

EL 2820 LED

2820-PA3001M-YAYBF3F62737-2T-AM



Features

- Package: SMD package
- Typical Color : CIE x 0.572 CIE y 0.415 phosphor converted amber
- Typical Luminous Flux: 45 lm @ 300mA
- Viewing angle: 120 °
- ESD : up to 8KV
- MSL : 3
- Qualifications: According to AEC-Q102
- Compliance with RoHS and REACH
- Sulfur robustness:A0
- Compliance Halogen Free. (Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm)

Applications

- Automotive lighting

Contents

1. Characteristics	3
2. Absolute Maximum Ratings	4
3. Characteristics Graph	5
4. Binning Information	10
5. Part Number	13
6. Ordering Information	14
7. Mechanical Dimension.....	15
8. Recommended Soldering Pad	16
9. Reflow Soldering Profile	16
10. Packaging Information.....	17
11. Precaution for Use	19
12. Sulfur Test Criteria.....	20

1. Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	I_F	50	300	350	mA	---
Luminous Flux ^{[1][2]}	I_v	39	45	70	lm	$I_F=300\text{mA}$
Forward Voltage ^{[3][4]}	V_F	2.75	3.05	3.75	V	$I_F=300\text{mA}$
Viewing Angle	ϕ	---	120	---	deg	$I_F=300\text{mA}$
Chromaticity Coordinates ^[5]	C x	0.5557	0.5772	0.5901	---	$I_F=300\text{mA}$
	C y	0.4054	0.4151	0.4315	---	$I_F=300\text{mA}$
Thermal Resistance (Junction to Solder)	Real	$R_{th JS real}$	---	---	16	K/W $I_F=300\text{mA}$
	Electrical	$R_{th JS el}$	---	---	12	

Notes:

1. Luminous Flux measurement tolerance: $\pm 8\%$.
2. The data of Luminous Flux measured at thermal pad=25°C
3. Forward voltage measurement tolerance: $\pm 0.05\text{V}$
4. The V_F range shown in the table above indicates 99% output.
5. Tolerance of Chromaticity Coordinates x,y : ± 0.005 .
6. Current pulse time: 25ms

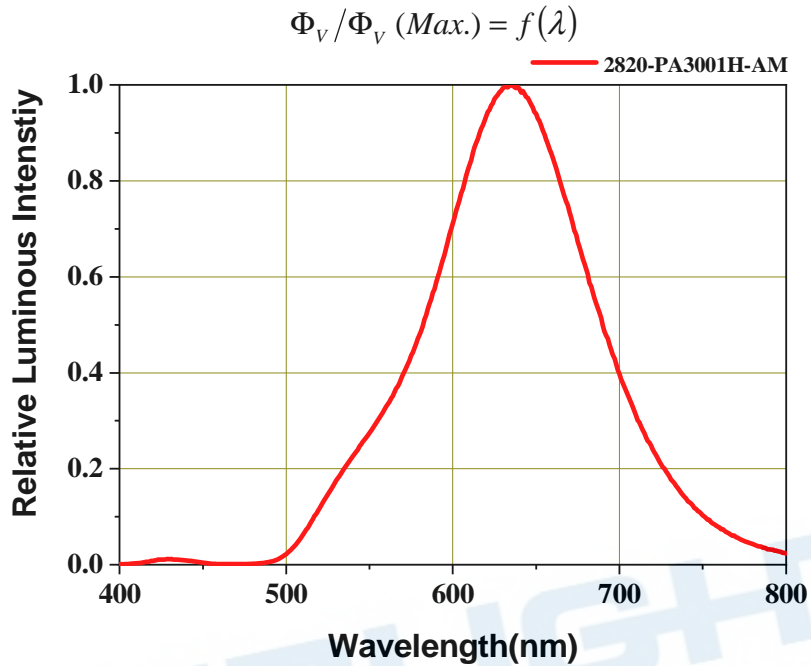
2. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	1315	mW
DC Forward Current	I_F	350	mA
Surge current ($t \leq 10 \mu s$; $D=0.005$; $T_s=25 \text{ }^\circ\text{C}$)	I_{FM}	500	mA
Reverse Voltage	V_R	Not designed for reverse operation	V
Junction Temperature	T_J	150	$^\circ\text{C}$
Operating Temperature	T_{opr}	-40 ~ +125	$^\circ\text{C}$
Storage Temperature	T_{stg}	-40 ~ +125	$^\circ\text{C}$
ESD Sensitivity ($R=1.5k\Omega$, $C=100pF$ Condition)	ESD_{HBM}	8	kV
Soldering Temperature	Reflow	260 $^\circ\text{C}$ for 30 sec	$^\circ\text{C}$

