

1PLB86V61A1D1001

◆Outline (L* H): 7.50*3.00*2.20 mm

◆Photo Link Light Transmitter Unit



Table of Contents

Product Code Method-----	2
Maximum Rating-----	2
Electronic-Optical Characteristics-----	3
Measuring Method -----	4
System Configuration Example-----	6
Application Circuit-----	6
Outline Dimensions -----	7
Packing-----	8
Precautions -----	9
Test Items and Results of Reliability-----	12

Features

- Unit-directional data transmission using plastic fiber
- High speed signal transmission.(16Mbps NRZ Signal)
- Operating Voltage: 2.7 to 5.5V.
- TTL and high speed C-MOS logic compatible.
- RoHS and REACH-compliant

Applications

- TVs
- Digital audio video equipment
- DVD player
- CD player
- STB



1 - PL - B - 86 - V61A - 1 - D - 1 - 0 - 01

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

①	②	③	④	⑤
Process Type	Product Type	Specification	Lead Frame Code	Dice Wavelength & Luminous Rank
1: normal process	PL: Photo Link	A: Encap B: Molding	86: one kind of frame	Vxxx : red
⑥	⑦	⑧	⑨	⑩
IC Code	Data rate Maximum	Appearance Code	Special Process Requirements	Assembly code
1: one kind of IC	D: 16Mbps	1: one kind of shape	0: normal	01: no expression above meaning for company

■ Maximum Rating(Ta=25℃)

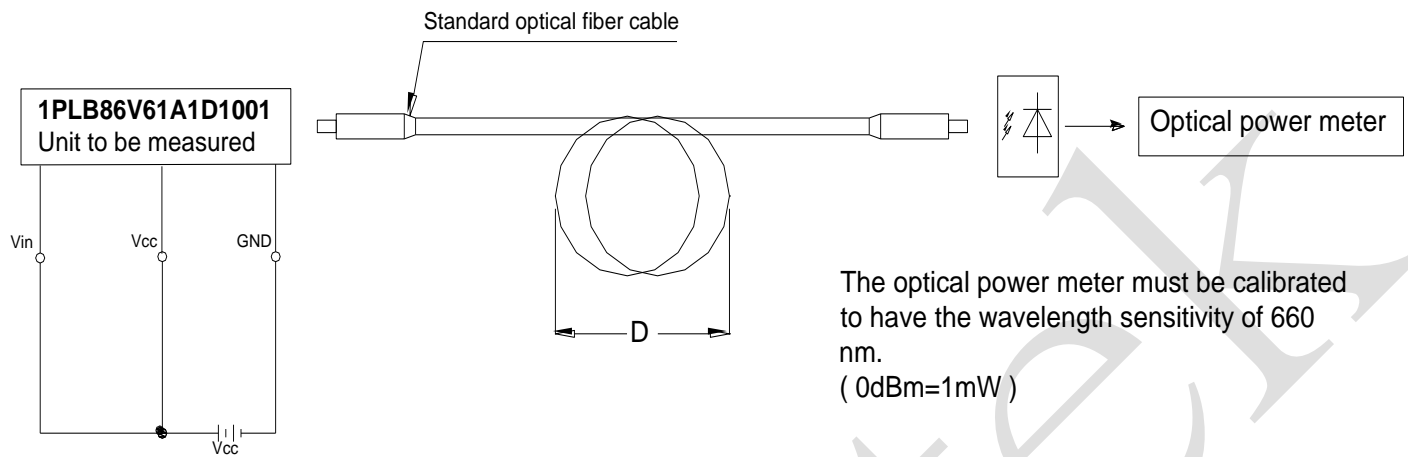
Characteristics	Symbol	Rating	Unit
Supply Voltage	Vcc	2.7~5.5	V
Operating Temperature	Topr	-40~80	℃
Storage Temperature	Tstg	-40~100	℃
Soldering Temperature	Tsol	260	℃

