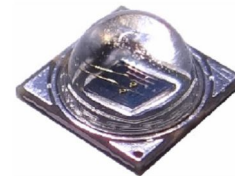


# Specification For IR Series

## HPL-H40DK1C4



### Features

- Dimension : 4.0mm(L)×4.0mm(W)
- High Radiant Flux type
- All Metal Design Cu Substrate with Silicone Lens
- Exceed narrow beam angle 40°
- Low thermal resistance
- The AlGaAs/ AlGaAs , AlGaAs/ GaAs Chip inside

### Applications

- IrDA
- Encoder
- Data Communication
- CCTV

5F, No 173-8, Yung-Fon Road, Tu-Cheng District, New Taipei City, Taiwan, R.O.C.  
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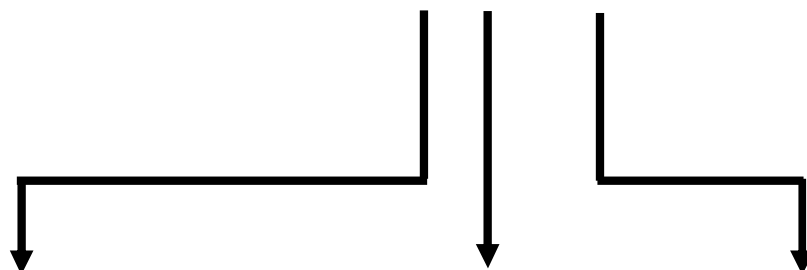


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General Information

# HPL - H40DK1C4



**Beam Angle-**  
Exceed narrow beam angle

**Wavelength-**  
K : IR 940nm

**Power-**  
C : 3W

## Part Number Matrix

Type Wavelength	40° Lens	40° Lens & Star
IR 940	HPL-H40DK1C4	HPL-H40XK1C4

## Absolute Maximum Ratings

(T<sub>j</sub>=25°C)

Parameter	Symbol	Rating	Unit
Power Dissipation	P	2.5	W
Forward Current	I <sub>F</sub>	1000	mA
Forward Pulse Current (1/10 Duty Cycle, 400msec Pulse Width)	I <sub>FP</sub>	1500	mA
Thermal Resistance, Junction-Case	R <sub>th, J-C1</sub>	5	°C/W
Reverse Voltage	V <sub>R</sub>	5	V
LED Junction Temperature	T <sub>J</sub>	125	°C
Operating Temperature Range	T <sub>opr</sub>	- 40°C to + 80°C	
Storage Temperature Range	T <sub>stg</sub>	- 40°C to + 120°C	
Soldering Condition	T <sub>sol</sub>	260°C For 10 Seconds	

Note: 1. The thermal resistance value is measured with MCPCB (Star).

## Initial Electrical/Optical Characteristics

- Forward Voltage** (T<sub>j</sub>=25°C)

Wavelength	Forward Voltage					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 940nm	V <sub>F</sub>	-	1.9	-	I <sub>F</sub> = 1000mA	V

- Reverse Current** (T<sub>j</sub>=25°C)

Wavelength	Reverse Current					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 940nm	I <sub>R</sub>	-	-	100	V <sub>R</sub> = 5V	μA

- Radiant Flux** (T<sub>j</sub>=25°C)

Wavelength	Radiant Flux					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 940nm	Φ <sub>e</sub>	500	800	-	I <sub>F</sub> = 1000mA	mW

- Radiant Intensity** (T<sub>j</sub>=25°C)

Wavelength	Radiant Intensity					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 940nm	I <sub>e</sub>	-	720	-	I <sub>F</sub> = 1000mA	mW/sr

- Peak wavelength** (T<sub>j</sub>=25°C)

Wavelength	Wavelength					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 940nm	λ <sub>p</sub>	930	-	950	I <sub>F</sub> = 1000mA	nm

- Spectra half-width** (T<sub>j</sub>=25°C)

Wavelength	Wavelength					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 940nm	Δλ	-	40	-	I <sub>F</sub> = 1000mA	nm

