Ambient Light Sensor
Surface - Mount
ALS-PT19-315C/L177/TR8

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
- Guaranteed temperature performance, -40°C to 85°C
- Wide supply voltage range, 2.5V to 5.5V
- Size : 1.7mm(L)*0.8mm(W)*0.6mm(H)
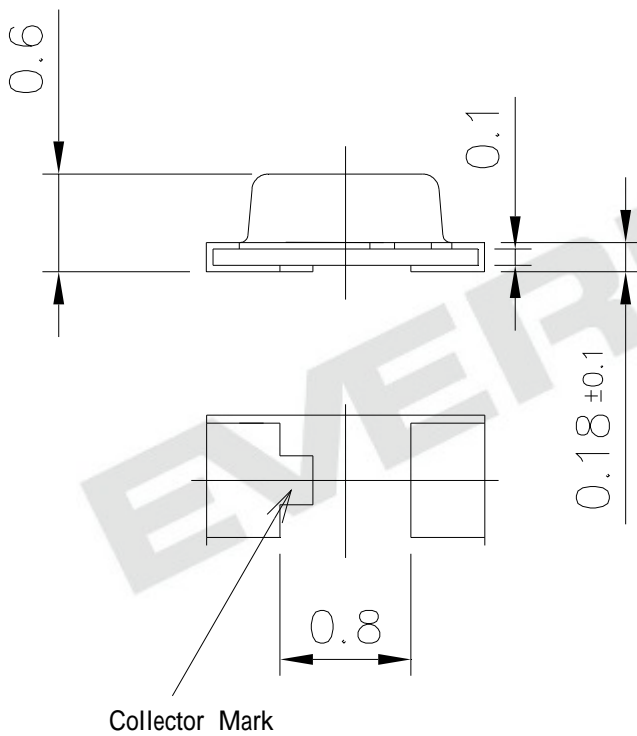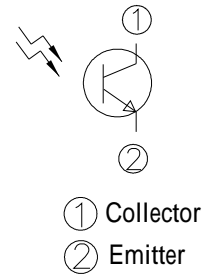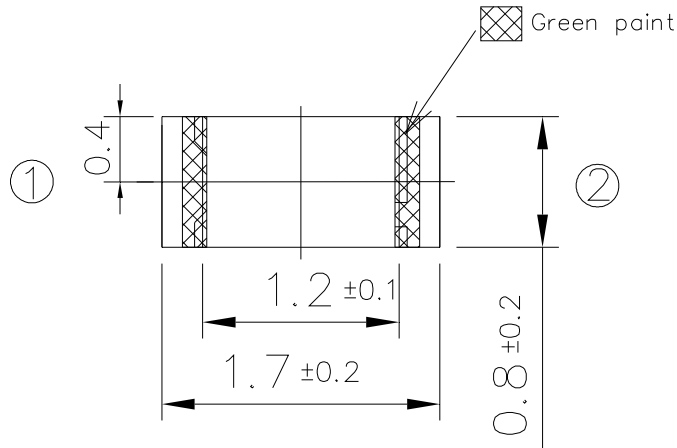- RoHS compliant and Pb Free package

Description

The ALS-PT19-315C/L177/TR8 is a low cost ambient light sensor, consisting of phototransistor in miniature SMD. EVERLIGHT ALS series product are a 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 that of human eyes.
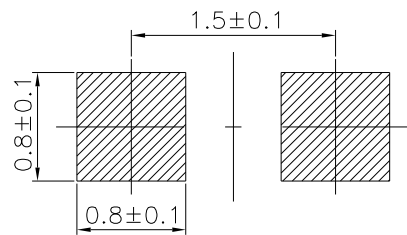
Applications

- 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 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

LifecyclePhase: Approved   Expired Period: Forever

Package Dimensions

Top View

Green paint

0.4

① ②

1.2 ±0.1

1.7 ±0.2

0.8 ±0.2

① Collector

② Emitter

0.6

0.1

0.18 ±0.1

For reflow soldering (proposal)

1.5±0.1

0.8±0.1

0.8±0.1

0.8

Collector Mark

Bottom View

Unit : mm
Tolerances : ±0.1mm

LifecyclePhase: Approved   Expired Period: Forever

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
Soldering Temperature Range [Note1]	T_{sol}	260 ± 10	°C

Note1: For detail reflow time and the recommended temperature profile, please refer to page 8.

