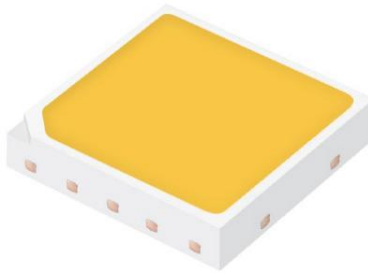


SPECIFICATIONS

High Power LED Series LH502D General

High efficacy and lumen makes
The LH502D suitable for Streetlight and High-bay applications



Features & Benefits

- Operates at a maximum current of up to 1000mA
- Uniform light distribution under any beam angle
- Strengthened Anti sulfurization
- Color binning @ 85℃

Dongbu LED Co., Ltd.

53-24 , Dongtansandan 6-gil , Hwaseong-si , Gyeonggi-do , Republic of Korea 18487

Tel. : +82 - 70 - 8874 - 9943 Fax. : +82 - 31 - 373 - 7626

[http : //www.dongbuled-s.com](http://www.dongbuled-s.com)

Table of Contents

1	Product Code Information	3
2	Characteristics	4
3	Typical Characteristics Graphs	9
4	Outline Drawing & Dimension	11
5	Soldering Conditions	12
6	Tape & Reel	12
7	Label Structure	14
8	Packing Structure	15
9	Precautions in Handling & Use	17

1. Product Code Information

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
S	P	H	W	H	2	L	5	N	6	0	3	Y	E	T	5	A	3

Digit	PKG Information	Code	Specification
1 2 3	Dongbu Package High Power	SPH	High power PKG
4 5	Color	WH	White
6	Product Version	2	2nd Version
7 8	Form Factor	L5	5050 Size
9	Lens Type	N	No lens
10	Model	6	5050 Sieries
11	Internal Code	0	
12	CRI	3	Min. 70
		4	Min. 75
		5	Min. 80
		7	Min. 90
13 14	Forward Voltage (V)	YE	Bin Code A0 5.9 ~ 6.1
			A1 6.1 ~ 6.3
15	CCT (K)	Y	2200K
		W	2700K
		V	3000K
		U	3500K
		T	4000K
		R	5000K
		Q	5700K
		P	6500K (CRI70/80)
16	MacAdam step	3	MacAdam 3-Step
		5	MacAdam 5-Step
17 18	MacAdam step	A3	

2. Characteristics

(1) Absolute Maximum Ratings

Item	Symbol	Rating	Unit	Condition
Operating Temperature	T_{opr}	-40 ~ +105	°C	Note 1)*
Storage Temperature	T_{stg}	-40 ~ +100	°C	-
LED Junction Temperature	T_j	125	°C	-
Forward Current	I_F	1000	mA	-
Peak Pulsed Forward Current	I_{FP}	1250	mA	Duty 1/10, pulse width 10ms
Assembly Process Temperature	-	260<10	°C/S	-
Electrostatic Discharge Withstand Voltage(HBM)	ESD(HBM)	±8 (Class 3B)	KV	-

(2) Electro-optical Characteristics ($I_F = 640 \text{ mA}$, $T_j = 25 \text{ °C}$)

Item	Unit	Rank	Min.	Typ.	Max.
Forward Voltage (V_F)	V	YE	5.9	-	6.3
Color rendering Index ® / R9	-	3	70 / -50	-	-
		4	75 / -50	-	-
		5	80 / 0	-	-
		7	90 / 50	-	-
Thermal Resistance (junction to solder point)	°C/W		-	3	-
Beam Angle	°			120	

* Note :

1) Dongbu maintains measurement tolerance of: forward voltage = ±0.1 V, luminous flux = ±7 %, forward voltage = ±0.1 V, CRI = ±1, R9 = ±6.5

(3) Luminous Flux Rank ($I_F=640\text{mA}$, $T_j = 25^\circ\text{C}$)

CRI (R _a) Min.	Nominal CCT(K)	Product Code	VF Rank	Chrom Rank (Bins)	Flux		Flux Range (Φ _v , lm)
					Rank	Bins	
70	2200	SPHWH2L5N603YFY3A3	YE	Y3, Y5	A3	58	580-620
		SPHWH2L5N603YFY5A3				62	620-660
	2700	SPHWH2L5N603YEW3A3		W3, W5		64	640-680
		SPHWH2L5N603YEW5A3				68	680-720
	3000	SPHWH2L5N603YEV3A3		V3, V5		66	660-700
		SPHWH2L5N603YEV5A3				70	700-740
	3500	SPHWH2L5N603YEU3A3		U3, U5		67	670-710
		SPHWH2L5N603YEU5A3				71	710-750
	4000	SPHWH2L5N603YET3A3		T3, T5		69	690-730
		SPHWH2L5N603YET5A3				73	730-770
	5000	SPHWH2L5N603YER3A3		R3, R5		68	680-720
		SPHWH2L5N603YER5A3				72	720-760
	5700	SPHWH2L5N603YEQ3A3		Q3, Q5		67	670-710
		SPHWH2L5N603YEQ5A3				71	710-750
	6500	SPHWH2L5N603YEP3A3		P3, P5		66	660-700
		SPHWH2L5N603YEP5A3				70	700-740
75	2700	SPHWH2L5N604YEW3A3	YE	W3, W5	A3	59	590-630
		SPHWH2L5N604YEW5A3				63	630-670
	3000	SPHWH2L5N604YEV3A3		V3, V5		62	620-660
		SPHWH2L5N604YEV5A3				66	660-700
	3500	SPHWH2L5N604YEU3A3		U3, U5		64	640-680
		SPHWH2L5N604YEU5A3				68	680-720
	4000	SPHWH2L5N604YET3A3		T3, T5		65	650-690
		SPHWH2L5N604YET5A3				69	690-730
	5000	SPHWH2L5N604YER3A3		R3, R5		65	650-690
		SPHWH2L5N604YER5A3				69	690-730
	5700	SPHWH2L5N604YEQ3A3		Q3, Q5		64	640-680
		SPHWH2L5N604YEQ5A3				68	680-720
	6500	SPHWH2L5N604YEP3A3		P3, P5		64	640-680
		SPHWH2L5N604YEP5A3				68	680-720
80	2200	SPHWH2L5N605YFY3A3	YE	Y3, Y5	A3	47	470-510
		SPHWH2L5N605YFY5A3				51	510-550
	2700	SPHWH2L5N605YEW3A3		W3, W5		55	550-590
		SPHWH2L5N605YEW5A3				59	590-630
	3000	SPHWH2L5N605YEV3A3		V3, V5		58	580-620
		SPHWH2L5N605YEV5A3				62	620-660
	3500	SPHWH2L5N605YEU3A3		U3, U5		60	600-640
		SPHWH2L5N605YEU5A3				64	640-680
	4000	SPHWH2L5N605YET3A3		T3, T5		62	620-660
		SPHWH2L5N605YET5A3				66	660-700
	5000	SPHWH2L5N605YER3A3		R3, R5		62	620-660
		SPHWH2L5N605YER5A3				66	660-700
	5700	SPHWH2L5N605YEQ3A3		Q3, Q5		61	610-650
		SPHWH2L5N605YEQ5A3				65	650-690
	5700	SPHWH2L5N605YEP3A3		P3, P5		61	610-650
		SPHWH2L5N605YEP5A3				65	650-690

