

Features

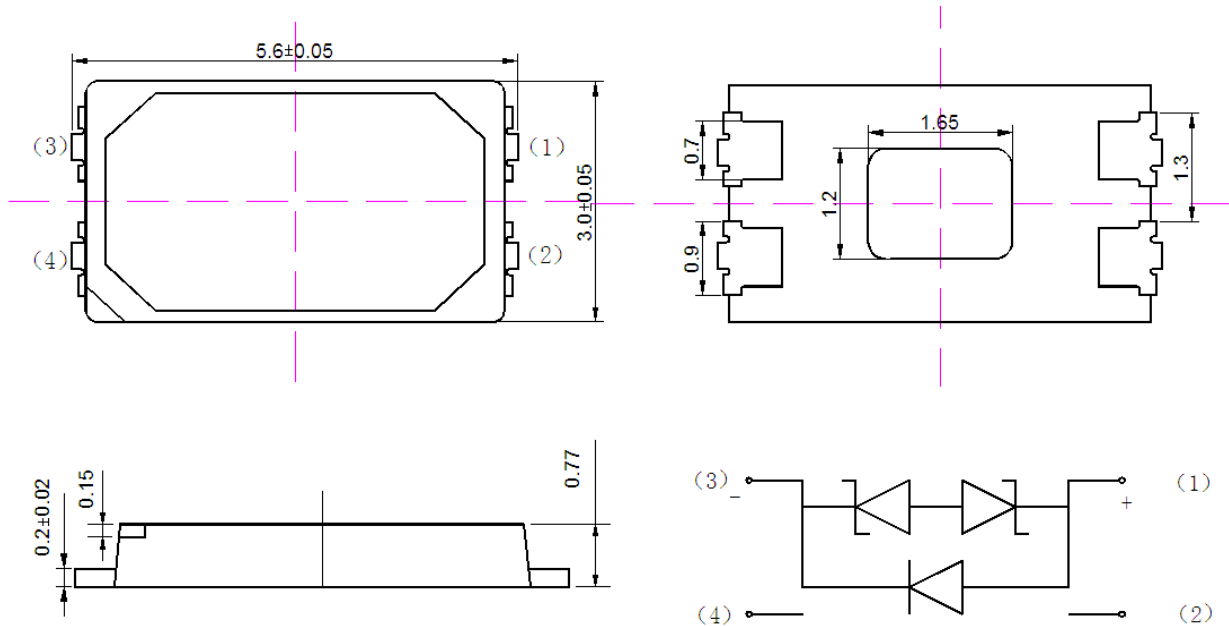
- **Top view white LED (5.6 x 3.0 x 0.77 mm) for BLU**
- **High luminous flux output**
- **High current capability**
- **Base on InGaN / GaN technology**
- **Wide view angle (X : 120° / Y : 120°)**
- **IR reflow soldering**
- **Zener inside**
- **Pb-free**
- **ESD protection**
- **The product itself will remain within RoHS compliant version**

Typical Applications

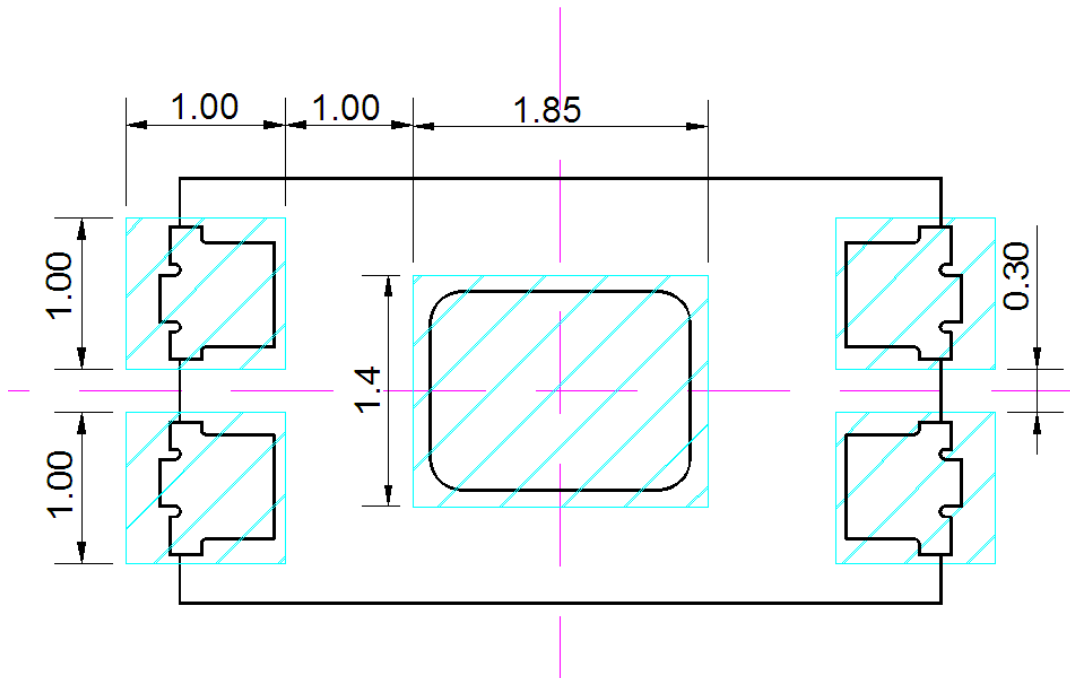
- **Backlight for LCD Monitor/TV**
- **Light pipe application**
- **Indicator and backlight in office and family equipment**
- **General use**



