

# Specification for IR Series

## HPL-H44X<sub>1</sub>X<sub>2</sub>1BA

### Features

- Dimension :4.4mm(L)×4.4mm(W)
- High Radiant Flux type
- High Speed
- All Metal Design Cu PCB/ Al reflector
- Low thermal resistance
- The AlGaAs/ AlGaAs , AlGaAs/ GaAs Chip inside

### Applications

- IrDA
- Encoder
- Data Communication

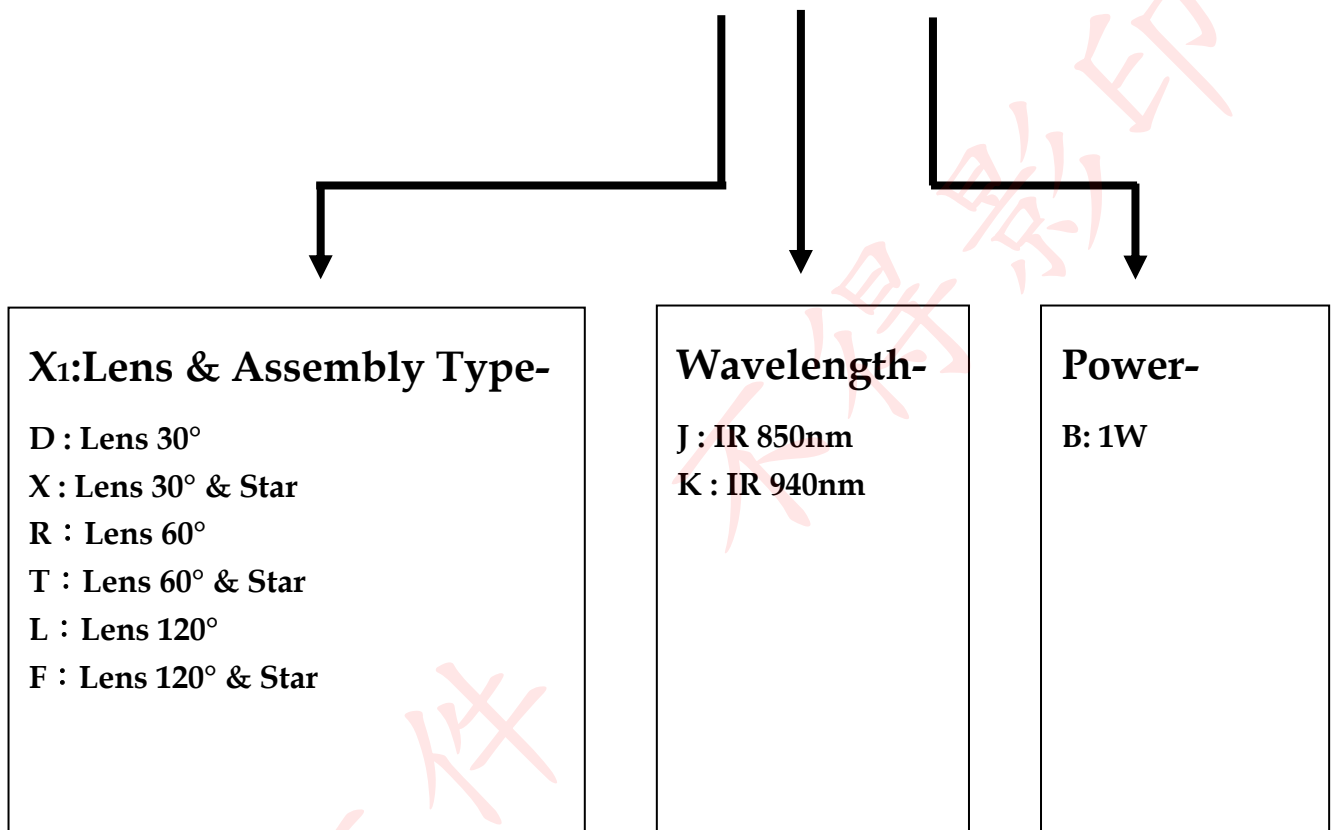
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## General Information

# HPL - H44X<sub>1</sub>X<sub>2</sub>1BA



### Caution:

Depends on different chips structures, the thermal pad could has a polarity as Anode. **It is strongly recommended to consider (Anode - thermal pad)** condition while designing a circuit to avoid the risk of circuit-fail.

## Part Number Matrix

Type Wavelength	30°Lens	30°Lens & Star	60°Lens	60°Lens & Star	120°Lens	120°Lens & Star
IR 850nm	HPL-H44DJ1BA	HPL-H44XJ1BA	HPL-H44RJ1BA	HPL-H44TJ1BA	HPL-H44LJ1BA	HPL-H44FJ1BA
IR 940nm	HPL-H44DK1BA	HPL-H44XK1BA	HPL-H44RK1BA	HPL-H44TK1BA	HPL-H44LK1BA	HPL-H44FK1BA

## Absolute Maximum Ratings

(T<sub>j</sub>=25°C)

Parameter	Symbol	Rating	Unit
Power Dissipation	IR 850nm	0.6	W
	IR 940nm	0.5	
Forward Current	I <sub>F</sub>	350	mA
Forward Pulse Current (1/10 Duty Cycle, 400msec Pulse Width)	I <sub>FP</sub>	500	mA
Thermal Resistance, Junction-Case	R <sub>th, J-C1</sub>	10	°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 5 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 850nm	V <sub>F</sub>	-	1.65	-	I <sub>F</sub> = 350mA	V
IR 940nm		-	1.5	-		

**Caution:** The real output is decided by chip capability

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

Wavelength	Reverse Current					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 850nm	I <sub>R</sub>	-	-	100	V <sub>R</sub> = 5V	μA
IR 940nm		-	-	100		

- Radiant Flux** (T<sub>j</sub>=25°C)

Wavelength	Radiant Flux					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 850nm	Φ <sub>e</sub>	75	120	175	I <sub>F</sub> = 350mA	mW
IR 940nm		50	100	150		

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

Wavelength	Wavelength					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
IR 850nm	λ <sub>p</sub>		850		I <sub>F</sub> = 350mA	nm
IR 940nm			940			

● **View Angle** (T<sub>j</sub>=25°C)

Wavelength	Viewing Angle					Test Condition	Unit
	Symbol	Lens 30°	Lens 60°	Lens 120°			
All	2θ <sub>1/2</sub>	30°	60°	120°		I <sub>F</sub> = 350mA	degree

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

Wavelength	Wavelength				Test Condition	Unit
	Symbol	MIN.	TYP.	MAX.		
IR 850nm	Δλ	-	40-	-	I <sub>F</sub> = 350mA	nm
IR 940nm			50			

● Bin Code List for Reference

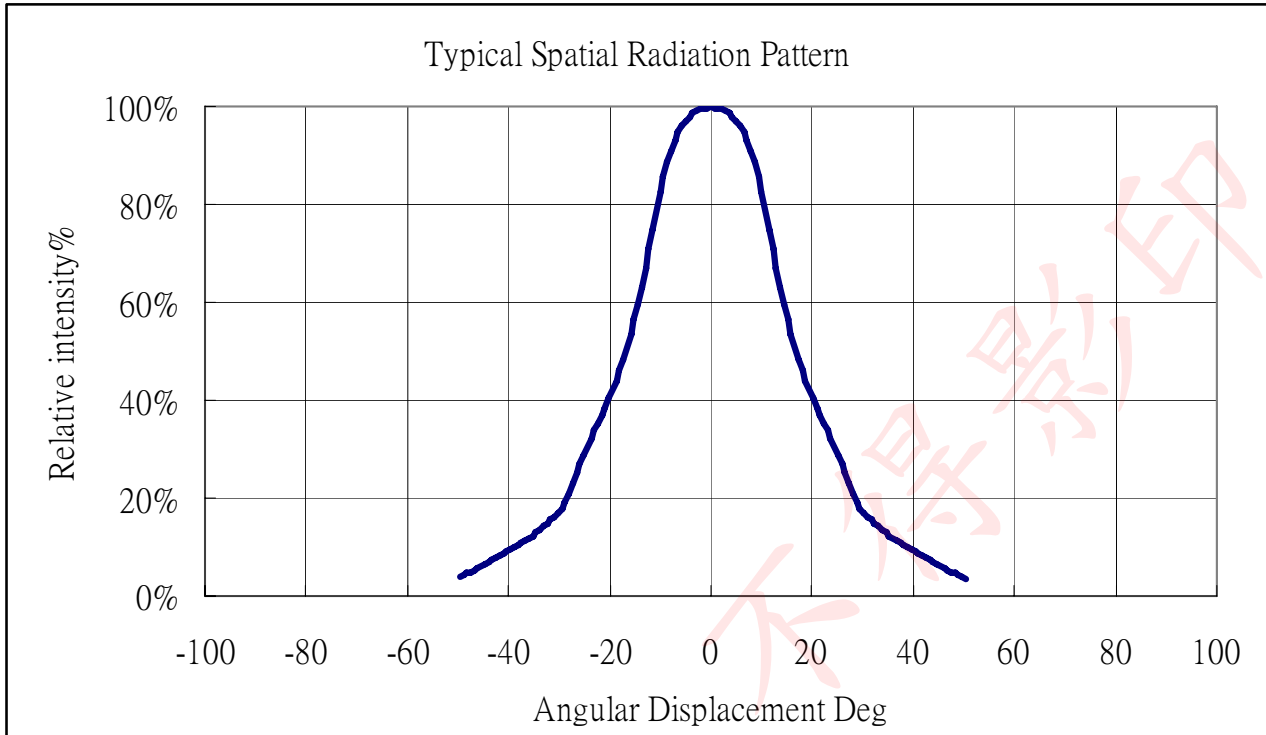
(T<sub>j</sub>=25°C)

