

Americas

147 Central Avenue
Hackensack, NJ 07601
(201) 489-8989
www.cml-it.com

Europe

Robert Bunsen Str. 1
D-67098 Bad Dürkheim
+49 (6322) 9567-0
www.cml-it.com

CMDA31RGB15D13L Power LED on Star PCB
1 Watt - Full Color Emitter (Red, Green, Blue)

- Features

- Super high flux output and high luminance
- Designed for high current operation
- Low thermal resistance
- SMT solder compatible
- Lead (Pb) Free Product – RoHS Compliant

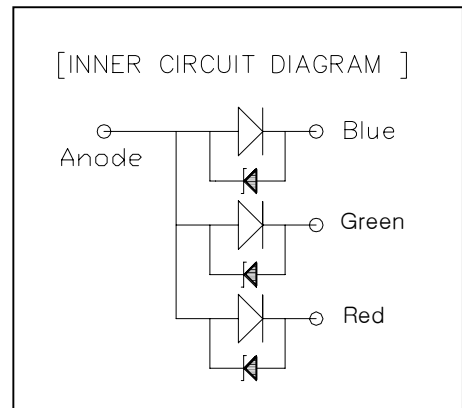
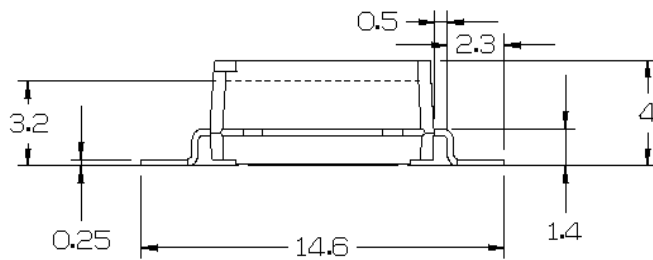
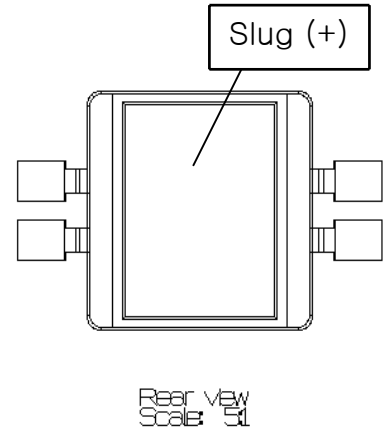
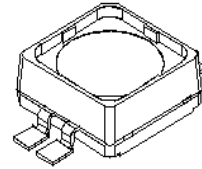
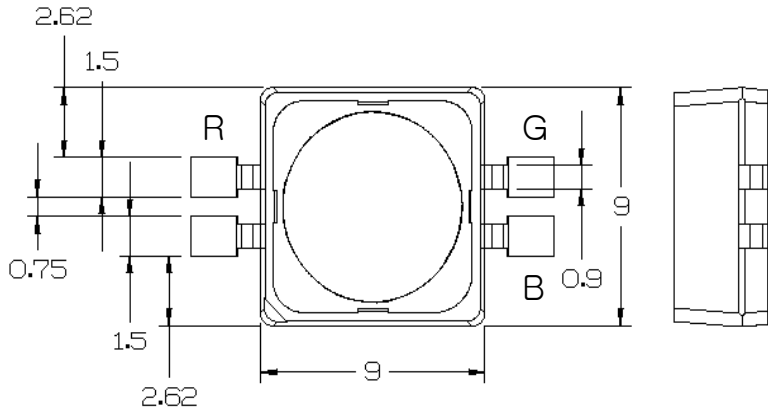
- Applications

- General Illumination
 - Outdoor & Indoor Architectural Lighting
 - Decorative Lighting
 - Portable Lighting / Flash Light (Torch) Lamps
 - Reading Lamps and Task Lighting
 - Traffic Signaling

- Description

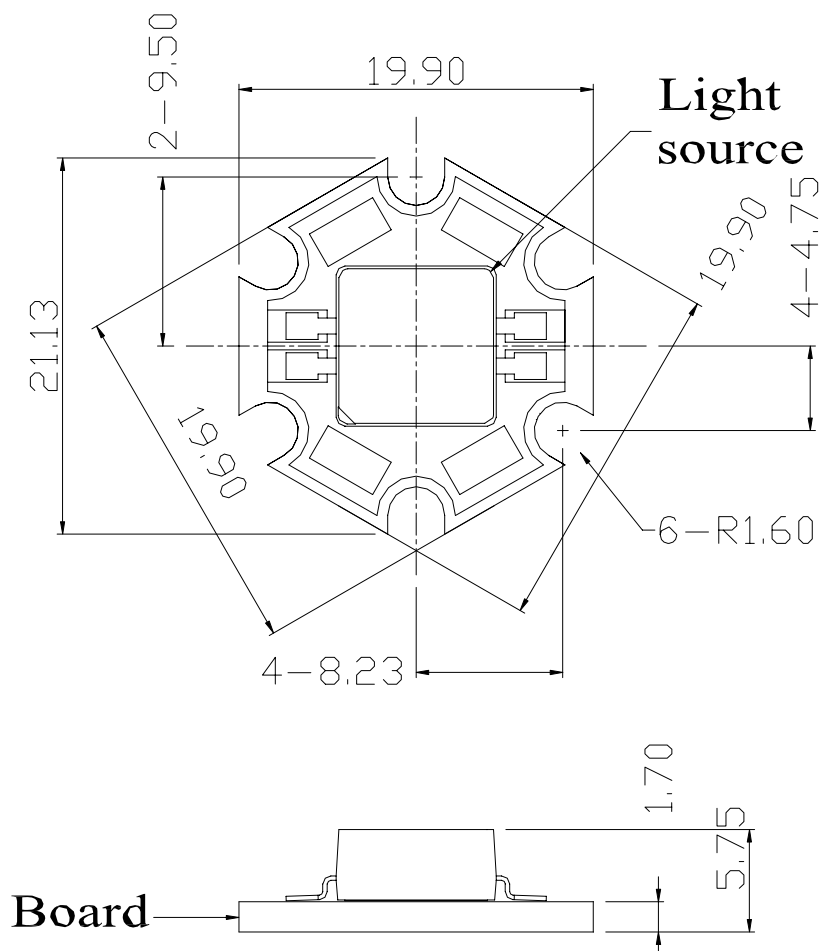
This LED package is designed for high current operation and high flux output applications. The package design features better thermal management characteristics than other LED solutions. Because of these advantages, this product has many applications such as internal & external lighting, automobile lighting, large size LCD backlight, etc.

