

SPECIFICATION

HPL- H77X X 1 C 0

3W LED

Lens & Assembly Type :

N : No special Work
S : with Star
A : Lens 25°
B : Lens 45°
L : Lens 120°
P : Lens 100°/50°
G : Star & Lens 25°
H : Star & Lens 45°
F : Star & Lens 120°
U : Star & Lens 100°/50°

Colors :

W : Cool White
N : Neutral White
S : Warm White

Caution:

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

Part Number Matrix

Without Star:

Colors / Type	Flat Type	Lens 25°	Lens 45°	Lens 120°	Lens 100°/50°
Cool White	HPL-H77NW1C0	HPL-H77AW1C0	HPL-H77BW1C0	HPL-H77LW1C0	HPL-H77PW1C0
Neutral White	HPL-H77NN1C0	HPL-H77AN1C0	HPL-H77BN1C0	HPL-H77LN1C0	HPL-H77PN1C0
Warm White	HPL-H77NS1C0	HPL-H77AS1C0	HPL-H77BS1C0	HPL-H77LS1C0	HPL-H77PS1C0

With Star:

Colors / Type	Star & Flat Type	Star & Lens 25°	Star & Lens 45°	Star & Lens 120°	Star & Lens 100°/50°
Cool White	HPL-H77SW1C0	HPL-H77GW1C0	HPL-H77HW1C0	HPL-H77FW1C0	HPL-H77UW1C0
Neutral White	HPL-H77SN1C0	HPL-H77GN1C0	HPL-H77HN1C0	HPL-H77FN1C0	HPL-H77UN1C0
Warm White	HPL-H77SS1C0	HPL-H77GS1C0	HPL-H77HS1C0	HPL-H77FS1C0	HPL-H77US1C0

1. Features

- Dimension : 7.0mm(L)×7.0mm(W)
- 3W High Flux type
- All Metal Design Cu PCB/Al reflector
- Low thermal resistance
- The InGaN Chip inside



2. Applications

- Signal lighting
- Backlighting
- Interior & exterior automotive lighting
- Decorative and landscape lighting
- Signage and channel letter
- Portable light source
- Decorating and entertainment lighting

3. Absolute Maximum Ratings

(Tj=25°C)

Parameter		Symbol	Rating	Unit
Power Dissipation	Cool White	P	2.66	W
	Neutral White		2.66	
	Warm White		2.66	
Forward Current		IF	700	mA
Forward Pulse Current (1/10 Duty Cycle, 400msec Pulse Width)		IFP	1000	mA
Thermal Resistance, Junction-Case		Rth, J-C1	10	°C/W
Reverse Voltage		VR	5	V
LED Junction Temperature		Tj	125	°C
Operating Temperature Range		Topr	-40°C to + 80°C	
Storage Temperature Range		Tstg	-40°C to + 120°C	
Soldering Condition		Tsol	260°C For 5 Seconds	

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

4. Initial Electrical/Optical Characteristics

• Forward Voltage

(Tj=25°C)

Color	Forward Voltage					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Cool White	V _F	3.03	3.80	4.23	I _F = 700mA	V
Neutral White	V _F	3.03	3.80	4.23	I _F = 700mA	V
Warm White	V _F	3.03	3.80	4.23	I _F = 700mA	V

• Reverse Current

(Tj=25°C)

Color	Reverse Current					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Cool White	I _R	-	-	100	V _R = 5V	μA
Neutral White	I _R	-	-	100	V _R = 5V	μA
Warm White	I _R	-	-	100	V _R = 5V	μA

● **Luminous Flux** (T_j=25°C)

Color	Luminous Flux (With Lens type / Flat type)					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Cool White	Φ_V	-	125/99	135/105	$I_F = 700\text{mA}$	lm
Neutral White		-	117/92	130/100		
Warm White		-	89/68	98/73		

● **Color Temperature** (T_j=25°C)

Color	Color Temperature					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Cool White	CCT	4500	5650	10000	$I_F = 700\text{mA}$	K
Neutral White		3500	4000	4500		
Warm White		2670	2850	3500		

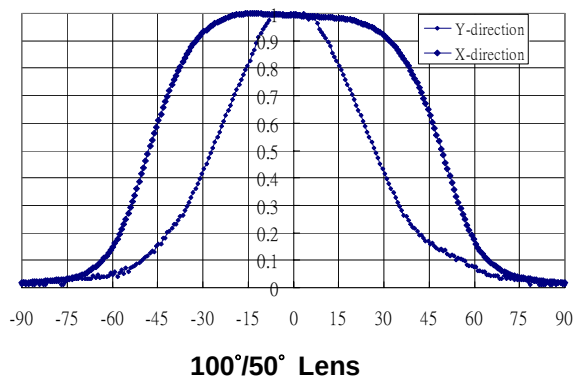
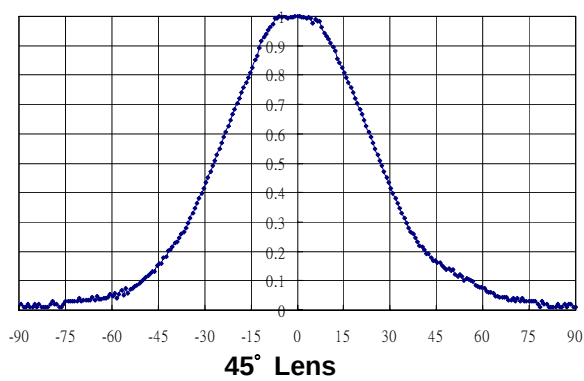
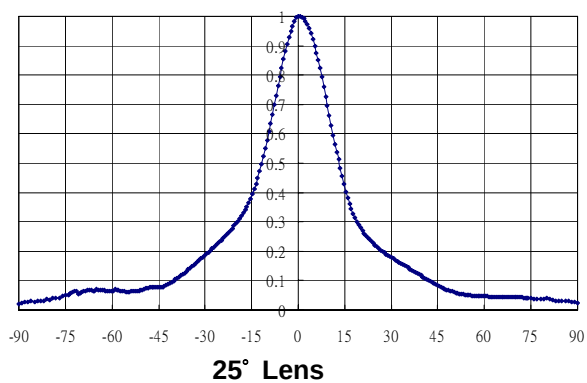
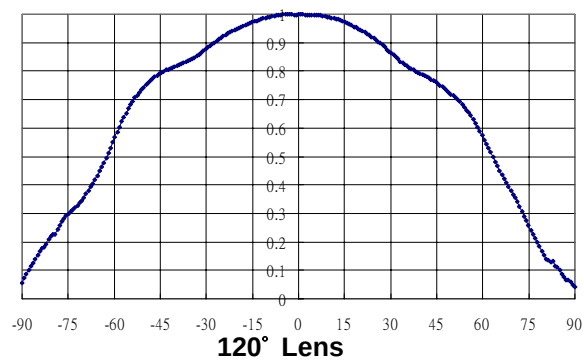
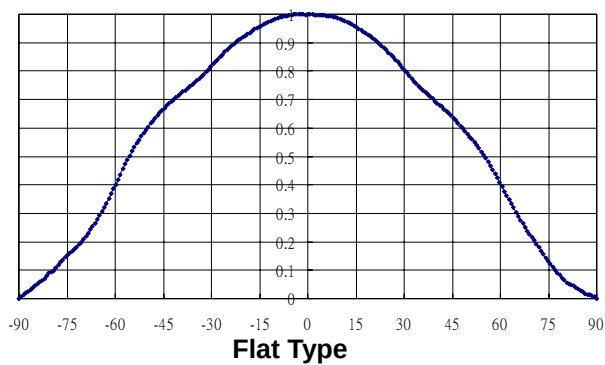
● **View Angle** (T_j=25°C)