Item	Bin Code	Symbol	Condition	Min.	Max.	Unit
Forward Voltage <sup>1</sup>	A	V <sub>F</sub>	I <sub>F</sub> = 350 [mA]	1.35	1.59	V
	B			1.59	1.83	
	C			1.83	2.07	
	D			2.07	2.31	
	E			2.31	2.55	
	F			2.55	2.79	
Luminous Flux <sup>2</sup>	5	Φ <sub>V</sub>	I <sub>F</sub> = 350 [mA]	50	75	mW
	6			75	100	
	7			100	125	
	8			125	150	
	9			150	175	

Note

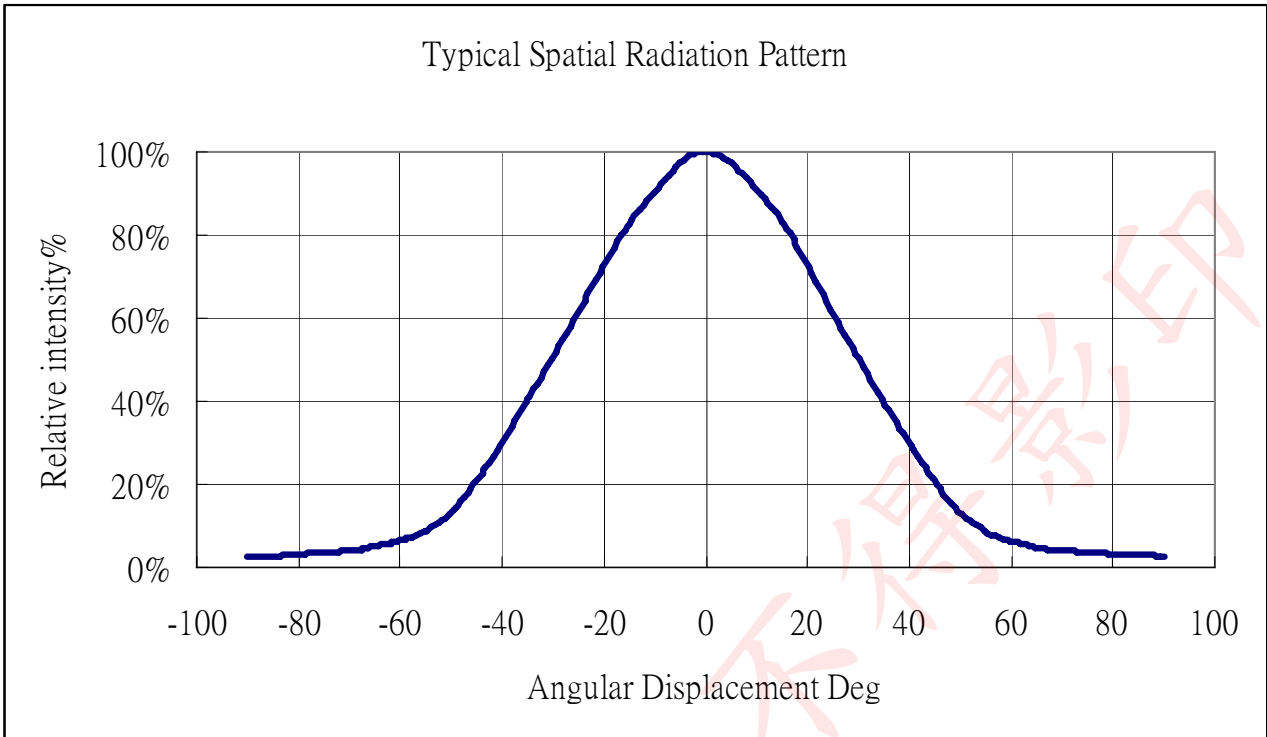
1. Forward voltage measurement allowance is ± 0.1V.
2. Radiant flux measurement allowance is ± 10%.