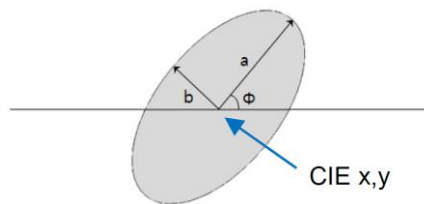
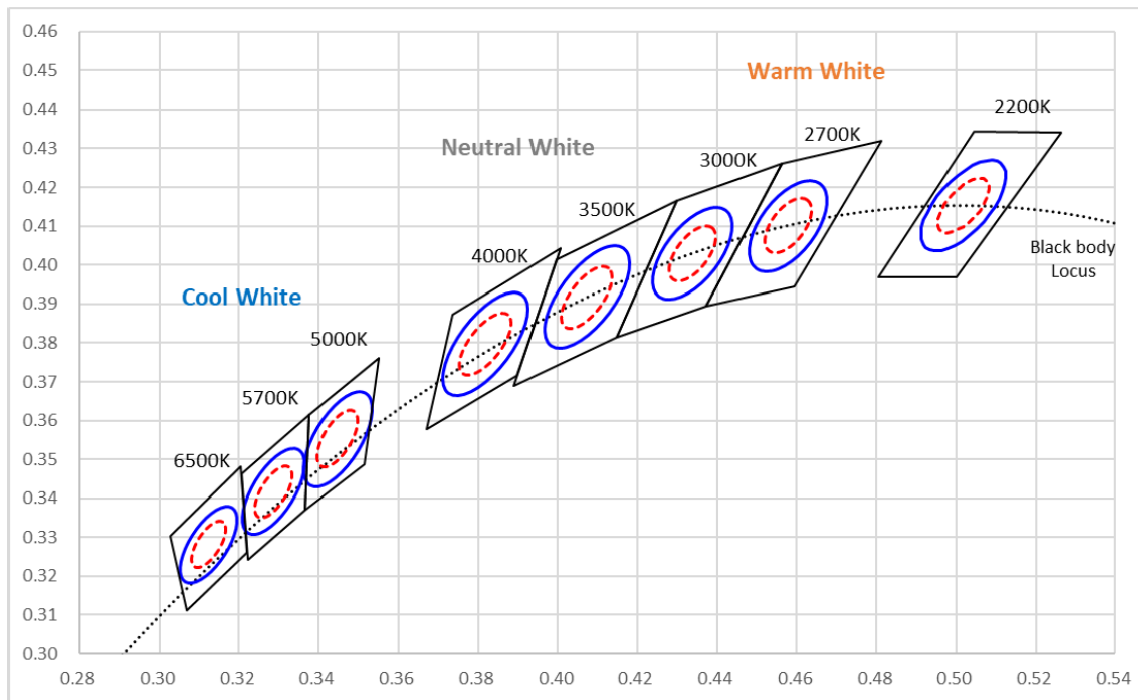
(3) Luminous Flux Rank ($I_F=640\text{mA}$, $T_j = 25^\circ\text{C}$)

CRI (R _a) Min.	Nominal CCT(K)	Product Code	VF Rank	Chrom Rank (Bins)	Flux		Flux Range (Φ _v , lm)
					Rank	Bins	
90	2200	SPHWH2L5N607YFY3A3	YE	Y3, Y5	A3	41	410-450
		SPHWH2L5N607YFY5A3				45	450-490
	2700	SPHWH2L5N607YEW3A3		W3, W5		46	460-500
		SPHWH2L5N607YEW5A3				50	500-540
	3000	SPHWH2L5N607YEV3A3		V3, V5		48	480-520
		SPHWH2L5N607YEV5A3				52	520-560
	3500	SPHWH2L5N607YEU3A3		U3, U5		49	490-530
		SPHWH2L5N607YEU5A3				53	530-570
	4000	SPHWH2L5N607YET3A3		T3, T5		52	520-560
		SPHWH2L5N607YET5A3				56	560-600
	5000	SPHWH2L5N607YER3A3		R3, R5		52	520-560
		SPHWH2L5N607YER5A3				56	560-600
	5700	SPHWH2L5N607YEQ3A3		Q3, Q5		52	520-560
		SPHWH2L5N607YEQ5A3				56	560-600