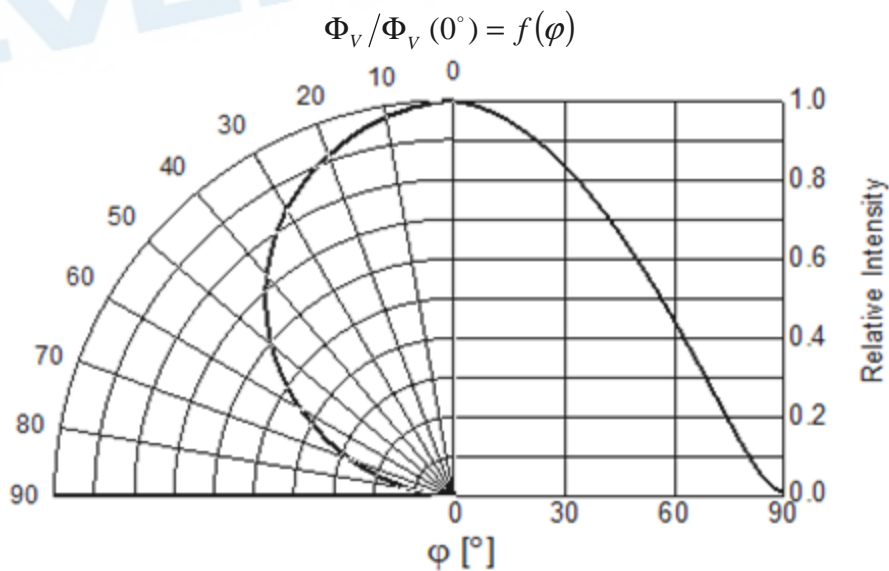
3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution

@ Ts = 25°C , If=300mA



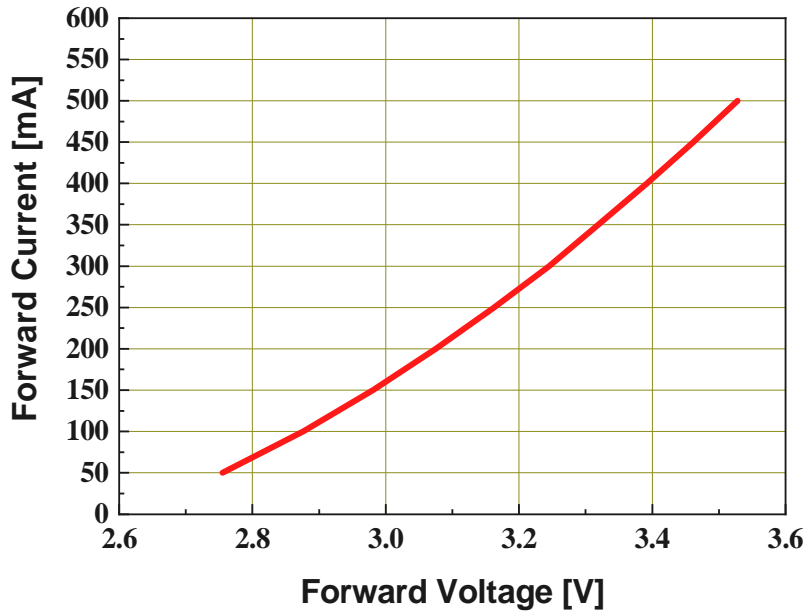
Typical Diagram Characteristics of Radiation



Notes:

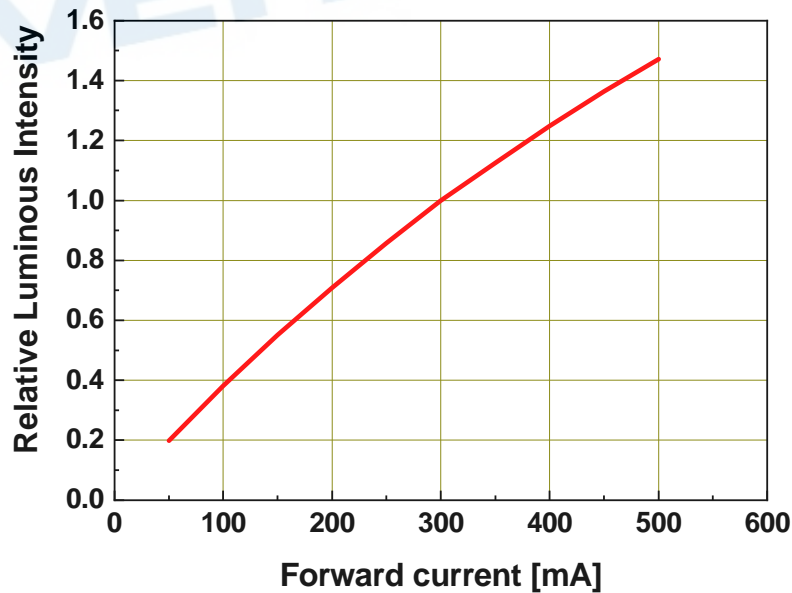
1. φ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is ± 5

