EXCELLENCE OPTO. INC.

Spec No.	Date	Page	Ver.
A-TS-006-00	2005/12/30	1/12	A-01

LED SPECIFICATION

PART NO. : EOS-RGB601A00

PART DESCRIPTION:

Full Color Top LED

(Red,Green,Blue Color)

EOI			CUSTOMER APPROVED
ACTION	NAME	DATE	
PREPARED	*Peggy Liang*	**2005/12/30**	
CHECKED	*Cathy Huang*	**2005/12/30**	
APPROVED	*Ader Wu*	**2005/12/30**	

PART NO. : EOS-RGB601A00

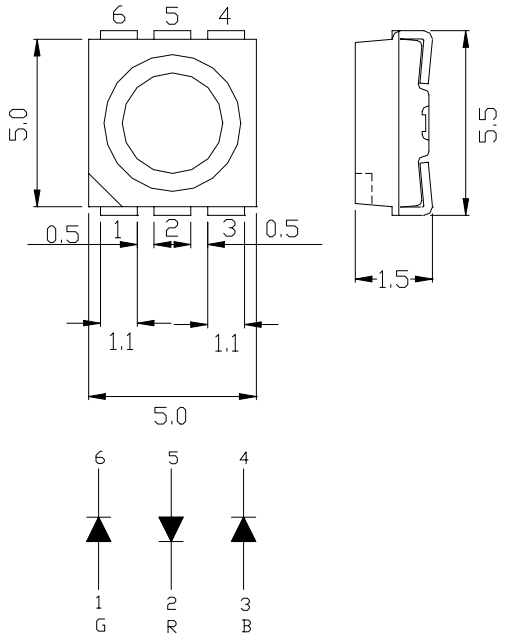
Features

- Super-luminosity chip LED
- PLCC-6 SMT Package
- Built-in Red,Green,and Blue chip
- Good heat dissipation
- Pb free & RoHS compliant product
- Class 1 ESD sensitive

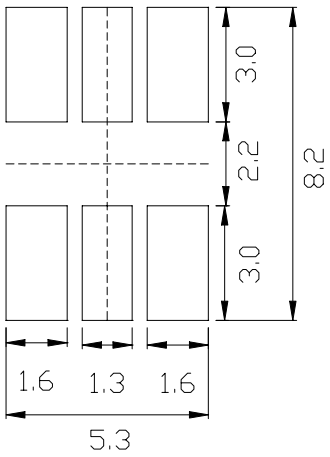
Applications

- Flashlight for digital camera of cellular
- Information boards
- Amusement equipment
- Full color application
- General Use

Package Dimension



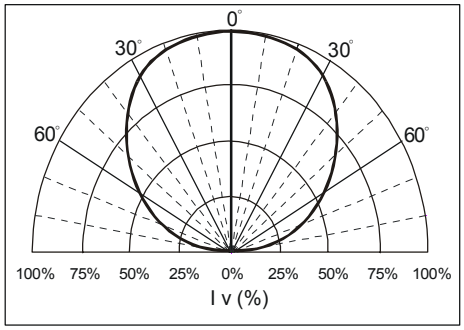
Recommended soldering pad



Notes:

1.All dimensions are in millimeters.

Beam Pattern



PART NO. : EOS-RGB601A00

Absolute Maximum Ratings at T_A=25℃

Parameter	MAX.		Unit
	Red	Green, Blue	
DC Forward Current	30	20	mA
Peak Pulse Current	120	100	mA
Reverse Voltage	5	5	V
Power Consumption	78	80	mW
LED Junction Temperature	125		℃
Operating Temperature Range	-40 to +85		℃
Storage Temperature Range	-40 to +100		℃

Note:[a] Duty Ratio=1/10, Pulse Width=0.1ms.

Electrical and Optical Characteristics at T_A =25℃

Parameter	Symbol	Color	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	Iv	Red	300	430	900	mcd	I_F=20mA
		Green	400	650	1800		
		Blue	110	200	450		
Viewing Angle	$2\theta_{1/2}$	Red	---	120	---	deg	I_F=20mA
		Green	---	120	---		
		Blue	---	120	---		
Dominant Wavelength	λd	Red	---	623	---	nm	I_F=20mA
		Green	---	525	---		
		Blue	---	470	---		
Forward Voltage	V_F	Red	1.8	---	2.5	v	I_F=20mA
		Green	2.75	---	3.5		
		Blue	2.75	---	3.5		
Reverse Current	I_R	Red	---	---	10	μA	V_R=5V
		Green	---	---	10		
		Blue	---	---	10		