1. Outline Dimensions



- Notes: 1. All dimensions are in millimeters.
2. Scale: none
3. This drawing is reference only for engineering

1. Metal Outline Dimensions



**CMDA31RGB15D13L
Star PCB**

Note: 1. All dimensions are in millimeters

2. Scale : none

3. This drawing is reference only engineering.

2. Electro-Optical Characteristics (at $T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux ^[1]	Φ_V ^[2]	-	60	-	lm
Correlated Color Temperature ^[3]	CCT	-	6000	-	K
Forward Voltage ^[4]	V_F	-	R: 2.5 , B/G: 3.4	-	V
Forward Current	I_F	R: 237, G:370, B:120			mA

3. Absolute Maximum Ratings (at $T_A=25^{\circ}\text{C}$)

Parameter	Symbol	Value	Unit
Forward Current	I_F	1.2	A
Power Dissipation	P_D	3.5	W
Junction Temperature	T_j	125	$^{\circ}\text{C}$
Operating Temperature	T_{opr}	-30 ~ +85	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-40 ~ +120	$^{\circ}\text{C}$
ESD Sensitivity ^[5]	-	$\pm 20,000\text{V HBM}$	-

*Notes:

[1] CML-IT maintains a tolerance of $\pm 10\%$ on flux and power measurements.

[2] Φ_V is the total luminous flux output as measured with an integrated sphere.

[3] Correlated Color Temperature is derived from the CIE 1931 Chromaticity diagram.
CCT $\pm 5\%$ tester tolerance

[4] A tolerance of $\pm 0.06\text{V}$ on forward voltage measurements

[5] Break voltage of Metal PCB is 6.5kVAC

[6] The emitter does include a Zener chip to protect the product from ESD.

-----Caution-----

Please do not drive at rated current more than 5 sec. without proper heat sink

2. Electro-Optical Characteristics (at $I_F=350\text{mA}$, $T_A=25^\circ\text{C}$)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux ^[1]	Φ_V ^[1]	22	30	-	lm
Dominant Wavelength ^[3]	λ_D	618	625	632	nm
Forward Voltage ^[4]	V_F	2.0	2.5	3.0	V
View Angle	2Θ 1/2	128			deg.
Thermal Resistance ^[5]	$R\Theta_{J-B}$	12			$^\circ\text{C}/\text{W}$

3. Absolute Maximum Ratings (at $T_A=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Forward Current	I_F	0.4	A
Power Dissipation	P_D	1.2	W
Junction Temperature	T_J	100	$^\circ\text{C}$
Operating Temperature	T_{opr}	-30 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +120	$^\circ\text{C}$
ESD Sensitivity ^[6]	-	$\pm 20,000\text{V}$ HBM	-

*Notes:

[1] CML-IT maintains a tolerance of $\pm 10\%$ on flux and power measurements.

[2] Φ_V is the total luminous flux output as measured with an integrated sphere.

[3] Dominant wavelength is derived from the CIE 1931 Chromaticity diagram.

A tolerance of $\pm 0.5\text{nm}$ for dominant wavelength

[4] A tolerance of $\pm 0.06\text{V}$ on forward voltage measurements

[5] $R\Theta_{J-B}$ is measured with a SSC metal core PCB ($25^\circ\text{C} \leq T_J \leq 110^\circ\text{C}$).

Break voltage of Metal PCB is 6.5kVAC

[6] The emitter does include a Zener chip to protect the product from ESD.

-----Caution-----

Please do not drive at rated current more than 5 sec. without proper heat sink

Green

2. Electro-Optical Characteristics (at $I_F=350\text{mA}$, $T_A=25^\circ\text{C}$)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux ^[1]	Φ_V ^[2]	24	48	-	lm
Dominant Wavelength ^[3]	λ_D	520	527	535	nm
Forward Voltage ^[4]	V_F	3.0	3.5	4.0	V
View Angle	2Θ 1/2	130			deg.
Thermal Resistance ^[5]	$R\Theta_{J-B}$	8			$^\circ\text{C}/\text{W}$

3. Absolute Maximum Ratings (at $T_A=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Forward Current	I_F	0.4	A
Power Dissipation	P_D	1.6	W
Junction Temperature	T_j	125	$^\circ\text{C}$
Operating Temperature	T_{opr}	-30 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +120	$^\circ\text{C}$
ESD Sensitivity ^[6]	-	$\pm 20,000\text{V}$ HBM	-

*Notes:

[1] CML-IT maintains a tolerance of $\pm 10\%$ on flux and power measurements.

[2] Φ_V is the total luminous flux output as measured with an integrated sphere.

[3] Dominant wavelength is derived from the CIE 1931 Chromaticity diagram.

A tolerance of $\pm 0.5\text{nm}$ for dominant wavelength

[4] A tolerance of $\pm 0.06\text{V}$ on forward voltage measurements

[5] $R\Theta_{J-B}$ is measured with a SSC metal core PCB ($25^\circ\text{C} \leq T_j \leq 110^\circ\text{C}$).

Break voltage of Metal PCB is 6.5kVAC

[6] The emitter does include a Zener chip to protect the product from ESD.

-----Caution-----

Please do not drive at rated current more than 5 sec. without proper heat sink

2. Electro-Optical Characteristics (at $I_F=350\text{mA}$, $T_A=25^\circ\text{C}$)

Parameter	Symbol	Value			Unit
		Min	Typ	Max	
Luminous Flux ^[1]	Φ_V ^[2]	6	11	-	lm
Dominant Wavelength ^[3]	λ_D	455	460	475	nm
Forward Voltage ^[4]	V_F	3.0	3.5	4.0	V
View Angle	2Θ 1/2	130			deg.
Thermal Resistance ^[5]	$R\Theta_{J-B}$	8			$^\circ\text{C}/\text{W}$

3. Absolute Maximum Ratings (at $T_A=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Forward Current	I_F	0.4	A
Power Dissipation	P_D	1.6	W
Junction Temperature	T_j	125	$^\circ\text{C}$
Operating Temperature	T_{opr}	-30 ~ +85	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +120	$^\circ\text{C}$
ESD Sensitivity ^[6]	-	$\pm 20,000\text{V}$ HBM	-

*Notes:

[1] CML-IT maintains a tolerance of $\pm 10\%$ on flux and power measurements.

