LED SPECIFICATION

PART NO. : EOL-K5RTDD0-KK

PART DESCRIPTION:

4 Ø 105°/45° Red LED Lamp

EOI			CUSTOMER APPROVED
ACTION	NAME	DATE	
PREPARED	Cathy Huang	2006/4/27	
CHECKED	Amy Lin	2006/4/27	
APPROVED	Ader Wu	2006/4/27	

EXCELLENCE OPTO. INC.

Spec No.	Date	Page	Ver.
A-L-379-00	2006/4/27	2/11	A-00

PART NO. : EOL-K5RTDD0-KK

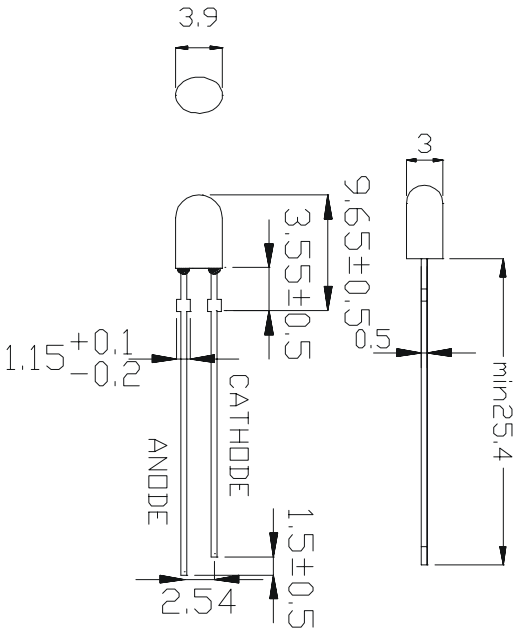
Features

- Oval Shape Package
- Wide Viewing Angle:
  major axis 105°
  minor axis 45°
- High brightness AlInGaP LED
- UV Resistant Epoxy
- Pb free & RoHS Compliant Product

Applications

- Indoor/Outdoor Applications
- Full Color Signs
- Variable Message Signs

Package Dimension



Notes:

1.All dimensions are in millimeter.

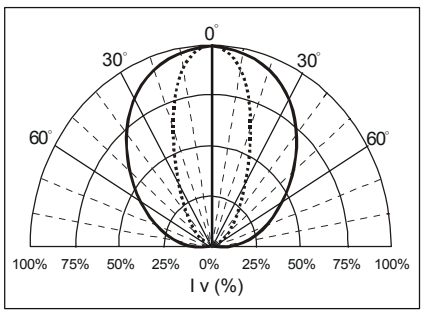
2.Tolerance is ±0.20mm unless otherwise noted.

3.Protruded resin under flange is 1.5mm max.

4.Lead spacing is measured where the leads emerge from the package.

Lens Color	Beam Color	Lead Frame Material	Stand Off	Flange
Red Diffused	Red	Iron base	Yes	No

Beam Pattern



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Absolute Maximum Ratings at T_A=25℃

Parameter	Symbol	MAX.	Unit
Average Forward Current[a] [c]	I_F	30	mA
Peak Forward Current[b]	I_{peak}	100	mA
Reverse Voltage	V_R	5	V
Power Dissipation	P_D	72	mW
Current Linearity vs. Ambient Temperature	TC_I	- 0.5	mA/℃
LED Junction Temperature	T_J	125	℃
Operating Temperature Range[c]	T_{OPR}	-40℃ ~+85℃	
Storage Temperature Range	T_{STO}	-40℃ ~+100℃	
Lead Soldering Condition [4mm(.157") away from epoxy]	T_{SOL}	260℃ / 5 seconds	

Note: [a] Design of heat dissipation should be considered.
[b] Duty Ratio=1/10, Pulse Width=0.1ms.
[c]The allowable operating current at different operation temperature, please take reference from Fig. 4 page 4.