● Typical Radiation Pattern

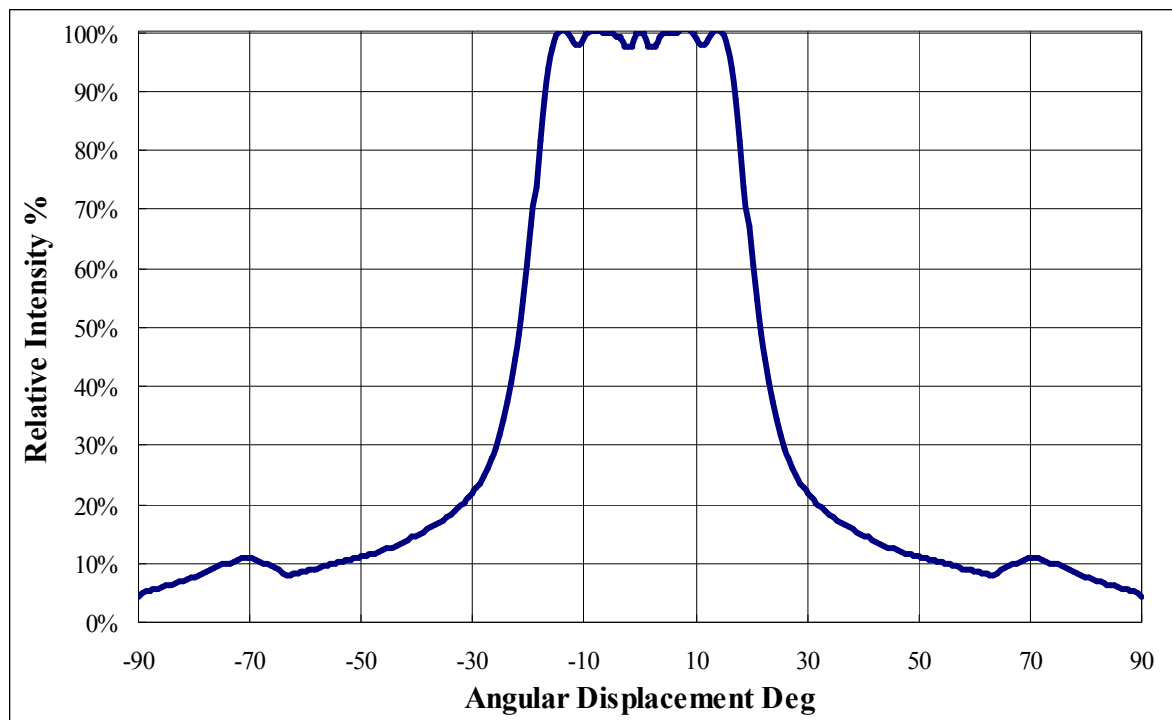


Fig. Typical Representative Spatial Radiation Pattern : 40 degree

● Bin Code List for Reference

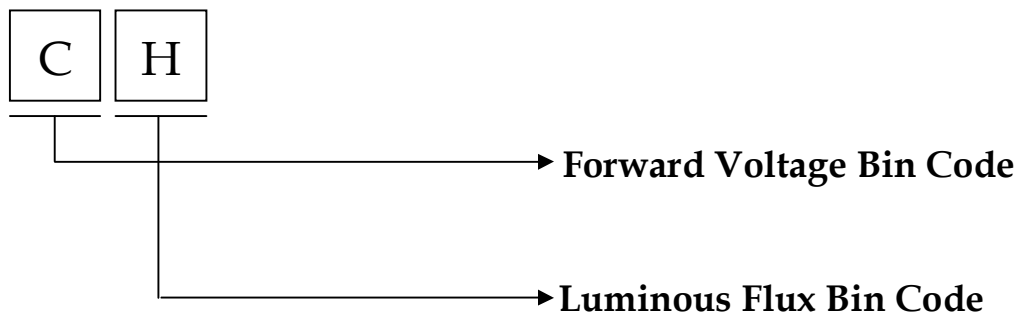
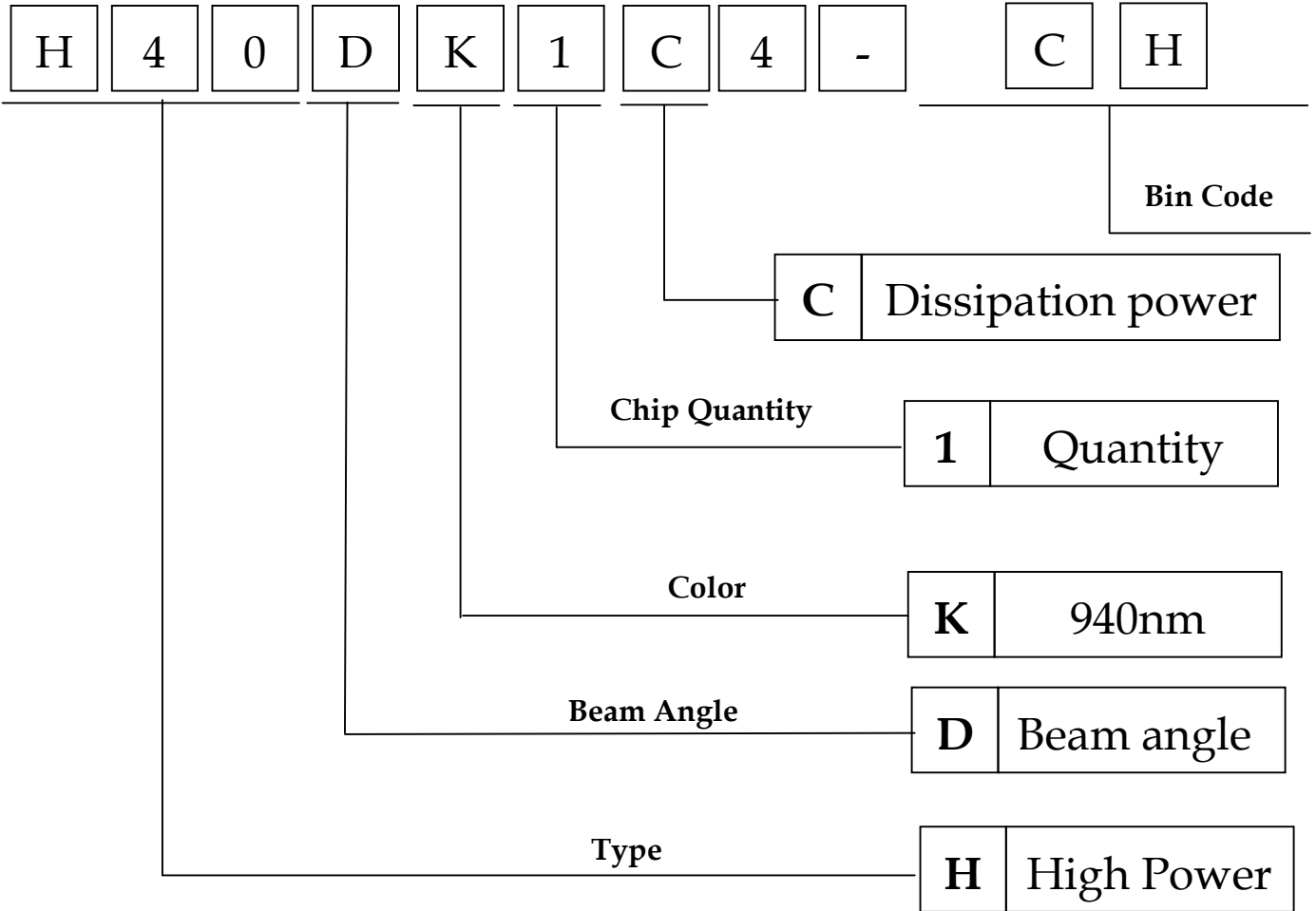
(Tj=25°C)

Item	Bin Code	Symbol	Condition	Min.	Max.	Unit
Forward Voltage <sup>1</sup>	B	V <sub>F</sub>	I <sub>F</sub> = 1000 [mA]	1.59	1.83	V
	C			1.83	2.07	
	D			2.07	2.31	
	E			2.31	2.55	
Luminous Flux <sup>2</sup>	F	Φ <sub>e</sub>	I <sub>F</sub> = 1000 [mA]	500	600	mW
	G			600	700	
	H			700	800	
	J			800	900	

