

EL ALFS series

CH2924-C0PA2501H-AM

Preliminary



Features

- Package : SMD ceramic package
- Typ. Luminous Flux Cool White : 88 lm @ 250mA
- Typ. Luminous Flux PC Amber : 55 lm @ 250mA
- Viewing angle : 120°
- ESD : up to 8KV
- MSL : 2
- Qualifications : According to AEC-Q102
- Compliance with RoHS & REACH
- Compliance Halogen Free. (Br<900ppm, Cl<900ppm, Br+Cl<1500ppm)
- Sulfur robustness

Applications

- Automotive Exterior Lighting
- Daytime running light (DRL)
- Fog lamp
- Ambient light

Contents

1. Characteristics.....	3
2. Absolute Maximum Ratings.....	4
3. Characteristics Graph	5
4. Binning Information.....	11
5. Part Number	16
6. Ordering Information.....	17
7. Mechanical Dimension	18
8. Recommended Soldering Pad.....	19
9. Reflow Soldering Profile	20
10. Packaging Information	21
11. Precaution for Use.....	23

1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition ^[1]
Forward Current	CW / PA	I _F	50	250	350	mA	---
Luminous Flux ^{[2][3]}	Cool White	Φ _v	70	88	100	lm	I _F =250mA
	PC Amber	Φ _v	40	55	70	lm	I _F =250mA
Forward Voltage ^{[4][5]}	Cool White	V _F	2.9	3.0	3.8	V	I _F =250mA
	PC Amber						
Viewing Angle	Cool White	ϕ	---	120	---	deg	I _F =250mA
	PC Amber						
Chromaticity Coordinates ^[6]	Cool White (Color)	K	5180	-	6880	K	I _F =250mA
	PC Amber (Coordinates)	CIE x	---	0.565	---	---	
		CIE y	---	0.420	---		
Thermal Resistance (Junction to Solder)	CW / PA	R _{th JS real}	---	21	23	K/W	I _F =250mA
		R _{th JS el}	---	19	22		

Notes:

1. Forward conditon by each of LED.
2. Luminous flux measurement tolerance: $\pm 8\%$.
3. The data of luminous flux measured at thermal pad=25°C
4. Forward voltage measurement tolerance: $\pm 0.05\text{V}$
5. The V_f range shown in the table above indicates 99% output.
6. Tolerance of Chromaticity coordinates x, y : ± 0.005

2. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	1330	mW
Forward Current	I_F	350	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}	8	KV
Soldering Temperature	Reflow	260°C for 30sec	°C

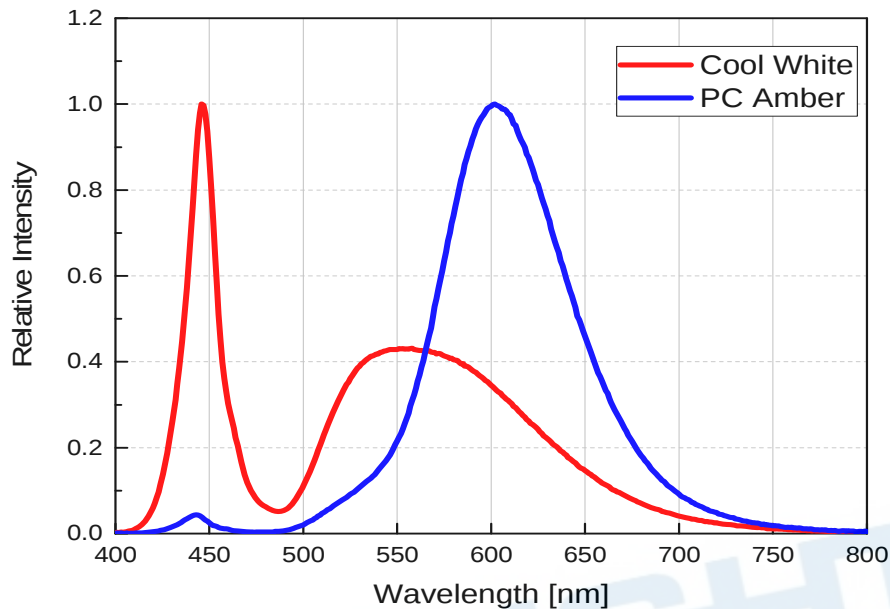
EVERLIGHT

3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution

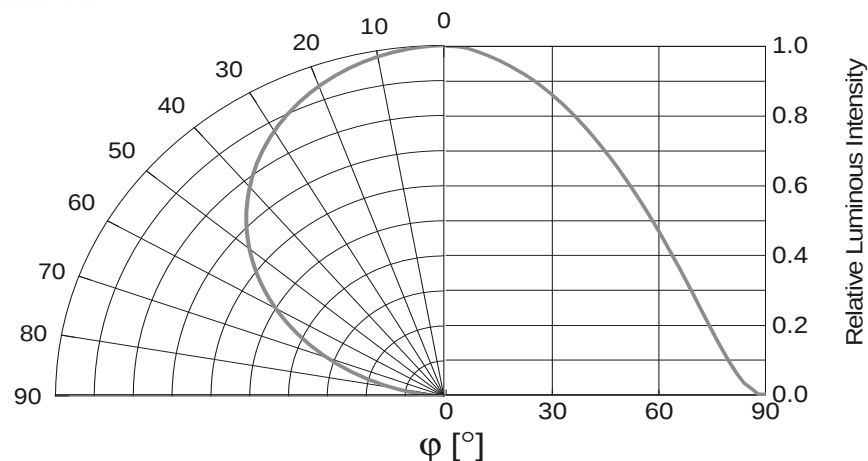
@ $T_s = 25^\circ\text{C}$ 、 $I_F = 250\text{mA}$ (CW / PA)

$$\Phi_V / \Phi_V(\text{Max.}) = f(\lambda)$$



Typical Diagram Characteristics of Radiation (CW / PA)

