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A-L-260-00	2005/4/29	1/11	B-00

LED SPECIFICATION

PART NO. : EOL-K1YCCC0-DG

PART DESCRIPTION:

5 Ø 15° Yellow LED Lamp

EOI			CUSTOMER APPROVED
ACTION	NAME	DATE	
PREPARED	Cathy Huang	2005/4/29	
CHECKED	Amy Lin	2005/4/29	
APPROVED	Ader Wu	2005/4/29	

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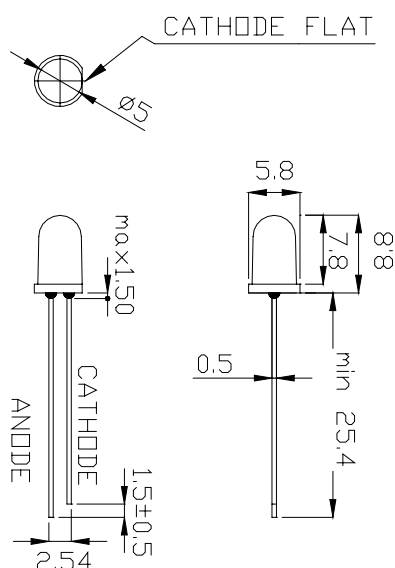
Features

Standard T-1 3/4 Package
 High brightness AlGaInP LED
 UV Resistant Epoxy
 Pb free & RoHS Compliant Product

Applications

Indoor/Outdoor Applications
 Indicator
 Vehicle Tail Light
 Variable Message Signs
 Center High Mount Stop Light
 Warning Light

Package Dimension

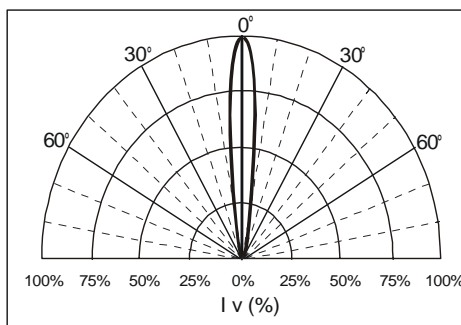


Notes:

- 1.All dimensions are in millimeters.
- 2.Tolerance is $\pm 0.20\text{mm}$ 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
Clear Water	Yellow	Iron base	No	Yes

Beam Pattern



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Absolute Maximum Ratings at $T_A=25$

Parameter	MAX.	Unit
Power Dissipation	72	mW
Peak Forward Current ^[a] (I_{FP})	100	mA
DC Forward Current ^[b] (I_F)	30	mA
Current Linearity vs. Ambient Temperature	- 0.5	mA/
Reverse Voltage (V_R)	5	V
LED Junction Temperature	125	
Operating Temperature Range ^[c]	-40 to +85	
Storage Temperature Range	-40 to +100	
Lead Soldering Condition [4mm(.157") away from epoxy]	260±5 for 5 Seconds	

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

[b] Design of heat dissipation should be considered.

[c] The allowable operating current see page 4 Fig 4.

Electrical and Optical Characteristics at $T_A=25$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	I_v	2225	4200	---	mcd	$I_F=20\text{mA}$
Viewing Angle	$2\frac{1}{2}$	---	15	---	Deg	$I_F=20\text{mA}$
Dominant Wavelength	d	---	589	---	nm	$I_F=20\text{mA}$
Spectra Half width		---	25	---	nm	$I_F=20\text{mA}$
Forward Voltage	V_F	---	2.0	2.4	V	$I_F=20\text{mA}$
Reverse Current	I_R	---	---	10	μA	$V_R=5\text{V}$

Ranks Combination

Dominant Wavelength λ_D (nm) @ $I_F=20\text{mA}$			Luminous Intensity I_v (mcd) @ $I_F=20\text{mA}$			Forward Voltage V_F (v) @ $I_F=20\text{mA}$		
Code	min	max	Code	min	max	Code	min	max
Y3	585	589	0U	2225	3115	G	1.8	2.0
Y4	589	592	0V	3115	4360	H	2.0	2.2
Y5	592	595	0W	4360	6105	J	2.2	2.4
-	-	-	-	-	-	-	-	-

