

SA3203VGBMFN2



- ◆ **Outline(L*W*H): 3.2*0.3*1.0 mm**
- ◆ **Good thermal dissipation & optical uniformity**

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Features

- Forward current: $\leq 20\text{mA}$
- Typical view angle 50% Iv: 130°
- RoHS2.0 and REACH-compliant
- Lens color: white diffused
- Qualified according to JEDEC moisturevity Level 3
- ESD level 1 kV(HBM)

Applications

- Indoor lighting applications
- Flat backlight for LCD. Switch and symbol
- Indicator and backlighting for all consumer electronics
- Others applications

■ Product Code Method

SA - 3203 - VGB- M - F - N2

① ② ③ ④ ⑤ ⑥

①	②	⑤	④	⑤	⑥
Process Type	Lead Frame Size	Dice wavelength	Cap Color	Spectral Condition Code	Flow Code
SA : PCB flat	3203: 3.2* 0.3mm	V: red G:green B:blue	M: white diffused	F: 20mA	N: no zener 2: no expression above meaning for company

■ Maximum Rating(Ta=25°C)

Characteristics	Symbol	Rating	Unit
DC Forward Current	I _F	30	mA
Pulse Forward Current *3	I _{PF}	100	mA
Reverse Voltage	V _R	5	V
Power Dissipation	P _D	Red(V)	80
		Green(G)	100
		Blue(B)	100
Operating Temperature Range	T _{OP}	-40-85	°C
Storage Temperature Range	T _{STG}	-40-100	°C
Soldering Temperature *4	T _{SD}	260	°C

Notes 1: There is no maximum or typical voltage parameter

2: For other ambient, limited setting of current will be depended on de-rating curves.

3: Duty 1/10, pulse width 0.1ms

4: The maximum of soldering time is 10 seconds in T_{SD}

■ Typical Product Characteristics(Ta=25°C)

Characteristics	Symbol	Min.	Typ.	Max.	Unit	Test condition	
Reverse Current	I_R	-	-	10	μA	$V_R=5V$	
View angle	$2\theta_{1/2}$	-	130	-	Deg	$I_F=20mA$	
Forward Voltage	V_F	Red(V)	2.0	2.3	2.6	V	$I_F=20mA$
		Green(G)	2.4	2.7	3.0		$I_F=20mA$
		Blue(B)	2.6	2.9	3.2		$I_F=20mA$
Luminous Intensity	I_v	Red(V)	-	450	-	mcd	$I_F=20mA$
		Green(G)	-	1700	-		$I_F=20mA$
		Blue(B)	-	370	-		$I_F=20mA$
		White(W)	-	2370	-		$I_F=20mA$
Dominant Wavelength	λ_d	Red(V)	618	-	628	nm	$I_F=20mA$
		Green(G)	520	-	535		$I_F=20mA$
		Blue(B)	460	-	475		$I_F=20mA$
Color Coordinate	x	-	0.2590	-		$I_F=20mA$	
	y	-	0.2492	-			

Notes: 1. Measurement Errors:

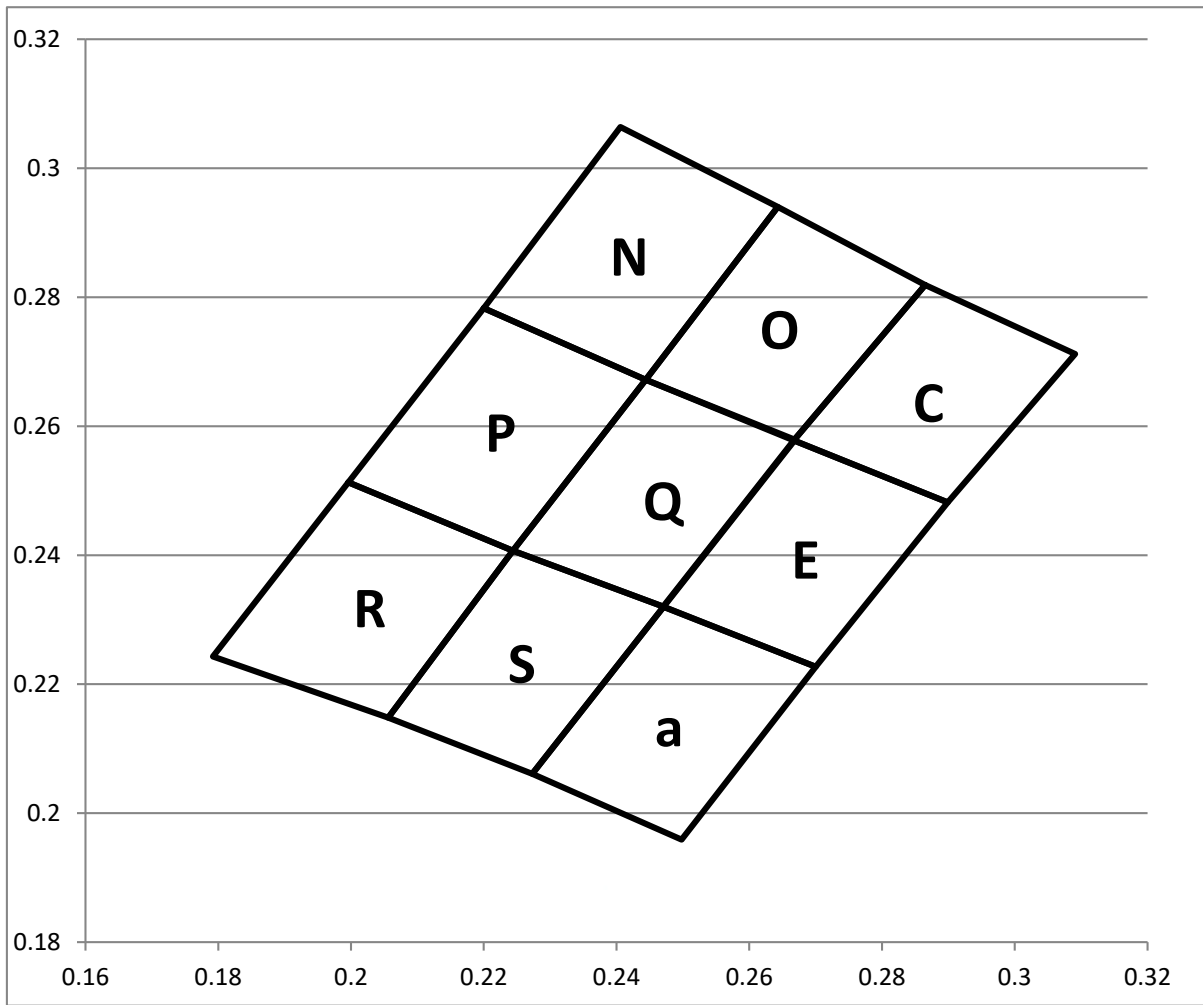
 Forward Voltage: $\pm 0.1V$, Luminous Intensity: $\pm 10\%I_v$, Dominant Wavelength: $\pm 1.0nm$, Viewing Angle ($2\theta_{1/2}$): $\pm 5\%$

2. Electrical-Optical Characteristics (Ta=25°C)

■ Range of Bins
1) Luminous Intensity-White (IF = 20mA)

Bin Code	Min. I_v (mcd)	Max. I_v (mcd)
23	1250	1600
24	1600	2000
25	2000	2500
26	2500	3200
27	3200	4000

