

EL TOP VIEW LED XI3030-RGB200BH-AM

Preliminary



Features

- Color : Red, Green, Blue
- Package size : 3.0 x 3.0 x 0.6 mm
- Luminous Flux: Red 23~33lm, Green 30~45lm, Blue 8~13lm
- Viewing angle : 120°
- ESD(HBM) : 2kV
- MSL : 2
- Qualified AEC-Q102
- Corrosion Robustness Class: A1
- The product itself will remain within RoHS compliant version
- Compliance with EU REACH
- Compliance Halogen Free .(Br <900 ppm , Cl <900 ppm , Br+Cl < 1500 ppm)

Applications

- Automotive exterior lighting
- Automotive interior lighting
- Ambient light
- Switches

Contents

1. Characteristics	3
2. Absolute Maximum Ratings	4
3. Characteristics Graph	5
4. Binning Information	10
5. Part Number.....	12
6. Ordering Information	13
7. Mechanical Dimension.....	14
8. Recommended Soldering Pad.....	15
9. Reflow Soldering Profile.....	15
10. Packaging Information.....	16
11. Precaution for Use	18

1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	Red	I_F	10	200	250	mA	---
	Green		10	200	250		
	Blue		10	200	250		
Luminous flux ^{[1][2]}	Red	I_v	23	---	33	lm	$I_F=200mA$
	Green		30	---	45		
	Blue		8	---	13		
Forward Voltage ^{[2][3][4]}	Red	V_F	1.75	2.25	2.75	V	$I_F=200mA$
	Green		2.75	3.25	3.75		
	Blue		2.75	3.25	3.75		
Dominant Wavelength ^{[2][5]}	Red	λ_d	617	---	631	nm	$I_F=200mA$
	Green		520	---	534		
	Blue		456	---	470		
Viewing Angle	Red	2ϕ	---	120	---	deg	$I_F=200mA$
	Green		---	120	---		
	Blue		---	120	---		
Thermal Resistance (Junction to Solder)	Real	Red	---	20	---	K/W	$I_F=200mA$
		Green	---	54	---		
		Blue	---	58	---		
	Electrical	Red	---	15	---	K/W	$I_F=200mA$
		Green	---	39	---		
		Blue	---	41	---		

Notes:

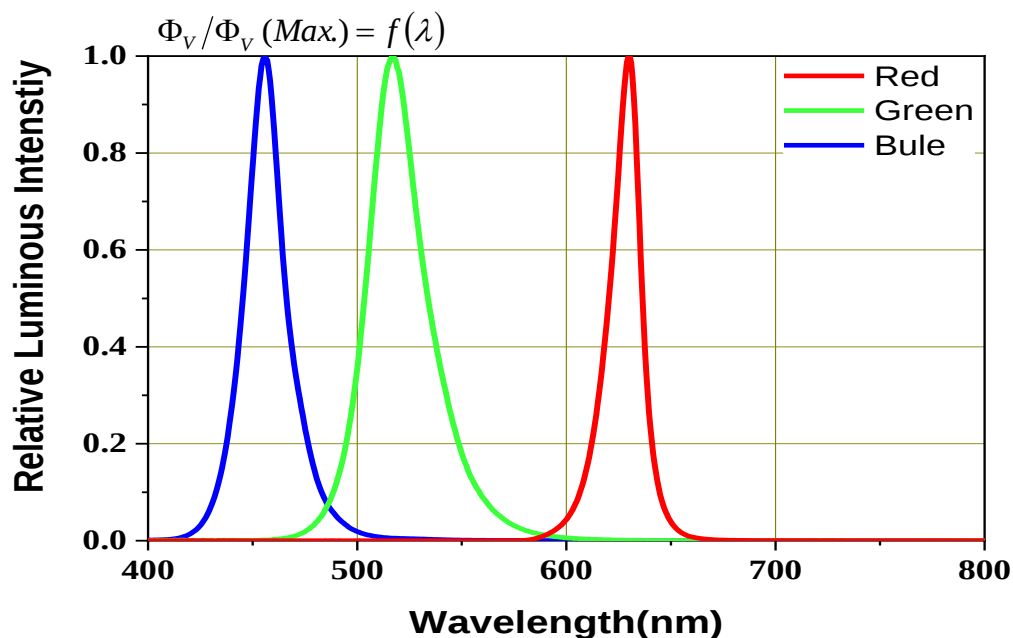
1. Measurement tolerance of Brightness: $\pm 8\%$
2. The measured data at thermal pad=25°C
3. Measurement tolerance of Forward voltage: $\pm 0.05V$
4. The V_F range shown in the table above indicates 99% output
5. Measurement tolerance of Dominant Wavelength : $\pm 1nm$

