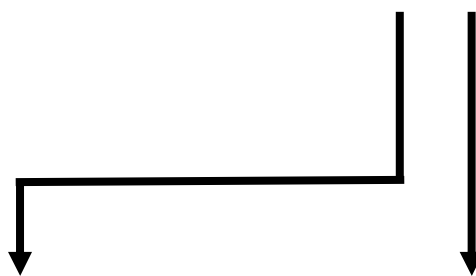


Specification

HPL- M28XS3YA



Lens & Assembly Type:

V : 160° Lens

Q : 160° Lens With Star

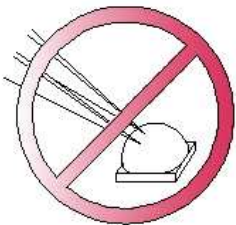
Color:

S: Warm White

- **Part Number Matrix**

Color \ Type	160° Lens	160° Lens With Star
Warm White	HPL-M28VS3YA	HPL-M28QS3YA

- **Handling precaution**



Do not poke the silicone encapsulant with sharp object



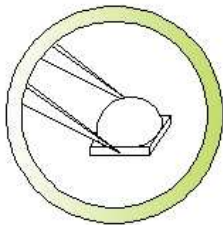
Do not stack assembled PCB



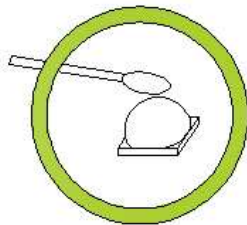
Do not hold the LED with hand



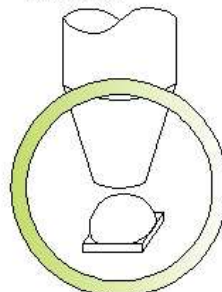
Do not touch and press the silicone encapsulant



Hold the LED only by the metal substrate



Clean the silicone surface with cotton bud with minimal pressure



Use pick and place nozzle per recommendation in datasheet

研晶光電股份有限公司
High Power Lighting Corporation.

台北縣土城市永豐路 173 之 8 號 5 樓
 5F, No. 173-8, Yung-Fong Road, Tu Cheng City, Taipei Hsien, Taiwan, ROC
 TEL : 02-8262-8886 FAX : 02-8262-8885

1. Features

- Dimension : 2.8mm(L)×2.8mm(W)×1.5mm(H)
- Wide View Angle
- White LED by GaN Die
- Warm White LED with high CRI , Ra>90
- Good for SMT Process
- All Metal Design for low thermal resistance performance
- High luminous efficacy
- Integrated size and low thermal density for light module
- VF tiny binning, easy for circuit layout
- Consistency Hue bin

2. Absolute Maximum Ratings

(Ta=25°C)

Parameter	Symbol	Rating	Unit
Power Dissipation	P_o	0.28	W
Forward Current	I_F	30	mA
LED Junction Temperature	T_j	125	°C
Operating Temperature Range	T_{opr}	-40°C to + 80°C	-
Storage Temperature Range	T_{stg}	-40°C to + 120°C	
Wave Soldering Condition	T_{sol}	250°C For 5 Seconds	

3. Initial Electrical/Optical Characteristics

- Forward Voltage**

(T_j=25°C)

Color	Forward Voltage					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Warm-White→S	V _F	8.6	9.1	9.6	I _F = 30mA	V

- View Angle**

Wavelength	Viewing Angle			
	Symbol	Lens 160°	Test Condition	Unit
All	2θ _{1/2}	160°	I _F = 30mA	degree

- Luminous Flux**

(T_j=25°C)

Color	Luminous Flux					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Warm-White→S	Φ _V	-	25	-	I _F = 30mA	lm

- Color Temperature or Dominate wavelength**

(T_j=25°C)

Color	Color Temperature or Dominate Wavelength					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Warm-White→S	CCT	2600	2700	2900	IF = 30mA	K

- Color rendering Index (CRI, Ra value)**

(T_j=25°C)

Color	Color Temperature or Dominate Wavelength					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Warm-White→S	Ra		90	-	IF =30mA	-

- Typical Radiation Pattern

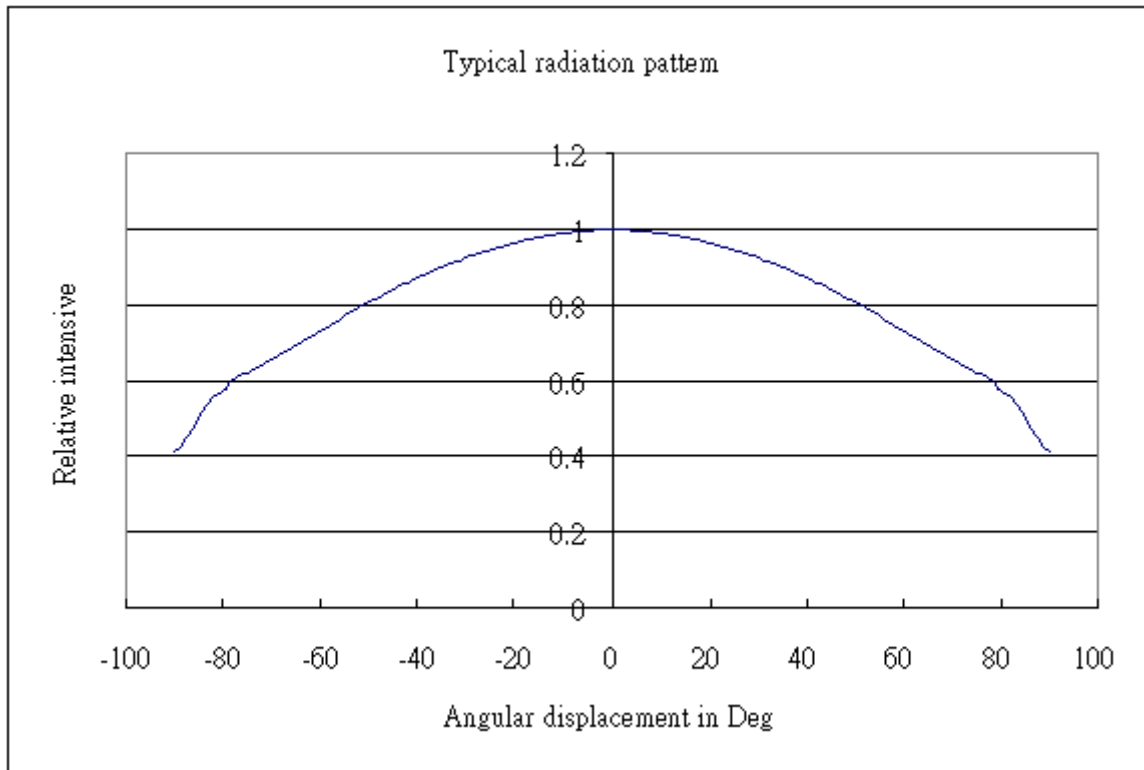


Fig.3A Typical Representative Spatial Radiation Pattern for Warm-White .