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



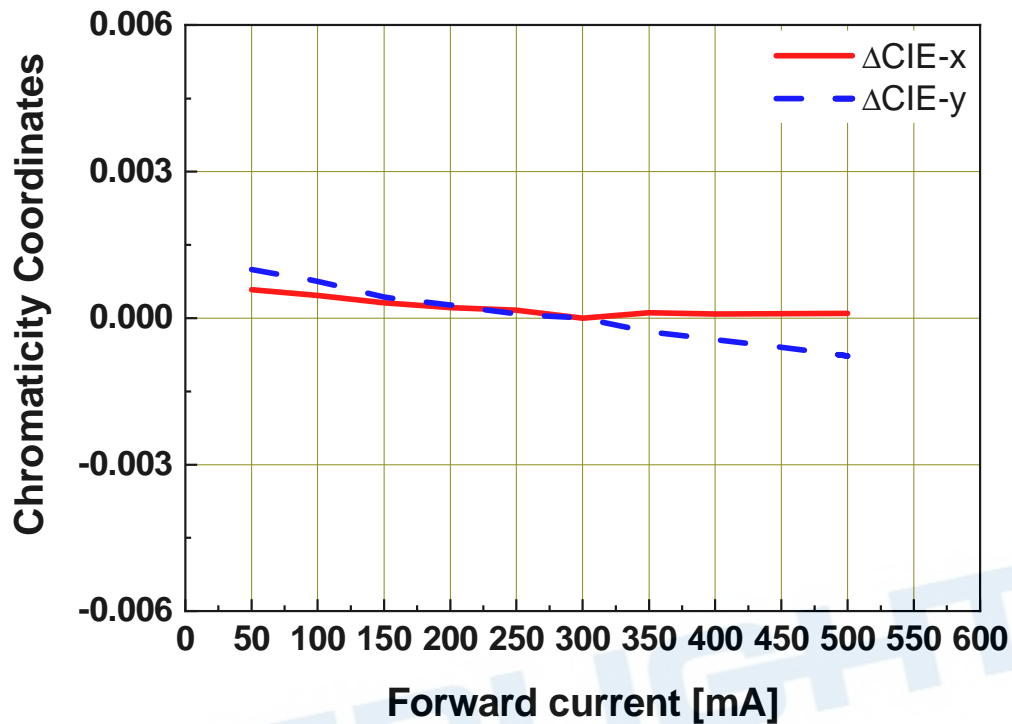
Relative Luminous Flux vs. Forward Current
@ Ts = 25°C

$$\Phi_v / \Phi_v(300mA) = f(I_F)$$



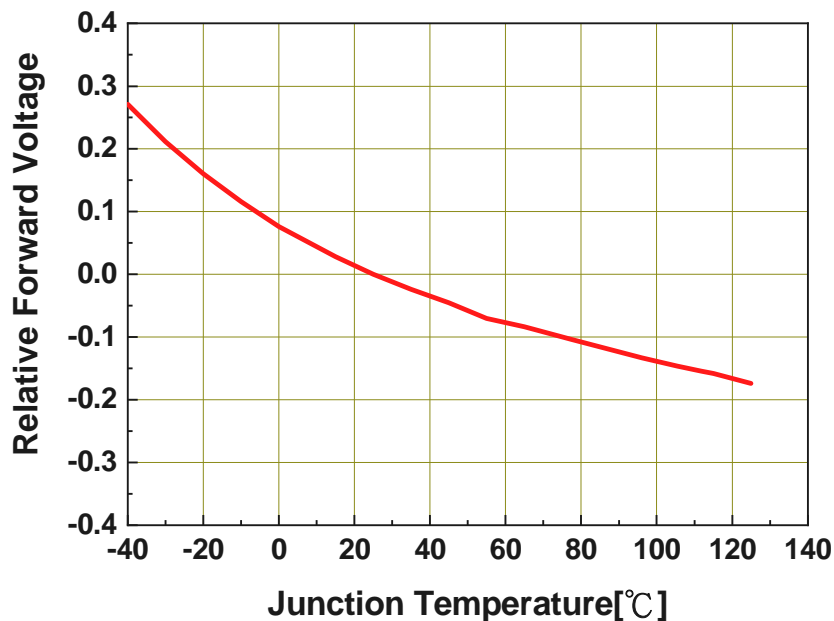
Chromaticity Coordinates Shift vs. Forward Current
@ $T_s = 25^\circ\text{C}$

$$\Delta CIE\ x, \Delta CIE\ y = f(I_F)$$



Relative Forward Voltage vs. Junction Temperature
@ $I_F = 300\text{mA}$

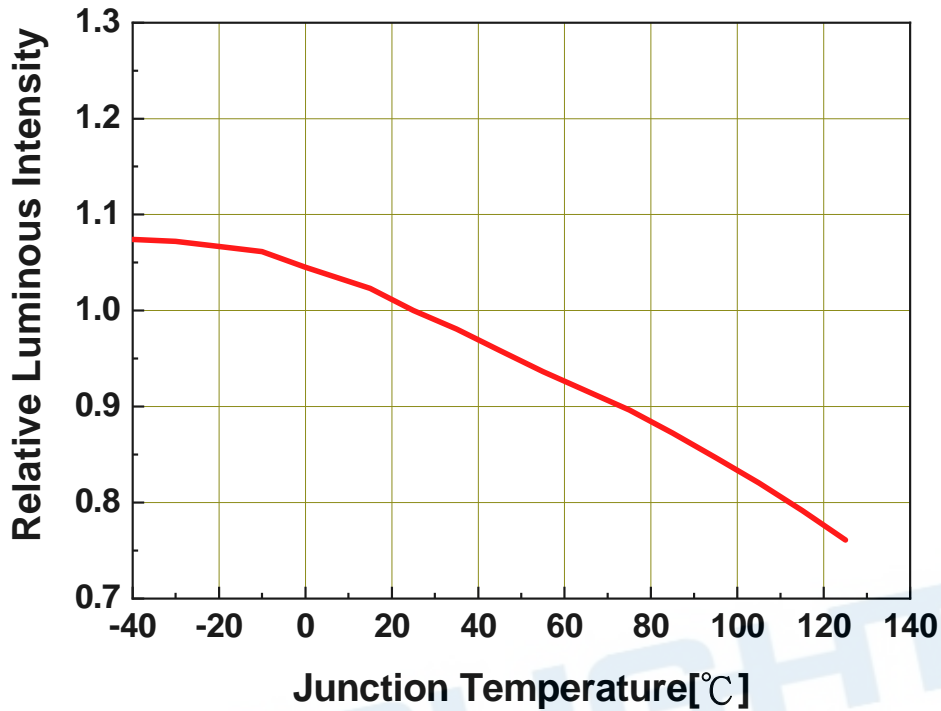
$$\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j)$$