Notes: The maximum of soldering time is 5 seconds in T_{SD}



Characteristics	Symbol	Min.	Typ.	Max.	Unit	Test condition
Peak wavelength	λ_p	-	660	-	nm	
Operating supply voltage	V _{cc}	2.7	3.0	5.5	V	
Data rate	T	DC	-	16.0	Mbps	NRZ code
Transmission Distance	D	0.2	-	20	m	Using All Plastic Fiber (970/1000 μ m) and TORX179
Optical power output	P _f	-21	-17	-15	dBm	Refer to Fig. 1
Dissipation current	I _{cc}	-	-	10	mA	Refer to Fig. 2
High level input voltage	V _{iH}	2.0	-	V _{cc}	V	Refer to Fig. 2
Low level input voltage	V _{IL}	0	-	0.8	V	Refer to Fig. 2
Low→High delay time	t _{PLH}	-	-	100	ns	Refer to Fig. 3
High→Low delay time	t _{PHL}	-	-	100	ns	Refer to Fig. 3
Rise time	t _r	-	10	20	ns	Refer to Fig. 3
Fall time	t _f	-	10	20	ns	Refer to Fig. 3
Pulse width distortion	Δ tw	-20	-	+20	ns	Refer to Fig. 3
Jitter	Δ t _j r	-	2	15	ns	Refer to Fig. 3

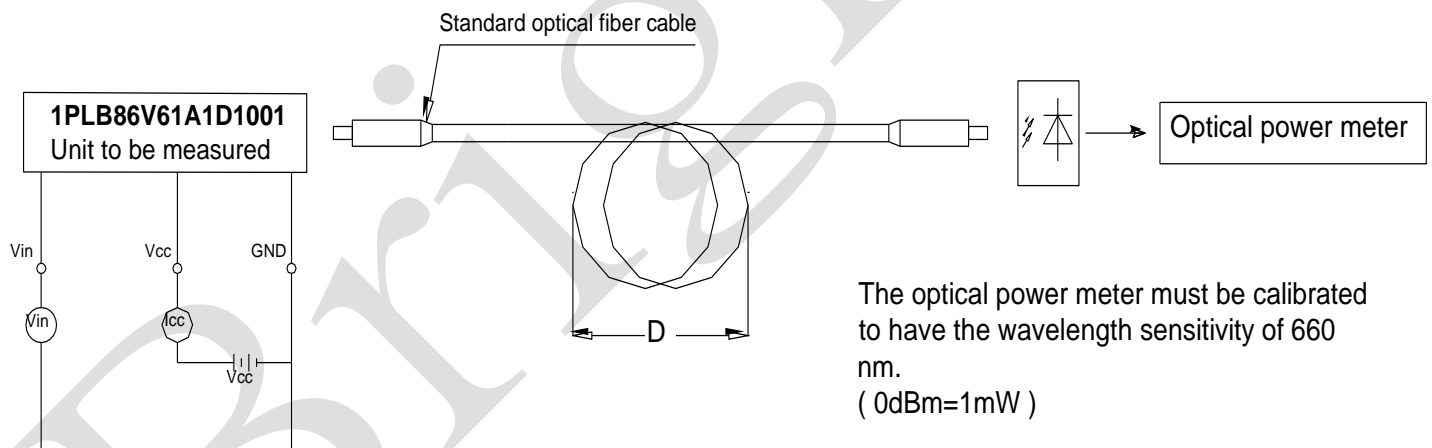
Fig.1 Measuring Method of Optical Output Coupling with Fiber.



Notes: (1) Vcc=3.0V (State of operating)

(2) To bundle up the standard fiber optic cable, make it into a loop with the diameter D=10cm or more.

Fig.2 Measuring Method of Input Voltage and Supply Current.