Note:

1. Measurement Uncertainty of the Luminous Intensity: ±15%
2. Measurement Uncertainty of the Dominant Wavelength: ±1nm
3. Measurement Uncertainty of the Voltage: ±0.05V

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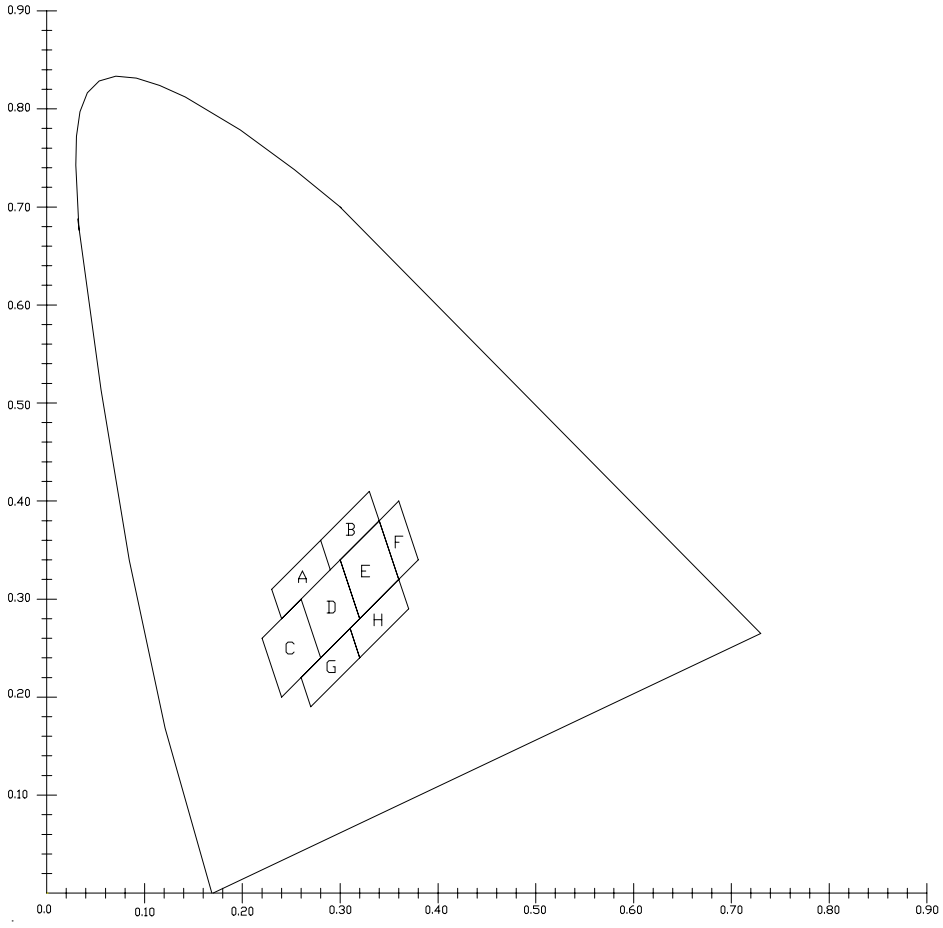
Sorting Chart for Chromaticity Coordinates

Bin coordinate / Chromaticity bin	P1 (x,y)	P2 (x,y)	P3 (x,y)	P4 (x,y)
A	(0.24,0.28)	(0.23,0.31)	(0.28,0.36)	(0.29,0.33)
B	(0.29,0.33)	(0.28,0.36)	(0.33,0.41)	(0.34,0.38)
C	(0.24,0.20)	(0.22,0.26)	(0.26,0.30)	(0.28,0.24)
D	(0.28,0.24)	(0.26,0.30)	(0.30,0.34)	(0.32,0.28)
E	(0.32,0.28)	(0.30,0.34)	(0.34,0.38)	(0.36,0.32)
F	(0.36,0.32)	(0.34,0.38)	(0.36,0.40)	(0.38,0.34)
G	(0.27,0.19)	(0.26,0.22)	(0.31,0.27)	(0.32,0.24)
H	(0.32,0.24)	(0.31,0.27)	(0.36,0.32)	(0.37,0.29)



Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

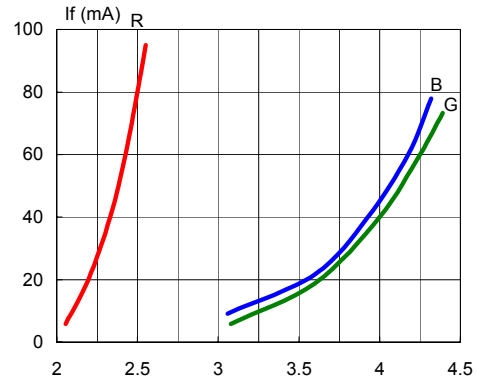


Fig.1 Forward Current vs. Forward Voltage

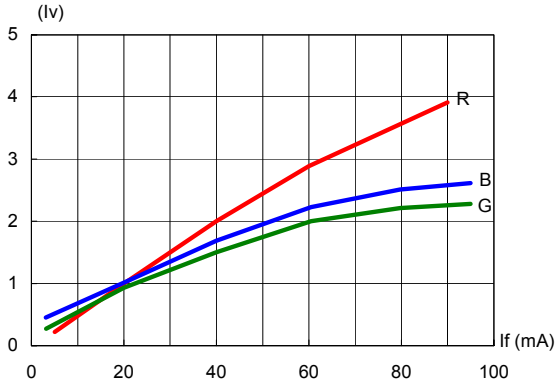


Fig.2 Relative Luminous Intensity vs. Forward Current

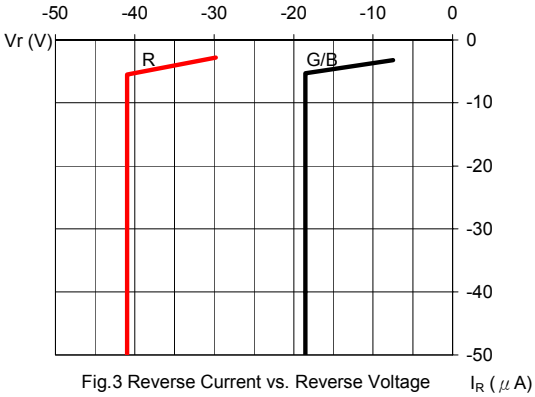


Fig.3 Reverse Current vs. Reverse Voltage

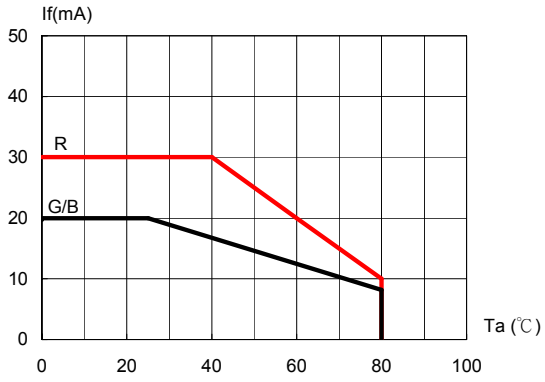


Fig.4 Allowable Forward Current vs. Ambient Temperature

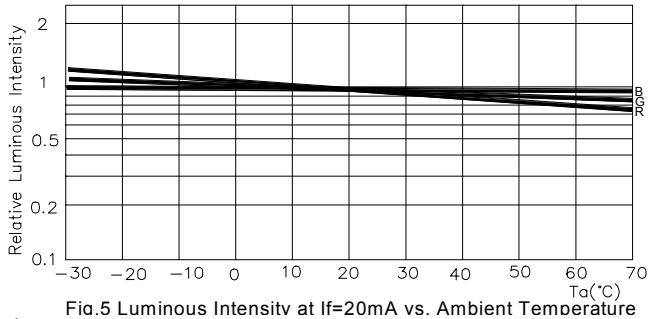


Fig.5 Luminous Intensity at If=20mA vs. Ambient Temperature

***Note: The data shown above are typical curves. Every LED component may have some variations of characteristics.**

Reliability Test

Classification	Test Item	Standard Test Method	Test Conditions	Duration	Unit	Acc/Rej Criteria
Life Test	Operation Life Test	MIL-STD-750D Method 1026.3	*Ta=25℃;B I_F=14mA G,R I_F=20mA	500hrs	50pcs	0/1
Environment Test	High Temperature Storage	MIL-STD-750D Method 1032.1	Ta=100℃	500hrs	50pcs	0/1
	Low Temperature Storage	MIL-STD-750D Method 1032.1	Ta=-40℃	500hrs	50pcs	0/1
	Temp&Humidity	MIL-STD-750D Method 103B	Ta=60℃; RH=90%,	500hrs	50pcs	0/1
	Thermal Shock	MIL-STD-750D Method 1056.1	0℃(15sec) ~100℃(15sec)	100cycles	50pcs	0/1
	Temperature Cycling Test	MIL-STD-750D Method 1051.5	-40℃(30min)~25℃(5min) ~100℃(30min)~25℃(5min)	100cycles	50pcs	0/1
Mechanical Test	Resistance to Soldering Heat	MIL-STD-750D Method 2031.1	260℃;5sec	2 times	50pcs	0/1

