

# SPECIFICATION

## 3020LT-PT

LUMINLITE		CUSTOMER	
Approved by	Drawn by	Approved by	Checked by

文件編號：

版 本： 20140509

## Electrical/Optical Specification

Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	VF	If = 20mA	3.0	-	3.6	V
Reverse current	IR	Vr = 5V	0	-	5	μA
Luminous intensity	IV	If = 20mA	1400	-	2100	mcd
Luminous intensity	LM	If = 20mA	4.0	-	6	lm
Chromaticity coordinate*	X	If = 20mA	0.320		0.350	-
	Y		0.255		0.285	-
View Angle	2θ <sub>1/2</sub>	If = 20 mA	-	120	-	degree
Color Rendering Index	Ra			80		



\* Please refer to CIE 1931 chromaticity diagram.

## Absolute Maximum Ratings

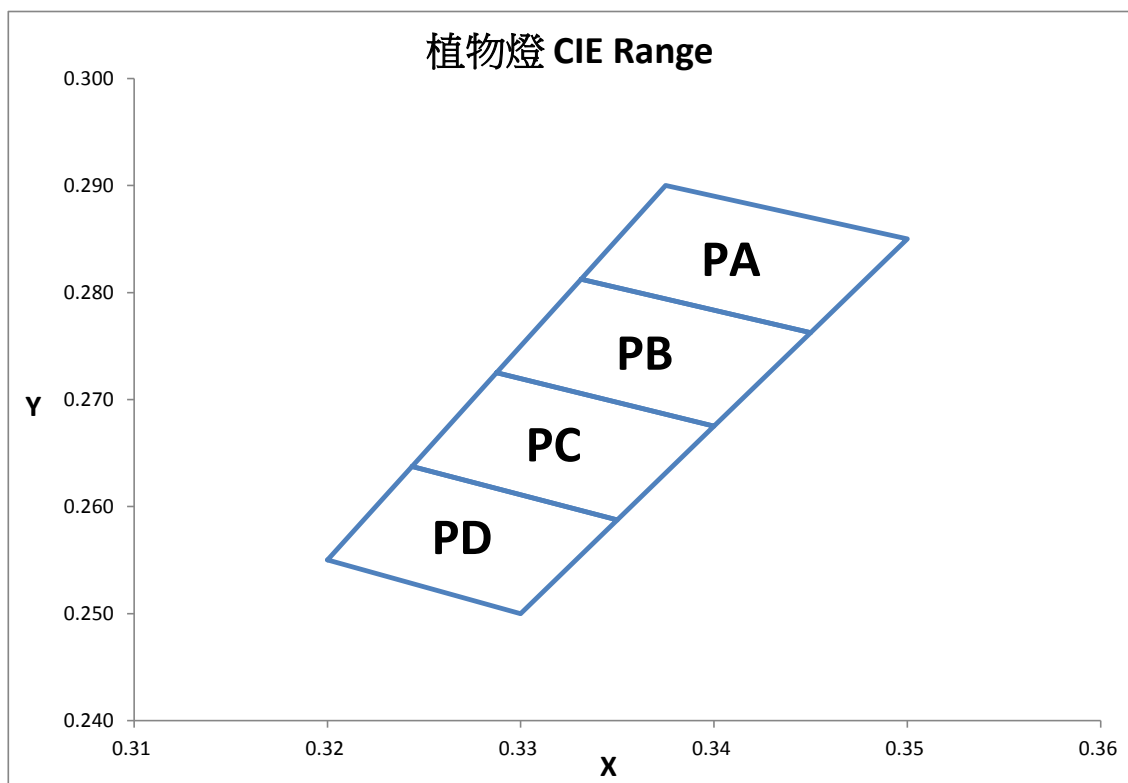
Ta = 25°C

Item	Symbol	Maximum Rating	Unit
Forward current	If	50	mA
Pulse forward current*	Ifp	100	mA
Reverse voltage	Vr	5	V
Power dissipation	Pd	120	mW
Operation temperature	Top	- 30 ~ + 85	°C
Storage temperature	Tstg	- 40 ~ + 100	°C
Soldering temperature	Tslid	Reflow Soldering : 260°C / 10 sec	
		Hand Soldering: 350°C / 3 sec	

\* Duty Cycle ≤ 1/10 ; Pulse Width ≤ 10 msec.

- Notes :**
1. Subjecting the part to stresses beyond listed under this section may cause permanent damage to the device. These are stress ratings only and do not imply that the devices will function beyond these ratings. Exposure to the extremes of these capability.

## CIE Color Rank



### CIE@20mA

Type	X/Y	1	2	3	4
PA	X	0.333	0.338	0.350	0.345
	Y	0.281	0.290	0.285	0.276
PB	X	0.329	0.333	0.345	0.340
	Y	0.273	0.281	0.276	0.268
PC	X	0.324	0.329	0.340	0.335
	Y	0.264	0.273	0.268	0.259
PD	X	0.320	0.324	0.335	0.330
	Y	0.255	0.264	0.259	0.250

Notes : Measurement Uncertainty of the Color Coordinates :  $\pm 0.01$

## Rank Table

### - Forward Voltage Ranks

Forward Voltage measured at  $I_f=20\text{mA}$ .

VF Code	Min.(V)	Max.(V)
3.0	3.00	3.20
3.2	3.20	3.40
3.4	3.40	3.60

\* Forward Voltage Measurement Tolerance is  $\pm 0.05$  Volt.

### - Luminous Intensity Ranks

Luminous intensity measured at  $I_f=20\text{ mA}$ ,  $T_a=25^\circ\text{C}$ .

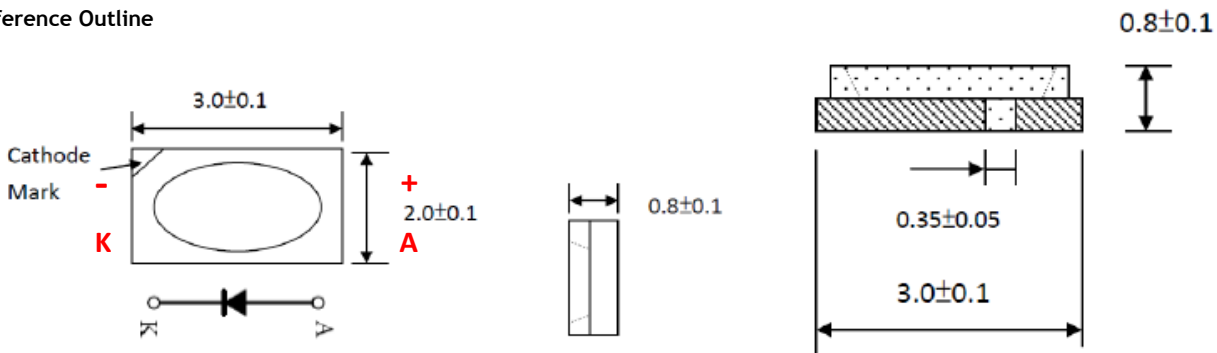
LM Code	Min.(lm)	Max.(lm)	LM Code	Min.(lm)	Max.(lm)
5.0	5.0	5.2	6.0	6.0	6.2
5.2	5.2	5.4	6.2	6.2	6.4
5.4	5.4	5.6	6.4	6.4	6.6
5.6	5.6	5.8	6.6	6.6	6.8
5.8	5.8	6.0	6.8	6.8	7.0

\* Luminous Intensity Measurement Tolerance is  $\pm 10\%$

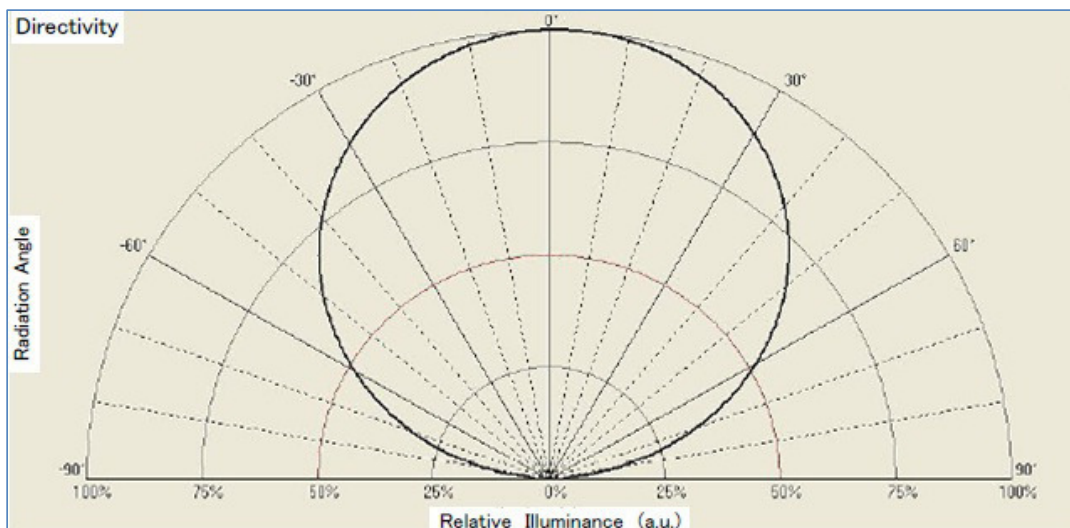
## Outline Dimensions and Materials

Item	Materials
Package	Heat-resistant polymer
Encapsulating Resin	Silicone Resin (with Phosphor)
Electrodes	Ag plating Copper Alloy

## Reference Outline

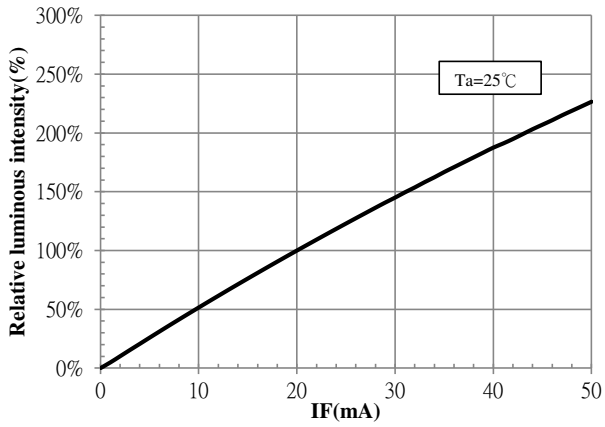


NOTE : All dimensions in mm tolerance is  $\pm 0.1\text{mm}$  unless otherwise noted.

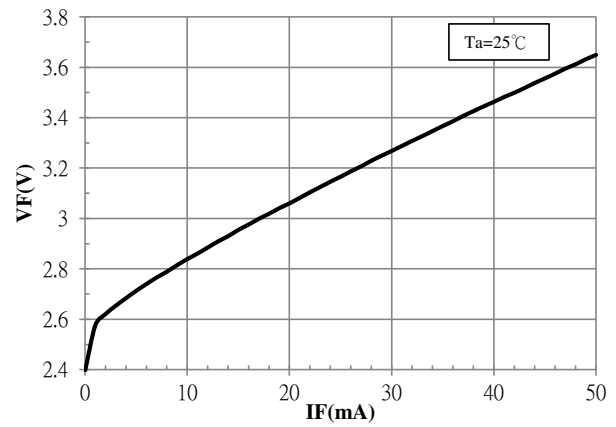


## Optical/Electrical Characterization

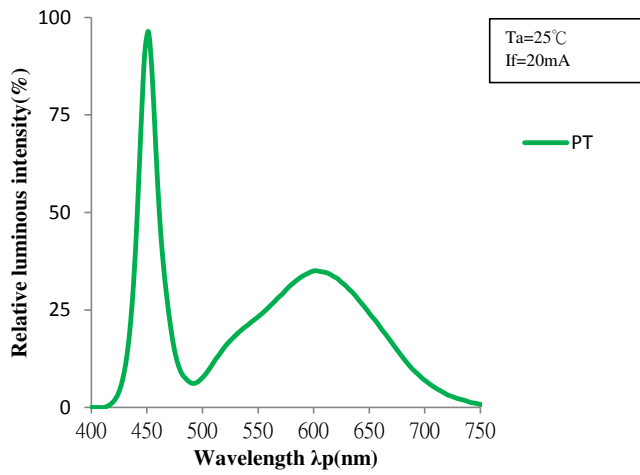
■ Relative Luminous vs. Forward Current



■ Forward Voltage vs. Forward Current

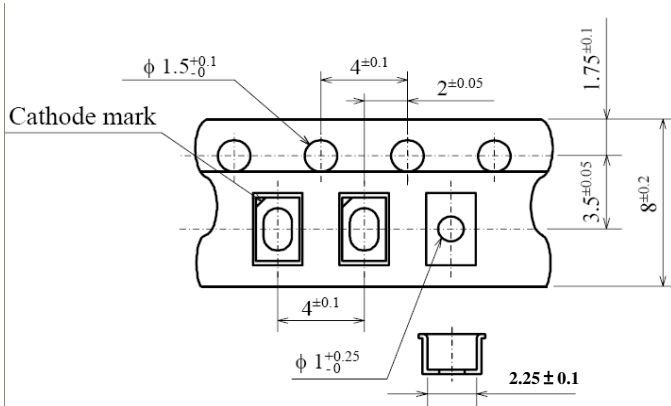


## Optical/Electrical Characterization Spectrum

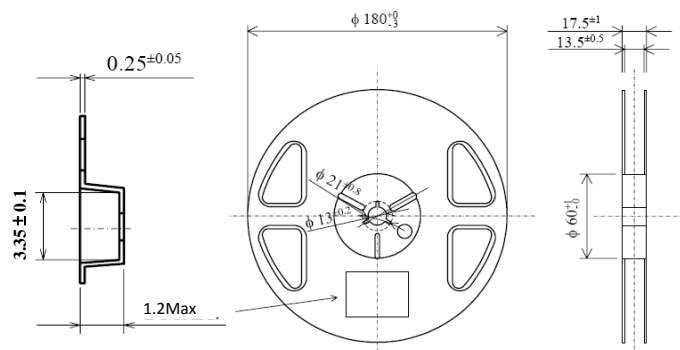


## Packing Information

### - Embossed Tape Dimension



### - Reel Dimension

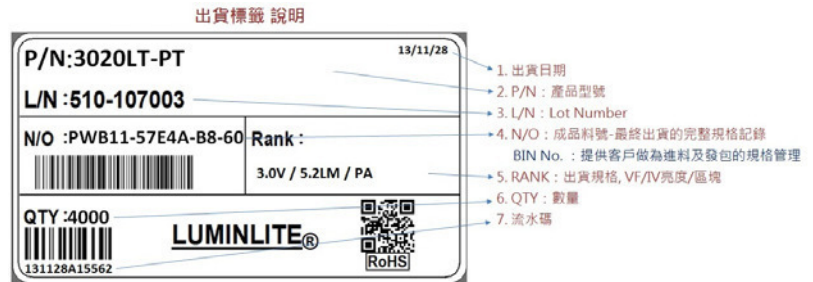
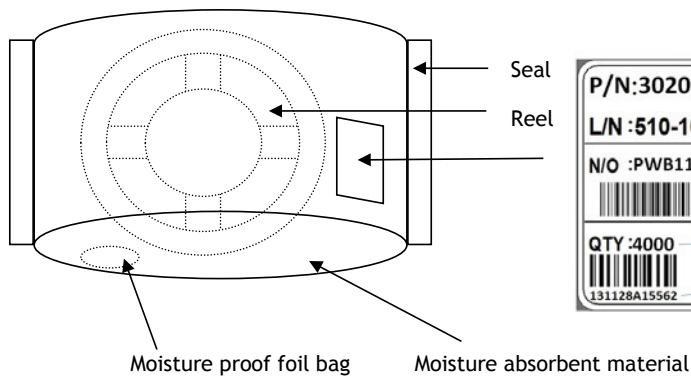


### Notes :

1. Dimensions are in millimeters.
2. Dimensions conform to JIS-C-0806 and EIA-481.

## Moisture Proof Bag

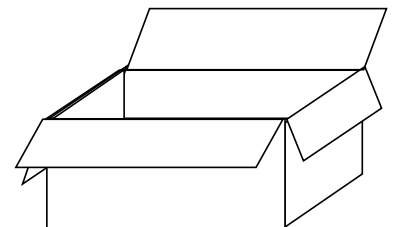
Label on the moisture proof bag consists the following information.