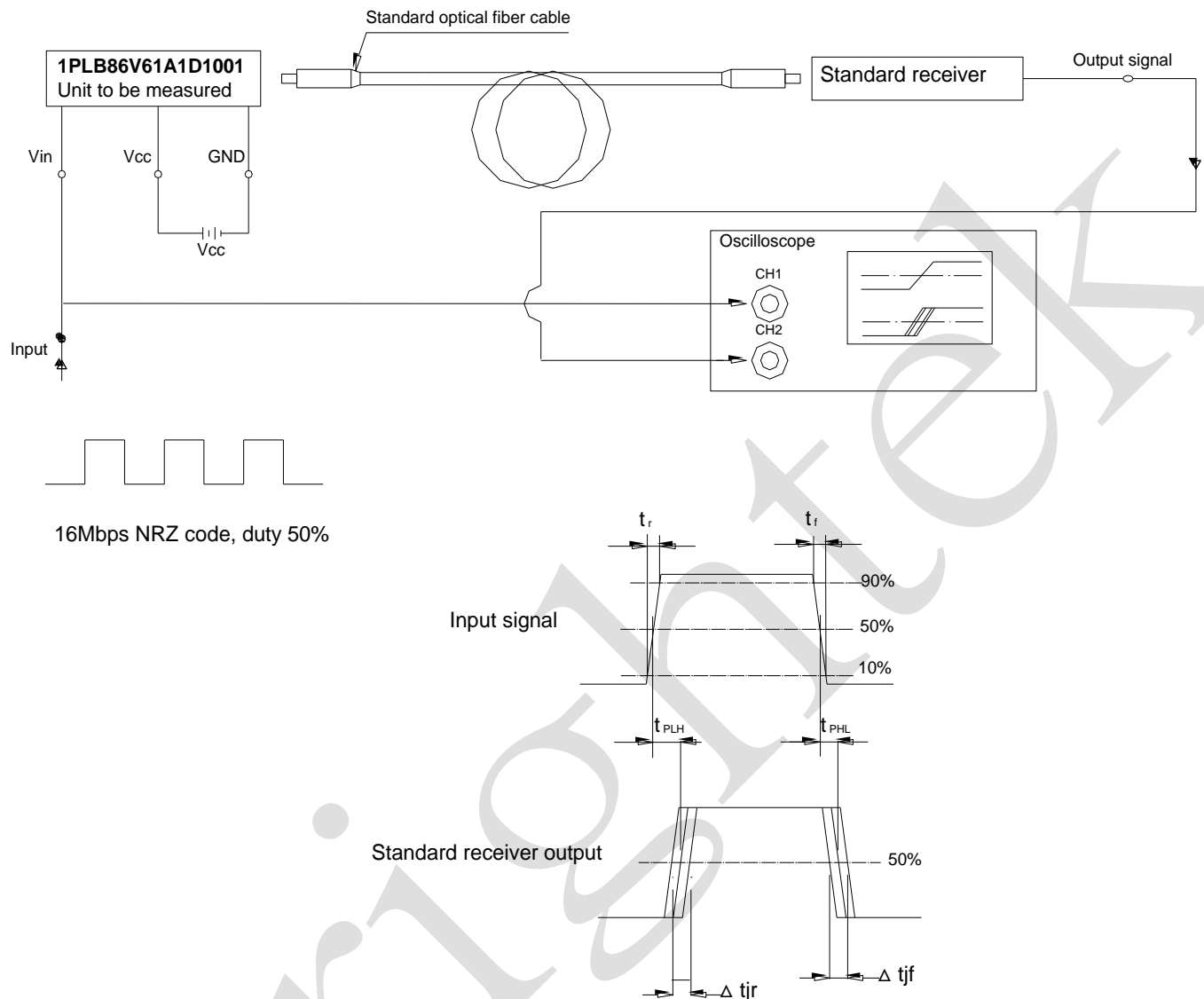


Input conditions and judgment method Supply Current

Conditions	Judgment method
Vin=2.0V or more	-21 dBm ≤ Pc ≤ -15 dBm, Icc=10mA or less
Vin=0.8 V or less	Pc ≤ -36 dBm, Icc=10mA or less

Notes: Vcc=3.0V (State of operating).