Package Outline Dimensions



Recommended soldering pad design



Notes:

All dimensions in mm tolerance is ± 0.1 mm unless otherwise noted.

**Absolute Maximum Ratings**

Items	Symbol	Absolute maximum Rating	Unit
Power Dissipation	P_D	500	mW
Forward Current(DC)	I_F	150	mA
Peak Forward Current*	I_{FP}	450	mA
Reverse Voltage	V_R	5	V
Operation Temperature	T_{opr}	-40~ +85	°C
Storage Temperature	T_{stg}	-40 ~ +100	°C
Reflow Soldering Temperature	T_{sol}	260°C for 10 seconds	°C

*Pulse width \cong 0.1msec duty \cong 1/10**Typical Electrical & Optical Characteristics**

Items	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F = 120 \text{ mA}$	2.8	---	3.6	V
Reverse Current	I_R	$V_R = 5V$	---	---	1	μA
Luminous Flux	Φ	$I_F = 120 \text{ mA}$	---	43	---	Lm
Chromaticity Coordinate		$I_F = 120 \text{ mA}$	---	X=0.31 Y=0.33	---	
50% Power Angle	$2\theta_{\frac{1}{2}}$	$I_F = 120 \text{ mA}$	---	120	---	Deg

Notes:

1. Tolerance of measurement of Luminous Flux: $\pm 10\%$
2. Tolerance of measurement of Forward Voltage: ± 0.1
3. Tolerance of measurement of Chromaticity Coordinates: ± 0.005



Chromaticity Coordinates Bin Code

BIN Code	CIE_X	CIE_Y	BIN Code	CIE_X	CIE_Y
D1	0.3000	0.3469	D2	0.3017	0.3389
	0.3091	0.3563		0.3103	0.3476
	0.3103	0.3476		0.3114	0.3390
	0.3017	0.3389		0.3033	0.3308
D3	0.3033	0.3308	D4	0.3050	0.3227
	0.3114	0.3390		0.3126	0.3303
	0.3126	0.3303		0.3138	0.3216
	0.3050	0.3227		0.3067	0.3146
D5	0.3067	0.3146	D6	0.3083	0.3065
	0.3138	0.3216		0.3149	0.3129
	0.3149	0.3129		0.3161	0.3041
	0.3083	0.3065		0.3100	0.2983
D7	0.3091	0.3563	D8	0.3103	0.3476
	0.3196	0.3666		0.3203	0.3574
	0.3203	0.3574		0.3209	0.3481
	0.3103	0.3476		0.3114	0.3390
D9	0.3114	0.3390	D10	0.3126	0.3303
	0.3209	0.3481		0.3215	0.3387
	0.3215	0.3387		0.3222	0.3294
	0.3126	0.3303		0.3138	0.3216
D11	0.3138	0.3216	D12	0.3149	0.3129
	0.3222	0.3294		0.3228	0.3200
	0.3228	0.3200		0.3234	0.3107
	0.3149	0.3129		0.3161	0.3041
D13	0.3196	0.3666	D14	0.3203	0.3574
	0.3287	0.3748		0.3288	0.3650
	0.3288	0.3650		0.3289	0.3552
	0.3203	0.3574		0.3209	0.3481
D15	0.3209	0.3481	D16	0.3215	0.3387
	0.3289	0.3552		0.3290	0.3453
	0.3290	0.3453		0.3291	0.3554
	0.3215	0.3387		0.3222	0.3294