Note

1. Forward voltage measurement allowance is ± 0.1V.
2. Radiant flux measurement allowance is ± 10%.

## Part Number Formation



## Characteristic Diagram

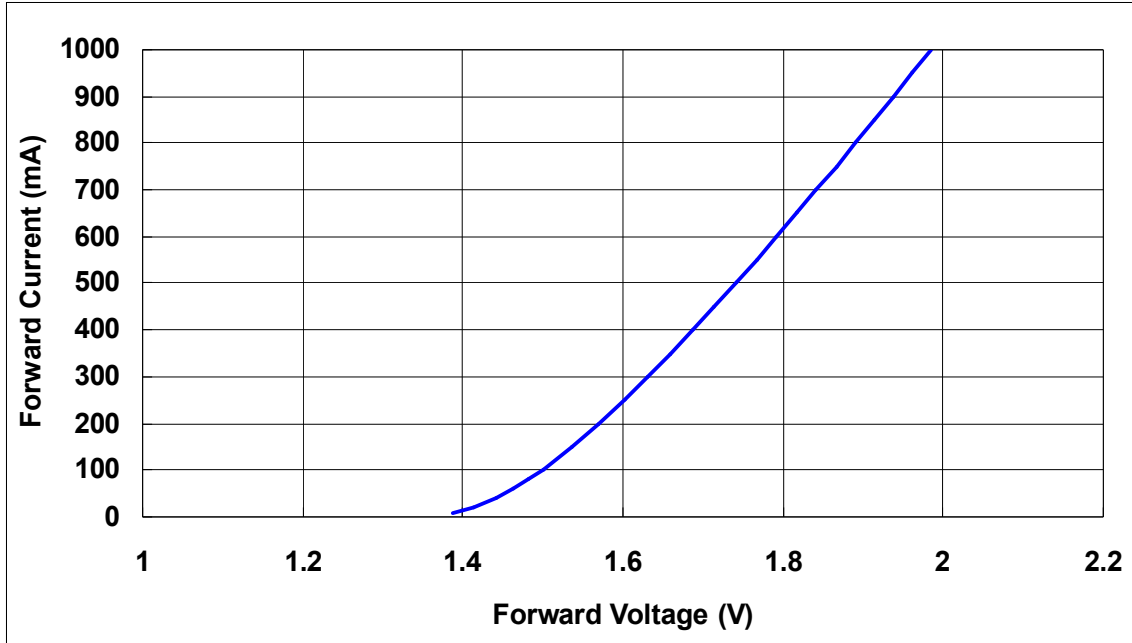


Fig. Forward Current vs. Forward Voltage

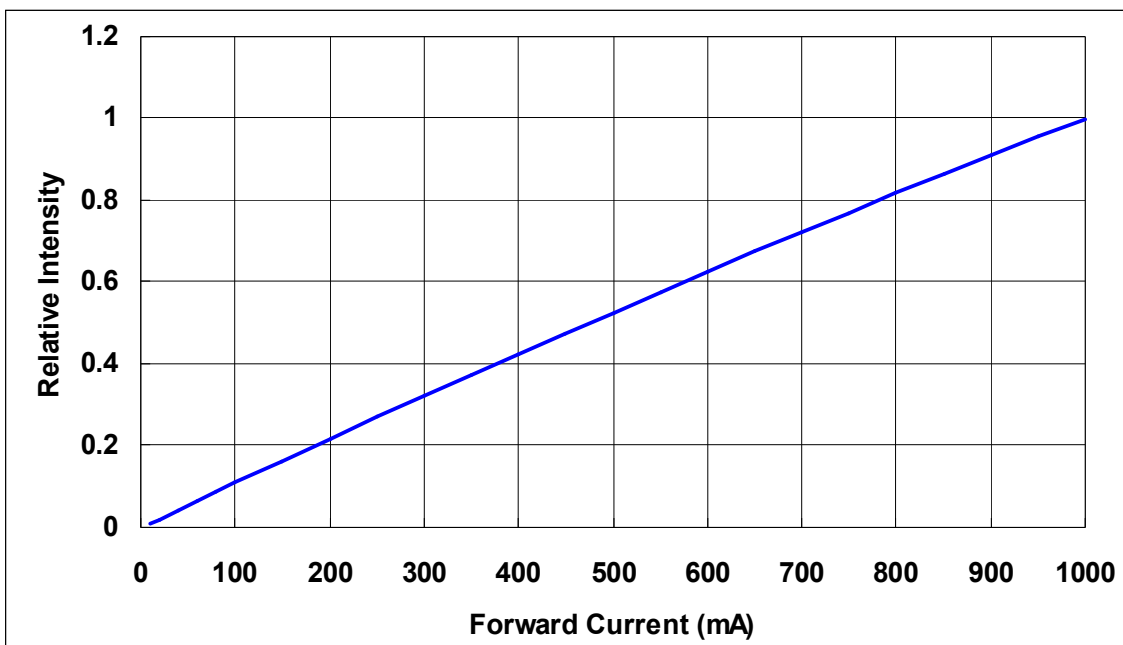
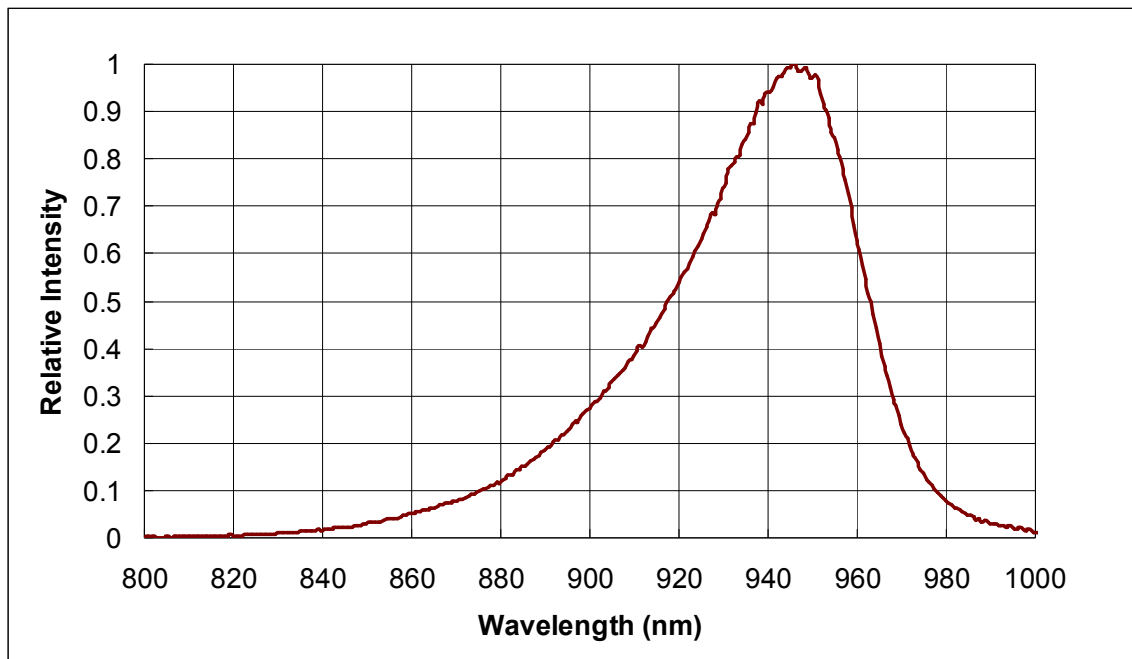


Fig. Relative Intensity vs. Forward Current.





**Fig. Typical Relative Intensity vs. wavelength**

## Outline Dimension

Unit : mm

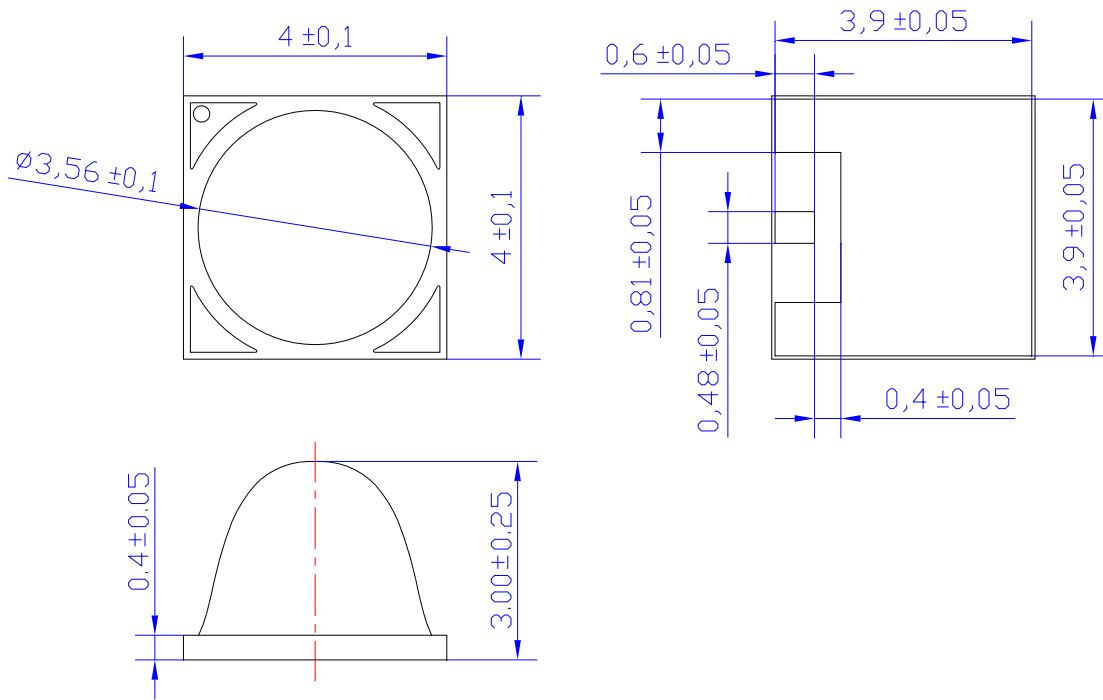
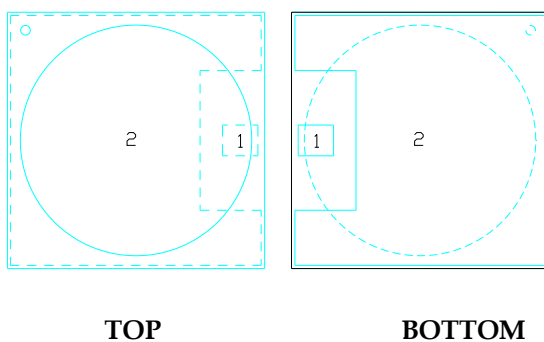


Fig. Package Outline Drawing.

