

## APPROVAL SHEET

AOT MODEL NAME	3030M
AOT PART NUMBER	3030M-W31S
CUSTOMER NAME	General
DATE	2021/Oct.
Version	01

MAKER			CUSTOMER			
Prepared	Checked	Approved				
<b>Nelson</b>	<b>Joy</b>					

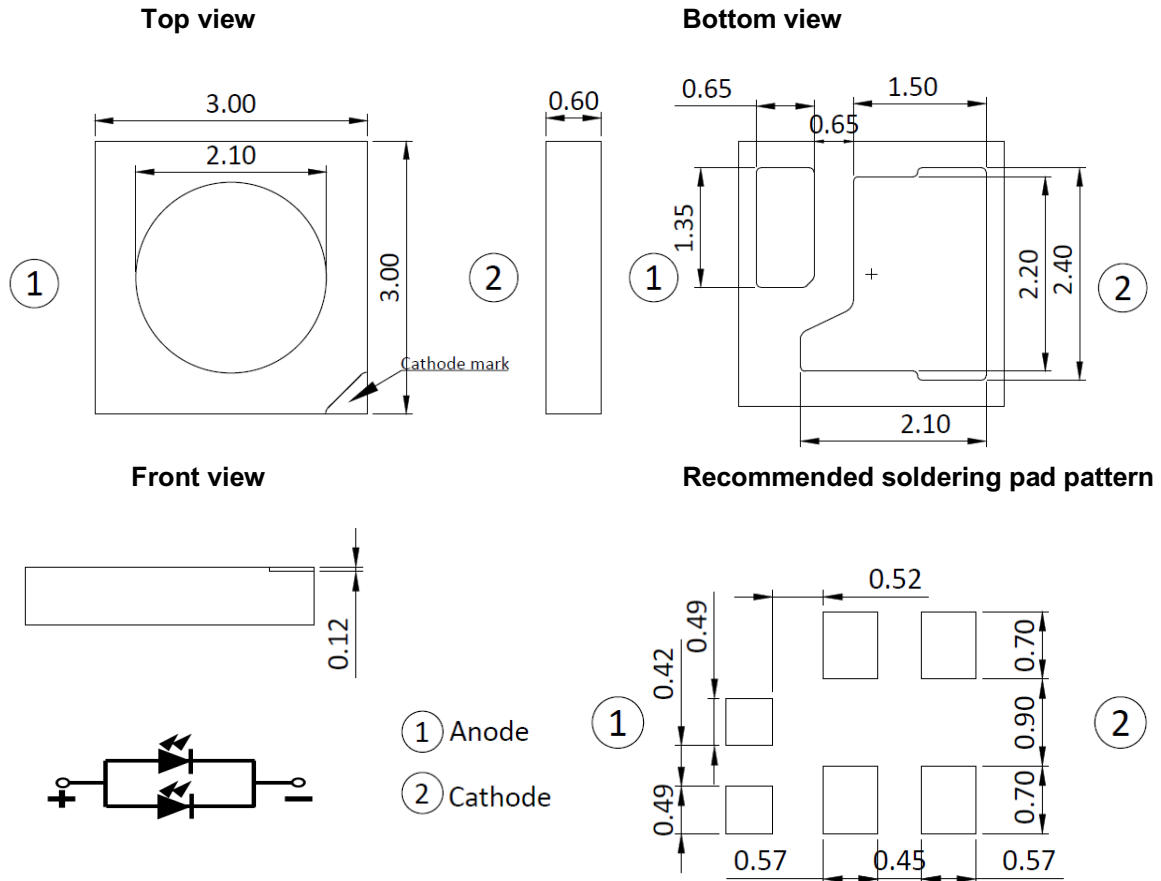
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## Package Outline

Model name:3030M-W31S

Unit: mm, Tolerance:  $\pm 0.2$  mm



Item	Materials
Package	Heat-Resistant Polymer
Encapsulating	Silicone Resin(with phosphor)
Electrode	Ag Plating Copper Alloy

- Two blue chips.
- High brightness SMD.
- Compact package outline (LxWxH) of 3.0 mm x 3.0 mm x 0.6 mm.
- Compatible with reflow soldering.
- Complies with RoHS Directive.

## Optical/Electronic Characteristics (T<sub>A</sub>=25°C)

Item	Symbol	Condition	Min	Typ.	Max	Unit
Forward Voltage	V <sub>F</sub>	I <sub>F</sub> = 320mA	2.9	-	3.2	V
Luminous Flux	φ <sub>v</sub>	I <sub>F</sub> = 320mA	100	-	130	lm
Thermal Resistance	R <sub>thj-s</sub>	I <sub>F</sub> = 320mA	8	12		°C/W

\* Tolerance of measurements of the Forward Voltage is ± 0.05 V.

