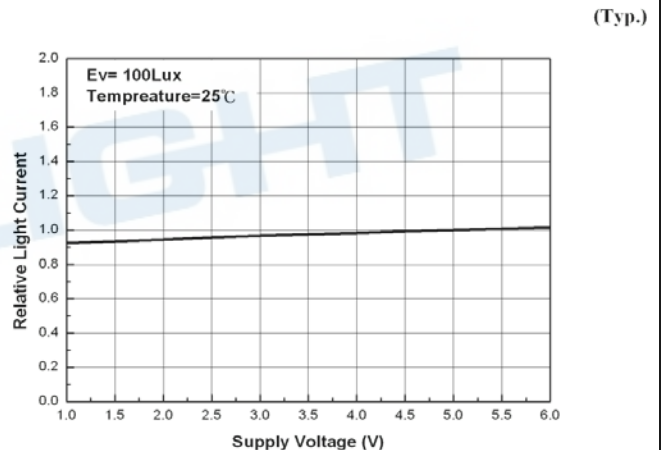


Fig.5 Light Current vs. Temperature

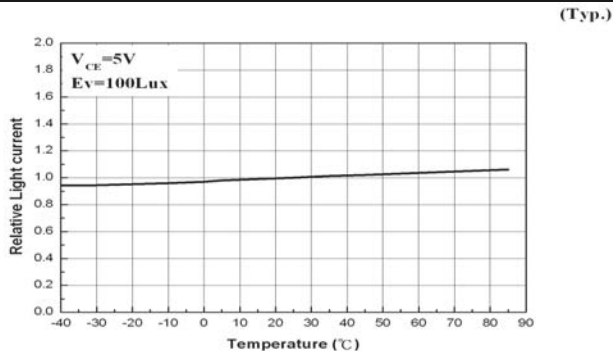
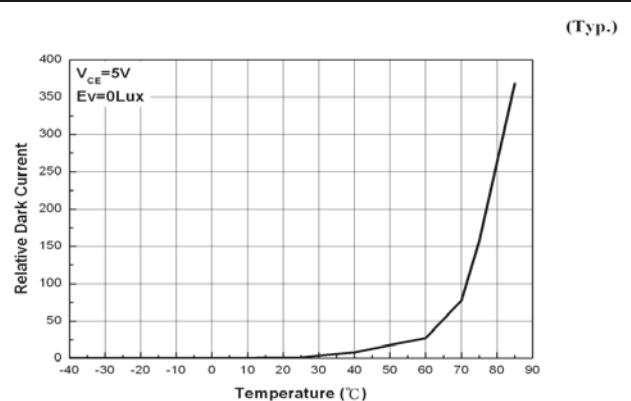
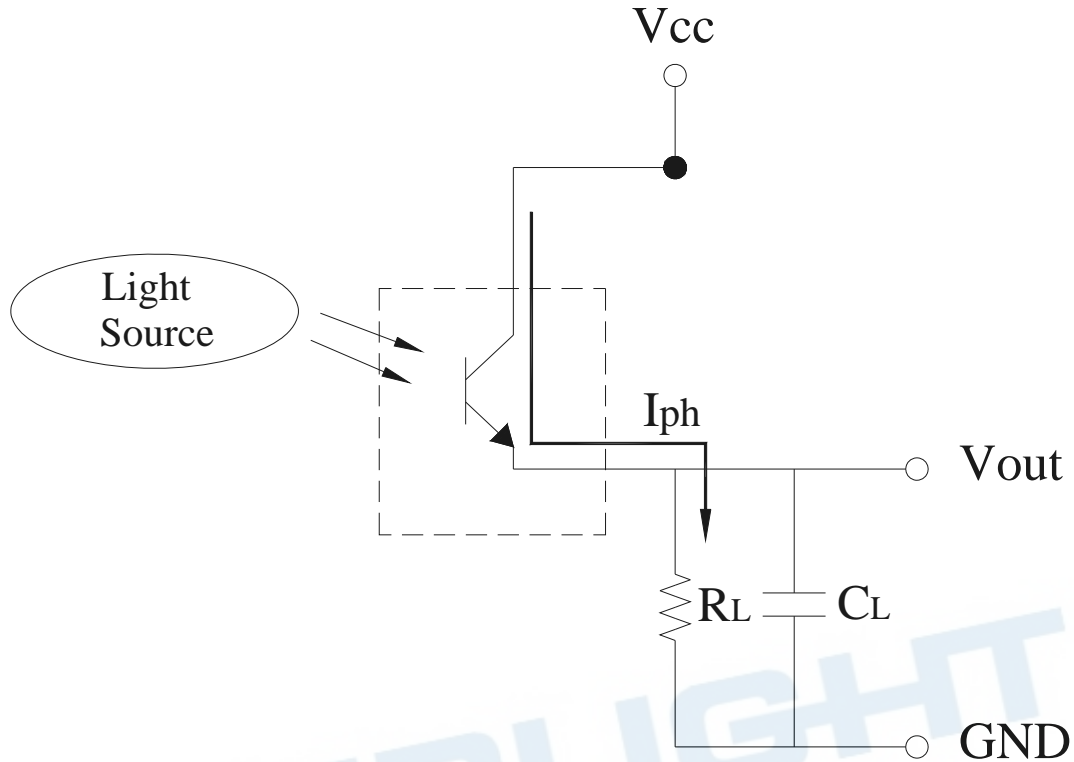


Fig.6 Dark Current vs. Temperature



Converting Photocurrent to Voltage



Note:

1. The output voltage (V_{out}) is the product of photocurrent (I_{PH}) and loading resistor (R_L)
2. A right loading resistor shall be chosen to meet the requirement of maximum ambient light, and output saturation voltage:

$$V_{out(max.)} = I_{out(max.)} \times R_L \leq V_{out(saturation)} = V_{cc} - 0.4V$$

Recommended method of storage

Dry box storage is recommended as soon as the aluminum bag has been opened prevent

1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift might cause big current happen. (Burned-out might happen).

2. Storage

- (1) Do not open moisture proof bag before components are ready to use.
- (2) Before opening moisture proof bag, components should be kept at 30°C or less and 90%RH or less.
- (3) Components should be used within a year.
- (4) After opened moisture proof bag, components should be kept at 30°C or less and 60%RH or less.
- (5) Components should be used within 24 hours after opened moisture proof bag.
- (6) If the moisture absorbent material (silica gel) has faded away or the components have exceeded the storage time, baking treatment should be performed using the following conditions. (Baking treatment: 60±5°C for 24 hours)

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Packing Quantity Specification

1. 1000PCS/1Bag , 4Bags/1Box
2. 10Boxes/1Carton

Label Format



CPN: Customer's Production Number
P/N : Production Number
QTY: Packing Quantity
CAT: Ranks
HUE: Peak Wavelength
REF: Reference
LOT No: Lot Number
MADE IN XXXXXX : Production Place

DISCLAIMER

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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