[2] Φ_V is the total luminous flux output as measured with an integrated sphere.

[3] Dominant wavelength is derived from the CIE 1931 Chromaticity diagram.

A tolerance of $\pm 0.5\text{nm}$ for dominant wavelength

[4] A tolerance of $\pm 0.06\text{V}$ on forward voltage measurements

[5] $R\Theta_{J-B}$ is measured with a SSC metal core PCB ($25^\circ\text{C} \leq T_j \leq 110^\circ\text{C}$).

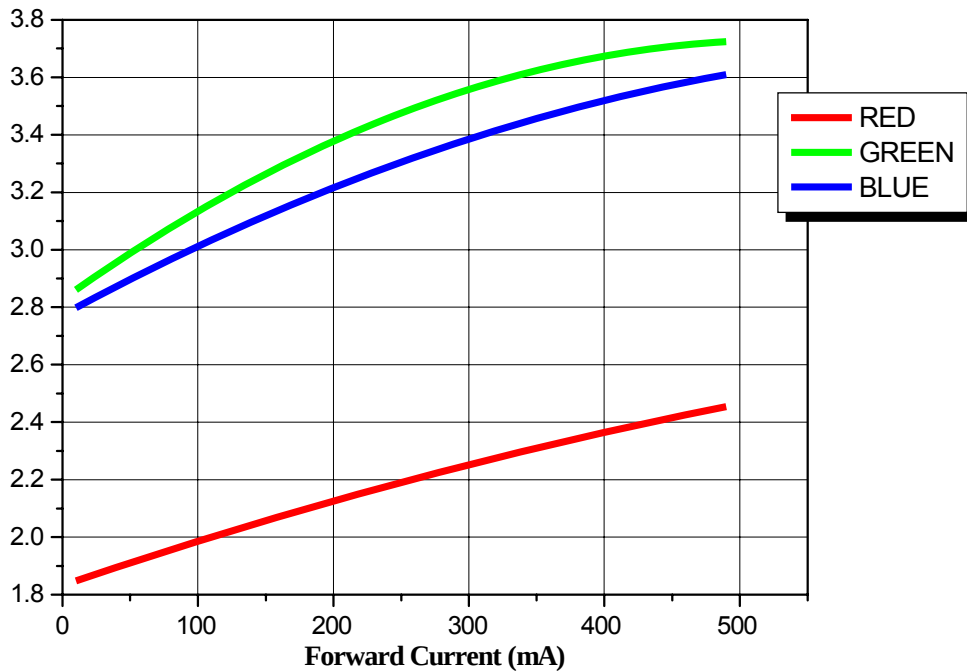
Break voltage of Metal PCB is 6.5kVAC

[6] The emitter does include a Zener chip to protect the product from ESD.

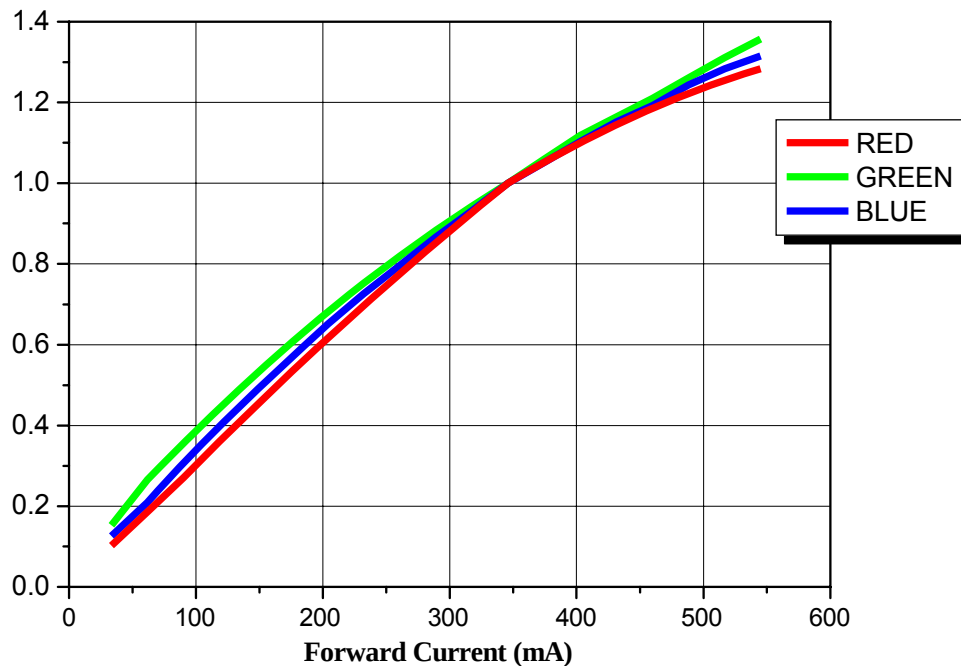
-----Caution-----

1. Please do not drive at rated current more than 5 sec. without proper heat sink
2. Blue power light sources represented here are IEC825 Class 2 for eye safety