\* Reference Label.

### - Packing unit

Package	Dimensions (mm)	No. of Reel/Unit	Q'ty (pcs)
Moisture proof foil bag		1 reel/bag	4,000 Max.
Cardboard box 25P	350 x 210 x 210 x 4t	25 reels/box Max.	100,000 Max.
Cardboard box 50P	410 x 350 x 210 x 4t	50 reels/box Max.	200,000 Max.



### Notes:

1. To avoid possible damages, it is recommended that same packing arrangement should be used for future transportation.
2. Packing tolerance is  $\pm 0.1\%$

## Reliability

Test Items	Test Standard	Test Conditions	Failure Rate
Resistance to Soldering Heat (Reflow Soldering)	JEITA ED-4701 300 301	Tsld=260oC, 10 sec, 2 times (Pre-treatment 30°C, 70%, 168 hrs)	0/50
Solderability (Reflow Soldering)	JEITA ED-4701 300 303	Tsld=215±5°C, 3 sec, 1 time (Lead Solder)	0/50
Thermal Shock	JEITA ED-4701 300 307	0°C ~ 100°C, 20 cycles 3 min. 3 min.	0/50
Temperature Cycle	JEITA ED-4701 100 105	-40°C ~ 25°C ~ 100°C ~ 25°C, 100 cycles 30min. 5min. 30min. 5min.	0/50
Moisture Resistance Cycle	JEITA ED-4701 200 203	25°C ~ 65°C ~ -10°C, 10 cycles 90%RH, 24 hrs./cycle	0/50
High Temperature Storage	JEITA ED-4701 200 201	Ta = 100°C 1000 hrs.	0/50
Temperature Humidity Storage	JEITA ED-4701 100 103	Ta = 60°C, RH = 90% 1000 hrs.	0/50
Low Temperature Storage	JEITA ED-4701 200 202	Ta = -40°C 1000 hrs.	0/50
Steady State Operation Life		Ta = 25°C, If = 20 mA 1000 hrs.	0/50
Steady State Operation Life - Condition II		Ta = 25°C, If = 50 mA 1000 hrs.	0/50
Steady State Operation Life of High Temperature		Ta = 85°C, If = 20 mA 1000 hrs.	0/50
Steady State Operation Life of High Humidity Heat		Ta = 60°C, RH = 90%, If = 50 mA 500 hrs.	0/50
Steady State Operation Life of Low Temperature		Ta = -30°C, If = 20 mA 1000 hrs.	0/50
Vibration	JEITA ED-4701 400 403	100 ~ 2000 ~ 100 Hz Sweep, 4 min. 200 m/sec <sup>2</sup> , 3 direction, 4 cycles, 48 min.	0/50
Substrate Bending	JEITA ED-4702	3mm, 5±1 sec. 1 time	0/50
Stick	JEITA ED-4702	5N, 10±1 sec. 1 time	0/50

## Failure criteria

Items	Conditions	Failure Criteria
Forward voltage	@ If = 20 mA, Ta =25°C	> 1.1 x USL
Reverse current	@Vr = 5V, Ta = 25°C	> 2.0 x USL
Luminous intensity	@ If = 20 mA, Ta =25°C	< 0.7 x LSL

Lumileds defined failure criteria as single 50% or average 35% degradation.

## Cautions

The lifetime and performance of the LEDs are sensitive to environment and operating conditions. □  
Cautions should be taken after due consideration when using LEDs.

### (1) Moisture Proof Package

- SMD type LED devices is sensitive to moisture uptake. Changes of optical characteristics or contact exfoliation □ may be resulted from moisture uptake. Moisture proof packages are used for product delivery. It is recommended that the original moisture proof bag or similar arrangement should be used for storage after the opening of sealed packages.

### (2) Storage

- Storage Conditions

Prior to opening of the package :

The LEDs should be stored in an environment with temperature less than 30°C and 50% □ RH or less. The shelf lifetime of unopened LEDs is six month.

After opening of the package :

The storage environment should be kept at 30°C or less and 50%RH or less. The LEDs □ should be soldered within 24 hours (1days) after opening the package. It is recommended to store those unused LEDs in the original moisture proof bag with moisture absorbent material.

- If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage □ time, baking treatment should be performed using the following conditions.

Baking treatment : more than 24 hours at 70 ± 5°C

- LUMINLITE LED electrode and lead frame are comprised of a silver plated copper alloy. Please avoid conditions which may cause □ the LED to corrode, tarnish or discolor. This corrosion or discoloration might lower solderability or might affect on optical characteristics.

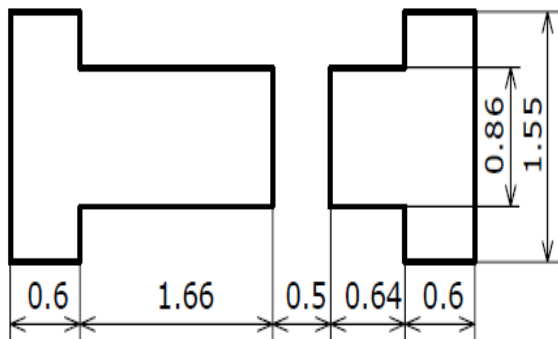
- Please avoid rapid transitions in ambient temperature, especially in high humidity □ environments where condensation can occur.□

### (3) Heat Generation

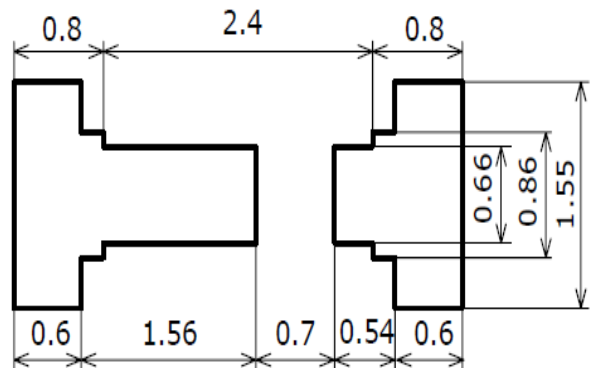
- The optical characteristics of LEDs are very sensitive to temperature. Therefore, thermal design of the end product is of □ paramount importance. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

### (4) Soldering Conditions(Reference Outline)

Soldering pad pattern

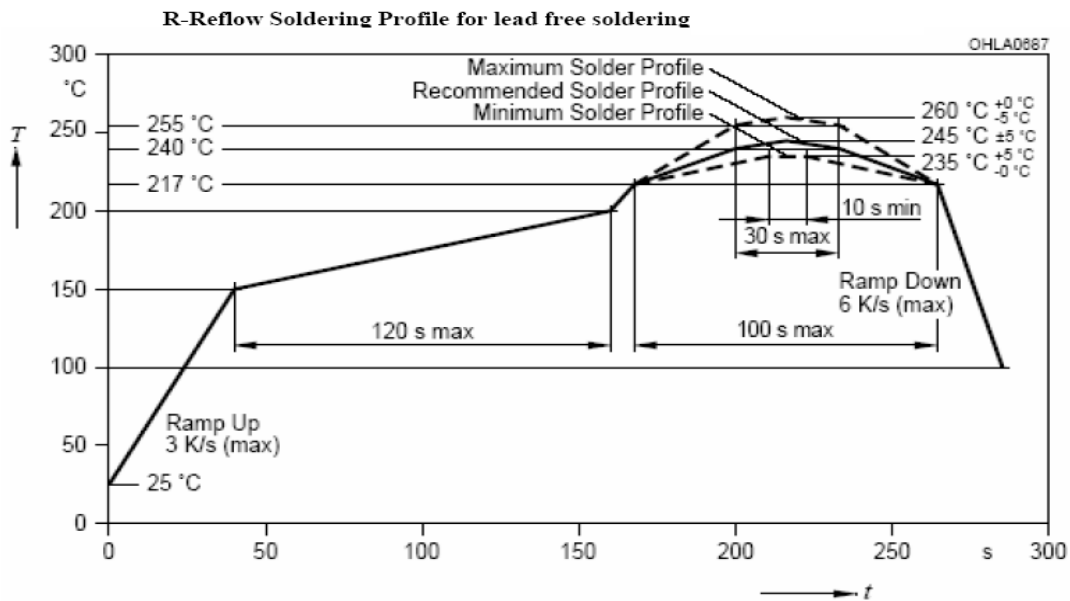


Metal solder stencil aperture



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

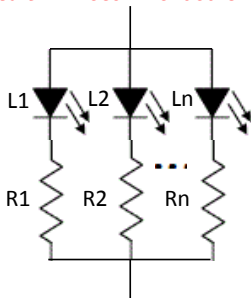
## Recommend reflow conditions



### (5) Recommended circuit

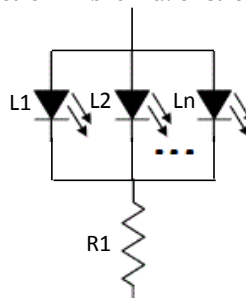
- When parallel circuit LED driver IC is applied in Lighting, hot spot may occur in low current operation region (dimming mode) by difference of LED voltage in low current region. In the worst case, some LED may be subjected to stresses in excess of the absolute maximum rating.
- It is recommended to use **Circuit A** which regulates the current flowing through each LED.

#### Circuit A : Recommended Circuit



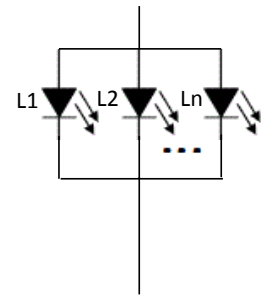
(Separate resistor per each LED)

#### Circuit B : Abnormal Circuit



(Easy to occur brightness problem)

#### Circuit C : Abnormal Circuit



### (6) Cleaning

- It is recommended to clean the LEDs using Isopropyl alcohol. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not. Freon solvents should not be used to clean the LEDs because of worldwide regulations. Never clean the LEDs with the ultrasonic machines.

### (7) Static Electricity

- Static electricity or surge voltage will damage the LEDs. It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
- All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.
- When inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to find static damaged LEDs by a light-on test or a VF test at a lower current (below 1mA is recommended).
- Damaged LEDs will show some unusual characteristics such as the leak current remarkably increases, the forward voltage becomes lower, or the LEDs do not light at the low current.

Criteria : (Vf > 2.0V at If=0.5mA)

## (8) Others

- Care must be taken to ensure that the reverse voltage will not exceed the absolute maximum rating when using the LEDs with matrix drive.
- The LED light output is strong enough to injure human eyes. Precautions must be taken to prevent looking directly at the LEDs with unaided eyes for more than a few seconds.
- Flashing lights have been known to cause discomfort in people: you can prevent this by taking precautions during use. Also, people should be cautious when using equipment that has had LEDs incorporated into it.
- The LEDs described in this brochure are intended to be used for ordinary electronic equipment. LED devices used in applications in which exceptional quality and reliability are required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health, must be expressly authorized.
- The formal specifications must be exchanged and signed by both parties before large volume purchase begins.
- Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typical data will be changed without any further notice.

## LED 儲存條件說明

注意事項：環境和操作條件對於LED的壽命與表現是很敏感的，**當使用時需注意是否有無過期**

下列注意事項：

如交貨後, 久未使用

建議 1. : 70°C烘烤24HR

建議 2. : 交由原廠做重新烘烤

(1) 防潮袋 **SMD類型的LED 對於吸收潮濕是很敏感的. 吸收潮濕將可能導致光學特性的改變或是Reflow後造成接觸剝落.** 防潮包裝可用來產品的運送，在防潮袋開封之後，建議為了儲存，可放回原本防潮袋或相似的環境安置。

(2) 儲存 包裝開封前：在出貨時均會在每捲料盤上附乾躁劑(全系列產品)  
**LED應該被儲存在低於30°C和低於溼度50%RH下的環境下，可耐儲存壽命為6個月。**  
包裝開封後：儲存溫度應該要保持在低於30°C和低於溼度50%RH，包裝開封後應該在24小時(1天)內焊接完成，建議儲存那些還未使用的LED需用含乾燥劑之原本防潮袋。

興亮LED電極和導線支架是由組合而成，請避免可能導致腐蝕、髒污或變色的情況發生，

這種腐蝕或變色可能會讓焊接性降低或者影響光特性。

**請避免環境溫度有快速的變化，尤其在高溼度的環境下凝結現象可能會發生。** □

(3) 熱產生 LED的光特性對於溫度是極為敏感的，因此，終端產品的熱量設計是最重要的，要求避免劇烈熱產生和在此規格書所示最大額定數值下操作。

(4) 焊接條件 建議無鉛焊接製程為迴流焊條件。(請參閱規格書第8頁之建議說明)

(5) 電路 當LED使用並聯電路在一般電路或照明設備時，有可能發生LED電壓差異導致電流分配不均(黯淡情況)在某一並聯電路。  
\* 在最壞情況下，LED會超過最大額定電流。  
**\* 建議使用單獨LED控制器在並聯電路中。**

(6) 清潔 建議使用異丙基類酒精作為清潔LED，當使用其他溶劑時應該預先確認好這些溶劑是否會把封裝或樹脂溶解代甲烷溶劑因世界性規定不應該被使用來清潔LED，絕不要用超音波機來清潔LED。