Fig.3 Measuring Method of Pulse Response and Jitter.



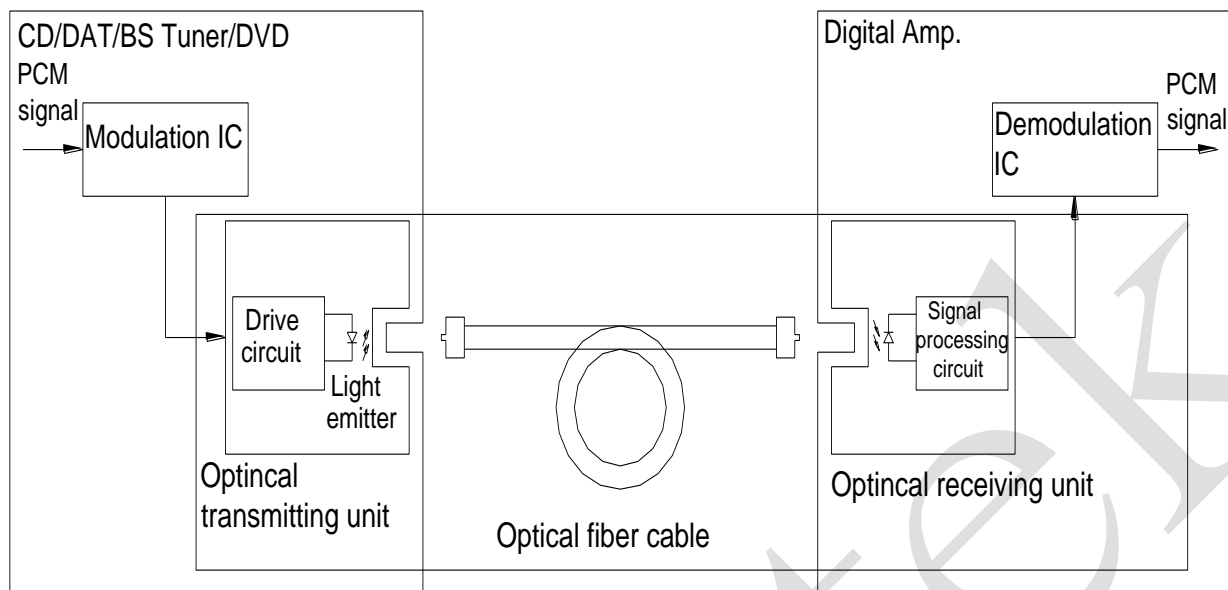
Test item

Test item	Symbol	Test item
Low→High pulse delay time	t_{PLH}	Refer to the above prescriptions.
High→Low pulse delay time	t_{PHL}	Refer to the above prescriptions.
Pulse width distortion	Δtw	$\Delta tw = t_{PHL} - t_{PLH}$.
Low→High Jitter	Δt_{jr}	Set the trigger on the rise of input signal to measure the jitter of the rise of output.
High→Low Jitter	Δt_{jf}	Set the trigger on the fall of input signal to measure the jitter of the fall of output.

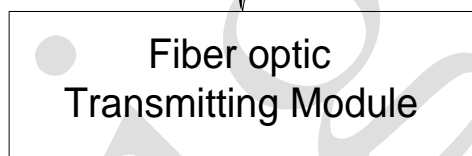
Notes: (1) The waveform write time shall be 4 seconds. But do not allow the waveform to be distorted by increasing the brightness too much.

(2) $V_{cc}=3.0V$ (State of operating)

(3) To probe for the oscilloscope must be more than $1M\Omega$ and less than $10pF$.

