

Technical Data Sheet

Ambient Light Sensor SMD Device

ALS-PT17-51C/L177/TR8

Features

- Close to the human eye's response
- Infrared light wavelength cut off : 390nm~700nm
- Good output linearity across wide illumination range
- Size : 2.0mm(L)*1.25mm(W)*0.8mm(H)
- Package in 8mm tape on 7" diameter reel.
- High photo sensitivity & Small junction capacitance.
- Compatible with automatic placement equipment.
- Compatible with infrared and vapor phase reflow solder process.
- Pb Free
- The product itself will remain within RoHS compliant version.



Descriptions

ALS-PT17-51C/L177/TR8 Ambient Light Sensor Device, consisting of a phototransistor in miniature SMD package, which is molded in water clear with flat top. It is a good effective solution to the power saving of display backlighting of mobile appliances, such as the mobile phones and PDAs. Due to the high rejection ration of infrared radiation, the spectral response of the ambient light sensor is close to that of human eyes.

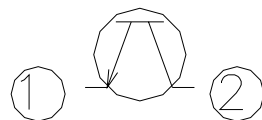
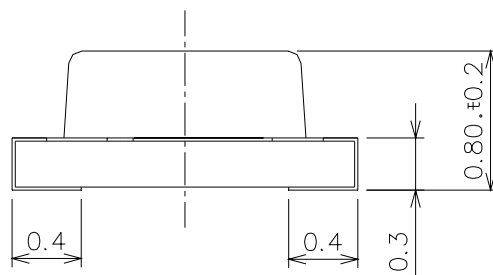
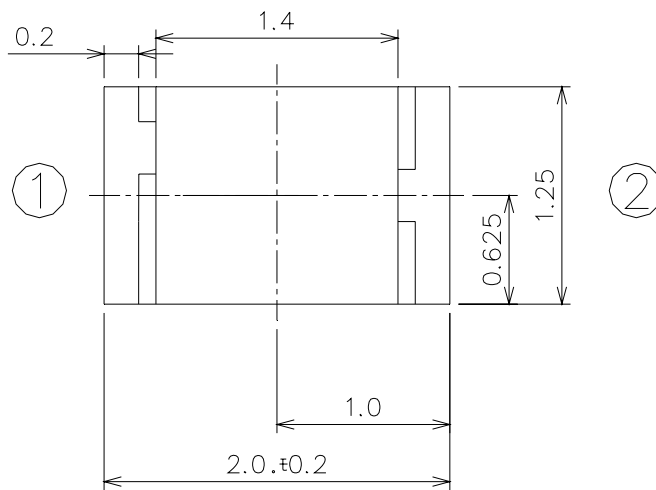
Applications

- 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, plasma TV, video camera, digital still camera
- Automatic residential and commercial management
- Automatic contrast enhancement for electronic signboard
- Ambient light monitoring device for daylight and artificial light

Device Selection Guide

PART	MATERIAL	COLOR
Chip	Silicon	---
Package	Epoxy	Clear

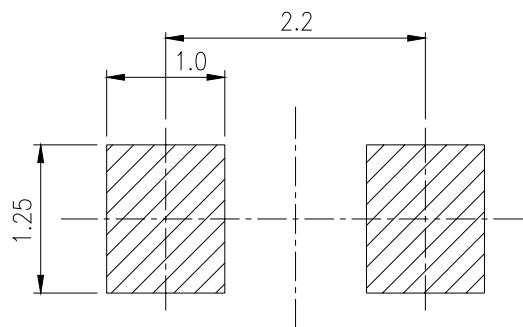
Package Dimensions



① Emitter
② Collector

Notes: 1.All dimensions are in millimeters
2.Tolerances unless dimensions $\pm 0.1\text{mm}$

For reflow soldering (propose)



Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit	Notice
Collector-Emitter Voltage	V _{CEO}	60	V	I _{CEO} =100 μA
Emitter-Collector Voltage	V _{ECO}	4	V	I _{ECO} =100 μA
Operating Temperature	T _{opr}	-25 ~ +80	°C	
Storage Temperature	T _{stg}	-40 ~ +85	°C	
Soldering Temperature	T _{sol}	260	°C	

Notes: *1:Soldering time ≤ 5 seconds.