### Optical Radiation Pattern

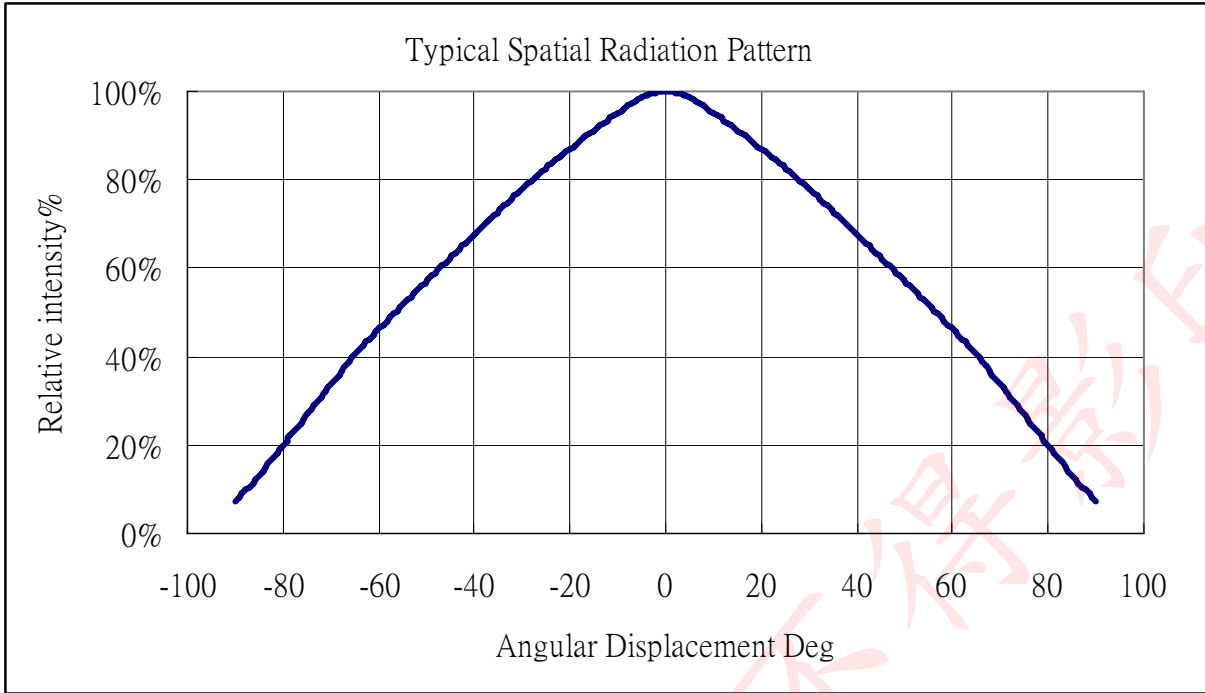


**Fig. (30° Lens) Typical Representative Spatial Radiation Pattern**



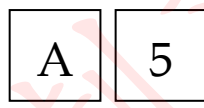
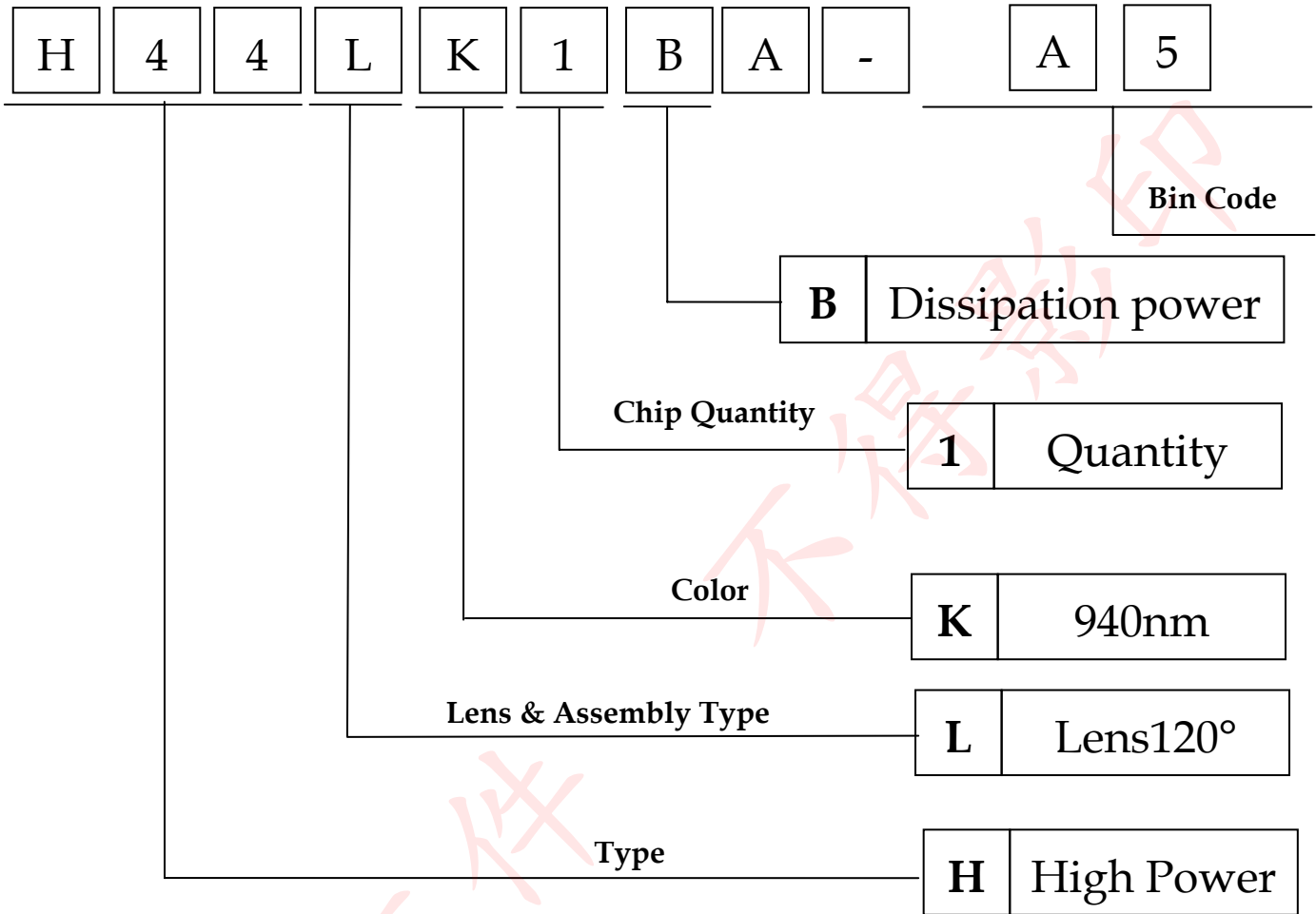


**Fig. (60° Lens) Typical Representative Spatial Radiation Pattern**



**Fig. (120° Lens) Typical Representative Spatial Radiation Pattern**

## Part Number Formation



→ Forward Voltage Bin Code

→ Luminous Flux Bin Code

## Characteristic Diagram

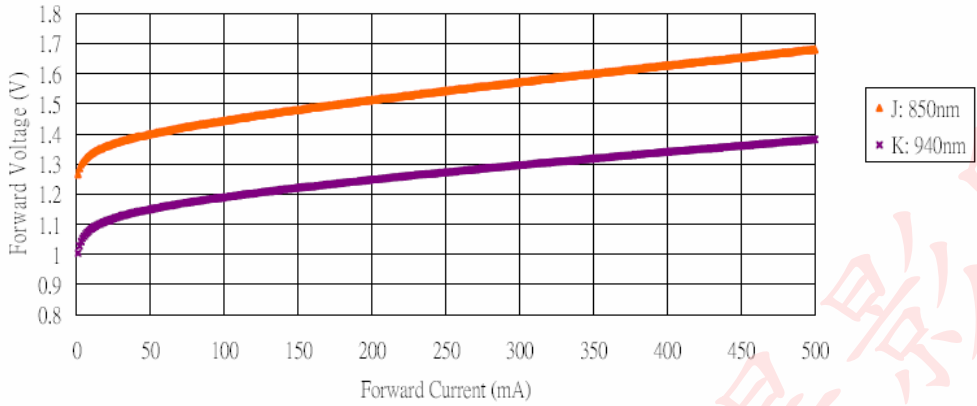


Fig. Forward Voltage VS. Forward Current

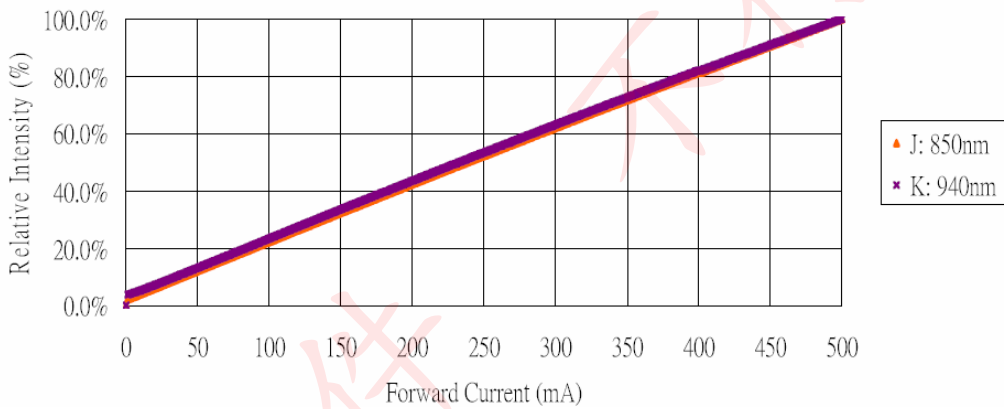


Fig. Forward Current VS. Relative Intensity

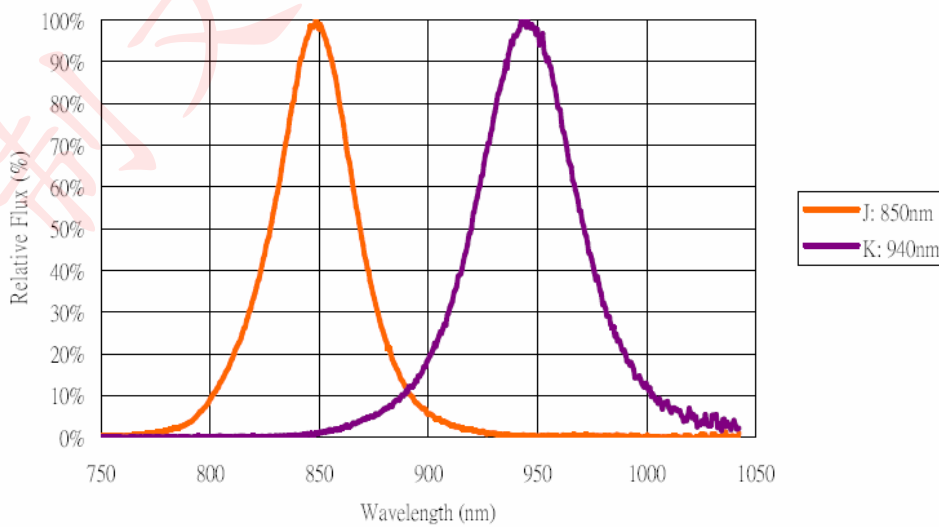
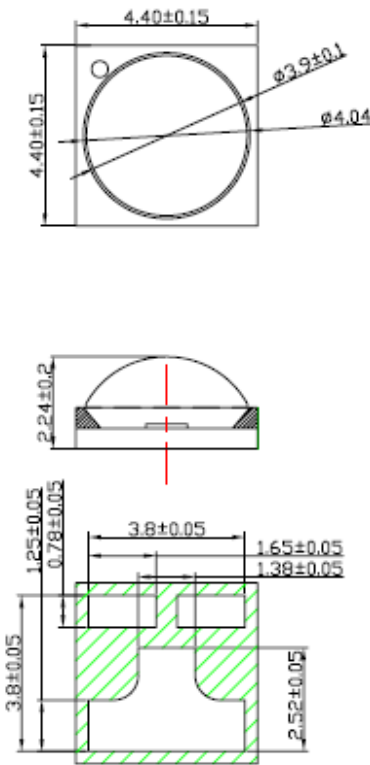