**Application Circuit**

Fiber optic connector insertion side



①

②

③

Vin

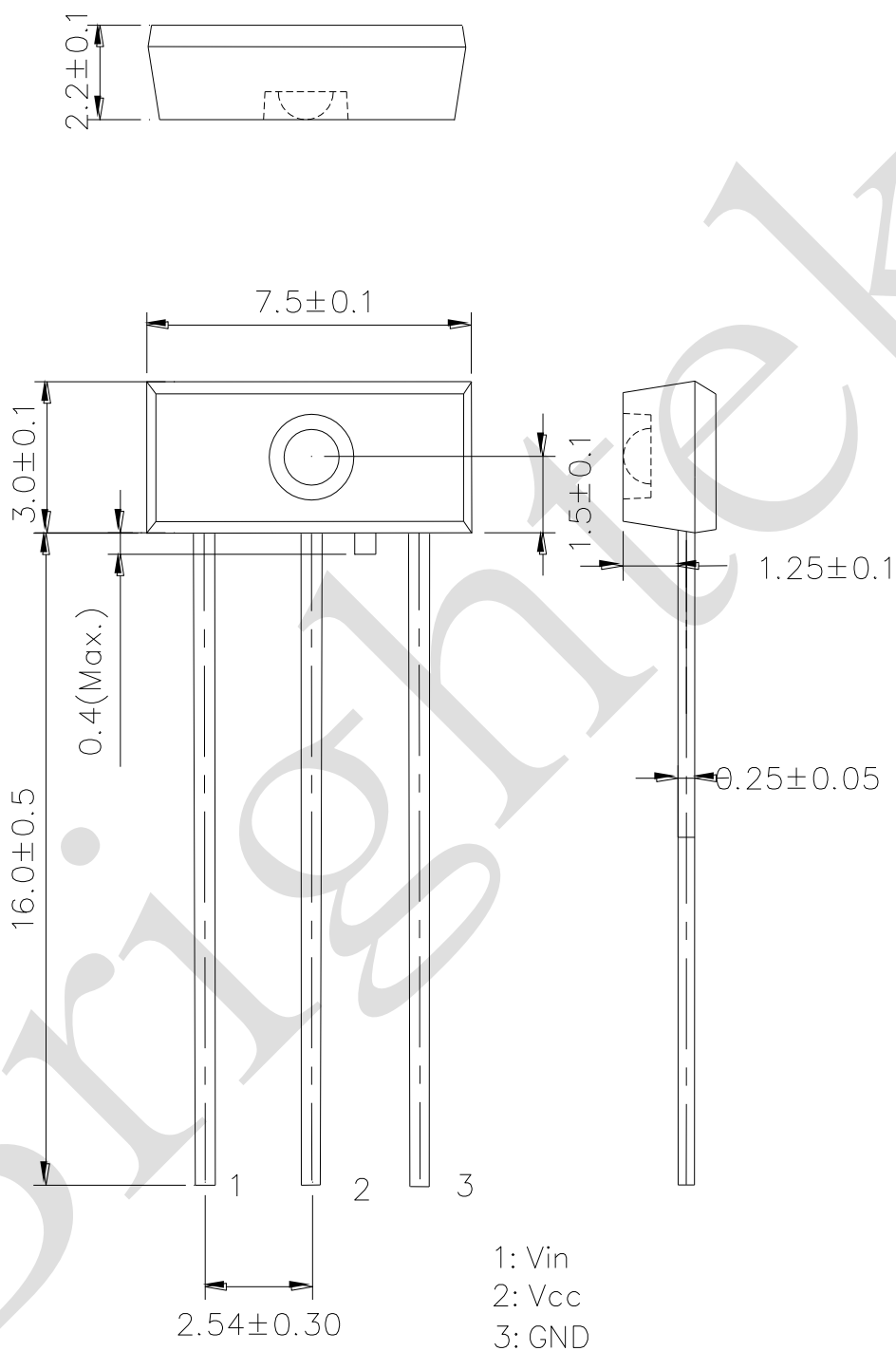
Vcc

GND

(Bottom View)

Less than 7 mm

0.1 μ F

**BRIGHTTEK****OPTOELECTRONIC CO.,LTD****Dimensions****The Infrared Series****Notes:**

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ ($0.01''$) unless otherwise specified.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.