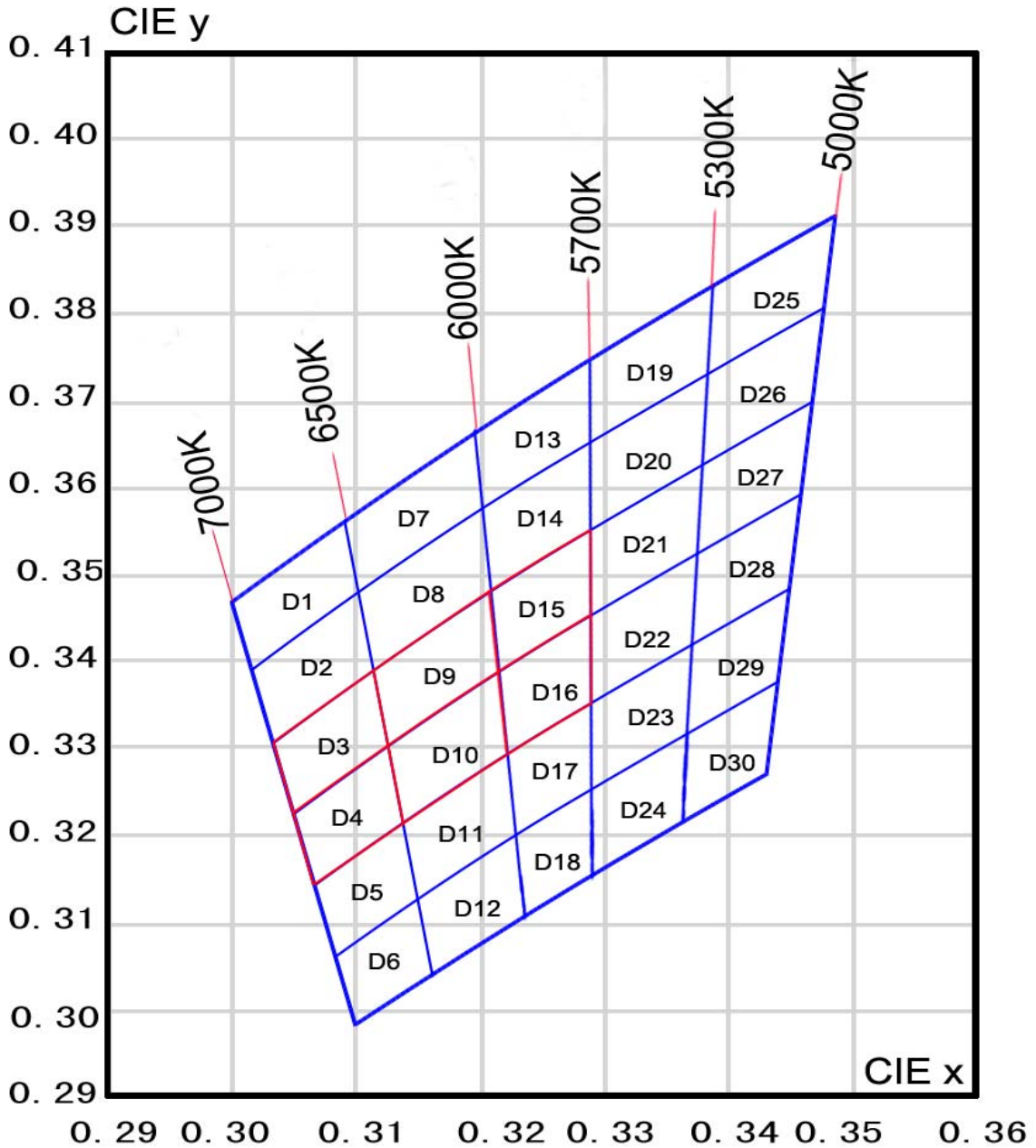
BIN Code	CIE_X	CIE_Y	BIN Code	CIE_X	CIE_Y
D17	0.3222	0.3294	D18	0.3228	0.3200
	0.3291	0.3554		0.3292	0.3255
	0.3292	0.3255		0.3293	0.3156
	0.3228	0.3200		0.3234	0.3107
D19	0.3287	0.3748	D20	0.3288	0.3650
	0.3387	0.3832		0.3382	0.3729
	0.3382	0.3729		0.3378	0.3626
	0.3288	0.3650		0.3289	0.3552
D21	0.3289	0.3552	D22	0.3290	0.3453
	0.3378	0.3626		0.3374	0.3523
	0.3374	0.3523		0.3370	0.3420
	0.3290	0.3453		0.3291	0.3554
D23	0.3291	0.3554	D24	0.3292	0.3255
	0.3370	0.3420		0.3366	0.3317
	0.3366	0.3317		0.3362	0.3214
	0.3292	0.3255		0.3293	0.3156
D25	0.3387	0.3832	D26	0.3382	0.3729
	0.3486	0.3915		0.3477	0.3807
	0.3477	0.3807		0.3468	0.3700
	0.3382	0.3729		0.3378	0.3626
D27	0.3378	0.3626	D28	0.3374	0.3523
	0.3468	0.3700		0.3458	0.3593
	0.3458	0.3593		0.3449	0.3485
	0.3374	0.3523		0.3370	0.3420
D29	0.3370	0.3420	D30	0.3366	0.3317
	0.3449	0.3485		0.3440	0.3378
	0.3440	0.3378		0.3430	0.3271
	0.3366	0.3317		0.3362	0.3214