$$\Phi_V / \Phi_V(0^\circ) = f(\varphi)$$

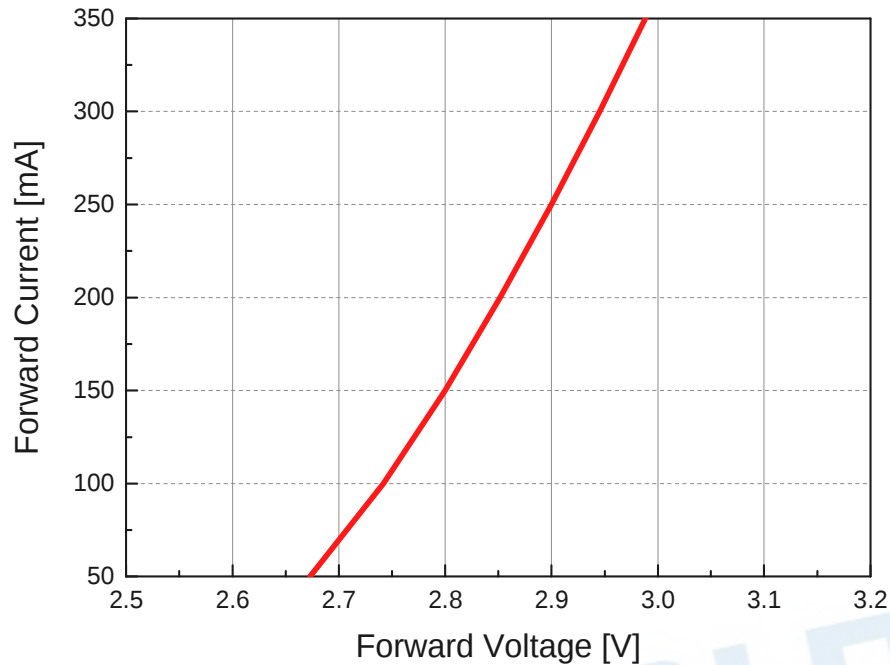


Notes:

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 $\pm 5^\circ$

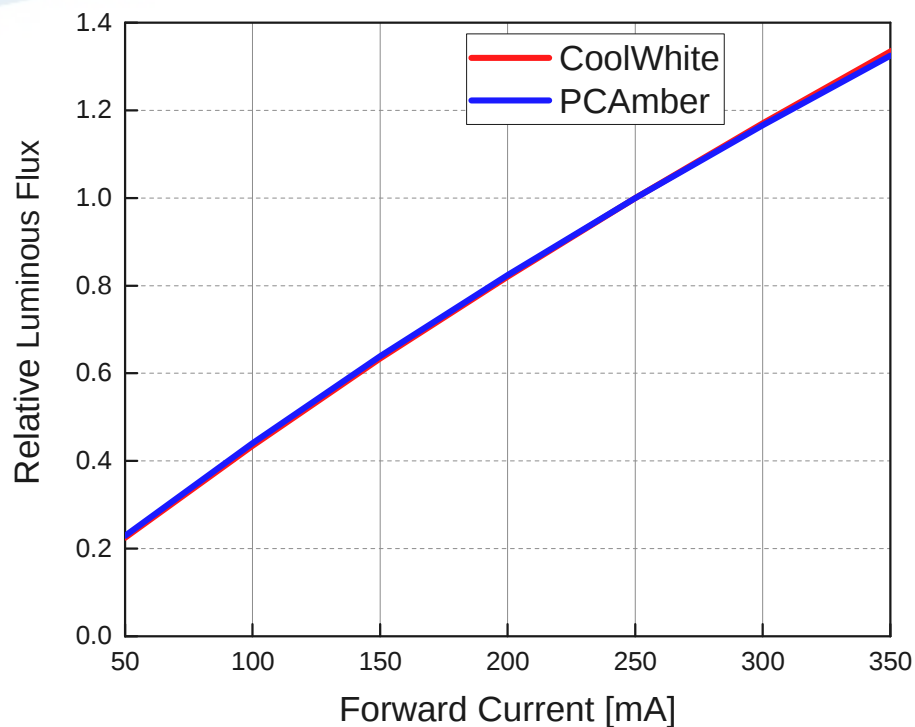
Forward Current vs. Forward Voltage @ T_s = 25°C (CW / PA)

$$I_F = f(V_F)$$



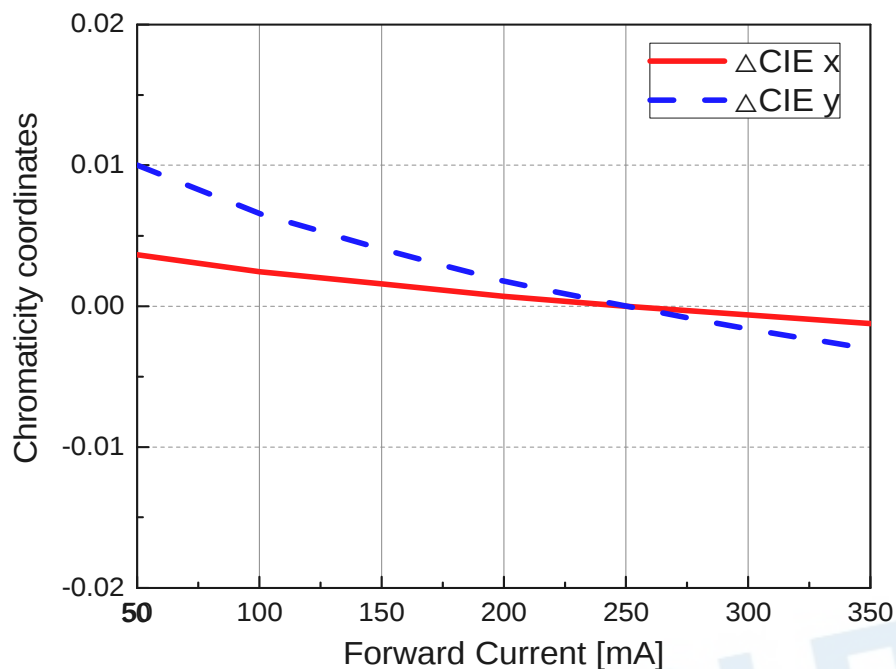
Relative Luminous Flux vs. Forward Current @ T_s = 25°C (CW / PA)