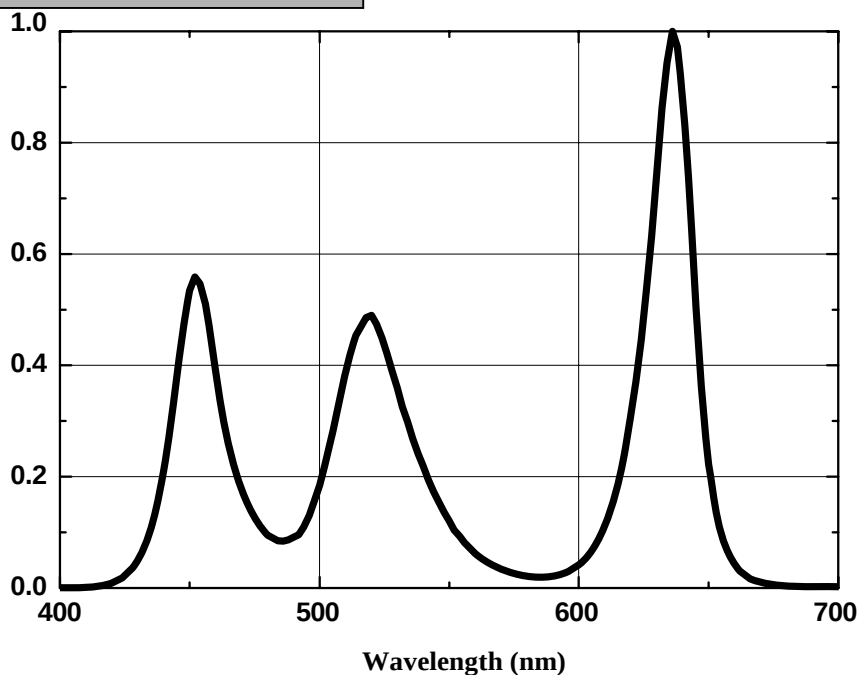
4. Forward Voltage vs. Forward Current (Ta=25 °C)



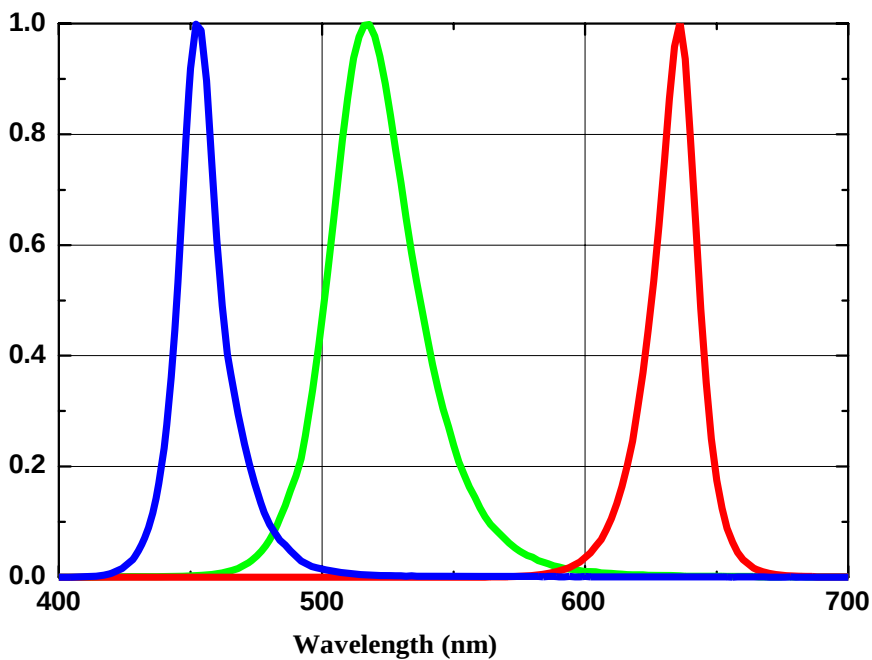
5. Forward Current vs. Normalized Relative Luminous Flux (Ta=25 °C)



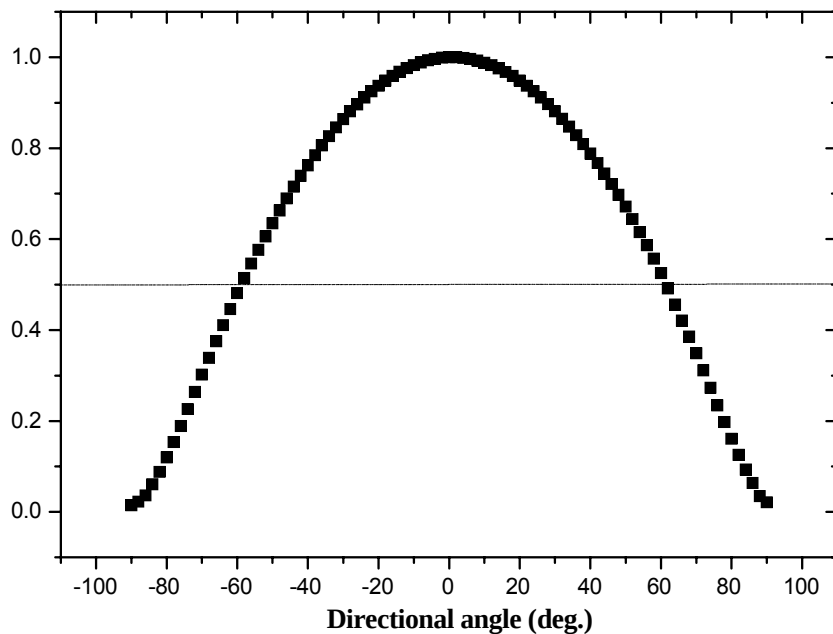
6. Spectrum for White (Ta=25 °C)



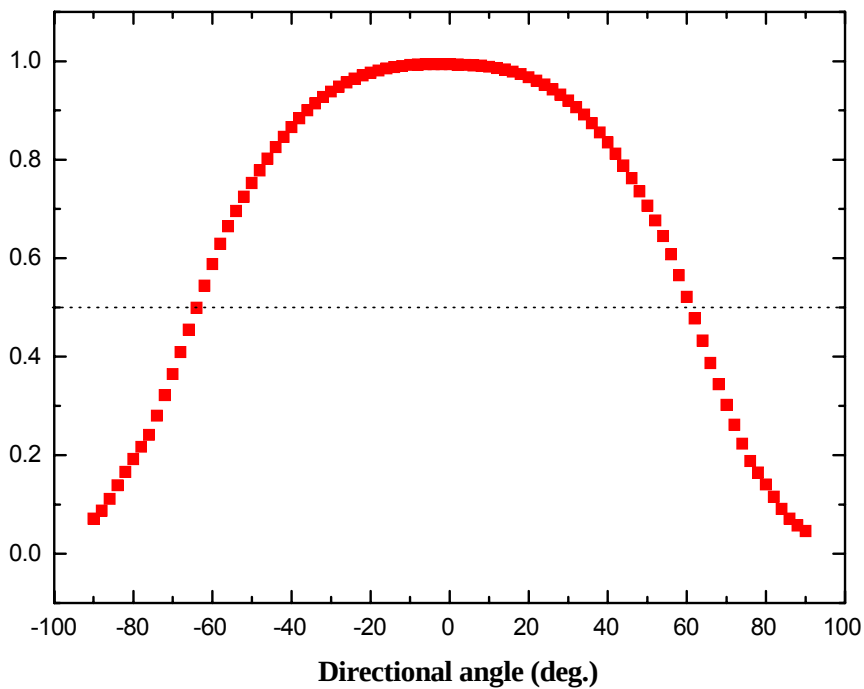
7. Wavelength Curve for Red, Green, Blue (Ta=25 °C)