Wavelength	Viewing Angle							
	Symbol	Flat Type	Lens 120°	Lens 25°	Lens 45°	Lens 100°/50°	Test Condition	Unit
All	$2\theta_{1/2}$	110°	120°	25°	45°	100°/50°	$I_F = 700\text{mA}$	degree

● **Chromaticity Coordinates / Dominate Wavelength** (T_j=25°C)

Color	Chromaticity Coordinates / Spectra half-width					
	Symbol	MIN.	TYP.	MAX.	Test Condition	Unit
Cool White	x	-	0.33	-	$I_F = 700\text{mA}$	-
	y	-	0.34	-		
Neutral White	x	-	0.38	-	$I_F = 700\text{mA}$	-
	y	-	0.38	-		
Warm White	x	-	0.43	-	$I_F = 700\text{mA}$	-
	y	-	0.40	-		

- Optical Radiation Pattern



Bin Code List for Reference

(Tj=25°C)

Forward Voltage Bins

Item	Bin Code	Symbol	Condition	Min.	Max.	Unit
Forward Voltage ¹	G	V _F	I _F = 700 [mA]	2.79	3.03	V
	H			3.03	3.27	
	J			3.27	3.51	
	K			3.51	3.75	
	L			3.75	3.99	
	M			3.99	4.23	

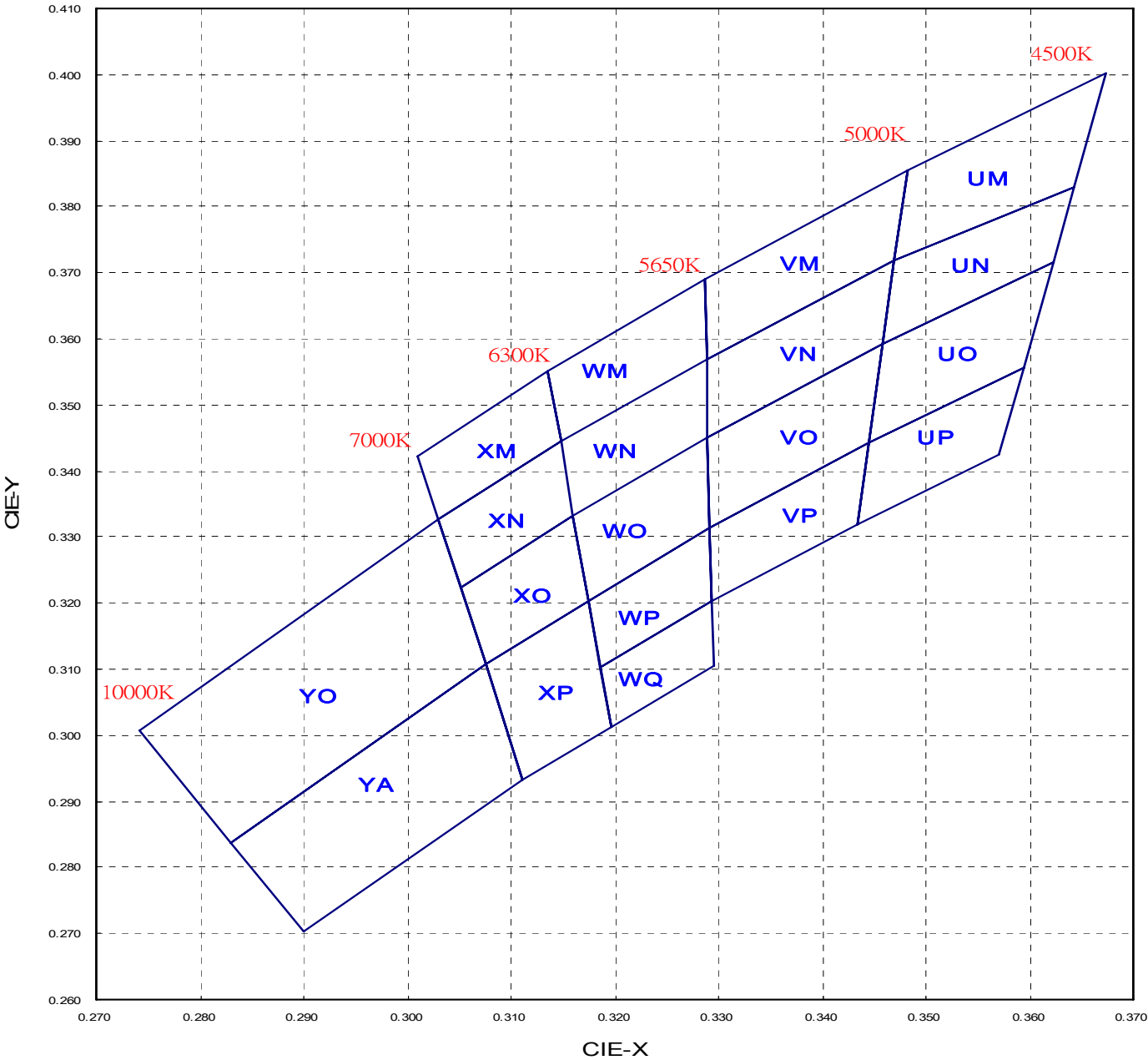
Luminous Flux Bins

Item	Bin Code	Symbol	Condition	Min.	Max.	Unit
Luminous Flux ²	A	Φ _V	I _F = 700 [mA]	8.2	10.7	lm
	B			10.7	13.9	
	C			13.9	18.1	
	D			18.1	23.5	
	E			23.5	30	
	F			30	40	
	G			40	50	
	H			50	60	
	J			60	70	
	K			70	80	
	L			80	90	
	M			90	100	
	N			100	120	
	P			120	140	
	Q			140	160	
	R			160	180	
	S			180	200	

Note: 1. Forward voltage measurement allowance is ± 0.1V.