Note:

1. Tolerance of Chromaticity Coordinates: ± 0.005
2. *Color coordinate is derived from the CIE 1931 chromaticity



The C.I.E 1931 Chromaticity Diagram



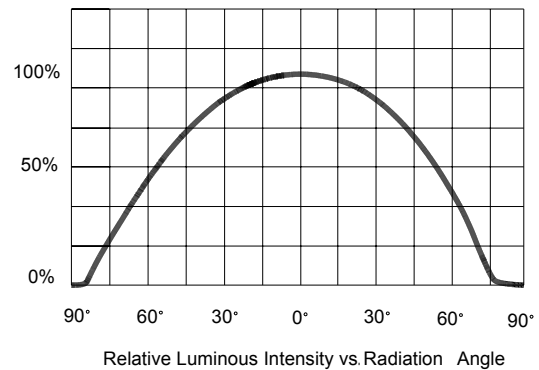
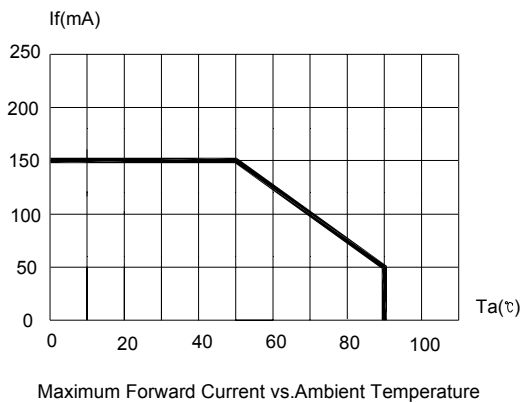
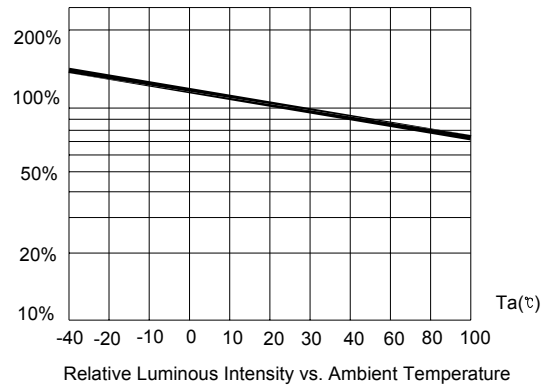
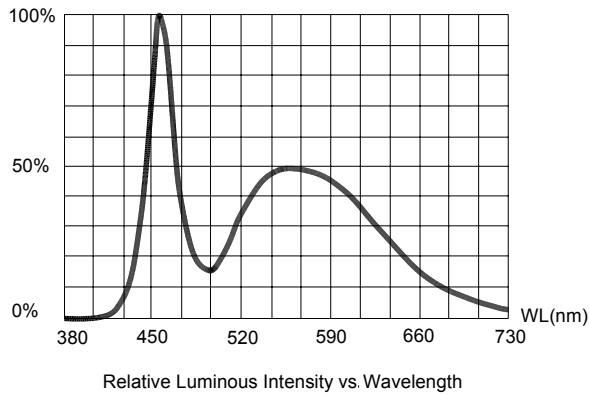
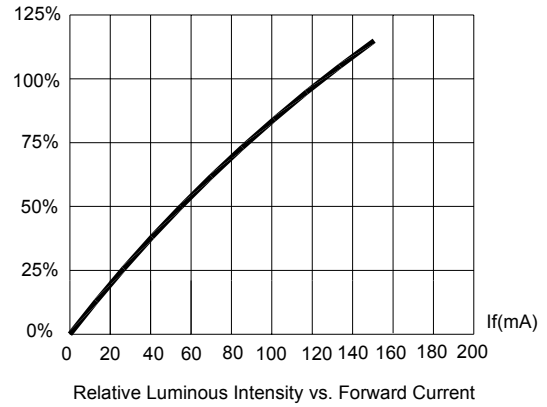
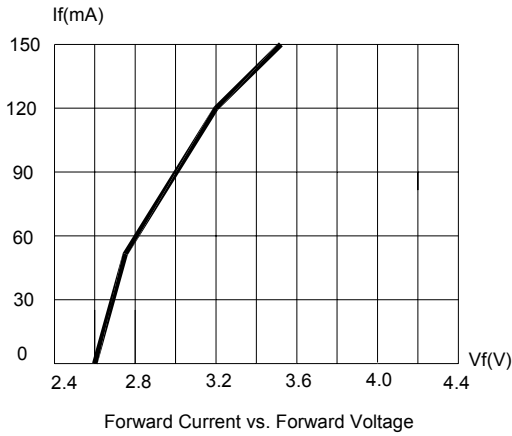
Note:

1. Tolerance of measurement of chromatic coordinates : ± 0.005
2. Please confirm with HB salesman, if your request different from standard specification
3. The red line in the figure is the main BIN



Typical Electrical/ Optical Characteristics Curves

(Ta=25°C Unless Otherwise Noted)



**Reliability**

1. Test Items And Results

Test Item	Test Conditions	Note	Number of Damaged
Reflow Soldering	T _{sld} =260°C , 10 sec (pre treatment 30°C,70%,168hrs)	3 time	0/100
High Temperature Storage	T _A =100°C	1000 Hrs	0/100
Low Temperature Storage	T _A =-40°C	1000 Hrs	0/100
Temperature Humidity Storage	T _A =85°C , RH=90%RH	1000 Hrs	0/100
Thermal Shock Test	-40°C ~ 100°C 15min 15 min	300 Cycles	0/100
Temperature Cycling Test	- 4 0 °C ~ 2 5 °C ~ 8 5 °C ~ 2 5 °C 30min 5min 30min 5min	160 Cycles	0/100
Operating Life Test	T _A =25°C I _F =120mA	1000 Hrs	0/100

2. Criteria for Judging The Damage

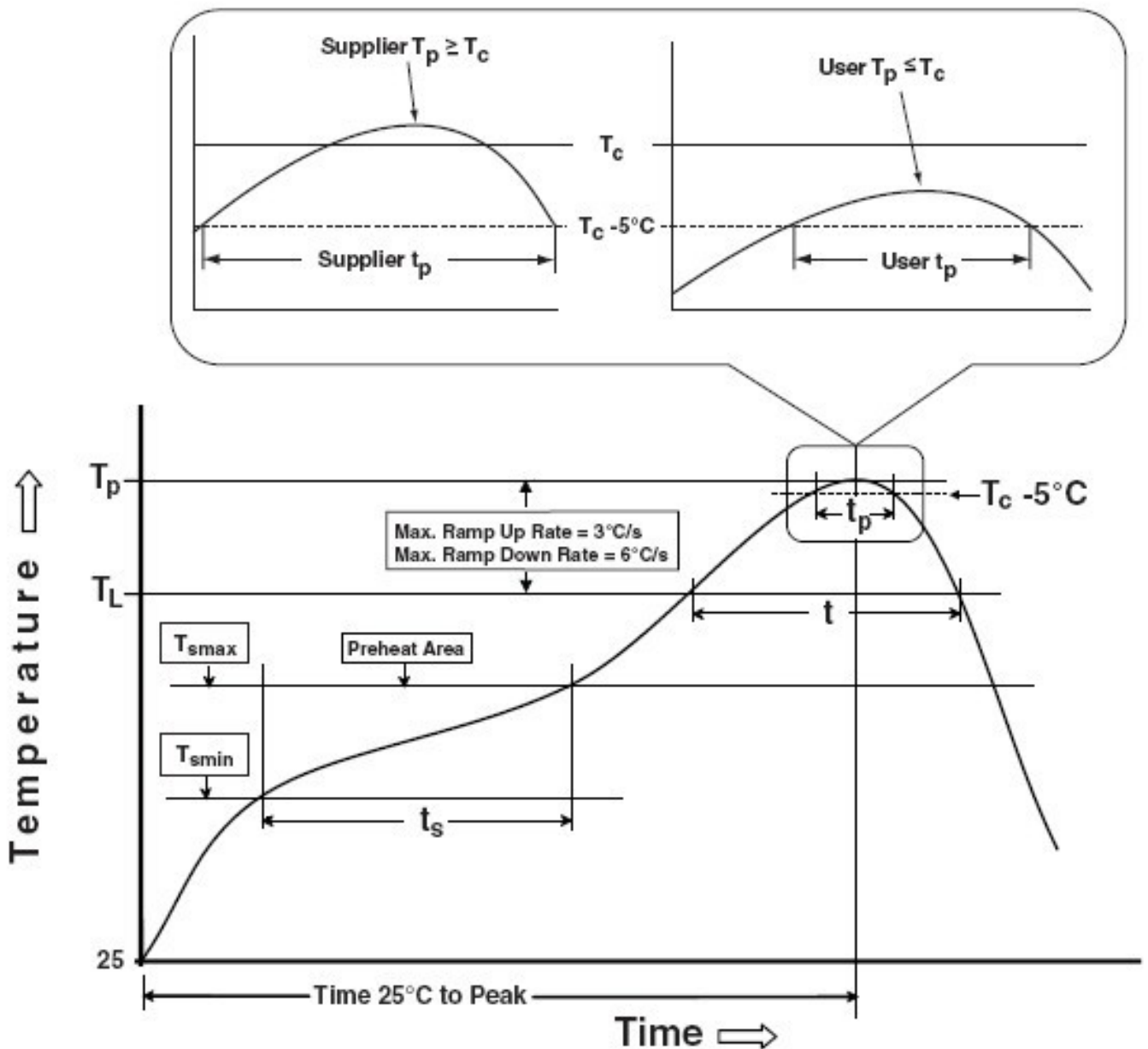
Item	Symbol	Test Conditions	Criteria for Judgment	
			Min.	Max.
Forward Voltage	V _F	I _F =120mA	---	Initial Data ×1.1
Luminous Intensity	I _V	I _F =120 mA	Initial Data × 0.8	---
Reverse Current	I _R	V _R = 5V	---	≦ 1μA