(4) Voltage Bins ($I_F = 640\text{ mA}$, $T_j = 25^\circ\text{C}$)

Nominal CCT (K)	CRI (R_a) Min.	Product Code	Voltage Rank	Voltage Bin	Voltage Range (V)
-	-	-	YE	A0	5.9~6.1
				A1	6.1~3.3

(7) Chromaticity Region & Coordinates ($I_F = 640 \text{ mA}$, $T_j = 85 \text{ }^\circ\text{C}$)



CRI	CCT	Rank	CIE x	CIE y	Φ	A	B
70 80 90	2200K	Y3	0.5019	0.4153	49.3	0.0086	0.004
		Y5				0.0144	0.0066
	2700K	W3	0.4578	0.4101	53.7	0.0081	0.0042
		W5				0.0135	0.007
	3000K	V3	0.4338	0.403	53.2	0.0083	0.0041
		V5				0.0138	0.0068
	3500K	U3	0.4073	0.3917	54	0.0093	0.0041
		U5				0.0155	0.0069
	4000K	T3	0.3818	0.3797	53.7	0.0094	0.004
		T5				0.0157	0.0067
	5000K	R3	0.3447	0.3553	59.6	0.0082	0.0035
		R5				0.0137	0.0058
	5700K	Q3	0.3287	0.3417	59.1	0.0075	0.0032
		Q5				0.0125	0.0053
	6500K	P3	0.3123	0.3282	58.6	0.0067	0.0029
		P5				0.0112	0.0048

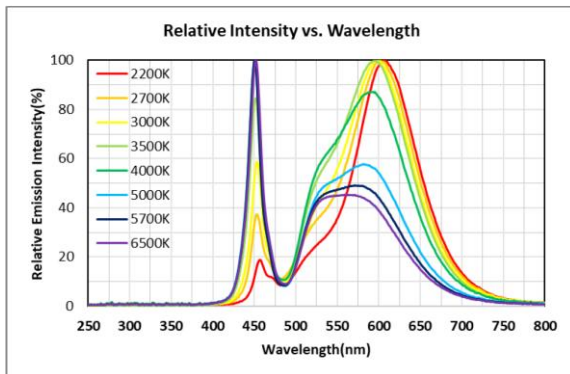
* Note :

Dongbu maintains measurement tolerance of: $C_x, C_y = \pm 0.005$

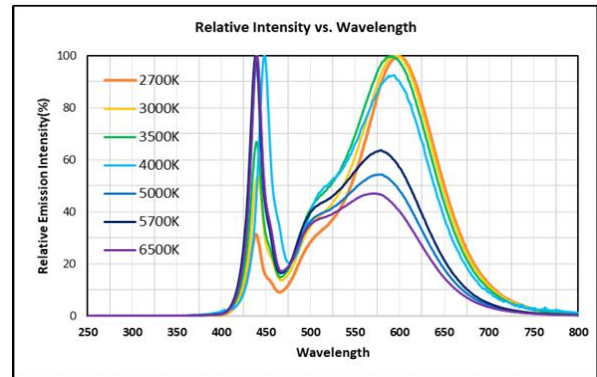
3. Typical Characteristics Graphs

(1) Spectrum Distribution ($I_F = 640 \text{ mA}$, $T_j = 25^\circ\text{C}$)

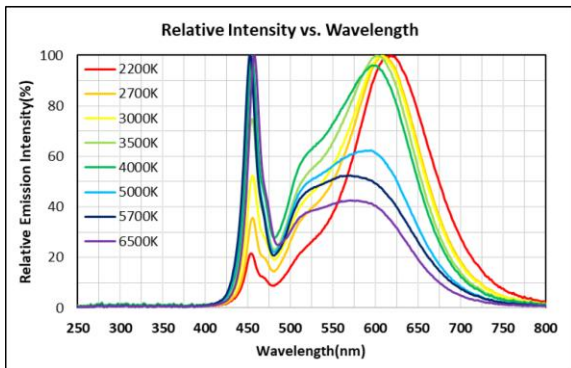
CRI70



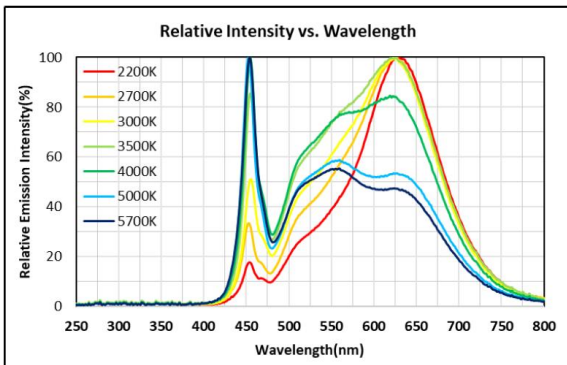
CRI70



CRI80

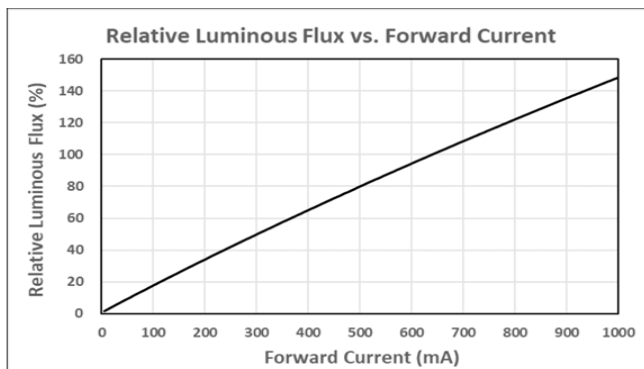
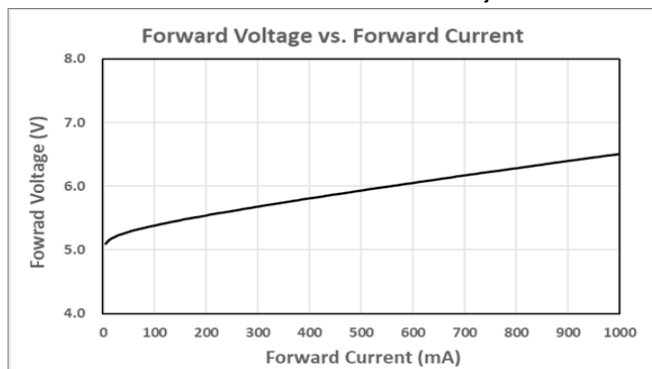


