

### *EL ALFS series*

#### **ALFS2BD-C010001H-AM(HS)**



#### **Features**

- Package : SMD ceramic package
- Typ. Color Temperature : 5850K
- Typ. Luminous Flux : 700 lm @ 1000mA
- Viewing angle : 120°
- ESD : up to 8KV
- MSL : 2
- Qualifications : According to AEC-Q102
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH
- Compliance Halogen Free. (Br<900ppm,Cl<900ppm,Br+Cl<1500ppm)
- Sulfur robustness

#### **Applications**

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

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# 1. Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward current <sup>[1]</sup>	$I_F$	50	1000	1500	mA	
Luminous Flux <sup>[2][3]</sup>	$\Phi_v$	600	700	800	lm	$I_F=1000\text{mA}$
Forward Voltage <sup>[4][5]</sup>	$V_F$	5.8	6.7	7.6	V	$I_F=1000\text{mA}$
Viewing Angle	$\phi$	---	120	---	deg	$I_F=1000\text{mA}$
Color	K	5180	5710	6240	K	$I_F=1000\text{mA}$
Thermal Resistance (Junction to Solder)	$R_{th JS real}$	---	3.1	3.5	KW	$I_F=1000\text{mA}$
	$R_{th JS el}$	---	2.1	2.5		

## 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= $25^\circ\text{C}$
4. Forward voltage measurement tolerance:  $\pm 0.05\text{V}$
5. The  $V_f$  range shown in the table above indicates 99% output.

## 2. Absolute Maximum Ratings

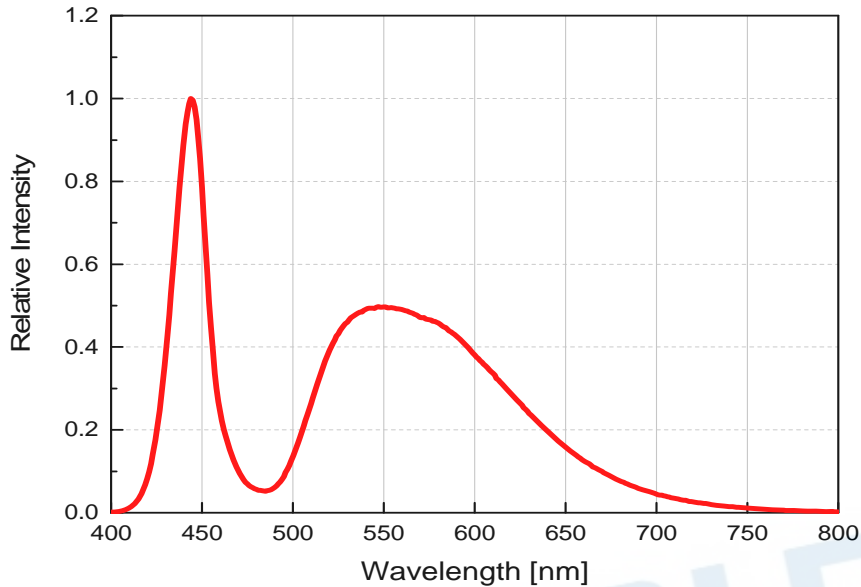
Parameter	Symbol	Ratings	Unit
Power Dissipation	$P_d$	11400	mW
Forward Current	$I_F$	1500	mA
Surge Current ( $t \leq 10 \mu s$ ; $D=0.005$ ; $T_s=25 \text{ }^\circ\text{C}$ )	$I_{FM}$	2500	mA
Reverse Voltage	$V_R$	Not designed for reverse operation	V
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Operating Temperature	$T_{opr}$	-40 ~ +125	$^\circ\text{C}$
Storage Temperature	$T_{stg}$	-40 ~ +125	$^\circ\text{C}$
ESD Sensitivity ( $R=1.5k\Omega$ , $C=100pF$ )	$ESD_{HBM}$	8	kV
Soldering Temperature	Reflow	260 $^\circ\text{C}$ for 30sec	$^\circ\text{C}$

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### 3. Characteristics Graph

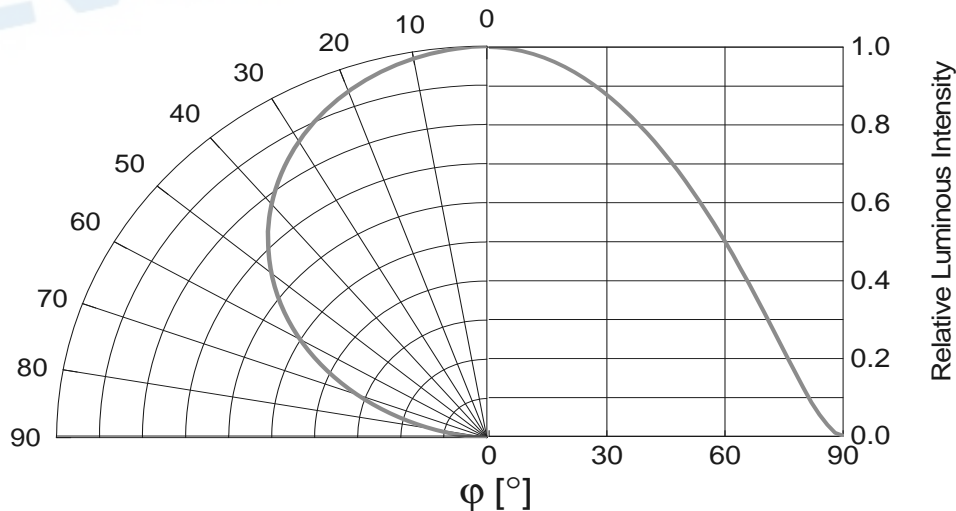
**Wavelength Characteristics Relative Spectral Distribution**  
@  $T_s = 25^\circ\text{C}$ 、 $I_F = 1000\text{mA}$