Recommend Reflow Soldering Profile

Soldering reflow

1. Soldering of the SMD LEDs should conform to the soldering condition in the individual specifications.
2. SMD LEDs are designed for reflow soldering.
3. In the reflow soldering, too high temperature and too large temperature gradient such as rapid heating/cooling may cause electrical & optical failures and damages of the devices.
4. HB can't guarantee the LEDs after they have been assembled using the solder dipping method.





Reflow Soldering			Hand Soldering	
Profile Feature	Lead Solder	Lead-free Solder	Temperature Soldering time	350 °C max. 3 seconds max. (one time only)
Pre-heat temperature (T_{smin} to T_{smax})	120~150 °C	180~200 °C		
Pre-heat time (T_{smin} to T_{smax})	60-120 seconds	60-120 seconds		
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.	3 °C/second max.		
Liquidous temperature (T_L)	183 °C	217 °C		
Time at liquidous (T_L)	60-150 seconds	60-150 seconds		
Peak package body temperature(T_p)*	234~240 °C max.	255~260 °C max.		
Classification temperature(T_c)	240 °C	260 °C		
Soldering time	10 seconds max.	10 seconds max.		
Time(T_p)**within 5°C of the specified classification temperature(T_c)	20**seconds	30**seconds		
Average ramp-dawn rate (T_p to T_{smax})	6 °C/second max.	6 °C/second max.		
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.		

Note:

- * Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.
- ** Tolerance for time at peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

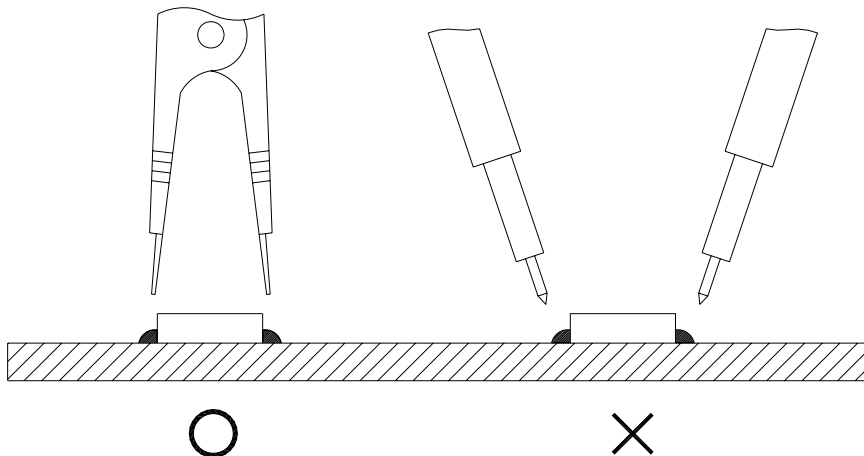


Soldering iron

1. When hand soldering, keep the temperature of the iron under 350°C, and at that temperature keep the time under 3 sec.
2. The hand soldering should be done only one time.
3. The basic spec is $\leq 3\text{sec}$, when the temperature of 350°C, do not contact and put dress on the resin.
4. The temperature of the iron should be controllable.

Rework

1. Customer must finish rework within 3 sec under 350°C.
2. The head of iron cannot touch the resin.
3. Twin-head type is preferred.
4. The temperature of the iron should be controllable.