Electro-Optical Characteristics (Ta=25°C, and V_{CE}=5V)

Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Dark Current	I _D	---	---	0.1	μA	V _{CE} =10V; E _v = 0Lx
Collector-Emitter Breakdown Voltage	BV _{CEO}	60	---	---	V	I _{CEO} =100 μA
Emitter-Collector Breakdown Voltage	BV _{ECO}	4	---	---	V	I _{ECO} =100 μA
Collector-Emitter Saturation Voltage	V _{CE(sat)}	---	---	0.4	V	I _C =10mA
Light Current (1)	I _{PH1}	---	7.5	---	μA	V _{CE} =5V; E _v = 100Lx ^[1]
Light Current (2)	I _{PH2}	---	150	---	μA	V _{CE} =5V; E _v = 1000Lx ^[1]
Light Current (3)	I _{PH3}	10	16	---	μA	V _{CE} =5V; E _v = 100Lx ^[2]
Light Current (4)	I _{PH4}	110	180	---	μA	V _{CE} =5V; E _v = 1000Lx ^[2]
Light Current (5)	I _{PH5}	760	920	---	μA	V _{CE} =5V; E _v = 1000Lx ^[3]
Saturation Output Voltage	V _O	4.5	4.6	---	V	V _{CE} =5V; E _v = 1000Lx ^[2] R _L =75KΩ
Peak Wavelength	λ _p	---	630	---	nm	
Response Wavelength	λ	390	---	700	nm	> 10% Response

Notes:

*1 : White LED is substituted in mass production.

*2 : White Fluorescent light (Color Temperature = 6500K) is used as light source.

*3 : Illuminance by CIE standard illuminant-A / 2856K, incandescent lamp.