Fig. Wavelength VS. Relative Radiometric Flux

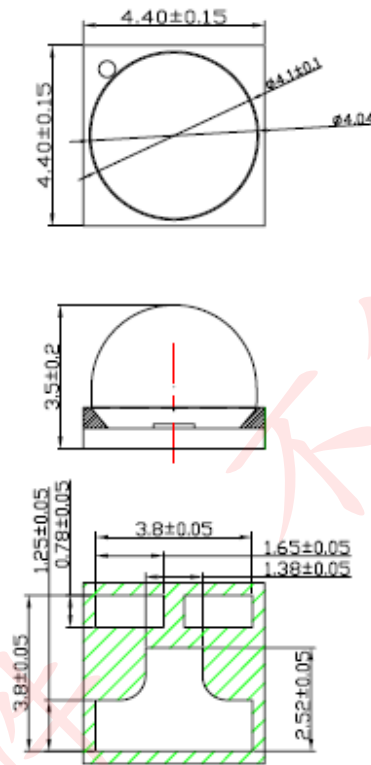
Outline Dimension

Unit : mm

HPL-H44LX1BA



HPL-H44RX1BA



HPL-H44DX1BA

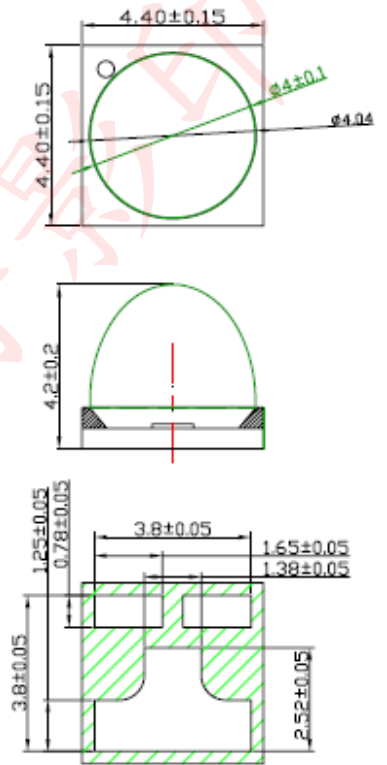
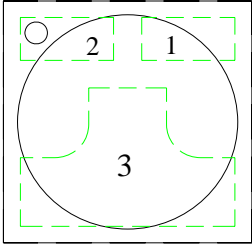
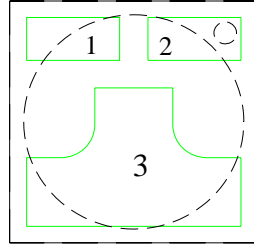


Fig. Package Outline Drawing.

● Pad Configuration



TOP



BOTTOM

PAD	Function
1	Cathode
2	Anode
3	Thermal

Fig. Pad configuration.

HPL-H44XX1BA

HPL-H44TX1BA

HPL-H44FX1BA

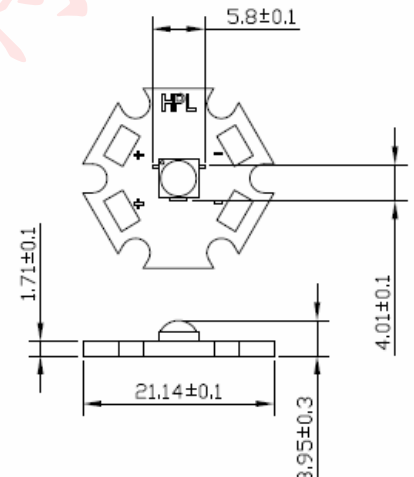
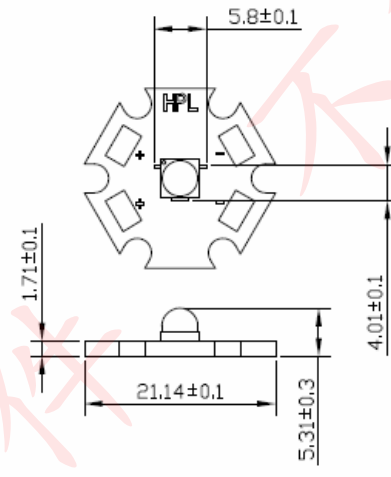
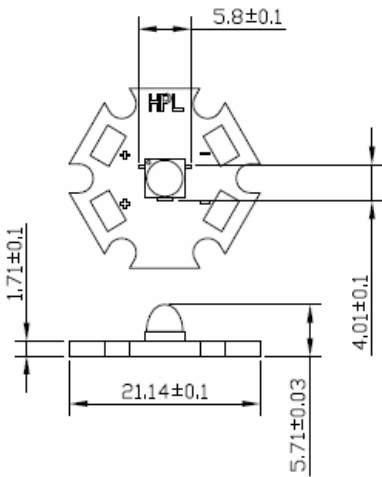
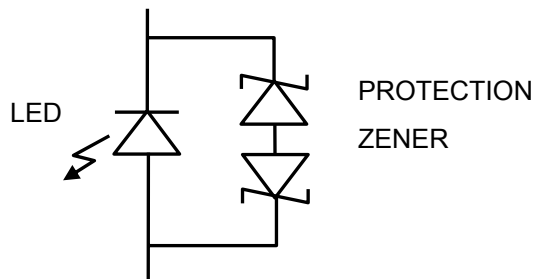
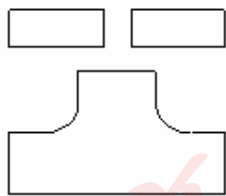
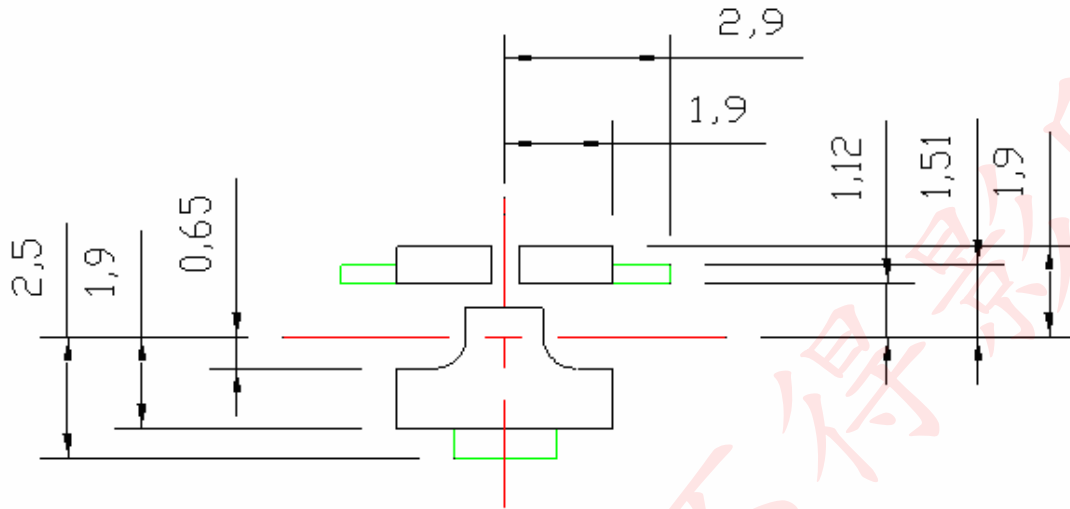


Fig. Assembly Outline Drawing.