(7) 靜電 \* 靜電或突波電壓將擊傷LED。 **當操作LED時，建議使用導靜電手環或防靜電手套**  
\* 所有裝置、設備和機台必須適當地大地接地。建議測量動作須採取必要的防護措施以避免突波電壓由設備導入LED  
\* 當檢驗這些LED已組上的最終產品，建議檢查這些已組上產品的LED是否遭受靜電的擊傷，很容易用點亮測試或在低電流下(建議<1mA)做VF測試來找出被靜電擊傷的LED。  
\* 已被擊傷的LED將顯現一些不尋常特性如漏電流明顯增加、正向電壓變低或在低電流下LED無法點亮(評判標準: Vf > 2.0V at If=0.5mA)。

(8) 絕對避免過大電流 \* 強烈建議客戶必須用電阻來保護且要正確地使用與非常小心地應用，否則輕微電壓變動將造成巨大電流改變(持續點亮時將會發生)，過大電流將很有可能性導致LED封裝產品遭受不可復原傷害或損毀。  
\* 當使用矩陣裝置LED時必須要小心並確保反向電壓不會超過絕對最大額定數值

(9) 絕對避免過大電壓 強烈建議客戶每一顆LED封裝產品不要應用或使用超過4.0V，過大電壓將很有可能性導致LED封裝產品遭受不可復原傷害或損毀。

## SPECIFICATION

### 5630@60mA(PT)

LUMINLITE		CUSTOMER	
Approved by	Drawn by	Approved by	Checked by

文件編號：

版 本：20140509

## Electrical/Optical Specification

Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	VF	If = 60mA	3.0	-	3.6	V
Reverse current	IR	Vr = 5V	0	-	5	μA
Luminous intensity	IV	If = 60mA	5300	-	8700	mcd
Luminous intensity	LM	If = 60mA	15.0	-	25.00	lm
Chromaticity coordinate*	X	If = 60mA	0.320		0.350	-
	Y		0.255		0.285	-
View Angle	2θ <sub>1/2</sub>	If = 60 mA	-	100	-	degree

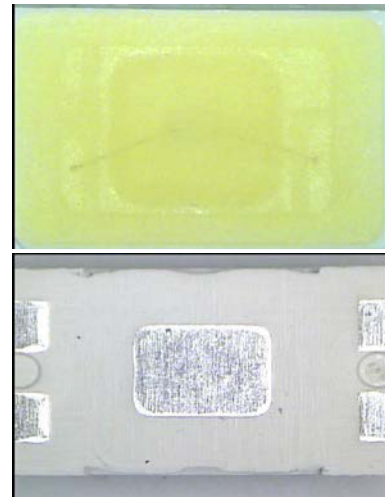
\* Please refer to CIE 1931 chromaticity diagram.

## Absolute Maximum Ratings

Ta = 25°C

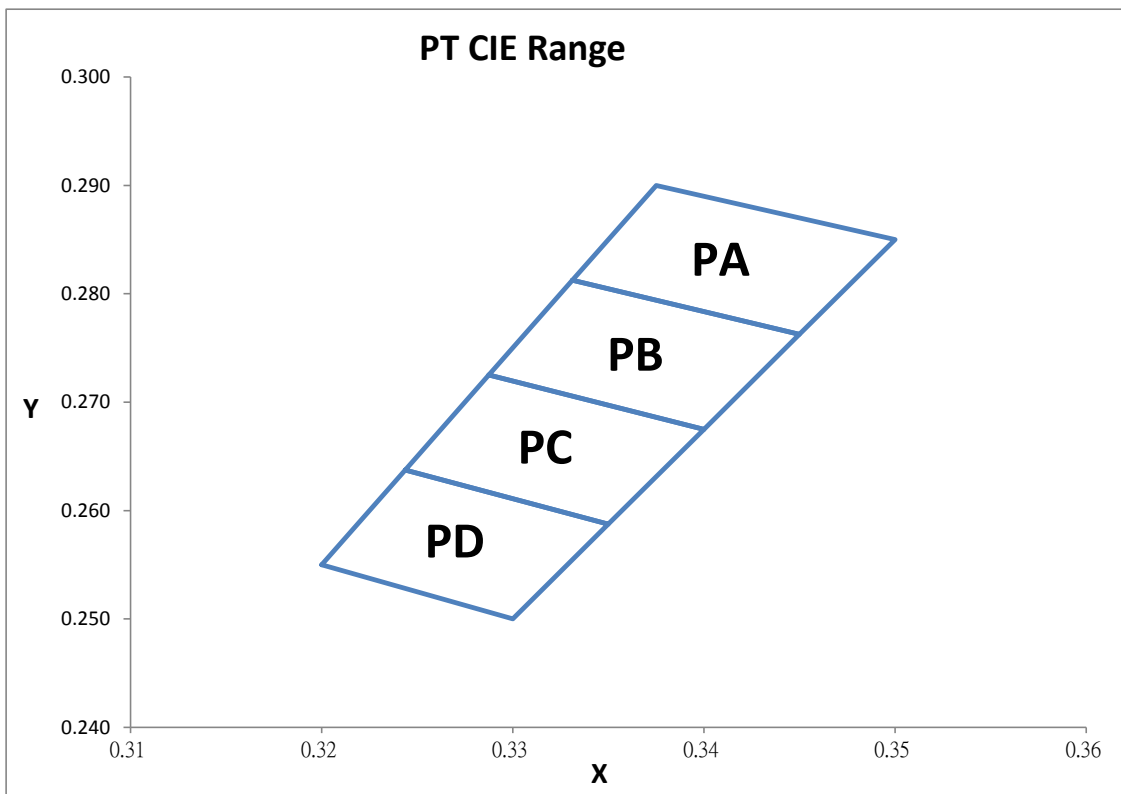
Item	Symbol	Maximum Rating	Unit
Forward current	If	100	mA
Pulse forward current*	Ifp	200	mA
Reverse voltage	Vr	5	V
Power dissipation	Pd	400	mW
Operation temperature	Top	200	°C
Storage temperature	Tstg	- 40 ~ + 100	°C
Soldering temperature	Tsl	Reflow Soldering : 260°C / 10 sec	
		Hand Soldering: 350°C / 3 sec	

\* Duty Cycle ≤ 1/10 ; Pulse Width ≤ 10 msec.



- Notes :
1. Subjecting the part to stresses beyond listed under this section may cause permanent damage to the device. These are stress ratings only and do not imply that the devices will function beyond these ratings. Exposure to the extremes of these capability.

## CIE Color Rank



### Iv(LM)@60mA

Type	X/Y	1	2	3	4
PA	X	0.333	0.338	0.350	0.345
	Y	0.281	0.290	0.285	0.276
PB	X	0.329	0.333	0.345	0.340
	Y	0.273	0.281	0.276	0.268
PC	X	0.324	0.329	0.340	0.335
	Y	0.264	0.273	0.268	0.259
PD	X	0.320	0.324	0.335	0.330
	Y	0.255	0.264	0.259	0.250

Notes : Measurement Uncertainty of the Color Coordinates :  $\pm 0.01$

## Rank Table

### - Forward Voltage Ranks

Forward Voltage measured at  $I_f = 60\text{mA}$ .

VF Code	Min. (V)	Max. (V)
3.0	3.00	3.20
3.2	3.20	3.40
3.4	3.40	3.60

\* Forward Voltage Measurement Tolerance is  $\pm 0.05$  Volt.

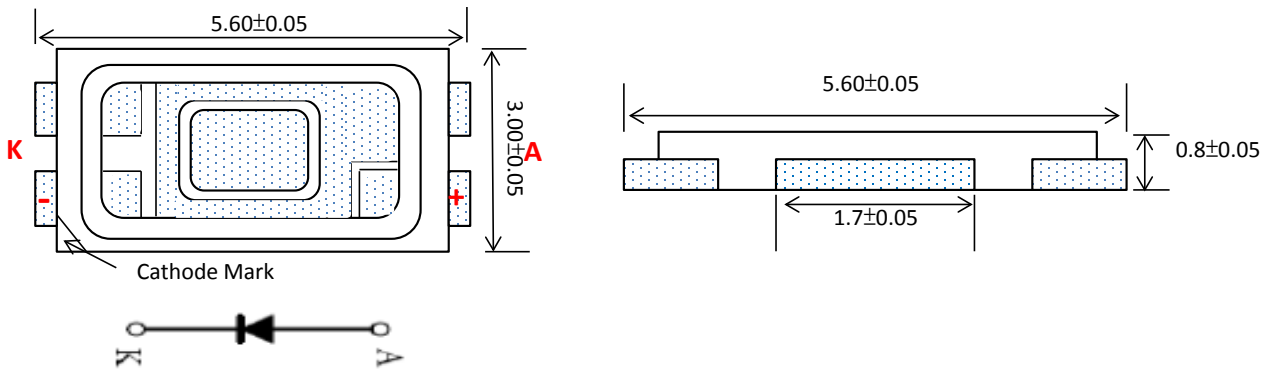
### - Luminous Intensity Ranks

Luminous intensity measured at  $I_f = 60\text{ mA}$ ,  $T_a = 25^\circ\text{C}$ .

LM Code	Min. (lm)	Max. (lm)	LM Code	Min. (lm)	Max. (lm)
15	15	16	20	20	21
16	16	17	21	21	22
17	17	18	22	22	23
18	18	19	23	23	24
19	19	20	24	24	25

\* Luminous Intensity Measurement Tolerance is  $\pm 10\%$

### - Reference Outline



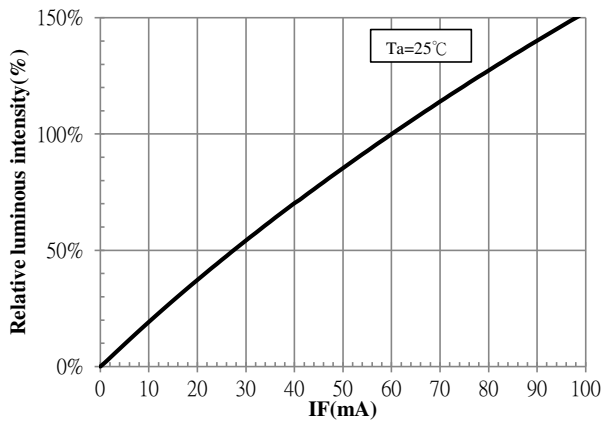
### Outline Dimensions and Materials

Item	Materials
Package	Heat-resistant polymer
Encapsulating Resin	Silicone Resin (with Phosphor)
Electrodes	Ag plating Copper Alloy

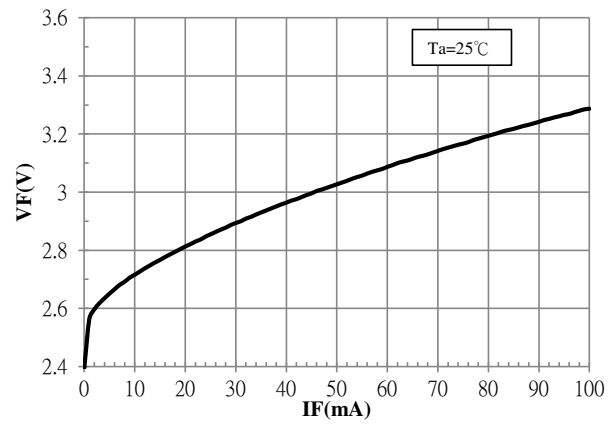
NOTE : All dimensions in mm tolerance is  $\pm 0.1\text{mm}$  unless otherwise noted.

## Optical/Electrical Characterization

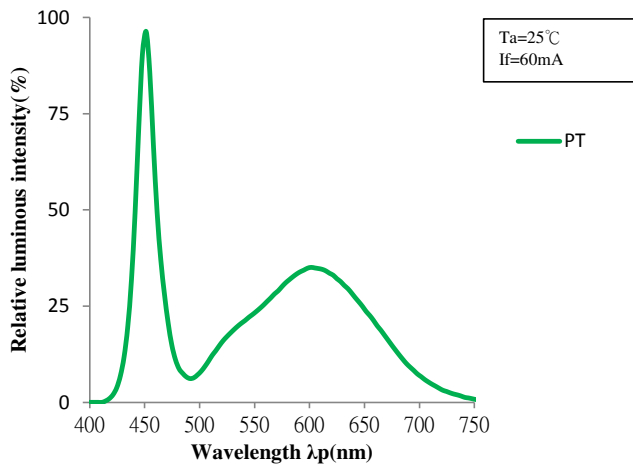
■ Relative Luminous vs. Forward Current



■ Forward Voltage vs. Forward Current



## Optical/Electrical Characterization Spectrum



# SPECIFICATION

## 5630(PT)

LUMINLITE		CUSTOMER	
Approved by	Drawn by	Approved by	Checked by

文件編號：

版 本：20140513

## Electrical/Optical Specification

Ta = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	VF	If = 120mA	3.0	-	3.6	V
Reverse current	IR	Vr = 5V	0	-	5	μA
Luminous intensity	IV	If = 120mA	10500	-	14000	mcd
Luminous intensity	LM	If = 120mA	30.0	-	40.00	lm
Chromaticity coordinate*	X	If = 120mA	0.320		0.350	-
	Y		0.255		0.285	-
View Angle	2θ <sub>1/2</sub>	If = 120 mA	-	100	-	degree

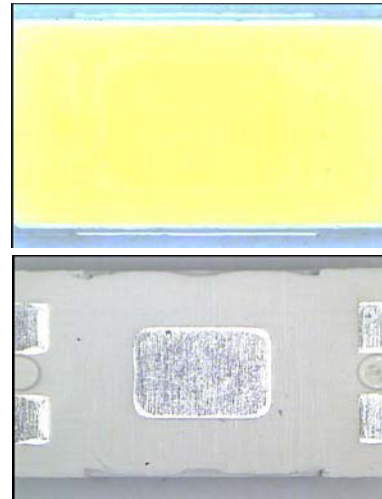
\* Please refer to CIE 1931 chromaticity diagram.