Typical Electro-Optical Characteristics Curves

Fig.-1 Illuminance vs. Output Phtocurrent

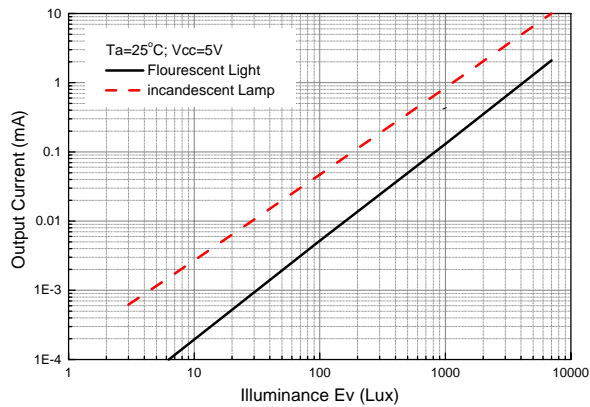


Fig.-2 Illuminance vs. Output Voltage

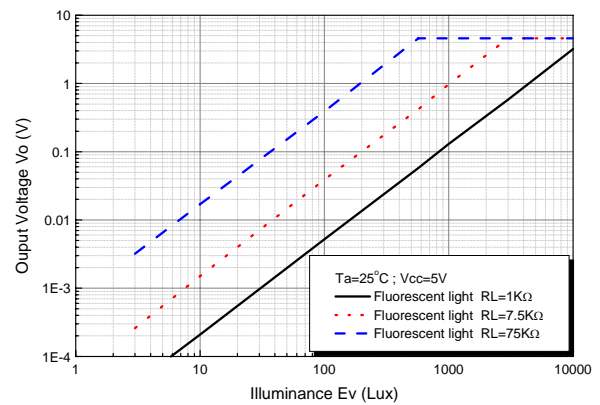
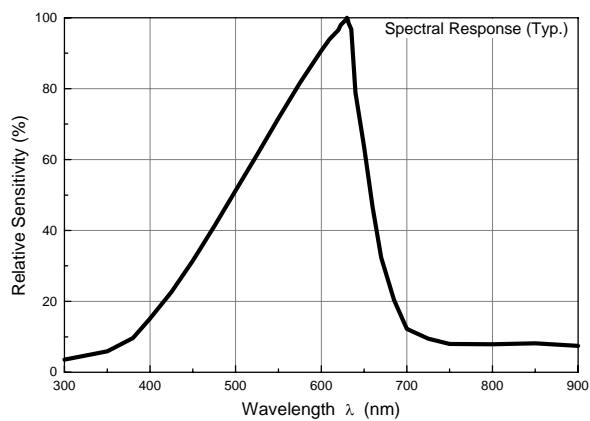
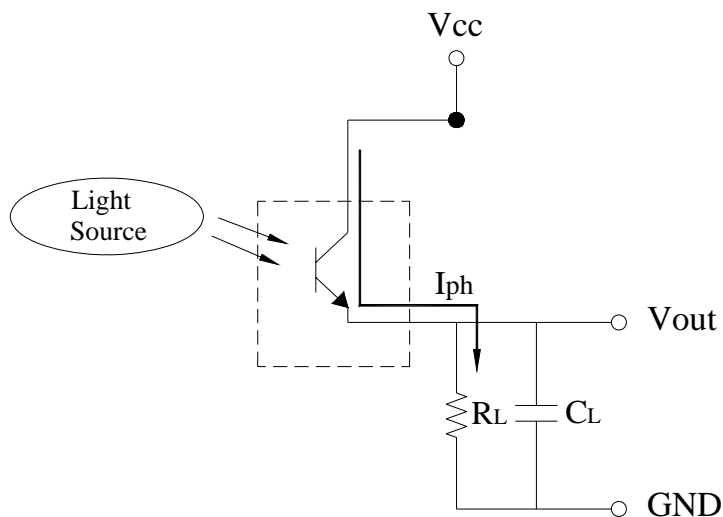


Fig.-3 Spectral Response



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:

$$V_{out(max.)} \cdot I_{out(max.)} \cdot R_L \leq V_{out(saturation)} \cdot V_{cc} \quad 0.4V$$

Precautions For Use**1. Over-current-proof**

Customer must apply resistors for protection , otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the LEDs should be kept at 30°C or less and 90%RH or less.

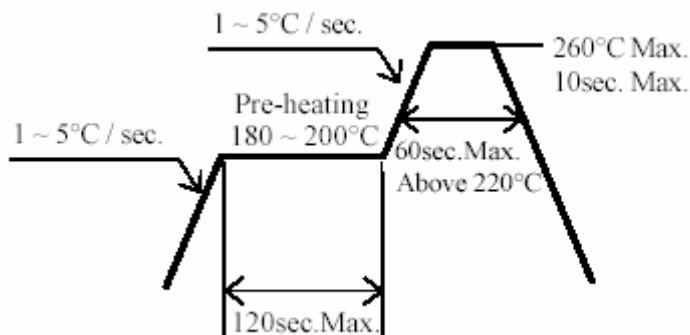
2.3 The LEDs should be used within a year.

2.4 After opening the package, the LEDs should be kept at 30°C or less and 70%RH or less.

2.5 The LEDs should be used within 168 hours (7 days) after opening the package.

2.6 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment : $60\pm5^{\circ}\text{C}$ for 24 hours.