### ● Pad Configuration

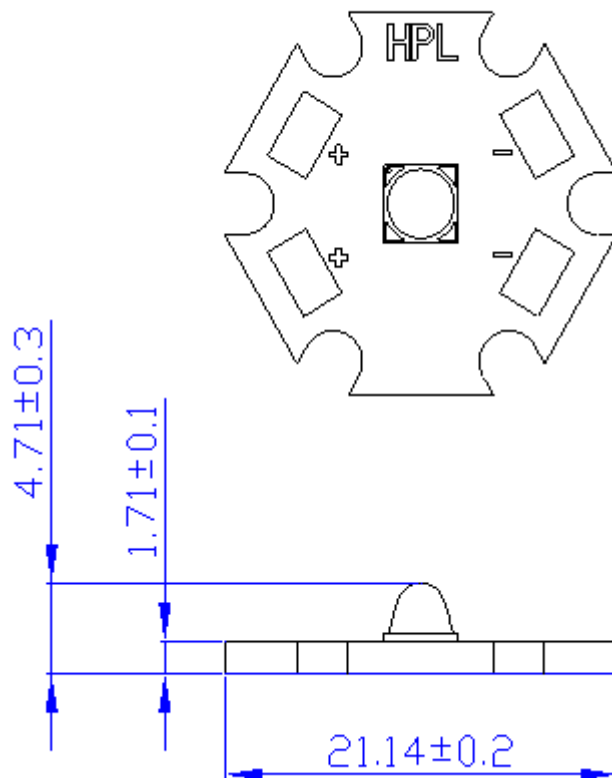


PAD	Function
1	Cathode
2	Anode 、 Thermal

Fig. Pad configuration.

Note: Please don't put conductive material on the top surface of LEDs.

**HPL-H40XK1C4**

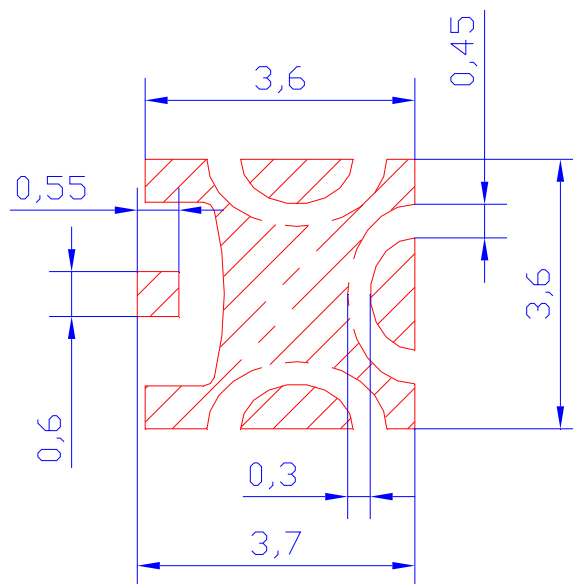
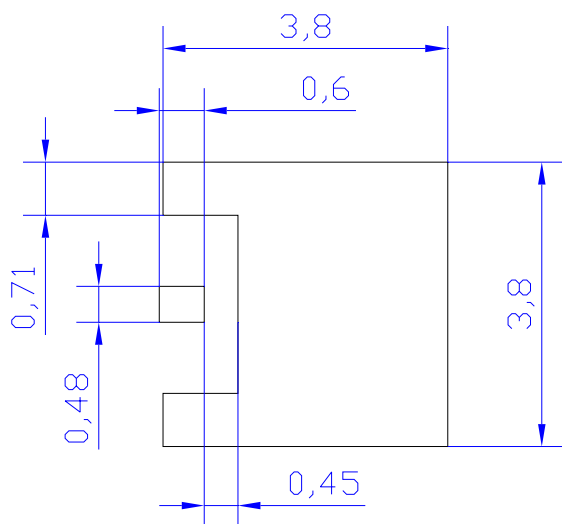


**Fig. Assembly Outline Drawing.**

## Recommended Solder Pattern

Unit : mm

Tolerance±0.05



MCPCB LAYOUT

SOLDER MASK

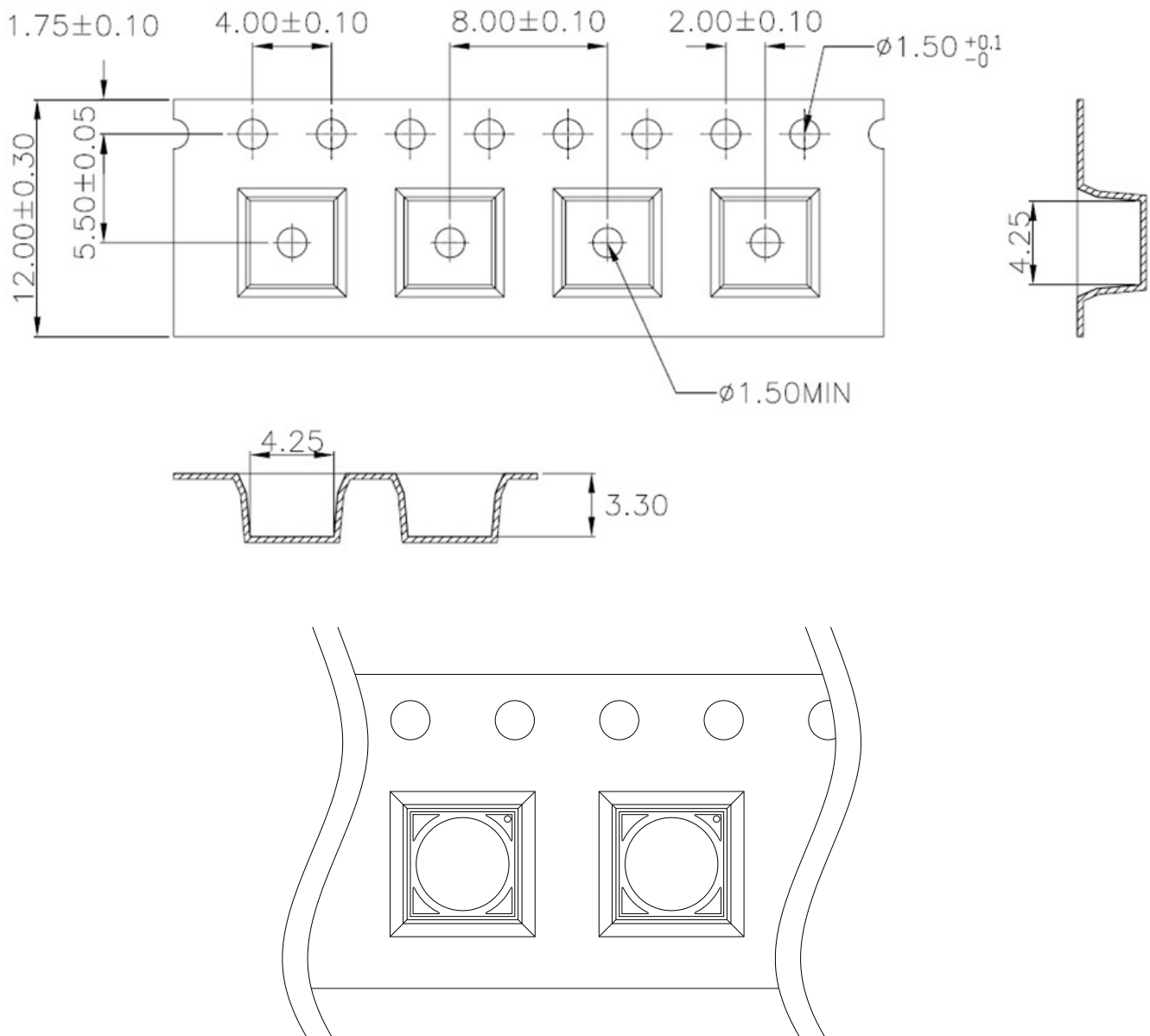
**Fig. Solder Pad Layout.**

## Shipping Package Style

### Tapping Dimension Packaging Specification

- Moisture proof bag.
- 1 Reel/bag.
- Q'ty : 700(MAX) / 7 inch Reel
- Q'ty : 2500(MAX) / 13 inch Reel