Electrical and Optical Characteristics at T_A =25℃

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	Iv	660	920	---	mcd	I_F=20mA
Viewing Angle	$2\theta_{1/2}$	---	105/45	---	Deg	I_F=20mA
Dominant Wavelength	λ_D	620	623	630	nm	I_F=20mA
Spectral Half Width	$\triangle\lambda$	---	25	---	nm	I_F=20mA
Forward Voltage	V_F	1.8	2.0	2.4	V	I_F=20mA
Reverse Current	I_R	---	---	10	μA	V_R=5V

Rank Combination

Dominant Wavelength λ_D (nm) @I_F=20mA			Luminous Intensity Iv (mcd) @I_F=20mA			Forward Voltage V_F (v) @I_F=20mA		
Code	min	max	Code	min	max	Code	min	max
RB	620	625	6Q	660	920	G	1.8	2.0
R7	625	630	6R	920	1285	H	2.0	2.2
-	-	-	6S*	1285	1800	J	2.2	2.4
-	-	-	-	-	-	-	-	-

Note:

1. All of rank combinations which include luminous intensity, dominant wavelength, and forward voltage will be included in every shipment.
2. Measurement Uncertainty of the Luminous Intensity: ±15%
3. Measurement Uncertainty of the Dominant Wavelength: ±1nm
4. Measurement Uncertainty of the Voltage: ±0.05V
5. [＊] Bin with less distribution.

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Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