## Absolute Maximum Ratings

Ta = 25°C

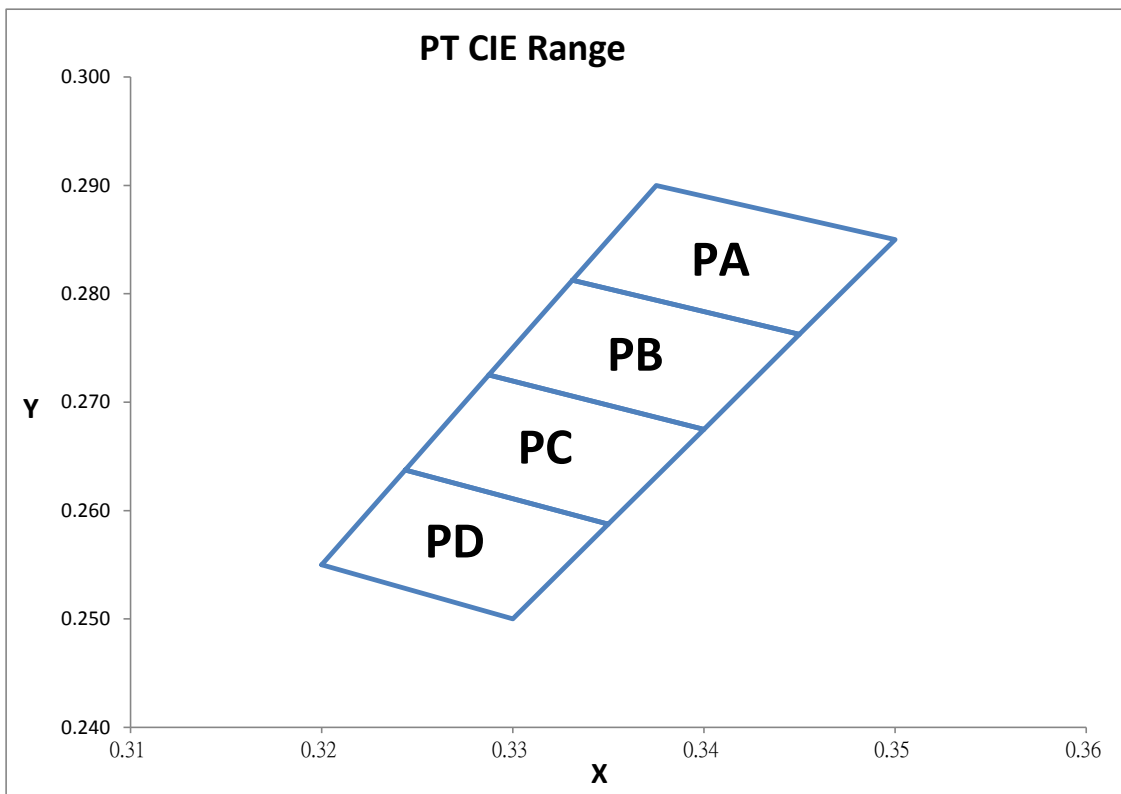
Item	Symbol	Maximum Rating	Unit
Forward current	If	180	mA
Pulse forward current*	Ifp	250	mA
Reverse voltage	Vr	5	V
Power dissipation	Pd	400	mW
Operation temperature	Top	- 30 ~ + 85	°C
Storage temperature	Tstg	- 40 ~ + 100	°C
Soldering temperature	Tslid	Reflow Soldering : 260°C / 10 sec	
		Hand Soldering: 350°C / 3 sec	

\* Duty Cycle ≤ 1/10 ; Pulse Width ≤ 10 msec.



- Notes :
1. Subjecting the part to stresses beyond listed under this section may cause permanent damage to the device. These are stress ratings only and do not imply that the devices will function beyond these ratings. Exposure to the extremes of these capability.

## CIE Color Rank



### lv(LM)@120mA

Type	X/Y	1	2	3	4
PA	X	0.333	0.338	0.350	0.345
	Y	0.281	0.290	0.285	0.276
PB	X	0.329	0.333	0.345	0.340
	Y	0.273	0.281	0.276	0.268
PC	X	0.324	0.329	0.340	0.335
	Y	0.264	0.273	0.268	0.259
PD	X	0.320	0.324	0.335	0.330
	Y	0.255	0.264	0.259	0.250

Notes : Measurement Uncertainty of the Color Coordinates :  $\pm 0.01$

## Rank Table

### - Forward Voltage Ranks

Forward Voltage measured at  $I_f = 120\text{mA}$ .

VF Code	Min. (V)	Max. (V)
3.0	3.00	3.20
3.2	3.20	3.40
3.4	3.40	3.60

\* Forward Voltage Measurement Tolerance is  $\pm 0.05$  Volt.

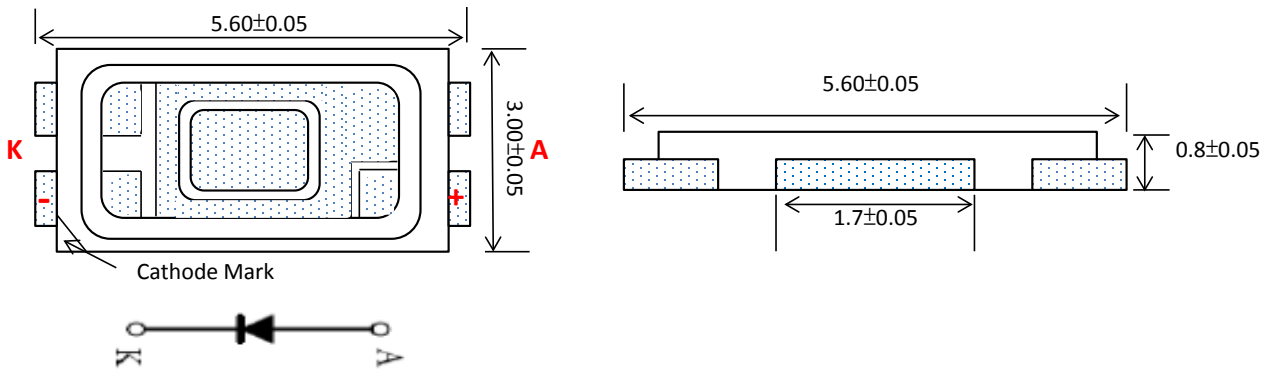
### - Luminous Intensity Ranks

Luminous intensity measured at  $I_f = 120\text{ mA}$ ,  $T_a = 25^\circ\text{C}$ .

LM Code	Min. (lm)	Max. (lm)
30	30	32
32	32	34
34	34	36
36	36	38
38	38	40

\* Luminous Intensity Measurement Tolerance is  $\pm 10\%$

### - Reference Outline



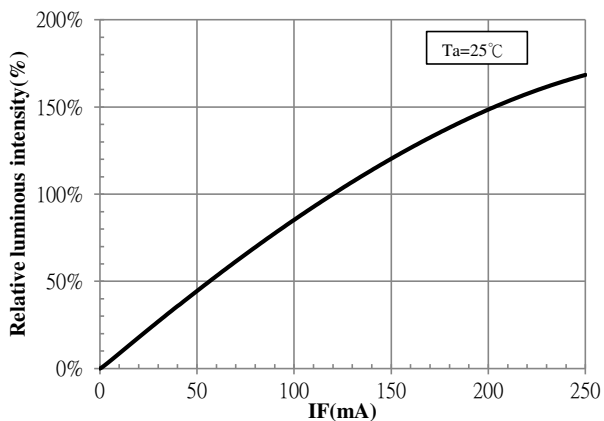
### Outline Dimensions and Materials

Item	Materials
Package	Heat-resistant polymer
Encapsulating Resin	Silicone Resin (with Phosphor)
Electrodes	Ag plating Copper Alloy

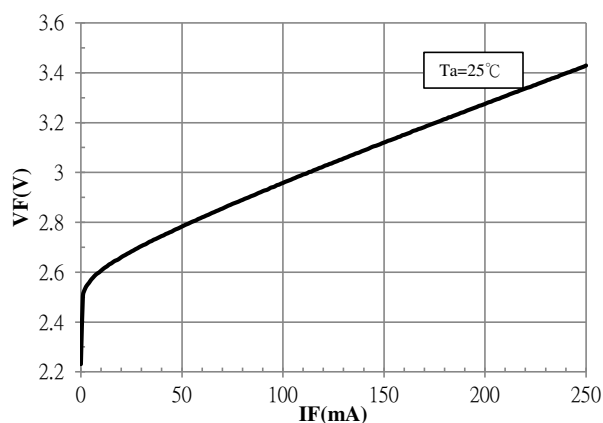
NOTE : All dimensions in mm tolerance is  $\pm 0.1\text{mm}$  unless otherwise noted.

## Optical/Electrical Characterization

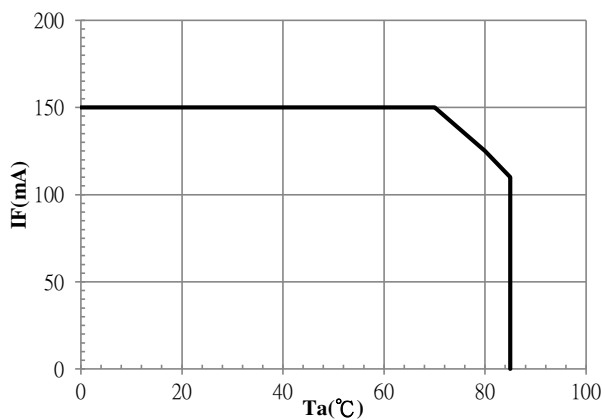
■ Relative Luminous vs. Forward Current



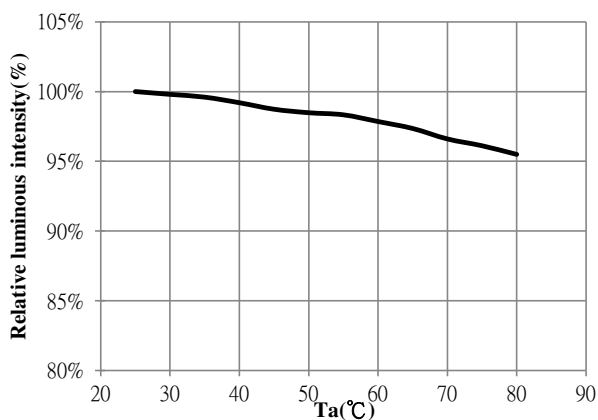
■ Forward Voltage vs. Forward Current



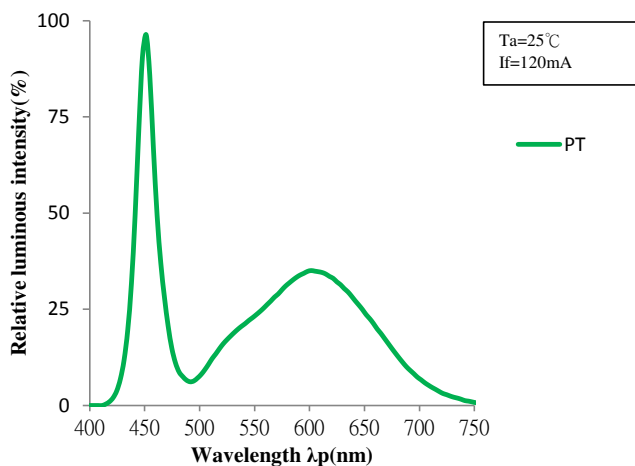
■ Forward Current vs. Ambient Temperature



■ Relative Luminous vs. Ambient Temperature



## Optical/Electrical Characterization Spectrum



# **SPECIFICATION**

5630-PT1 @ 120mA

LED PACKAGE

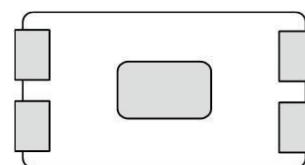
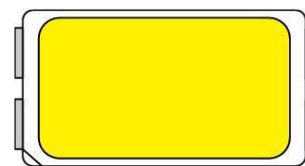
FOR PLANTING LIGHTING



## Electrical/Optical Specification

Ts = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	VF	If = 120mA	2.8	-	3.6	V
Reverse current	IR	Vr = 5V	0	-	5	μA
Luminous intensity	IV	If = 120mA	4200	-	7000	mcd
Luminous intensity	LM	If = 120mA	12	-	20	lm
Chromaticity coordinate*	X	If = 120mA	0.495	-	0.535	-
	Y		0.298	-	0.328	-
View Angle	2θ <sub>1/2</sub>	If = 120mA	-	120	-	degree



Note : Please refer to CIE 1931 chromaticity diagram

## Absolute Maximum Ratings

Ts = 25°C

Item	Symbol	Maximum Rating	Unit
Forward current	If	180	mA
Pulse forward current*	Ifp	250	mA
Reverse voltage	Vr	5	V
Power dissipation	Pd	400	mW
Operation temperature	Top	- 30 ~ + 85	°C
Storage temperature	Tstg	-40 ~ + 100	°C
Soldering temperature	Tslid	Reflow Soldering : 260°C/10 sec	-
		Hand Soldering: 350°C/3 sec	-

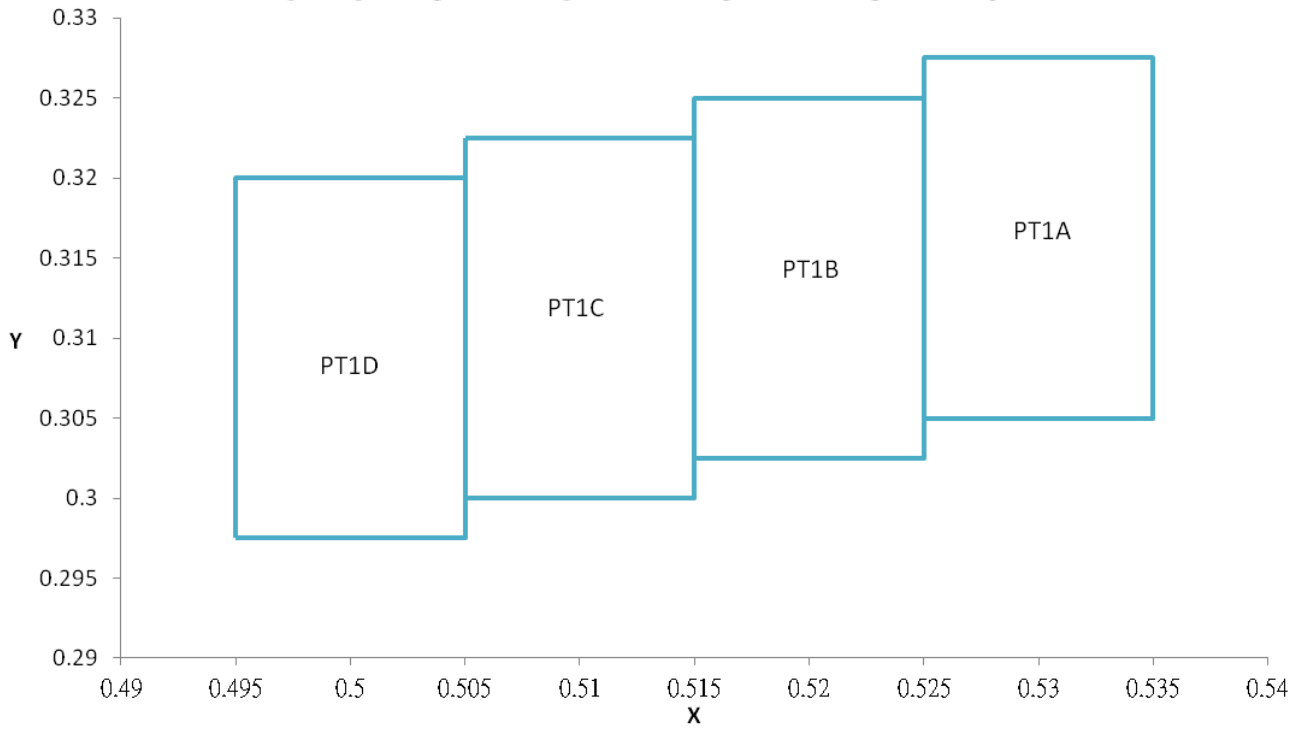
\* Duty Cycle < 1/10 ; Pulse Width < 10 msec.