Relative Luminous Flux vs. Junction Temperature

@ $I_F=300\text{mA}$

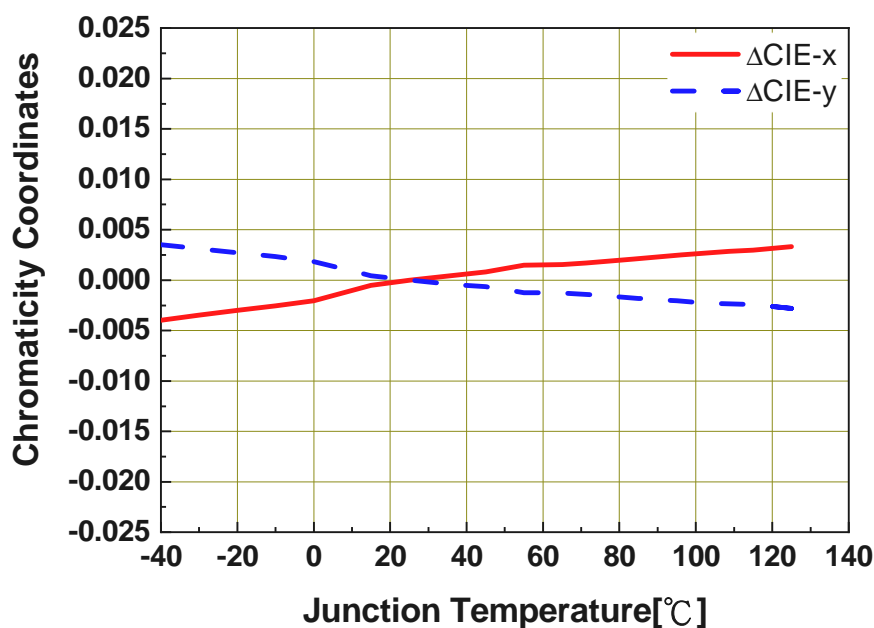
$$\Phi_v / \Phi_v(25^\circ\text{C}) = f(T_j)$$