Note:

1. All ranks of total luminous Intensity will be included in every shipment.
2. Measurement Uncertainty of the Luminous Intensity: $\pm 15\%$
3. Measurement Uncertainty of the Dominant Wavelength: $\pm 1\text{nm}$
4. Measurement Uncertainty of the Voltage: $\pm 0.05\text{V}$

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Typical Electrical / Optical Characteristics Curves

(25 Ambient Temperature Unless Otherwise Noted)

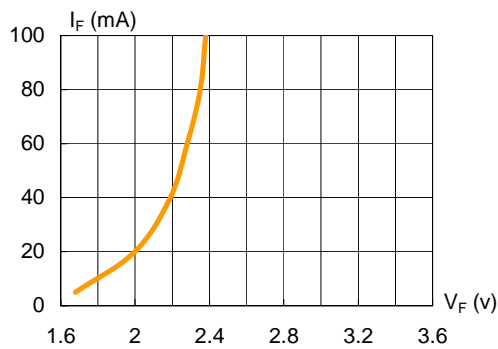


Fig.1 Forward Current vs. Forward Voltage

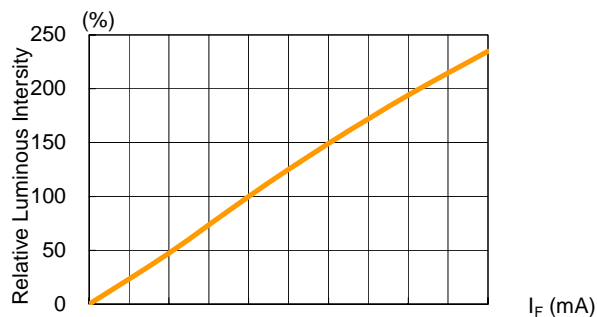


Fig.2 Luminous Intensity vs. Forward Current

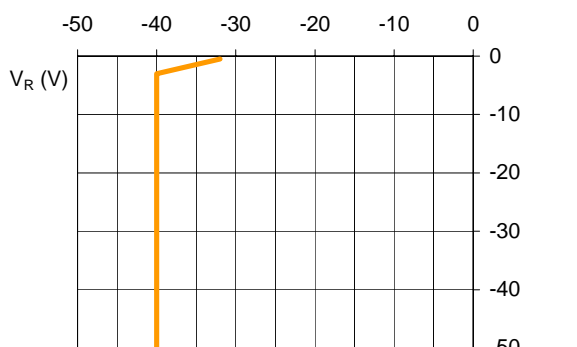


Fig.3 Reverse Current vs. Reverse Voltage

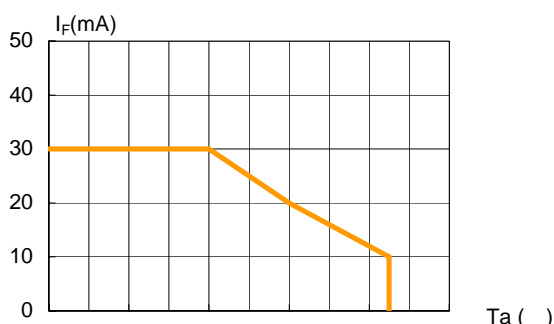


Fig.4 Allowable Forward Current vs. Ambient Temperature

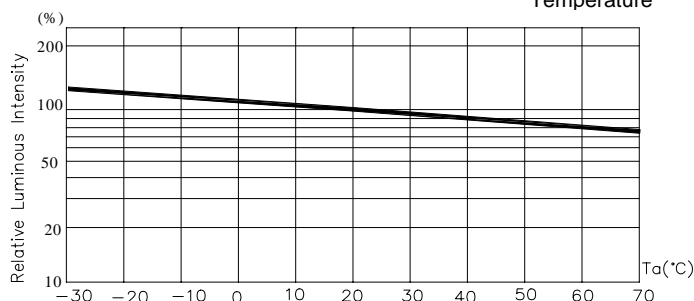


Fig.5 Luminous Intensity at $I_F=20$ mA vs. Ambient Temperature

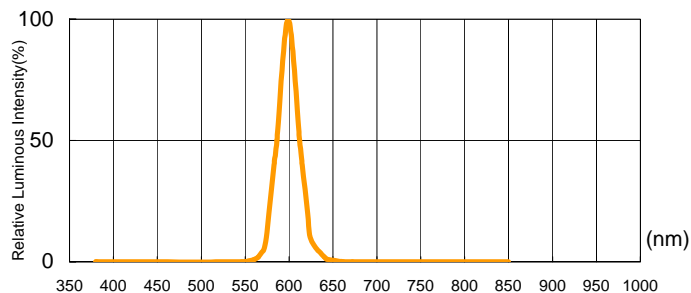


Fig.6 Relative Luminous Intensity vs. Wavelength

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

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Reliability Criteria & Results

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