Notes :

Subjecting the part to stresses beyond listed under this section may cause permanent damage to the device. These are stress ratings only and do not imply that the devices will function beyond these ratings. Exposure to the extremes of these capabilities.

**CIE Color Rank**

**CIE CHROMATICITY DIAGRAM FOR ANSI**



Notes : CIE CHROMATICITY DIAGRAM for ANSI

**IV ( LM ) @ 120mA**

Type	X/Y	1	2	3	4
PT1A	X	0.525	0.525	0.535	0.535
	Y	0.305	0.328	0.328	0.305
PT1B	X	0.515	0.515	0.525	0.525
	Y	0.303	0.325	0.325	0.303
PT1C	X	0.505	0.505	0.515	0.515
	Y	0.300	0.323	0.323	0.300
PT1D	X	0.495	0.495	0.505	0.505
	Y	0.298	0.320	0.320	0.298

Notes : Measurement Uncertainty of the Color Coordinates : ± 0.01

## Rank Table

### Forward Voltage Ranks

Forward Voltage measured at  $I_f = 120\text{mA}$

$T_s = 25^\circ\text{C}$

VF Code	Min.(V)	Max.(V)
2.8	2.8	3.0
3.0	3.0	3.2
3.2	3.2	3.4
3.4	3.4	3.6

Notes :

Forward Voltage Measurement Tolerance is  $\pm 0.05\text{ V}$ .

## Luminous Intensity Ranks

Luminous intensity measured at  $I_f = 120\text{ mA}$

$T_s = 25^\circ\text{C}$

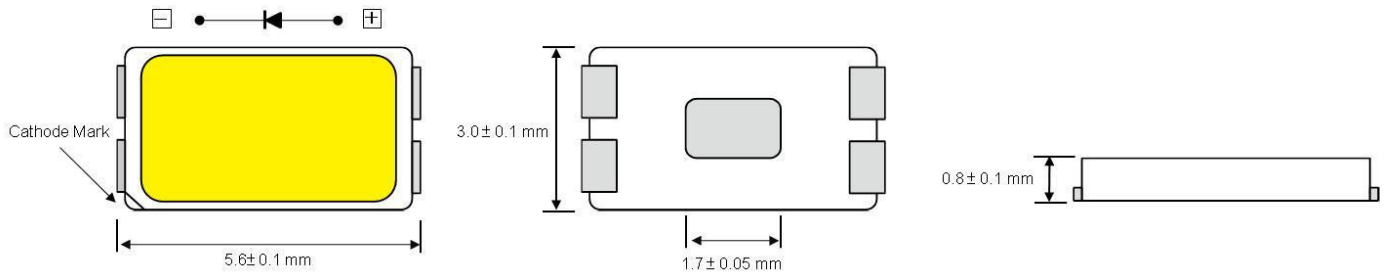
LM Code	Min.(lm)	Max.(lm)
12	12	14
14	14	16
16	16	18
18	18	20

Notes : Luminous Intensity Measurement Tolerance is  $\pm 10\%$

## Outline Dimensions and Materials

Item	Materials
Package	Heat-resistant polymer
Encapsulating Resin	Silicone Resin (with Phosphor)
Electrodes	Ag plating Copper Alloy

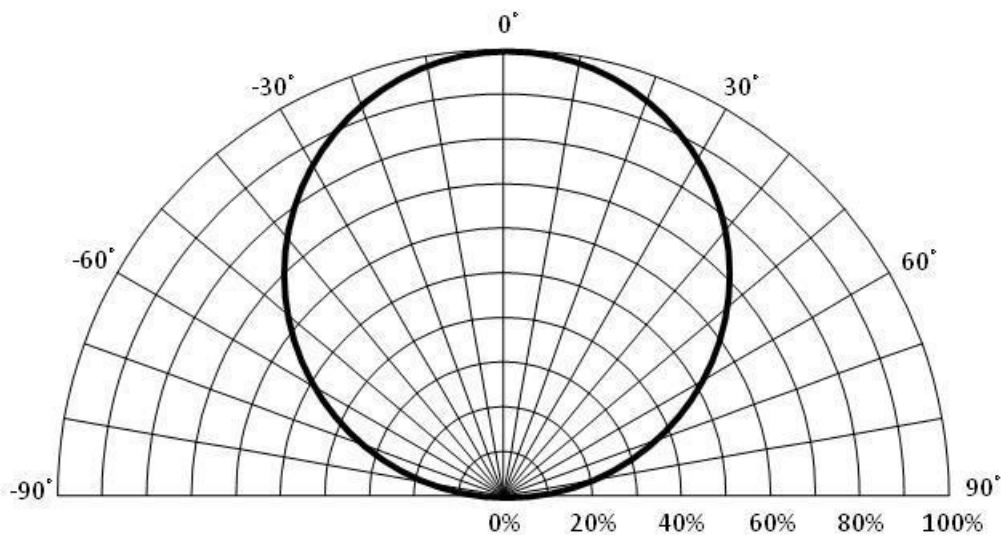
## Reference Outline



NOTE : All dimensions in mm tolerance is  $\pm 0.1$ mm unless otherwise noted.

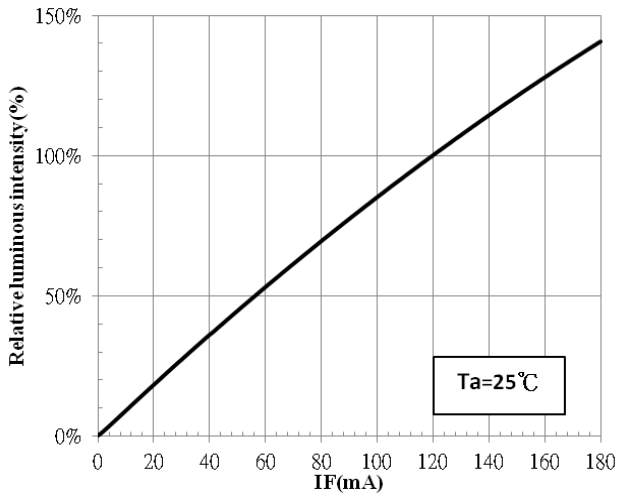
NOTE : All dimensions in mm tolerance is  $\pm 0.1$ mm unless otherwise noted.

## Radiation Characteristics

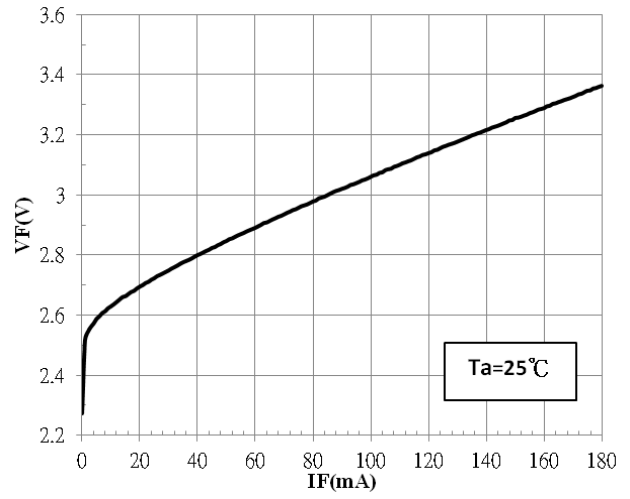


**Optical/Electrical Characterization**

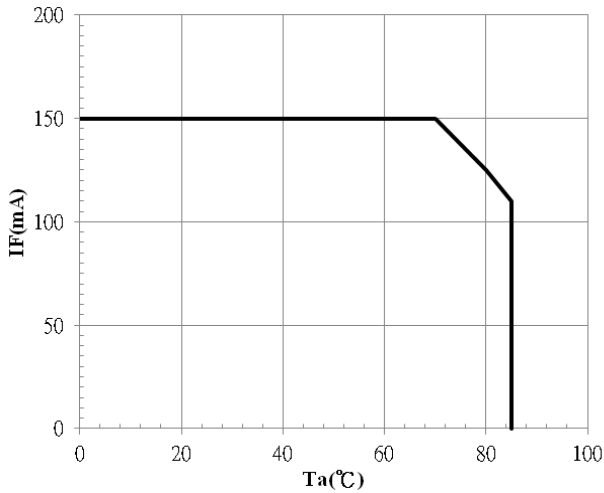
**Relative Luminous vs. Forward Current**



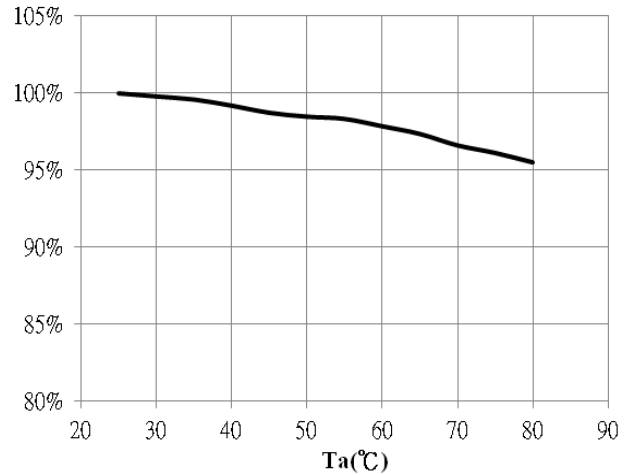
**Forward Voltage vs. Forward Current**



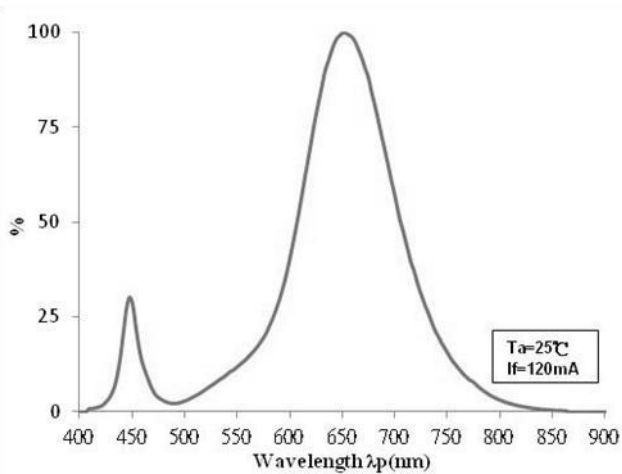
**Forward Voltage vs. Ambient Temperature**



**Relative Luminous vs. Ambient Temperature**



**Optical/Electrical Characterization Spectrum**



# SPECIFICATION

5630-PT2 @ 120mA

LED PACKAGE

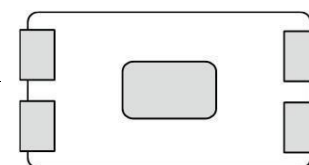
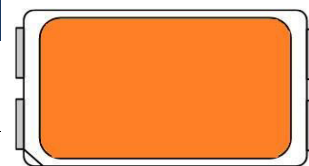
FOR PLANTING LIGHTING



## Electrical/Optical Specification

Ts = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	VF	If = 120mA	2.8	-	3.6	V
Reverse current	IR	Vr = 5V	0	-	5	μA
Luminous intensity	IV	If = 120mA	4900	-	7700	mcd
Luminous intensity	LM	If = 120mA	14	-	22	lm
Chromaticity coordinate*	X	If = 120mA	0.405	-	0.465	-
	Y		0.180	-	0.200	-
View Angle	2θ <sub>1/2</sub>	If = 120mA	-	120	-	degree



Note : Please refer to CIE 1931 chromaticity diagram

## Absolute Maximum Ratings

Ts = 25°C

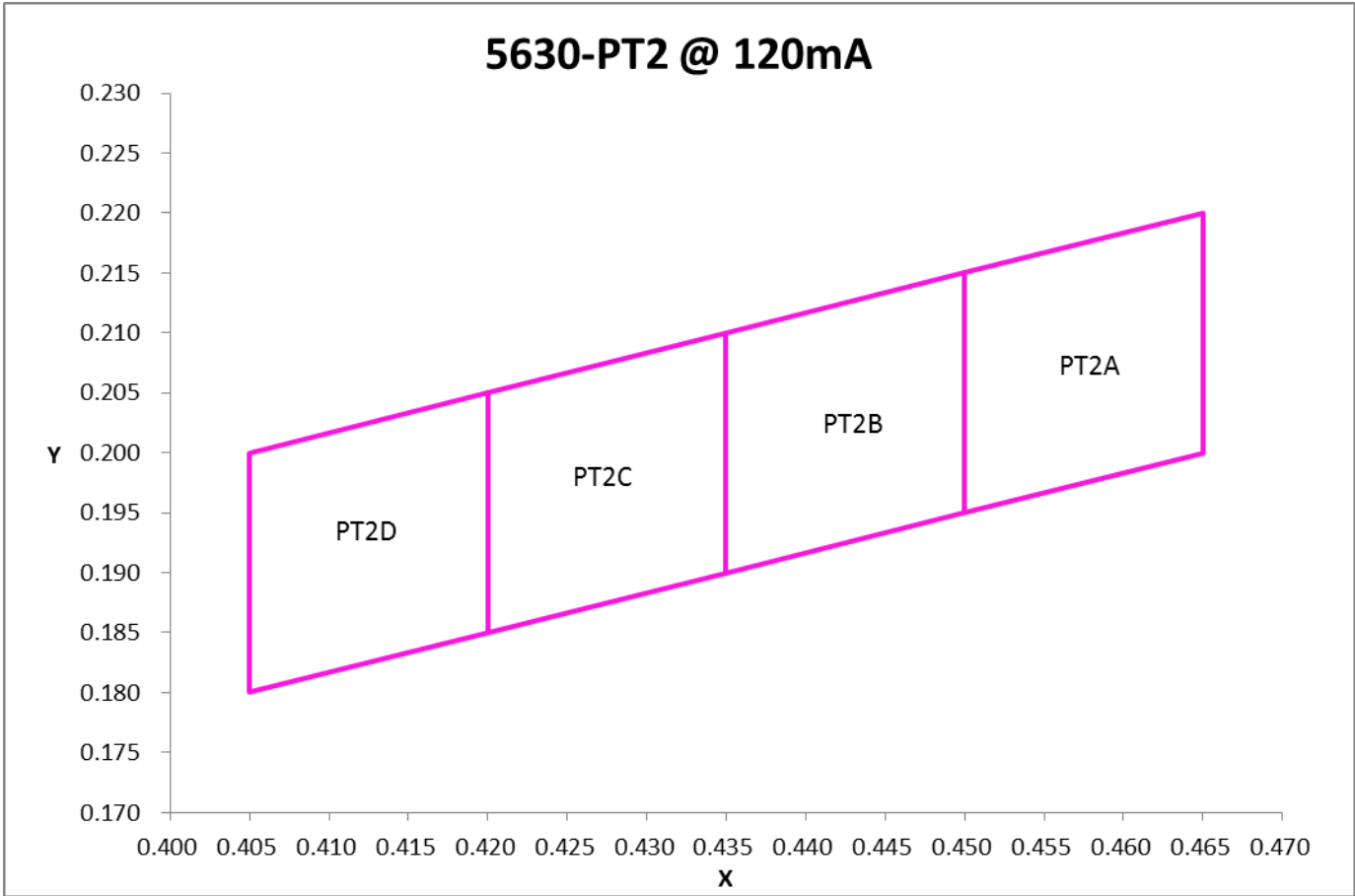
Item	Symbol	Maximum Rating	Unit
Forward current	If	180	mA
Pulse forward current*	Ifp	250	mA
Reverse voltage	Vr	5	V
Power dissipation	Pd	400	mW
Operation temperature	Top	- 30 ~ + 85	°C
Storage temperature	Tstg	-40 ~ + 100	°C
Soldering temperature	Tslid	Reflow Soldering : 260°C/10 sec	-
		Hand Soldering: 350°C/3 sec	-

\* **Duty Cycle < 1/10 ; Pulse Width < 10 msec.**

Notes :

Subjecting the part to stresses beyond listed under this section may cause permanent damage to the device. These are stress ratings only and do not imply that the devices will function beyond these ratings. Exposure to the extremes of these capabilities.