Chromaticity Coordinates Shift vs. Junction Temperature

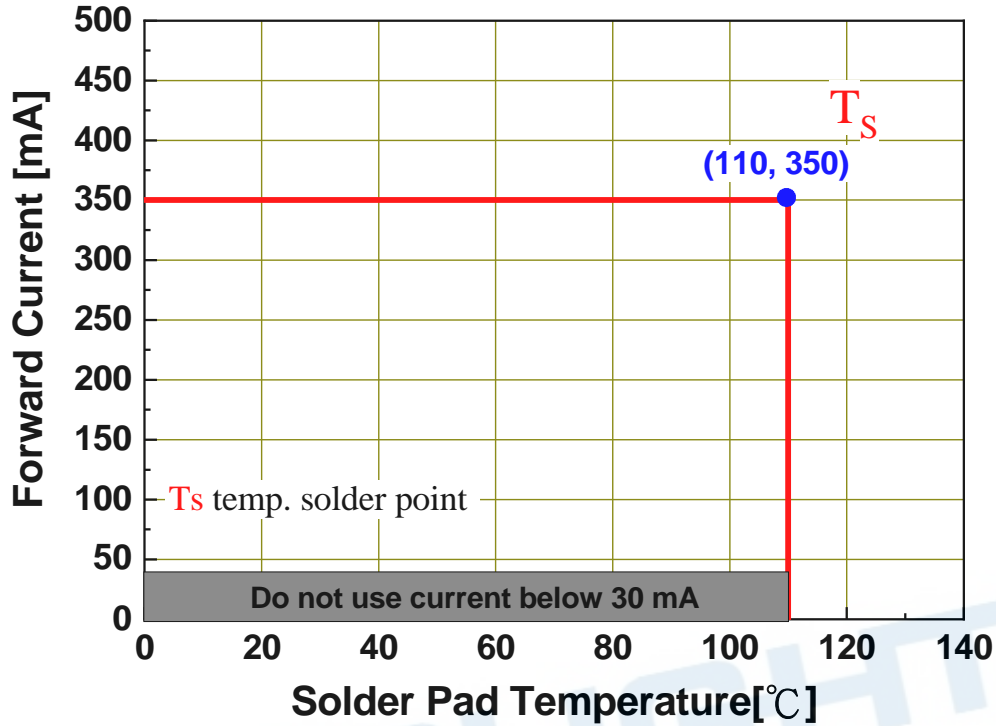
@ $I_F=300\text{mA}$

$$\Delta CIE\ x, \Delta CIE\ y = f(T_j)$$



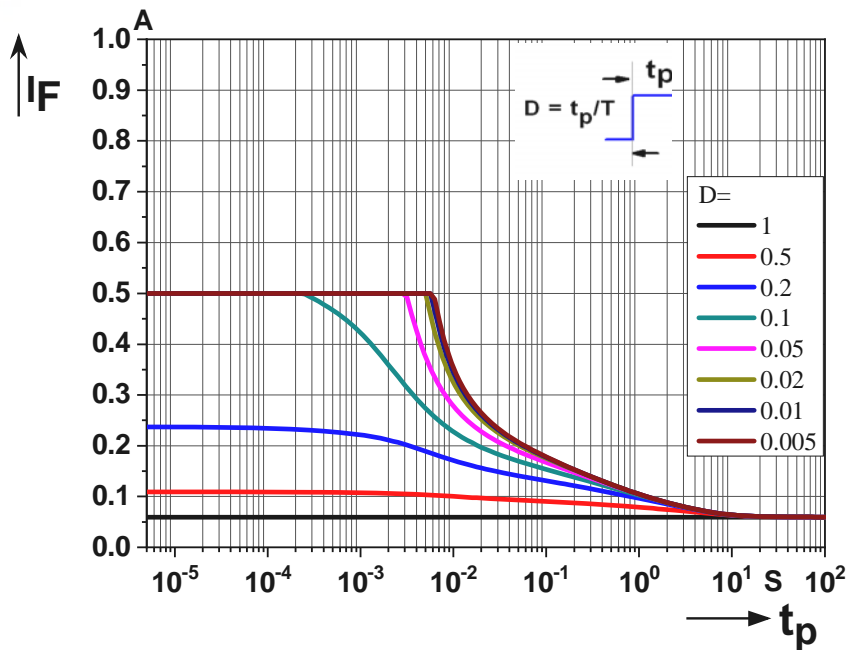
Forward Current Derating Curve

$$I_F = f(T_S)$$



Permissible Pulse Handling Capability

D=Duty cycle , $T_s = 25^\circ\text{C}$



4. Binning Information

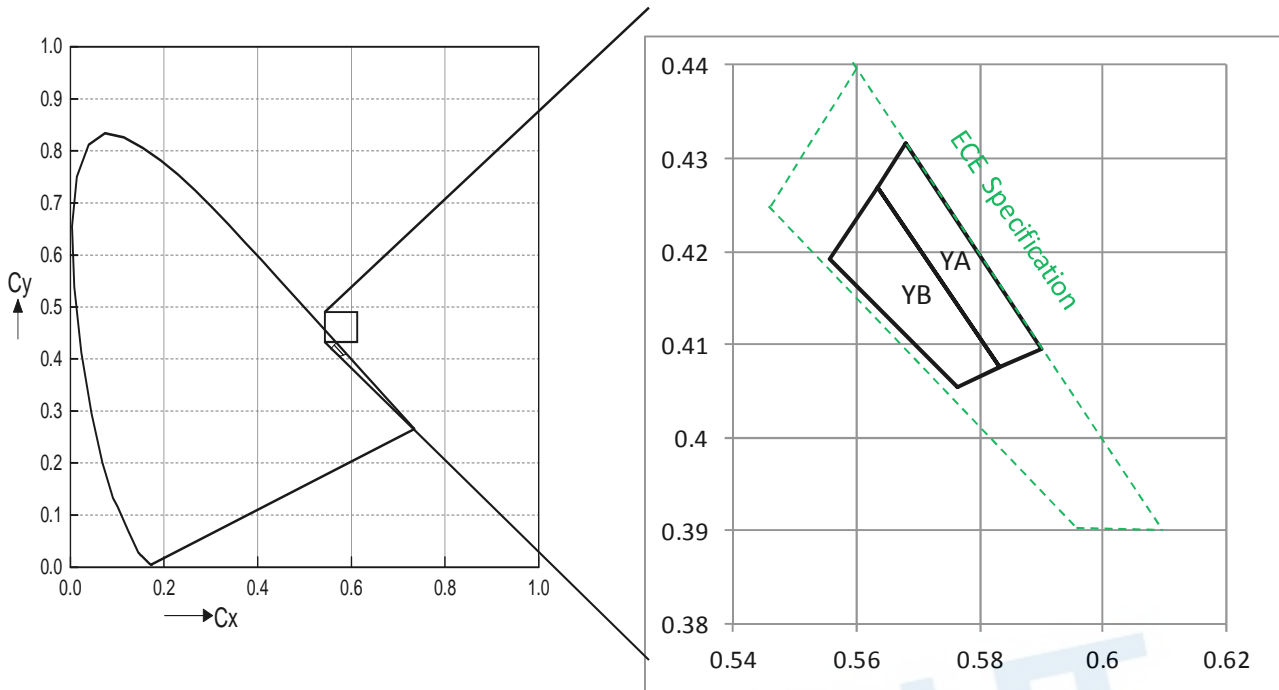
Luminous Intensity Bins

Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
E	1	4	5
	2	5	6
	3	6	8
	4	8	10
	5	10	13
	6	13	17
	7	17	20
	8	20	23
	9	23	27
F	1	27	33
	2	33	39
	3	39	45
	4	45	52
	5	52	60
	6	60	70
	7	70	80
	8	80	90
	9	90	100

Notes:

1. Luminous Intensity measurement tolerance: $\pm 8\%$.

**Product Binning Color Bin Structure
ECE Bin Structure**



ECE Phosphor Yellow Bin Coordinates

Bin	CIE x	CIE y
YA	0.5680	0.4315
	0.5634	0.4269
	0.5833	0.4075
	0.5901	0.4094

Bin	CIE x	CIE y
YB	0.5763	0.4054
	0.5833	0.4075
	0.5634	0.4269
	0.5557	0.4192

Notes:

1. Color coordinates measurement allowance: ± 0.005

Forward Voltage Bins

Bin	Minimum Forward Voltage [V]	Maximum Forward Voltage [V]
1012	1.00	1.25
1215	1.25	1.50
1517	1.50	1.75
1720	1.75	2.00
2022	2.00	2.25
2225	2.25	2.50
2527	2.50	2.75
2730	2.75	3.00
3032	3.00	3.25
3235	3.25	3.50
3537	3.50	3.75
3740	3.75	4.00
4042	4.00	4.25
4245	4.25	4.50
4547	4.50	4.75
4750	4.75	5.00
5052	5.00	5.25
5255	5.25	5.50
5557	5.50	5.75
5760	5.75	6.00
6062	6.00	6.25
6265	6.25	6.50
6567	6.50	6.75
6770	6.75	7.00

Notes:

1. Forward voltage measurement tolerance: $\pm 0.05V$.
2. Forward voltage bins are defined at $I_F = 300mA$ operation.

5. Part Number

2820-PA3001M-AM

Part number is designated with below details.

2820 = product family name.

PA = color [1]

300 = Test current [mA]

1 = Lead Frame Type (0=Ag ; 1=Au; 2=MLP)

M = Brightness Level (H=High ; M=Medium ; L=Low)

AM = Automotive Application

Note

[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
US	Orange
UA	Amber
UR	Red
SR	Super Red
RGB	RGB – Color
RGBY	RGBY – Color

6. Ordering Information

2820-PA3001M- **ABCDEFGHIJKL-MN-AM**

Part Number of the 2820	Order Code
2820-PA3001M-AM	2820-PA3001M- YAYBF3F62737-2T-AM

Order code contains information with below details :

ABCD = min/max wavelength or CCT

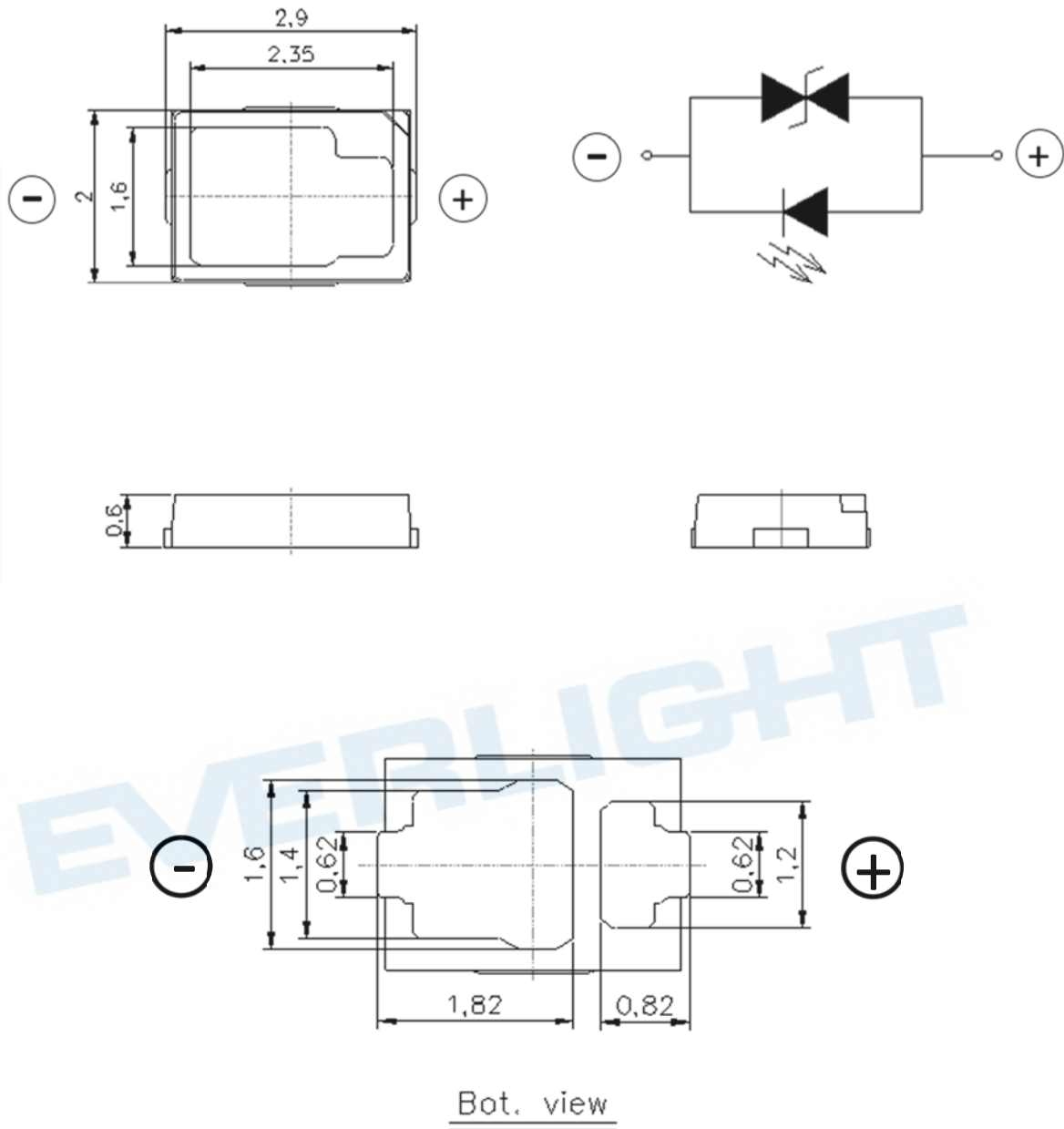
EFGH = min./max. luminous flux in [lm] or luminous intensity in [mcd]