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



**Typical Diagram Characteristics of Radiation**

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

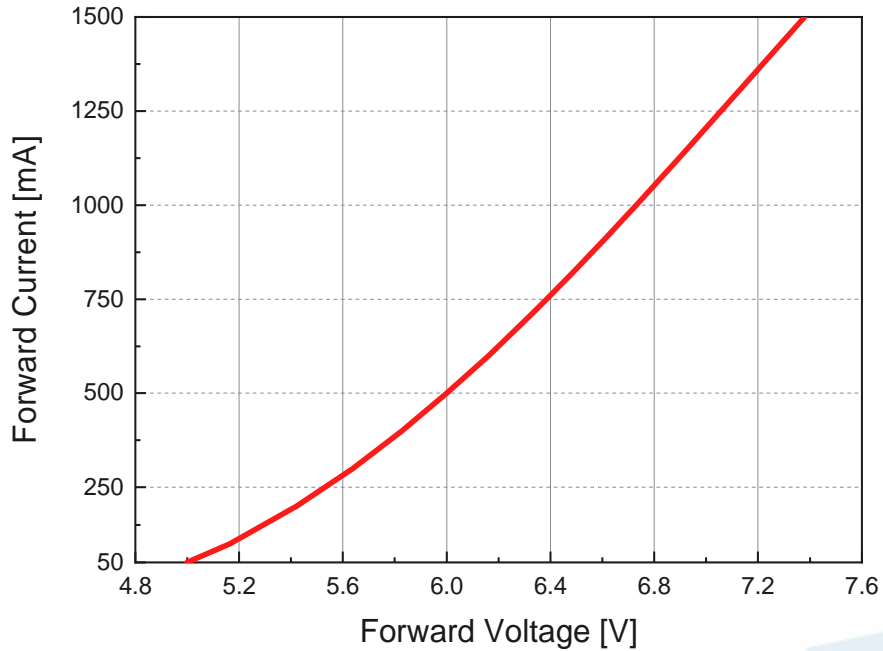


**Notes:**

1.  $\varphi$  is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is  $\pm 5^\circ$

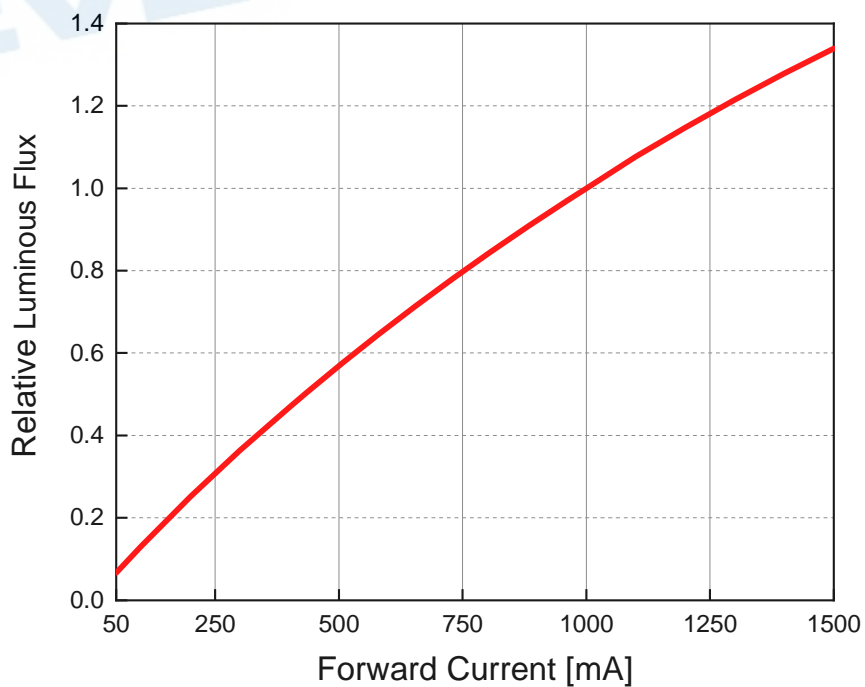
**Forward Current vs. Forward Voltage**  
**@ T<sub>s</sub> = 25°C**