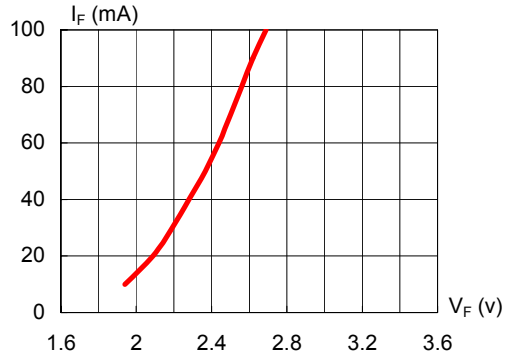

Fig.1 Forward Current vs. Forward Voltage

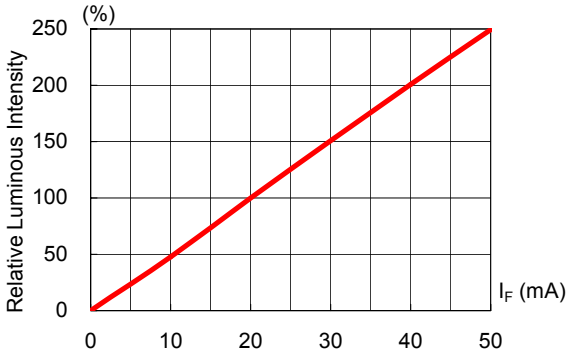

Fig.2 Luminous Intensity vs. Forward Current

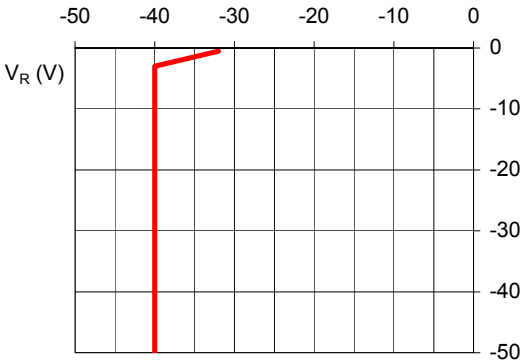

Fig.3 Reverse Current vs. Reverse Voltage

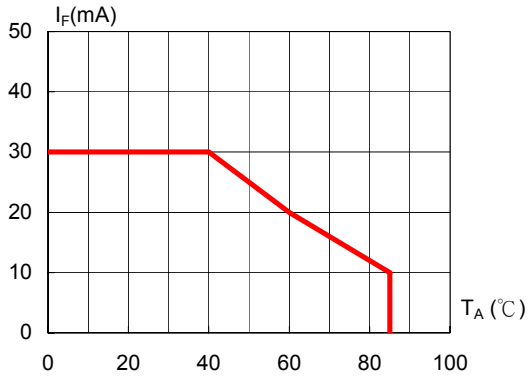

Fig.4 Allowable Forward Current vs. Ambient Temperature

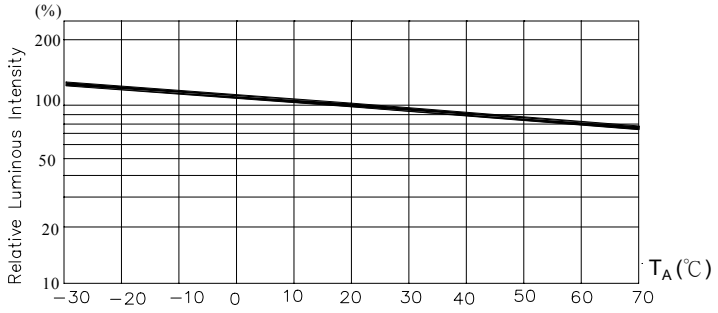

Fig.5 Luminous Intensity at I_F =20mA vs. Ambient Temperature

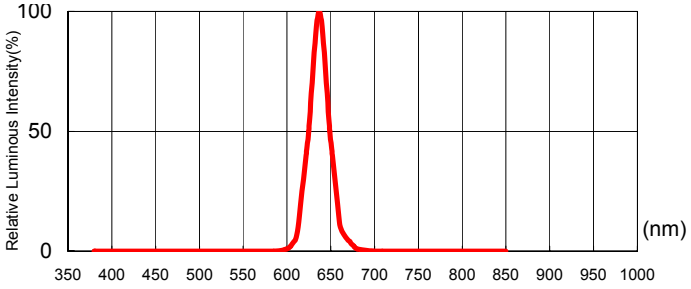

Fig 6. Relative Luminous Intensity vs. Wavelength

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

Reliability Test

EOI'S LED lamps are checked by reliability test based on MIL standards.

1. Test Conditions, Acceptable Criteria & Results:

Classi-fication	Test Item	Standard Test Method	Test Conditions	Duration	Unit	Acc / Rej Criteria	Result
Life Test	Operation Life Test (OLT)	MIL-STD-750D Method 1026.3	T_A=25℃ , I_F =30mA *	1000 Hrs	100	0 / 1	Pass
Environment Test	High Temperature Storage (HTS)	MIL-STD-750D Method 1032.1	T_A=100℃	1000 Hrs	100	0 / 1	Pass
	Low Temperature Storage (LTS)	MIL-STD-750D Method 1032.1	T_A=－40℃	1000 Hrs	100	0 / 1	Pass
	Temp. & Humidity with Bias (THB)	MIL-STD-750D Method 103B	T_A=85℃ , Rh=85% I_F =20mA **	500 Hrs	100	0 / 1	Pass
	Thermal Shock Test (TST)	MIL-STD-750D Method 1056.1	0℃ ~ 100℃ 2min 2min	100 cycles	100	0 / 1	Pass
	Temperature Cycling Test (TCT)	MIL-STD-750D Method 1051.5	-40℃ ~25℃~ 100℃ ~25℃ 30min 5min 30min 5min	100 cycles	100	0 / 1	Pass
Mechanical Test	Solderability	MIL-STD-750D Method 2026.4	235±5℃ , 5 sec	1 time	20	0 / 1	Pass
	Resistance to Soldering Heat	MIL-STD-750D Method 2031.1	260±5℃ , 10 sec	1 time	20	0 / 1	Pass
	Lead Integrity	MIL-STD-750D Method 2036.3	Load 2.5N (0.25kgf) 0°~ 90°~ 0° , bend	3 times	20	0 / 1	Pass

Remark : (*) I_F =30mA for AlInGaP chip ; I_F =20mA for InGaN chip

(**) I_F =20mA for AlInGaP chip ; I_F =10mA for InGaN chip

2. Failure Criteria (T_A =25℃):

Test Item	Symbol	Test Conditions	Criteria for Judgment	
			Min.	Max.
Luminous Intensity	I_V	I_F =20 mA	LSL×0.7 **	
Voltage (Forward)	V_F	I_F =20 mA		USL×1.1 *