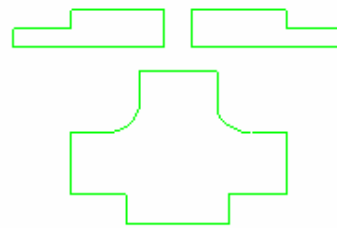
PROTECTION CIRCUIT



## Recommended Solder Pattern



**SOLDER  
MASK**



**COPPER  
LAYER**

Fig. Solder Pad Layout.

## Shipping Package Style

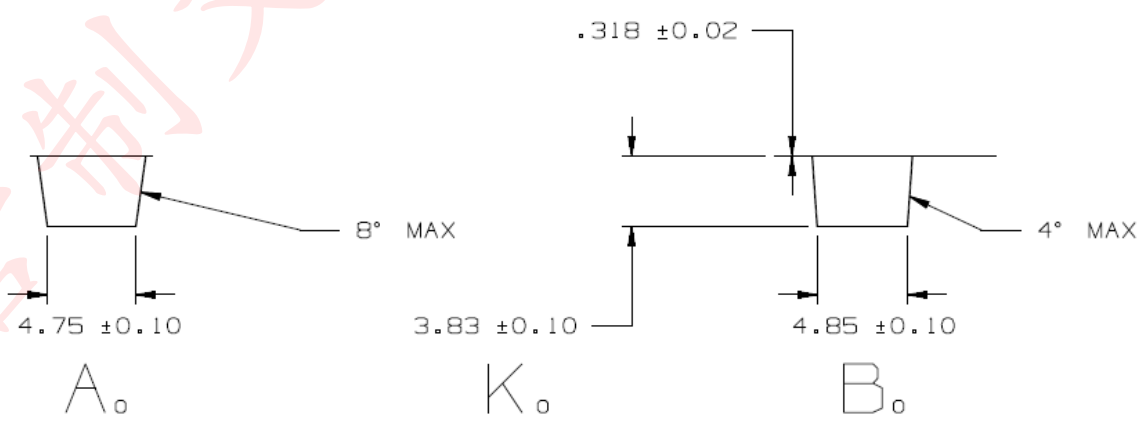
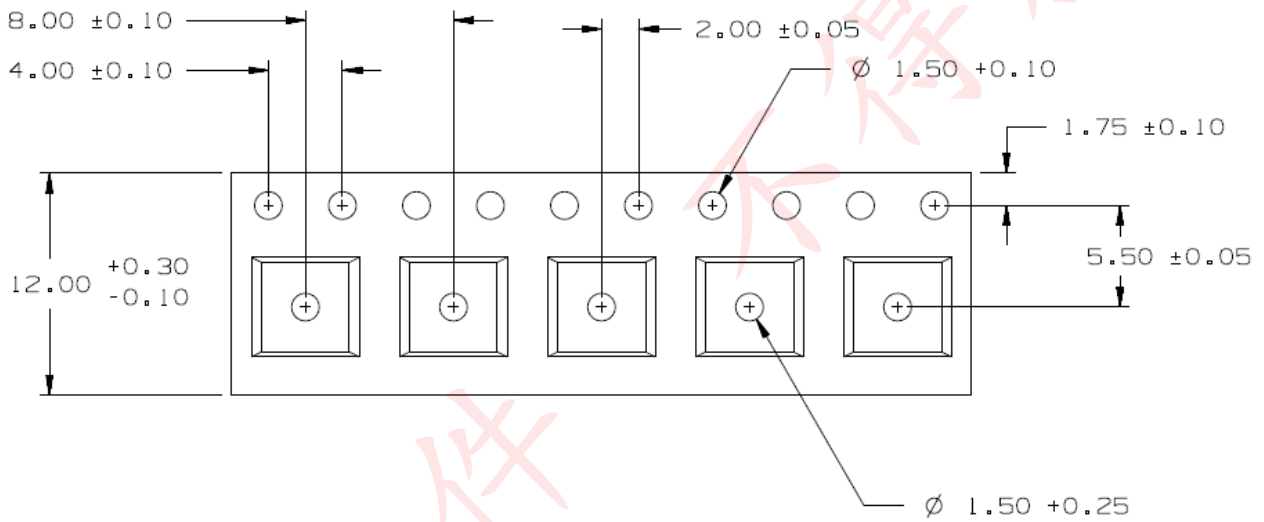
### Lens Type

#### Tapping Dimension Packaging Specification

##### 60 Degree Lens Type :

- Moisture proof bag.
- 1 Reel/bag.
- Q'ty: 650 (MAX)/Reel.

Unit : mm

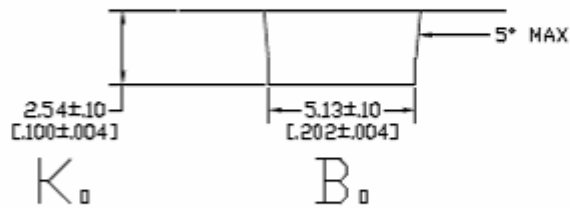
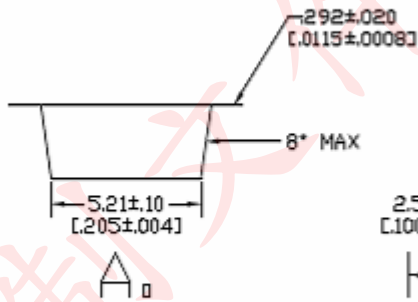
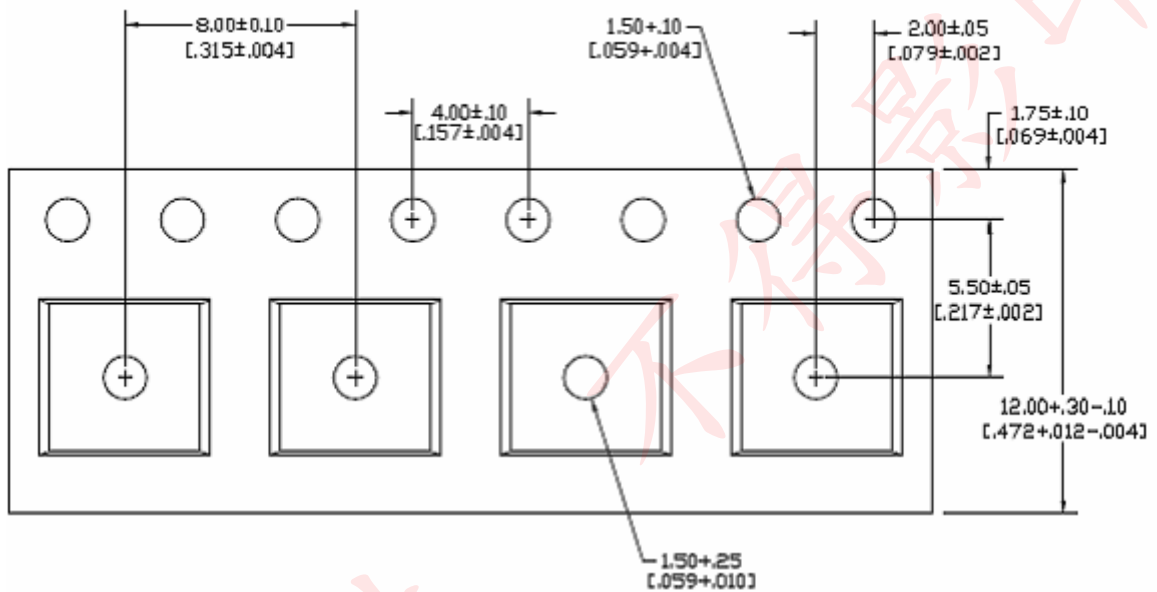




**120 Degree Lens Type :**

- Moisture proof bag.
- 1 Reel/bag.
- Q'ty: 800(MAX)/Reel.