**CIE Color Rank**



Notes : CIE CHROMATICITY DIAGRAM for ANSI

**Rank Table**

Type	X/Y	1	2	3	4
PT2A	X	0.450	0.450	0.465	0.465
	Y	0.195	0.215	0.220	0.200
PT2B	X	0.435	0.435	0.450	0.450
	Y	0.190	0.210	0.215	0.195
PT2C	X	0.420	0.420	0.435	0.435
	Y	0.185	0.205	0.210	0.190
PT2D	X	0.405	0.405	0.420	0.420
	Y	0.180	0.200	0.205	0.185

Notes : Measurement Uncertainty of the Color Coordinates : ± 0.01

## Forward Voltage Ranks

Forward Voltage measured at  $I_f = 120\text{mA}$

$T_s = 25^\circ\text{C}$

VF Code	Min.(V)	Max.(V)
2.8	2.8	3.0
3.0	3.0	3.2
3.2	3.2	3.4
3.4	3.4	3.6

Notes :

Forward Voltage Measurement Tolerance is  $\pm 0.05\text{ V}$ .

## Luminous Intensity Ranks

Luminous intensity measured at  $I_f = 120\text{ mA}$

$T_s = 25^\circ\text{C}$

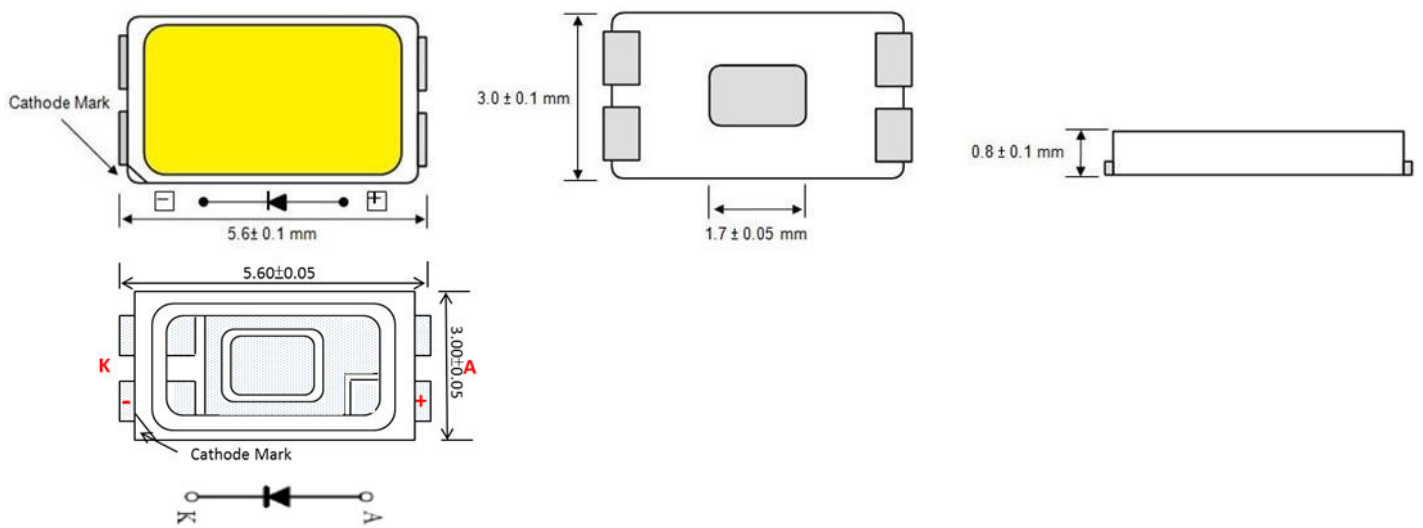
LM Code	Min.(lm)	Max.(lm)
14	14	16
16	16	18
18	18	20
20	20	22

Notes : Luminous Intensity Measurement Tolerance is  $\pm 10\%$

## Outline Dimensions and Materials

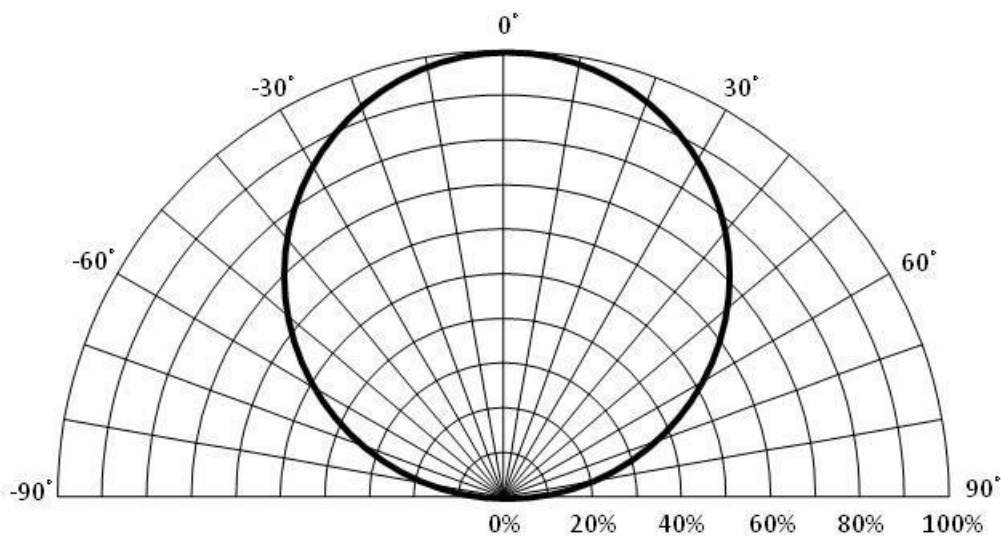
Item	Materials
Package	Heat-resistant polymer
Encapsulating Resin	Silicone Resin (with Phosphor)
Electrodes	Ag plating Copper Alloy

## Reference Outline



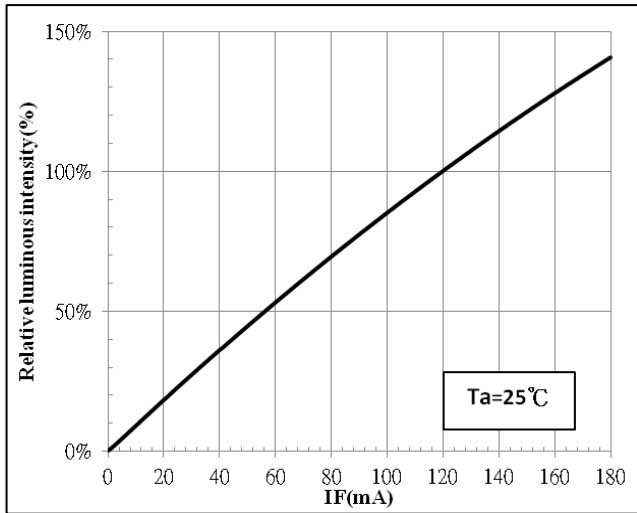
NOTE : All dimensions in mm tolerance is  $\pm 0.1$ mm unless otherwise noted.

## Radiation Characteristics

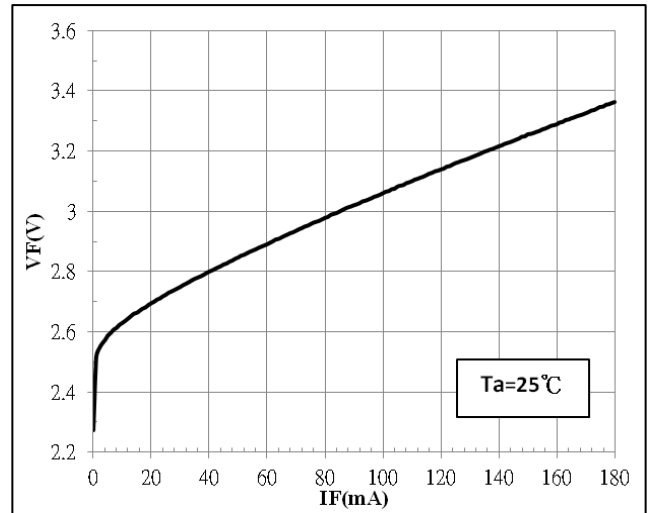


**Optical/Electrical Characterization**

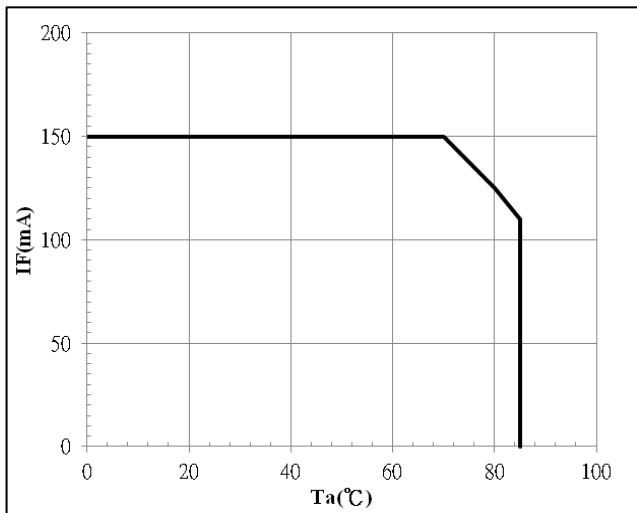
**Relative Luminous vs. Forward Current**



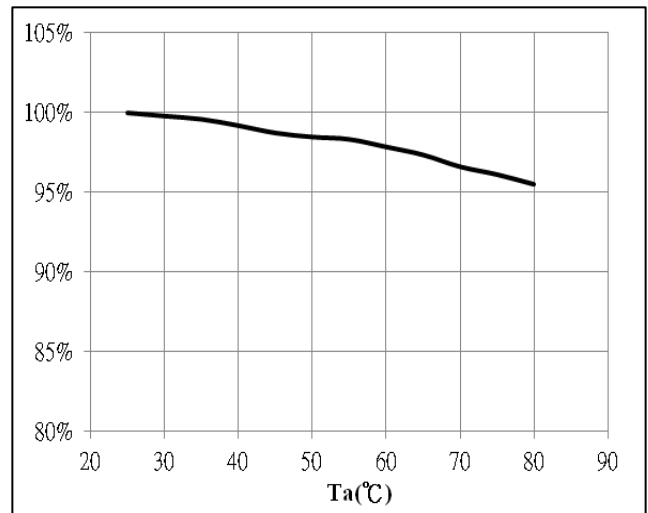
**Forward Voltage vs. Forward Current**



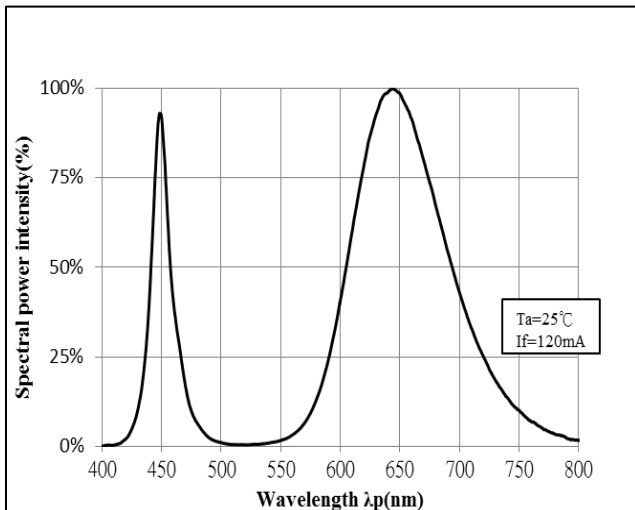
**Forward Voltage vs. Ambient Temperature**



**Relative Luminous vs. Ambient Temperature**



**Optical/Electrical Characterization Spectrum**



# SPECIFICATION

5630-PT4 @ 120mA

LED PACKAGE

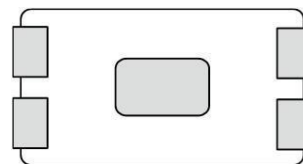
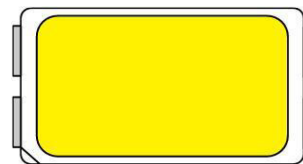
FOR PLANTING LIGHTING



## Electrical/Optical Specification

Ts = 25°C

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward voltage	VF	If = 120mA	2.8	-	3.6	V
Reverse current	IR	Vr = 5V	0	-	5	μA
Luminous intensity	IV	If = 120mA	12600	-	16800	mcd
Luminous intensity	LM	If = 120mA	36	-	48	lm
Chromaticity coordinate*	X	If = 120mA	0.365	-	0.408	-
	Y		0.290	-	0.340	-
View Angle	2θ <sub>1/2</sub>	If = 120mA	-	120	-	degree