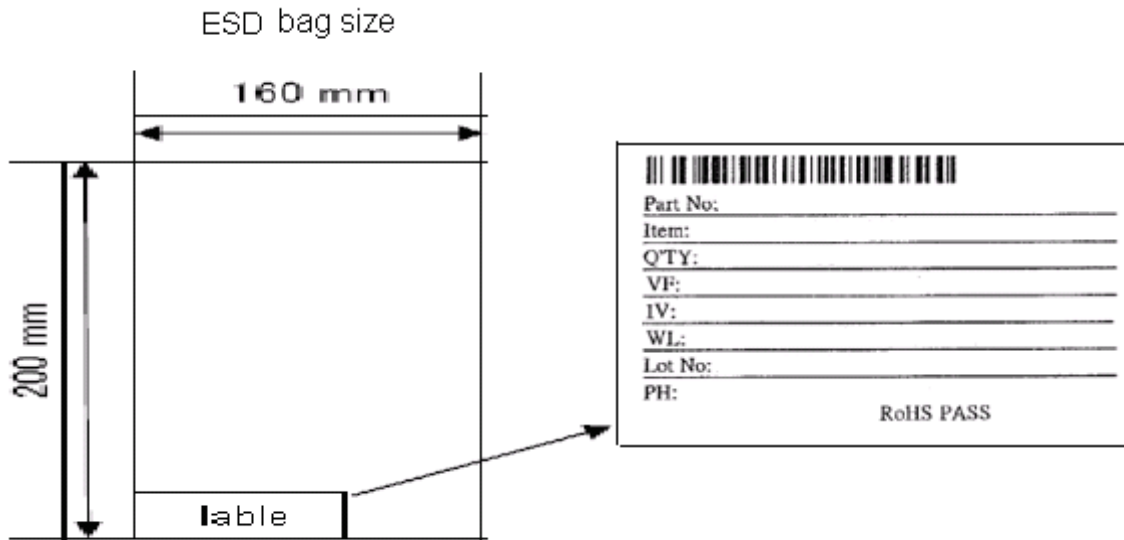
BRIGHTTEK

OPTOELECTRONIC CO.,LTD

■ **Packing**

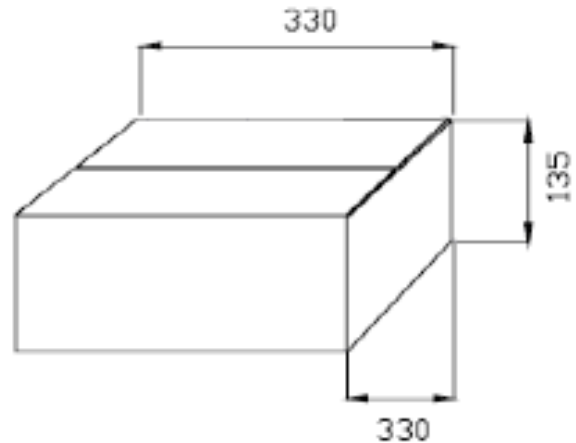
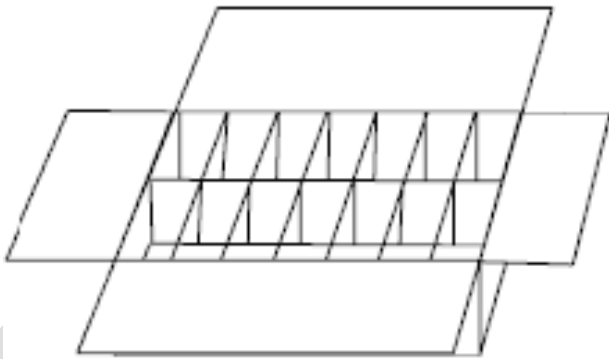
The Infrared Series

1. Package bag: vinyl bag(1000pcs per bag)
2. Label: label as below(label on the left)



3. Package

- 3.1. ESD bag: 12bags per carton (12,000pcs per carton)
- 3.2. Carton size: 330*135*330mm



4. Falling

The falling off of the device: we have to ensure the max loss number of LAMP is 2pcs.