Unit : mm



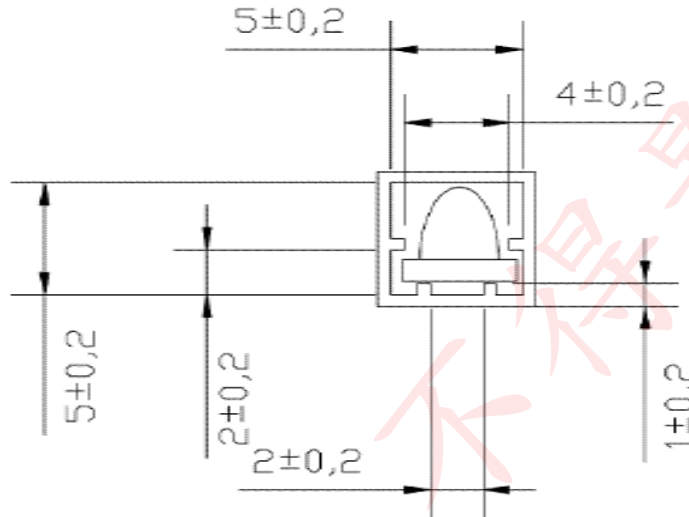
MM  
[INCH]

**30 Degree Lens Type :**

- 1 Tube
- Q'ty: 100(MAX)/Tube.
- Q'ty: 950Tube(MAX)/BOX

Unit : mm

Unit : mm



NOTES:  
 General tolerance=± 0.20mm  
 Material : PVC, Clear  
 THICKNESS : 0.5mm  
 LENGTH : 460mm ± 2mm

**Label Formation**

P/N: XXXXXXXXXXXXX	BIN Rank : XXXXXXXXX
LOT: XXXXXXXXXXXXX	Q'ty : XXXPCS XXX

75mm\*8mm

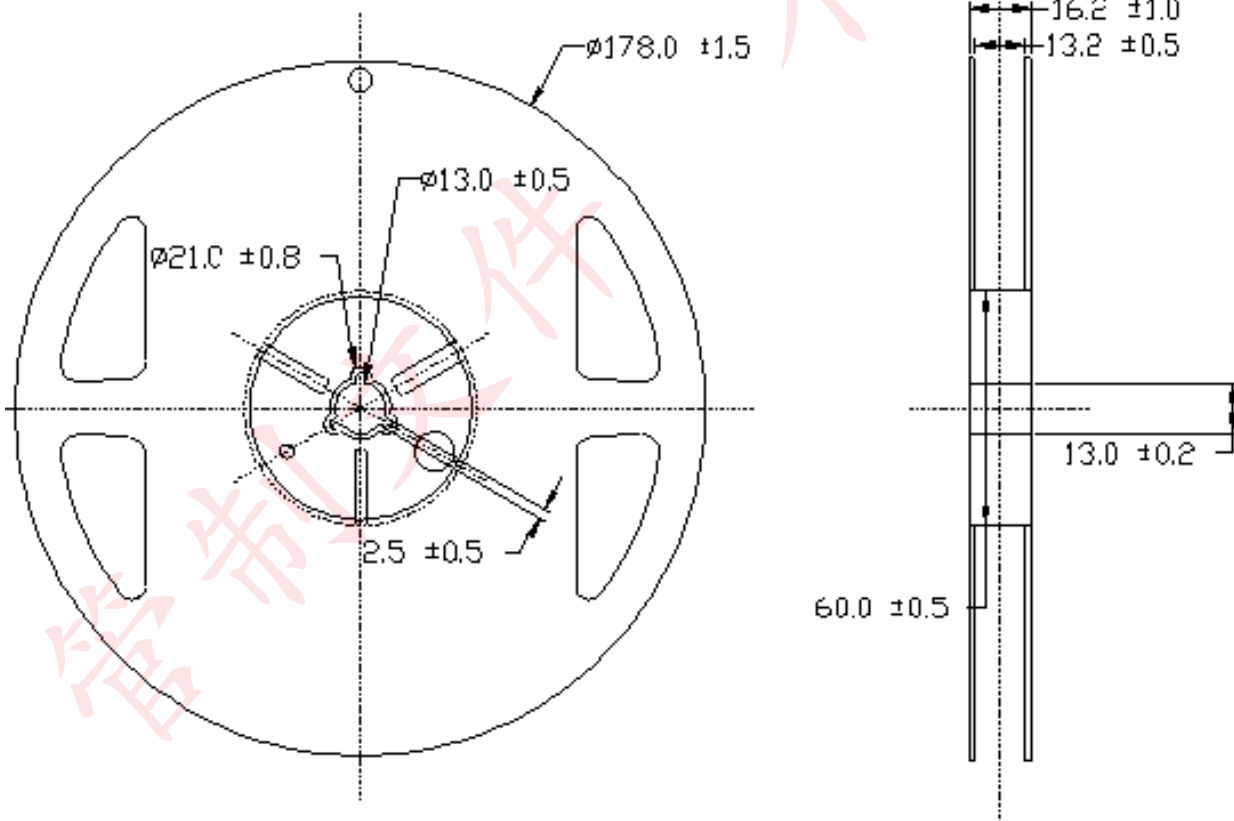
### Package

Box Type	Dimension (mm)	Reel/Box	60°Lens Type (Pcs)	120°Lens Type(Pcs)
Small Box(S)	230x85x265	5 Reel/Box	3250	4000
Middle Box(M)	470x265x270	30 Reel/Box	19500	24000
Large Box(L)	470x435x270	50 Reel/Box	32500	40000

### Reel Packaging :

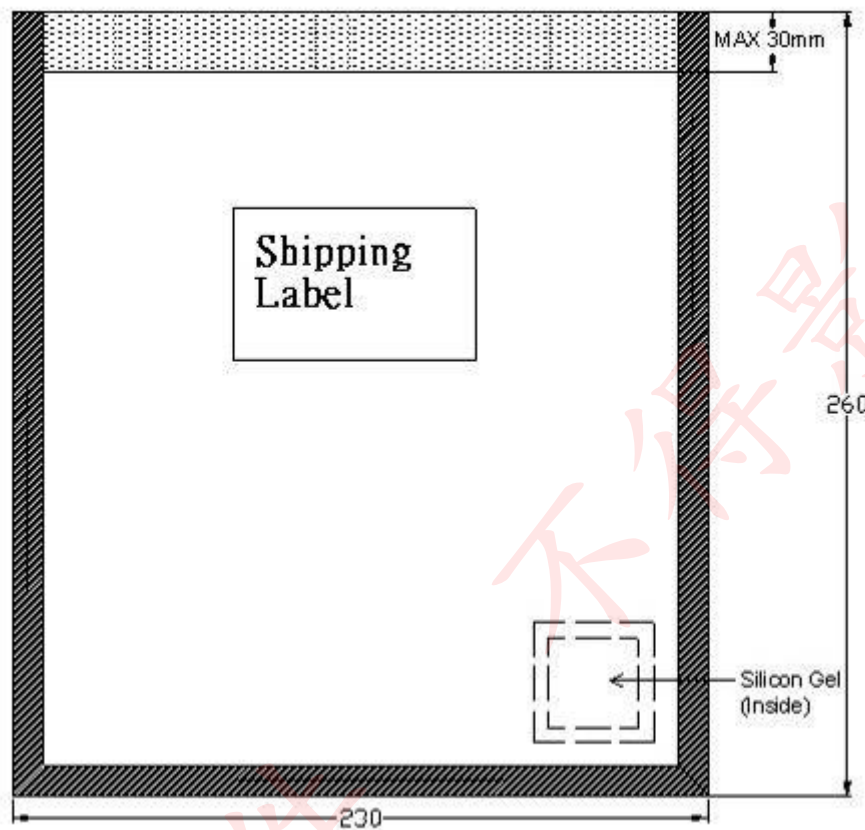
Reel Part :