Recommended Operating Conditions

Parameter	Symbol	Min.	Max.	Unit
Operating Temperature	T_{opr}	-40	+85	°C
Supply Voltage	V_{CC}	2.5	5.5	V

LifecyclePhase: Approved   Expired Period: Forever

Electrical and Optical Characteristics (T$_a$=25   )

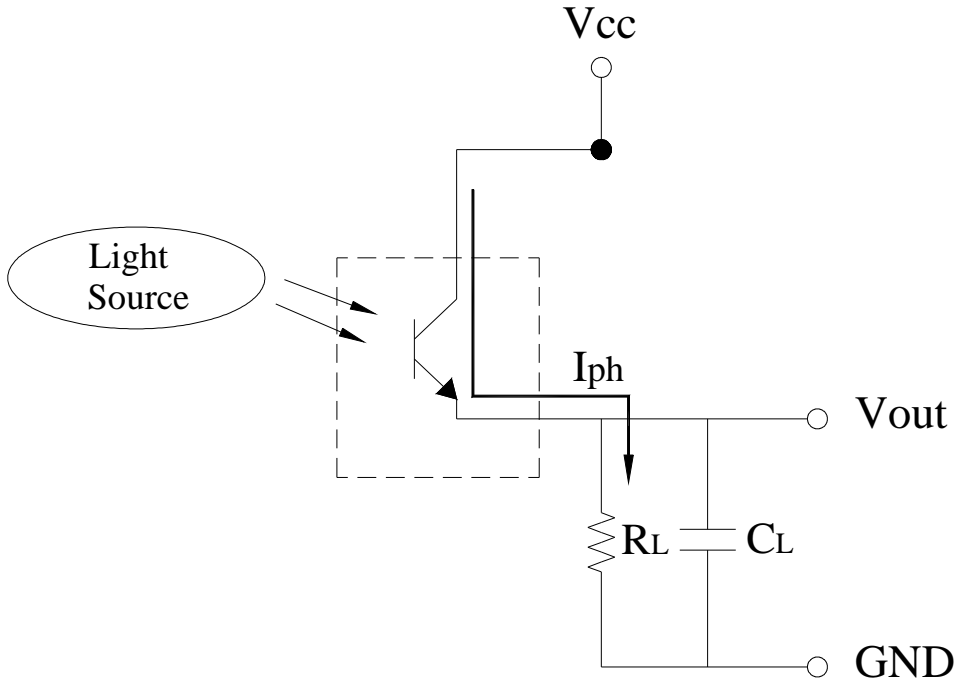| Parameter	Symbol	MIN.	TYP.	MAX.	Unit	Test Condition
Dark Current	I$_{CEO}$	---	---	0.1	uA	V$_{CE}$=10V, Ev= 0Lux
Collector-Emitter Saturation Voltage	V$_{CE(sat)}$	---	---	0.4	V	I$_C$=2mA, Ev= 1000Lux
Light Current	I$_{PH1}$	5	15	---	uA	V$_{CE}$=5V, Ev= 100Lx [Note1]
	I$_{PH2}$	50	150	---	uA	V$_{CE}$=5V, Ev= 1000Lx [Note1]
	I$_{PH3}$	140	520	---	uA	V$_{CE}$=5V, Ev= 1000Lx [Note2]
Photocurrent Ratio	I$_{PH3}$/ I$_{PH2}$	---	3.5	---	---	V$_{CE}$=5V, Ev= 1000Lx
Saturation Output Voltage	Vo	4.5	4.6	---	V	Vcc=5V, Ev= 1000Lx R$_L$=75K [Note2]
Peak Sensitivity Wavelength	λ$_p$	---	630	---	nm	---
Sensitivity Wavelength Range	λ	390	---	700	nm	---
Rise time	tr	---	0.11	---	ms	V$_{CC}$ = 5 V R$_L$ = 7.5KΩ
Fall time	tf	---	0.22	---	ms	