3. Soldering Condition**3.1 Pb-free solder temperature profile**

3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

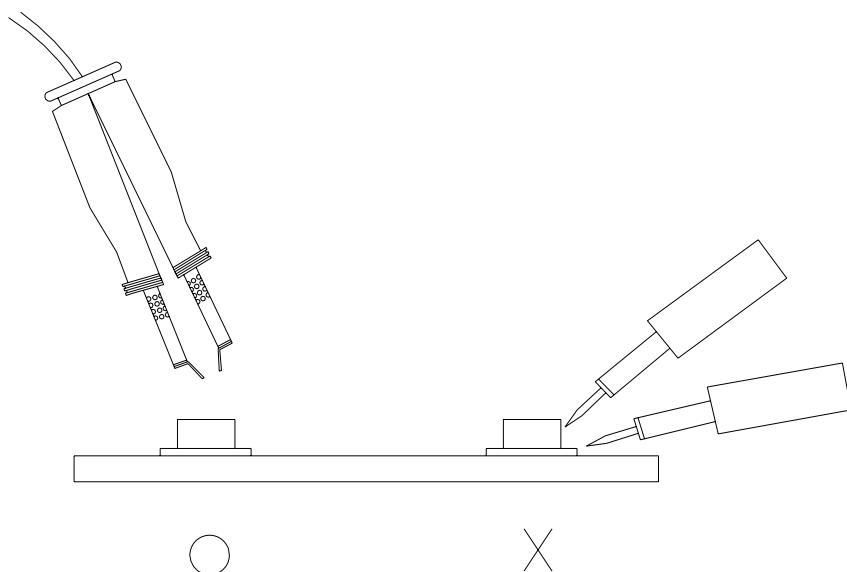
3.4 After soldering, do not warp the circuit board.

4.Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 280°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5.Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



Reliability Test Item And Condition

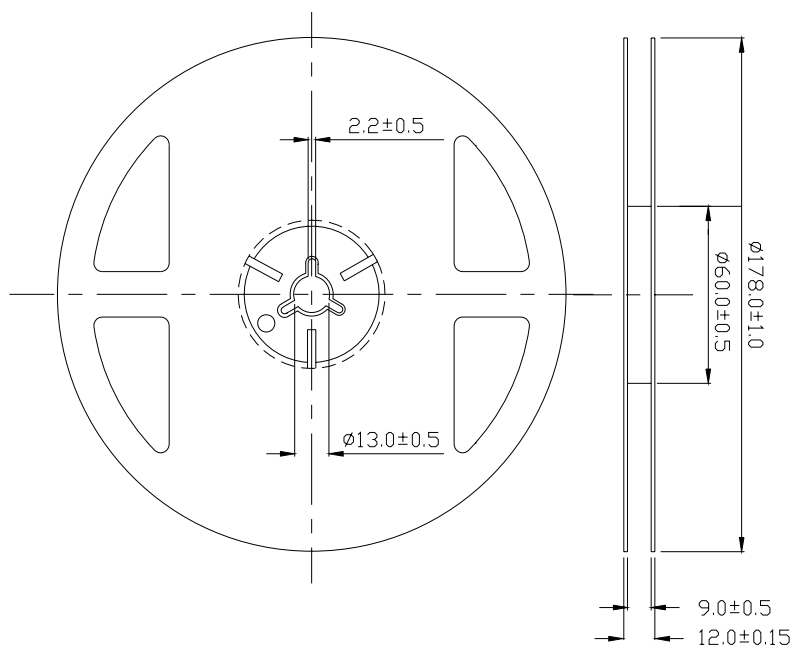
The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