CRI90

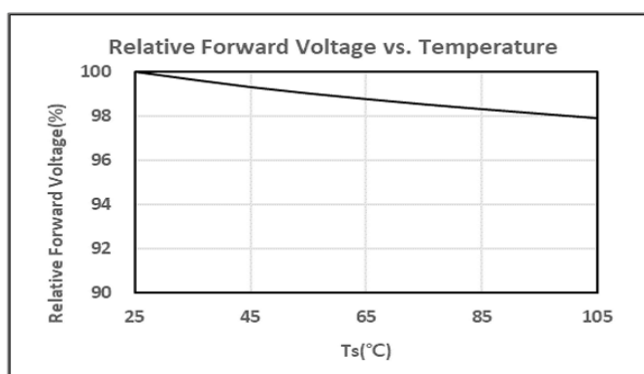
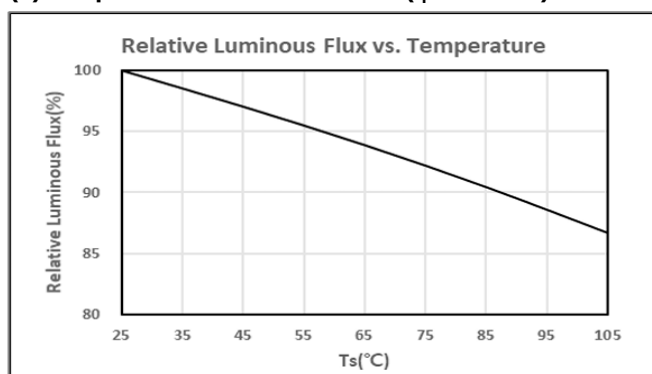


3. Typical Characteristics Graphs

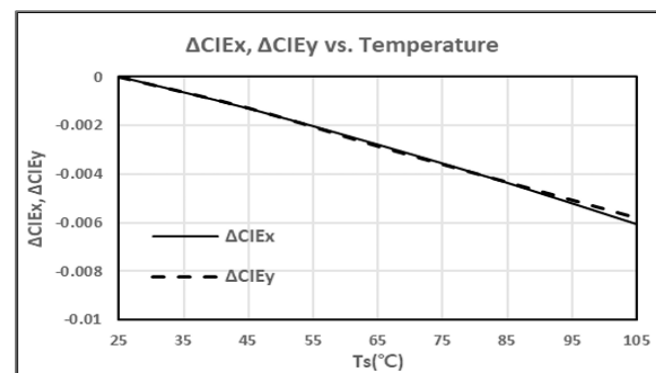
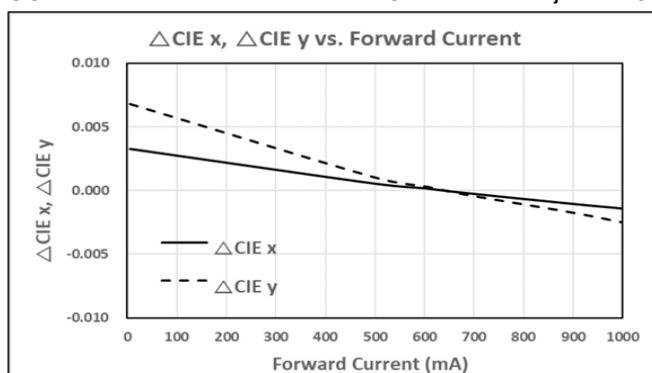
(2) Forward Current Characteristics ($T_j=25^\circ\text{C}$)



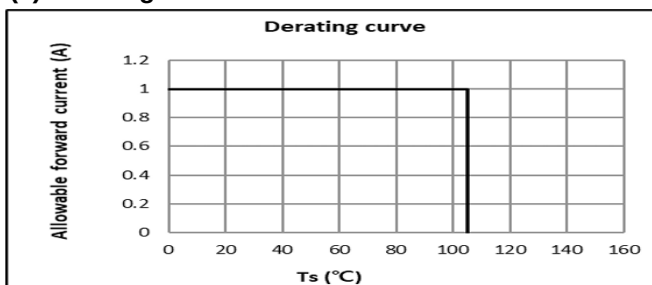
(3) Temperature Characteristics ($I_F=640\text{ mA}$)



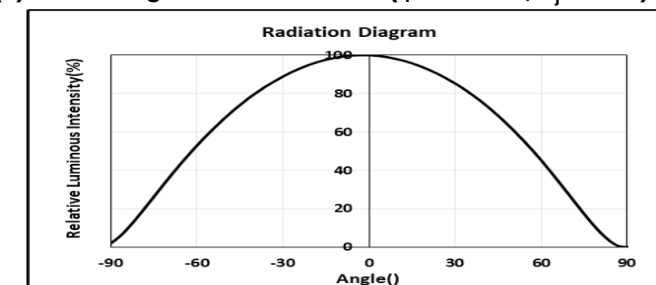
(4) Color Shift Characteristics ($I_F=700\text{ mA}$, $T_j=85^\circ\text{C}$)