$$I_F = f(V_F)$$



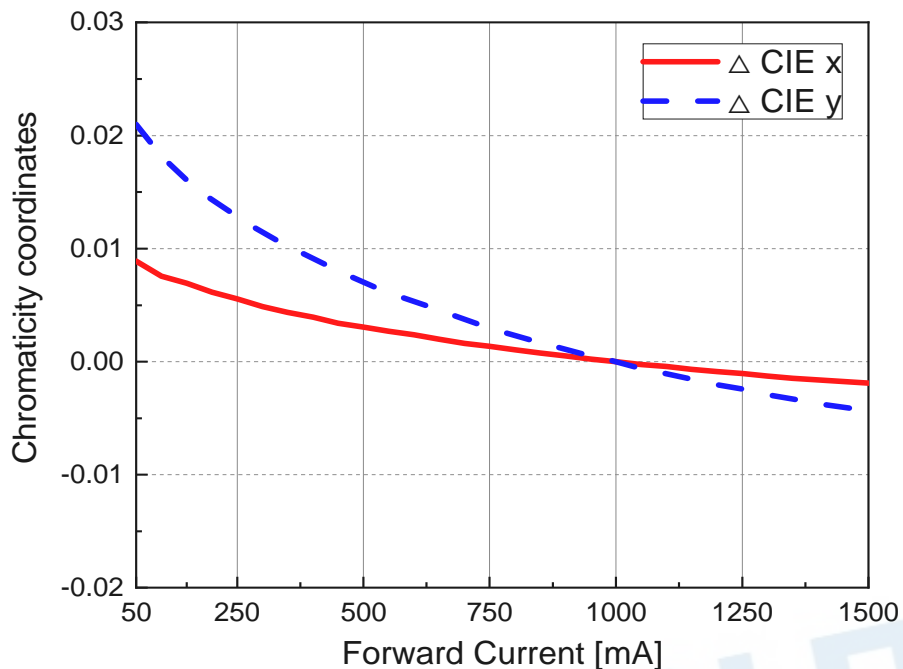
**Relative Luminous Flux vs. Forward Current**  
**@ T<sub>s</sub> = 25°C**

$$\Phi_V / \Phi_V (1000mA) = f(I_F)$$



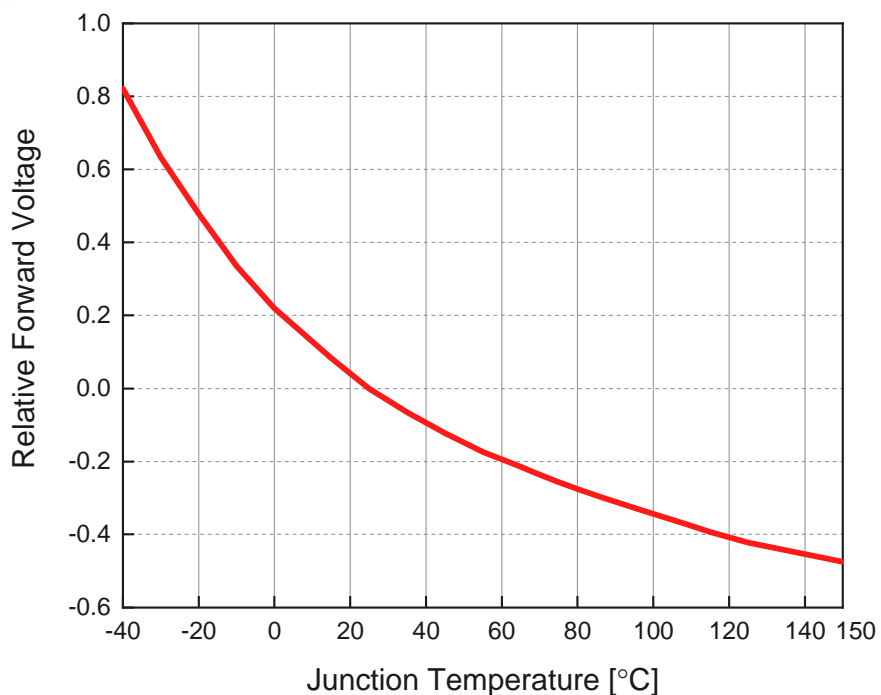
**Chromaticity Coordinates vs. Forward Current  
@  $T_s = 25^\circ\text{C}$**

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



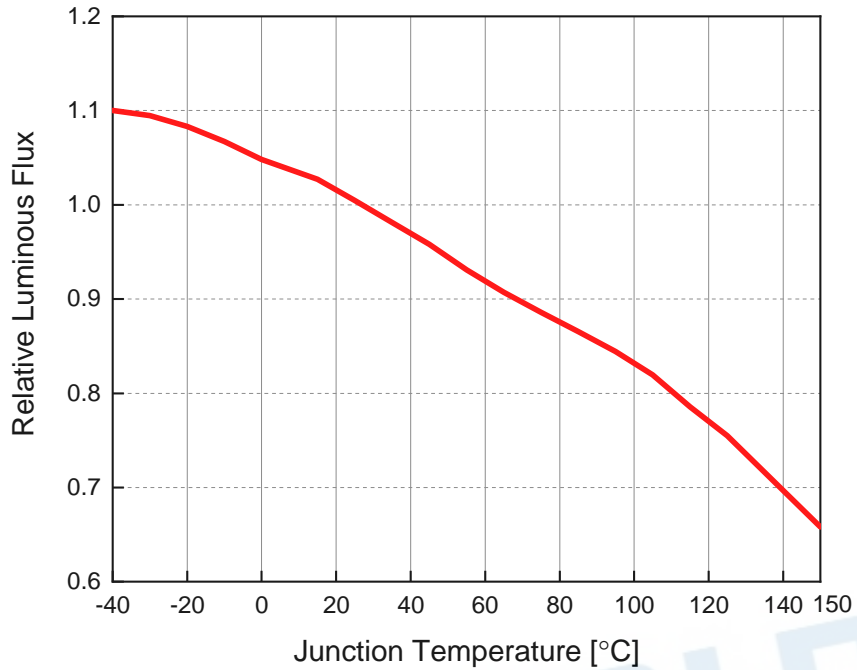
**Relative Forward Voltage vs. Junction Temperature  
@  $I_F = 1000\text{mA}$**