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　(LED) Light Current vs. Illuminance
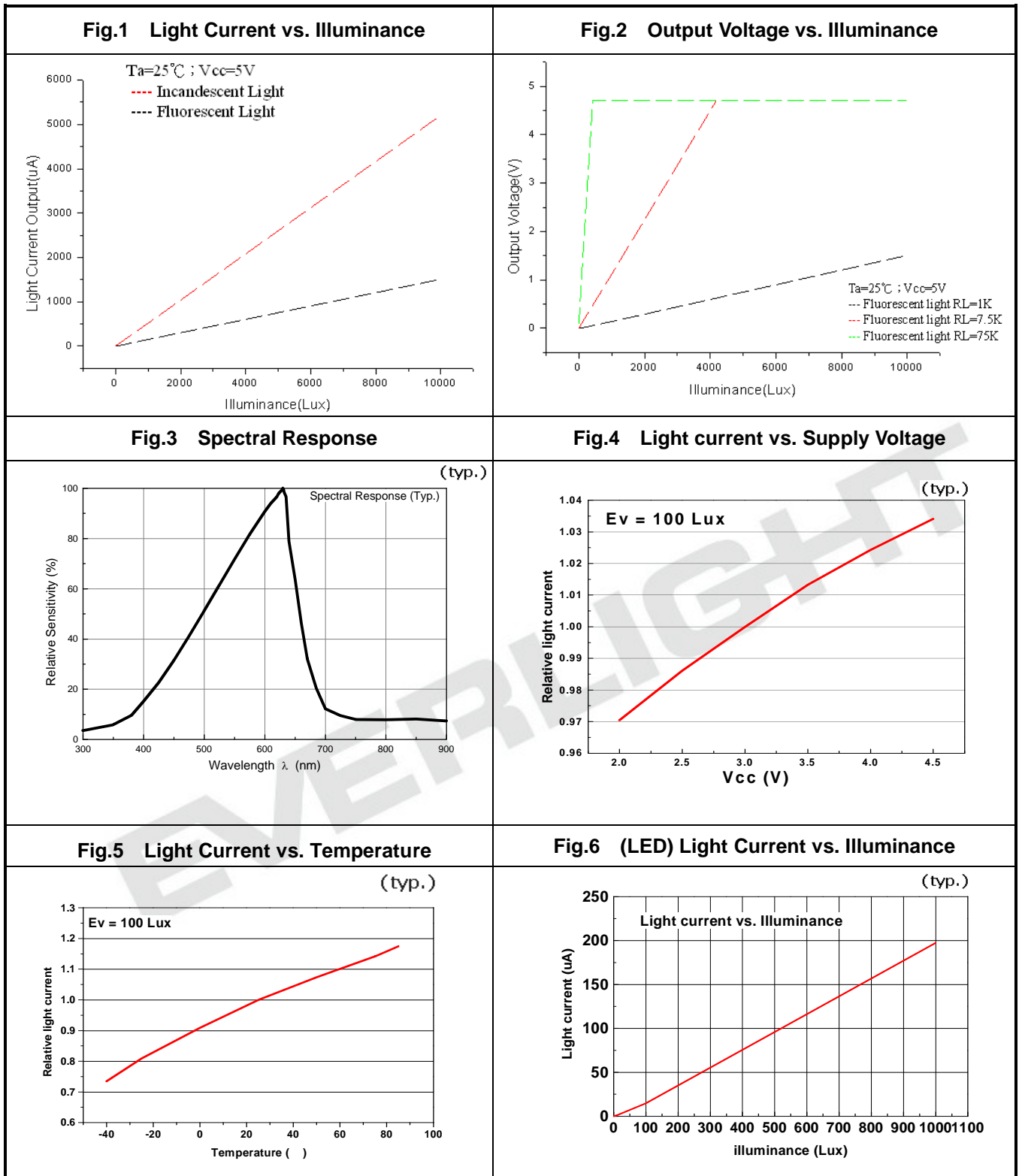
Converting Photocurrent to Voltage

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:

$$V_{out(max.)} = I_{PH(max.)} \times R_L \qquad V_{out(saturation)} \quad V_{cc} \quad 0.4V$$

$$R_L \times C_L \quad 0.5 \quad \text{(empirical data)}$$

Recommended method of storage

Reflow Terms: JEDEC Level 4 Specification

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   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   or less and

       70%RH or less.

   (5) Components should be used within 72 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   for 24 hours)

ESD Precaution:

Proper storage and handing procedures should be followed to prevent ESD damage to
the devices especially when they are removed from the Anti-static bag. Electro-Static Sensitive Devices warning
labels are on the packing.