$$\Phi_V / \Phi_V(250\text{mA}) = f(I_F)$$



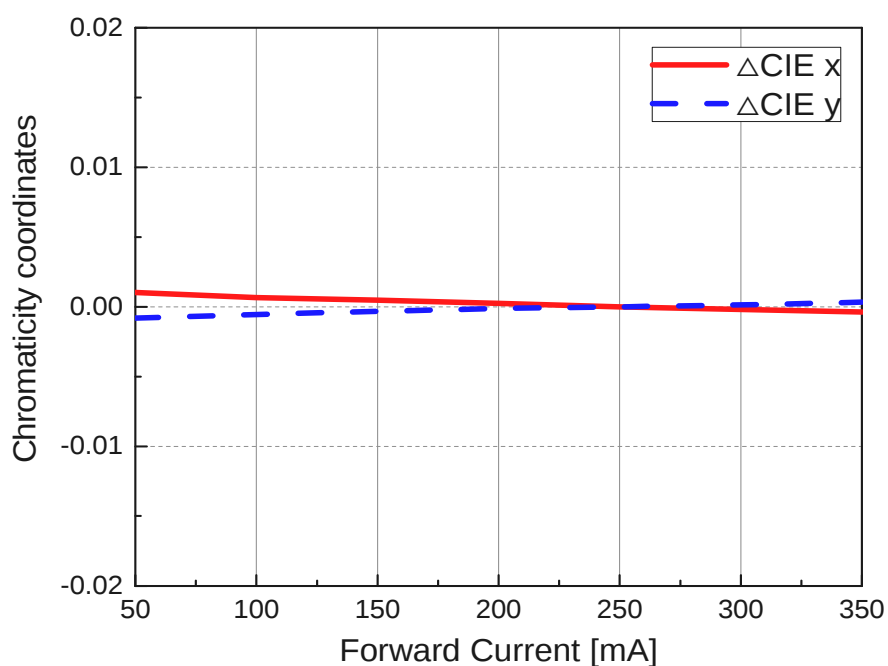
Chromaticity Coordinates vs. Forward Current @ $T_s = 25^\circ\text{C}$ (CW)

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



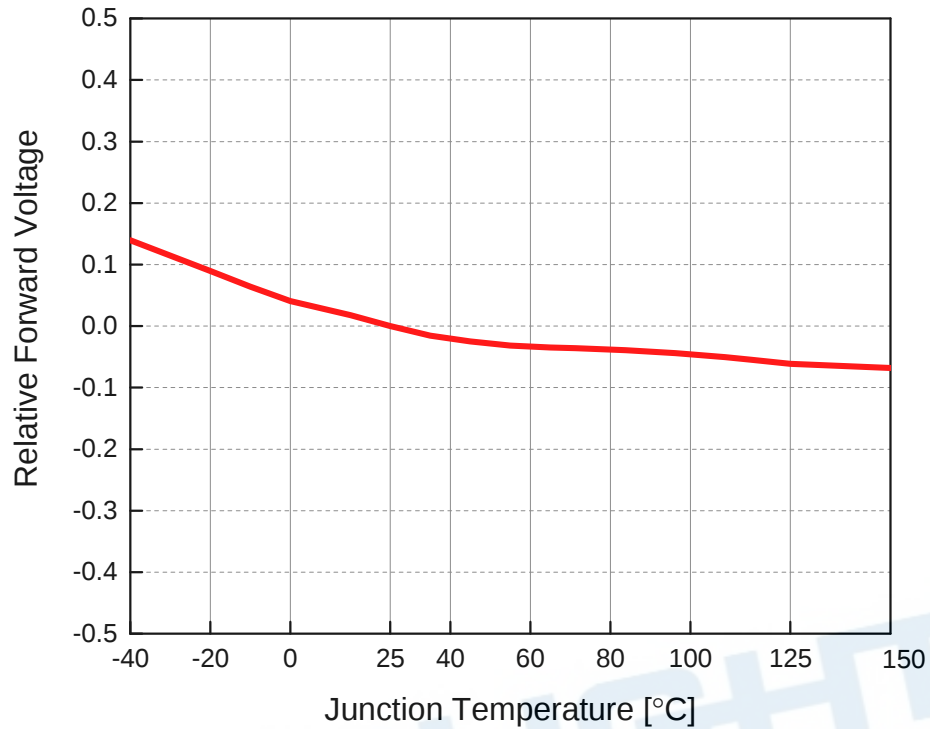
Chromaticity Coordinates vs. Forward Current @ $T_s = 25^\circ\text{C}$ (PA)

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



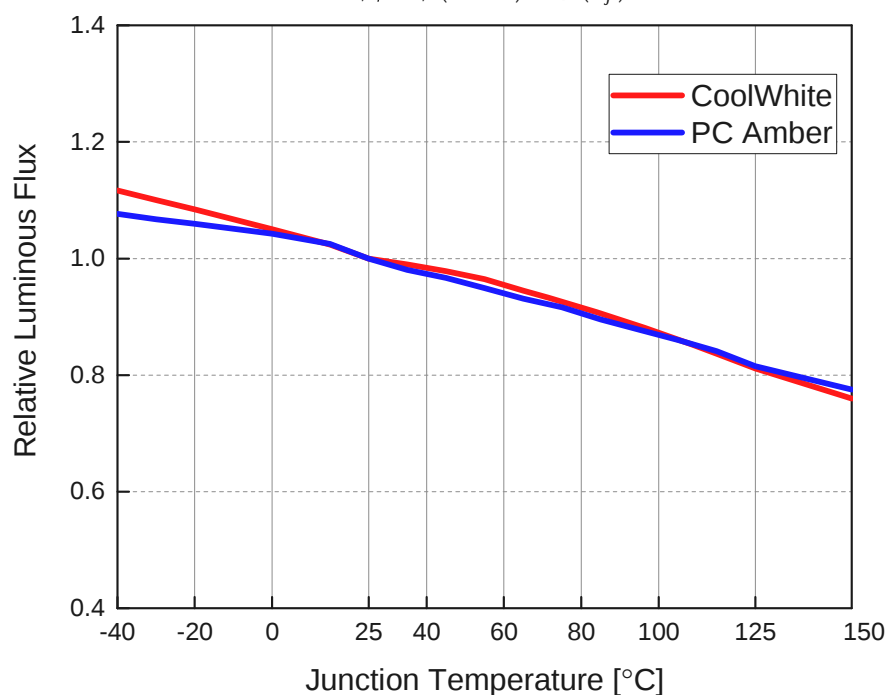
Relative Forward Voltage vs. Junction Temperature @ $I_F = 250\text{mA}$ (CW / PA)