Unit : mm



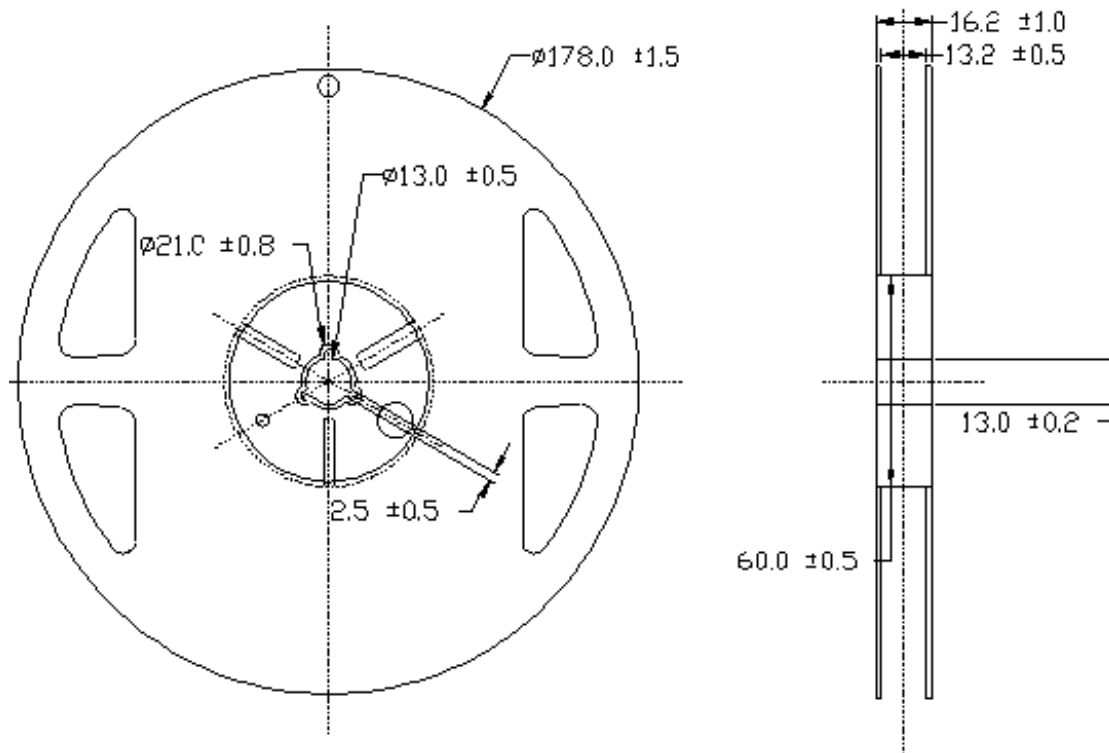
## 7 inch Reel Package

Box Type	Dimension (mm)	Reel/Box	40°Lens Type (Pcs)
Small Box(S)	230x85x265	5 Reel/Box	3500
Middle Box(M)	470x265x270	30 Reel/Box	21000
Large Box(L)	470x435x270	50 Reel/Box	35000

### Reel Packaging :

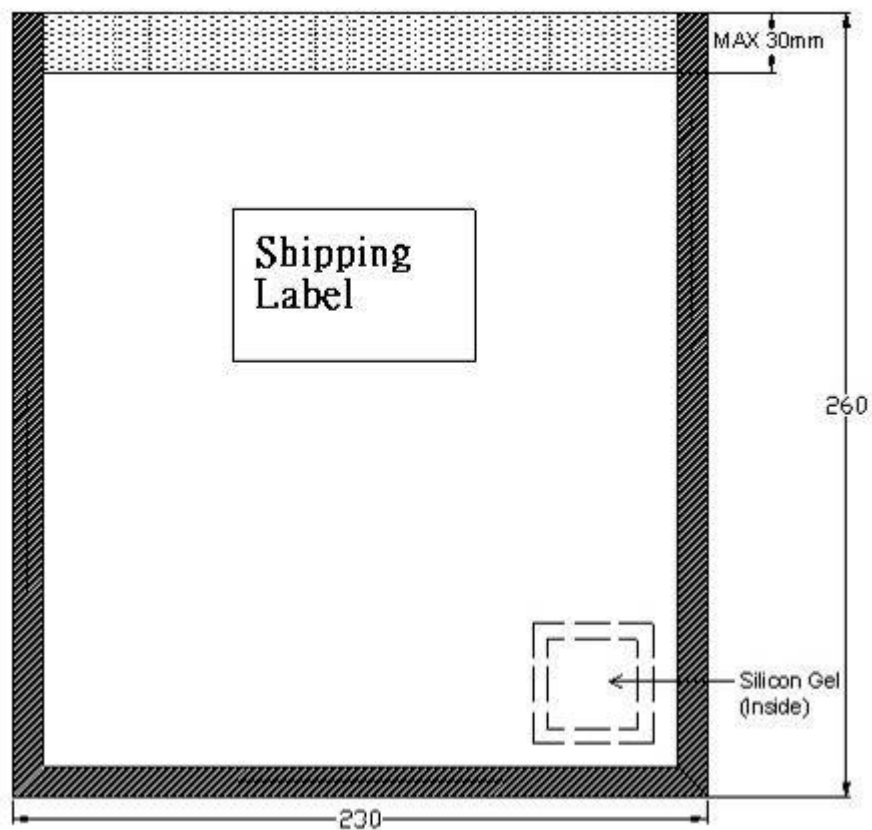
Reel Part :