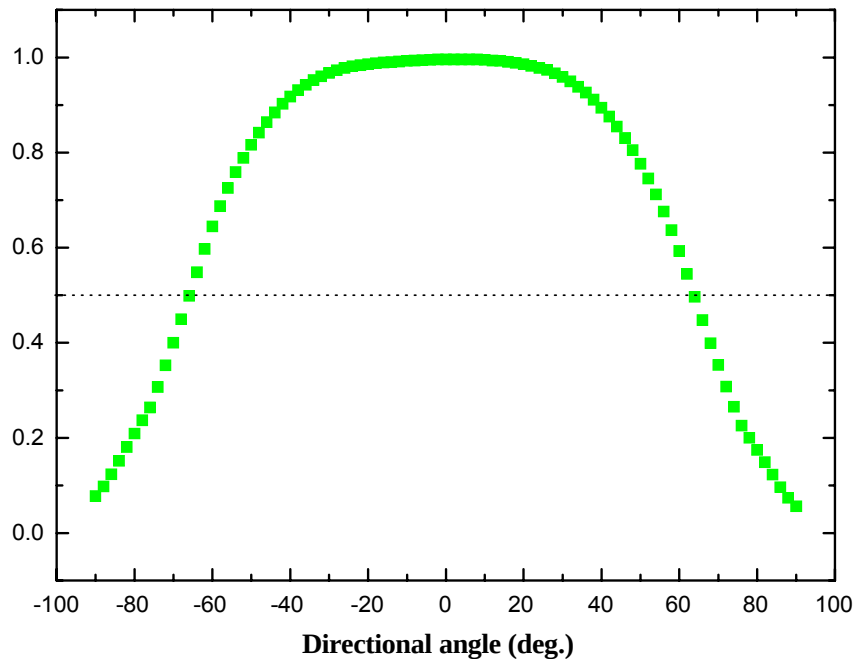
8. Radiant pattern for White



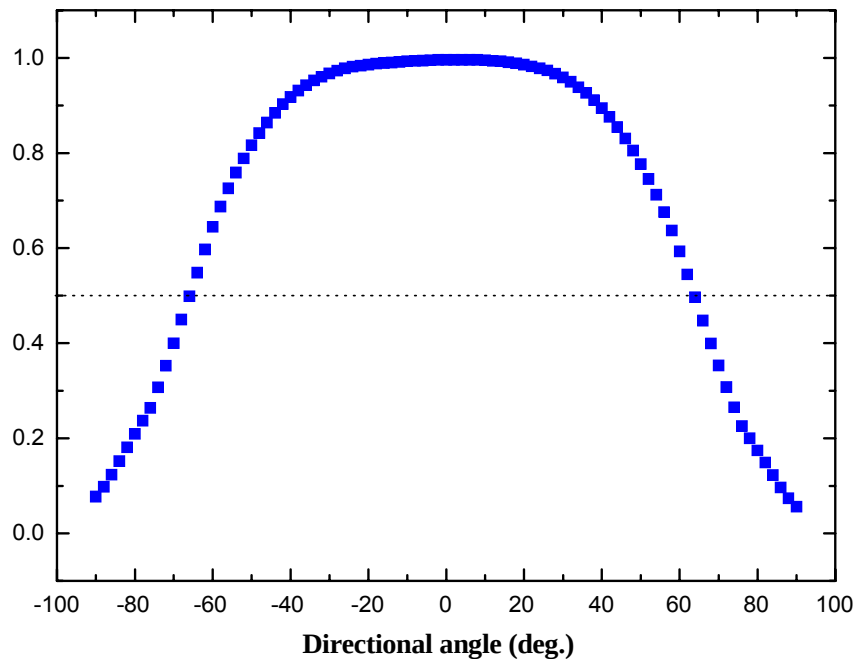
9. Radiant pattern for Red



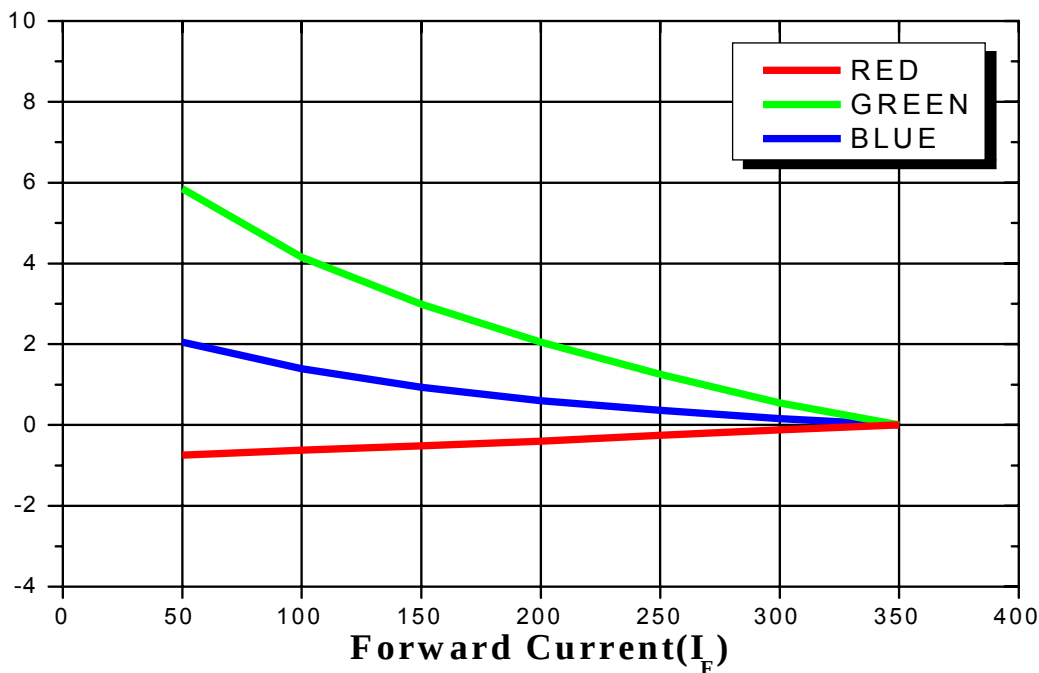