Remark:(*)Value for one LED device(Single color)

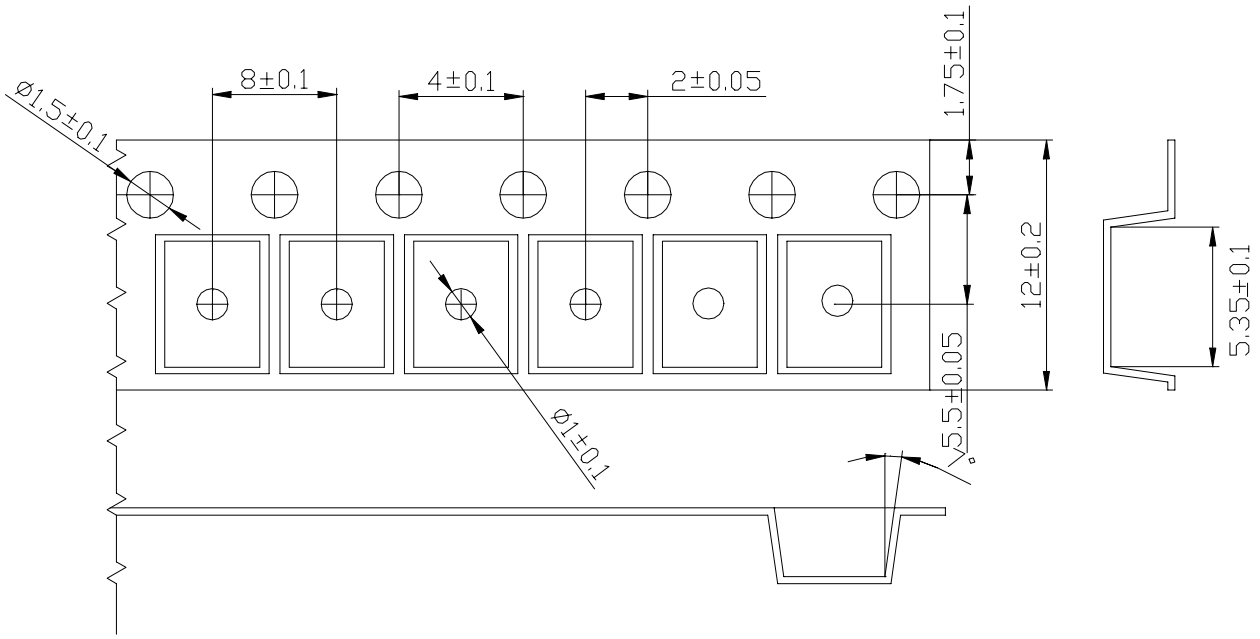
2.Failure Criteria(Ta=25℃)

Test Item		Test Conditions	Criteria for Judgment	
			Min	Max
Luminous Intensity	I_v	R,G,,B I_F=20mA	L.S.L.x0.7**	
Voltage(Forward)	V_F	R,G,B I_F=20mA		U.S.L.x1.1*

*U.S.L.:Upper Standard Level **L.S.L.:Low Standard Level

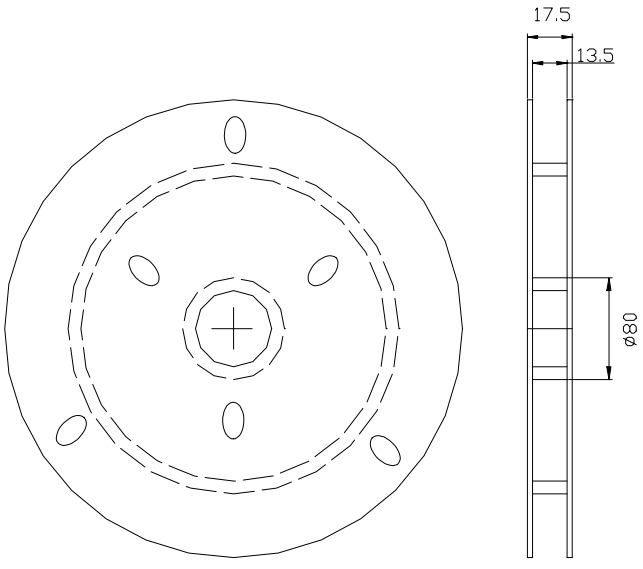
PART NO. : EOS-RGB601A00

Taping Dimension



1.Polarity referring onto the cathode mark/line is reversed on the UR/HR(N-side up chips).
2.The carrier tape and components loading specifications meet the EIA 481-1a Standard.
3.2,500 pieces per reel is standard loading quantity.