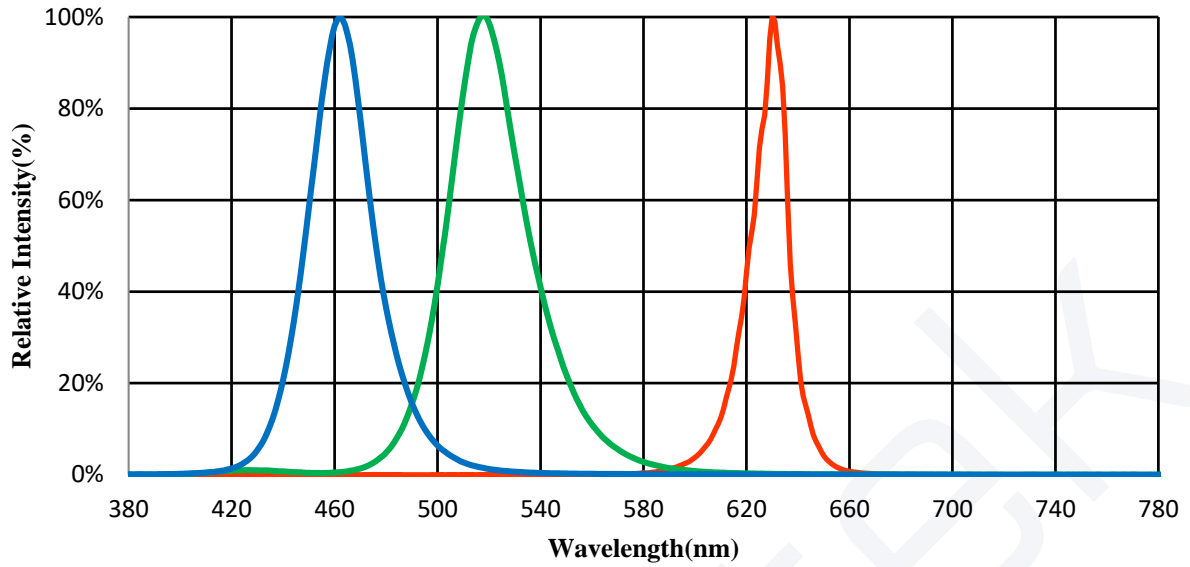
■ Color Coordinate Comparison-White



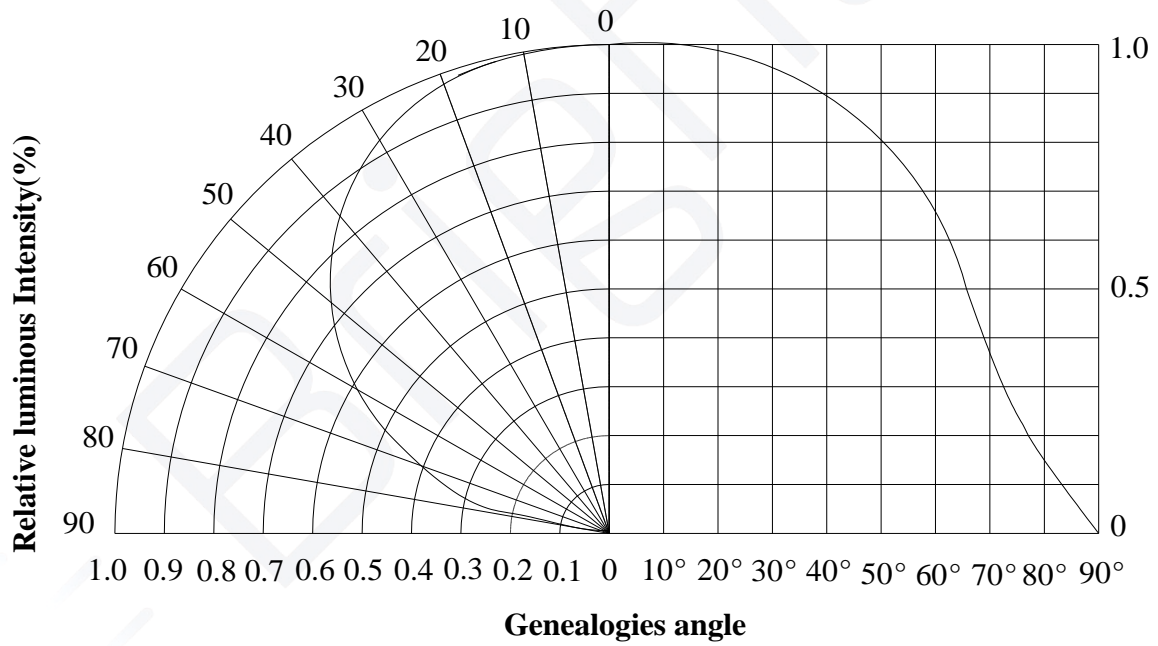
Color Rank

Bin	X	Y	X	Y	X	Y	X	Y
C	0.2865	0.2819	0.3091	0.2712	0.2899	0.2482	0.2667	0.2578
N	0.22	0.2783	0.2406	0.3064	0.2643	0.294	0.2444	0.2672
O	0.2444	0.2672	0.2643	0.294	0.2865	0.2819	0.2667	0.2578
E	0.2667	0.2578	0.2899	0.2482	0.27	0.2227	0.247	0.232
P	0.22	0.2783	0.1996	0.2513	0.2244	0.2407	0.2444	0.2672
Q	0.2444	0.2672	0.2244	0.2407	0.2471	0.232	0.2669	0.2579