10. Radiant pattern for Green



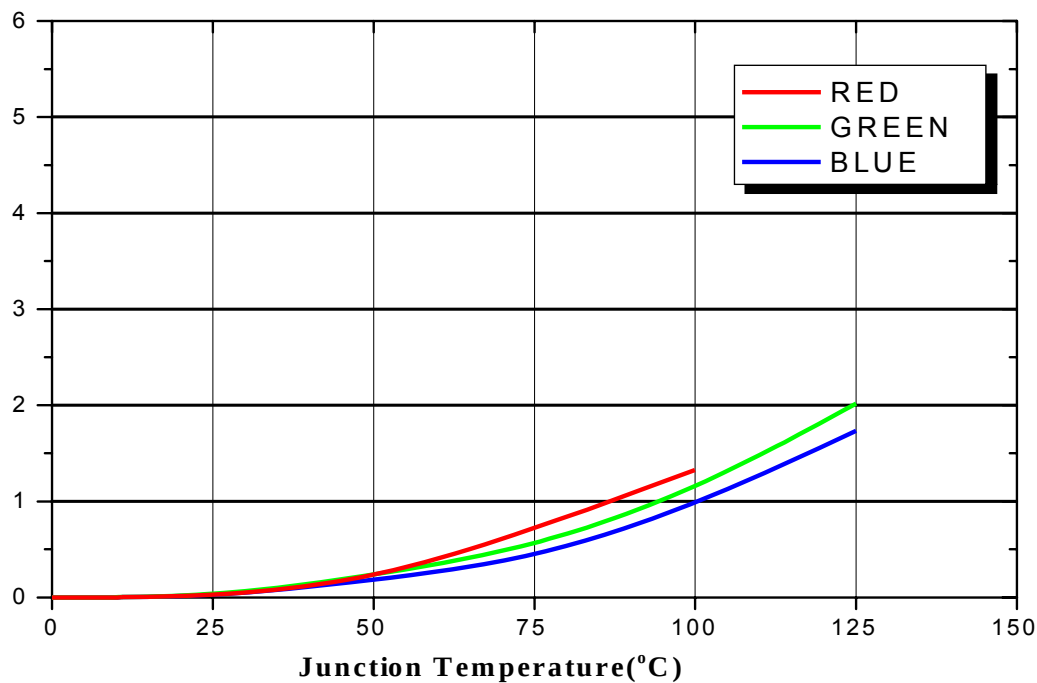
11. Radiant pattern for Blue



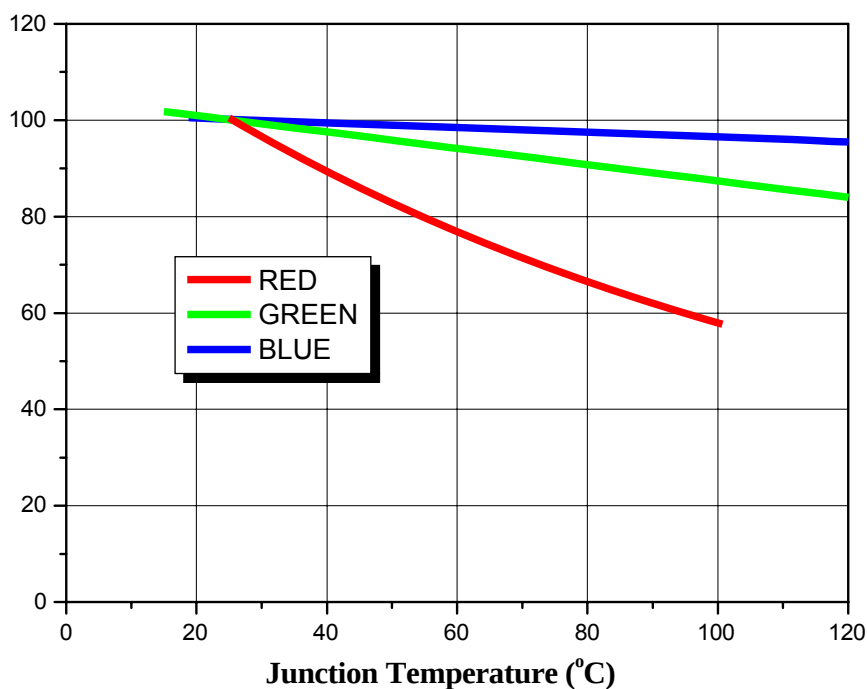
12. Forward Current vs. Wavelength shift ($T_a=25^\circ\text{C}$)