(5) Derating Curve



(6) Beam Angle Characteristics ($I_F=640\text{ mA}$, $T_j=25^\circ\text{C}$)

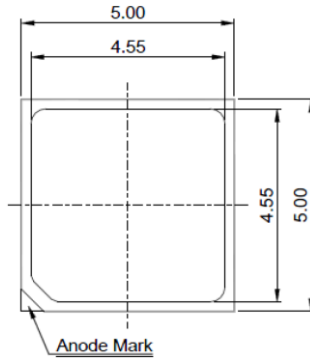


3. Typical Characteristics Graphs

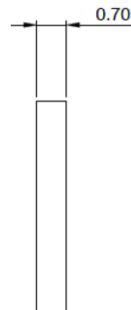
(7) Luminous Flux Characteristics (CRI =70, CCT=4000K)

CRI (Ra) Min.	Nominal CCT	IF	Vf	Typ. @Tj=25 °C	
				Im	Im/W
70	4000K	180mA	5.49	217 lm	219 lm/W
		360mA	5.74	421 lm	204 lm/W
		600mA	6.03	679 lm	188 lm/W
		640mA	6.08	720 lm	185 lm/W
		800mA	6.26	881 lm	176 lm/W
		1000mA	6.48	1073 lm	166 lm/W

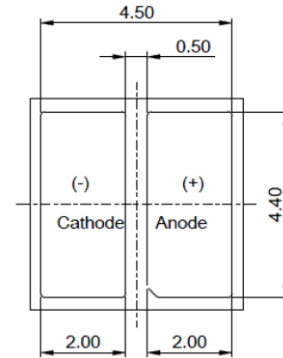
4. Outline Drawing & Dimension



[Top View]



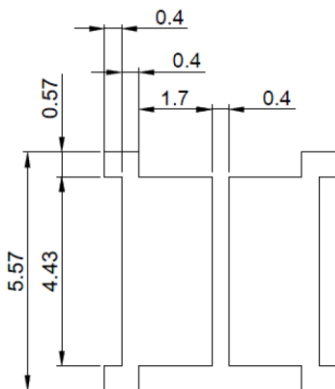
[Side View]



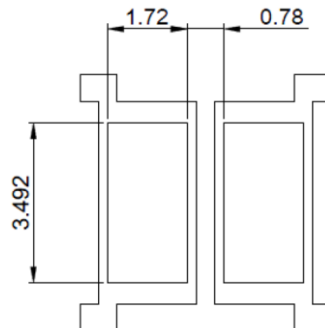
[Bottom View]

* Notes :

- 1) Mark for the Anode
- 2) Unit : mm
- 3) Tolerance : $\pm 0.1\text{mm}$



[Recommended PCB Solder Pad]

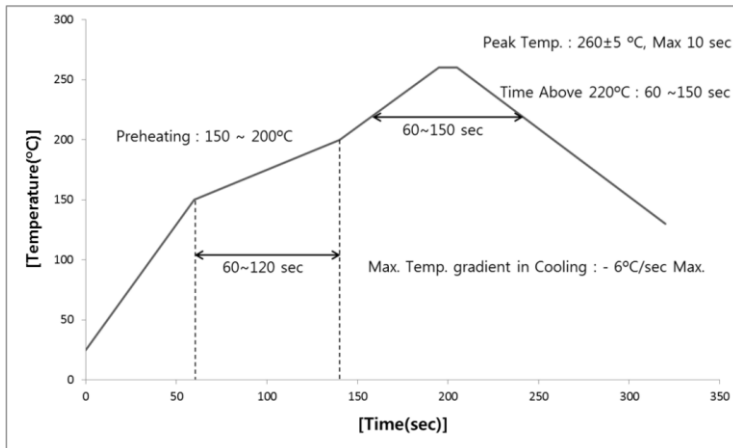


[Recommended Stencil Opening]

5. Soldering Conditions

(1) Reflow Conditions (Pb free)

Reflow frequency: 2 times max.



(2) Manual Soldering Conditions

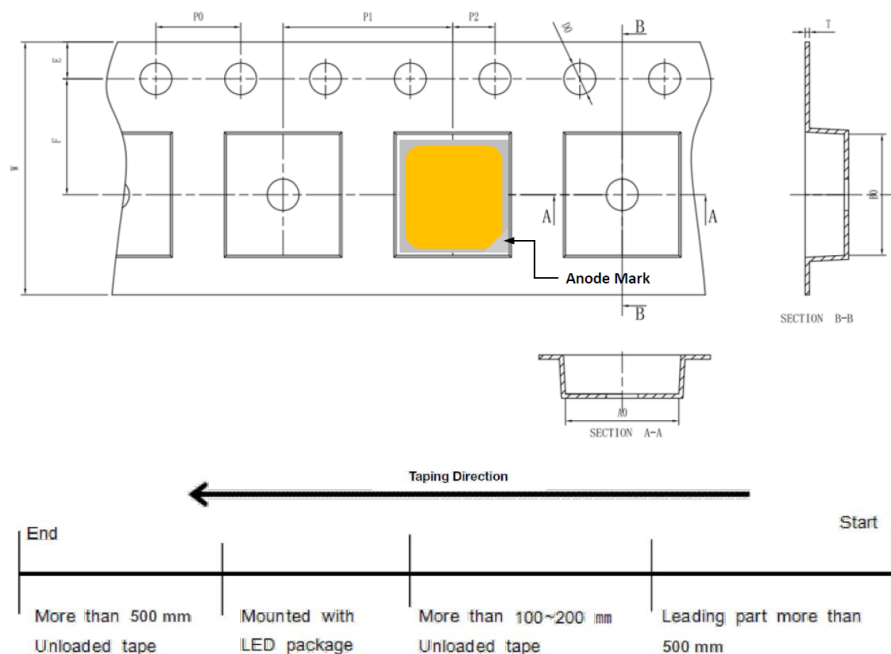
Not more than 5 seconds @ max. 300 °C, under soldering iron.