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



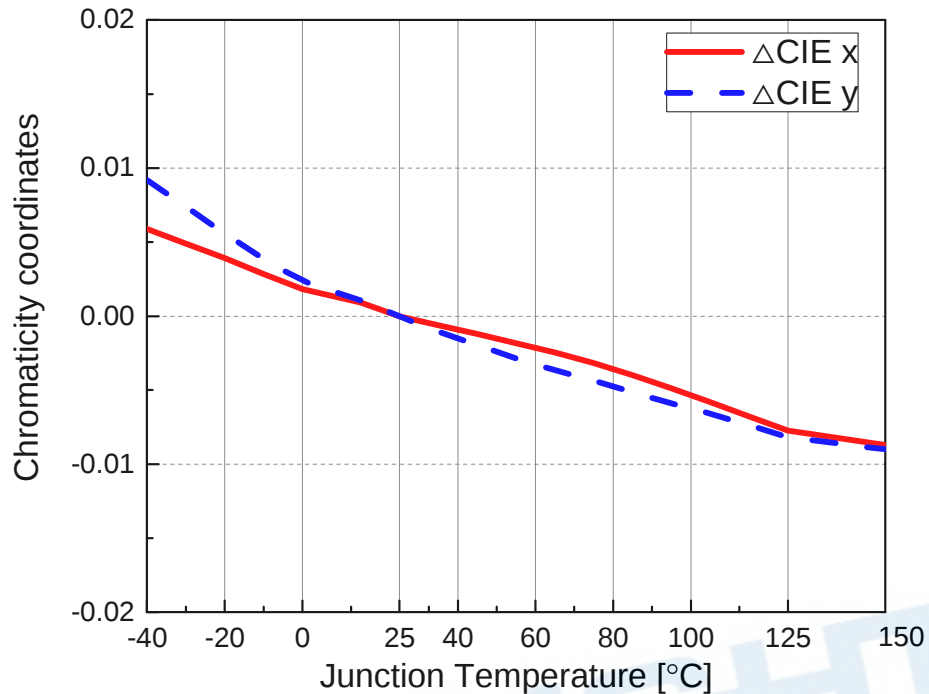
Relative Luminous Flux vs. Junction Temperature @ $I_F = 250\text{mA}$ (CW / PA)

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



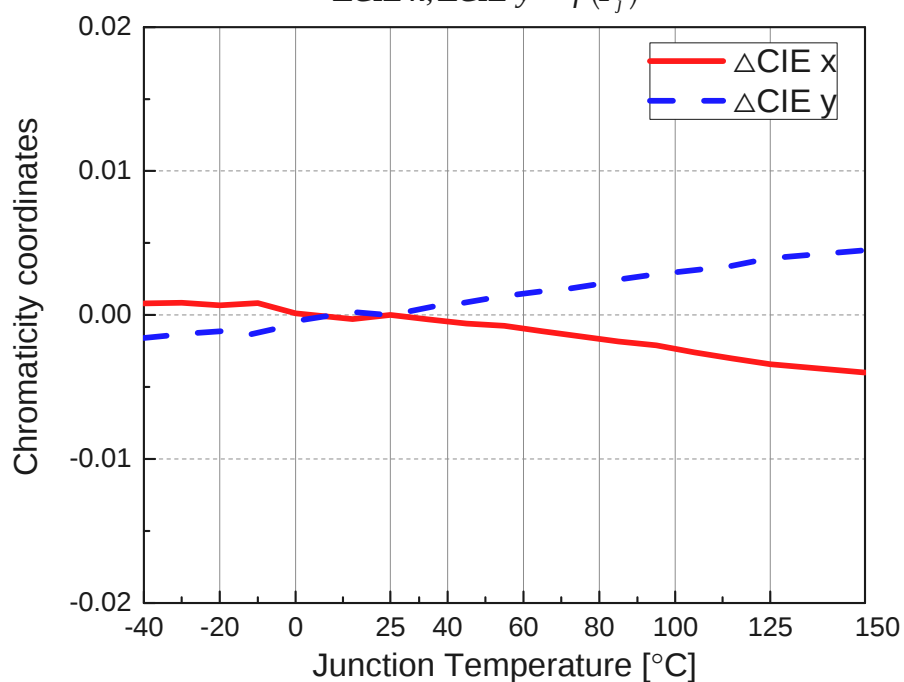
Chromaticity Coordinates Shift vs. Junction Temperature @ $I_F = 250\text{mA}$ (CW)

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



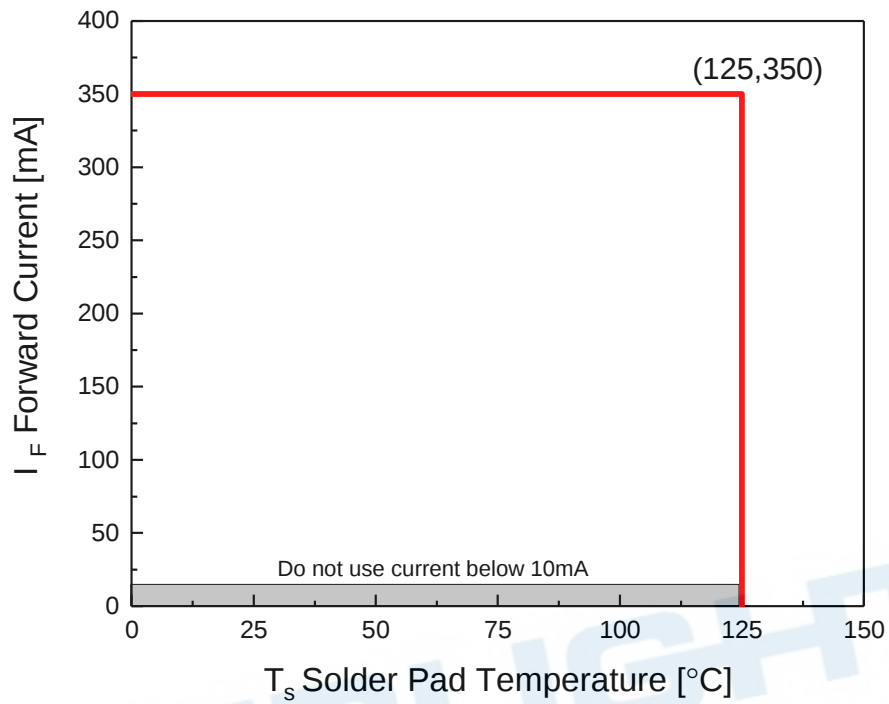
Chromaticity Coordinates Shift vs. Junction Temperature @ $I_F = 250\text{mA}$ (PA)

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



Forward Current Derating Curve (CW / PA)

$$I_F = f(T_s)$$



4. Binning Information

Luminous Intensity Bins

[Cool White]			
Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
A	4	40	50
	5	50	60
	6	60	70
	7	70	80
	8	80	90
	9	90	100