(*) USL : Upper Standard Level , (**) LSL : Lower Standard Level

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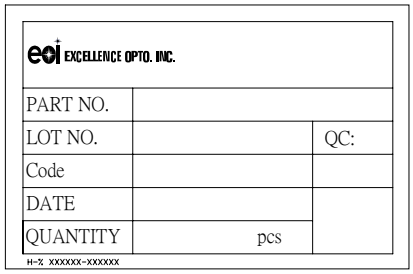
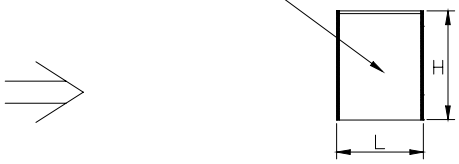
Bulk Package



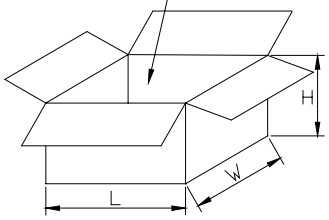
label

Anti-static/anti-corrosion bag
H : 200mm
L : 180mm
PCS/BAG
3.0/4.0/5.0mm: 500pcs
>7.5mm : 400pcs



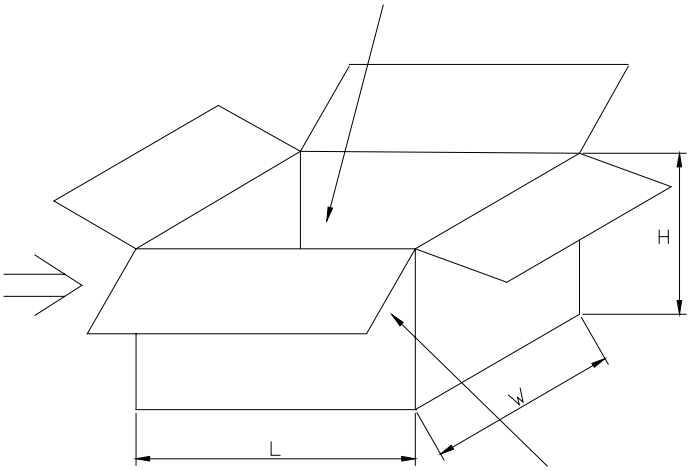
Bag

Corrugated paper box(3 layers)
H : 140mm
L : 350mm
W : 260mm
PCS/INNER BOX
3.0/4.0/5.0mm: 5,000pcs
>7.5mm : 4,000pcs



Inner Box

Corrugated paper box(5 layers)
H : 320mm
L : 380mm
W : 280mm
PCS/OUTER BOX
3.0/4.0/5.0mm:10,000pcs
>7.5mm : 8,000pcs



Outer Box

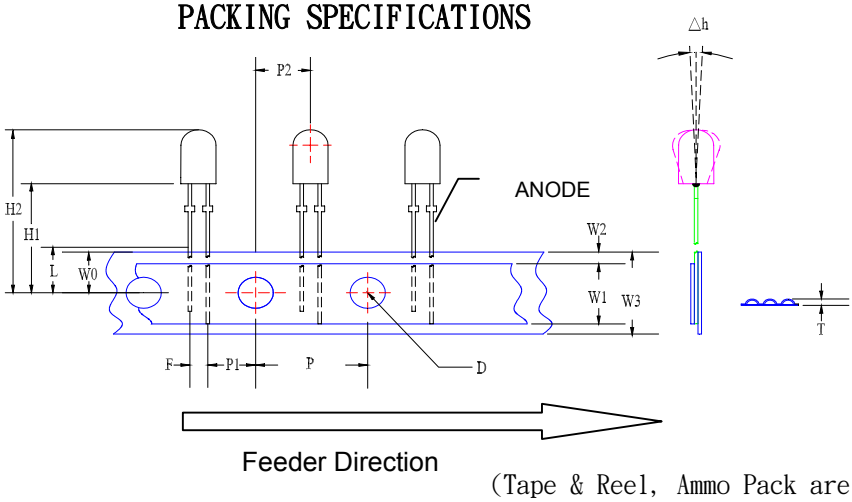
label

PART NO. : EOL-K5RTDD0-KK

Taping Package

(TT-0001)

