DATASHEET

EVERLIGHT AUTOMOTIVE

EL ALFS series

ALFS2BD-C0PA07001H-AM



Features

- Package：SMD ceramic package
- Typ. Luminous Flux (Cool White)：280 lm @ 700mA
- Typ. Luminous Flux (PC Amber)：180 lm @ 700mA
- Viewing angle：120°
- ESD：up to 8KV
- MSL：2
- Qualifications：According to AEC-Q102
- Sulfur robustness：Class A1
- Compliance with RoHS & REACH
- Compliance Halogen Free.(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm).

Applications

- Automotive Exterior Lighting
- Daytime running light (DRL)
- Turning lamp

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1. Characteristics

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Forward Current	CW / PA	I_F	50	700	1000	mA	---
Luminous Flux	Cool White	Φ_v	260	280	320	lm	I_F=700mA
	PC Amber	Φ_v	160	180	220	lm	I_F=700mA
Forward Voltage	Cool White	V_F	2.90	3.20	3.80	V	I_F=700mA
	PC Amber						
Viewing Angle	Cool White	ϕ	---	120	---	deg	I_F=700mA
	PC Amber						
Color	Cool White CCT	CCT	5180	---	6680	K	I_F=700mA
	PC Amber	CIE $_x$	---	0.5736	---	---	I_F=700mA
		CIE $_y$	---	0.4166	---		
Thermal Resistance (Junction to Solder)	Real	$R_{th\ JS\ real}$	---	4.6	9.0	K/W	I_F=700mA
	Electrical	$R_{th\ JS\ el}$	---	3.6	8.0		

Notes:

1. Luminous flux measurement tolerance: ±8%.
2. The data of luminous flux measured at thermal pad=25°C
3. Forward voltage measurement tolerance: ±0.05V
4. Current pulse time: 25ms

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2. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Power Dissipation	P_d	7600	mW
Forward Current	I_F	1000	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 30 sec	°C

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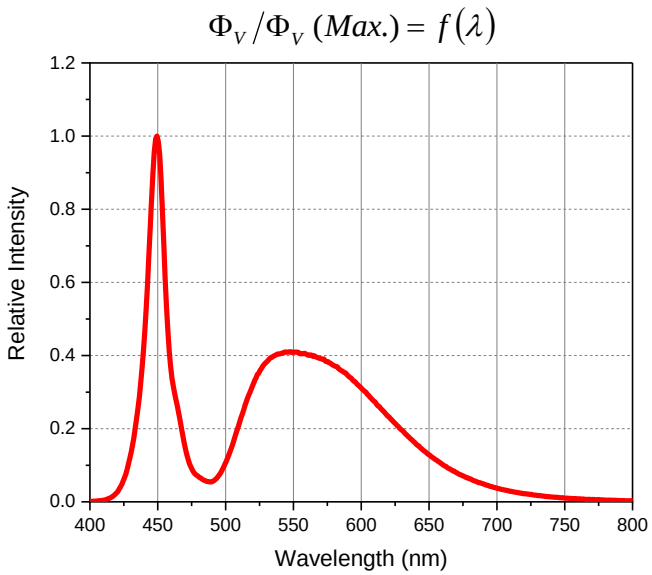
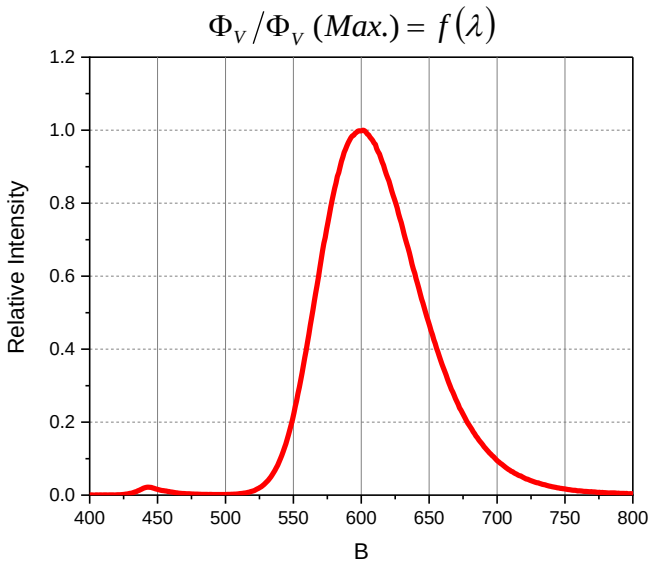
3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution @ T_S = 25°C、I_F = 700mA (CW)



Wavelength Characteristics Relative Spectral Distribution @ T_S = 25°C、I_F = 700mA (PC Amber)