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



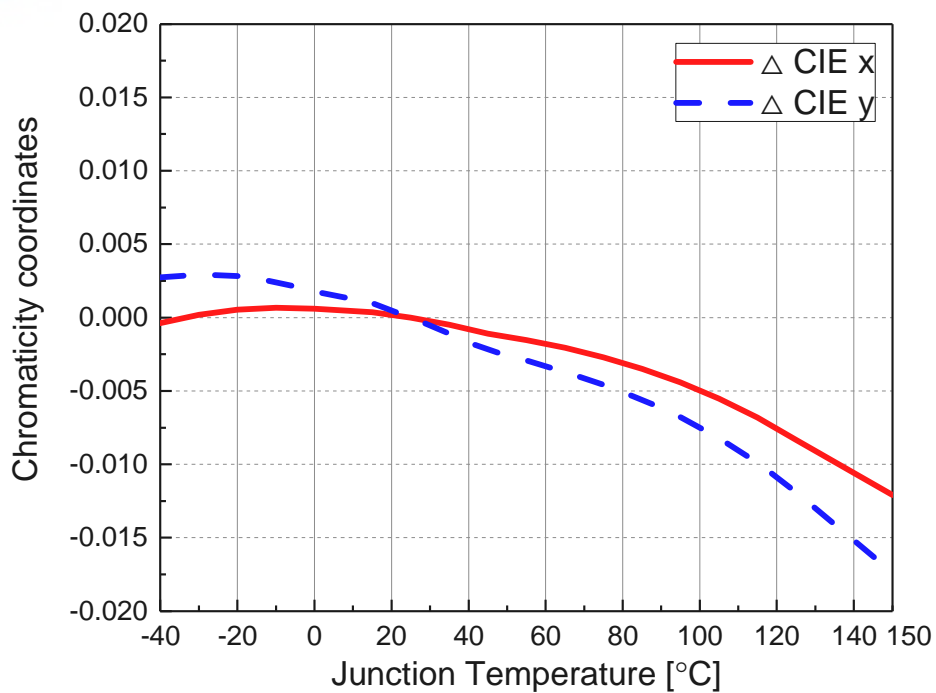
**Relative Luminous Flux vs. Junction Temperature**  
**@ I<sub>F</sub> = 1000mA**

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



**Chromaticity Coordinates Shift vs. Junction Temperature**  
**@ I<sub>F</sub> = 1000mA**

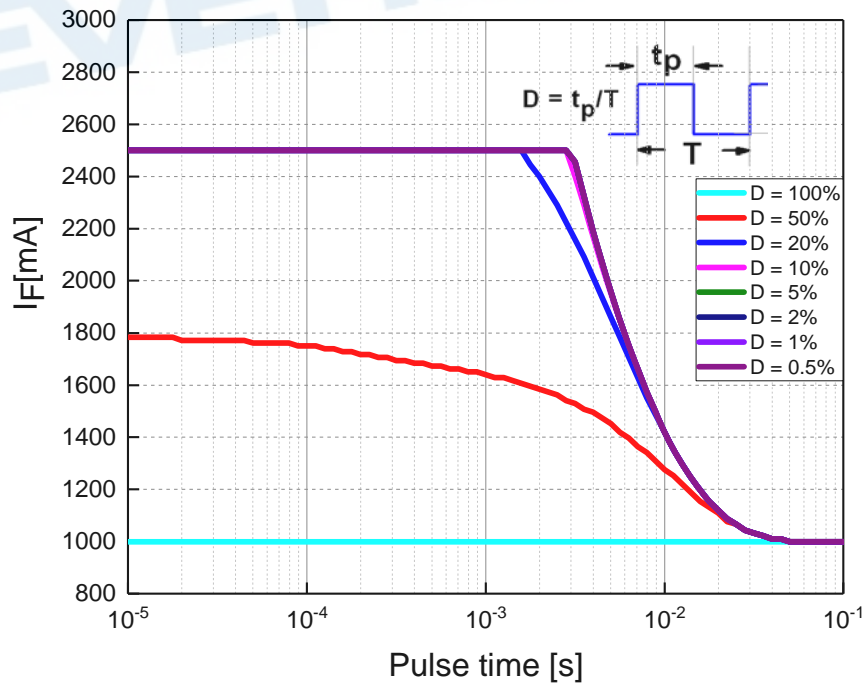
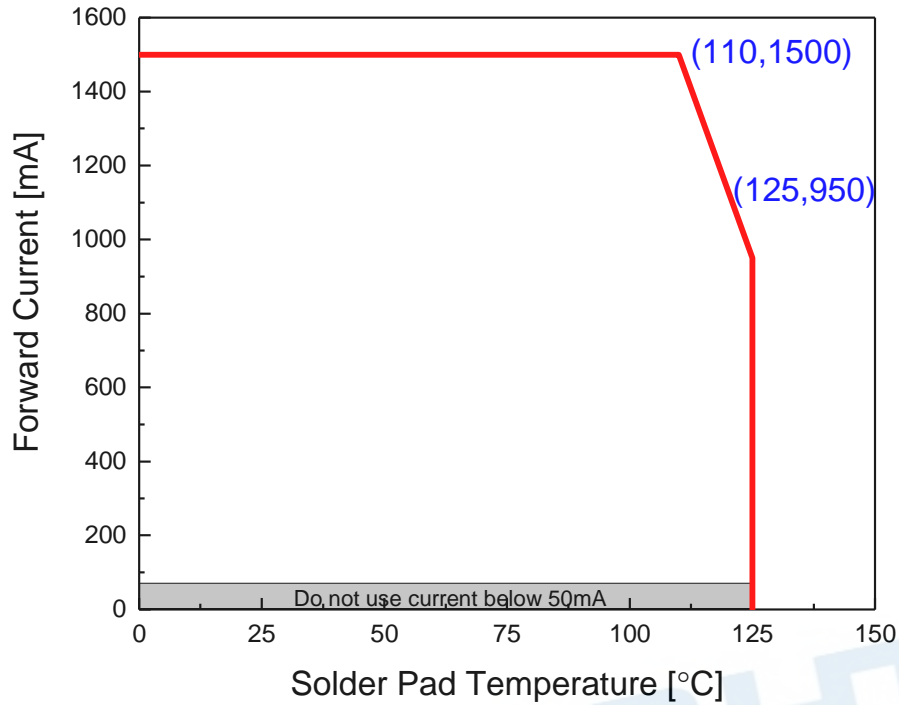
$$\Delta CIE_x, \Delta CIE_y = f(T_j)$$