Unit : mm



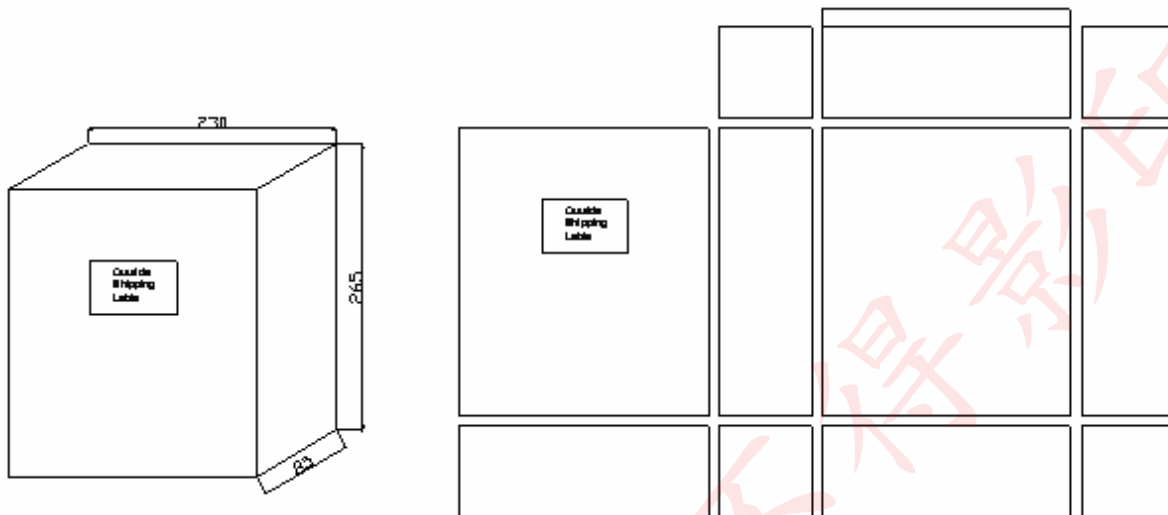
**Anti Statistic Bag :**

**Unit : mm**



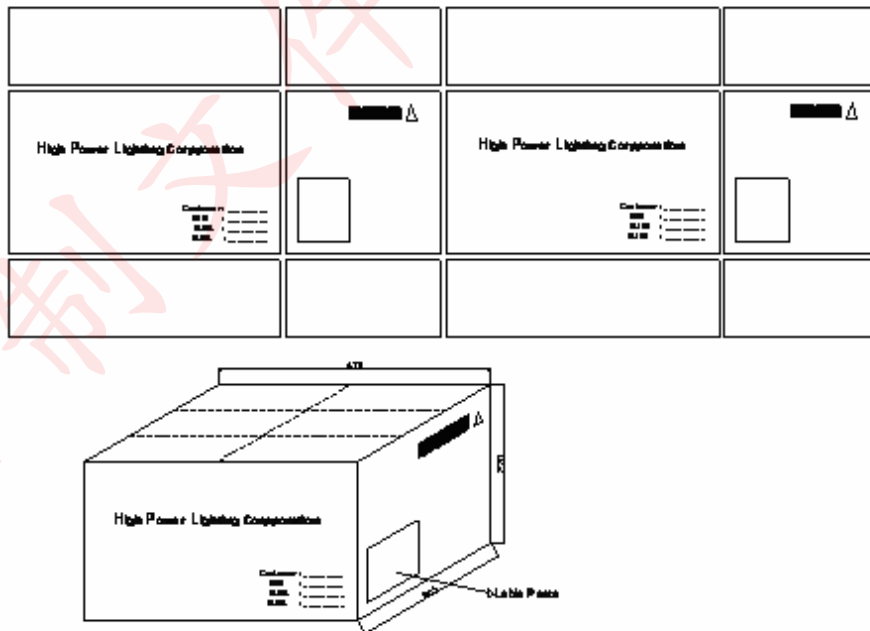
**Small Box**

Unit : mm



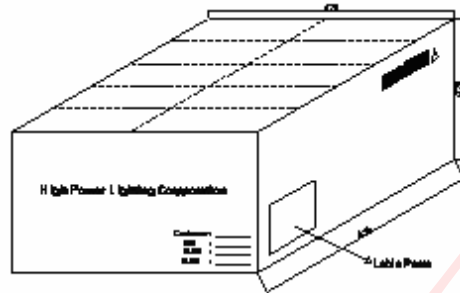
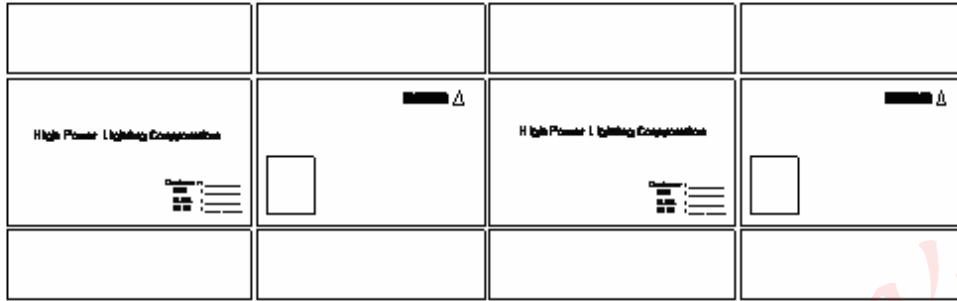
**Middle Box**