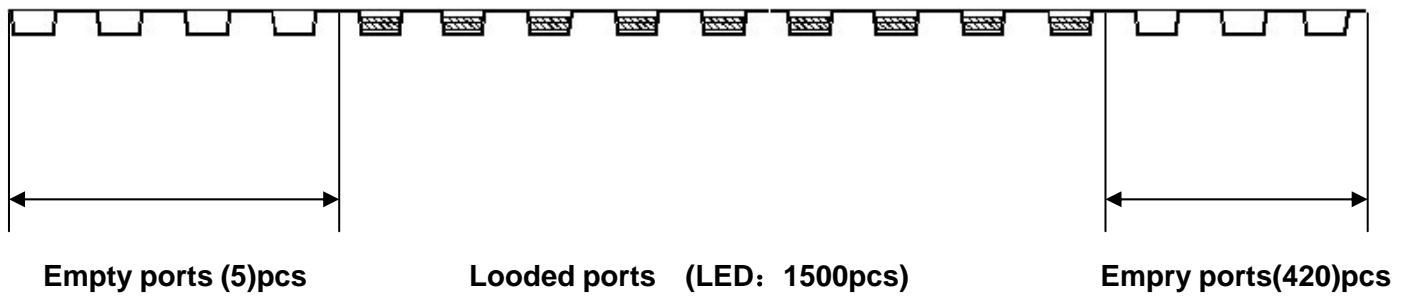
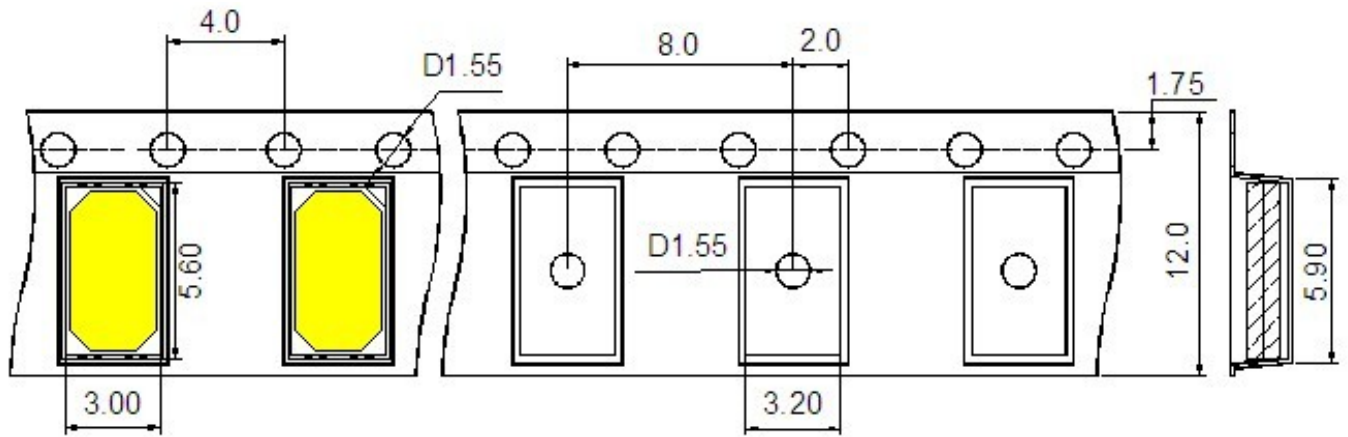
Notes:

1. There is possibility that the brightness of LEDs is decreased, which is influenced by heat or ambient atmosphere during reflow. It is recommended to use the Nitrogen reflow method use the nitrogen reflow method.
2. After LEDs have been soldered, repair should not be done. As repair is Unavoidable , a twin-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will be damaged by repairing or not.
3. Reflow soldering should not be done more than two times.



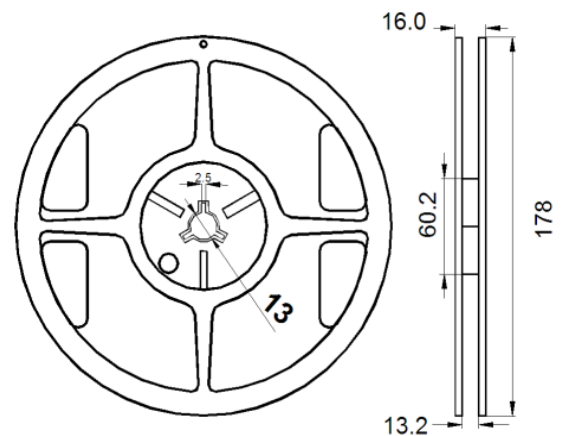
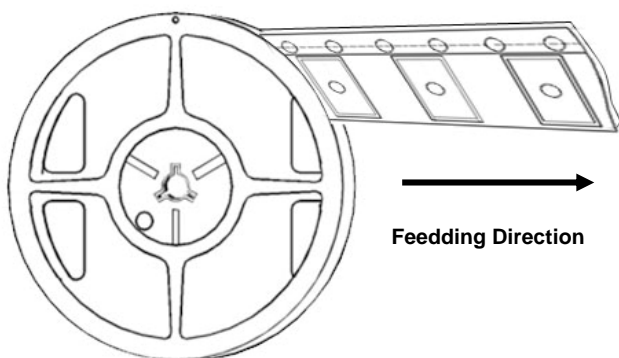
Packing Specifications