### Forward Current Derating Curve

$$I_F = f(T_S)$$



## 4. Binning Information

### Luminous Intensity Bins

[ Cool White ]			
Group	Bin	Minimum Photometric Flux (lm)	Maximum Photometric Flux (lm)
D	5	600	650
	6	650	700
	7	700	750
	8	750	800

#### Notes:

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

### Forward Voltage Bins

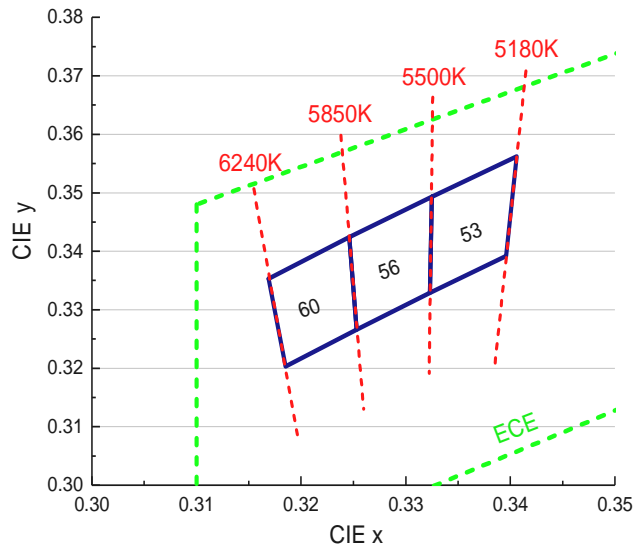
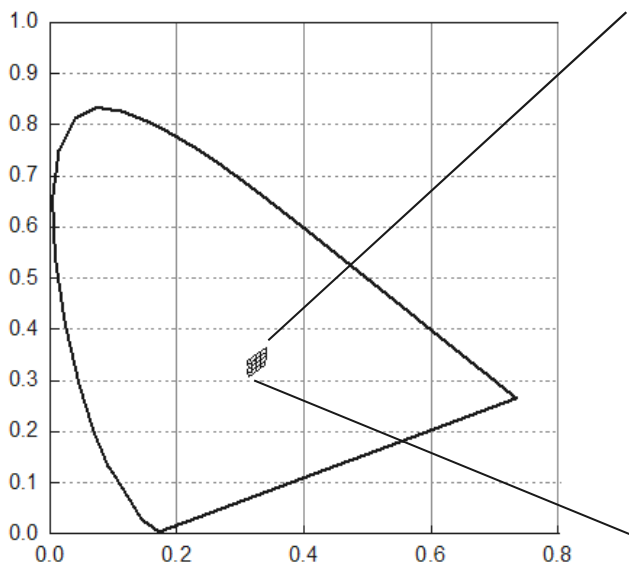
Group	Minimum Forward Voltage(V)	Maximum Forward Voltage(V)
2A	5.80	6.40
2B	6.40	7.00
2C	7.00	7.60

**Notes:**

1. Forward Voltage measurement tolerance:  $\pm 0.05V$ .

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### Color Bin Structure ECE Bin Structure



### Cool White Bin Coordinates

Bin	CIE x	CIE y
53	0.3325	0.3493
	0.3406	0.3562
	0.3396	0.3392
	0.3323	0.3329
Reference Range: 5180~5500K		

Bin	CIE x	CIE y
56	0.3246	0.3424
	0.3325	0.3493
	0.3323	0.3329
	0.3253	0.3266
Reference Range: 5500~5850K		

Bin	CIE x	CIE y
60	0.3169	0.3353
	0.3246	0.3424
	0.3253	0.3266
	0.3185	0.3203
Reference Range: 5850~6240K		

**Notes:**

1. Color coordinates measurement tolerance:  $\pm 0.005$ .

## 5. Part Number

### ALFS2BD-C010001H-AM

Part number is designated with below details.

ALFS = product family name.