R	0.1996	0.2513	0.1792	0.2243	0.2056	0.2148	0.2244	0.2407
S	0.2244	0.2407	0.2056	0.2148	0.2273	0.2061	0.2471	0.232
a	0.2471	0.232	0.2273	0.2061	0.2498	0.1959	0.27	0.2227

■ **Relative Spectral Power Distribution**

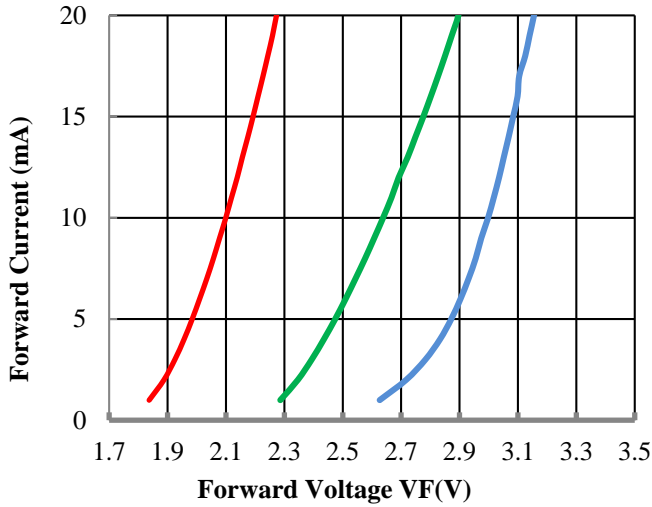


■ **Typical Diagram Characteristics of Radiation**

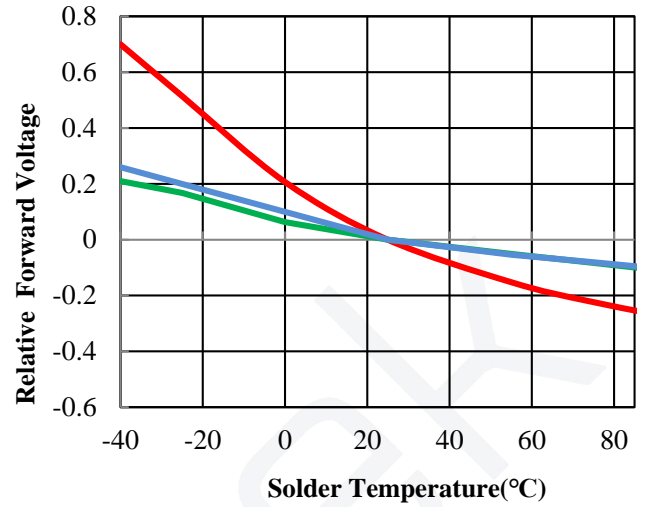


■ Relative Spectral Power Distribution

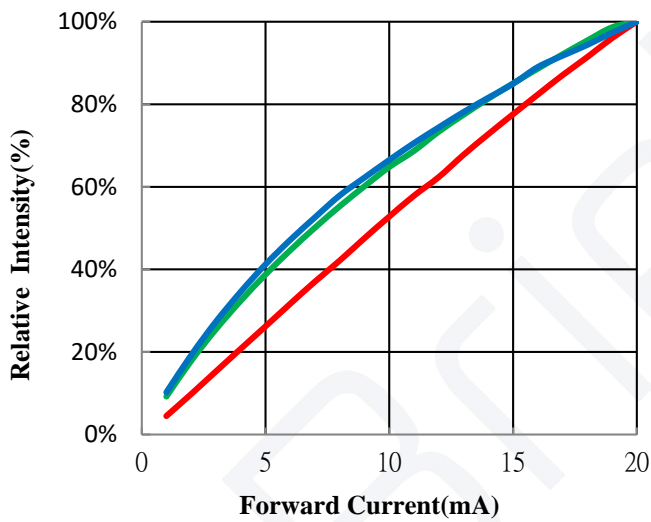
Relative Forward Current vs. Forward Voltage