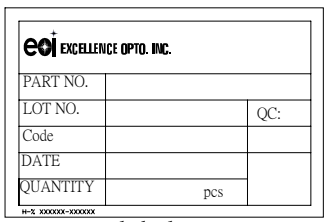
PACKING SPECIFICATIONS



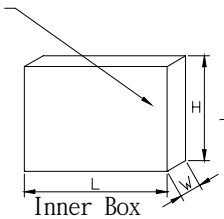
(Tape & Reel, Ammo Pack are available)

(Maximum 10 inner boxes in one outer box)

ITEM	SYMBOL	SPECIFICATION			
		MINIMUM		MAXIMUM	
		MM	INCH	MM	INCH
• Tape Feed Hole Diameter	D	3.8	0.149	4.2	0.165
• Component Lead Pitch	F	2.34	0.092	2.74	0.108
• Front To Rear Deflection	△ h	--	--	2.0	0.078
• Feed Hole To Bottom Of Component	H1	19.0	0.709	21.0	0.787
• Feed Hole To Overall Component Height	H2	--	--	32.00	1.260
• Lead Length After Component Height	L	W0		11.0	0.433
• Feed Hole Pitch	P	12.4	0.488	13.0	0.511
• Lead Location	P1	4.4	0.173	5.8	0.228
• Center Of Component Location	P2	5.05	0.198	7.65	0.301
• Total Tape Thickness	T	--	--	1.4	0.056
• Feed Hole Location	W0	8.5	0.334	9.50	0.374
• Adhesive Tape Width	W1	12.0	0.472	14.0	0.551
• Adhewive Tape Position	W2	--	--	4.0	0.157
• Tape Width	W3	17.5	0.689	19.0	0.748

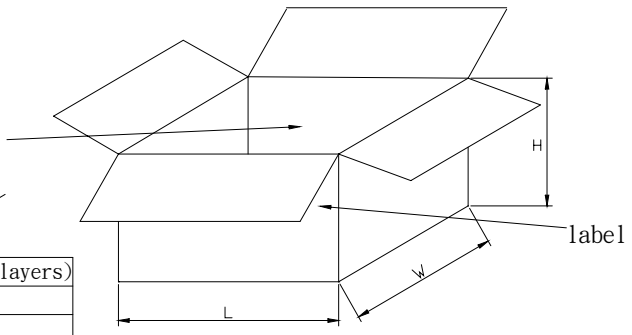


label



Inner Box

Corrugated paper box(3 layers)
H : 250mm
L : 330mm
W : 50mm
PCS/INNER BOX
3/4mm :2,500pcs
5.0mm :2,000pcs
> 7.5mm :1,000pcs



Outer Box

Corrugated paper box(5 layers)
H : 290mm
L : 520mm
W : 360mm
PCS/OUTER BOX
3/4mm :25,000pcs
5.0mm :20,000pcs
> 7.5mm :10,000pcs

Note: Several standard types of taping package are available.
Please contact with our salesman to get detail information.

Precaution of Application

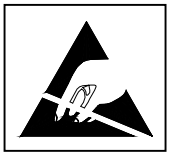
1. Circuit layout

Due to the forward voltage of LED will vary with temperature and its driving current, the current- limited protective circuit should be considered in the LED circuit design.

When LEDs are arrayed as parallel circuit, different inherent resistance of LED will cause unbalance current. The unbalanced driving current which exists in every parallel circuit may make LED to be drived at different power. Therefore, the LED driven at higher power may be damaged by over driving current, and the LED driven at lower power may be dimmer than the others.

To solve this situation, a suitable resistor is recommended to put in series with each LED circuit. The resistor will limit and balance the driving current which flow through every parallel circuits.

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 protected from ESD within all the process.