6. Tape & Reel

(1) Taping Dimension

(unit : mm)

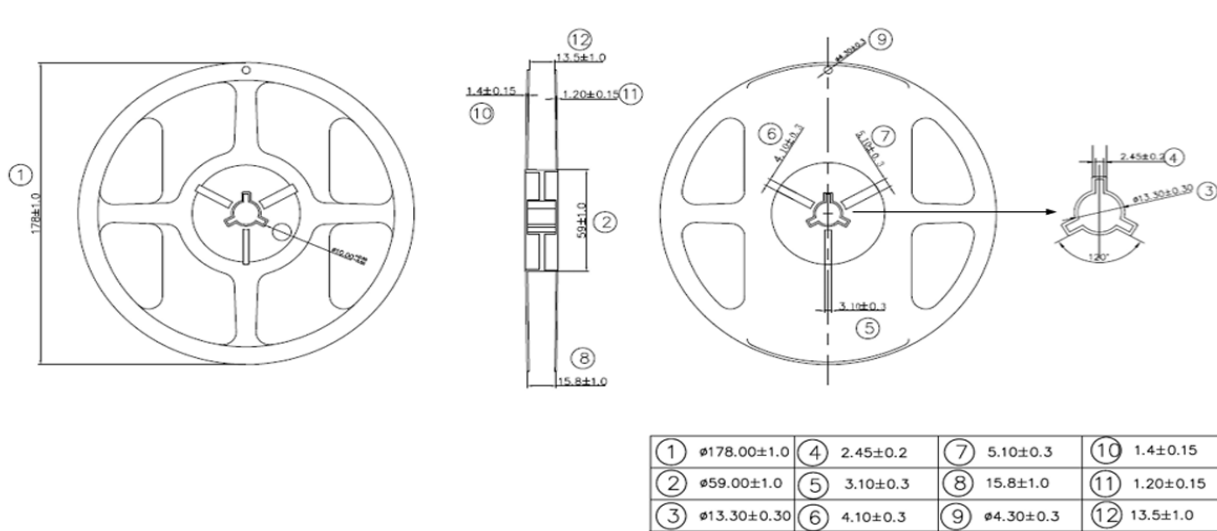
ITEM	W	A0	B0	K0	E	F	D0	D1	P0	P1	P2	T	LENGTH	PCS/REEL
DIM	12.00	5.40	5.20	0.95	1.75	5.50	1.50	1.50	4.00	4.00	2.00	0.20		
5.35	+0.10	+0.05	+0.05	+0.05	+0.10	+0.10	+0.10	+0.10	+0.10	+0.10	+0.10	+0.05		
	-0.10	-0.05	-0.05	-0.05	-0.10	0.00	0.00	0.00	0.00	-0.10	-0.10	-0.05		



6. Tape & Reel

(2) Reel Dimension

(unit : mm)

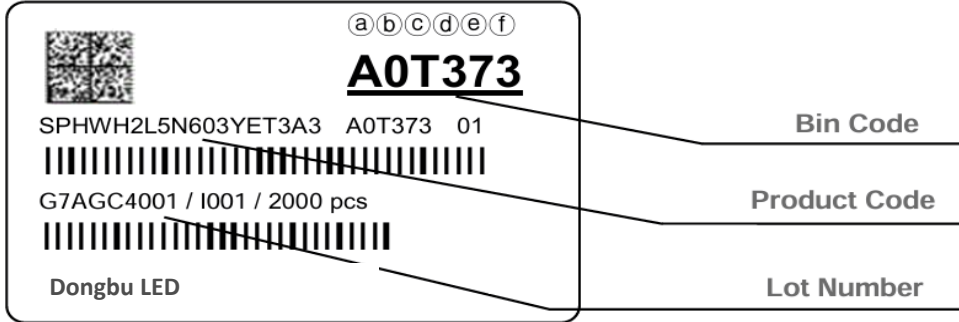


*** Note :**

- 1) Quantity: The quantity/reel is 2,000 pcs
- 2) All dimensions are millimeters.
- 3) Packaging : P/N, Manufacturing data code no. and quantity are indicated on the aluminum packing bag.

7. Label Structure

(1) Label Structure



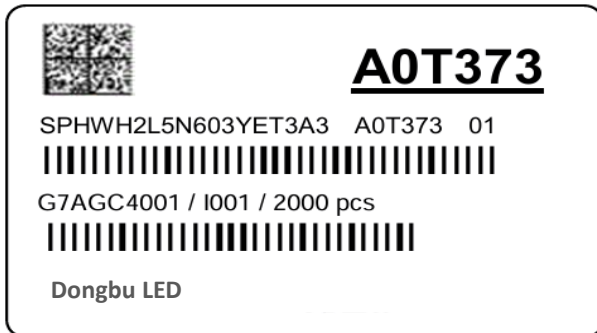
* Note : Denoted bin code and product code above is only an example (see description on page 2)

Bin Code

- ⒶⒷ: Forward Voltage bin (refer to page 7)
- ⒸⒹ: Chromaticity bin (refer to page 8)
- ⒺⒻ: Luminous Flux bin (refer to page 6)

(2) Lot Number

The lot number is composed of the following characters:



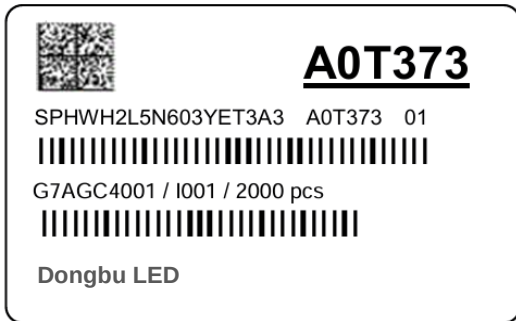
①②③④⑤⑥⑦⑧⑨ / IⒶⒷⒸ / xxxx pcs

- ①② : Production site (G4 : Guangzhou, China)
- ③ : Product state (A: Normal, B: Bulk, C: First Production, R: Reproduction, S: Sample)
- ④ : Year (E: 2020, F: 2021, G: 2022, H: 2023 ...)
- ⑤ : Month (1~9, A, B, C)
- ⑥ : Day (1~9, A, B~V)
- ⑦⑧⑨ : Serial number (001 ~ 999)
- ⒶⒷⒸ : Reel number (001 ~ 999)

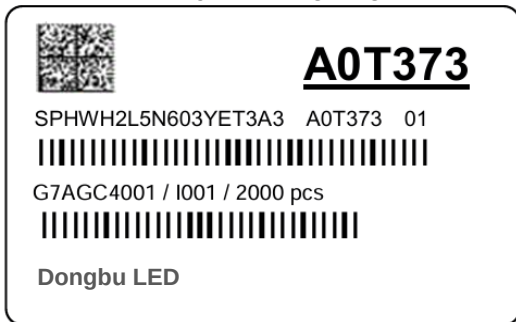
8. Packing Structure

(1) Packing Process

Reel



Aluminum Vinyl Packing Bag

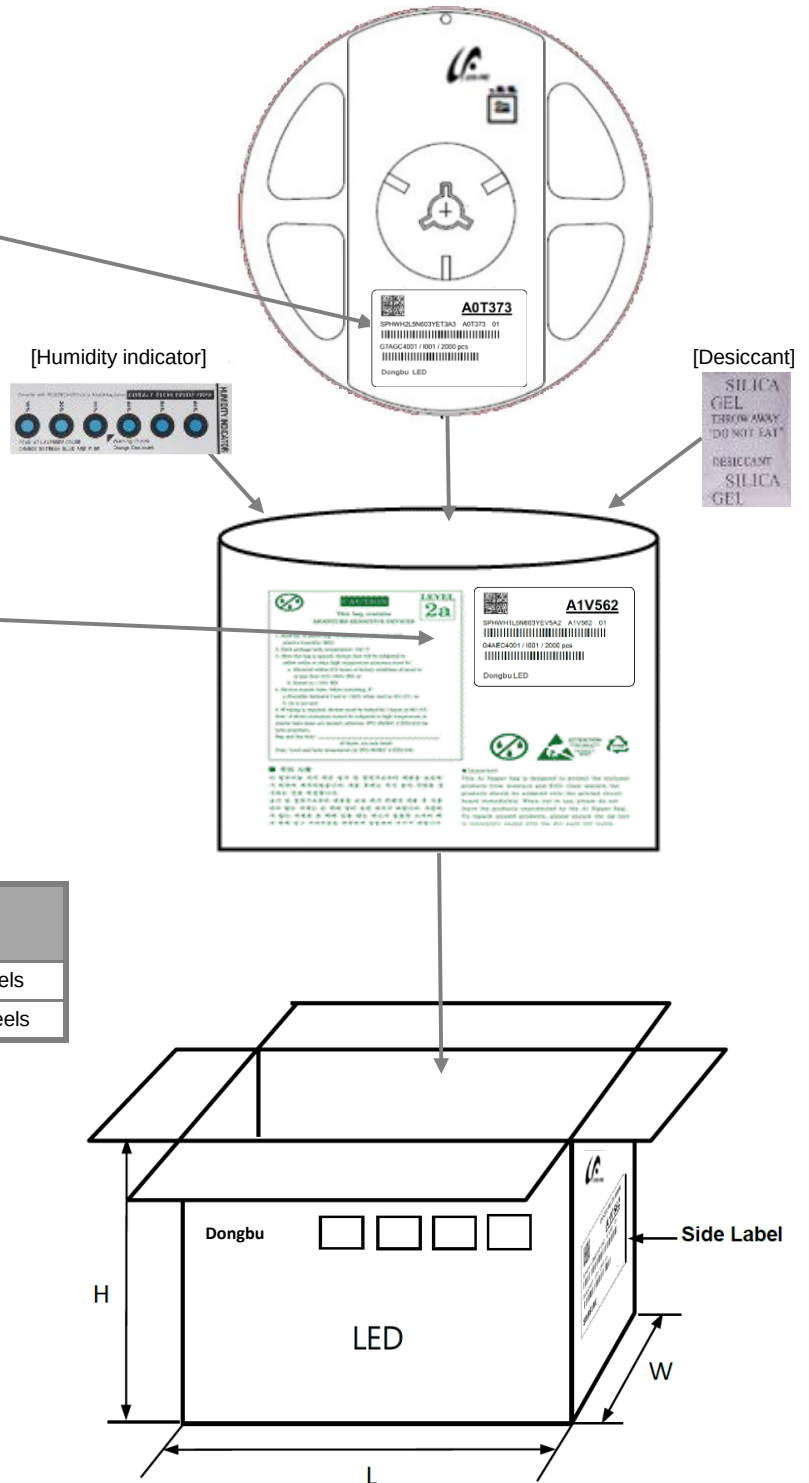
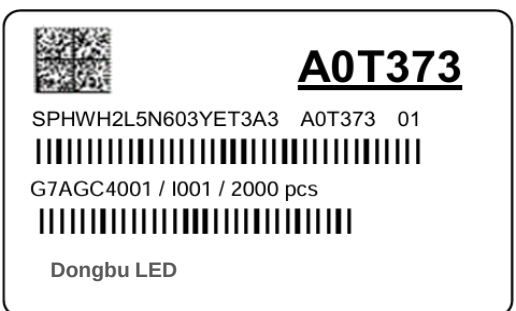