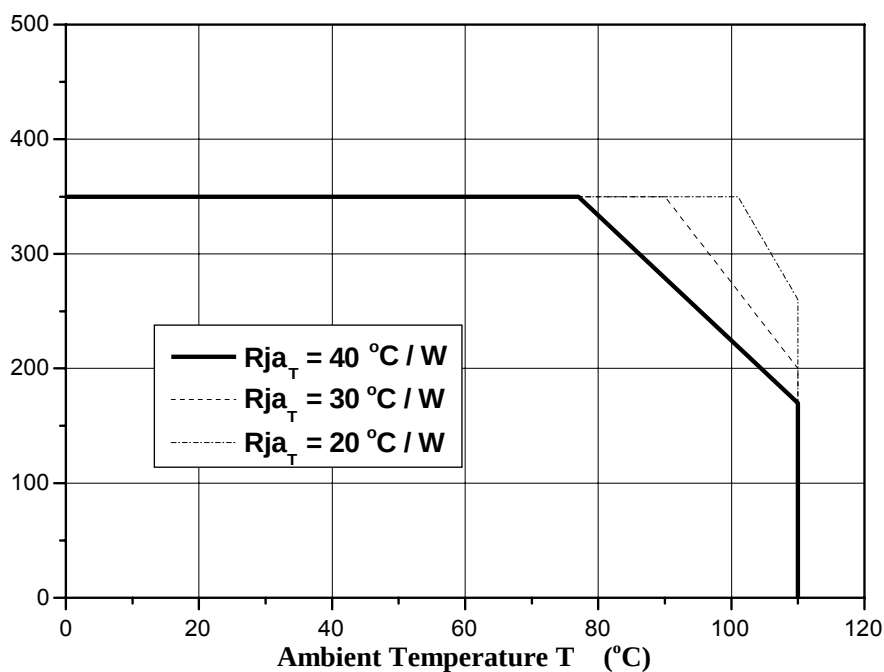
13. Junction Temp vs. Wavelength shift ($T_a=25^\circ\text{C}$)



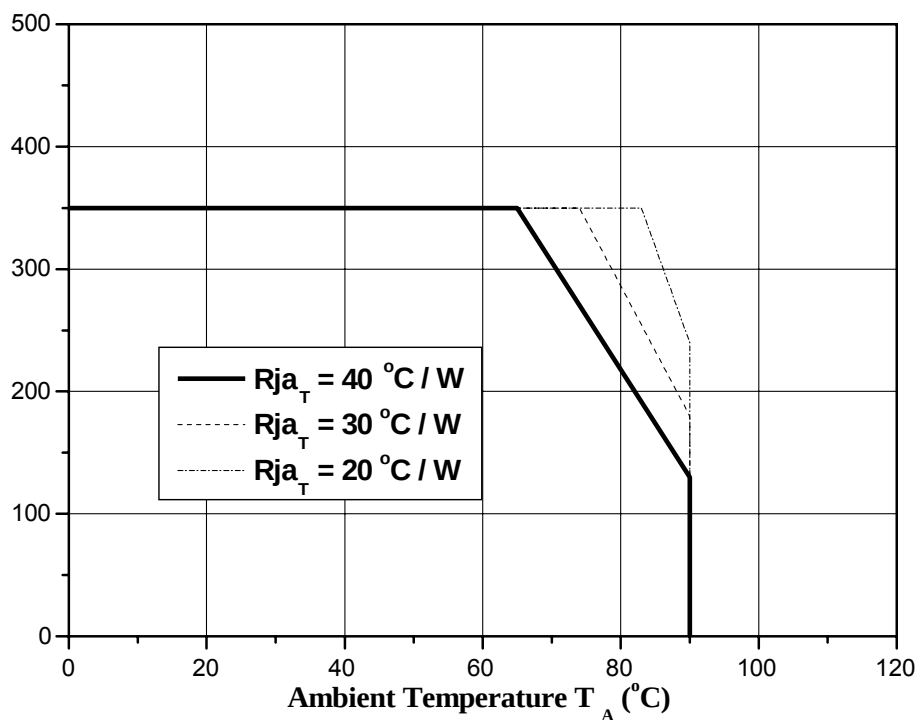
14. Temperature of Junction vs. Relative Light Output for Blue, Green, Red ($T_a=25^\circ\text{C}$)



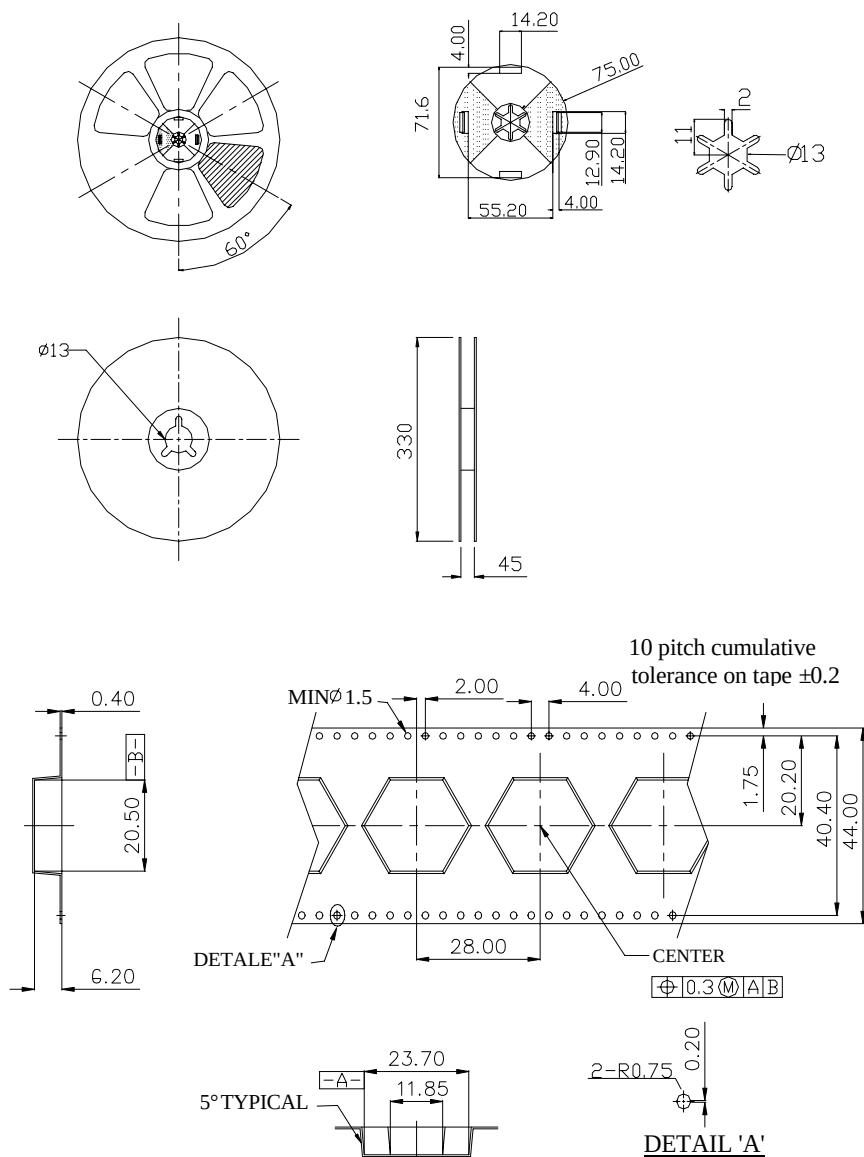
15. Ambient Temperature vs. Allowable Forward Current for 1 chip Blue, Green