Unit : mm



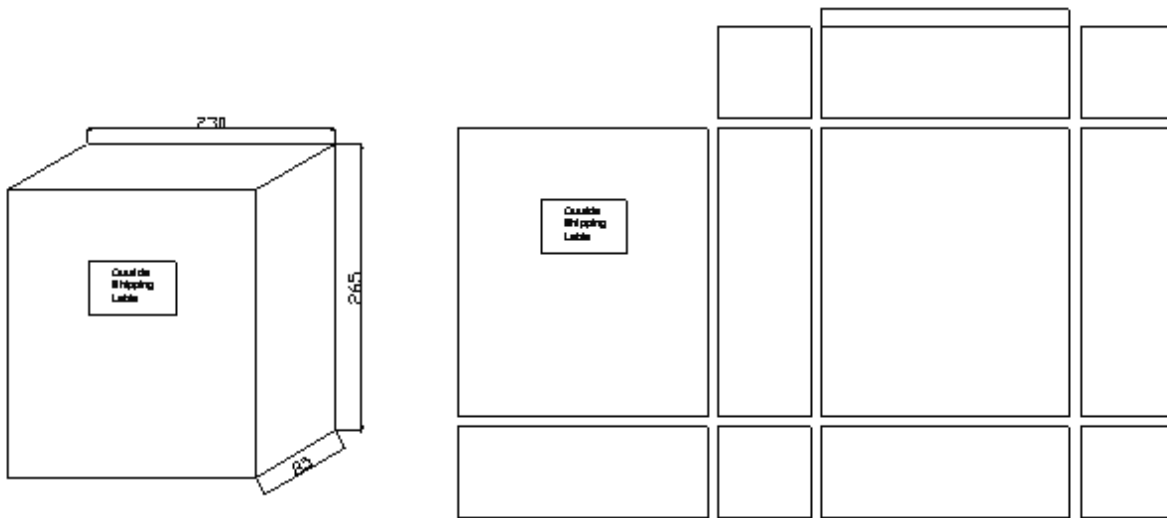
**Anti Statistic Bag :**

**Unit : mm**



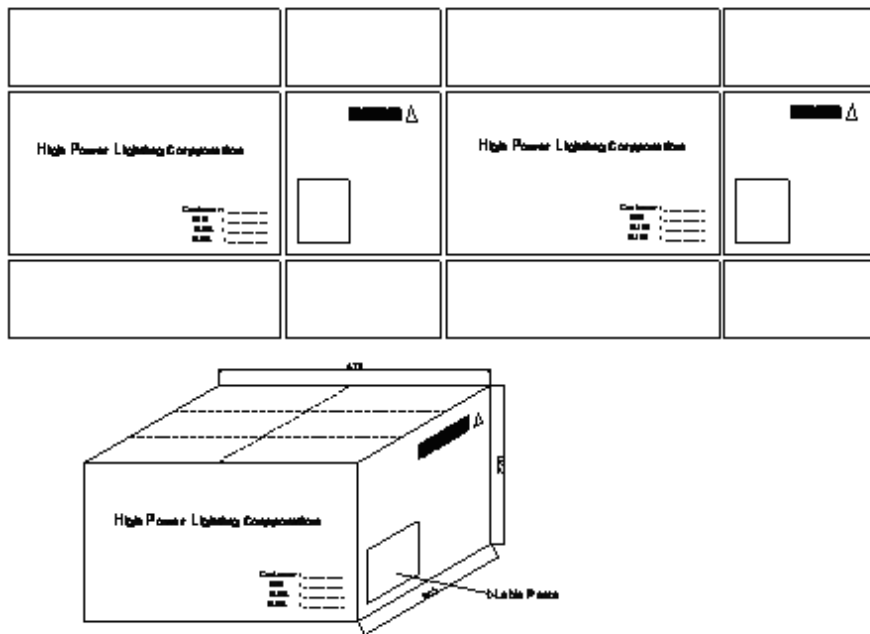
**Small Box**

Unit : mm



**Middle Box**

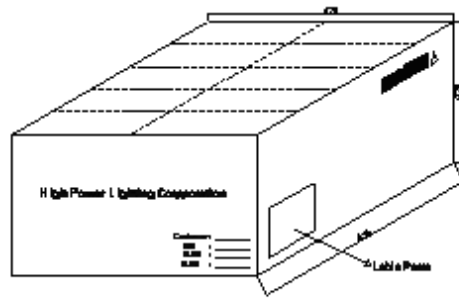
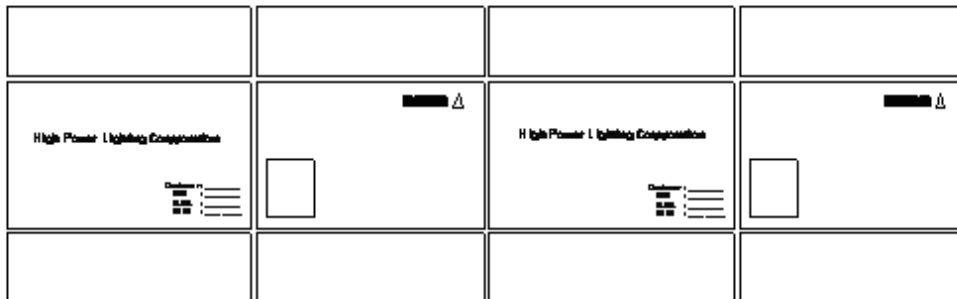
Unit : mm





Large Box

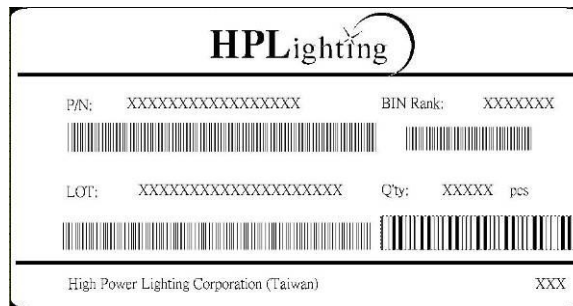
Unit : mm



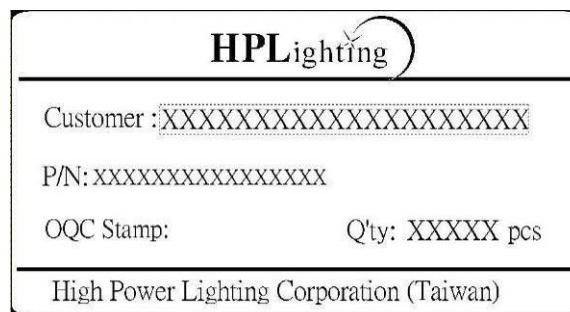
Label Formation

Unit : mm

70mm



40mm



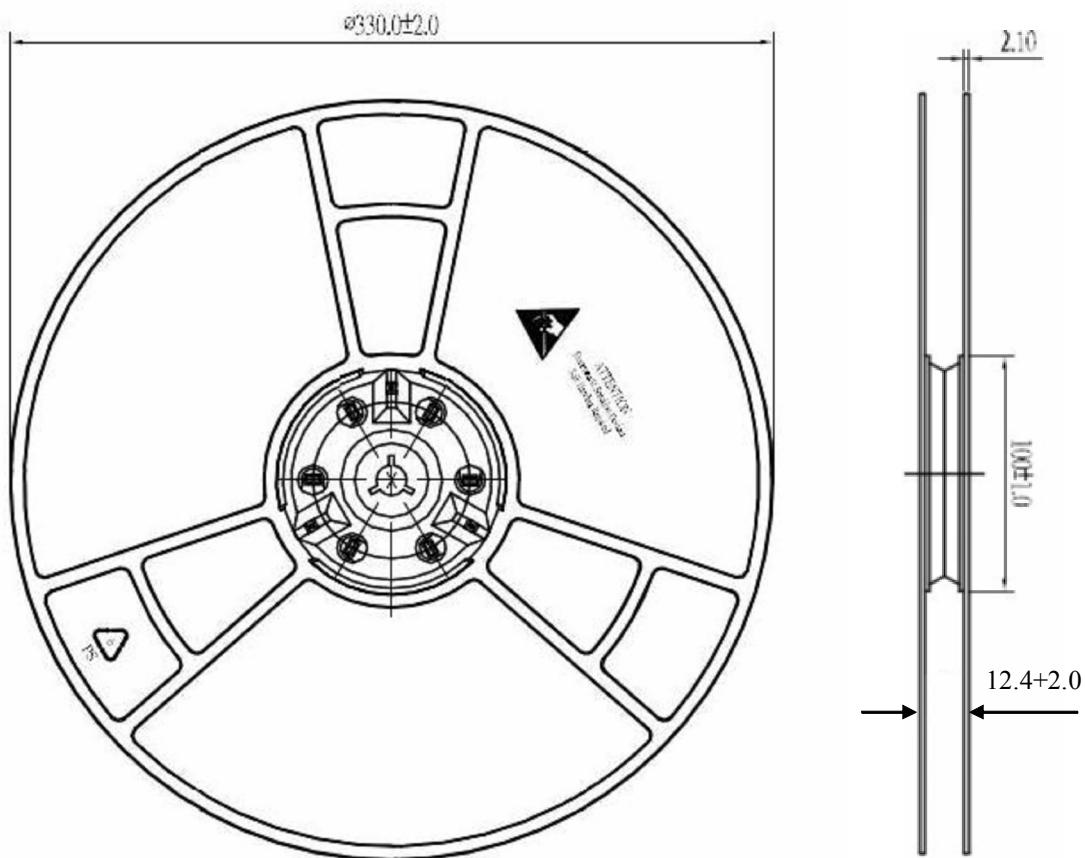
### 13 inch Reel Package

Box Type	Dimension (mm)	Reel/Box	40°Lens Type (Pcs)
Small Box(S)	415 x 380 x 95	5 Reel/Box	12500
Middle Box(M)	415 x 380 x 290	15 Reel/Box	37500
Large Box(L)	780 x 432 x 310	30 Reel/Box	75000