4. Part Number Formation

- Bin Code List for Reference

(T_j=25°C)

Item	Bin Code	Symbol	Condition	Min.	Max.	Unit
Forward Voltage ¹	J	V _F	I _F = 30 [mA]	8.6	8.7	V
	K			8.7	8.8	
	L			8.8	8.9	
	M			8.9	9	
	N			9	9.1	
	P			9.1	9.2	
	Q			9.2	9.3	
	R			9.3	9.4	
	S			9.4	9.5	
	T			9.5	9.6	
Luminous Flux ²	B	Φ _v	I _F = 30 [mA]	15	20	lm
	C			20	25	
	D			25	30	
	E			30	35	

Note: 1. Forward voltage measurement allowance is ± 0.05V.

2. Luminous flux measurement allowance is ±5%.

Lm/W vs. current: Warm White

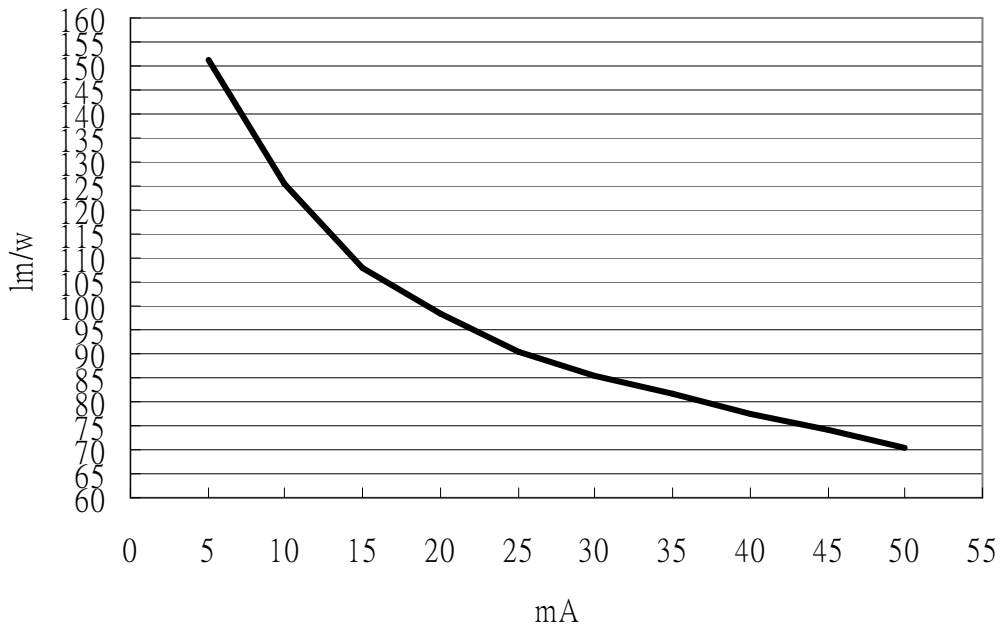


Fig.4A lm/W vs. current: Warm White.