Reel Dimension



UNIT:MM

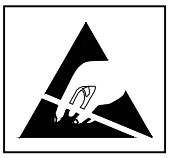
Precaution of Application

1: Circuit layout

Due to the circuit design is not available, assuming the LED are used in parallel and one resistor that is put in series in the circuit, it may not provide and effective current-limiting function to the LEDs due to each LED has own inherent resistance, maybe the resistance each other is different. Different inherent resistance will cause different current; the LED on the different path would be driven at different power. If one LED with a higher resistance, it would be dimmer than the others.

To solve this situation, a suitable resistor is put in series with each LED to limit her current disparity through the LED will be very useful.

2: Electric Static Discharge (ESD) Protection



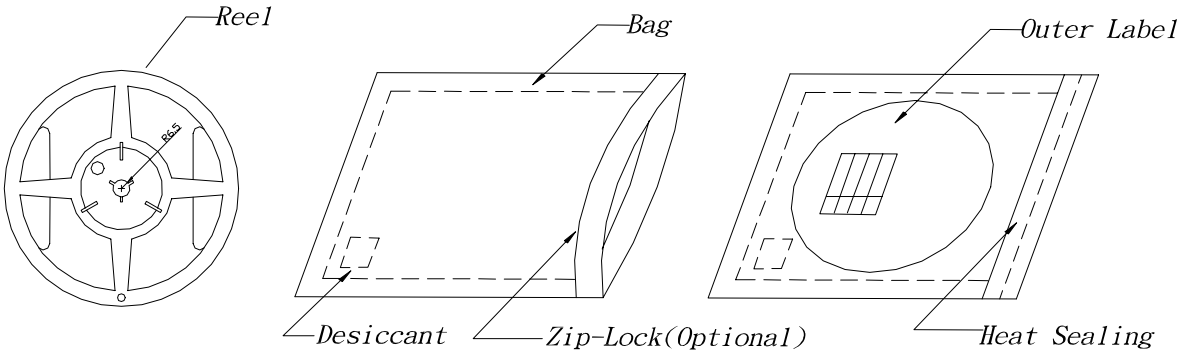
ESD protection for GaP and AlGaAs chips are still necessary even though they are safety in low static-electric discharge. Material in AllnGaP, GaN, or/and InGaN chips are **STATIC SENSITIVE device**. ESD protection shall be considered and taken in the initial design stage.

If manual work/process is needed, please ensure the device is well protective from ESD within all the process.

3: Dry Pack

Any SMD optical device, like this chip LED, is MOISTURE SENSITIVE device. Please avoid absorbing moisture at any time during transportation or storage. Every reel will be packaged in the moisture barrier anti-static bag (Specific bag material will depend upon customer's requirement or option). And the bag is well sealed before shipment.

The package is the following:



4: Pick and Place

(a)It should be avoided to load stress on the resin during high temperature.

(b)Avoid rubbing or scraping the resin by any object.

(c)Electric-static may cause damage to the component. Please confirm that the equipment is grounding well.

(d)Every piece of LED will be sorted and the same binning grade LEDs will be taped into the same reel. It is recommended the same module assembled from the same reel to ensure the uniformity of brightness, hue, and so on.

5: Storage

It's recommended to store the products in the following conditions:

Humidity: 60%RH Max.

Temperature:5℃ ~30℃ (41°F ~86°F)

(1) Shelf life in sealed bag: 12month at<40℃ and <30%RH.(Base on aluminum laminated moisture barrier bag.)

(2) After the bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be:

(a)Mounted within 72 hours at factory conditions of ≦30℃/60%RH,or

(b)Stored at ≦20%RH with zip-lock sealed.