Notes:

1. Luminous flux measurement tolerance: $\pm 8\%$.
2. Highlighted Black Box is available bins.

Forward Voltage Bins

Group	Minimum Forward Voltage(V)	Maximum Forward Voltage(V)
1A	2.9	3.2
1B	3.2	3.5
1C	3.5	3.8

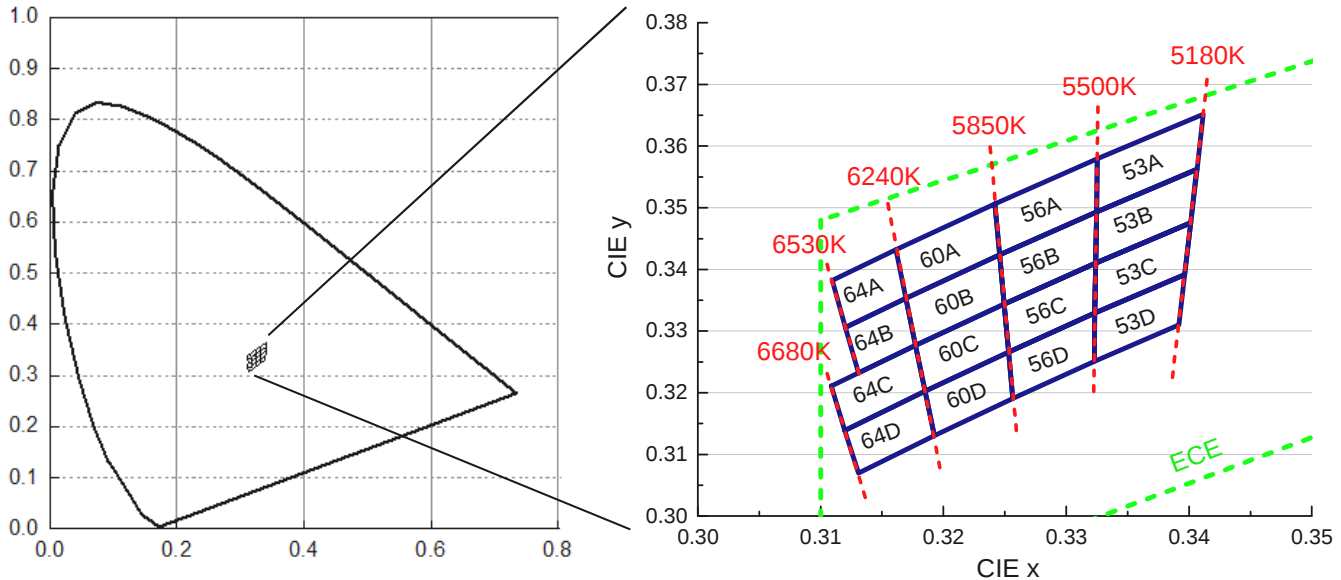
Notes:

1. Forward voltage measurement tolerance: $\pm 0.05V$.
2. Forward voltage bins are defined at $I_F = 250mA$ operation.

EVERLIGHT

Color Bin Structure

ECE Bin Structure



Cool White Bin Coordinates

Bin	CIE x	CIE y
64A	0.3109	0.3382
	0.3161	0.3432
	0.3169	0.3353
	0.3120	0.3306
Reference Range: 6240~6530K		

Bin	CIE x	CIE y
64B	0.3120	0.3306
	0.3169	0.3353
	0.3177	0.3277
	0.3131	0.3232
Reference Range: 6240~6530K		

Bin	CIE x	CIE y
64C	0.3109	0.3211
	0.3177	0.3277
	0.3185	0.3203
	0.3120	0.3139
Reference Range: 6240~6680K		

Bin	CIE x	CIE y
64D	0.3120	0.3139
	0.3185	0.3203
	0.3192	0.3131
	0.3131	0.3070
Reference Range: 6240~6680K		

Bin	CIE x	CIE y
60A	0.3161	0.3432
	0.3242	0.3506
	0.3246	0.3424
	0.3169	0.3353
Reference Range: 5850~6240K		

Bin	CIE x	CIE y
60B	0.3169	0.3353
	0.3246	0.3424
	0.3249	0.3344
	0.3177	0.3277
Reference Range: 5850~6240K		

Bin	CIE x	CIE y
60C	0.3177	0.3277
	0.3249	0.3344
	0.3253	0.3266
	0.3185	0.3203
Reference Range: 5850~6240K		

Bin	CIE x	CIE y
60D	0.3185	0.3203
	0.3253	0.3266
	0.3256	0.3191
	0.3192	0.3131
Reference Range: 5850~6240K		

Bin	CIE x	CIE y
56A	0.3242	0.3506
	0.3325	0.3579
	0.3325	0.3493
	0.3246	0.3424
Reference Range: 5500~5850K		

Bin	CIE x	CIE y
56B	0.3246	0.3424
	0.3325	0.3493
	0.3324	0.3410
	0.3249	0.3344
Reference Range: 5500~5850K		

Bin	CIE x	CIE y
56C	0.3249	0.3344
	0.3324	0.3410
	0.3323	0.3329
	0.3253	0.3266
Reference Range: 5500~5850K		

Bin	CIE x	CIE y
56D	0.3253	0.3266
	0.3323	0.3329
	0.3323	0.3251
	0.3256	0.3191
Reference Range: 5500~5850K		

Bin	CIE x	CIE y
53A	0.3325	0.3579
	0.3412	0.3652
	0.3406	0.3562
	0.3325	0.3493
Reference Range: 5180~5500K		

Bin	CIE x	CIE y
53B	0.3325	0.3493
	0.3406	0.3562
	0.3401	0.3476
	0.3324	0.3410
Reference Range: 5180~5500K		

Bin	CIE x	CIE y
53C	0.3324	0.3410
	0.3401	0.3476
	0.3396	0.3392
	0.3323	0.3329
Reference Range: 5180~5500K		