Warm-White Bin Structure

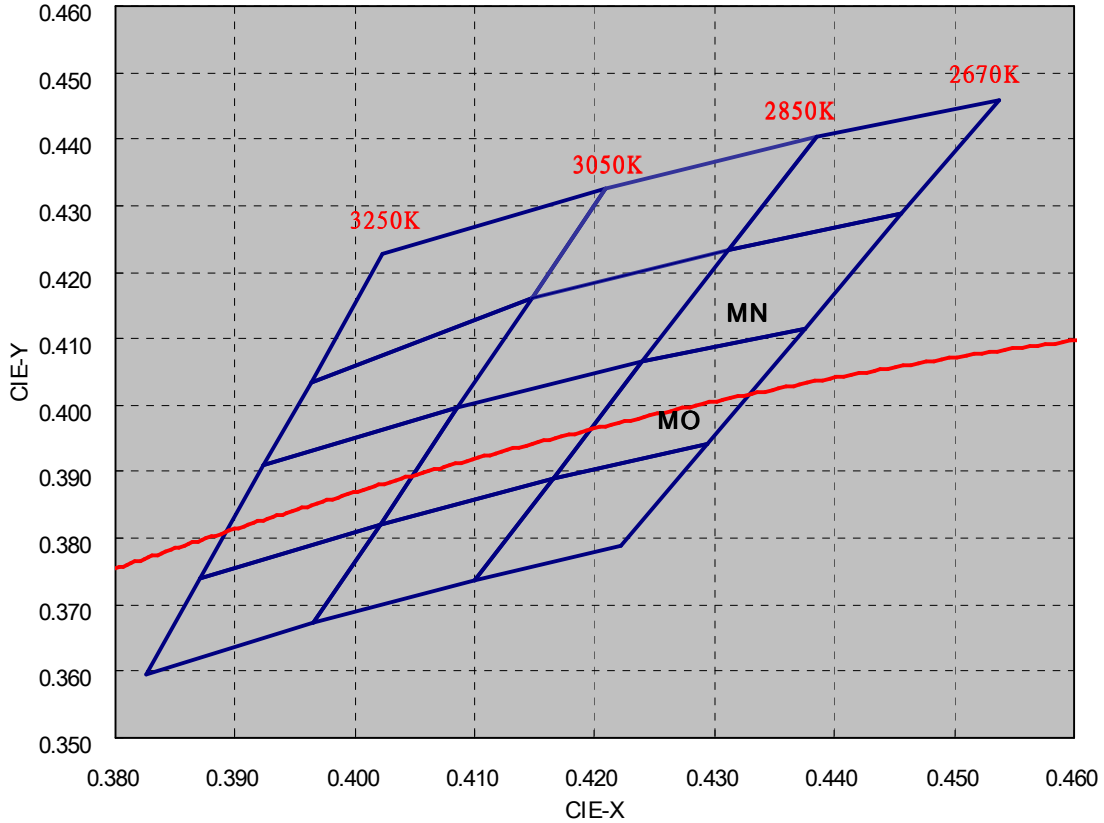
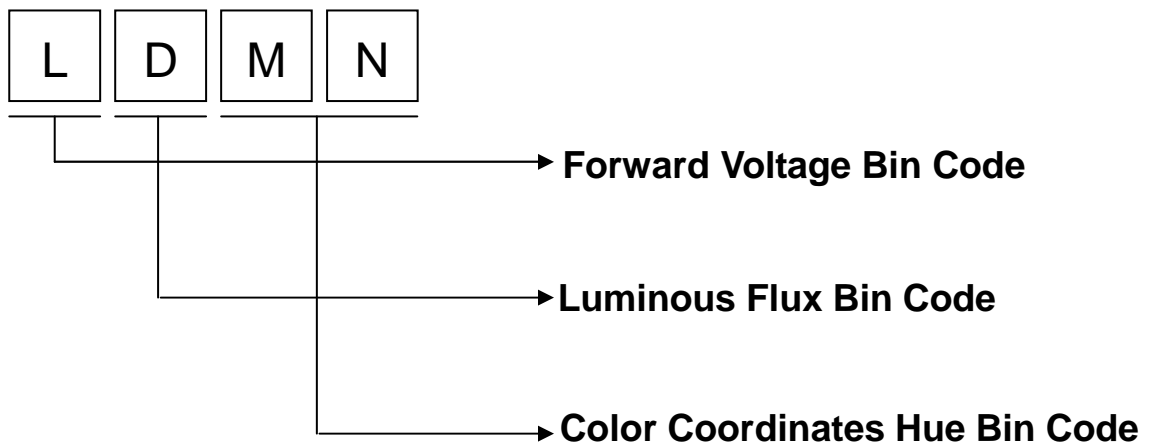
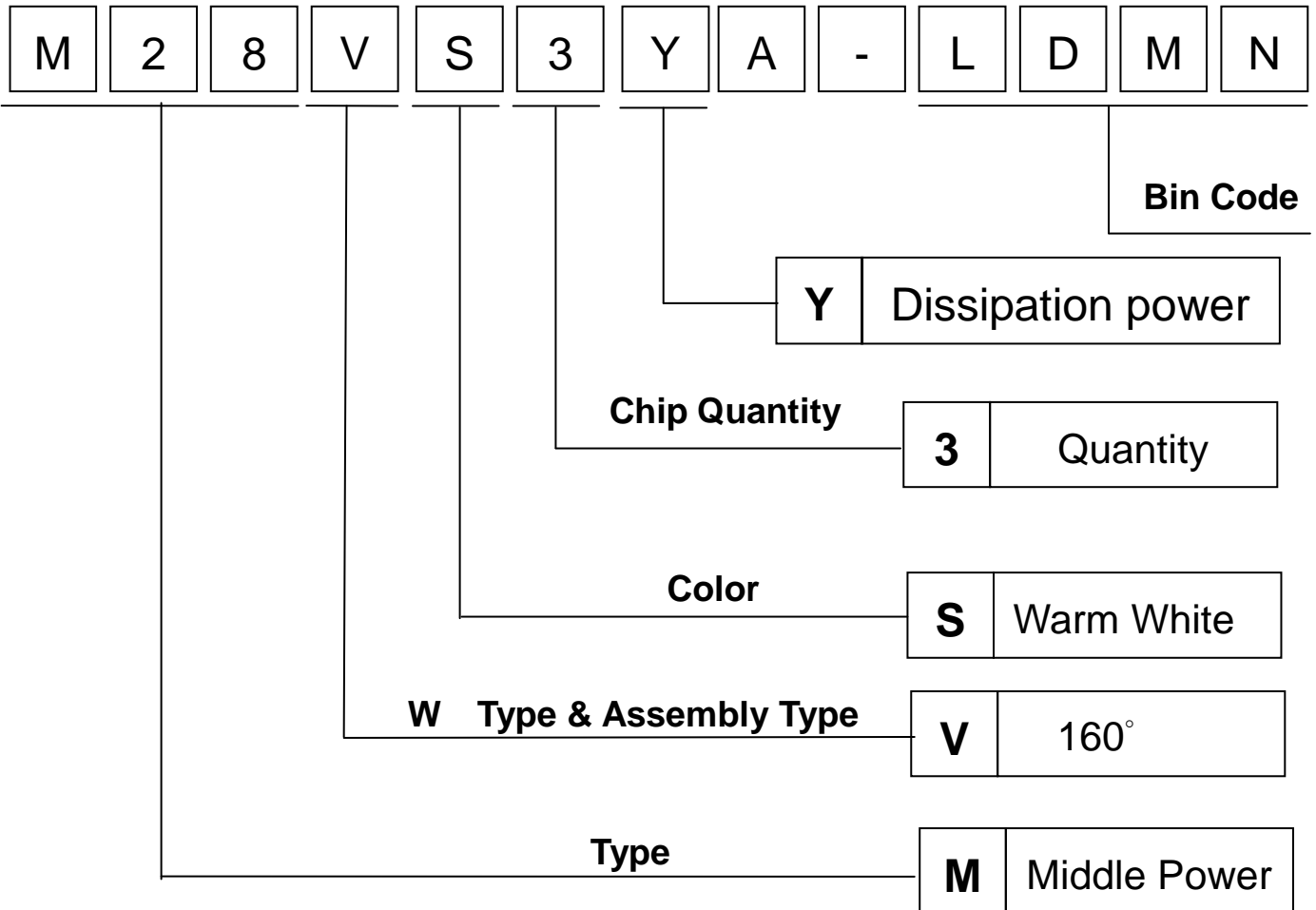


Fig. 4D Warm-White Bin Structure.