Note : Please refer to CIE 1931 chromaticity diagram

## Absolute Maximum Ratings

Ts = 25°C

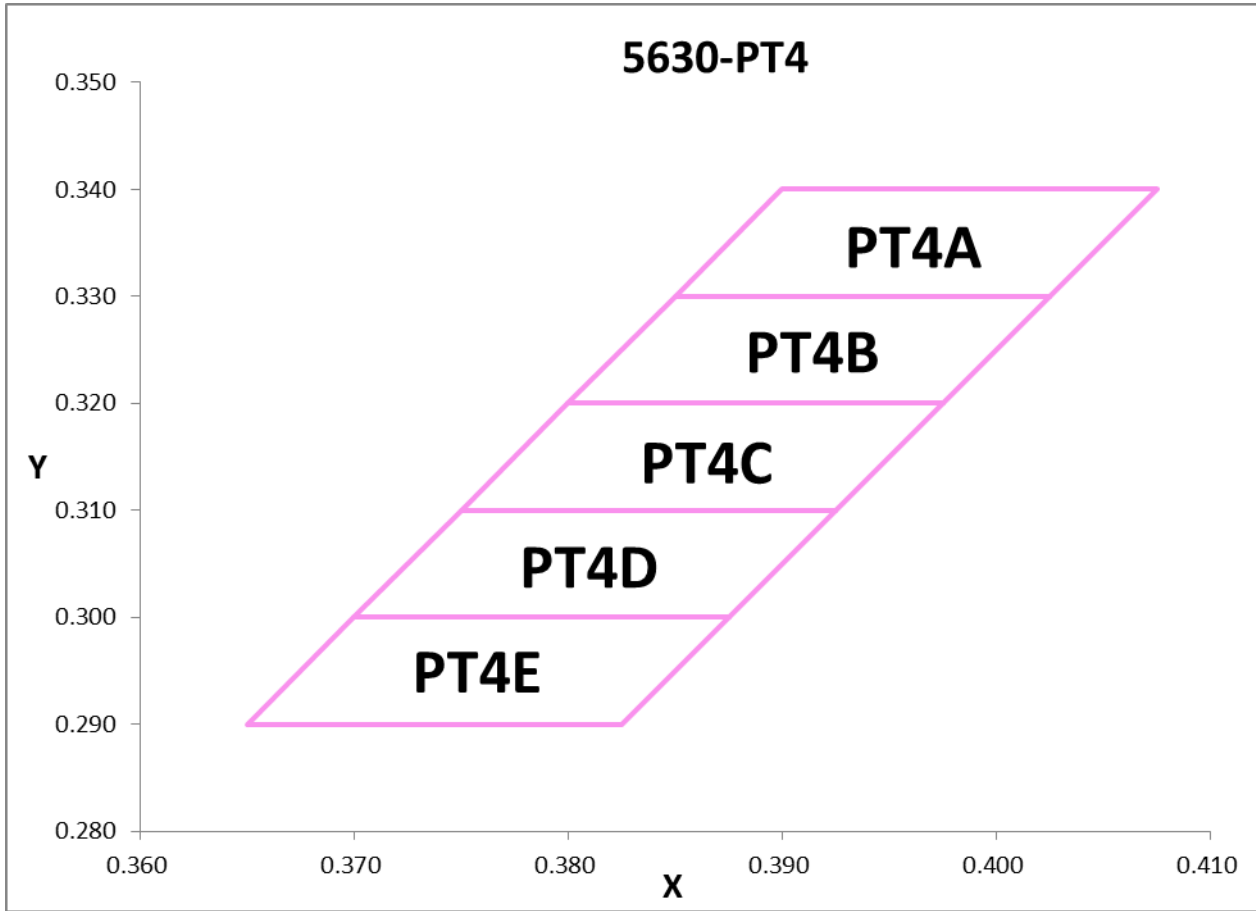
Item	Symbol	Maximum Rating	Unit
Forward current	If	180	mA
Pulse forward current*	Ifp	250	mA
Reverse voltage	Vr	5	V
Power dissipation	Pd	400	mW
Operation temperature	Top	- 30 ~ + 85	°C
Storage temperature	Tstg	-40 ~ + 100	°C
Soldering temperature	Tslid	Reflow Soldering : 260°C/10 sec	-
		Hand Soldering: 350°C/3 sec	-

\* Duty Cycle < 1/10 ; Pulse Width < 10 msec.

Notes :

Subjecting the part to stresses beyond listed under this section may cause permanent damage to the device. These are stress ratings only and do not imply that the devices will function beyond these ratings. Exposure to the extremes of these capabilities.

**CIE Color Rank**



Notes : CIE CHROMATICITY DIAGRAM for ANSI

**Rank Table**

Type	X/Y	1	2	3	4
PT4A	X	0.385	0.390	0.408	0.403
	Y	0.330	0.340	0.340	0.330
PT4B	X	0.380	0.385	0.403	0.398
	Y	0.320	0.330	0.330	0.320
PT4C	X	0.375	0.380	0.398	0.393
	Y	0.310	0.320	0.320	0.310
PT4D	X	0.370	0.375	0.393	0.388
	Y	0.300	0.310	0.310	0.300
PT4E	X	0.365	0.370	0.388	0.383
	Y	0.290	0.300	0.300	0.290

Notes : Measurement Uncertainty of the Color Coordinates : ± 0.01

## Forward Voltage Ranks

Forward Voltage measured at  $I_f = 120\text{mA}$

$T_s = 25^\circ\text{C}$

VF Code	Min.(V)	Max.(V)
2.8	2.8	3.0
3.0	3.0	3.2
3.2	3.2	3.4
3.4	3.4	3.6

Notes :

Forward Voltage Measurement Tolerance is  $\pm 0.05\text{ V}$ .

## Luminous Intensity Ranks

Luminous intensity measured at  $I_f = 120\text{ mA}$

$T_s = 25^\circ\text{C}$

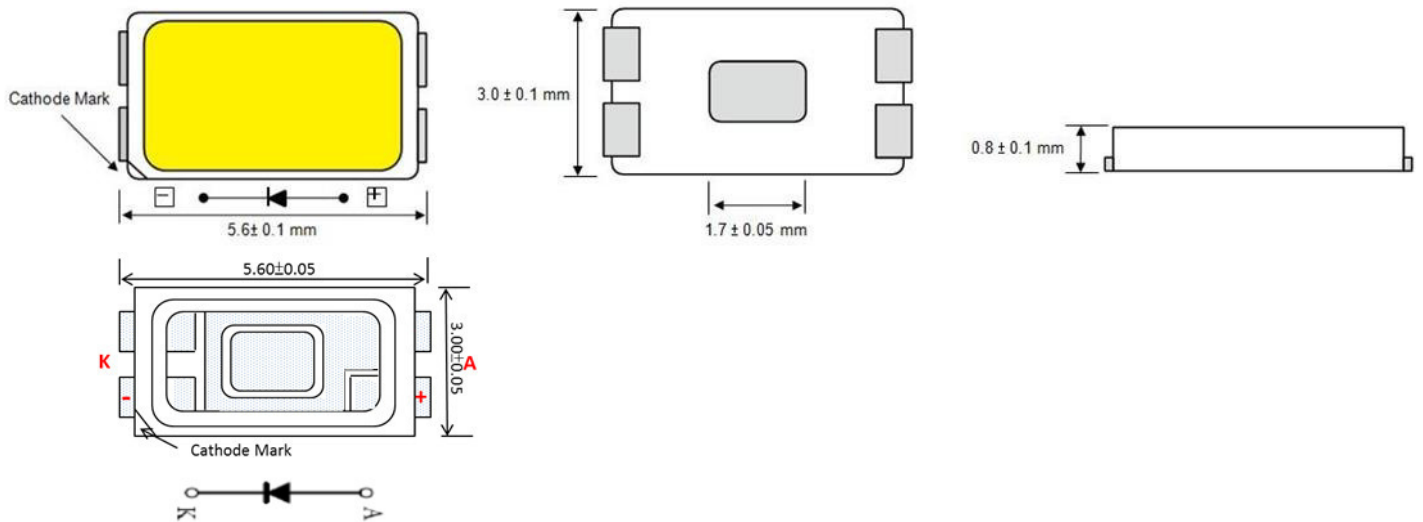
LM Code	Min.(lm)	Max.(lm)
36	36	38
38	38	40
40	40	42
42	42	44
44	44	46
46	46	48

Notes : Luminous Intensity Measurement Tolerance is  $\pm 10\%$

## Outline Dimensions and Materials

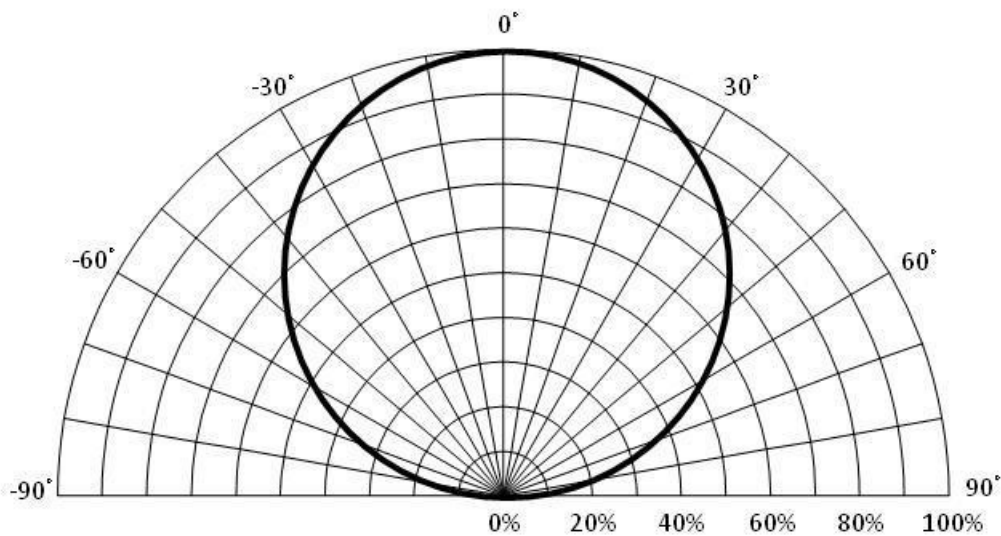
Item	Materials
Package	Heat-resistant polymer
Encapsulating Resin	Silicone Resin (with Phosphor)
Electrodes	Ag plating Copper Alloy

## Reference Outline



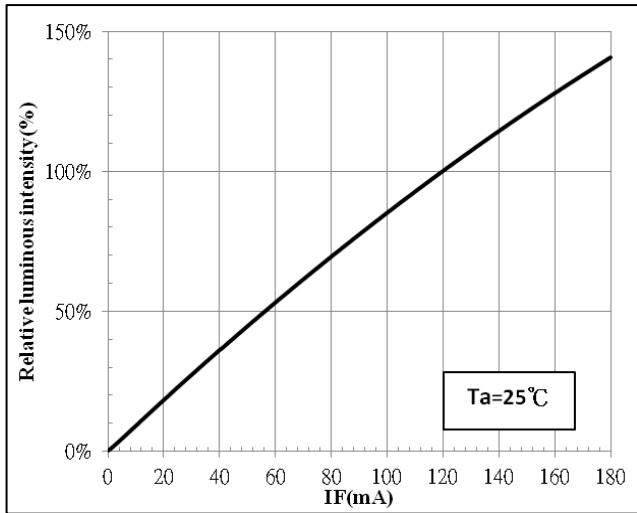
NOTE : All dimensions in mm tolerance is  $\pm 0.1$ mm unless otherwise noted.

## Radiation Characteristics

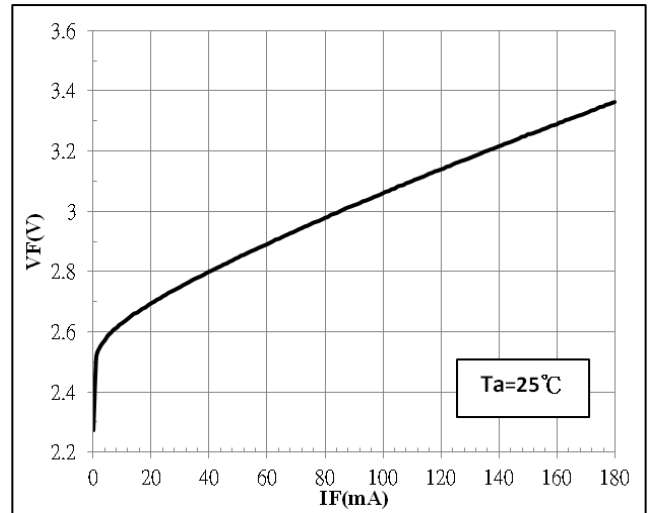


## Optical/Electrical Characterization

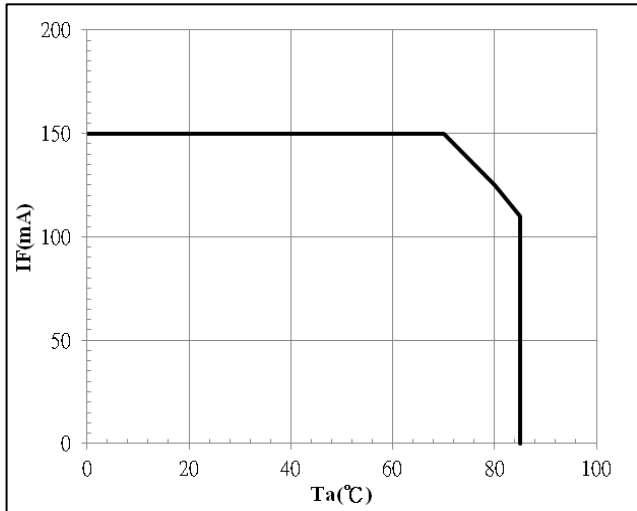
**Relative Luminous vs. Forward Current**



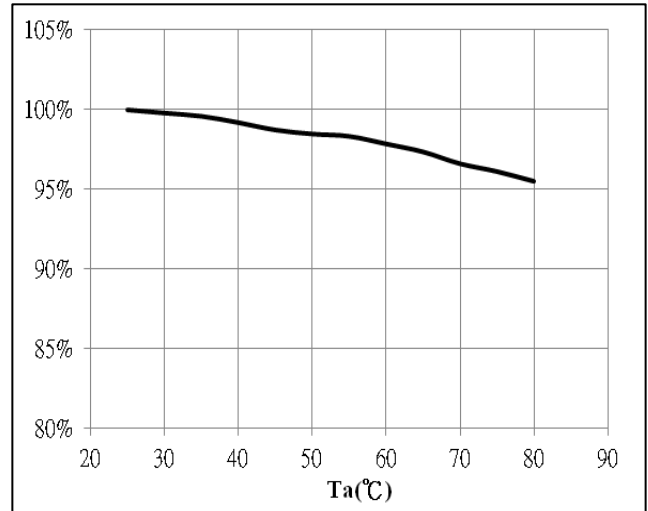
**Forward Voltage vs. Forward Current**



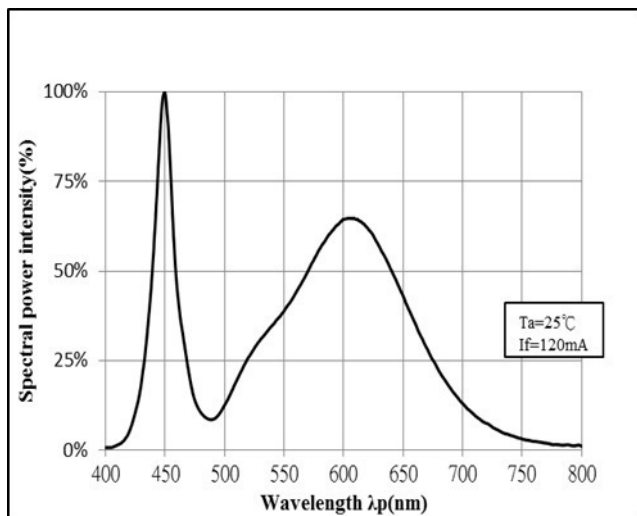
**Forward Voltage vs. Ambient Temperature**