2. Luminous flux measurement allowance is ± 10%.

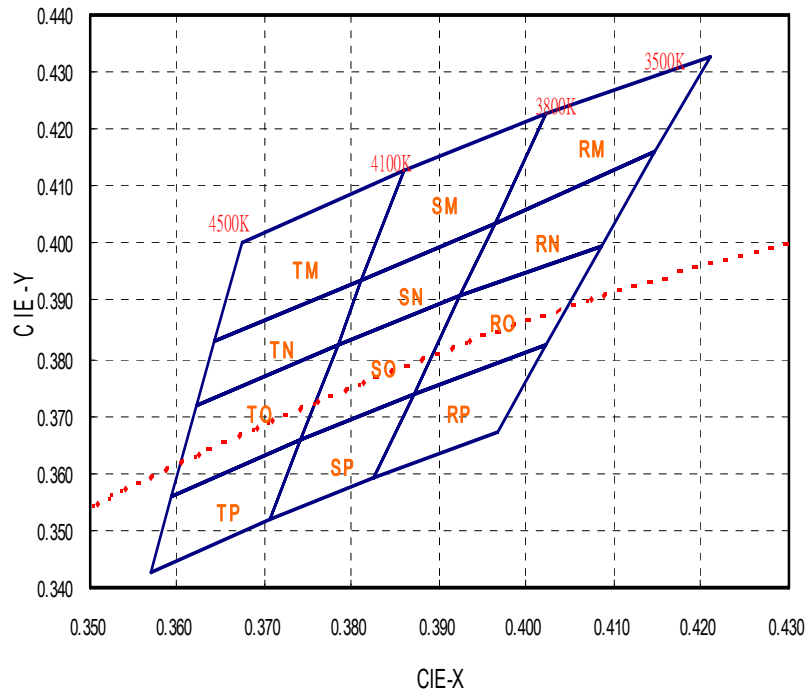
CIE Diagram Hue Bin Specification for Cool white →C Color



Bin Code	X	Y	CCT	Bin Code	X	Y	CCT	Bin Code	X	Y	CCT
YO	0.2742	0.3007	7000~10000	WN	0.3148	0.3444	5650~6300	VP	0.3292	0.3313	5000~5650
	0.3031	0.3327			0.3288	0.3569			0.3444	0.3442	
	0.3076	0.3108			0.3290	0.3451			0.3434	0.3320	
	0.2830	0.2838			0.3160	0.3332			0.3294	0.3202	
YA	0.2830	0.2838	7000~10000	WO	0.3160	0.3332	5650~6300	UM	0.3481	0.3856	4500~5000
	0.3076	0.3108			0.3290	0.3451			0.3673	0.4003	
	0.3112	0.2932			0.3292	0.3313			0.3642	0.3829	
	0.2899	0.2703			0.3175	0.3204			0.3469	0.3717	
XM	0.3011	0.3422	6300~7000	WP	0.3175	0.3204	5650~6300	UN	0.3469	0.3717	4500~5000
	0.3136	0.3550			0.3292	0.3313			0.3642	0.3829	
	0.3148	0.3444			0.3294	0.3202			0.3622	0.3716	
	0.3031	0.3327			0.3186	0.3102			0.3458	0.3592	
XN	0.3031	0.3327	6300~7000	WQ	0.3186	0.3102	5650~6300	UO	0.3458	0.3592	4500~5000
	0.3148	0.3444			0.3294	0.3202			0.3622	0.3716	
	0.3160	0.3332			0.3295	0.3105			0.3594	0.3557	
	0.3052	0.3224			0.3196	0.3013			0.3444	0.3442	
XO	0.3052	0.3224	6300~7000	VM	0.3286	0.3690	5000~5650	UP	0.3444	0.3442	4500~5000
	0.3160	0.3332			0.3481	0.3856			0.3594	0.3557	
	0.3175	0.3204			0.3469	0.3717			0.3571	0.3426	
	0.3076	0.3108			0.3288	0.3569			0.3434	0.3320	
XP	0.3076	0.3108	6300~7000	VN	0.3288	0.3569	5000~5650				
	0.3175	0.3204			0.3469	0.3717					
	0.3196	0.3013			0.3458	0.3592					
	0.3112	0.2932			0.3290	0.3451					
WM	0.3136	0.3550	5650~6300	VO	0.3290	0.3451	5000~5650				
	0.3286	0.3690			0.3458	0.3592					
	0.3288	0.3569			0.3444	0.3442					
	0.3148	0.3444			0.3292	0.3313					

Note: . The CIE x, y color coordinates measurement allowance is ± 0.01 .

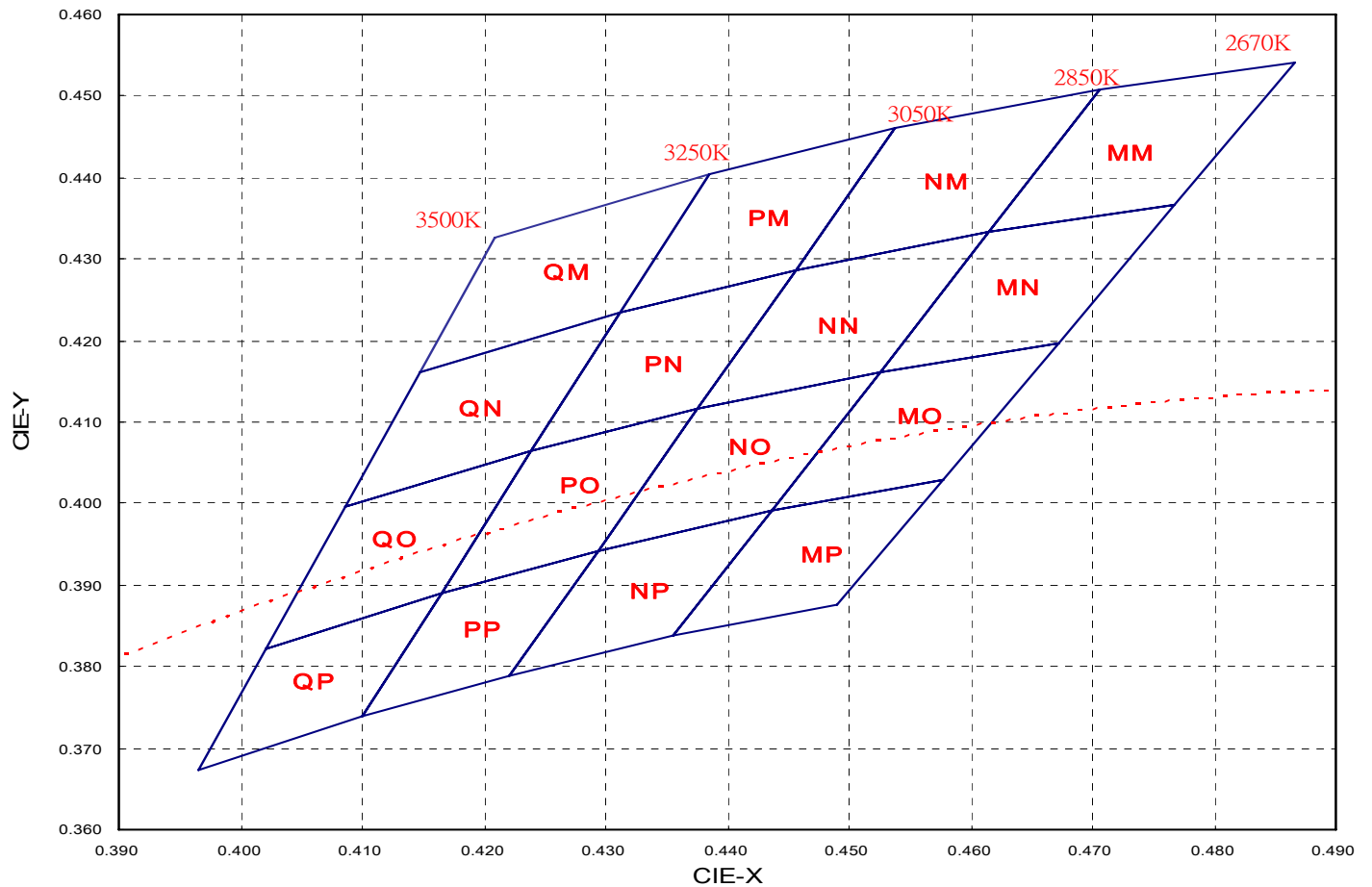
CIE Diagram Hue Bin Specification for Neutral white → N Color