Hue Bin Code List for Reference
Warm-White→S color

Bin Code	X	Y	CCT(K)
MN	0.4614	0.4333	2670-2850
	0.4767	0.4366	
	0.4671	0.4196	
	0.4525	0.4162	
MO	0.4525	0.4162	
	0.4671	0.4196	
	0.4577	0.4029	
	0.4436	0.3991	

5. Part Number Formation



6. Spectrum Characteristic Diagram

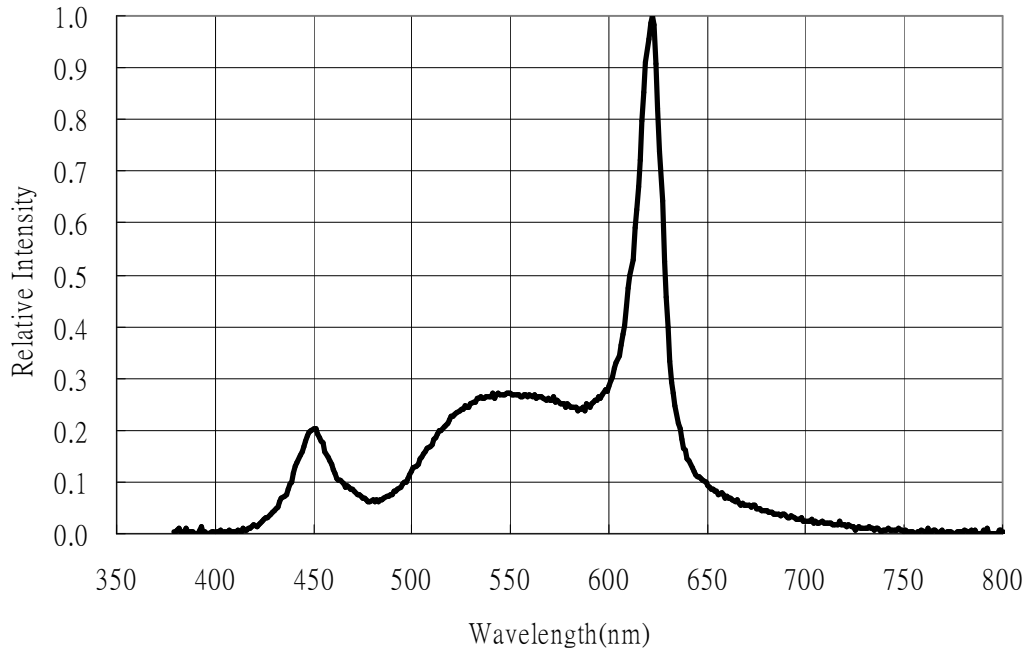


Fig.6B Relative Intensity vs. Wavelength: Warm White.

7. Outline Dimensions

Unit: mm

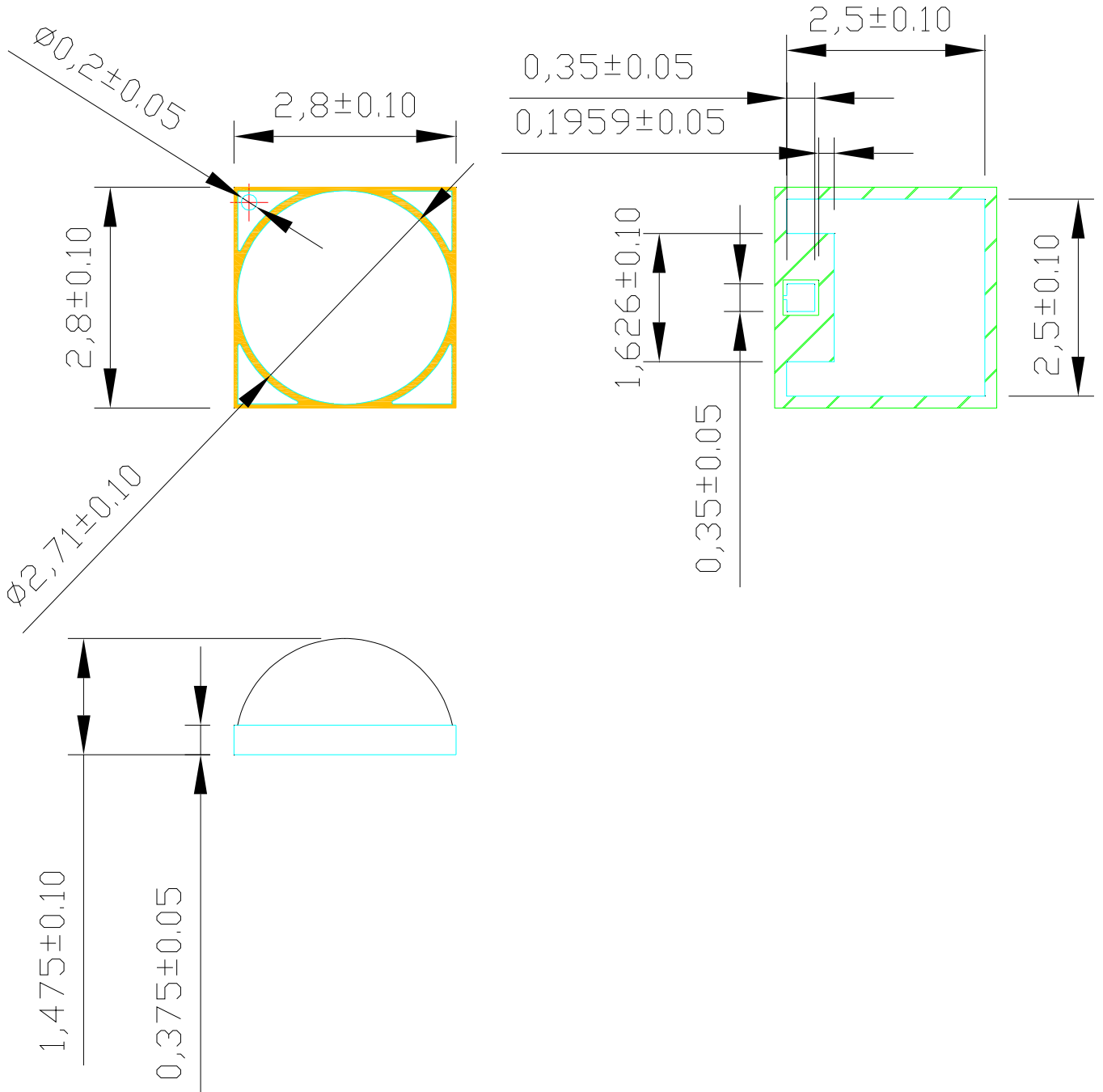


Fig.7A Package Outline Drawing.