1. Test Conditions, Accept Criteria & Results:

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

Remark:

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

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

2. Failure Criteria (Ta =25):

Test Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Luminous Intensity	I _V	I _F = 20mA	LSL×0.7 ^{**}	
Voltage (Forward)	V _F	I _F = 20mA		USL × 1.1 [*]


* USL : Upper Standard Level

* * LSL : Low Standard Level

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Bulk Package

 EOI EXCELLENCE OPTO. INC. <small>A MEMBER OF GROUP</small>		
PART NO.		
LOT NO.		QC:
Code		
DATE		
QUANTITY		pcs

H-Z XXXXXX-XXXXXX

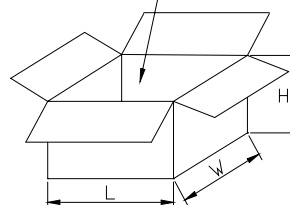
label

Anti-static/anti-corrosion bag	
H	: 200mm
L	: 180mm
PCS/BAG	
3.0/4.0/5.0mm	: 1,000pcs
>7.5mm	: 400pcs



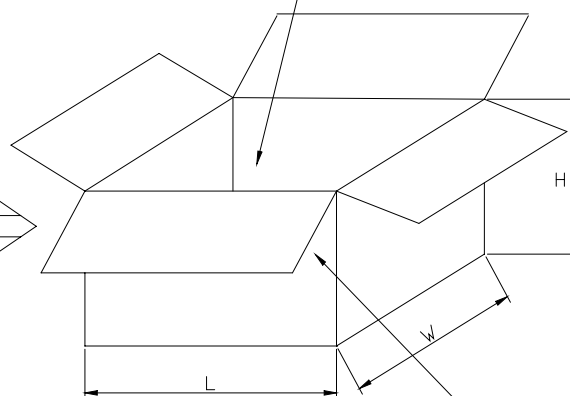
Bag

Corrugated paper box(3 layers)	
H	: 140mm
L	: 350mm
W	: 260mm
PCS/INNER BOX	
3.0/4.0/5.0mm	: 10,000pcs
>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	: 20,000pcs
>7.5mm	: 8,000pcs



Outer Box

label

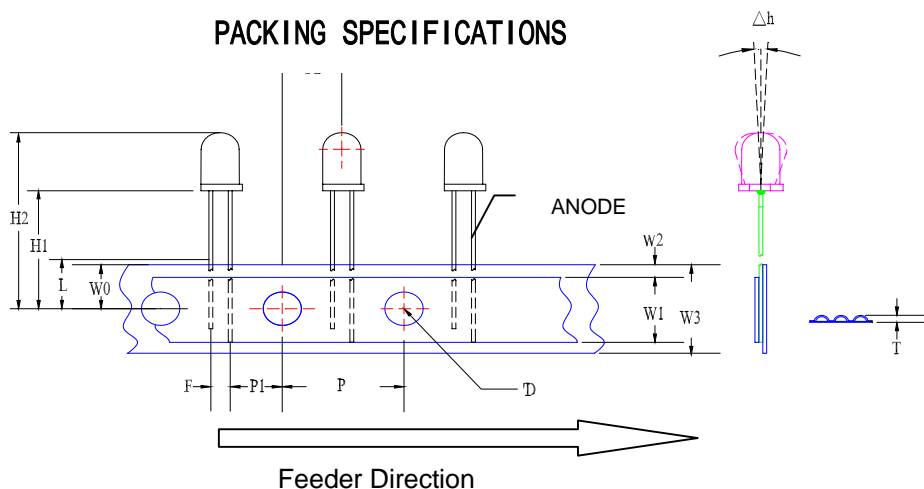
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Taping Package