2 = chip number

B = Product type

D = Device

C = Color <sup>[1]</sup>

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

1000 = test current [mA]

1 = internal code

H = Brightness Level

AM = automotive application

Note :

<sup>[1]</sup> 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

## 6. Ordering Information

### ALFS2BD-C010001H-**ABCDEFGHIJKLM**-OP-AM

Part Number of the ALFS	Order Code
ALFS2BD-C010001H-AM	ALFS2BD-C010001H-ABCDEFGHIJKLM-OP-AM(HS)

Order code contains information with below details :

ABCD = min/max wavelength or CCT

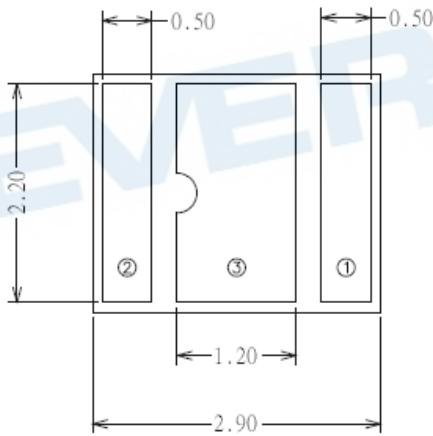
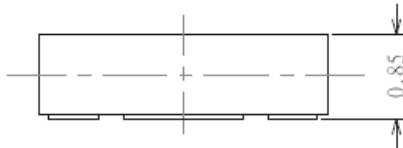
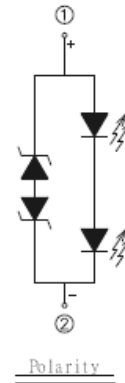
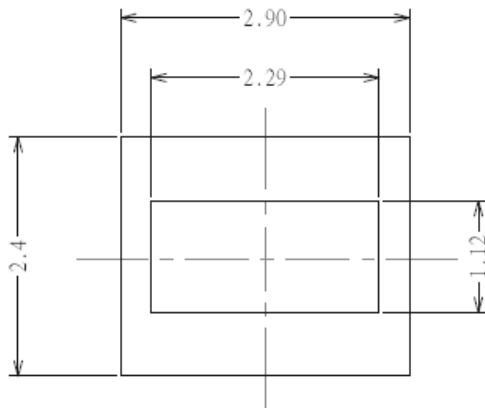
EFGH = min./max. luminous flux in [lm] or luminous intensity in [mcd]

JKLM = min./max. Forward Voltage

OP = Packing quantity (Minimum package)

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## 7. Mechanical Dimension

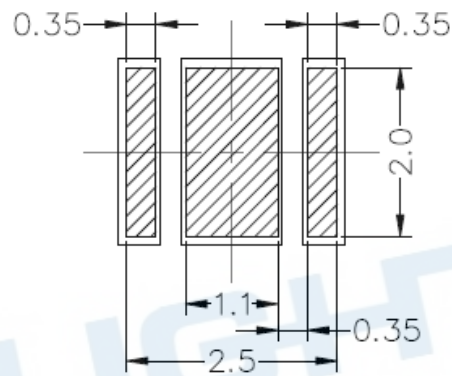
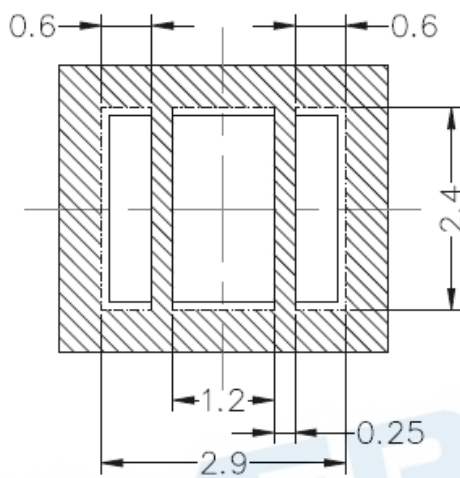
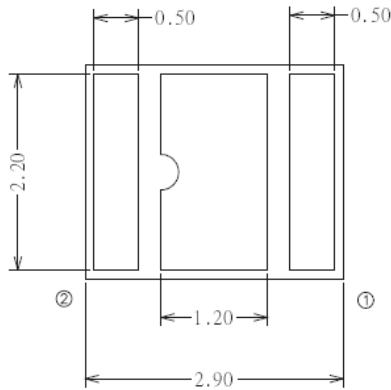


①	Anode
②	Cathode
③	Thermal pad

### Notes:

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

## 8. Recommended Soldering Pad



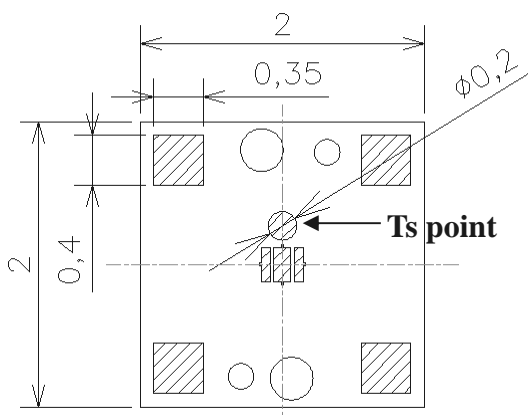
 solder resist

 solder stencil

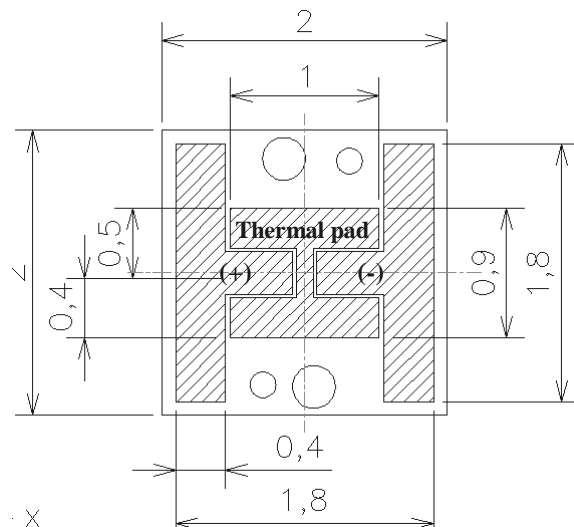
(Unit:mm)