Recommended solder mask and MCPCB copper layer

Unit : mm

Tolerance ± 0.05

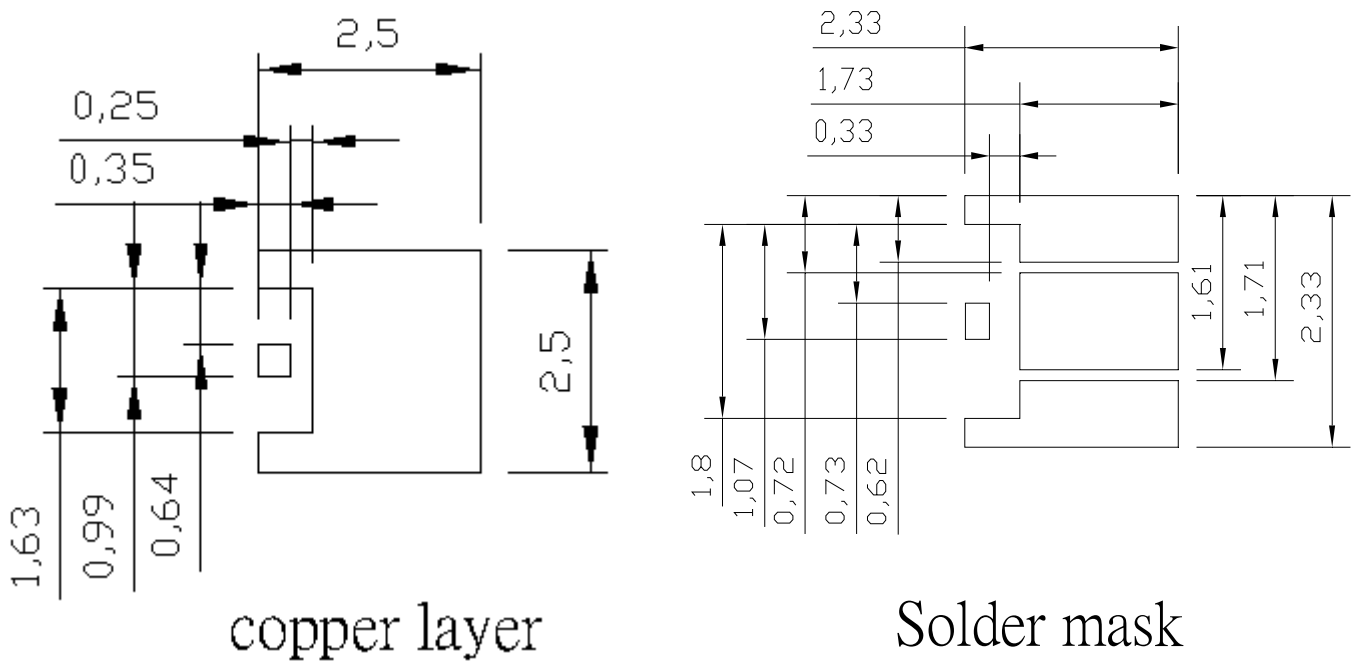


Fig.7B Solder Pad Layout.

8. Shipping Package Style

A. Lens Type

(1) Tapping Dimension Packaging Specification

- 160 degree Lens Type :
 - Moisture proof bag.
 - 1 Reel/bag.
 - Q'ty: 2000(MAX)/Reel.

Unit : mm

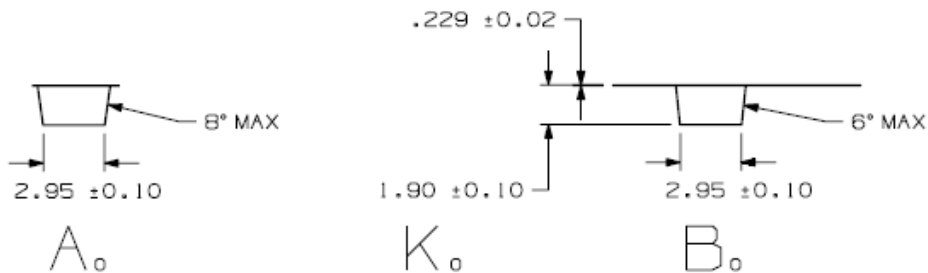
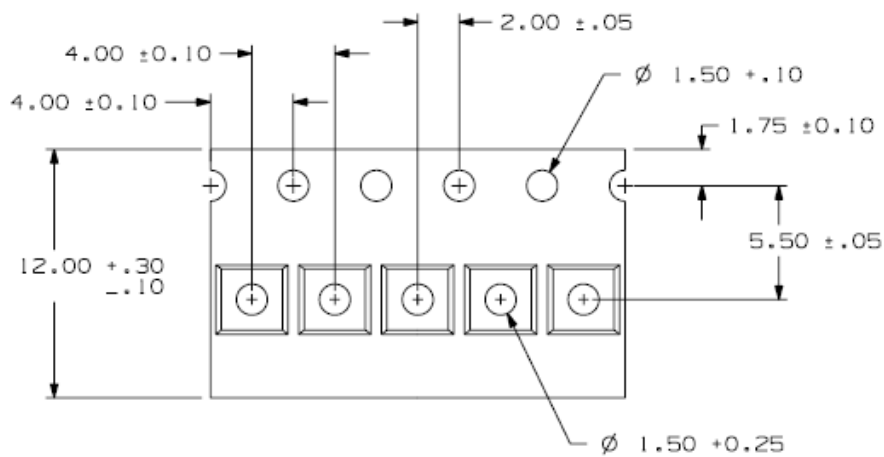


Fig.8A Carry tape Drawing.

(2) Package

Box Type	Dimension (mm)	Reel/Box	160°Lens Type(Pcs)
Small Box(S)	230x85x265	5 Reel/Box	10000
Middle Box(M)	470x265x270	30 Reel/Box	60000
Large Box(L)	470x435x270	50 Reel/Box	100000

Reel Packaging :

Reel Part :