5. Different rank

The product of different rank will be separate in the same box



A. Storage

It can be stored for 3 months under conditions of Temperature 23 ± 5 and humidity 40-70%. During storage, there must not be any damage to the sealed bag, and if opened once, do not store again. After the package is opened, the products should be used within one week under the same temperature and humidity.

B. Cleaning

Do not use any unidentified chemical to clean LEDs, it could damage or crack the LED epoxy surface. If necessary, soak LED in alcohol for a time not exceeding one minute in normal temperature.

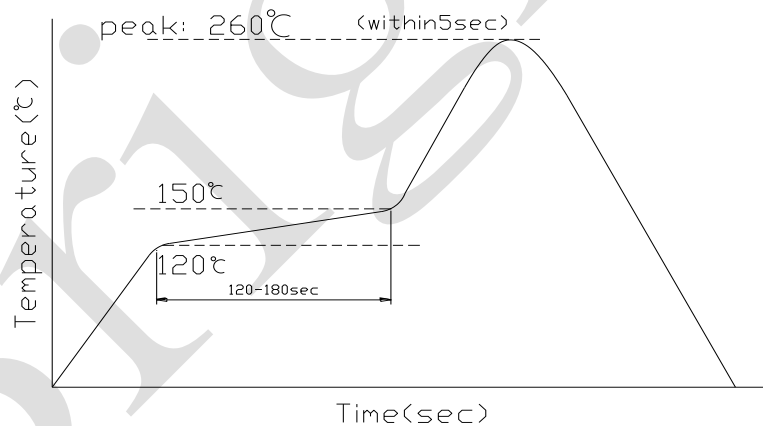
C. Lead Frames Shaping & Trimming

1. The shaping should be done underneath the wedge point. No pressure should be exerted to the epoxy shell of the LED during shaping.
2. Shaping of the leads should be done before soldering.
3. Lead trimming should only be done at normal temperature.

D. Soldering

1. When soldering, the soldering iron needs to be at least 1.6mm away from the epoxy edge. Do not apply any pressure to the epoxy encapsulation or the lead frame during the soldering process.

2. When reflow soldering or wave soldering, please solder once for less than 5 seconds at a maximum temperature of 265°C . During the soldering process, if the temperature or timing is not controlled within limits, it would cause the epoxy to deform or cause the die or wires within the LED to be damaged.



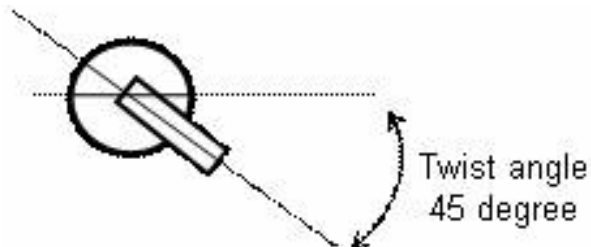
3. When using soldering iron, please solder once for less than 5 seconds at a maximum temperature of $350^{\circ}\text{C}\pm 10^{\circ}\text{C}$. When soldering a row of LED on a PCB, please do not solder both leads of a LED in sequence. (Solder the positive lead at first, then the negative leads)

4. Do not dip the epoxy encapsulation part of LED into any soldering paste liquid.
5. After soldering, do not adjust the location of the LED anymore.

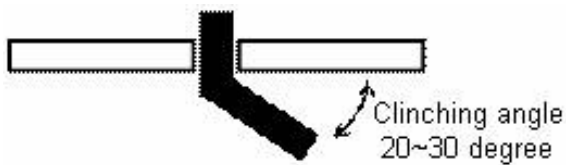


6. LED view

1) Bottom view:



2) Side view:



E. Installation

1. During the installation process, do not apply any pressure to the leads.
2. Please make sure the installation holes on the PCB matches the leads of the LED.