Bin Code	X	Y	CCT	Bin Code	X	Y	CCT	Bin Code	X	Y	CCT
TM	0.3673	0.4003	4100~4500	SM	0.3860	0.4130	3800~4100	RM	0.4023	0.4228	3500~3800
	0.3860	0.4130			0.4023	0.4228			0.4209	0.4326	
	0.3811	0.3937			0.3963	0.4035			0.4148	0.4161	
	0.3642	0.3829			0.3811	0.3937			0.3963	0.4035	
TN	0.3642	0.3829	4100~4500	SN	0.3811	0.3937	3800~4100	RN	0.3963	0.4035	3500~3800
	0.3811	0.3937			0.3963	0.4035			0.4148	0.4161	
	0.3783	0.3825			0.3924	0.3909			0.4086	0.3995	
	0.3622	0.3716			0.3783	0.3825			0.3924	0.3909	
TO	0.3622	0.3716	4100~4500	SO	0.3783	0.3825	3800~4100	RO	0.3924	0.3909	3500~3800
	0.3783	0.3825			0.3924	0.3909			0.4086	0.3995	
	0.3741	0.3658			0.3871	0.3739			0.4021	0.3822	
	0.3594	0.3557			0.3741	0.3658			0.3871	0.3739	
TP	0.3594	0.3557	4100~4500	SP	0.3741	0.3658	3800~4100	RP	0.3871	0.3739	3500~3800
	0.3741	0.3658			0.3871	0.3739			0.4021	0.3822	
	0.3706	0.3520			0.3826	0.3595			0.3966	0.3673	
	0.3571	0.3426			0.3706	0.3520			0.3826	0.3595	

Note: . The CIE x, y color coordinates measurement allowance is ± 0.01 .

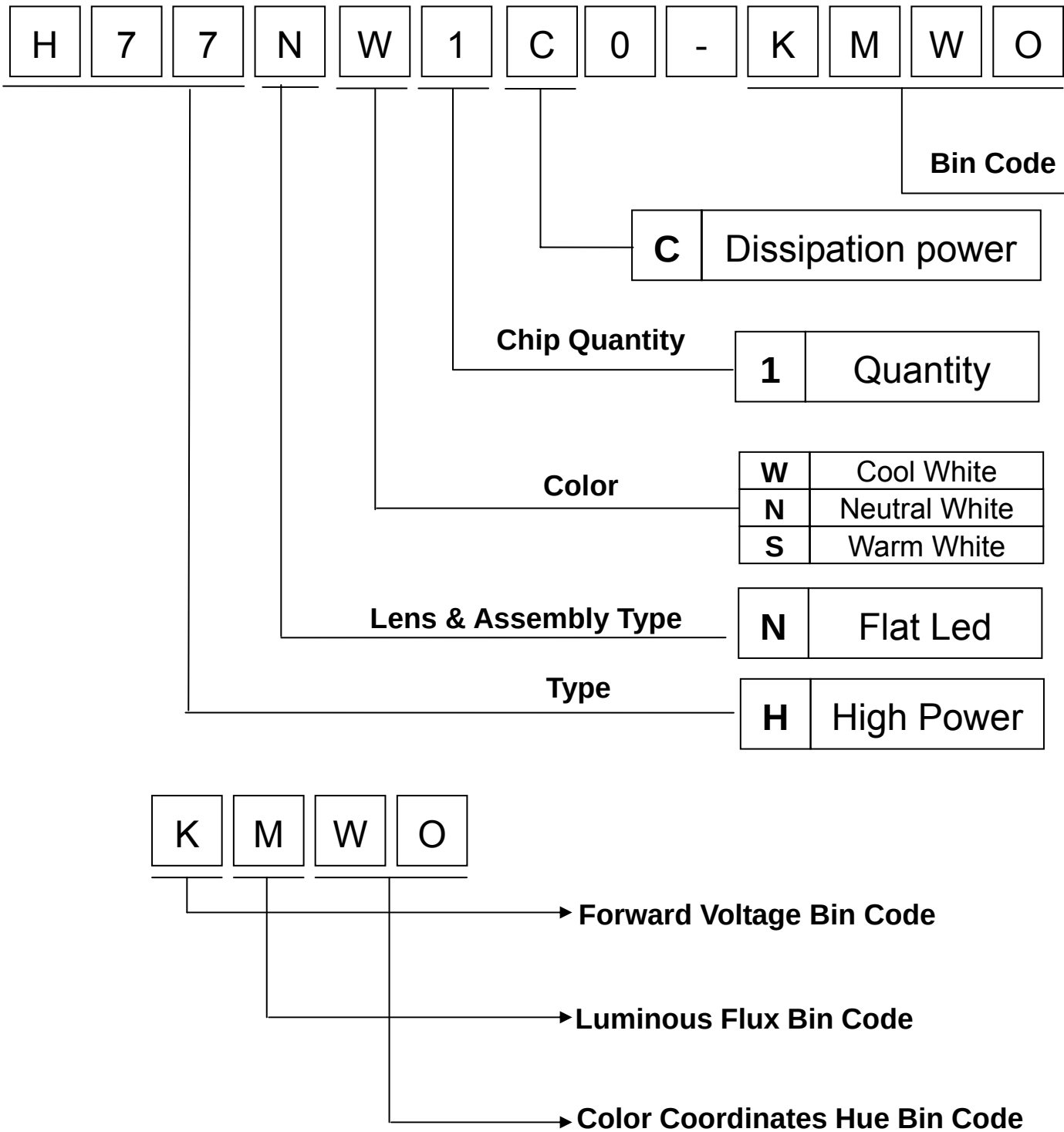
CIE Diagram Hue Bin Specification for Warm white →S Color