Unit : mm

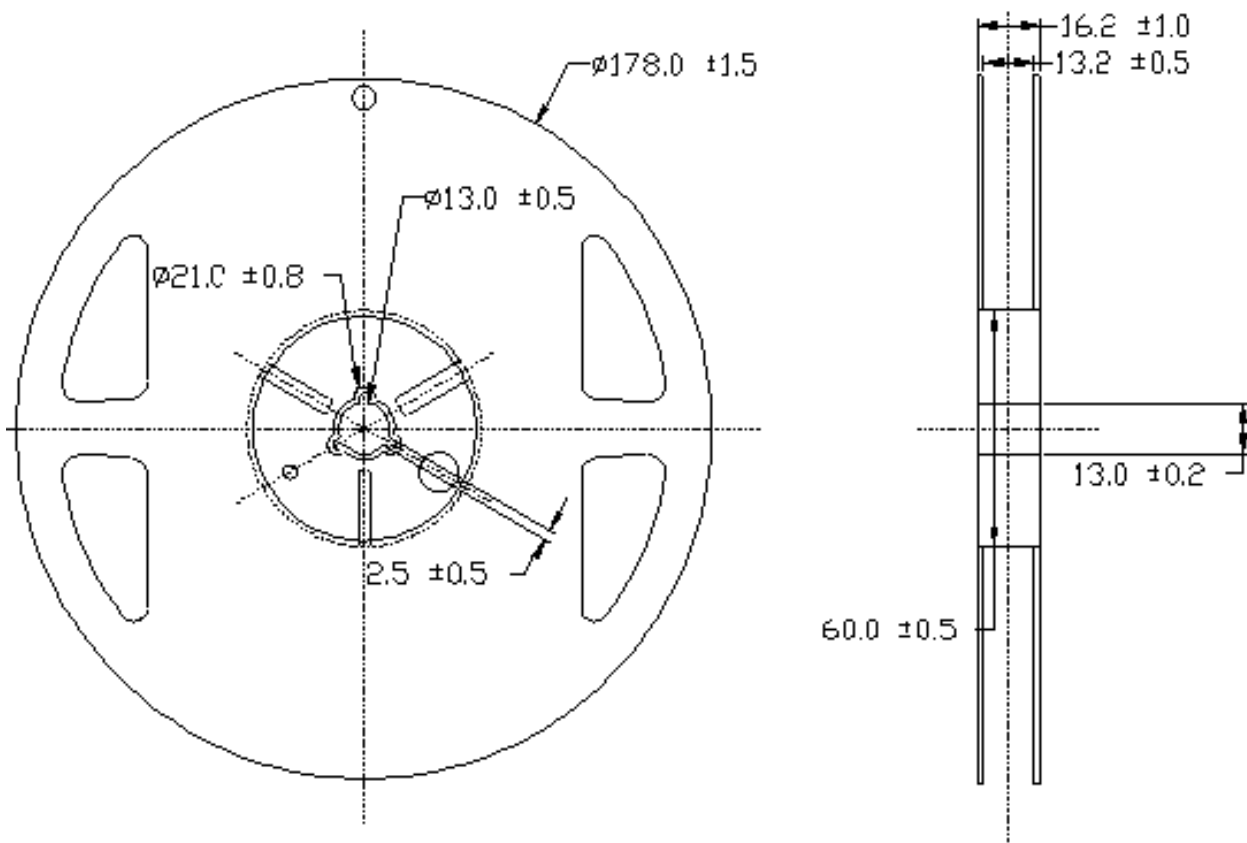
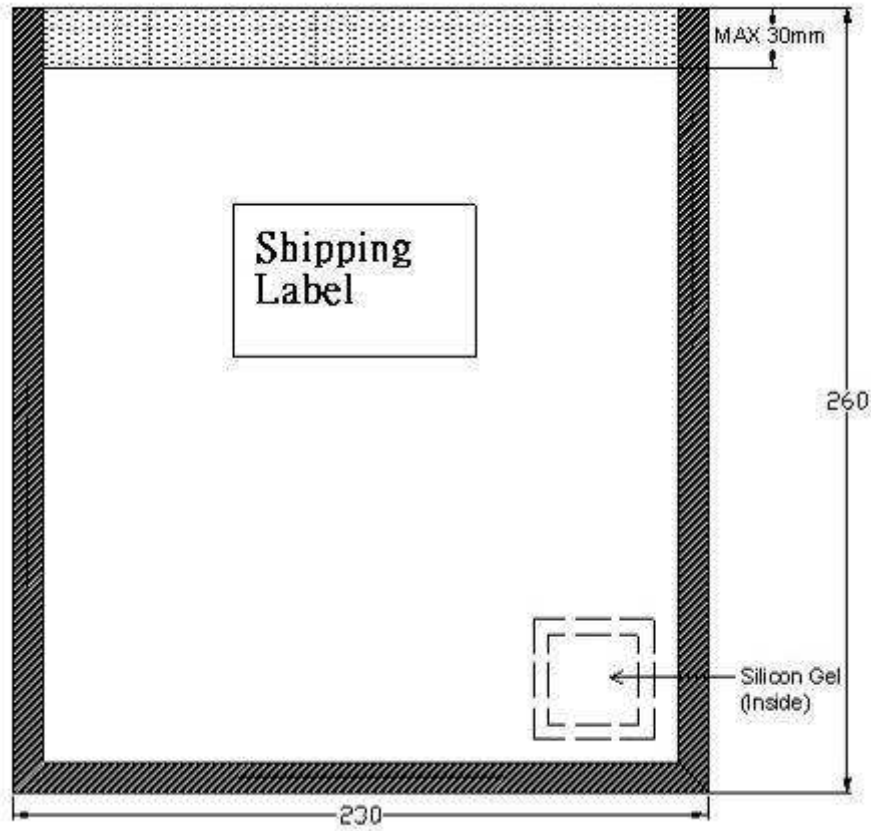


Fig.8B Reel Drawing.

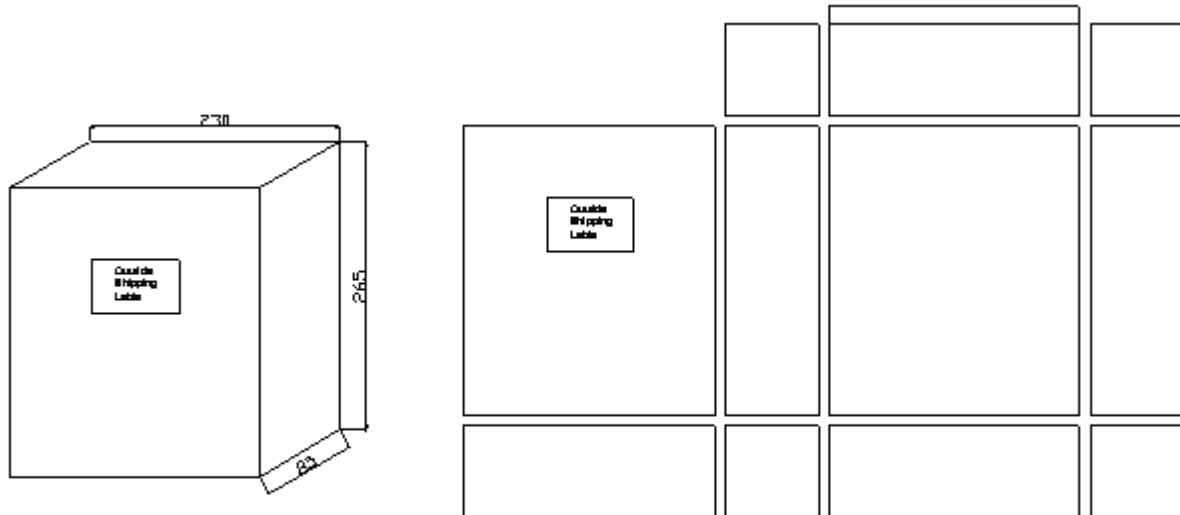
Anti Statistic Bag :