2. Absolute Maximum Ratings

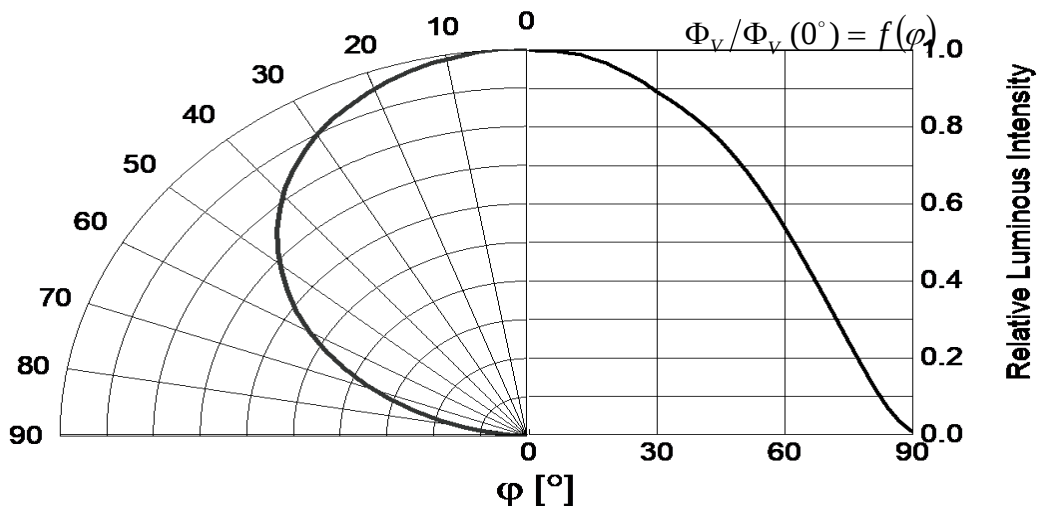
Parameter	Symbol	Ratings			Unit
		Red	Green	Blue	
Power Dissipation	P_d	687.5	937.5	937.5	mW
Forward Current	I_F	250			mA
Reverse Voltage	V_R	Not designed for reverse operation			V
Junction Temperature	T_J	150			°C
Operating Temperature	T_{opr}	-40 ~ +125			°C
Storage Temperature	T_{stg}	-40 ~ +125			°C
ESD Sensitivity (R=1.5kΩ, C= 100pF)	ESD_{HBM}	2			KV
Soldering Temperature	Reflow	260°C for 30sec			°C

3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution
@ Ts = 25°C, If=200mA



Typical Diagram Characteristics of Radiation
@ Ts = 25°C, If=200mA

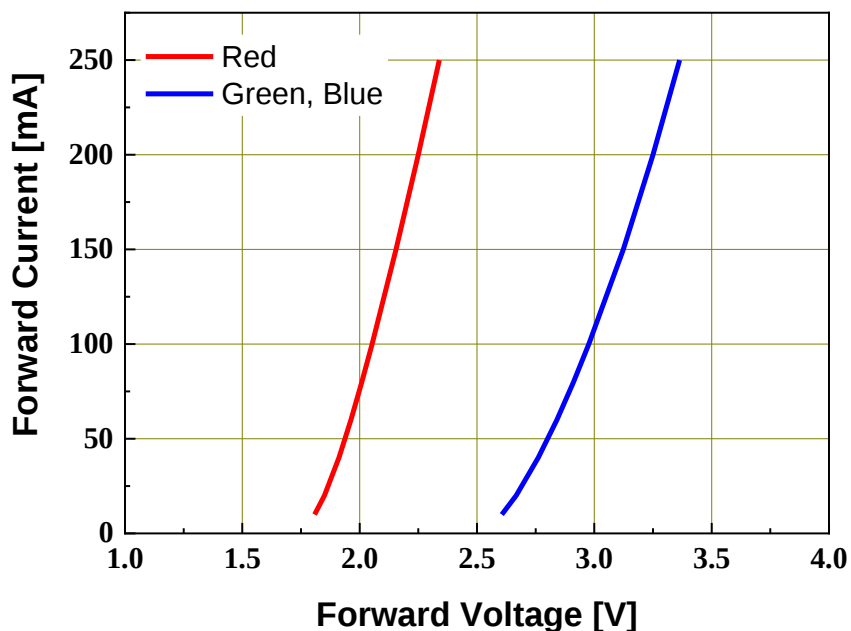


Notes:

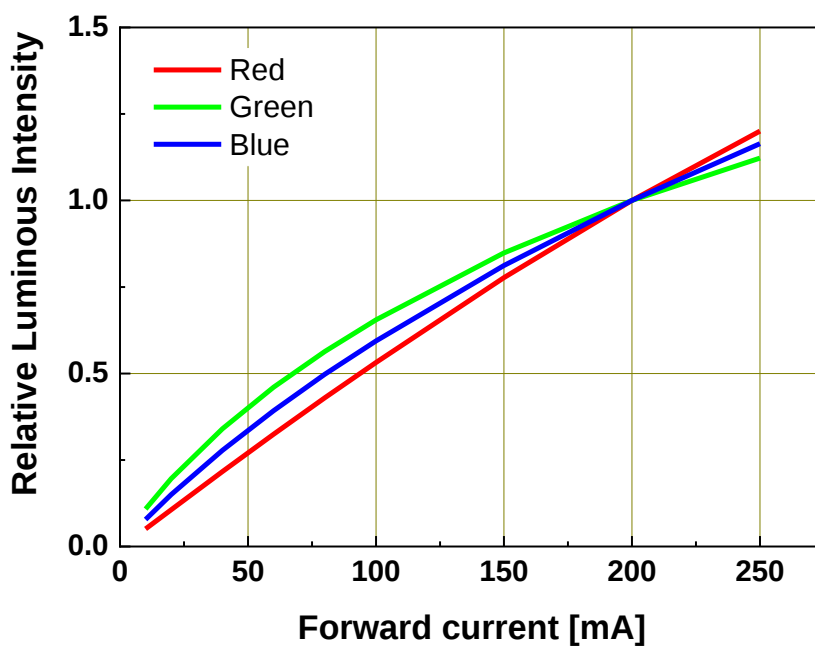
1. φ is the off axis angle from lamp center line where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is ± 5°.

Forward Current vs. Forward Voltage @ Ts = 25°C

$$I_F = f(V_F)$$

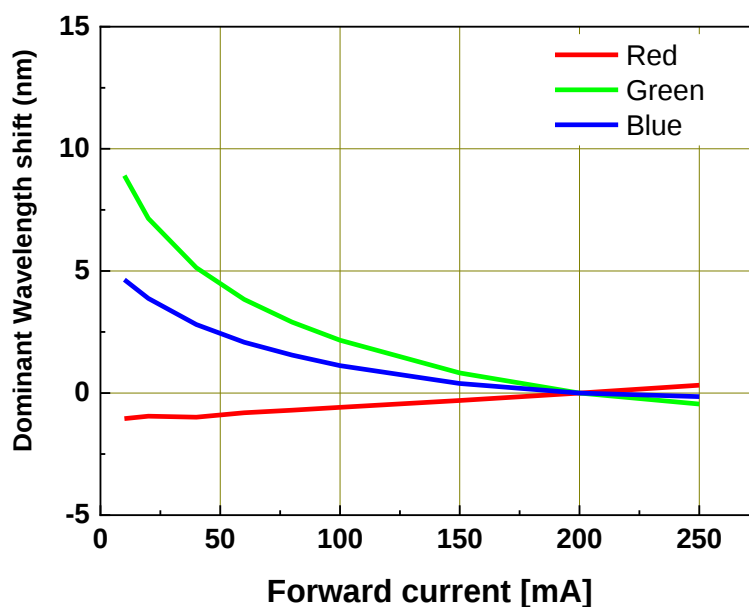


Relative Luminous Intensity vs. Forward Current @ Ts = 25°C



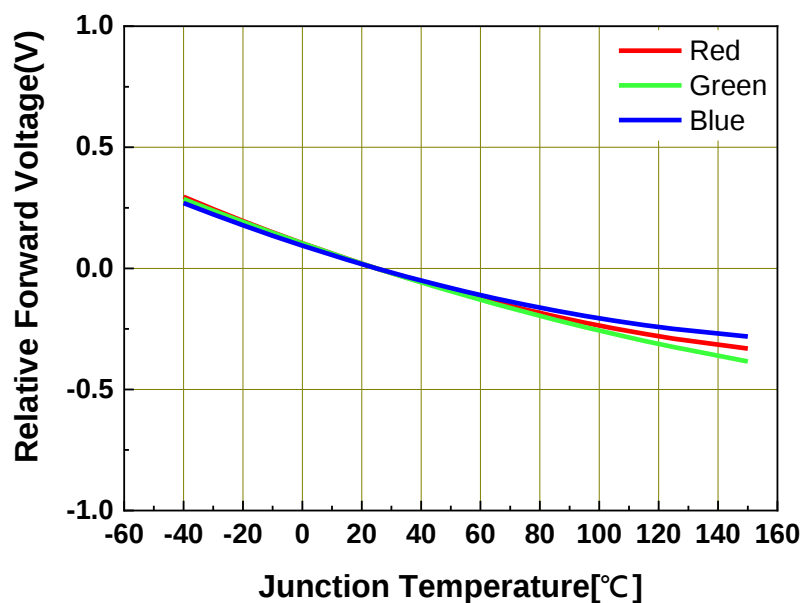
Dominant Wavelength shift vs. Forward Current @ Ts = 25°C