Bin Code	X	Y	CCT	Bin Code	X	Y	CCT	Bin Code	X	Y	CCT
QM	0.4209	0.4326	3250~3500	PO	0.4240	0.4065	3000~3250	MM	0.4705	0.4508	2670~2850
	0.4385	0.4404			0.4376	0.4116			0.4866	0.4542	
	0.4312	0.4234			0.4294	0.3943			0.4767	0.4366	
	0.4148	0.4161			0.4165	0.3890			0.4614	0.4333	
QN	0.4148	0.4161	3250~3500	PP	0.4165	0.3890	3000~3250	MN	0.4614	0.4333	2670~2850
	0.4312	0.4234			0.4294	0.3943			0.4767	0.4366	
	0.4240	0.4065			0.4221	0.3790			0.4671	0.4196	
	0.4086	0.3995			0.4100	0.3738			0.4525	0.4162	
QO	0.4086	0.3995	3250~3500	NM	0.4538	0.4460	2850~3000	MO	0.4525	0.4162	2670~2850
	0.4240	0.4065			0.4705	0.4508			0.4671	0.4196	
	0.4165	0.3890			0.4614	0.4333			0.4577	0.4029	
	0.4021	0.3822			0.4456	0.4287			0.4436	0.3991	
QP	0.4021	0.3822	3250~3500	NN	0.4456	0.4287	2850~3000	MP	0.4436	0.3991	2670~2850
	0.4165	0.3890			0.4614	0.4333			0.4577	0.4029	
	0.4100	0.3738			0.4525	0.4162			0.4490	0.3875	
	0.3966	0.3673			0.4376	0.4116			0.4356	0.3837	
PM	0.4385	0.4404	3000~3250	NO	0.4376	0.4116	2850~3000				
	0.4538	0.4460			0.4525	0.4162					
	0.4456	0.4287			0.4436	0.3991					
	0.4312	0.4234			0.4294	0.3943					
PN	0.4312	0.4234	3000~3250	NP	0.4294	0.3943	2850~3000				
	0.4456	0.4287			0.4436	0.3991					
	0.4376	0.4116			0.4356	0.3837					
	0.4240	0.4065			0.4221	0.3790					

Note: . The CIE x, y color coordinates measurement allowance is ± 0.01 .

5. Part Number



6. Characteristic Diagram (T_j=25°C)

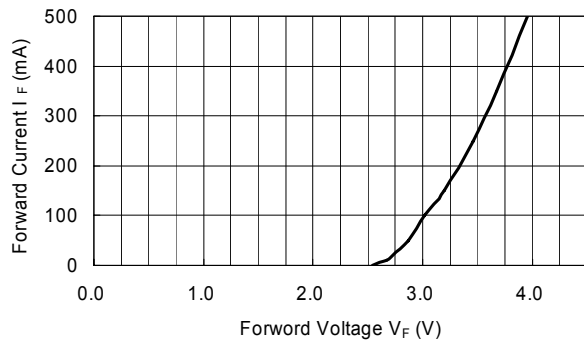


Fig. 1 Forward Current vs. Forward Voltage: Cool White/ Neutral White / Warm White

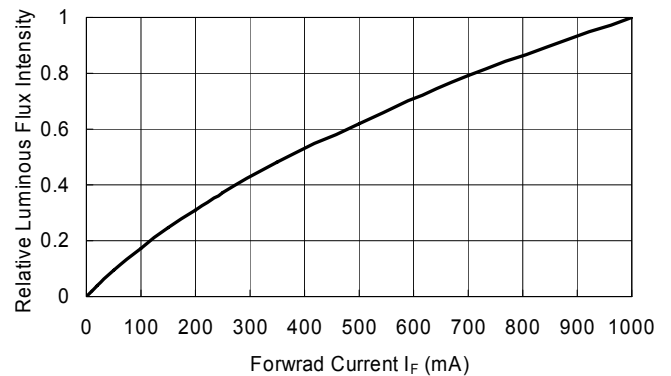


Fig. 2 Relative Intensity VS Forward Current

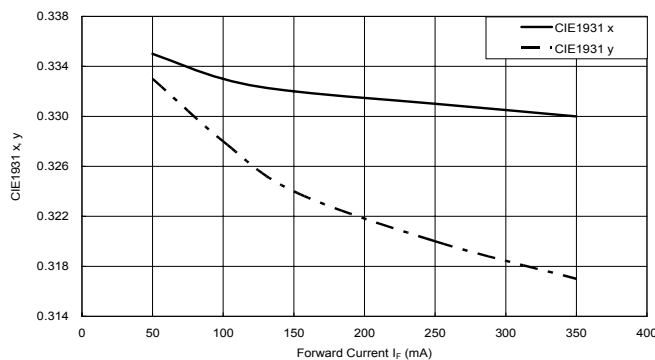


Fig. 3 Forward Current VS CIE1931 x, y

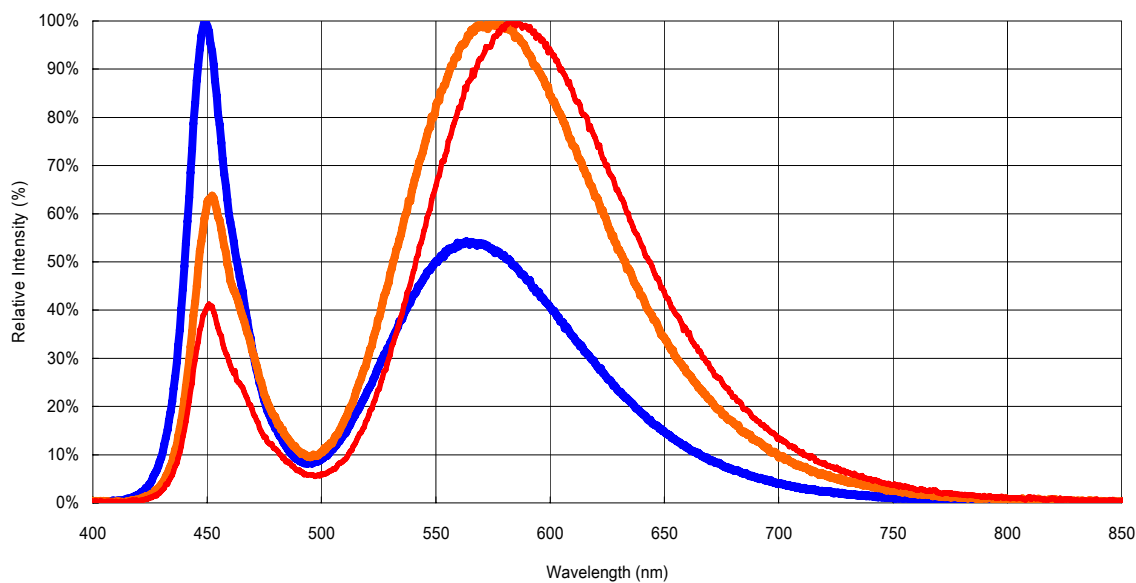
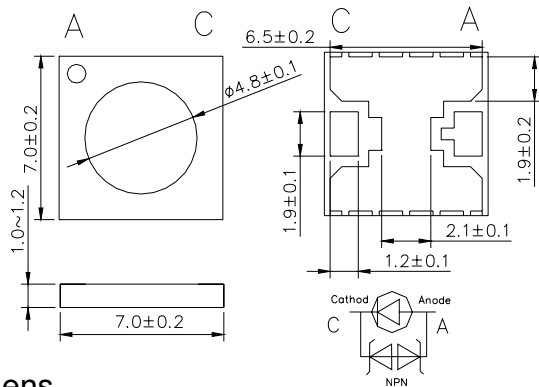