Unit : mm



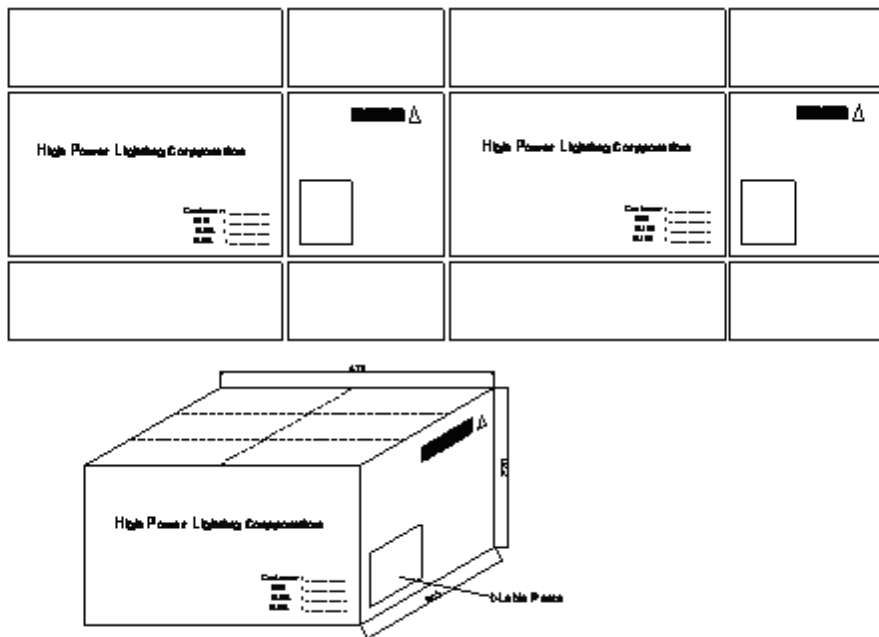
Small Box

Unit : mm



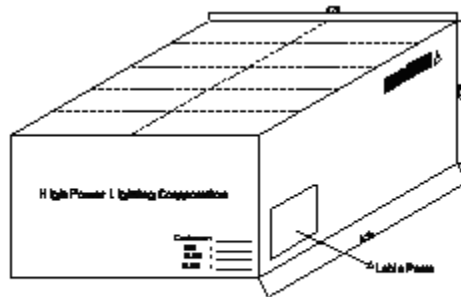
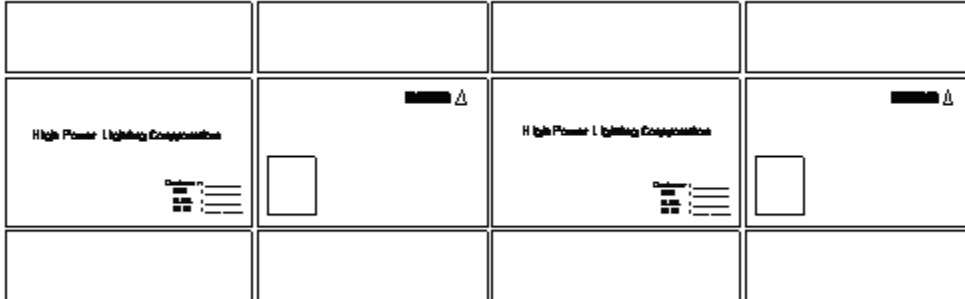
Middle Box