We recommend Cu area like below drawing. You can use this recommendation when you draw your module design.

(MCPCB information; Cu thickness 35um, dielectric layer 100um, 2W/mK, Al thickness 1.5mm)



**Cu open area**



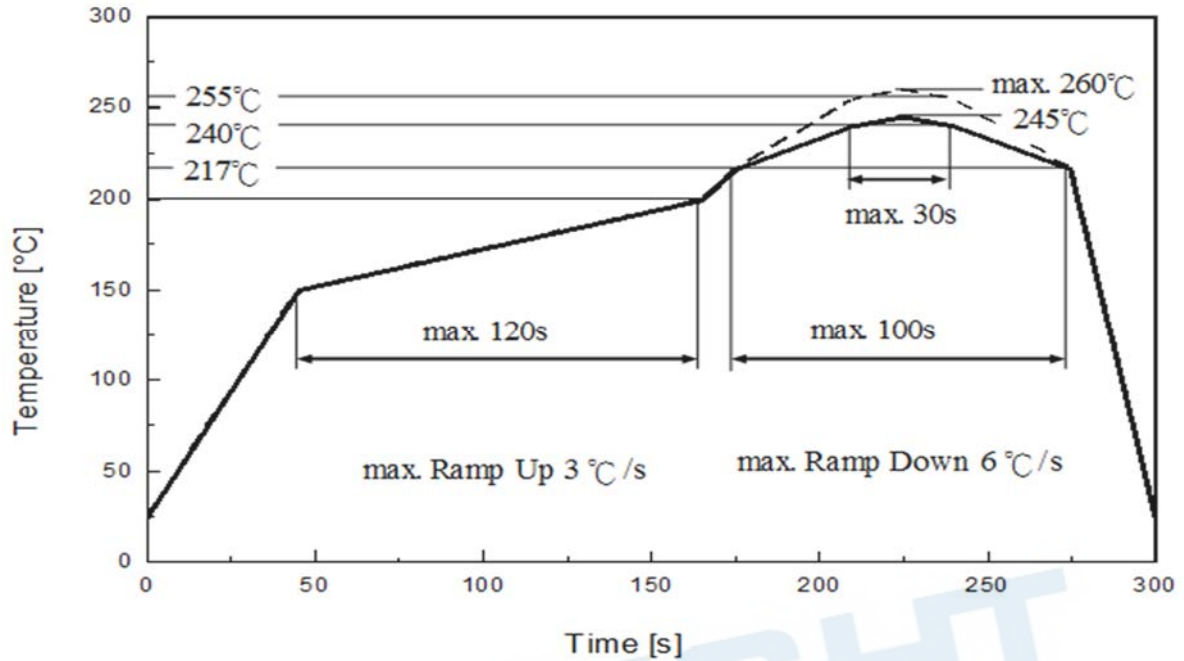
**Cu pattern**

(Unit:cm)



## 9. Reflow Soldering Profile

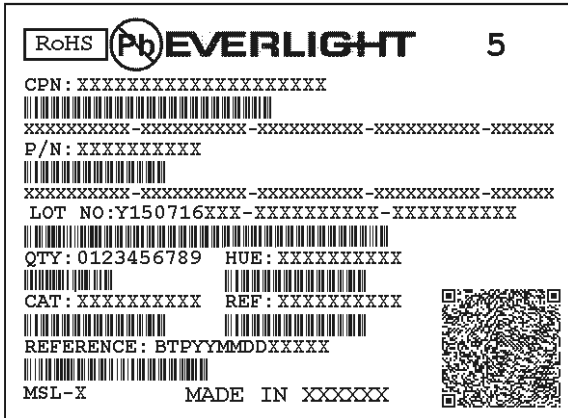
Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