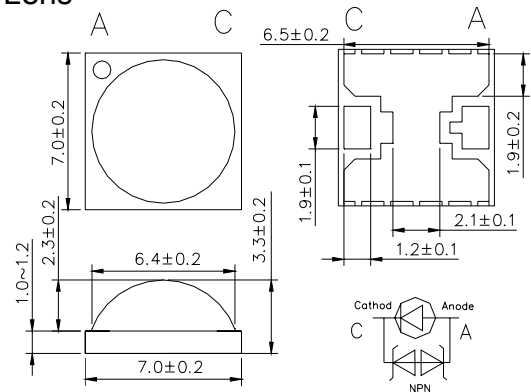
Fig. 4 Relative Intensity vs. Wavelength: Cool White/ Neutral White/ Warm White

7. Dimensions (Unit : mm)

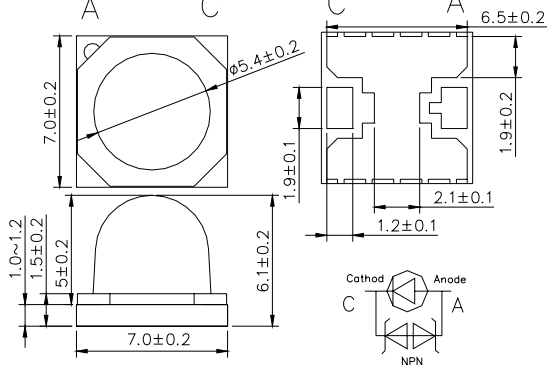
Flat Type



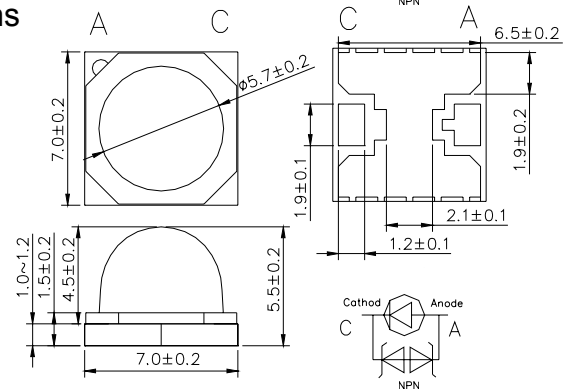
120° Lens



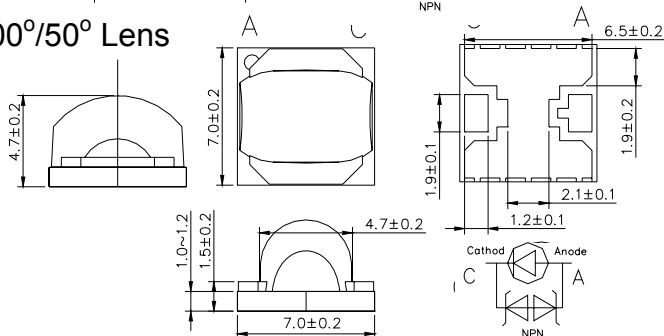
25° Lens



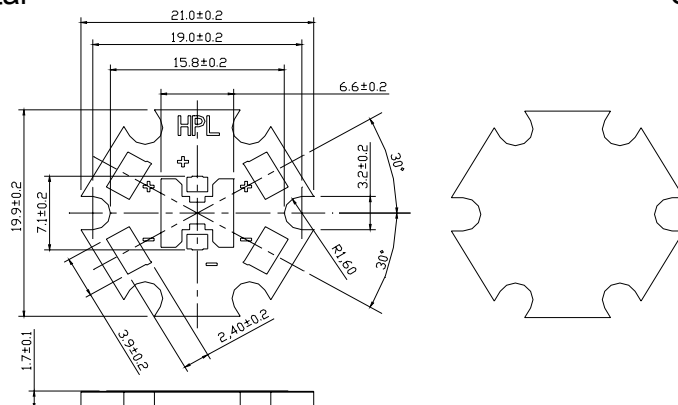
45° Lens



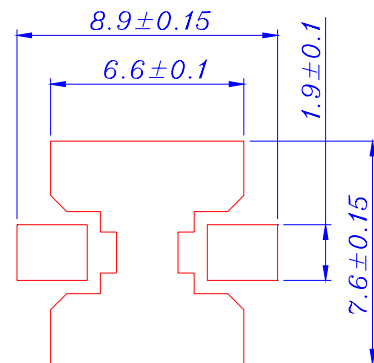
100°/50° Lens



Star



Solder Pad Note: See the caution area

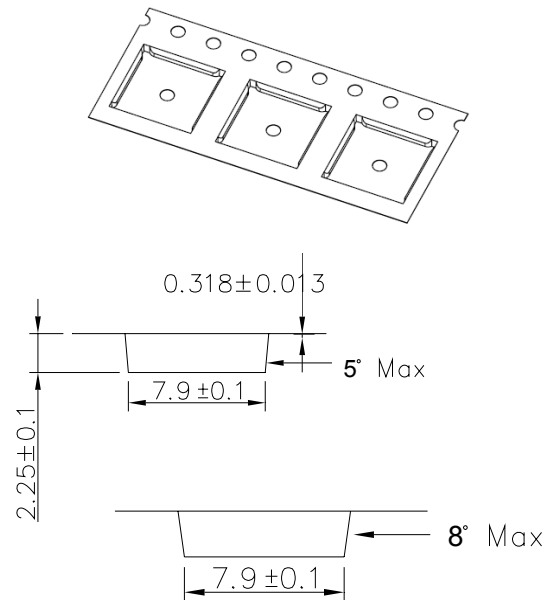
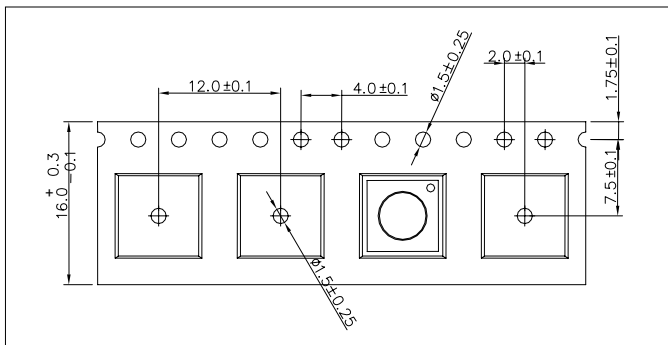