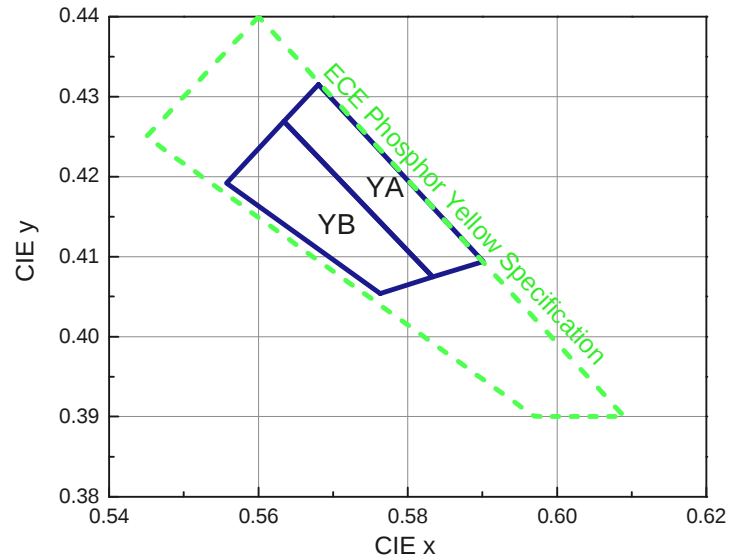
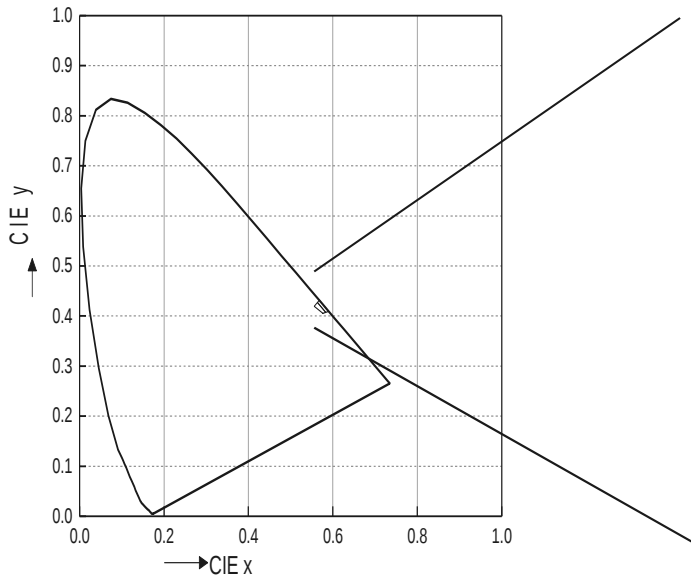
Bin	CIE x	CIE y
53D	0.3323	0.3329
	0.3396	0.3392
	0.3392	0.3310
	0.3323	0.3251
Reference Range: 5180~5500K		

Notes:

1. Color coordinates measurement tolerance: ± 0.005 .

Color Bin Structure

ECE Bin Structure



PC Amber 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 tolerance: ± 0.005 .

5. Part Number

CH2924-C0PA2501H-AM

Part number is designated with below details.

CH = Product family name.

2924 = package size

C = Color ^[1]

C = Color ^[1]

0 = CRI (0=N/A ; >70%=7 ; >80%=8 ; >90%=9)

PA= Color ^[1]

250 = Test current [mA]

1 = Metallic Plating Type (0=Ag ; 1=Au ; 2=MLP)

H = Brightness Level

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
UA	Amber
UR	Red
SR	Super Red
RGB	RGB-Color

6. Ordering Information

CH2924-C0PA2501H-ABC-DE-AM

Part Number of the ALFS	Order Code
CH2924-C0PA2501H-AM	CH2924-C0PA2501H-ABC-DE-AM

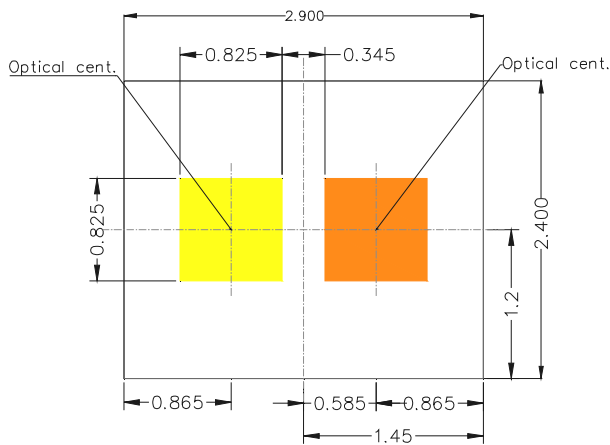
Order code contains information with below details :

ABC= Group Code

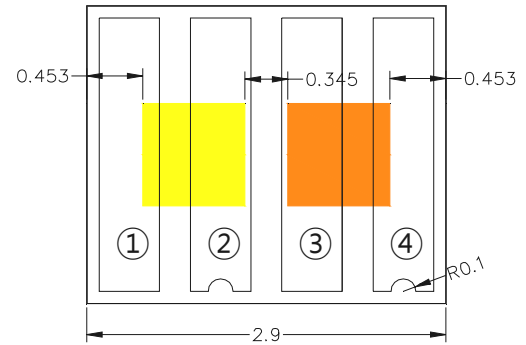
DE = Packing quantity (Minimum package)