### Reel Packaging :

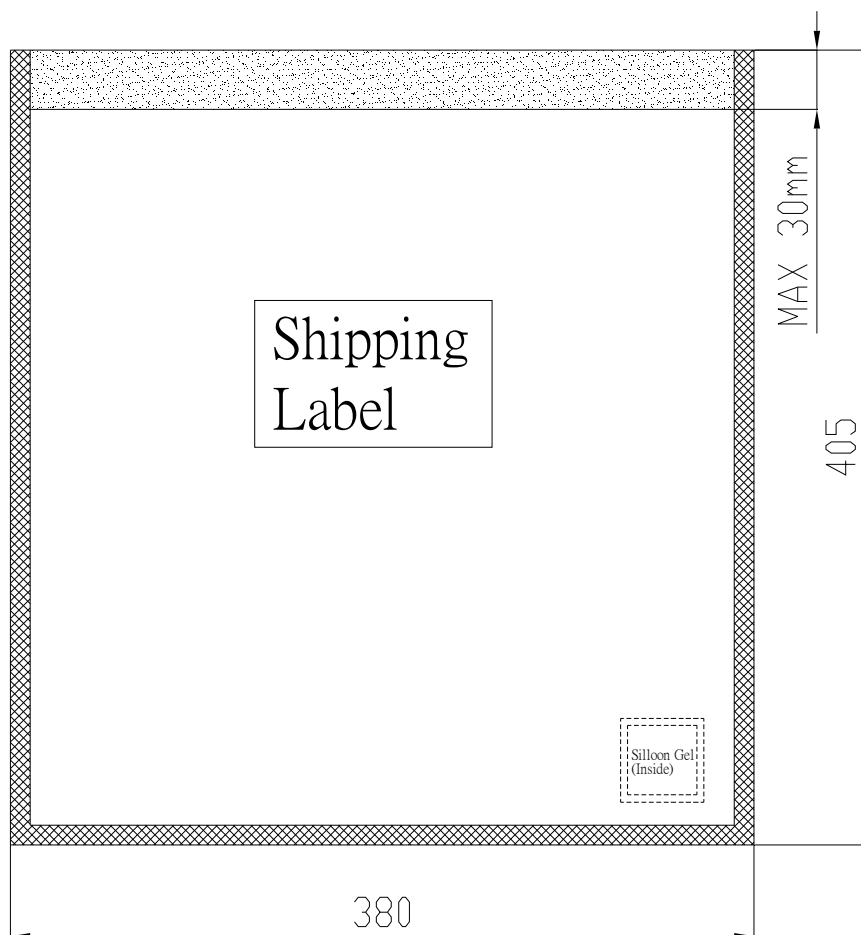
Reel Part :

Unit : mm



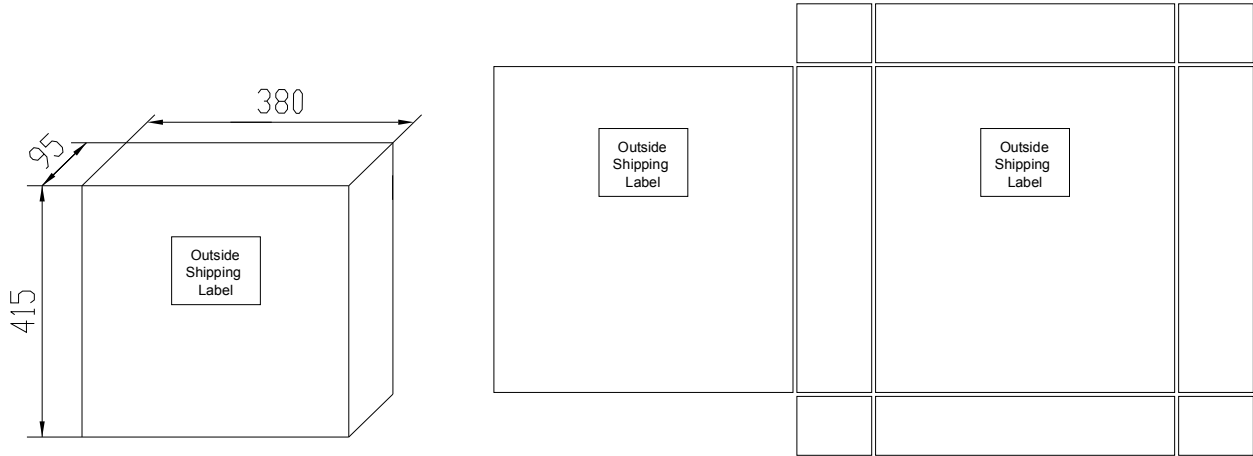
**Anti Statistic Bag :**

**Unit : mm**



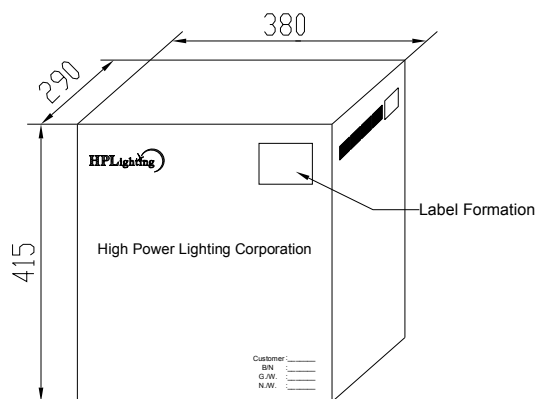
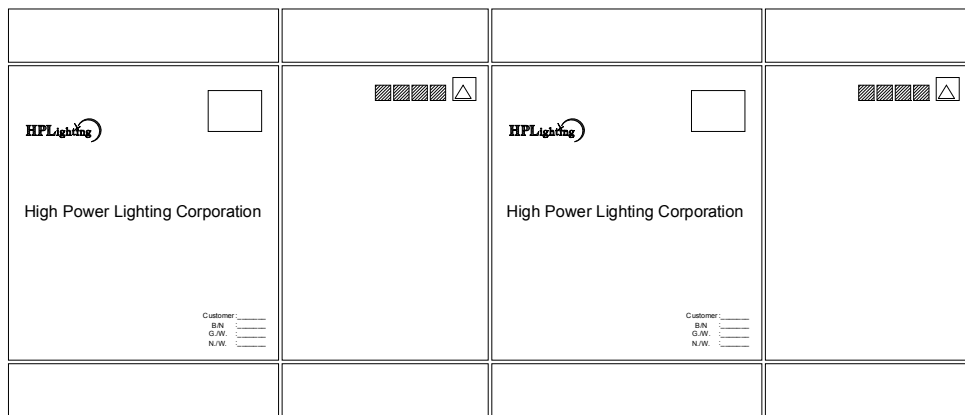
**Small Box**