8. Shipping Package Unit : mm

(1) Tapping Dimension Packaging Specification

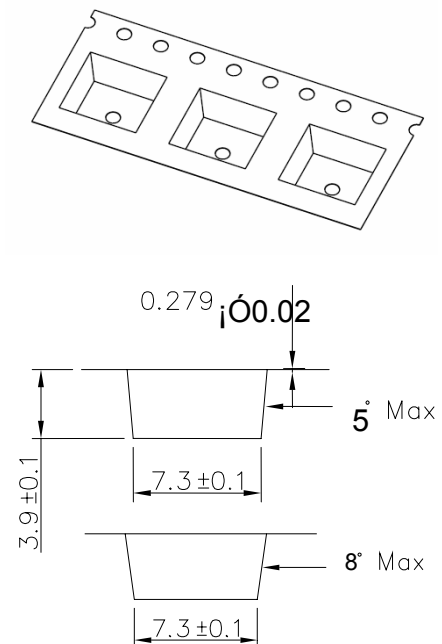
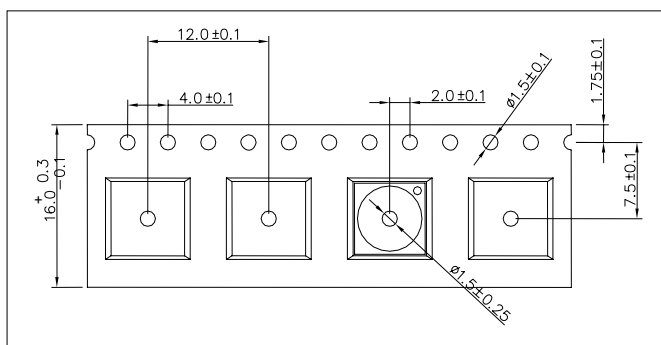
● Flat Type :

- Moisture proof bag.
- 1 Reel/bag.
- Q'ty: 500(MAX)/Reel.



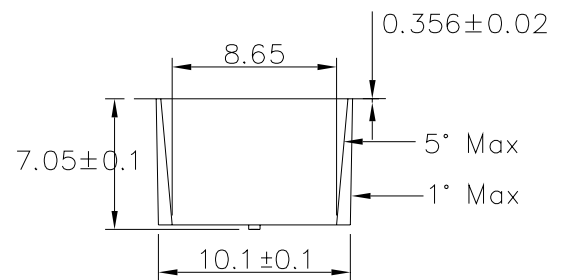
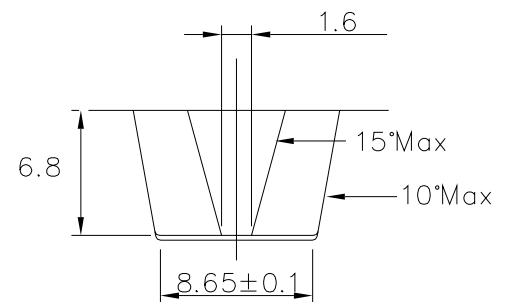
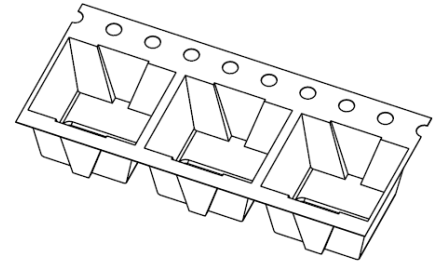
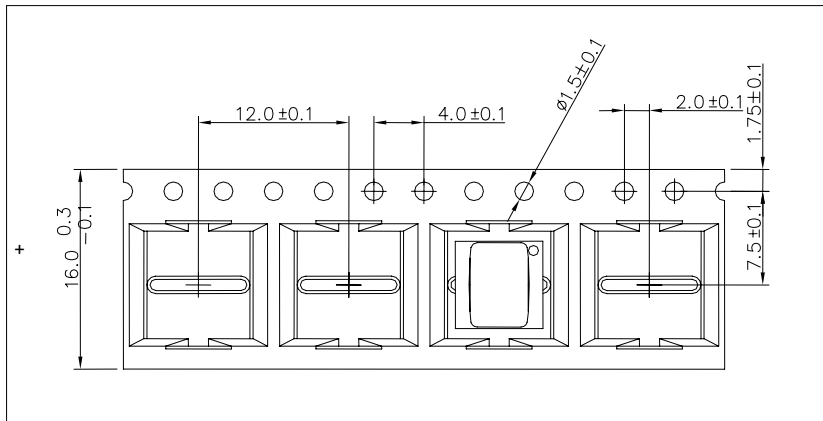
● With 120 degree Lens:

- Moisture proof bag.
- 1 Reel/bag.
- Q'ty: 200(MAX)/Reel.



● With 45, 100/50 degree Lens:

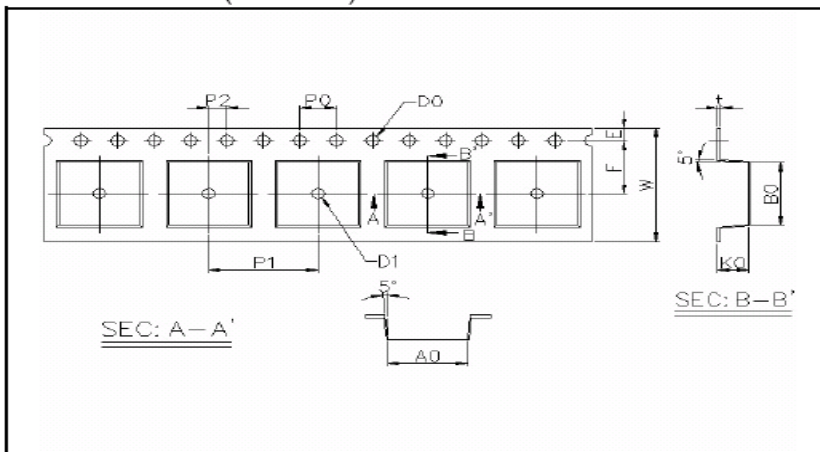
- Moisture proof bag.
- 1 Reel/bag.
- Q'ty: 150(MAX)/Reel.



● With 25 degree Lens & Special Shipping:

- Moisture proof bag.
- 1 Reel/bag.
- Q'ty: 150(MAX)/Reel.