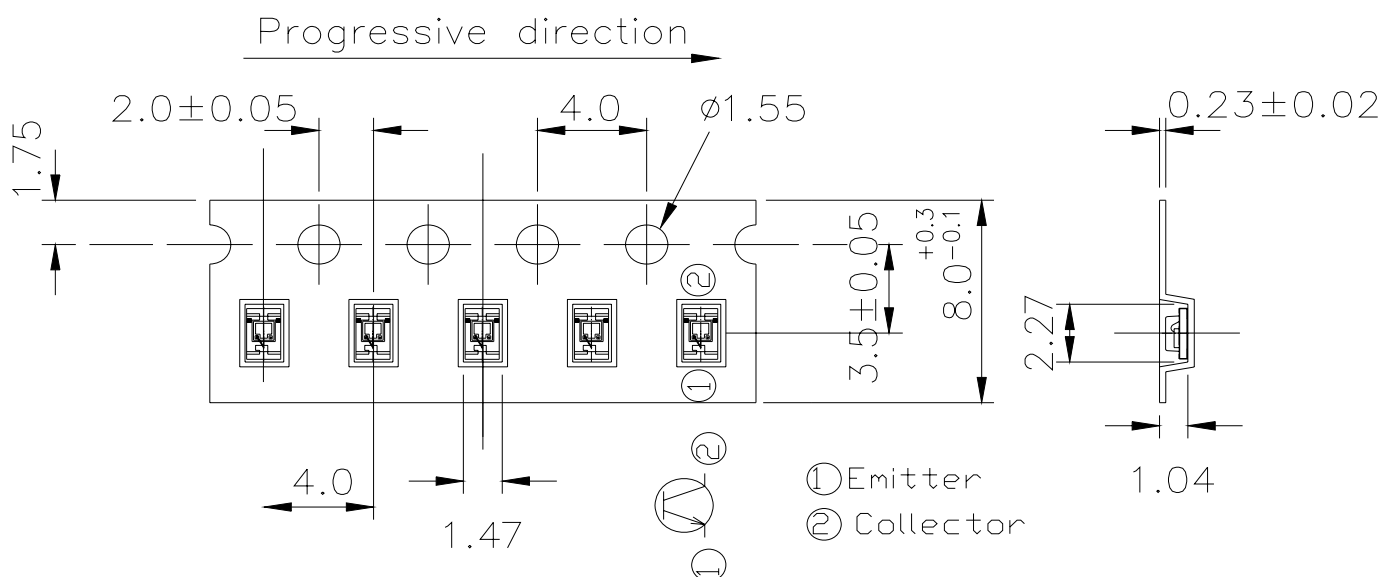
NO.	Item	Test Conditions	Test Hours/ Cycles	Sample Sizes	Failure Judgement Criteria	Ac/Re
1	REFLOW Soldering	TEMP. : $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ 5secs	6Mins	22pcs	$I_{C(ON)} \leq L \times 0.8$ L : Lower Specification Limit	0/1
2	Temperature Cycle	H : $+100^{\circ}\text{C}$ 15mins \updownarrow 5mins L : -40°C 15mins	50Cycles	22pcs		0/1
3	Thermal Shock	H : $+100^{\circ}\text{C}$ 5mins \updownarrow 10secs L : -10°C 5mins	50Cycles	22pcs		0/1
4	High Temperature Storage	TEMP. : $+100^{\circ}\text{C}$	1000hrs	22pcs		0/1
5	Low Temperature Storage	TEMP. : -40°C	1000hrs	22pcs		0/1
6	DC Operating Life	$V_{CE}=5\text{V}$	1000hrs	22pcs		0/1
7	High Temperature/ High Humidity	85°C / 85% R.H	1000hrs	22pcs		0/1

Package Dimensions



Note: The tolerances unless mentioned are ± 0.1 , Unit = mm.

Carrier Tape Dimensions:



Note: Tolerances Unless Dimension is ± 0.1 mm , Unit = mm



ALS-PT17-51C/L177/TR8

Packing Quantity Specification

1. 3000 PCS/1 Reel
2. 10 Reel /1Carton

Label explanation



CPN: Customer's Production Number

P/N : Production Number

QTY: Packing Quantity

CAT: Ranks

HUE: None

REF: Reference

LOT No: Lot Number

MADE IN TAIWAN: Production Place

Notes

1. Above specification may be changed without notice. EVERLIGHT will reserve authority on material change for above specification.
2. 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 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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