\* Tolerance of measurements of the Luminous Flux is ± 7%.

## Absolute Maximum Ratings (T<sub>A</sub>=25°C)

Item	Symbol	Absolute Maximum Rating	Unit
Forward Current	I <sub>F</sub>	700	mA
*Pulse Forward Current	I <sub>FP</sub>	900	mA
Power Dissipation	P <sub>D</sub>	2800	mW
Operating Temperature	T <sub>opr</sub>	-30~+85 (I <sub>F</sub> =320mA)	°C
Storage Temperature	T <sub>stg</sub>	-40~+100	°C
Soldering Temperature	T <sub>sld</sub>	Reflow Soldering : 260°C for 10sec Hand Soldering : 350°C for 3sec	
Junction Temperature	T <sub>j</sub>	125	°C
Forward Voltage at Low Current	V <sub>F2</sub>	>1.9 ( @1uA )	V

\* I<sub>FP</sub> Conditions : Pulse Width ≤ 10msec, and duty ≤ 1/10

\* Max condition is not guarantee for life time

## Group Definition of Forward Voltage

Rank	Condition	V <sub>F</sub> (V)
S4	T <sub>A</sub> =25°C I <sub>F</sub> =320mA	2.9 ~ 3.0
S5		3.0 ~ 3.1
S6		3.1 ~ 3.2

## Group Definition of Brightness

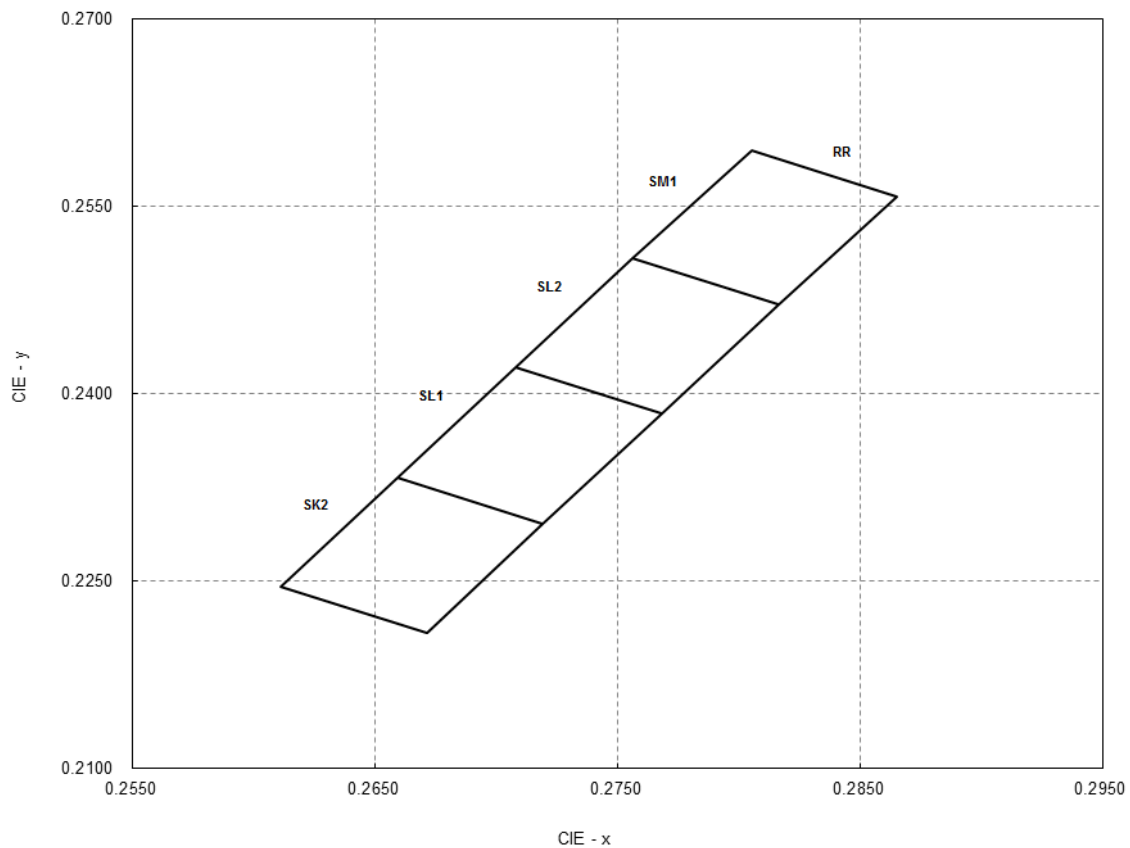
Rank	Condition	Luminous Flux(lm)
T100	T <sub>A</sub> =25°C I <sub>F</sub> =320mA	100 ~ 105
T105		105 ~ 110
T110		110 ~ 115
T115		115 ~ 120
T120		120 ~ 125
T125		125 ~ 130

\*A shipment shall consist of LEDs in a combination of above ranks.