**Relative Luminous vs. Ambient Temperature**

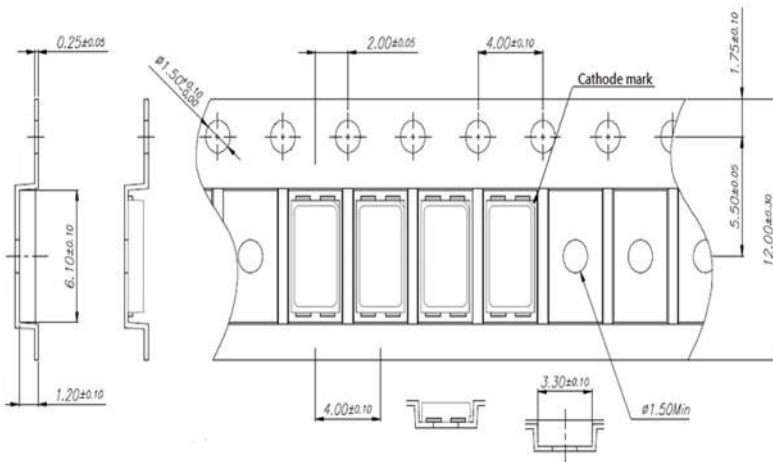


**Optical/Electrical Characterization Spectrum**

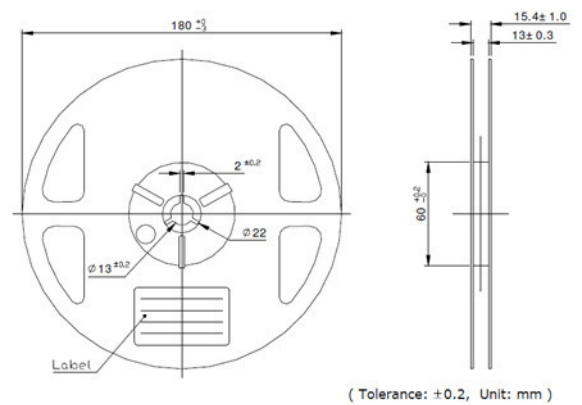


## Packing Information

### Embossed Tape Dimension



### Reel Dimension



Notes :

1. Dimensions are in millimeters.
2. Dimensions conform to JIS-C-0806 and EIA-481.

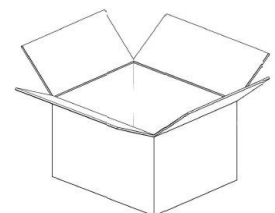
## Moisture Proof Bag

Label on the moisture proof bag consists the following information.



## Packing unit

Package	Dimensions (mm)	No. of Reel/Unit	Q'ty (pcs)
Moisture proof foil bag	N/A	1 reel/bag	4,000 Max.
Cardboard box 25P	350 x 210 x 210 x 4t	25 reels/box Max.	100,000 Max.
Cardboard box 50P	410 x 350 x 210 x 4t	50 reels/box Max.	200,000 Max.



Notes :

1. To avoid possible damages, it is recommended that same packing arrangement should be used.
2. Packing tolerance is ± 0.1%.

## Reliability

Test Item	Test Standard	Test Conditions	Failure Rate
Resistance to Soldering Heat (Reflow Soldering)	JEITA ED-4701 300 301	Tsld = 260°C (10 sec), 2 times (Pre-treatment 30°C, 70%, 168 hrs)	0/50
Solder ability (Reflow Soldering)	JEITA ED-4701 300 303	Tsld = 215+5°C (3 sec), 1 time ( Lead Solder )	0/50
Thermal Shock	JEITA ED-4701 300 307	0°C (3 min) ~ 100°C (3 min), 20 cycles	0/50
Temperature Cycle	JEITA ED-4701 100 105	-40°C (30min) ~ 25°C (5min) ~ 100°C (30min) ~ 25°C (5min), 100 cycles	0/50
Moisture Resistance Cycle	JEITA ED-4701 200 203	25°C ~ 65°C ~ -10°C, 10 cycles 90%RH, 24 hrs./cycle	0/50
High Temperature Storage	JEITA ED-4701 200 201	Ta = 100°C 1000 hrs.	0/50
Temperature Humidity Storage	JEITA ED-4701 100 103	Ta = 60°C, RH = 90% 1000 hrs.	0/50
Low Temperature Storage	JEITA ED-4701 200 202	Ta = -40°C 1000 hrs.	0/50
Steady State Operation Life		Ta = 25°C, If = 120 mA 1000 hrs.	0/50
Steady State Operation Life - Condition II		Ta = 25°C, If = 180 mA 1000 hrs.	0/50
Steady State Operation Life of High Temperature		Ta = 85°C, If = 120 mA 1000 hrs.	0/50
Steady State Operation Life of High Humidity Heat		Ta = 60°C, RH = 90%, If = 180 mA 500 hrs.	0/50
Steady State Operation Life of Low Temperature		Ta = -30°C, If = 120 mA 1000 hrs.	0/50
Vibration	JEITA ED-4701 400 403	100 ~ 2000 ~ 100 Hz Sweep, 4 min. 200 m/sec <sup>2</sup> , 3 direction, 4 cycles, 48 min.	0/50
Substrate Bending	JEITA ED-4702	3mm, 5+1 sec. 1 time	0/50
Stick	JEITA ED-4702	5N, 10+1 sec. 1 time	0/50

## Failure criteria

Items	Conditions	Failure Criteria
Forward voltage	@ If = 120 mA, Ta =25°C	> 1.1 x USL
Reverse current	@Vr = 5V, Ta = 25°C	> 2.0 x USL
Luminous intensity	@ If = 120 mA, Ta =25°C	

**Notes :**

Luminlite defined failure criteria as single 50% or average 35% degradation.

## Cautions

The lifetime and performance of the LEDs are sensitive to environment and operating conditions.

Cautions should be taken after due consideration when using LEDs.

### (1) Moisture Proof Package

SMD type LED devices is sensitive to moisture uptake. Changes of optical characteristics or contact exfoliation may be resulted from moisture uptake. Moisture proof packages are used for product delivery. It is recommended that the original moisture proof bag or similar arrangement should be used for storage after the opening of sealed packages.

### (2) Storage

Storage Conditions Prior to opening of the package :

The LEDs should be stored in an environment with temperature less than 30°C and 50% RH or less. The shelf lifetime of unopened LEDs is six month.

After opening of the package :

The storage environment should be kept at 30°C or less and 50%RH or less. The LEDs should be soldered within 24 hours (1days) after opening the package. It is recommended to store those unused LEDs in the original moisture proof bag with moisture absorbent material.

If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions :

Baking treatment : More than 24 hours at 70 ± 5°C.

LUMINLITE LED electrode and lead frame are comprised of a silver plated copper alloy. Please avoid conditions which may cause the LED to corrode, tarnish or discolor. This corrosion or discoloration might lower solder ability or might affect on optical characteristics.

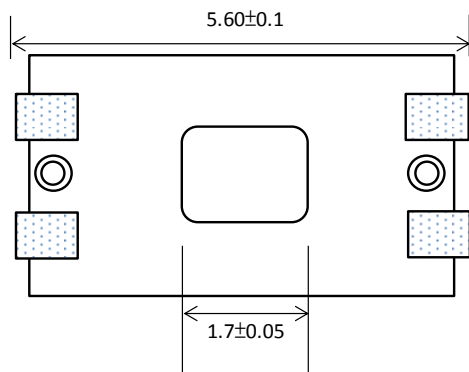
Please avoid rapid transitions in ambient temperature, especially in high humidity environments where condensation can occur.

### (3) Heat Generation

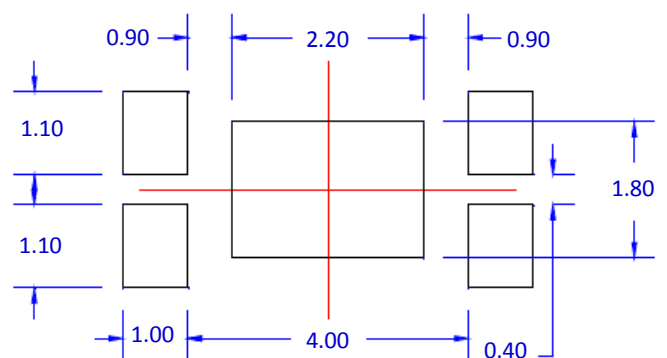
The optical characteristics of LEDs are very sensitive to temperature. Therefore, thermal design of the end product is of paramount importance. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

### (4) Soldering Conditions(Reference Outline)

※Soldering pad pattern

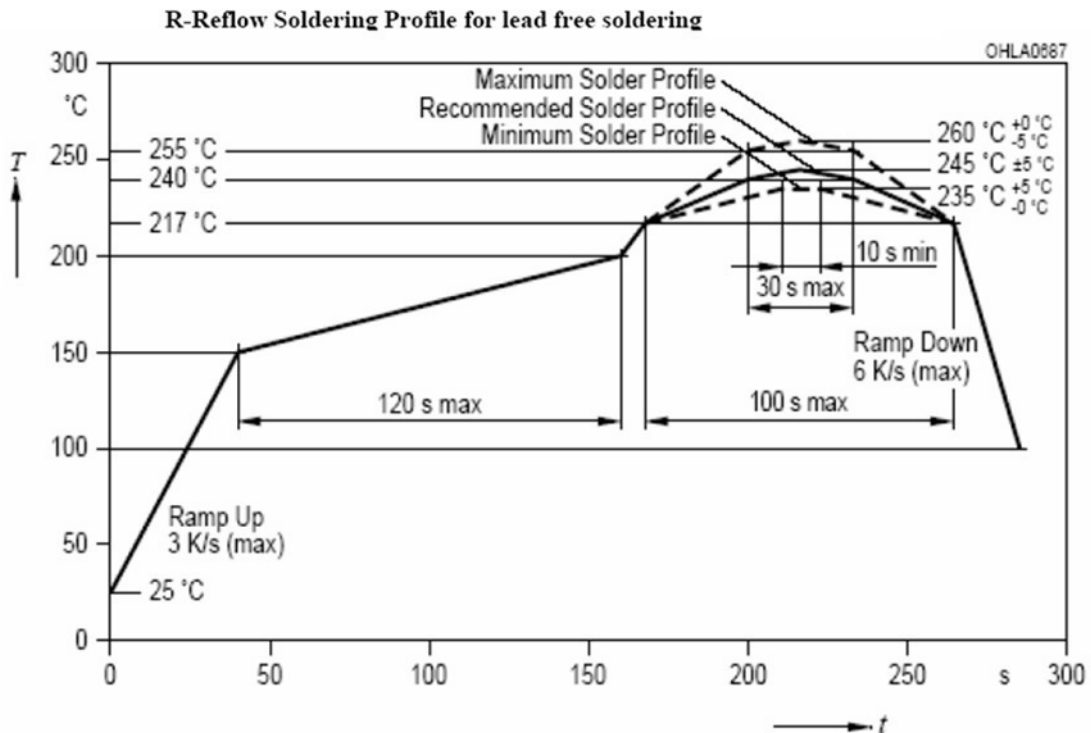


※Metal solder stencil aperture



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

※Recommend reflow conditions

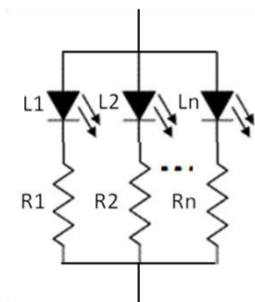


(5) Recommended circuit

When parallel circuit LED driver IC is applied in Lighting, hot spot may occur in low current operation region (dimming mode) by difference of LED voltage in low current region. In the worst case, some LED may be subjected to stresses in excess of the absolute maximum rating.

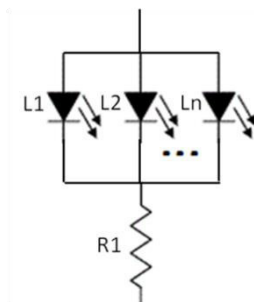
It is recommended to use **Circuit A** which regulates the current flowing

**Circuit A : Recommended Circuit**



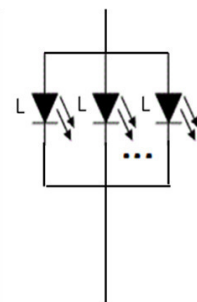
Separate resistor per each LED

**Circuit B : Abnormal Circuit**



Easy to occur brightness problem

**Circuit C : Abnormal Circuit**



Easy to occur brightness problem

(6) Cleaning

It is recommended to clean the LEDs using Isopropyl alcohol. When using other solvents, it should be confirmed beforehand whether the solvents will dissolve the package and the resin or not. Freon solvents should not be used to clean the LEDs because of worldwide regulations. Never clean the LEDs with the ultrasonic machines.

(7) Static Electricity

Static electricity or surge voltage will damage the LEDs.

It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.

All devices, equipment and machinery must be properly grounded.

It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.

When inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to find static damaged LEDs by a light-on test or a VF test at a lower current (below 1mA is recommended).

Damaged LEDs will show some unusual characteristics such as the leak current remarkably increases, the forward voltage becomes lower, or the LEDs do not light at the low current.

**Criteria : ( Vf > 2.0V at If = 0.5mA )**

(8) Others

Care must be taken to ensure that the reverse voltage will not exceed the absolute maximum rating when using the LEDs with matrix drive.

The LED light output is strong enough to injure human eyes. Precautions must be taken to prevent looking directly at the LEDs with unaided eyes for more than a few seconds.

Flashing lights have been known to cause discomfort in people: you can prevent this by taking precautions during use. Also, people should be cautious when using equipment that has had LEDs incorporated into it.

The LEDs described in this brochure are intended to be used for ordinary electronic equipment. LED devices used in applications in which exceptional quality and reliability are required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health, must be expressly authorized.

The formal specifications must be exchanged and signed by both parties before large volume purchase begins.

Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typical data will be changed without any further notice.