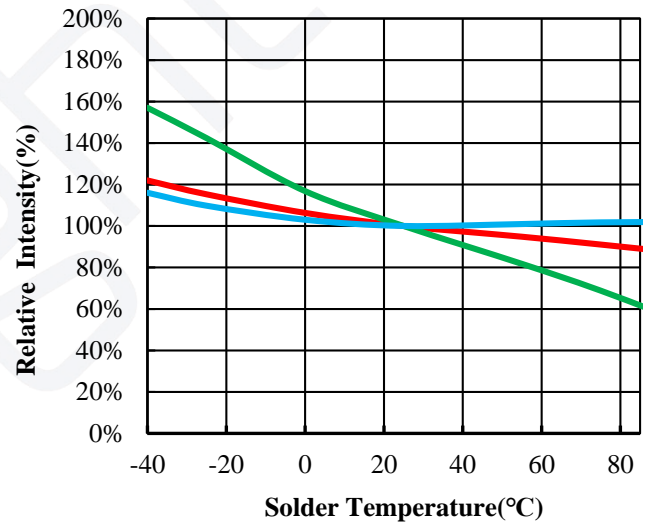
Relative Forward Voltage vs. Solder Temperature



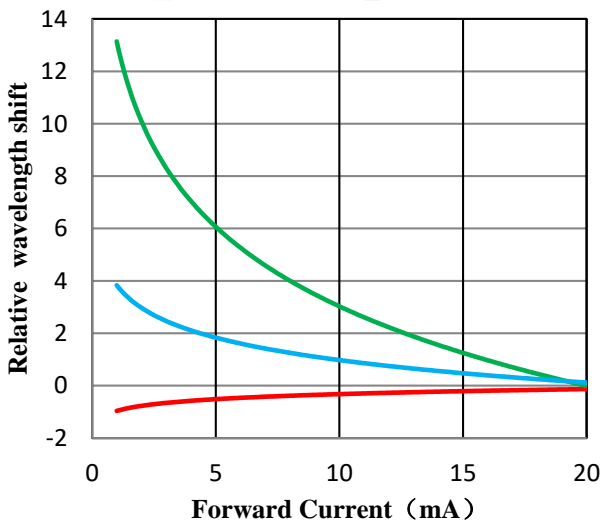
Relative Intensity vs. Forward Current



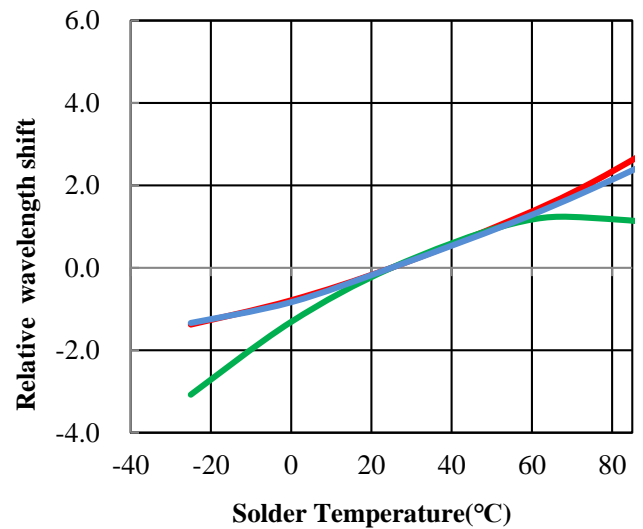
Relative Intensity vs. Solder Temperature