Unit : mm



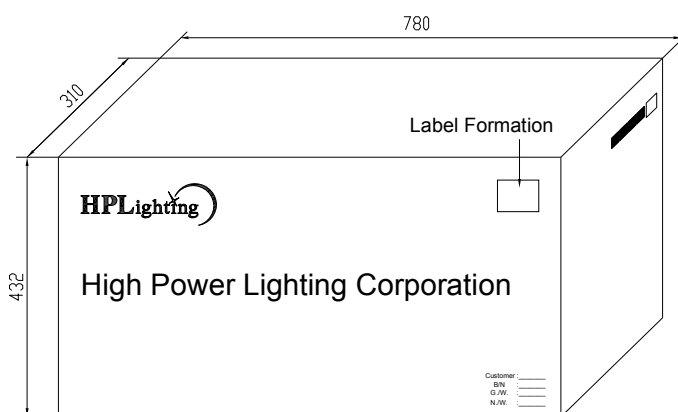
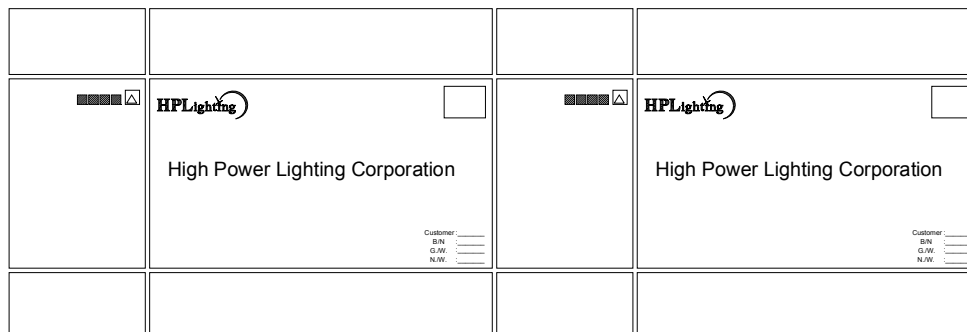
**Middle Box**

Unit : mm



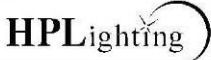

**Large Box**

**Unit : mm**

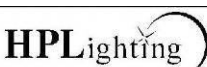


### Label Formation

70mm

	
P/N: XXXXXXXXXXXXXXXXX	BIN Rank: XXXXXXX
	
LOT: XXXXXXXXXXXXXXXXXXXX	Q'ty: XXXXX pcs
	
High Power Lighting Corporation (Taiwan)	XXX

40mm

	
Customer :XXXXXXXXXXXXXXXXXXXXXX	
P/N: XXXXXXXXXXXXXXXXX	
OQC Stamp:	Q'ty: XXXXX pcs
High Power Lighting Corporation (Taiwan)	

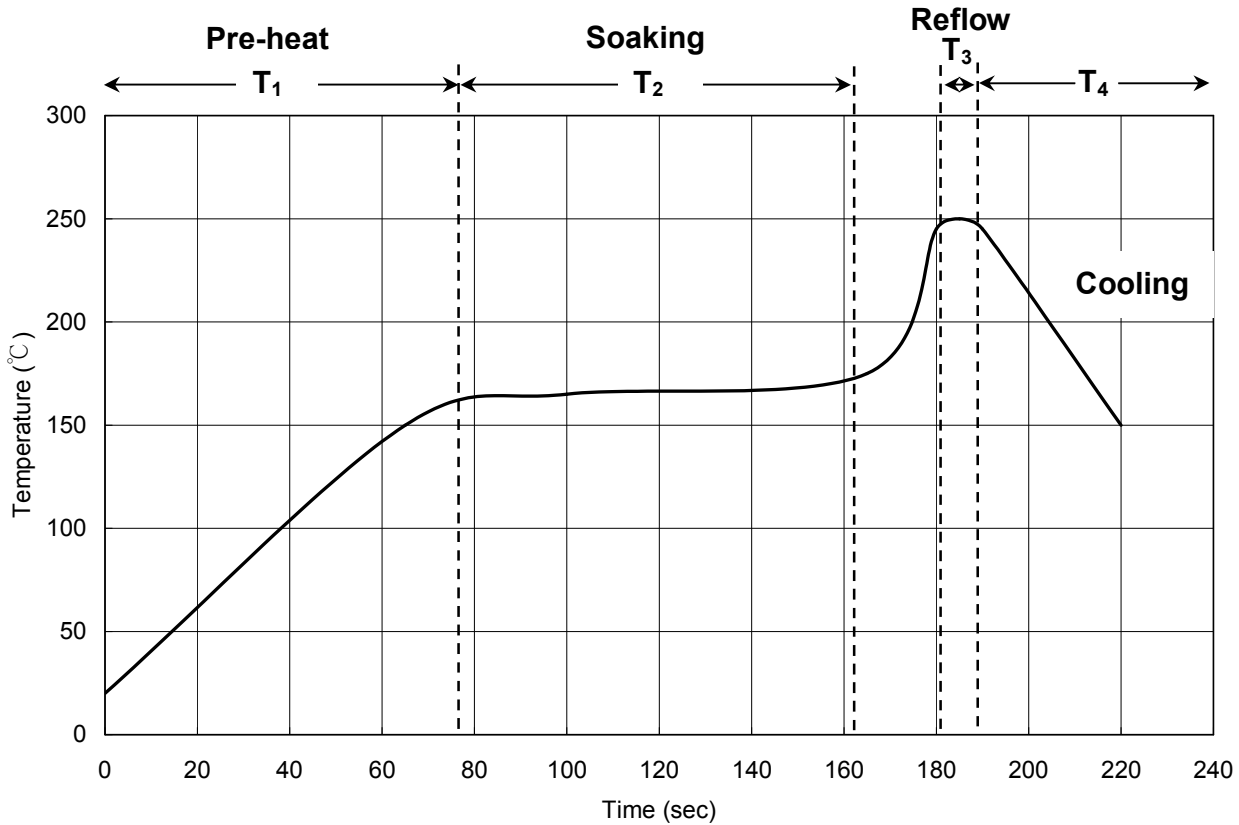
## Qualification Reliability Testing

Classification	Test Item	Test conditions	Reference Standard
Endurance Test	Operation Life	$I_F = 1000\text{mA}$ $T_a = 25^\circ\text{C}$ Test Duration = 1000hrs	MIL-STD-750: 1026 MIL-STD-883: 1005 JIS C 7021: B-1
	High Temperature High Humidity Storage	$T_a = 85\pm 5^\circ\text{C}$ RH = 85±5% Test Duration = 1000hrs	MIL-STD-202: 103B JIS C 7021: B-11
	High Temperature Storage	$T_a = 105\pm 5^\circ\text{C}$ Test Duration = 1000hrs	MIL-STD-202: 1008 JIS C 7021: B10
	Low Temperature Storage	$T_a = -40\pm 5^\circ\text{C}$ Test Duration = 1000hrs	JIS C 7021: B-12
Environmental Test	Temperature Cycling	$-30^\circ\text{C} \sim 25^\circ\text{C} \sim 105^\circ\text{C} \sim 25^\circ\text{C}$ 30min 5min 30min 5min Test Duration = 10 cycle	MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1010 JIS C 7021: A-4
	Thermal Shock	$-30\pm 5^\circ\text{C} \sim 105\pm 5^\circ\text{C}$ 30min 30min Test Duration = 10 cycle	MIL-STD-202: 107D MIL-STD-750: 1051 MIL-STD-883: 1011
	Solder Resistance	$T_{sol} = 260\pm 5^\circ\text{C}$ Dwell Time = 10sec	MIL-STD-202: 210A MIL-STD-750: 2031 JIS C 7021: A-1

Measuring Items	Symbol	Measuring Conditions	Failure Criteria
Forward voltage	$V_F$	$I_F = 1000\text{mA}$	$V_F$ shift > 10%
Luminous	$I_v\%$	$I_F = 1000\text{mA}$	$I_v\%$ shift > 10%

## Recommended Solder Profile

Soldering Recommended soldering conditions:



T <sub>1</sub>	Ramp up rate	1.0 ~ 3.0 °C/sec
	Pre-heat time	50 ~ 80 sec
T <sub>2</sub>	Soaking temperature	155 ~ 185 °C
	Dwell time during soaking	60 ~ 120 sec
T <sub>3</sub>	Reflow temperature	240 ~ 250 °C
	Reflow time	Max 10 sec
	Ramp up rate during reflow	1.2 ~ 2.3 °C/sec
T <sub>4</sub>	Cooling	1.0 ~ 6.0 °C/sec

Note: Suggest using Sn96Ag3Cu0.5 lead free solder.

### Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LED if necessary.





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