The percentage of each rank in the shipment shall be determined by AOT.

\*The ranking information of LEDs can be found on the reel label.

## Group Definition of Chromaticity Coordinate



## Color Rank

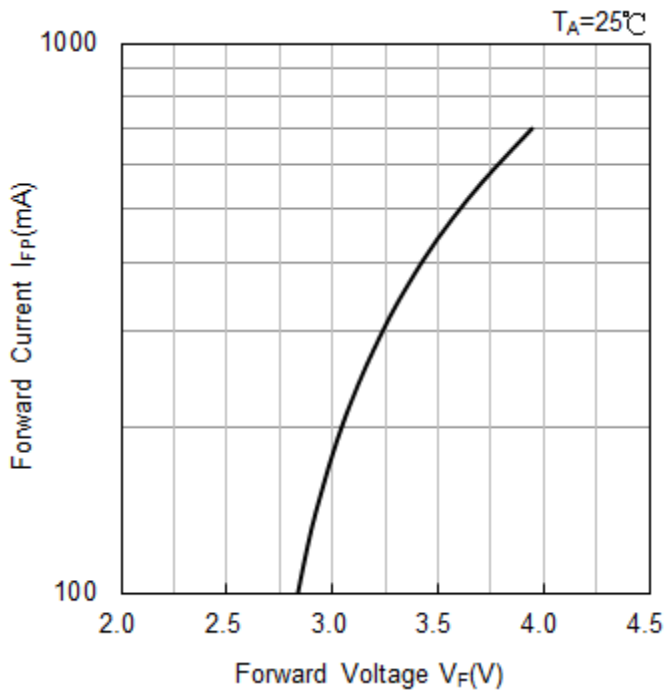
Rank	x	y	Rank	x	y	Rank	x	y
SK2RR	0.2611	0.2245	SL1RR	0.2659	0.2333	SL2RR	0.2708	0.2421
	0.2659	0.2333		0.2708	0.2421		0.2756	0.2508
	0.2719	0.2296		0.2768	0.2384		0.2816	0.2471
	0.2671	0.2208		0.2719	0.2296		0.2768	0.2384
SM1RR	0.2756	0.2508						
	0.2805	0.2595						
	0.2865	0.2558						
	0.2816	0.2471						

**Note:**

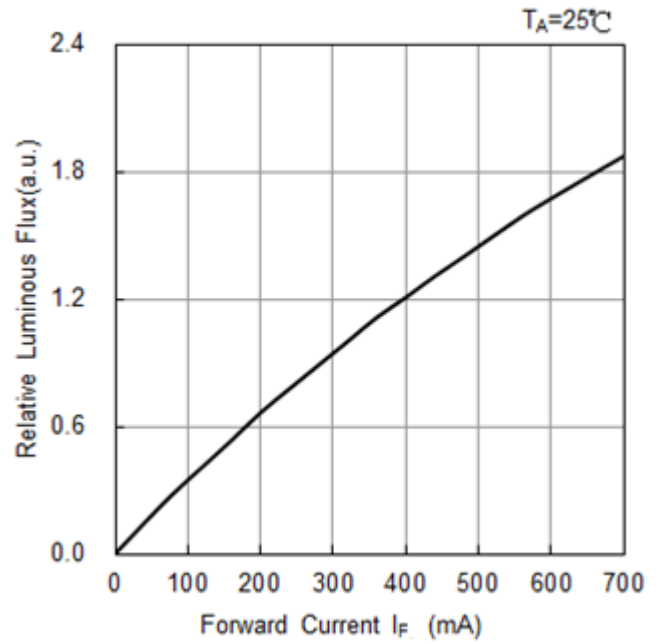
Chromaticity coordinate groups are measured with an accuracy of  $\pm 0.005$ .