Unit : mm



Large Box

Unit : mm



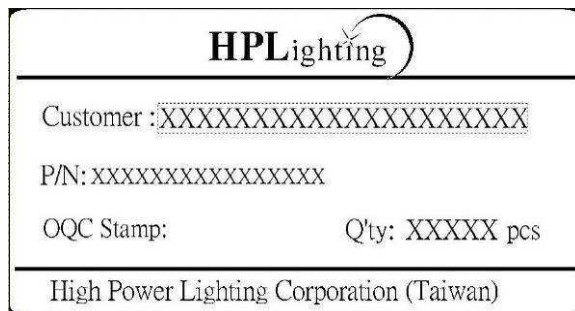
(3) Label Formation

70mm

Unit : mm



40mm



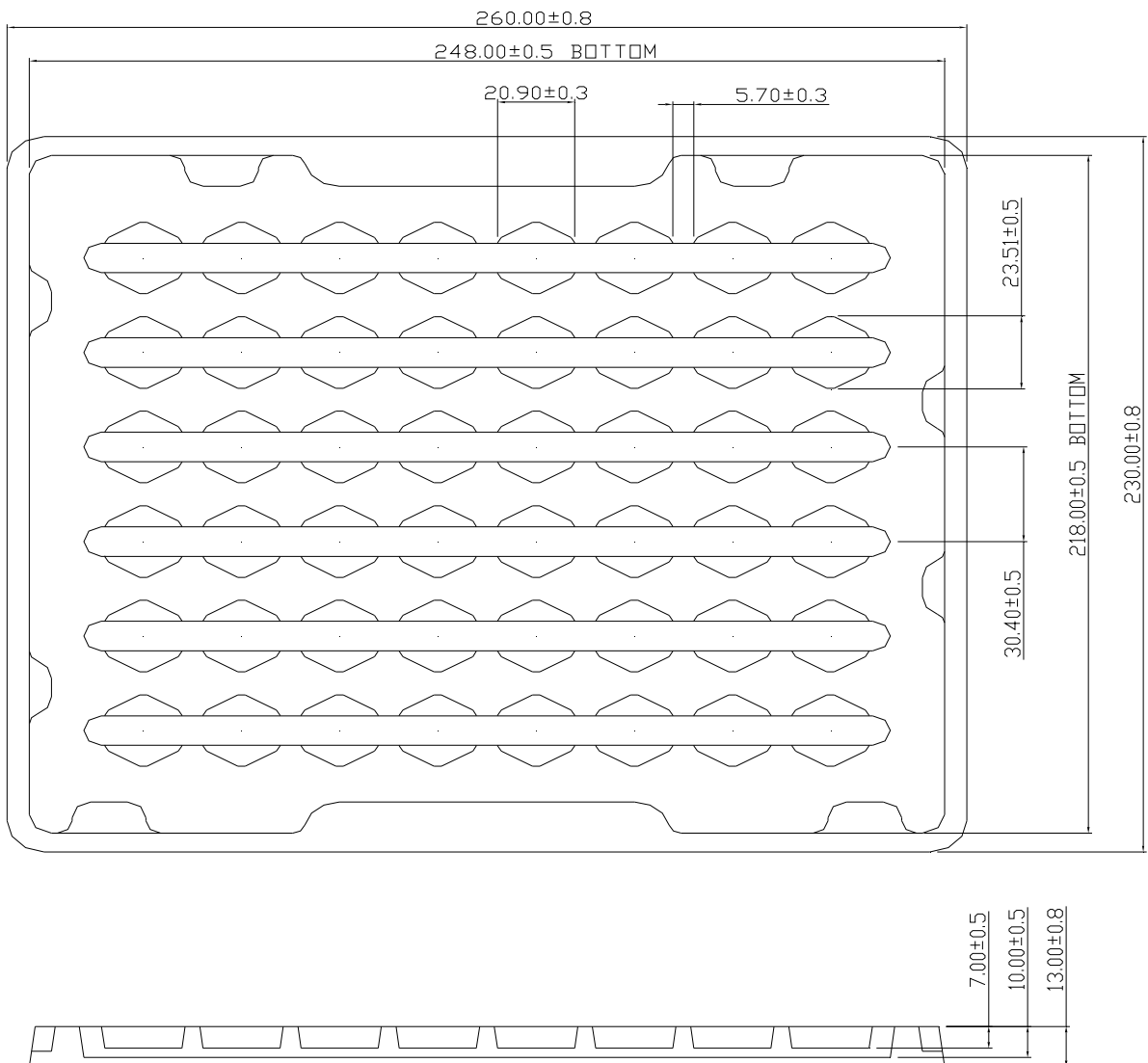
B. Assembly Type

(1) Tapping Dimension Packaging Specification

- 160 degree Assembly Type :

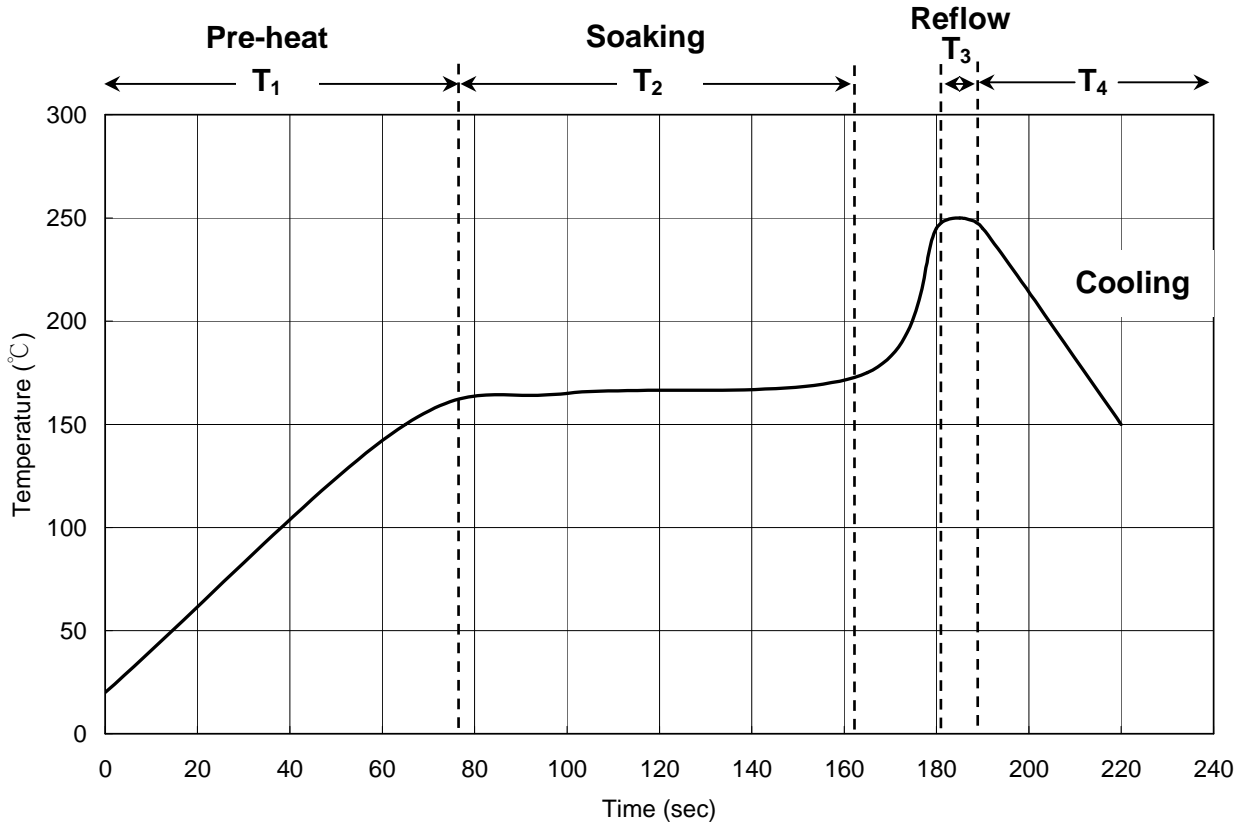
- Moisture proof bag.
- 21 Tray (MAX) /bag.
- Q'ty:48pcs(MAX)/Tray

Unit : mm



9. Recommended Solder profile

Soldering Recommended soldering conditions:



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

Note: Suggest using Sn96Ag3Cu0.5 lead free solder.