$$\lambda_d = f(I_F)$$

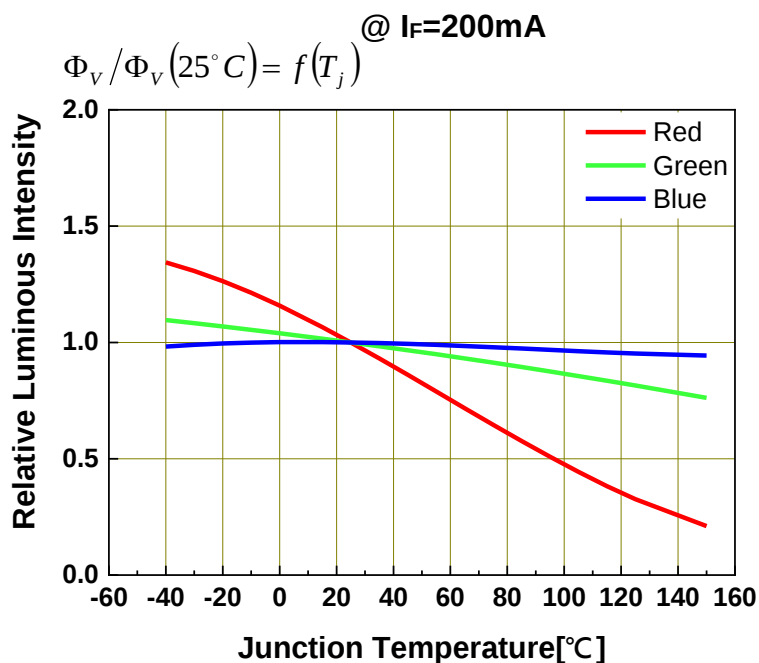


Relative Forward Voltage vs. Junction Temperature @ IF=200mA

$$\Delta V_F = V_F - V_F(25^\circ C) = f(T_j)$$



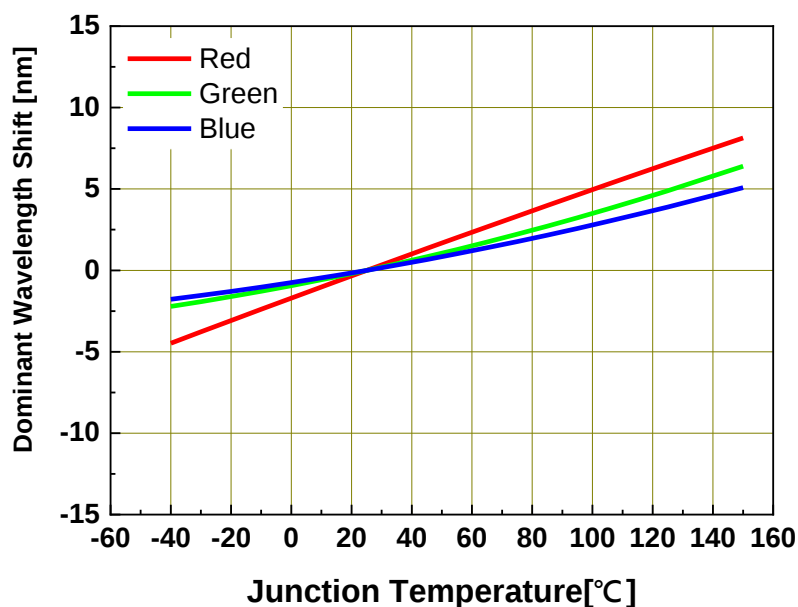
Relative Luminous Intensity vs. Junction Temperature