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

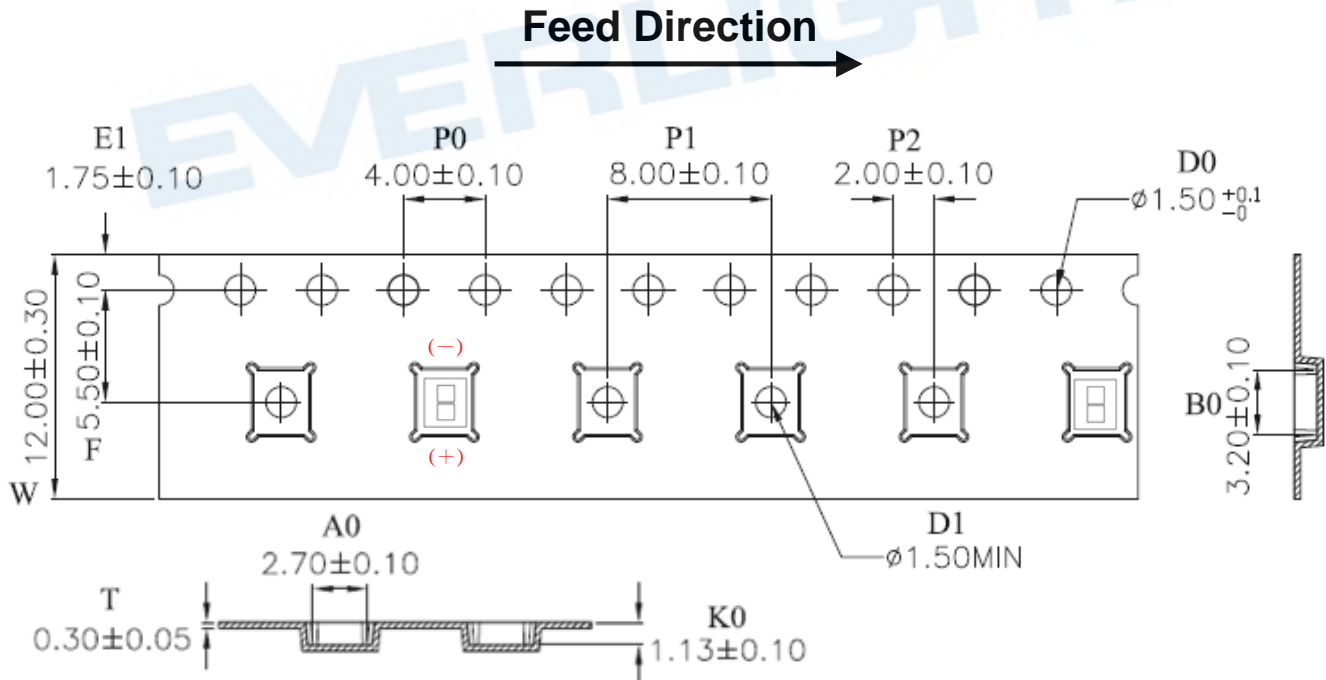
### • Product Labeling



- 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

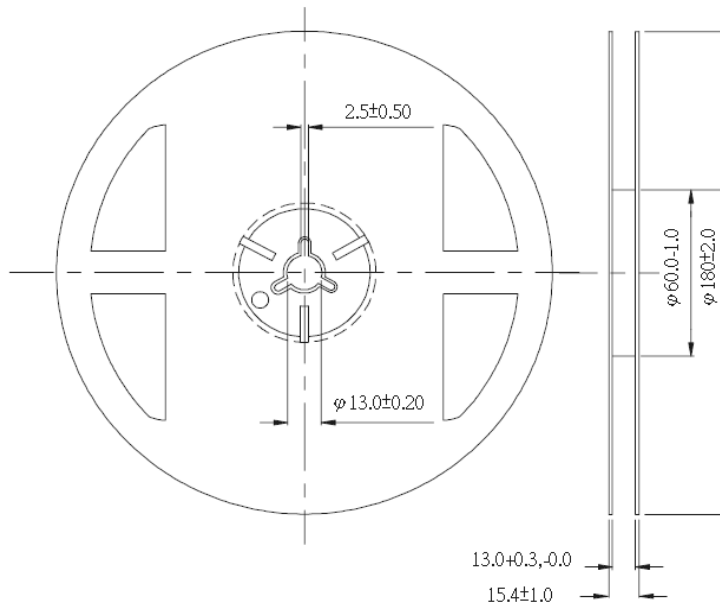
Reel: 1000pcs, MOQ<sub>≥</sub> 100pcs (has to be a multiple of 100pcs)



**Notes:**

1. Dimensions are in millimeters.

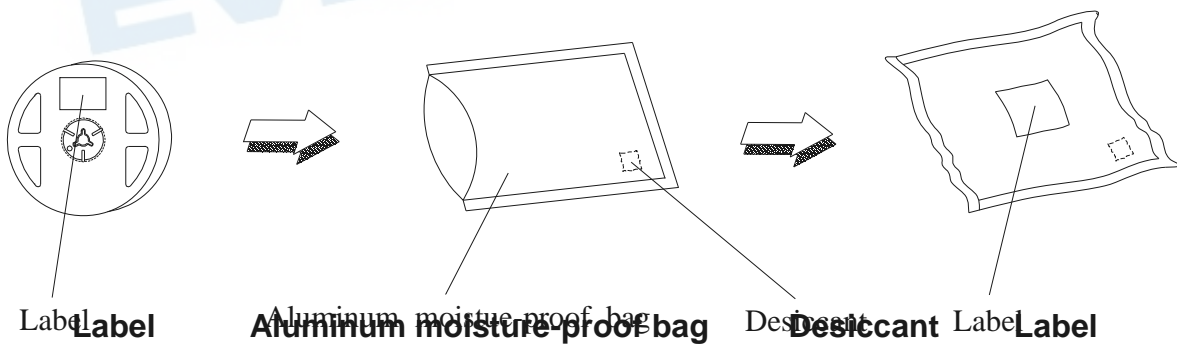
● **Reel Dimensions**



**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.

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## Revision History

Current version: Dec.04.2019

Issue No: DHE-0003672

Version: 1

Created by : Steven Lin

Rev.	Subjects (major change in previous version)	Modified date
1	Preliminary	2019/12/04

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