Unit : mm



**Large Box**

Unit : mm



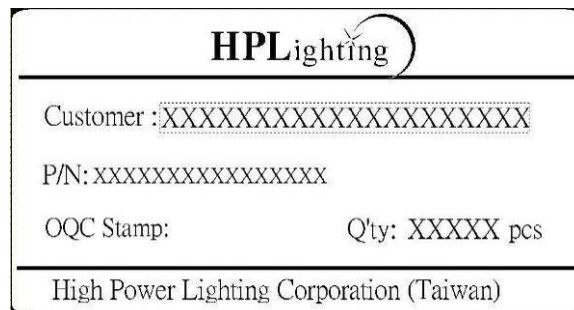
**Label Formation**

70mm

Unit : mm



40mm



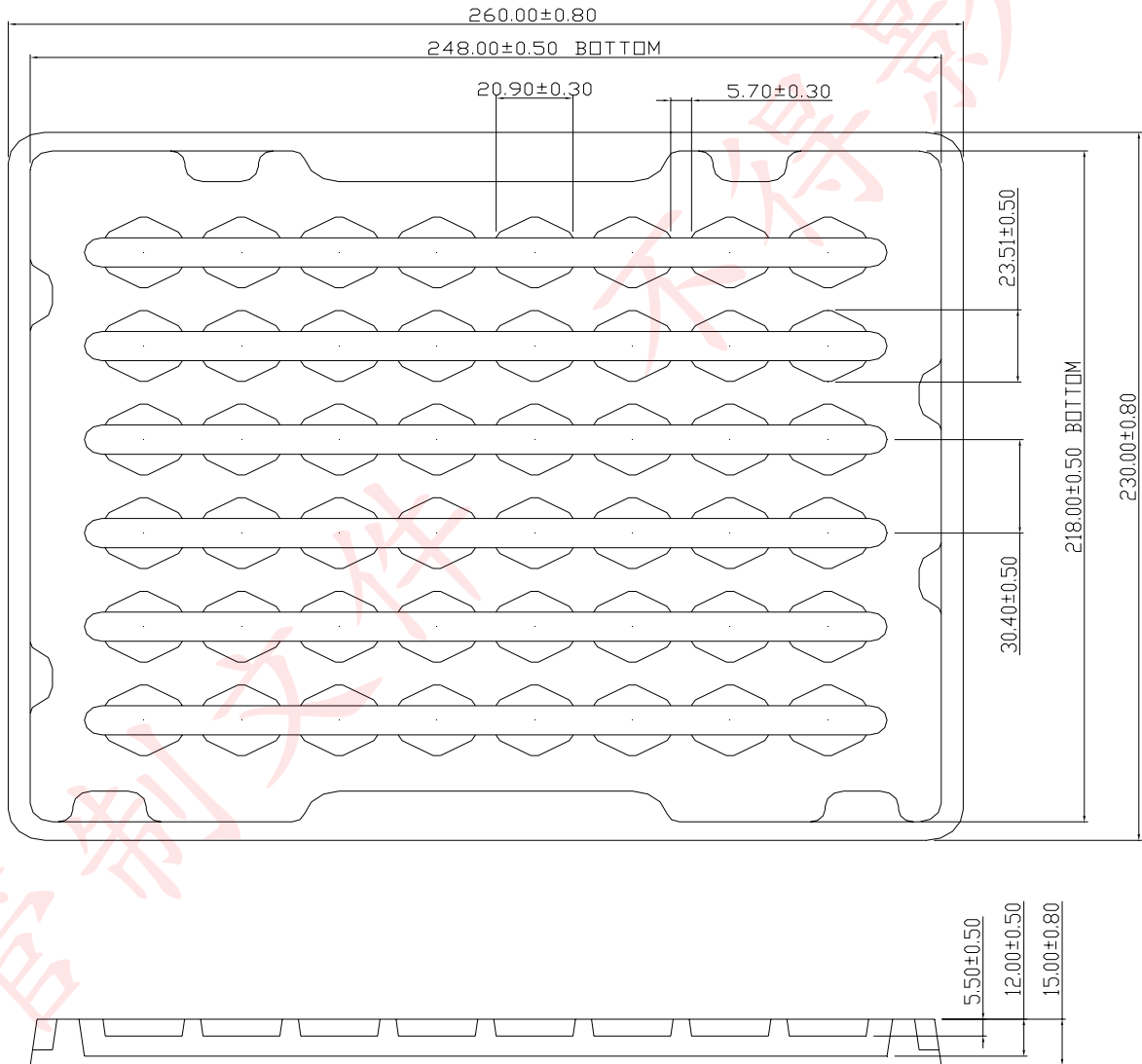
## Assembly Type

### Tapping Dimension Packaging Specification

#### 30, 60 & 120 Degree Assembly Type :

- Moisture proof bag.
- 21 Tray (MAX) /bag.
- Q'ty: 48pcs(MAX)/Tray

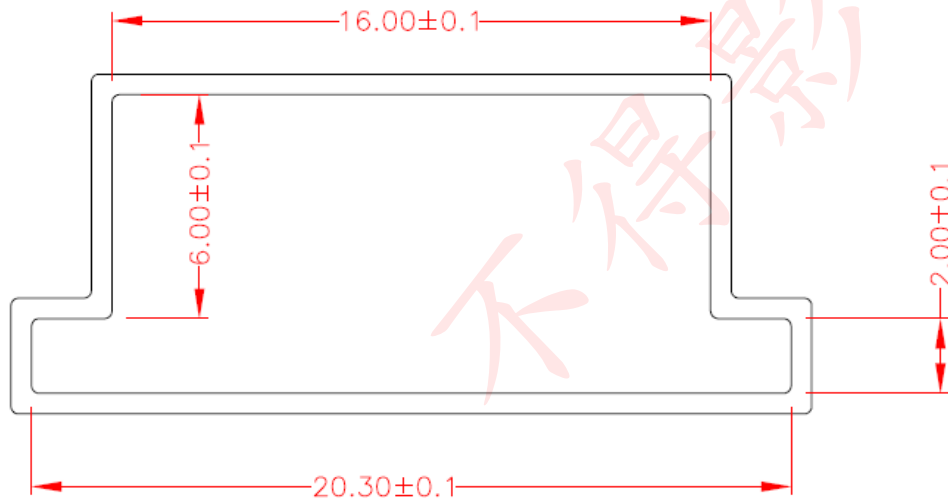
Unit : mm



**30, 60 & 120 Degree Assembly Type :**

- 1 Tube
- Q'ty: 20pcs(MAX)/Tube
- Q'ty: 300Tube(MAX)/BOX

**Unit : mm**



**NOTES:**

General tolerance =  $\pm 0.10$  mm  
Material : PVC, Clear  
THICKNESS :  $0.55 \pm 0.05$   
LENGTH :  $424 \pm 2$ MM

**Label Formation**

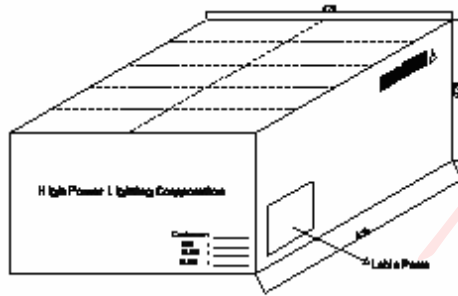
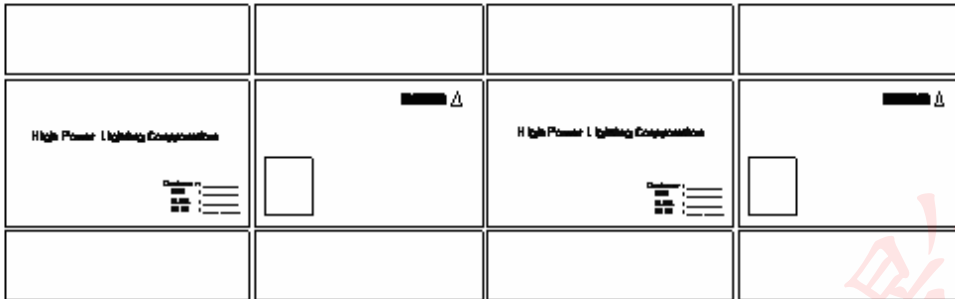
P/N: XXXXXXXXXXXXX	BIN Rank : XXXXXXXXX
LOT: XXXXXXXXXXXXX	Q'ty : XXXXPCS XXX

75mm\*8mm



**Package  
Large Box**

Unit : mm



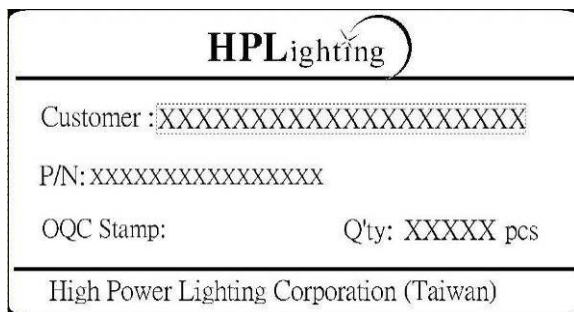
**Label Formation**

70mm

Unit : mm

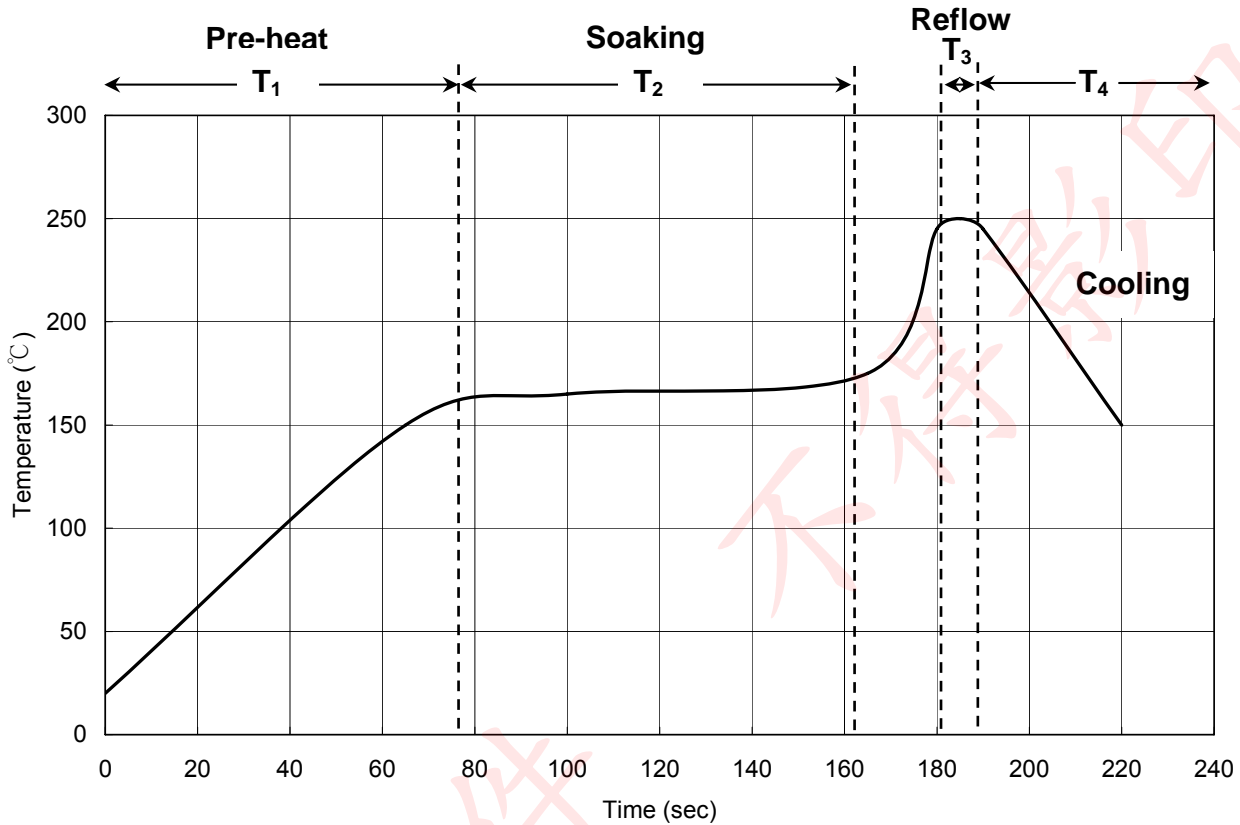


40mm



## 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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