(TT-0001)

PACKING SPECIFICATIONS



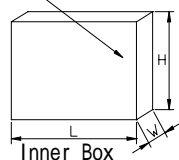
(Tape & Reel, Ammo Pack are available)

(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
Adhesive Tape Position	W2	--	--	4.0	0.157
Tape Width	W3	17.5	0.689	19.0	0.748

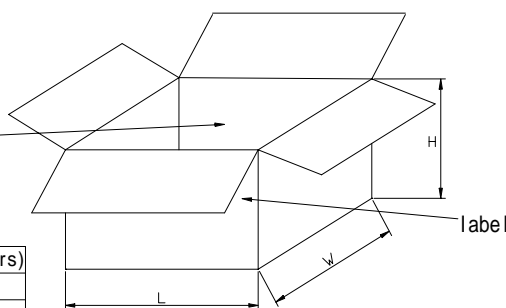
EOI EXCELLENCE OPTO. INC. A MEMBER OF UEC GROUP	
PART NO.	
LOT NO.	QC:
Code	
DATE	
QUANTITY	pcs
H-2 000000-000000	

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

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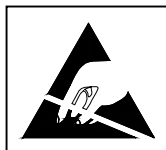
Precaution of Application

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 an effective current-limiting function to the LEDs due to each LED has its 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 its 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 AlInGaP, 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. Lead Forming

The leads should not be bent at the point of 3mm or above 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.

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4. Storage

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

Humidity: 60%RH Max.

Temperature: 5 ~ 30 (41 ~ 86)

Shelf life in sealed bag: 12month at <40 and <30%RH.(Base on aluminum laminated moisture barrier bag.) If the LEDs are stored for 3 months or more, the nitrogen atmosphere storage environment is recommended.

Although the leads of LED lamp is plated 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.

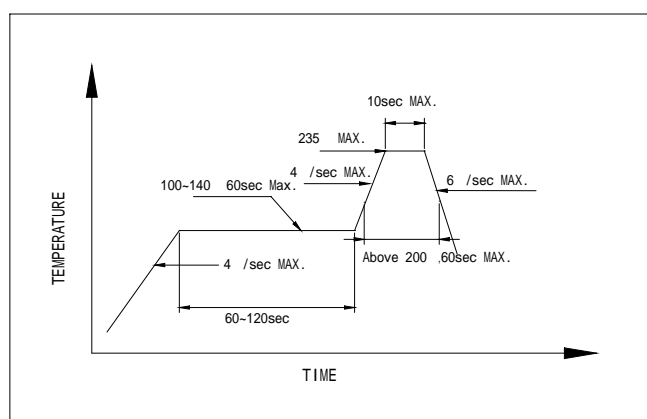
Please avoid rapid transitions in ambient temperature, especially in high humidity environment where condensation can occur.

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.

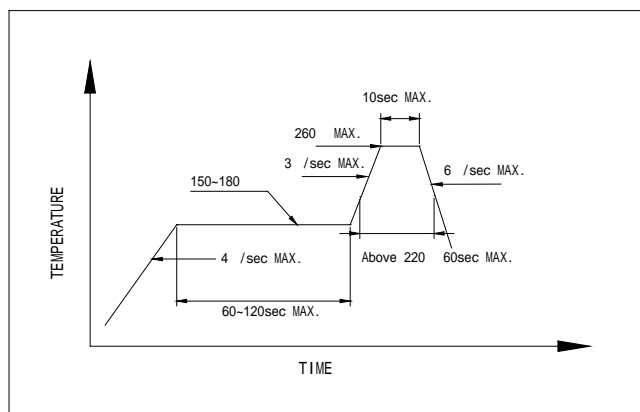
Recommended SnPb reflow soldering profile:



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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.

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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 cause 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 take place will affect the characteristics, performance or reliability. A customer's approval is 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 complete approve of this approval sheet.

Company Information

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