6: Baking

It's recommended to bake before soldering . The conditions are as followings:

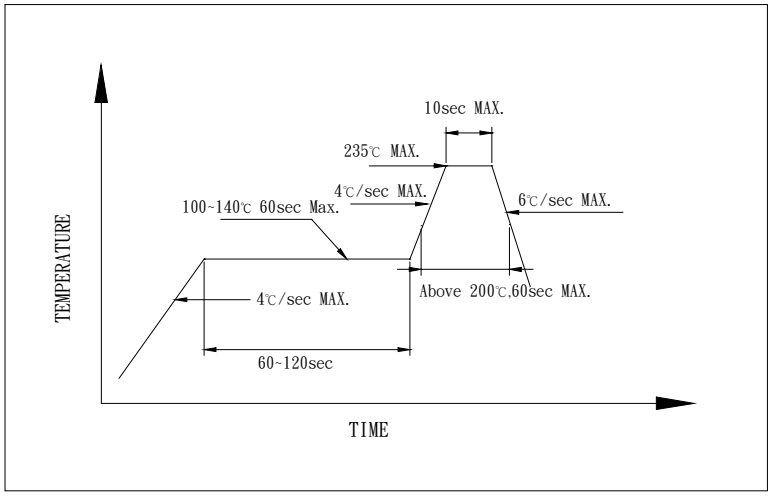
60±3℃x(6~12hrs) and <5%RH, taped reel type

100±3℃x(45min~1hrs), bulk type

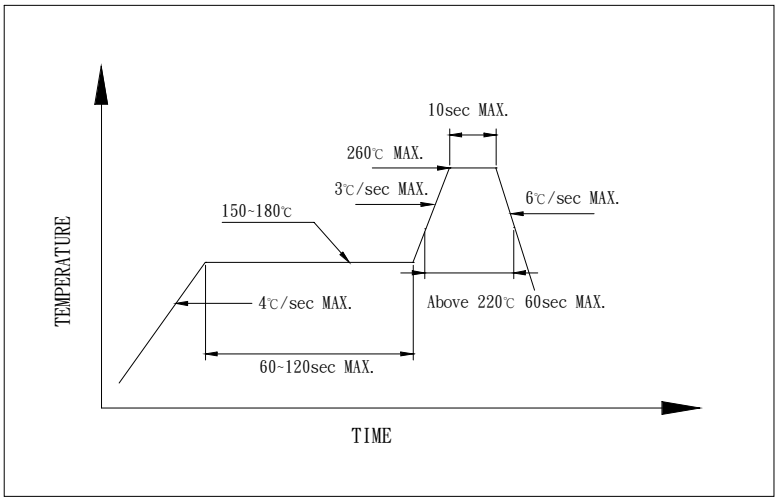
7: Reflow Soldering

To prevent cracking in reflow process, please bake SMD components before reflow soldering. Never take next process until the component is cooled down to room temperature after reflow. It's banned to load any stress on the resin during soldering. And, the manual soldering process is not recommended for quality consideration.

Recommended SnPb reflow soldering profile:



Recommended Pb free reflow soldering profile:



8: Cleaning

The conditions of cleaning after soldering:

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.

Temperatures Time: <50℃×30sec, or <30℃×3min

Ultra sonic cleaning: <15W/bath; Bath volume: 1 liter max.

Baking after cleaning: 100℃ max, <3min

9: Rework

(a) Please finish rework within 5 sec. under 245℃.

(b) Please avoid overheating of LED component in reworking process. Overheating may damange the LED package.

Terms and Condition

1. EOI warrants all sold LEDs which conform to the specifications approved by the customers.
2. Any LED supplied by EOI is found not conform to the specifications that both parties agreed upon, customer should claim within 90days of receipt. EOI will repair or replace the LEDs at EOI's option.
3. EOI will not hold any responsibility for the failed LEDs, which are caused by mishandling or using the LEDs exceeding the operating conditions that EOI suggested.
4. EOI's LED products are designed and manufactured for general electronic equipment (such as household appliances, communication equipment, office equipment, electronic instrumentation and so on). If customer's application requires exceptional quality or reliability, which might concern human safety, it is recommended to consult with EOI in advance.
5. All the information published is considered to be reliable. However, EOI does not assume any liability arising out of the application or use of any product described herein. EOI's liability for defective LED lamps shall only be limited to replacement, in no event shall EOI be liable for consequential damages or profit lose.
6. EOI and customer shall both confirm the specifications herein, and all quality related matters will base on the specifications both parties agreed upon.
7. Any modification of the design or manufacturing process taken place, which will affect the characteristics, performance or reliability of LED, customer's approval will be required.
8. This specification approval sheet is an agreement of shipment specification. Please sign it back and keep the copies in two parties. If customers don't sign it back, it is regarded as completely agree with the terms and conditions and also approve of this approval sheet.

Company Information

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