F. ESD (Electrostatic Discharge)

1. LED is very sensitive to ESD; please make sure during the whole usage and installation process, that no ESD exist to affect the LED. Excessive ESD could damage the LED chip and result in performance degradation.
2. LED can also be damaged by electrical surge, please make sure any driving electrical circuits are equipped with surge protection.
3. During the installation process, please make sure all the equipment and personnel are grounded properly. Make use ESD protection equipment such as anti-static gloves, anti-static wrist bands, anti-static mats, anti-static clothes, anti-static shoes, and anti-static containers.
4. When LED come into contact with low electrical resistance metallic surfaces, the ESD could damage the LED due to sudden discharge of ESD. Please make sure all surfaces that will be in contact with LED are covered with anti-static mats (Surface electrical resistance of $10^6 \sim 10^8 \Omega/\text{sq}$). LED should be placed in anti-static containers and anti-static bags.

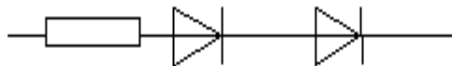


G. Recommended Usage Guidelines

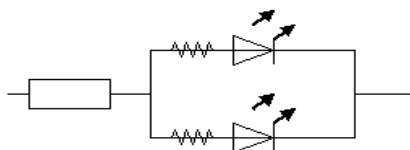
1. Please only use 20mA (Lamp LED) and 30mA (High Flux LED) of forward current to drive LEDS whether one LED or multiple LEDS are being used.

2. Circuit connections

i. Serial connection



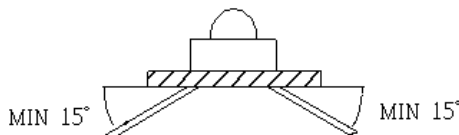
ii. Parallel connection



3. Sudden surge could damage the LED interior connections. Please design circuit with care so no sudden voltage surge or current surge will show when turning the circuit on or off.

4. When color or brightness uniformity is required while using multiple LEDS, the LED driver condition is critical. Our company guarantees the uniformity of the LEDS from the same bin when the driver current is 20mA (Lamp LED) and 30mA (High Flux LED)

5. A Clinch should be performed prior to soldering .Avoid excessive stress to the LED lamps when mounting (Please carry out at the minimum angle which can hold parts. As for both anode and cathode side recommend 15°C or more .Please fully perform a mounting check in the case of use on conditions other than this.)



H. Safety

1. Please comply with government electrical safety code while using the LEDS.
2. Do not look directly into a lit LED; it could damage the eyes after only a few seconds.
3. Do not look directly into powered UV LEDS; it could damage the eyes after only a few seconds.
(UV LEDS are mainly used in currency validating machines)

I. Direction

1. We are sending you our specification and drawings for your approval. Please return to us one copy "For Approval" with your approved signatures.
2. Comply with HSF request of customers



Test Item	Test Conditions	Duration/ Cycle	Number of Damage	Reference
Temperature Cycle	-40°C 30min ↑↓ 1 min 100°C 30min	100 cycles	0/22	JEITA ED-4701 300 303
High Temperature Storage	Ta=105°C	1000 hrs	0/22	EIAJED-4701 200 201
High Humidity Heat Life Test	Ta=85°C RH=85% Vcc=5V Vin=5V	1000 hrs	0/22	Tested with Brightek standard
Humidity Heat Storage	Ta=85°C RH=85%	1000 hrs	0/22	EIAJED-4701 100 103
Life Test	Ta=25°C Vcc=5V Vin=5V	1000 hrs	0/22	Tested with Brightek standard
Low Temperature Life Test	Ta=-40°C Vcc=5V Vin=5V	1000 hrs	0/22	Tested with Brightek standard
High Temperature Life Test	Ta=85°C Vcc=5V Vin=5V	1000 hrs	0/22	Tested with Brightek standard

***Criteria for Judging**

Item	Symbol	Condition	Criteria for Judgment of Pass
Supply Current	I _{CC}	V _{CC} = Vin=3V	Transfer <20%
Fiber Coupling Output Power	P _f		