Wavelength shift vs. Forward Current

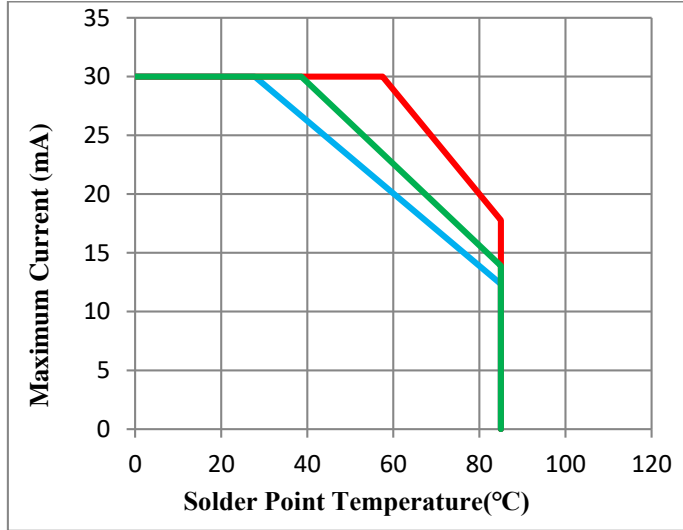


Wavelength shift vs. Solder Temperature

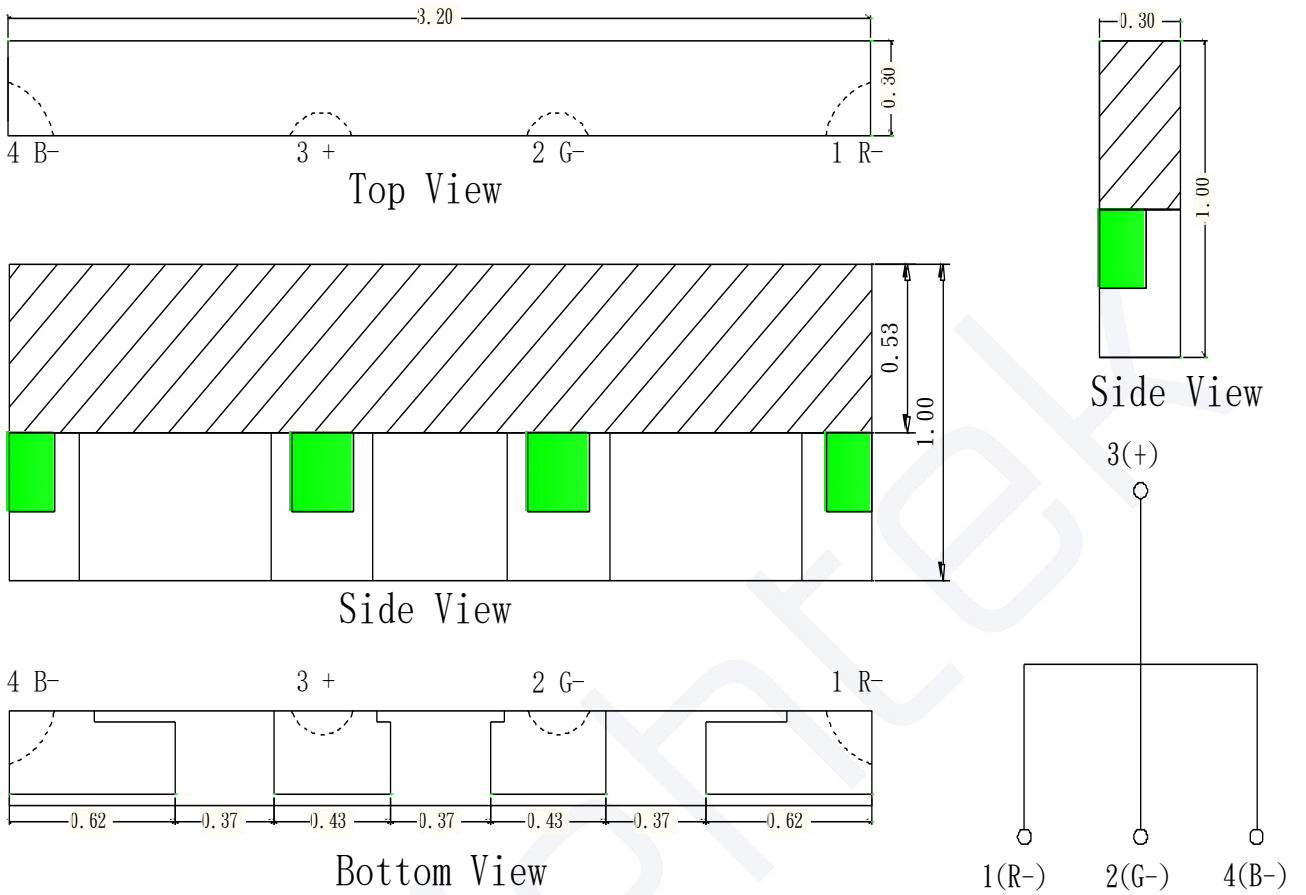


■ Relative Spectral Power Distribution

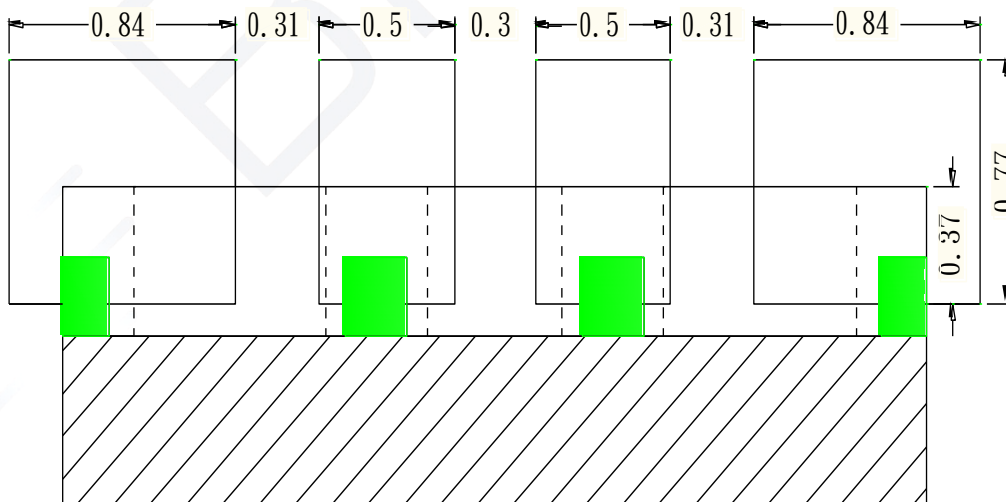
The maximum forward current is determined by the thermal resistance between the LED junction and solder point. It is crucial for the end product to be designed in a manner that minimizes the thermal resistance from the solder point to ambient in order to optimize lamp life and optical characteristics.