Dimensions. (Unit: mm)



Item	Specification	Tol. (+/-)
W	16.00	± 0.30
E	1.75	± 0.10
F	7.50	± 0.10
D0	1.50	+0.10,-0
D1	1.50	+0.10,-0
P0	4.00	± 0.10
P1	12.00	± 0.10
P2	2.00	± 0.10
P0 x 10	40.00	± 0.20

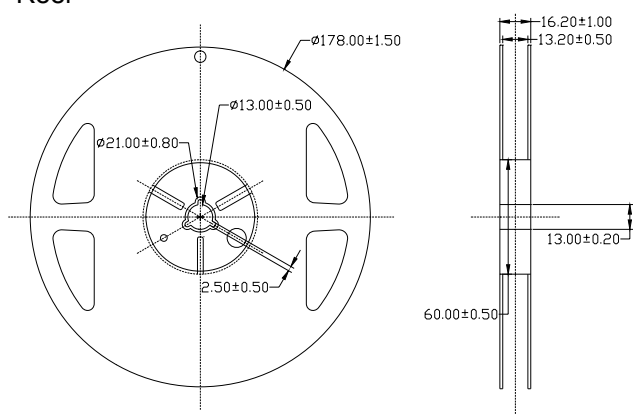
t	0.35	± 0.05
A0	7.60	± 0.10
B0	7.60	± 0.10
K0	5.30	± 0.10

(2) Package

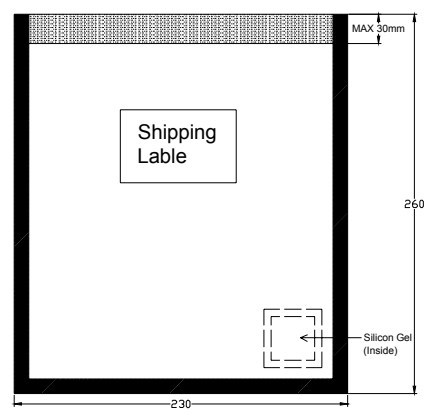
Box Type	Dimensions (mm)	Reel/Box
Small Box (S)	230 × 85 × 265	4 Reel/Box
Middle Box (M)	470 × 265 × 270	24 Reel/Box
Large Box (L)	470 × 435 × 270	40 Reel/Box

Reel Packaging Unit: mm

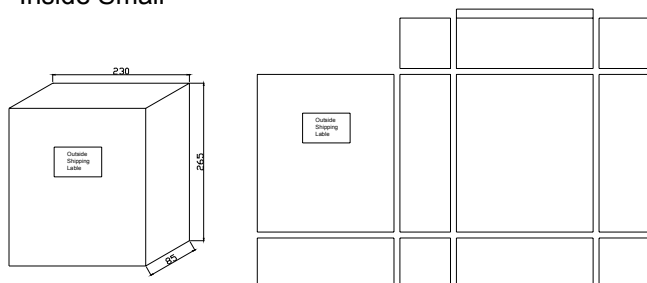
Reel



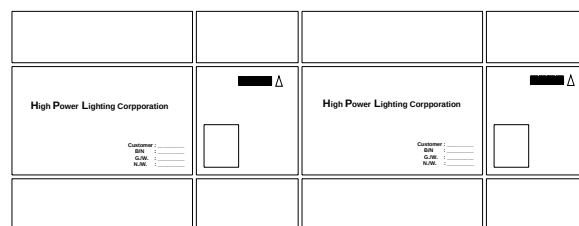
Anti Static Bag



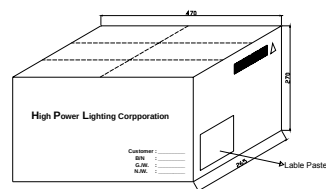
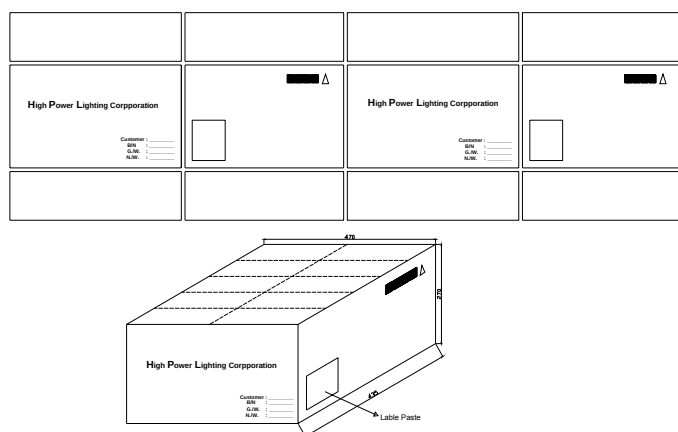
Inside Small



Middle Box



Large Box (Carton)



(3) Label Formation

Carton Label

P/N : HPL-###-####-#		
Date : 29-11-2005		
Q'ty : 150000pcs	Reel's Q'ty : 30 reels	
Customer :	OQC Stamp :	
High Power Lighting Corporation (Taiwan)		

100mm

Reel Label

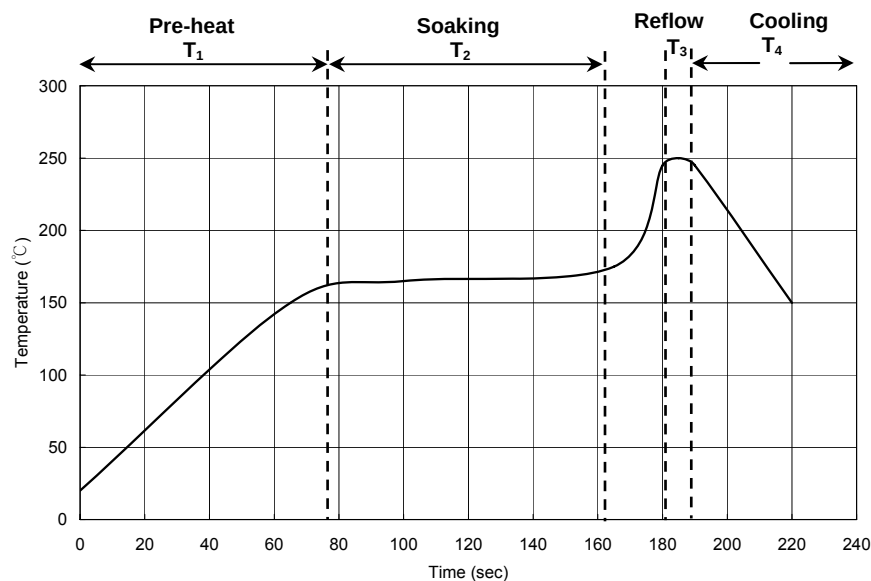
	
P/N : HPL-###-####-#	SN Rank : A2B
Lot : T051129001	Q'ty : 5000pcs
High Power Lighting Corporation (Taiwan)	

40mm

70mm

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.

Cleaning

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