EVERLIGHT

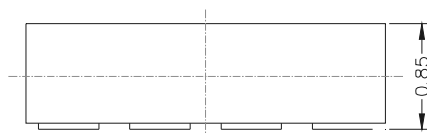
7. Mechanical Dimension



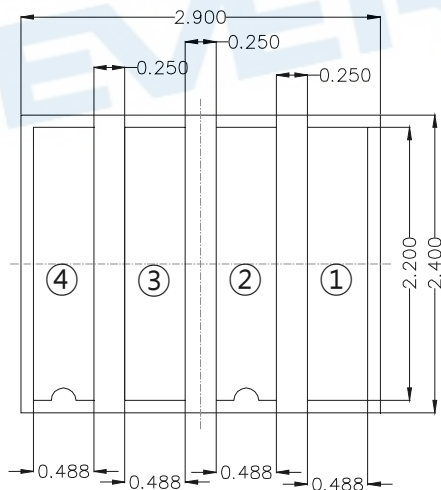
Top View



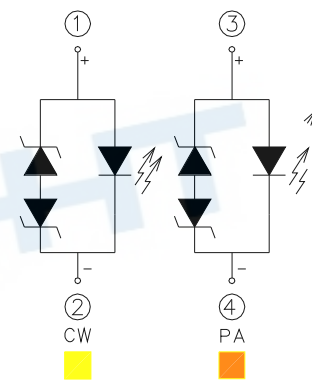
X-ray View



Side View



Bottom view



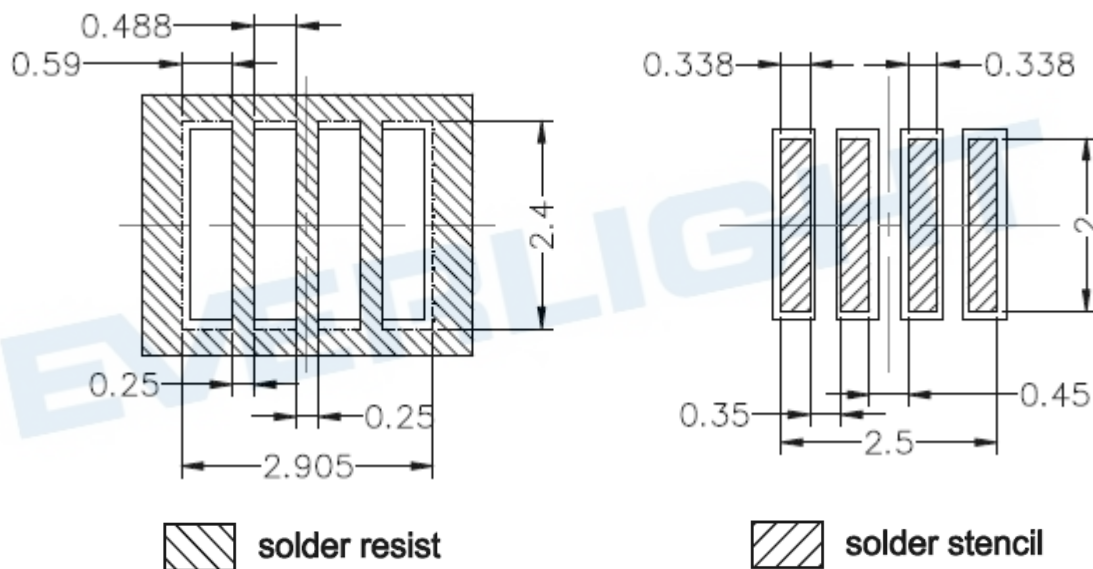
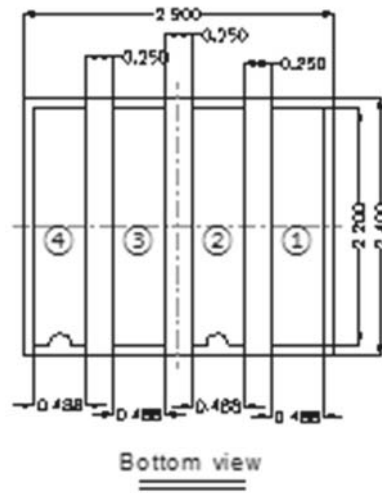
Polarity

Item	Description
Package Material	Ceramics
Encapsulating Resin Materials	Silicone Resin
Electrodes Materials	Au-plated copper alloy
Weight	0.0185g

Notes:

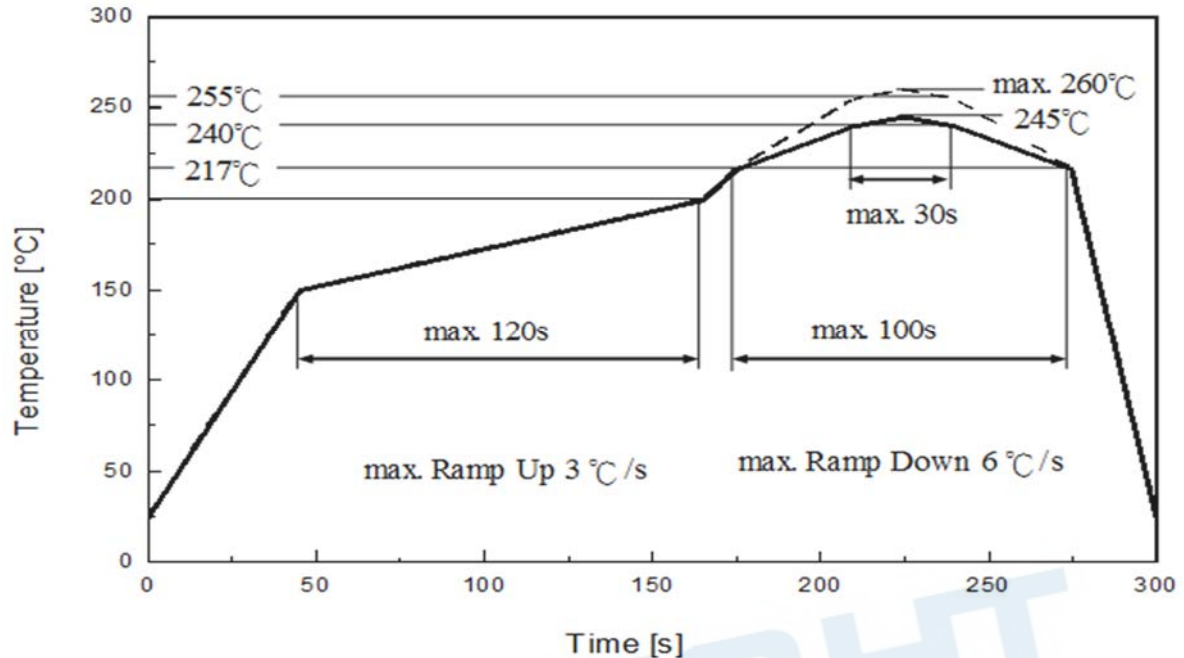
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.
3. The thermal pad is electrically connected to the Anode soldering pad.