■ Dimensions



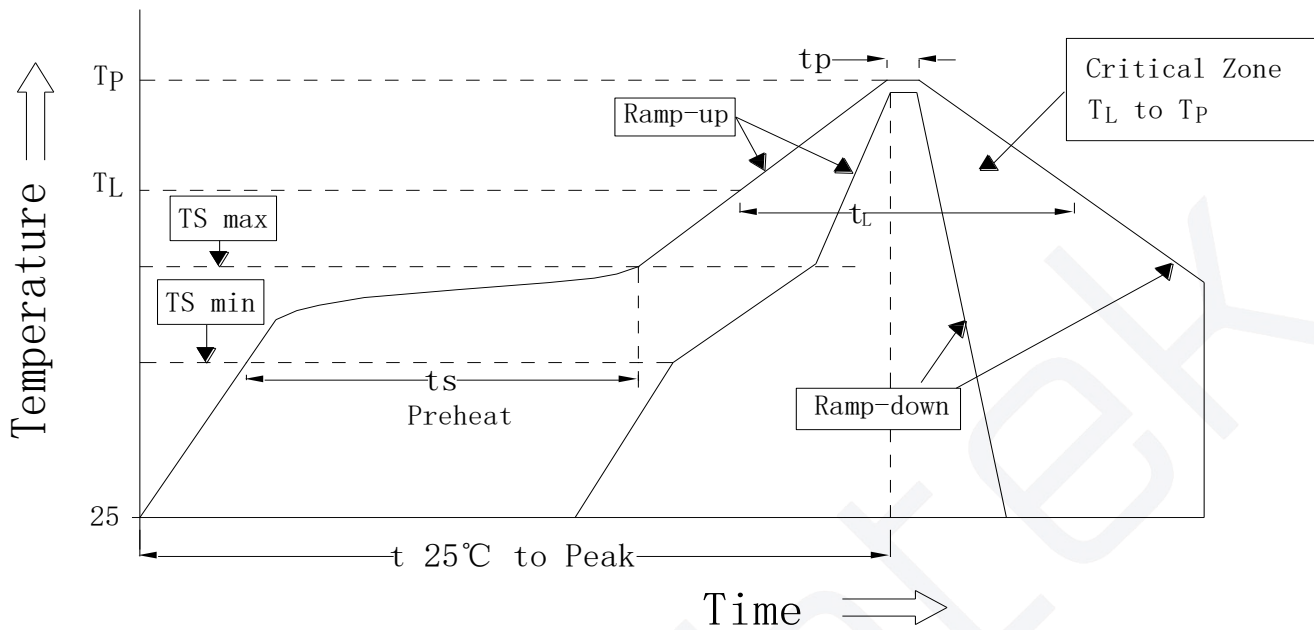
Recommended Solder Pad



- Notes:
1. All dimensions are in millimeters
 2. Tolerance is ± 0.1 mm unless otherwise noted
 3. Specifications are subject to change without notice.

■ Reflow Profile

SMT Reflow Soldering Profile



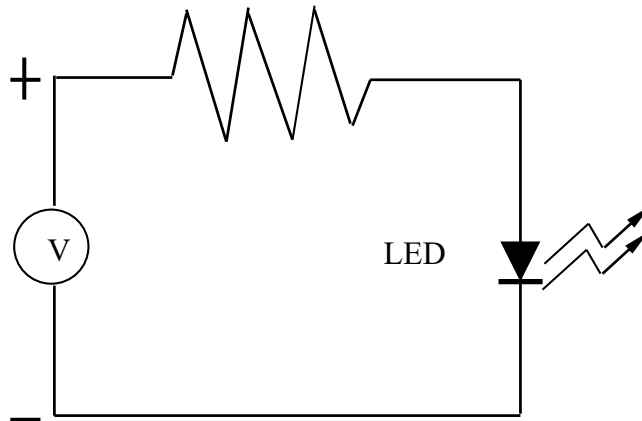
Profile Feature	Symbol	Pb-Free (SnAgCu) Assembly			Unit
		Min.	Recommendation	Max.	
Ramp-up rate to preheat (25°C to 150°C)	-	-	2	3	K/s
Time t_s ($T_S \min$ to $T_S \max$)	t_s	60	100	120	s
Ramp-up rate to peak ($T_S \max$ to T_P)	-	-	2	3	K/s
Liquidus temperature	T_L	-	217	-	°C
Time above liquidus temperature	t_L	-	80	100	s
Peak temperature	T_P	-	245	260	°C
Time within 5 °C of the specified peak temperature $T_P - 5 \text{ K}$	t_p	-	-	10	s
Ramp-down Rate (T_P to 100 °C)	-	-	3	4	K/s
Time 25 °C to T_P	-	-	-	480	s

Notes:

1. Do not stress the silicone resin while it is exposed to high temperature.
2. The reflow process should not exceed 3 times.

■ **Test Circuit and Handling Precautions**

1. Test Circuit



2. Handling Precautions

2.1. Over-current-proof

Customer must apply resistors for protection; otherwise slight voltage shift will cause big current change (Burn out will happen).

2.2. Storage

1). It is recommended to store the products in the following conditions:

Humidity: 60% R.H. Max.

Temperature: 5°C~30°C (41°F~86°F)

2). Shelf life in sealed bag: 12 month at <5°C~30°C and <60% R.H. after the package is Opened, the products should be used within a week or they should be keeping to stored at ≤20%R.H. with zip-lock sealed.

2.3. Baking

If the package has been opened for more than a week or over than 12 months in sealed bag, it is recommended to bake the products with the following instruction:

1). 60±3°C X 6hrs and <5%RH, for reel

2). 125±3°C X 2hrs, for single LED

It shall be normal to see slight color fading of carrier (light yellow) after baking in process