LifecyclePhase: Approved   Expired Period: Forever

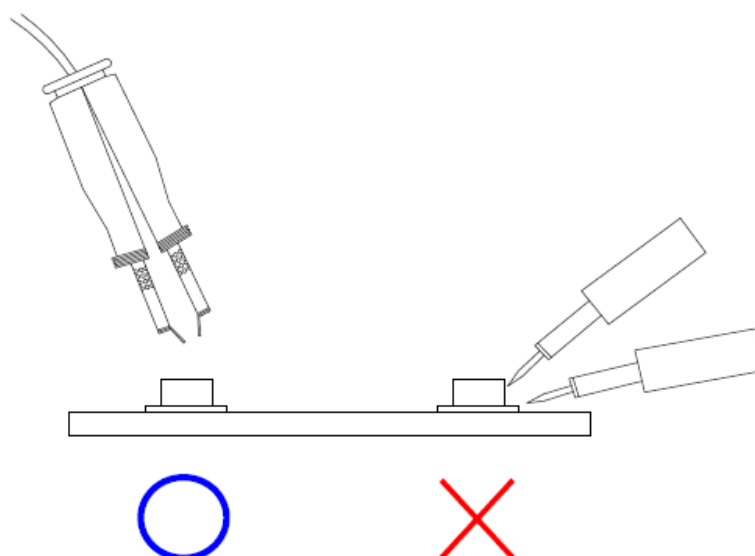**EVERLIGHT**

Recommended Solder Profile
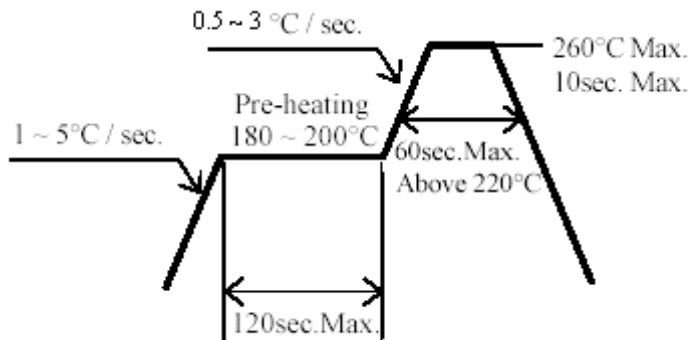
Notice:

   (1) Reflow soldering should not be done more than two times.

   (2) When soldering, do not put stress on the devices during heating.

   (3) After soldering, do not warp the circuit board.

Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350　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.
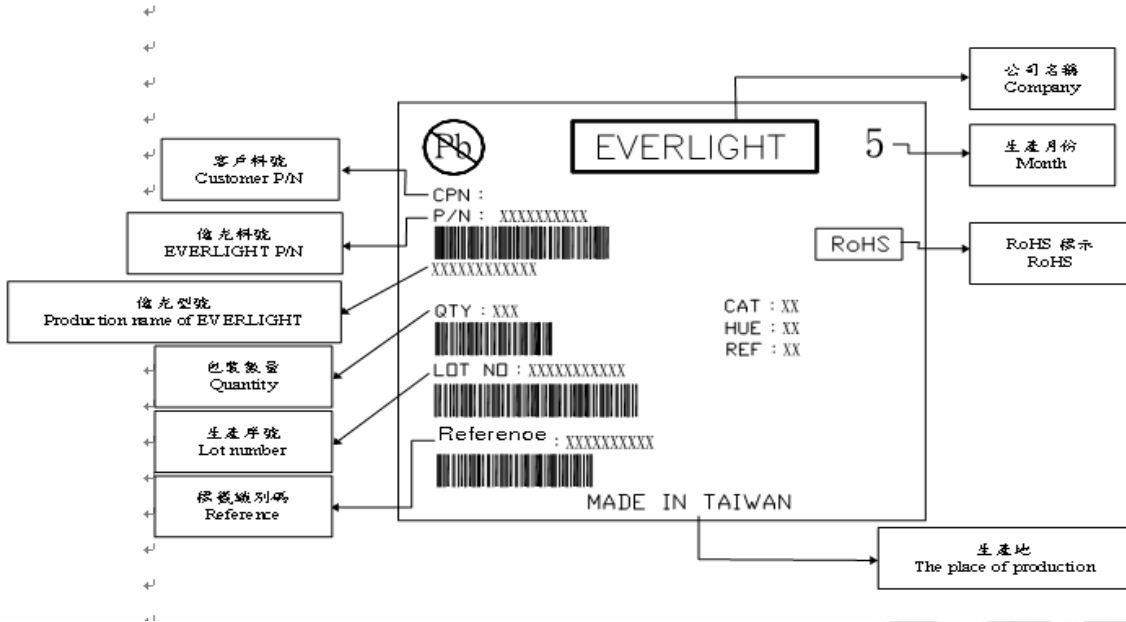
Repairing