Outer Box

Material: Paper (SW3B(B))

Type	Size (mm)			Note
	L	W	H	
7 inch S	245 ± 5	220 ± 5	182 ± 5	Up to 5 reels
7 inch L	245 ± 5	220 ± 5	86 ± 5	Up to 10 reels

Side Label



8. Packing Structure

(5) Aluminum Vinyl Packing Bag



CAUTION
This bag contains
MOISTURE SENSITIVE DEVICES

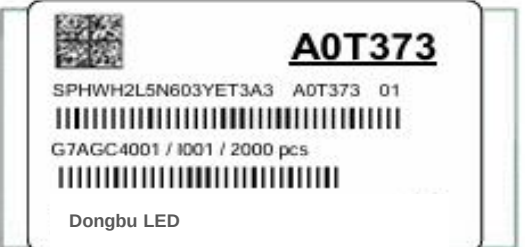
LEVEL 2a

- Shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH)
- Peak package body temperature: 240 °C
- After this bag is opened, devices that will be subjected to reflow solder or other high temperature processes must be:
 - Mounted within 672 hours at factory conditions of equal to or less than 30°C /60% RH, or
 - Stored at <10% RH
- Devices require bake, before mounting, if:
 - Humidity Indicator Card is >60% when read at 23±5°C, or
 - 2a is not met.
- If baking is required, devices must be baked for 10 ~ 24 hours at 60±5°C

Note: If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure.

Bag seal due date: _____
(if blank, see code label)

Note: Level and body temperature by IPC/JEDEC J-STD-020



A0T373
SPHWH2L5N603YET3A3 A0T373 01
G7AGC4001 / 1001 / 2000 pcs
Dongbu LED






■ 주의 사항

이 알루미늄 지퍼 백은 습기 및 정전기로부터 제품을 보호하기 위하여 제작되었습니다. 개봉 후에는 즉시 솔더 작업을 실시하는 것을 권장합니다.

습기 및 정전기로부터 제품을 보호 하기 위해서 개봉 후 사용하지 않는 자재는 본 팩에 넣어 보관 하시기 바랍니다. 사용하지 않는 자재를 본 팩에 넣을 때는 반드시 동봉된 드라이 팩과 함께 넣고 지퍼부분을 완전하게 밀봉하여 주시기 바랍니다.

■ Important

This Al Zipper bag is designed to protect the enclosed products from moisture and ESD. Once opened, the products should be soldered onto the printed circuit board immediately. When not in use, please do not leave the products unprotected by the Al Zipper Bag. To repack unused products, please ensure the zip-lock is completely sealed with the dry pack left inside.

(6) Silica Gel & Humidity Indicator Card inside Aluminum Vinyl Bag

(This image is for reference only. Silica gel and humidity indicator shapes may be different.)



9. Precautions in Handling & Use

- (1) For over-current protection, users are recommended to apply resistors connected in series with the LEDs to mitigate sudden change of the forward current caused by shift of forward voltage.
- (2) This device should not be used in any type of fluid such as water, oil, organic solvent, etc. When cleaning is required, IPA is recommended as the cleaning agent. Some solvent-based cleaning agent may damage the silicone resins used in the device.
- (3) When the device is in operation, the forward current should be carefully determined considering the maximum ambient temperature and corresponding junction temperature.
- (4) LEDs must be stored in a clean environment. Shelf life of sealed bags is 12 months at temperature 0~40 °C, 0~90 % RH
- (5) After storage bag is opened, device subjected to soldering, solder reflow, or other high temperature processes must be:
 - a. Mounted within 672 hours (28 days) at an assembly line with a condition of no more than 30 °C / 60 % RH*_{Note 1}, or
 - b. Mounted within 24 hours (1 day) at an assembly line with a condition of more than 30 °C / 70 % RH*_{Note 2}, or
 - c. Stored at <10 % RH
- (6) Repack unused devices with anti-moisture packing, fold to close any opening and then store in a dry place.
- (7) Devices require baking before mounting, if humidity card reading is >60 % at 23 ± 5 °C.
- (8) Devices must be baked for 1 hour at 60 ± 5 °C, if baking is required.
- (9) The LEDs are sensitive to the static electricity and surge current. It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs. If voltage exceeding the absolute maximum rating is applied to LEDs, it may cause damage or even destruction to LED devices. Damaged LEDs may show some unusual characteristics such as increase in leakage current, lowered turn-on voltage, or abnormal lighting of LEDs at low current.
- (10) VOCs (Volatile Organic Compounds) can be generated from adhesives, flux, hardener or organic additives used in luminaires (fixtures). Transparent LED silicone encapsulant is permeable to those chemicals and they may lead to a discoloration of encapsulant when they exposed to heat or light. This phenomenon can cause a significant loss of light emitted (output) from the luminaires. In order to prevent these problems, we recommend users to know the physical properties of materials used in luminaires and they must be carefully selected.
- (11) Risk of sulfurization (or tarnishing)

The LED from Dongbu LED Co., Ltd. uses a silver-plated lead frame and its surface color may change to black (or dark color) when it is exposed to sulfur(S), chlorine(Cl) or other halogen compound. Sulfurization of lead frame may cause intensity and change of chromaticity coordinates and, in extreme cases, open circuit. It requires caution. Due to possible sulfurization of lead frame, LED should not be used and stored together with oxidizing substances made of materials such as: rubber, plain paste, lead solder cream, etc.