IJKL = min./max. forward voltage

MN = internal code

EVERLIGHT

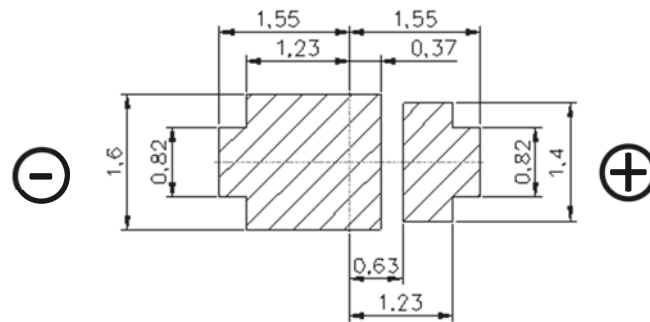
7. Mechanical Dimension



Notes:

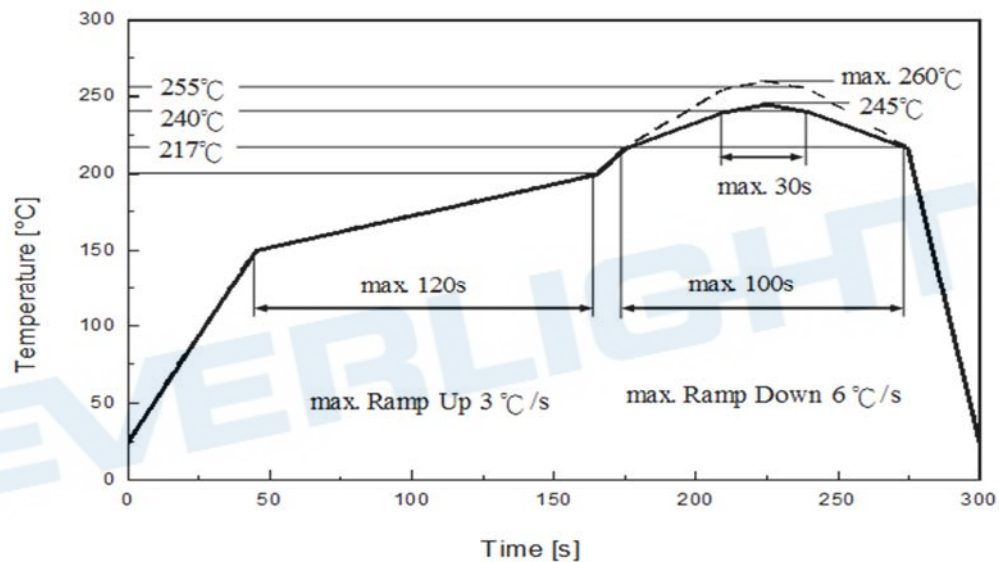
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.1 mm.

8.Recommended Soldering Pad



9.Reflow Soldering Profile

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



Profile Feature	Pb-Free Assembly	Unit Einheit
	Recommendation	
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