1. Reel Dimensions and Carrier Tape Dimensions: Loaded Quantity 1500pcs or 3000pcs Per Reel .



Feeding Direction

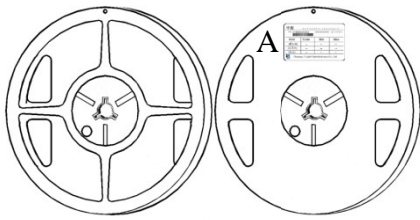
Dimensions of Reel



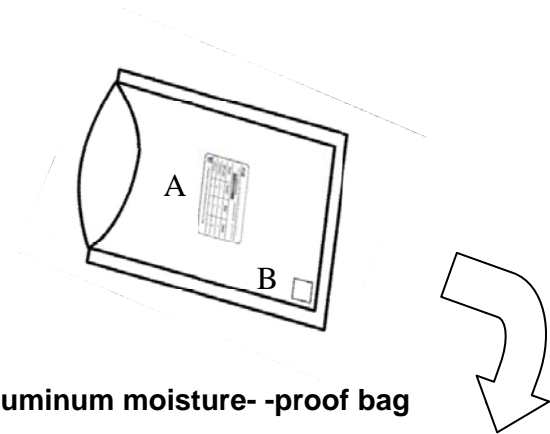
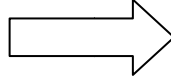
Notes:

The tolerance unless mentioned is ± 0.1 , unit=mm.

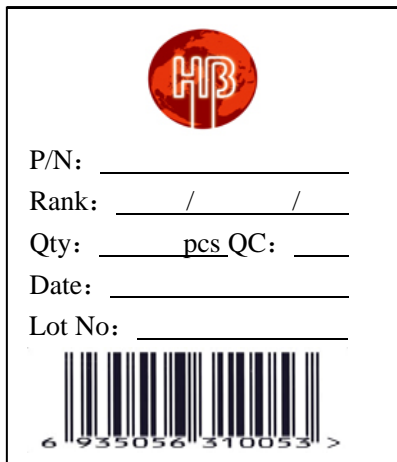
2. Moisture Resistant Packaging



Reel

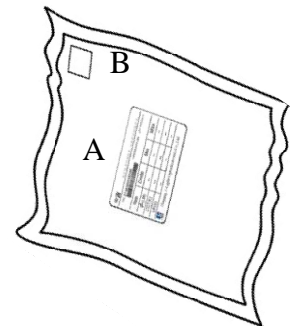


Aluminum moisture- -proof bag

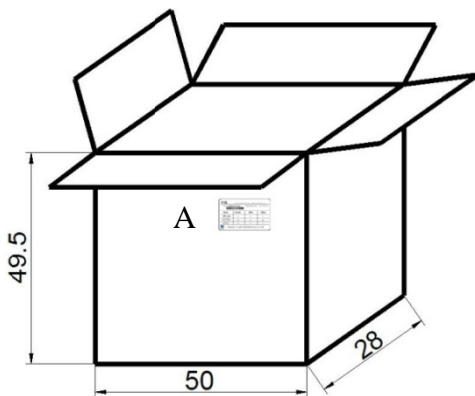
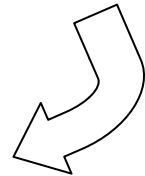


A: Label

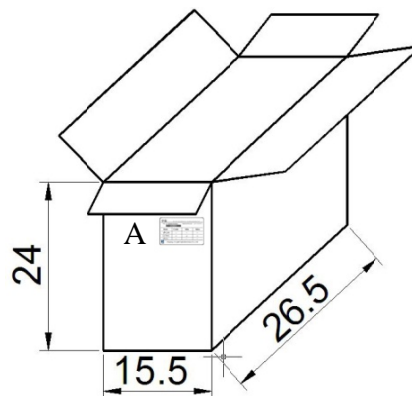
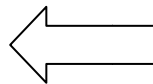
B: Desiccant



Aluminum moisture-proof bag



Outer box



Inner box

Note:

The tolerance unless mentioned is ± 0.1 , unit=cm.