16. Ambient Temperature vs. Allowable Forward Current for 1 chip Red,



17. Reel Packaging Dimensions (Star type)



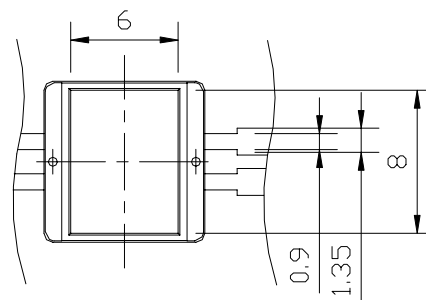
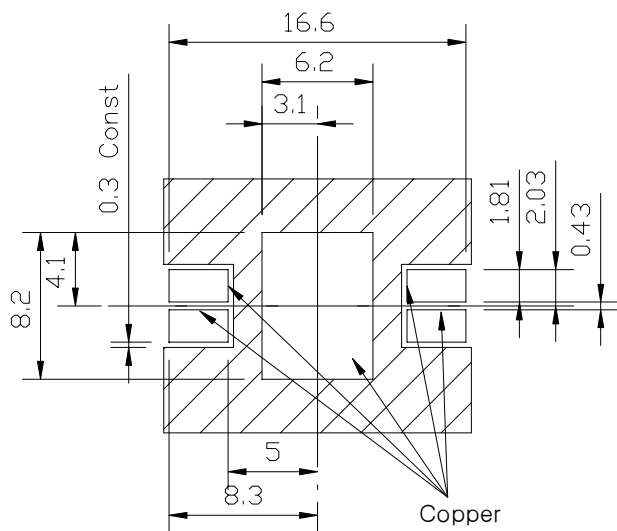
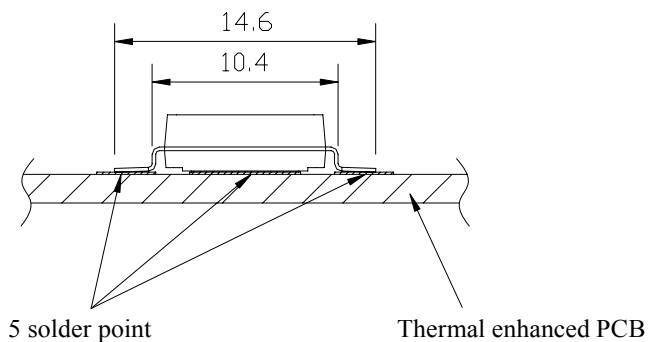
Note : 1. The number of loaded products in the reel is 100 pieces

2. All dimensions are in millimeters

3. Scale : none

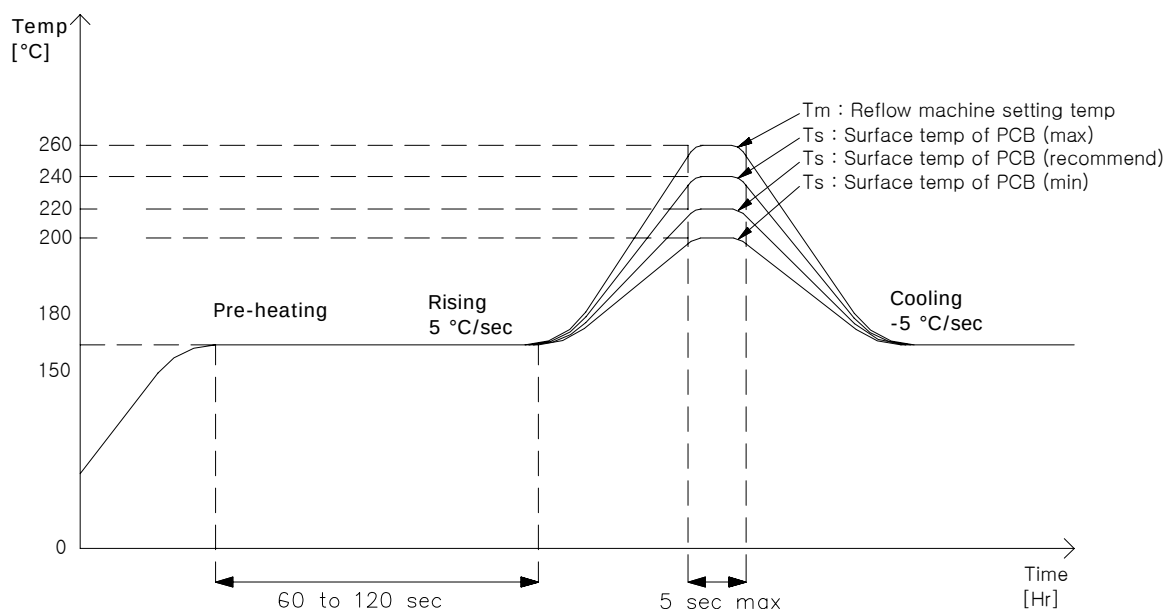
4. This drawing is reference only engineering

18. Recommended solder pad



19. Soldering Profile

(1) Reflow Soldering Conditions / Profile



(2) Hand Soldering conditions

- Lead : Not more than 3 seconds @ MAX280°C
- Slug : Use a thermal-adhesives

* Caution

1. Reflow soldering should not be done more than one time.
2. Repairing should not be done after the LED's have been soldered. When repairing is unavoidable, suitable tools must be used.
3. Die slug is to be soldered.
4. When soldering, do not put stress on the LED's during heating.
5. After soldering, do not warp the circuit board.
6. Recommend to use a convection type reflow machine with 7 ~ 8 zones.