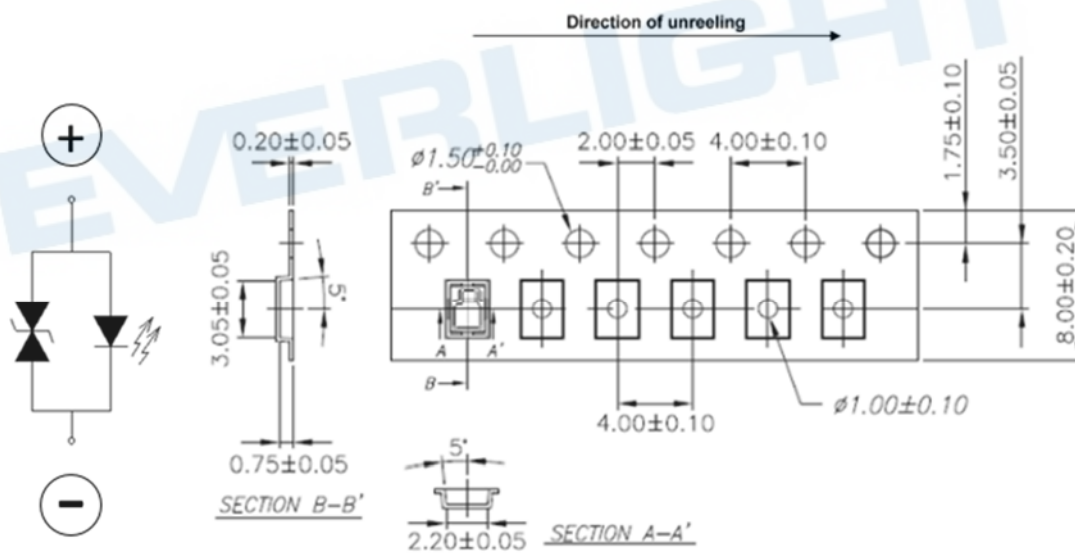
10. Packaging Information

• Product Labeling



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

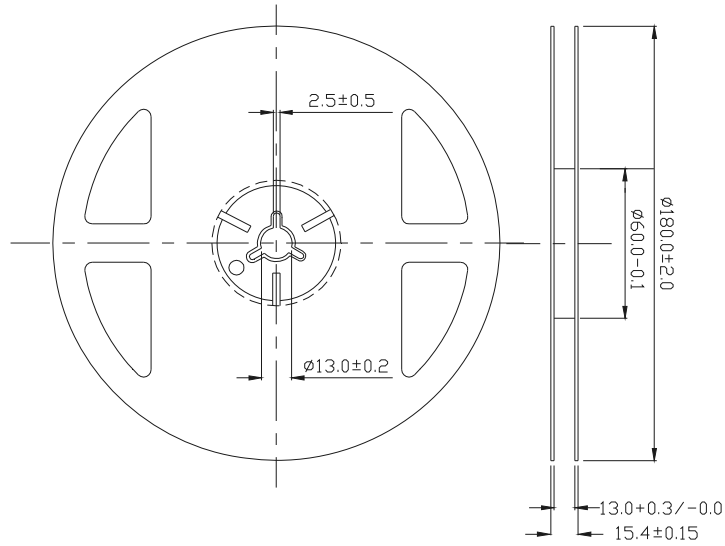
• Packing: Loaded Quantity 2000 pcs Per Reel



Notes:

1. Dimensions are in millimeters.

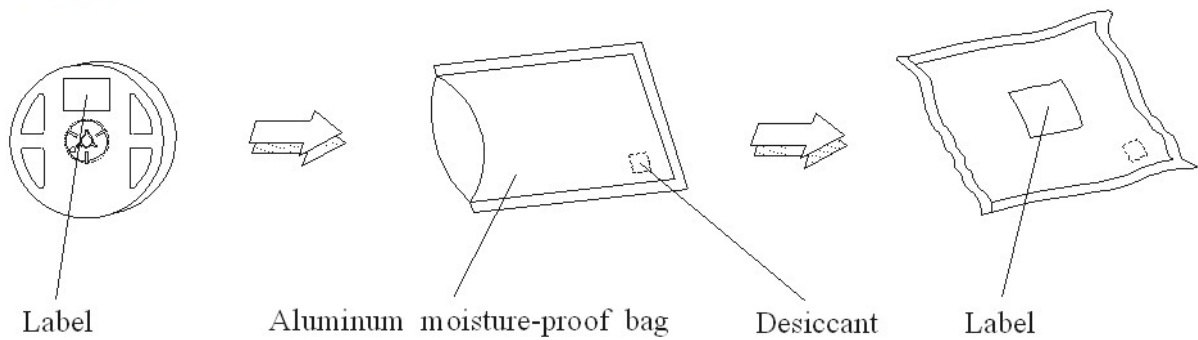
● **Reel Dimensions**



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.

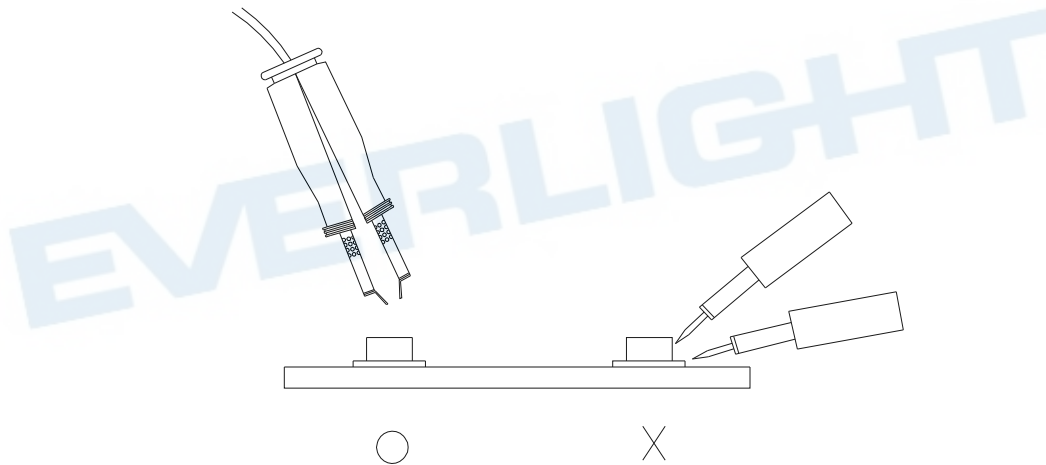
3.2 After soldering, do not warp the circuit board.

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
Grade of H2S and FMG test	Please refer to the table as below. As for discoloration, please refer to the Frame blackening after Grade of H2S and FMG test defect under Everlight's inspection criteria

Grade A0	Grade A1	Grade B0	Grade B1
No discoloration	discoloration		
		No discoloration	Discoloration

Class for H2S Test & 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.	

Class for H2S Test & FMG	Description
0	No discoloration
1	Discoloration

Revision History

Current version: 31.May.2022

Issue No: DSE-0026324

Version: 2.0

Created by: Tom Xaio

Rev.	Subjects (major change in previous version)	Modified date
1.0	Standard data sheet	2021/08/11
2.0	Revised mechanical dimension	2022/05/31

EVERLIGHT