## Optical and electrical characteristics

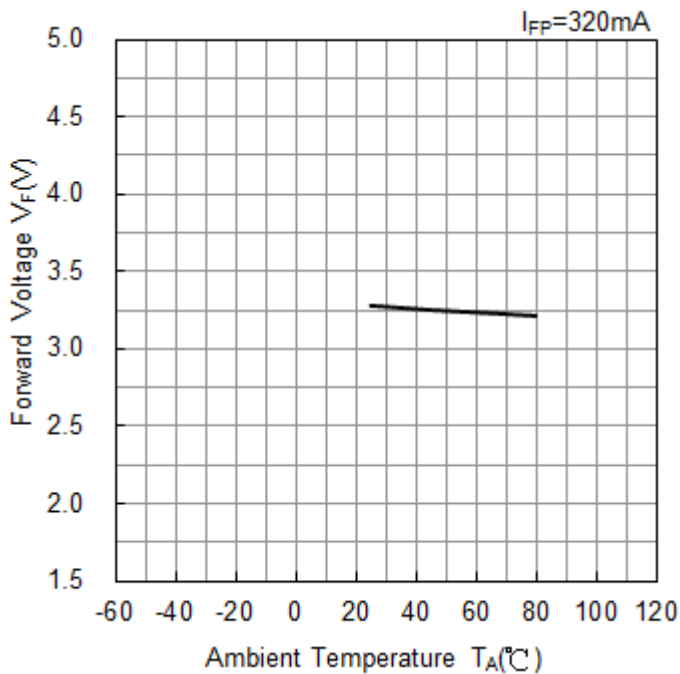
Forward Voltage vs. Forward Current



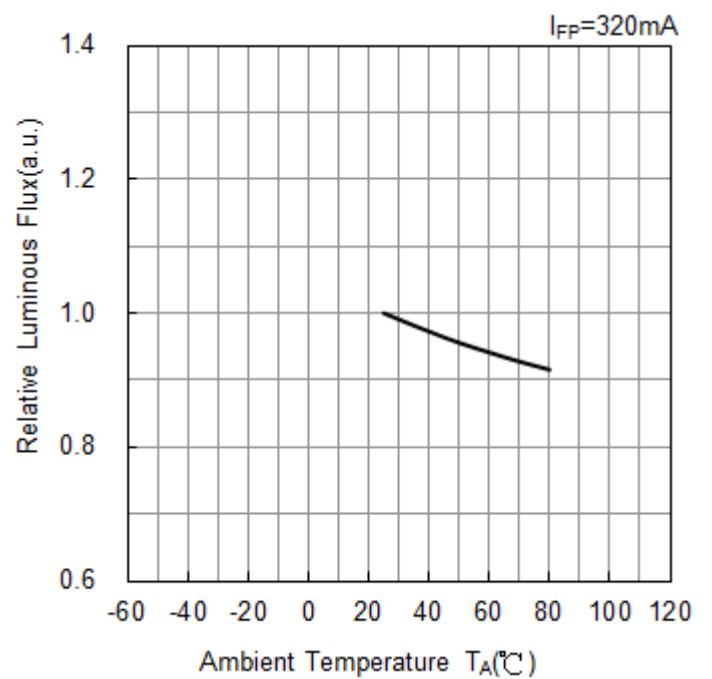
Forward Current vs. Relative Luminous Flux