Dominant Wavelength Shift vs. Junction Temperature

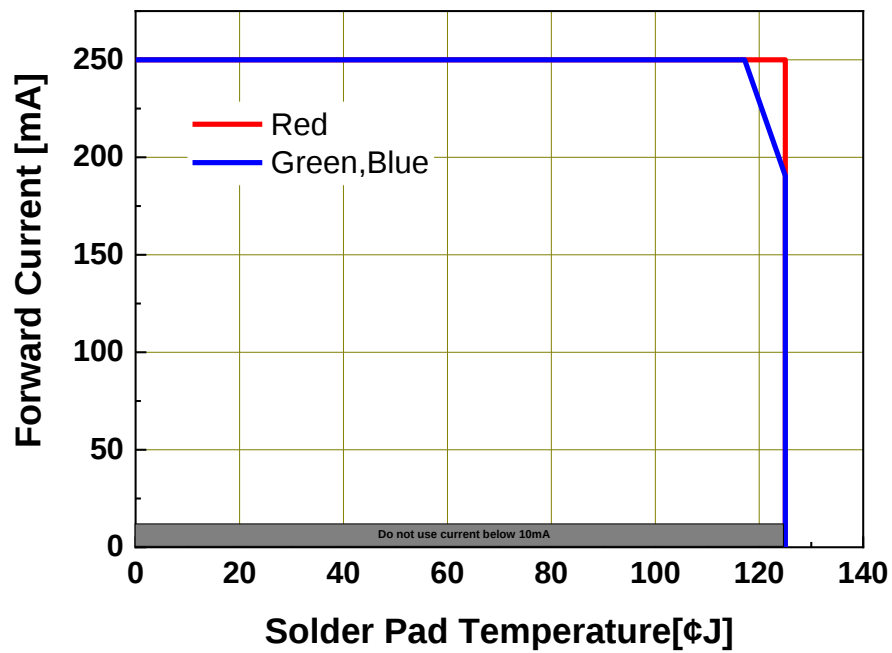
@ $I_F=200\text{mA}$

$$\Delta\lambda_d = \lambda_d - \lambda_d(25^\circ\text{C}) = f(T_j)$$



Forward Current Derating Curve

$$I_F = f(T_S)$$



4. Binning Information

Luminous Flux Bins

Color	Bin Code	Minimum Luminous Flux (lm)	Maximum Luminous Flux (lm)
Red	E9	23	27
	E9H	25	30
	F1	27	33
Green	F1H	30	36
	F2	33	39
	F2H	36	42
	F3	39	45
Blue	E4	8	10
	E4H	9	11.5
	E5	10	13

Notes:

1. Measurement tolerance of Brightness: $\pm 8\%$.

Dominant Wavelength Bins

Color	Bin Code	Minimum Dominant Wavelength [nm]	Maximum Dominant Wavelength [nm]
Red	R3	617	622
	R4	620	625
	R5	623	628
	R6	626	631
Green	G2	520	525
	G3	523	528
	G4	526	531
	G5	529	534
Blue	B4	456	461
	B5	459	464
	B6	462	467
	B7	465	470

Notes:

1. Measurement tolerance of Dominant wavelength: $\pm 1\text{nm}$

Forward Voltage Bins

Color	Bin Code	Minimum Forward Voltage [V]	Maximum Forward Voltage [V]
Red	1720	1.7	2
	1821	1.85	2.15
	2023	2	2.3
	2124	2.15	2.45
	2326	2.3	2.6
	2427	2.45	2.75
Green	2730	2.75	3.05
	2932	2.9	3.2
	3033	3.05	3.35
	3235	3.2	3.5
	3336	3.35	3.65
	3537	3.5	3.75
Blue	2730	2.75	3.05
	2932	2.9	3.2
	3033	3.05	3.35
	3235	3.2	3.5
	3336	3.35	3.65
	3537	3.5	3.75

Notes:

1. Measurement tolerance of Forward voltage: $\pm 0.05V$
2. Forward voltage bins are defined at I_F = Typical Input current

5. Part Number

XI3030-RGB200BH-AM

Part number is designated with below details

XI3030 = Product family name

RGB = Color ^[1]

200 = Test current [mA]

BH = Internal code

AM = Automotive application

Notes:

^[1] Color :

Symbol	Description
C	Cool White
N	Neutral White
W	Warm White
PA	Phosphor Converted Amber
PR	Phosphor Converted Red
UB	Blue
IB	Ice Blue
SB	Sky Blue
UP	Purple
UG	Green
UY	Yellow
UYG	Brilliant Yellow Green
UPG	Pale Green
UA	Amber
UR	Red
SR	Super Red
RGB	RGB Color
PYG	Phosphor Converted Yellow Green

6. Ordering Information

XI3030-RGB200BH-ABC-DE-AM

Part Number of the 3030-RGB	Order Code
XI3030-RGB200BH-AM	XI3030-RGB200BH-ABC-DE-AM

Order code contains information with below details :

ABC = Please refer to the table of group bin code^[1]