Repair should not be done after the device 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 device will or will not be damaged by repairing.
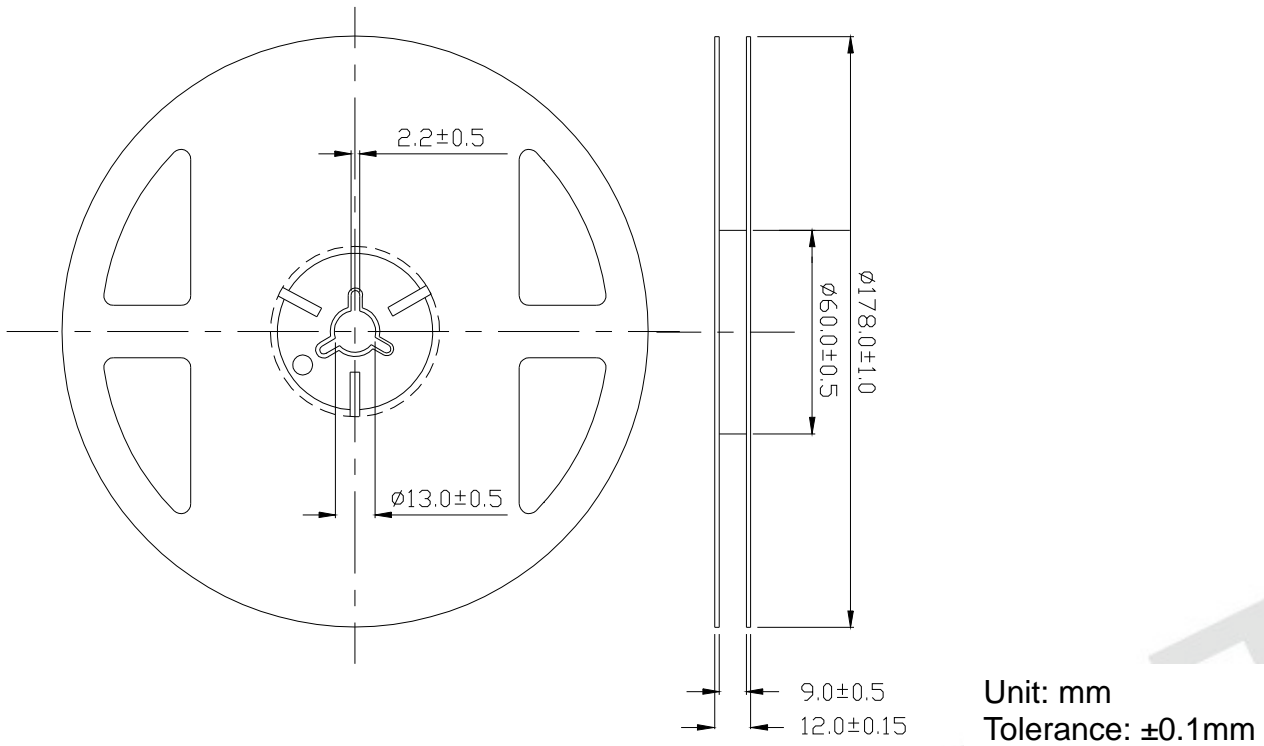
　www.everlight.com

LifecyclePhase:　Approved　　　　Expired Period: Forever

Packing Quantity Specification

4000 PCS/ 1 Reel

Label Format

Reel Dimensions

2.2±0.5

∅178.0±1.0
∅60.0±0.5
∅13.0±0.5

9.0±0.5
12.0±0.15

Unit: mm
Tolerance: ±0.1mm

Tape Dimensions

Progressive direction

2.0±0.05   4.0   1.50 $^{+0.10}_{-0.0}$ 0.25

1.75

3.5±0.05   8.0 $^{+0.3}_{-0.1}$ 1.83

4.0   0.90   0.83

② Emitter
① Collector

Unit: mm
Tolerance: ±0.1mm