3. Lead Forming

The leads should not be bent at the point of 3mm or below 3mm from the base of the epoxy bulb while forming the leads.

Do not apply any bending stress to the base of the lead, and don’t cause any stress after mounting the LED lamp on PCB. The stress to the base may damage the LED’s characteristics, or cause deterioration of the epoxy resin. This will hurt and degrade the LEDs.

4. Storage

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

Humidity (Hum.) : 60%RH Max.

Temperature (T_A) : 5℃ ~30℃ (41℉ ~86℉)

Shelf life in sealed bag: 12 month at T_A<25℃ ~30℃ and Hum.<30%RH.

After the package is opened, the products should be used within 72 hours.

Or they should be kept at Hum.≦20%RH in zip-locked sealed bags.

Although the leads of LED lamp is platted with pure tin to protect leads from corrosion, devices should be subjected to wave soldering, or equivalent process as soon as possible, after the bag is opened.

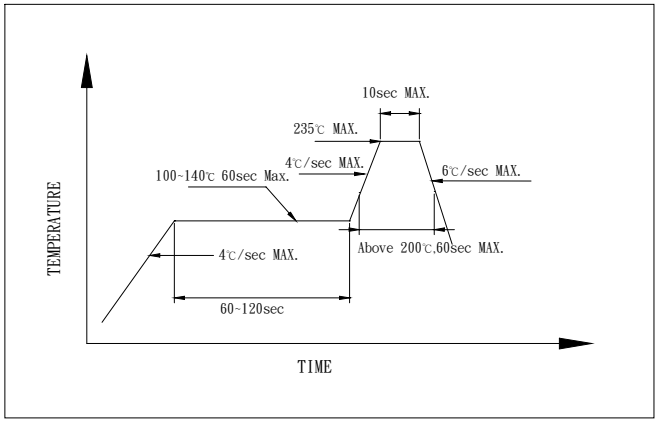
Please avoid rapid transitions in ambient temperature, especially in high humidity environment where condensation can occur.

5. Soldering

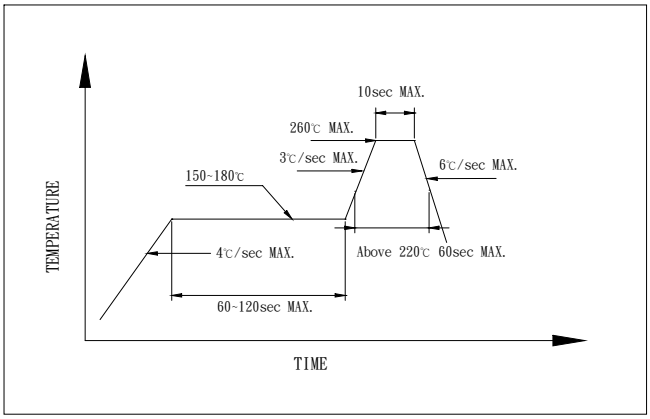
Soldering heat may damage the LED. Careful attention should be paid during soldering process.

Solder the LEDs no close than 3mm form the base of the epoxy bulb.

Recommended SnPb reflow soldering profile:



Recommended Pb free reflow soldering profile:



Never take next process until the component is cooled down to room temperature after soldering. It's banned to load any stress on the resin during soldering. If it's necessary to clamp the LED bulbs to help soldering, it is important to minimize the mechanical stress on the LEDs.

The manual soldering process is not recommended for quality consideration. When it is absolutely necessary, the LEDs may be mounted in this fashion but the user will assume responsibility for any problems.

6. Cleaning

An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended to clean the LED bulbs, after soldering process. Before cleaning, a pre-test should be done to confirm whether any damage to the LEDs will occur.

7. Others

The light output of LED might injure human eyes, directly look at the LED without protection is prohibited.

LED lamp is very sensitive to heat. Thermal design of the end product will decide the performance of LED lamps. It's necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

PART NO. : EOL-K5RTDD0-KK

Terms and Conditions

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 misusing 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 loss.
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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