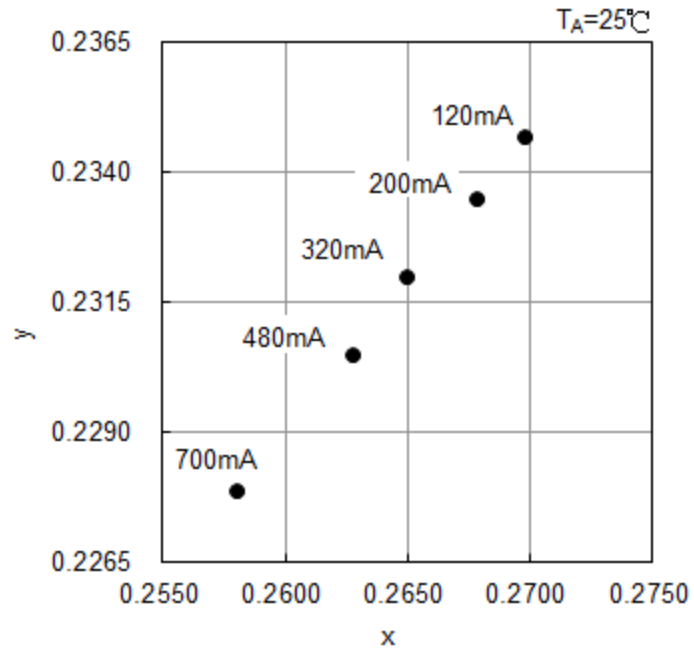
Ambient Temperature vs. Forward Voltage



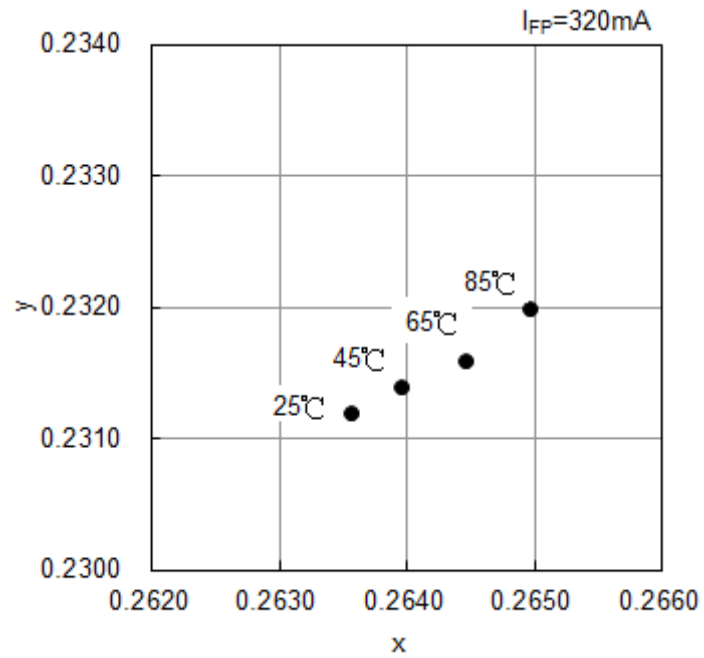
Ambient Temperature vs. Relative Luminous Flux