DE = Internal code

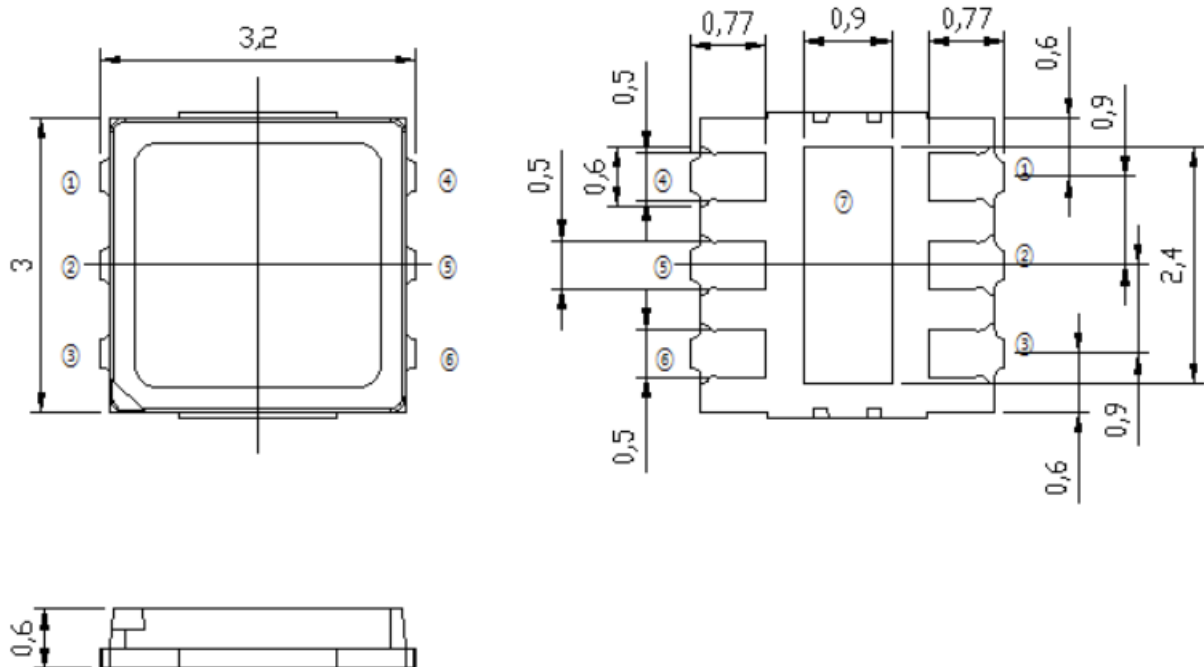
AM = Automotive Application

Notes:

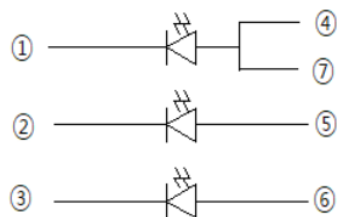
^[1] Table of Group Bin Code

Group Bin Code	Color	Dominant Wavelength Bins	Luminous Flux Bins	Forward Voltage Bins
B01	Red	R3R6	E9F1	1727
	Green	G2G5	F2F3	2737
	Blue	B4B6	E4E5	2737

7. Mechanical Dimension



Circuit diagram

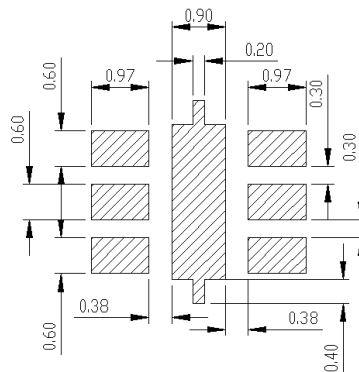


①	Red Cathode
②	Green Cathode
③	Blue Cathode
④	Red Anode
⑤	Green Anode
⑥	Blue Anode
⑦	Red Anode

Notes:

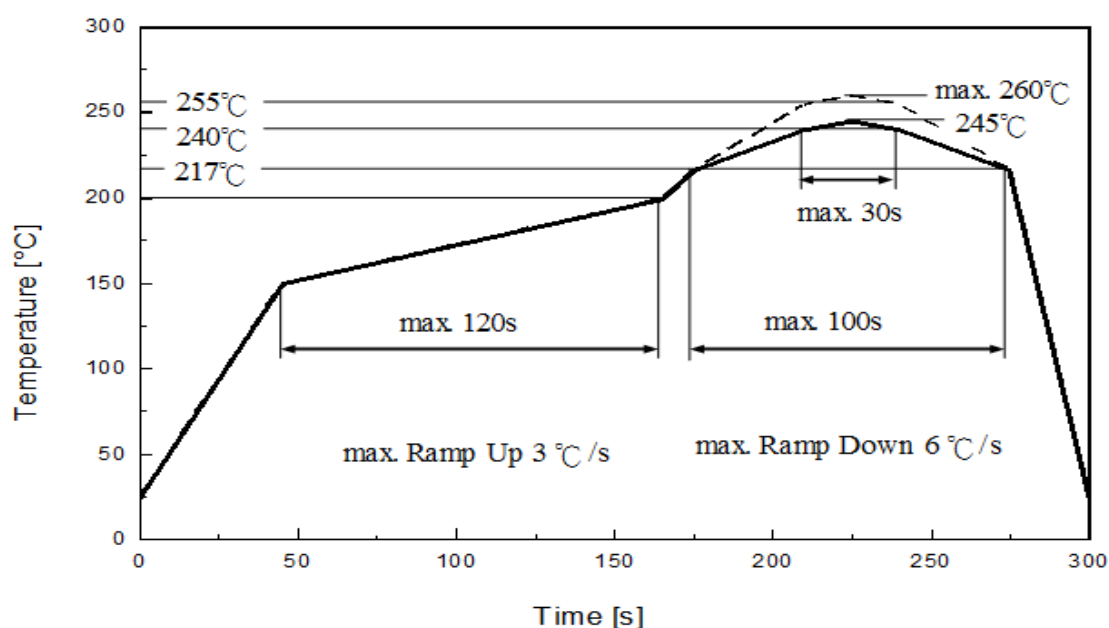
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.