8. Recommended Soldering Pad



9. Reflow Soldering Profile

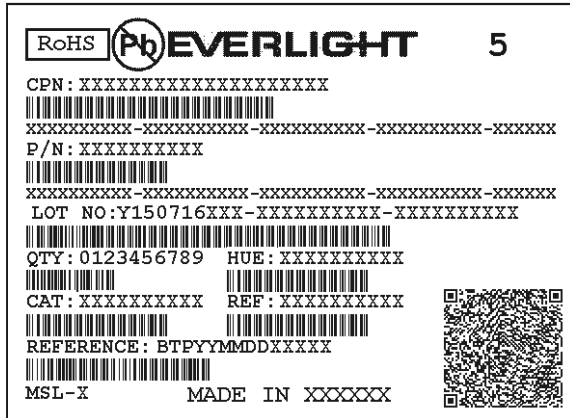
Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



Profile Feature	Pb-Free Assembly	Unit Einheit
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

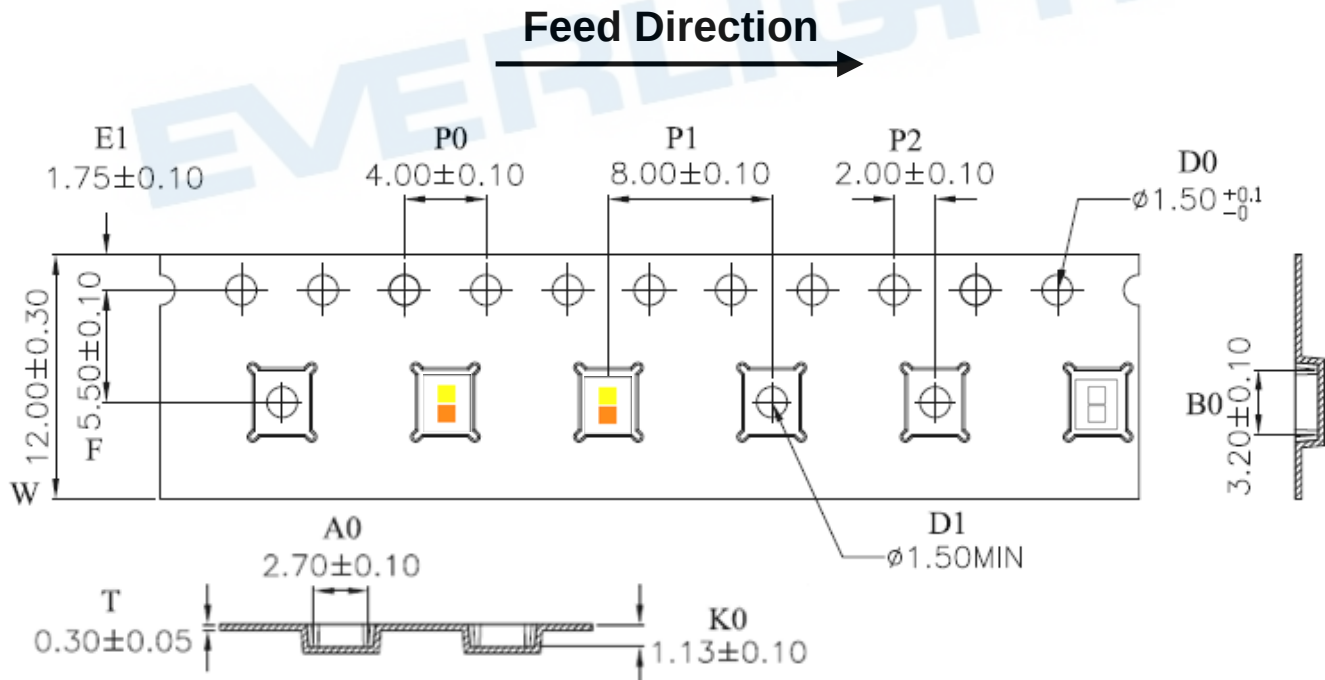
• Product Labeling



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

• Carrier Tape Dimensions as the following

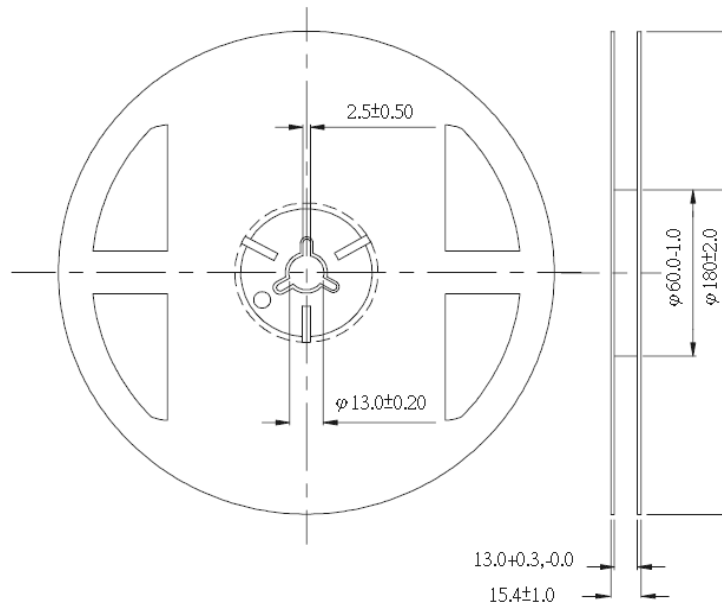
Reel: 1000pcs, MOQ $\geq$ 100pcs (has to be a multiple of 100pcs)



Notes:

1. Dimensions are in millimeters.

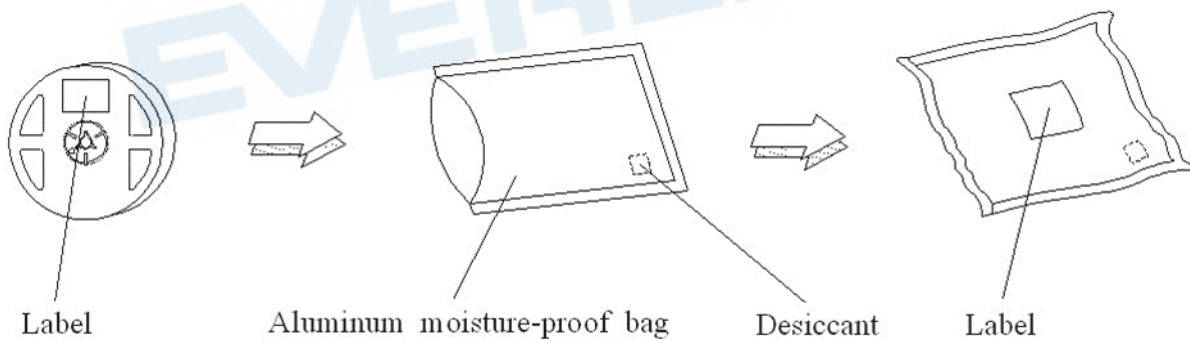
● Reel Dimensions



Notes:

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.

EVERLIGHT

Revision History

Current version: Mar, 18, 2022.

Issue No: DHE-0003888

Version: 2

Created by : Chris Chuang

Rev.	Subjects (major change in previous version)	Modified date
1	Standard data sheet	2022/01/22
2	Change product name	2022/03/18

EVERLIGHT