## Forward Current vs. Chromaticity Coordinate

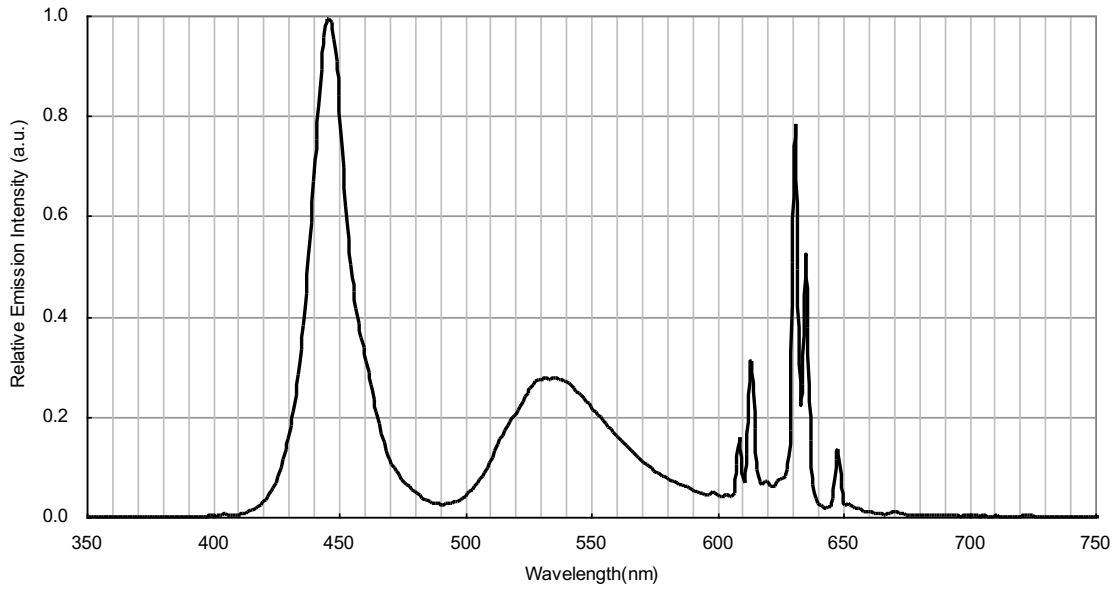


## Ambient Temperature vs. Chromaticity Coordinate

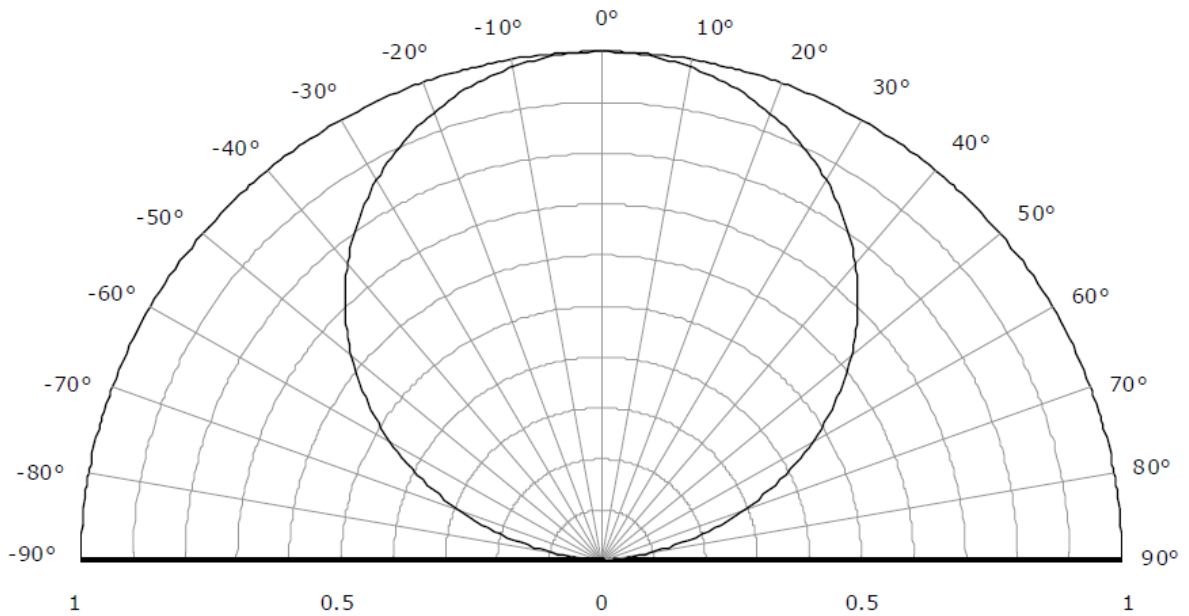




**Spectrum**( $T_A=25^\circ\text{C}$ ,  $I_{FP}=320\text{mA}$ )

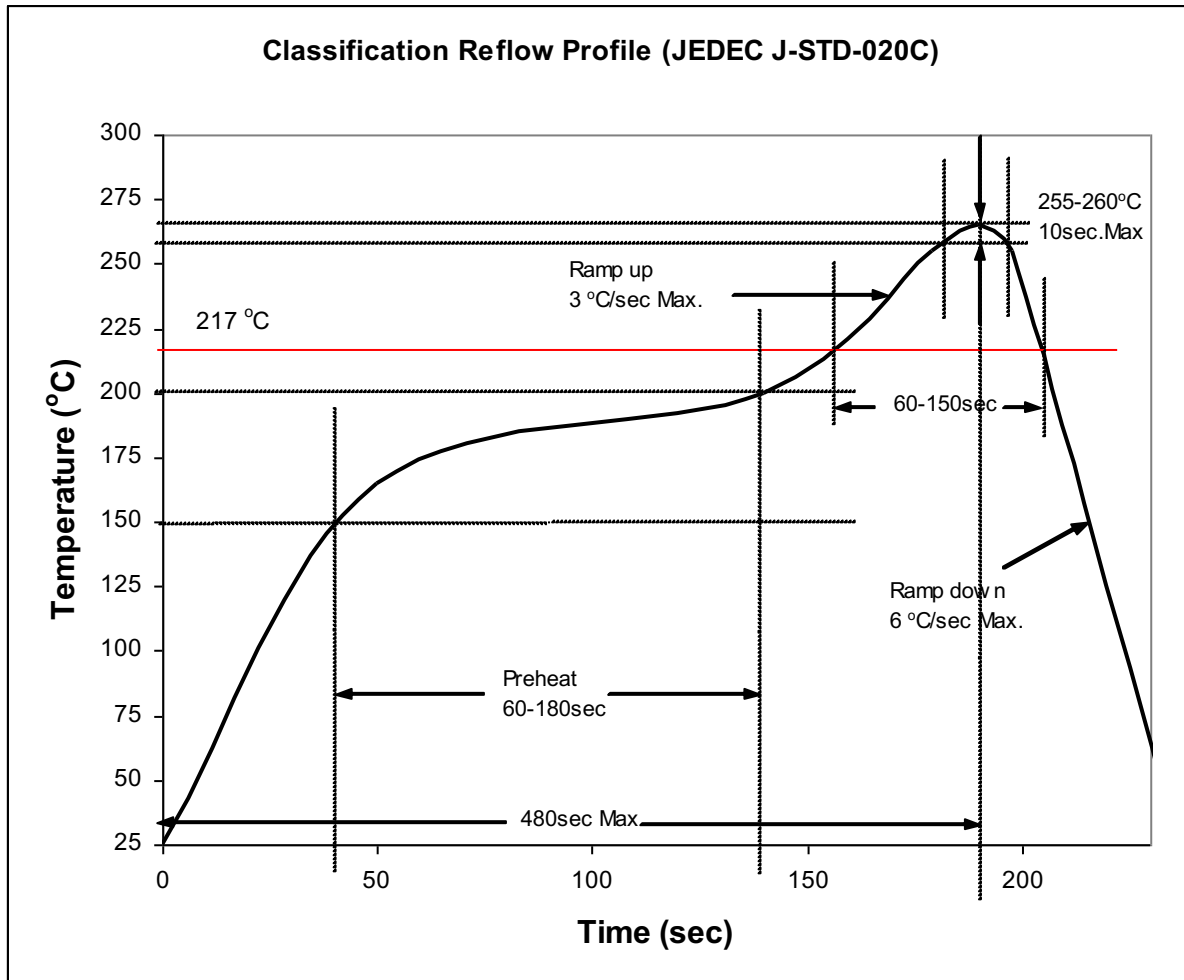


**Radiation Pattern**( $T_A=25^\circ\text{C}$ ,  $I_{FP}=320\text{mA}$ )





## 2) Lead-Free Solder



## 3) Manual Soldering Conditions

### - Lead Solder

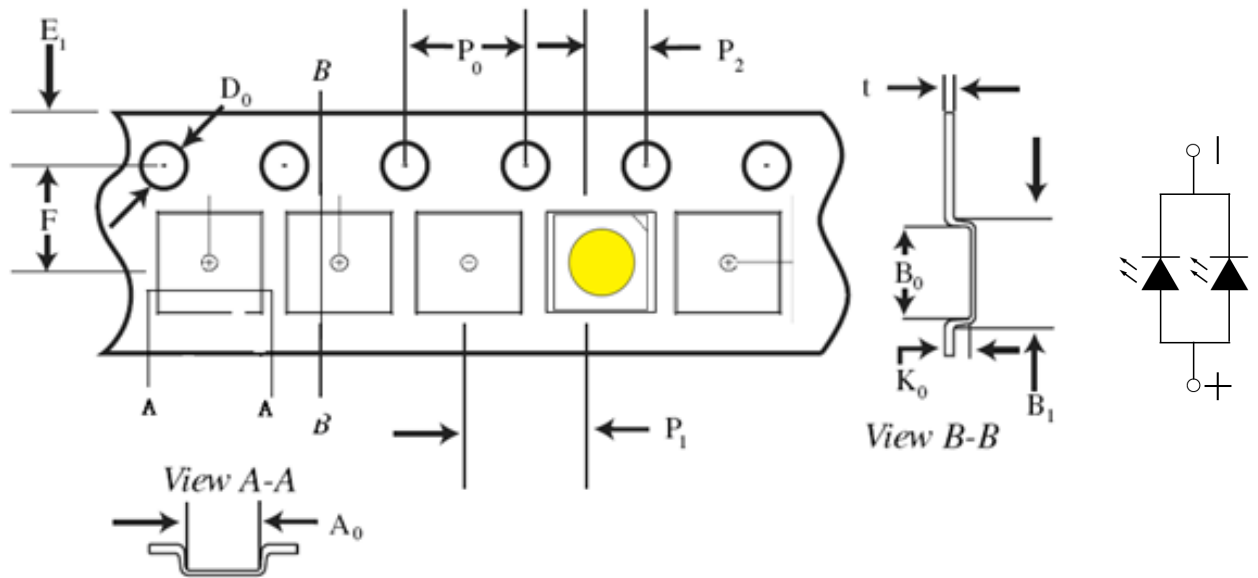
Max. 300°C for Max. 3sec, and only one time.

### - Lead-free Solder

Max. 350°C for Max. 3sec, and only one time.

- 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.
- After LEDs have been soldered, repair should not be done. As repair is unavoidable, a double-head soldering iron should be used. It should be confirmed beforehand whether the characteristics of the LEDs will be damaged by repairing or not.
- Reflow soldering should not be done more than two times.




## Dimensions (Unit :mm)



Item	Spec.	Tolerance(mm)	Item	Spec.	Tolerance(mm)
<b>W</b>	8.00	$\pm 0.10$	<b>P2</b>	2.00	$\pm 0.05$
<b>E</b>	1.75	$\pm 0.10$	<b>t</b>	0.25	$\pm 0.02$
<b>F</b>	3.50	$\pm 0.05$	<b>A0</b>	3.16	$\pm 0.05$
<b>D0</b>	1.50	$+0.10$	<b>B0</b>	3.16	$\pm 0.05$
<b>D1</b>	0.5	$\pm 0.05$	<b>K0</b>	0.71	$\pm 0.05$
<b>P0</b>	4.00	$\pm 0.10$			



## Reel Label Definition

SMD LED	SAP. No.
Part Number : XXXXX-XXXX	
Brightness : A	
CIE : B	
VF : C	
Quantity : nn ea	
Serial No : SM0yymmddxxxx	
	