8. Recommended Soldering Pad



9. Reflow Soldering Profile

Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



Profile Feature	Recommendation for Pb-Free Assembly	Unit
Ramp-up rate to preheat: 25 °C to 150 °C	3	°C /sec
Time of soaking zone: 150 °C to 200 °C	120	sec
Ramp-up rate to peak	3	°C /sec
Liquidus temperature	217	°C
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	°C
Time within 5°C of the specified peak temperature	30	sec
Ramp-down Rate (max.)	6	°C /sec

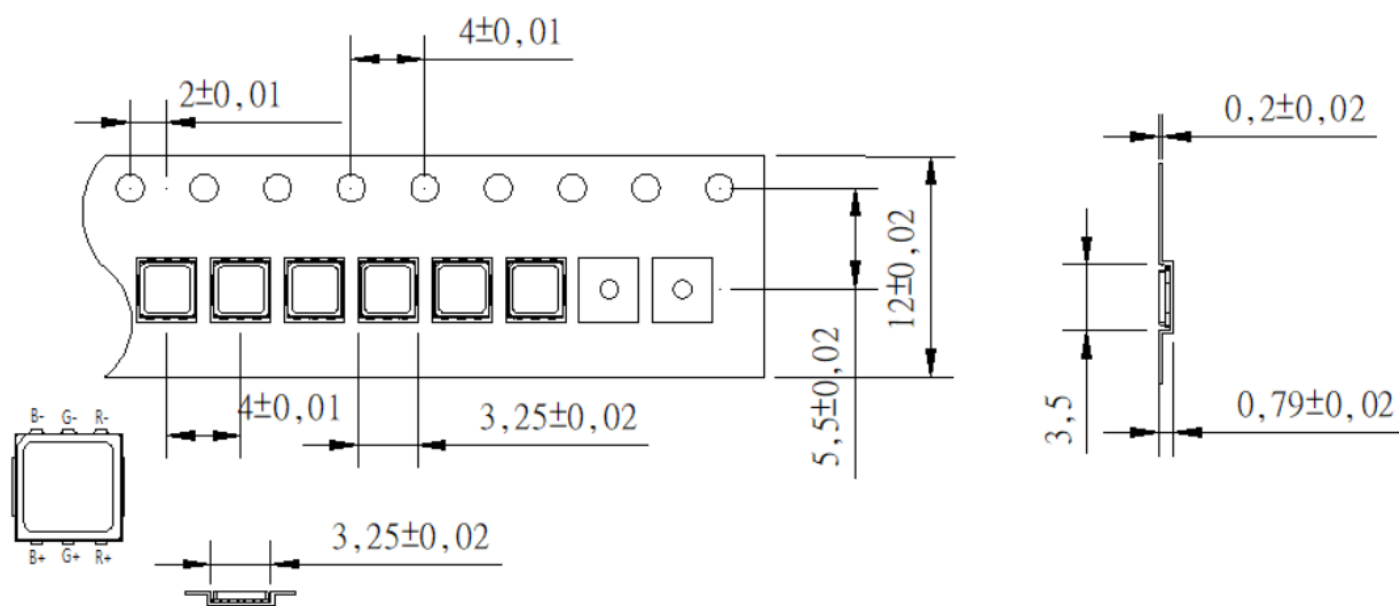
10. Packaging Information

• Product Labeling



- CPN : Customer's Product Number
- P/N : Everlight Part Number
- QTY : Packing Quantity
- CAT : Brightness Bin
- HUE : Color Bin
- REF : Forward Voltage Bin
- LOT No : Lot Number

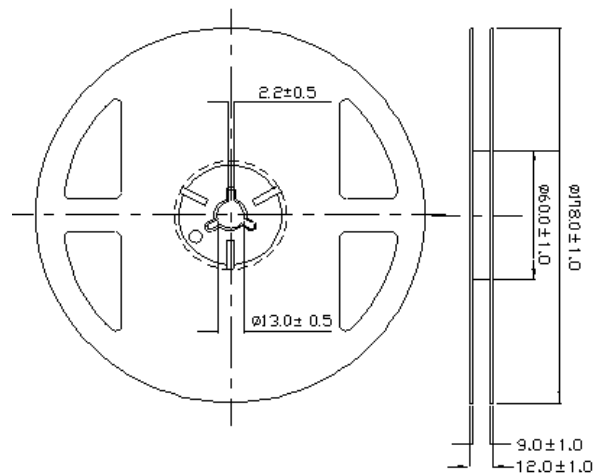
• Packing: Loaded Quantity 2000 pcs Per Reel



Notes:

1. Dimensions are in millimeters.

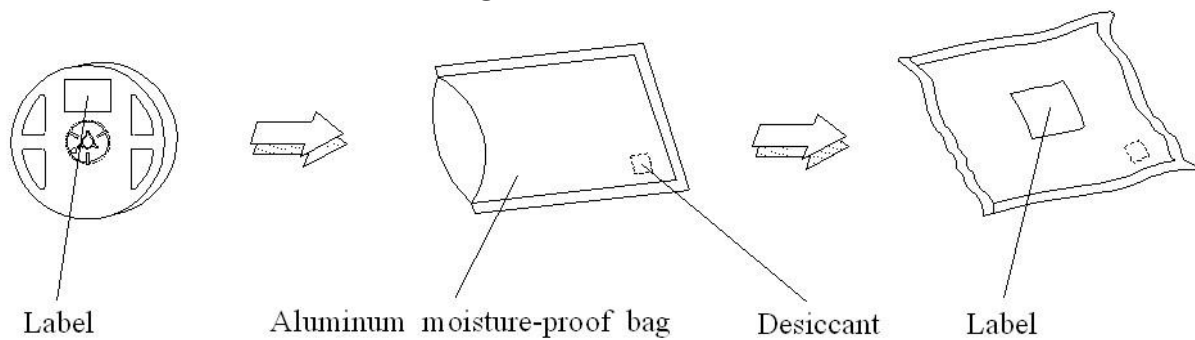
- **Reel Dimensions**



Notes:

1. Dimensions are in millimeters.

- **Moisture Resistant Packing Process**



11. Precaution for Use

1. Over-current-proof

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

2. Assemblies

Do not stack assemblies containing LEDs to prevent damage to the optical surface of LEDs. Forces applied to the optical surface may result in the surface being damaged.

3. Soldering Condition

3.1 When soldering, do not put stress on the LEDs during heating.

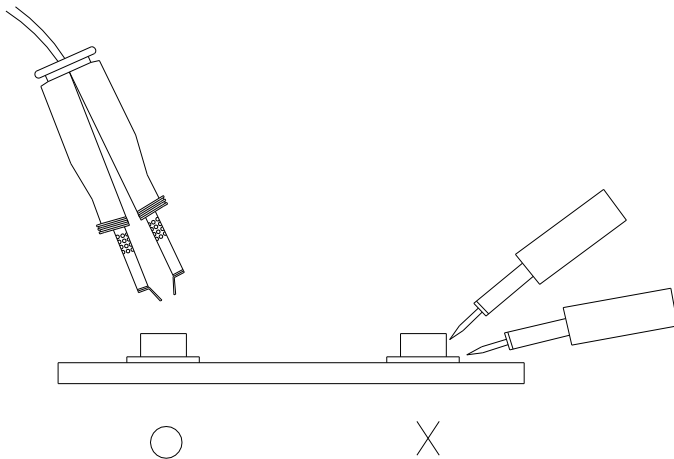
3.2 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.



12. Sulfur Test Criteria

Products	Failure Criteria
Exterior Lighting products	Luminous Flux +/-20%, forward voltage +/-10%, color coordinates x,y +/-0.01, color wavelength +/- 2 nm Visual defect issue following Everlight's inspection criteria
Interior lighting products	Luminous Flux +/-30% or +/-50% for some application, forward voltage +/-10%, color coordinates x,y +/-0.02, color wavelength +/- 2 nm Visual defect issue following Everlight's inspection criteria

H2S test	Grade A0	Grade A1	Grade B0	Grade B1
Class A	Pass ΔIV , $\Delta Color$, ΔVF criteria No Corrosion	Pass ΔIV , $\Delta Color$, ΔVF criteria Corrosion without the impact on reliability and lifetime		
Class B			Pass ΔIV , $\Delta Color$, ΔVF criteria No Corrosion	Pass ΔIV , $\Delta Color$, ΔVF criteria Corrosion without the impact on reliability and lifetime

Condition for H2S and FMG	Description	
	H2S	FMG
Class A	15 ppm with duration 336 h at 40 °C and 90% RH	Duration 500 h at 25 °C and 75% RH. H2S concentration: 10ppb SO2 concentration: 200ppb NO2 concentration: 200ppb Cl2 concentration: 10ppb
Class B	10 ppm with duration 500 h at 25 °C and 75% RH	

Grade for H2S Test	Description
0	No Corrosion
1	Corrosion without the impact on reliability and lifetime

Revision History

Current version: Jan.5.2022

Issue No: DSE-0028136

Version: 5.0

Created by: Youngho Na

Rev.	Subjects (major change in previous version)	Modified date
1.0	Preliminary datasheet	2022/8/3
2.0	Update Rth spec, Forward Current Derating Curve, and Mechanical Dimension	2022/8/19
3.0	Change Luminous flux bin range of Green color	2022/9/2
4.0	Change Part name, Update Characteristics Graph, Minimum Green Flux, Rth Value	2022/10/31
5.0	Add Carrier Reel dimension and sulfur test criteria, amend Thermal property, Blue Wd	2023/1/5