Cust. PN. : XXXXX-XXXX	

A : Iv value.  
B : CIE value noted  
C : Vf value.  
nn : Quantity of LED

SHyymmddxxx : yy : year, mm : month, dd : day, xxx : reel no

\*Reel Label to fill in practice data of all LED characteristic

## Reliability Test

No.	Test Item	Standard Test Method	Test Conditions	Note	Number of Damaged
1	Room Temp. Life Test	Internal Ref.	$T_A=25\text{ }^\circ\text{C}, I_F=320\text{mA}$	1000 hrs	20
2	High Temp. Operating Life Test	JESD22-A108	$T_A=65\text{ }^\circ\text{C}, I_F=320\text{mA}$	1000 hrs	20
3	High Temp. Operating Life Test	JESD22-A108	$T_A=85\text{ }^\circ\text{C}, I_F=320\text{mA}$	1000 hrs	20
4	High Temp. Storage Test	JESD22-A103	$T_A=85\text{ }^\circ\text{C}$	1000 hrs	20
5	Low Temp. Operating Life Test	JESD22-A108	$T_A=-40\text{ }^\circ\text{C}, I_F=320\text{mA}$	1000 hr	20
6	Wet High Temp. Operating Life Test	JESD22-A119	$60\text{ }^\circ\text{C } 95\%RH, I_F=320\text{mA}$	1000 hr	20
7	Temperature and humidity cycle test	IEC68-2-38	$25\text{ }^\circ\text{C} \sim 65\text{ }^\circ\text{C} \sim -10\text{ }^\circ\text{C}, 90\% RH$ 24hr per cycle	10 cycles	20
8	Thermal Cycling Test	JESD22-A106	$-40\text{C} \sim 100\text{C}, 30\text{min}$ Transform time 5min	300 cycles	50

## Criteria for Judging Damage

Item	Symbol	Test Conditions	Criteria for Judgement	
			Min.	Max.
Forward Voltage	$V_F$	$I_F=320\text{mA}$	-	*U.S.L $\times$ 1.1
Luminous Flux	$\phi_v$	$I_F=320\text{mA}$	*L.S.L $\times$ 0.7	-

\* U.S.L: Upper Standard Level

\* L.S.L: Lower Standard Level

## **Cautions**

### (1) Moisture Proof Package

The moisture proof package should be used to prevent moisture in the package as the moisture may Cause damage to optical characteristics of the LEDs.

The aluminum bag with zipper is used for moisture proof package. And, the moisture absorbent Material, Silica gel, is inserted into aluminum bag.

### (2) Storage:

Storage Conditions

Before opening the package:

The LEDs should be kept at 30°C or less than 90%RH or less. The LEDs should be used within a year. When storing the LEDs, moisture proof packaging with absorbent material is recommended.

After opening the package:

After open the package, the LED should be kept at 30°C, 60%RH or less. The LED should be soldered within 168 hours (7 days) after opening the package. If unused LEDs remain, it should be stored in moisture proof condition.

### (3) Heat Generation

Thermal design of the end products is of paramount importance. The heat generation must be taken into design consideration when using the LED. The coefficient of the temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components.

### (4) Static Electricity

Static electricity or surge voltage damages the LEDs. All equipment and machinery must be properly grounded. It is recommended to use a wristband or anti-electrostatic glove when handling 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).

Criteria:  $V_F > 1.9V$  at  $I_F = 1\mu A$

### (5) Cleaning

Use isopropyl alcohol as a solvent for cleaning the LEDs. The other solvent may dissolve the LEDs package and the epoxy.

Ultrasonic cleaning should not be done.

### (6) Electrostatic Discharge (ESD)

The products are sensitive to static electricity or surge voltage, An ESD event may damage its die or reduce its reliability performance. When handling the products, measures against electro static discharge, including the followings, are strongly recommended.

Eliminating the charge;

Wrist strap, ESD footwear and garments, ESD floors





Solid-State Light. Done Right.

Grounding the equipment and tools at workstation

ESD table / shelf mat (conductive materials)

Proper grounding techniques are required for all devices, equipment and machinery used in the assembly of the products, Also note that surge protection should be considered in the design of customer products.

If tools or equipment contain insulating materials, such as glass or plastic, proper measures against electro static discharge, including the followings are strongly recommended.

Dissipating the charge with conductive materials

Preventing the charge generation with moisture

Neutralizing the charge with ionizer

(7) Others

When using the LEDs, it must care that the reverse voltage will not exceed the absolute maximum rating.

The LED light is enough to injure human eyes, so it should avoid looking at LED light directly.

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**NOTE.**

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