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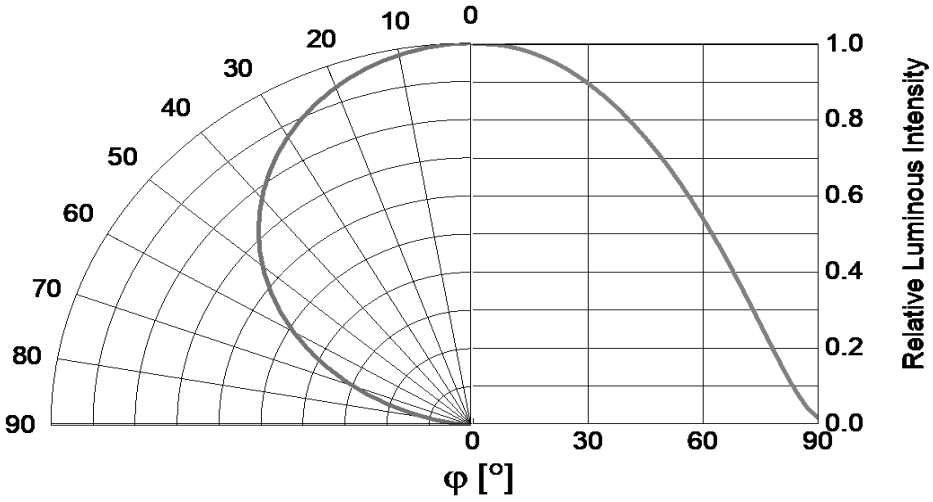
Typical Diagram Characteristics of Radiation (CW、PC Amber)

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

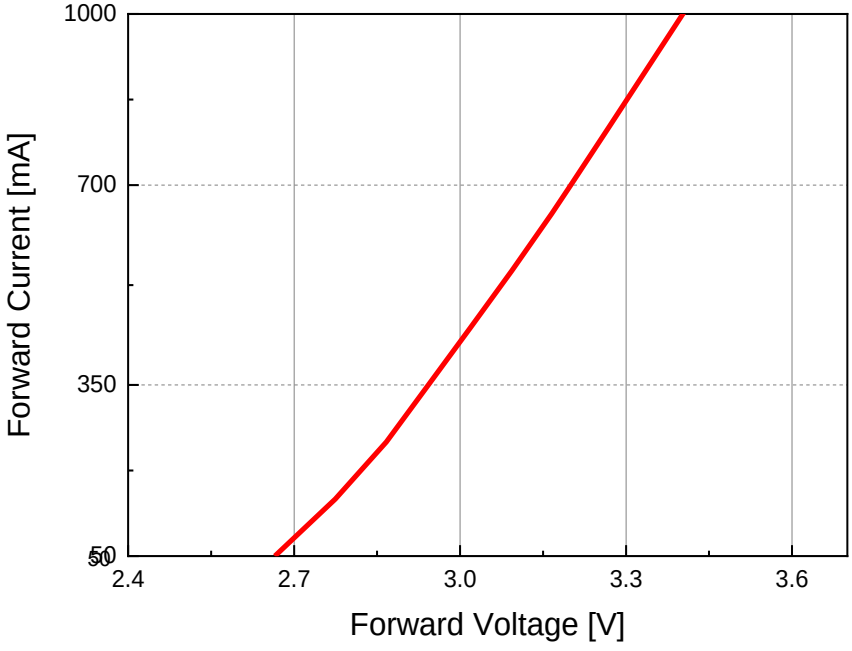


Notes:

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 ± 5°

Forward Current vs. Forward Voltage @ T_S = 25°C (CW / PC Amber)

$$I_F = f(V_F)$$



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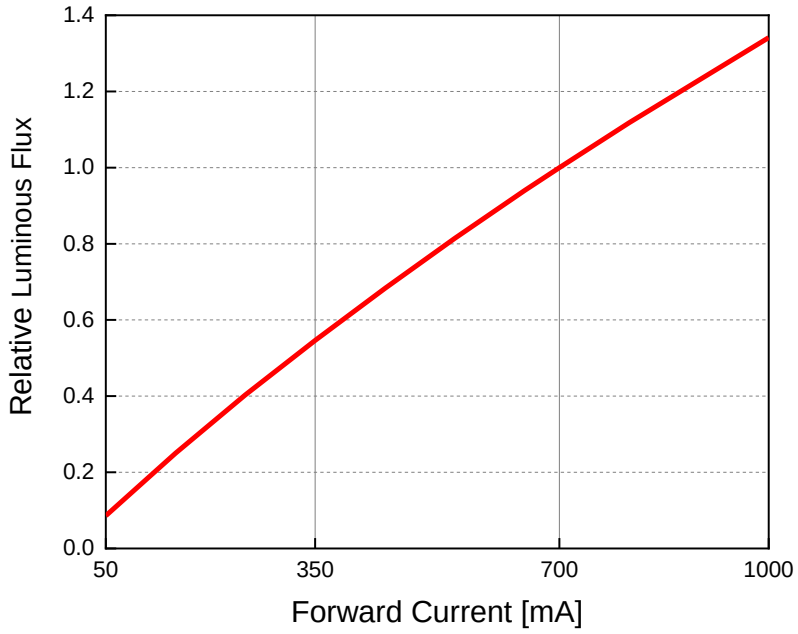
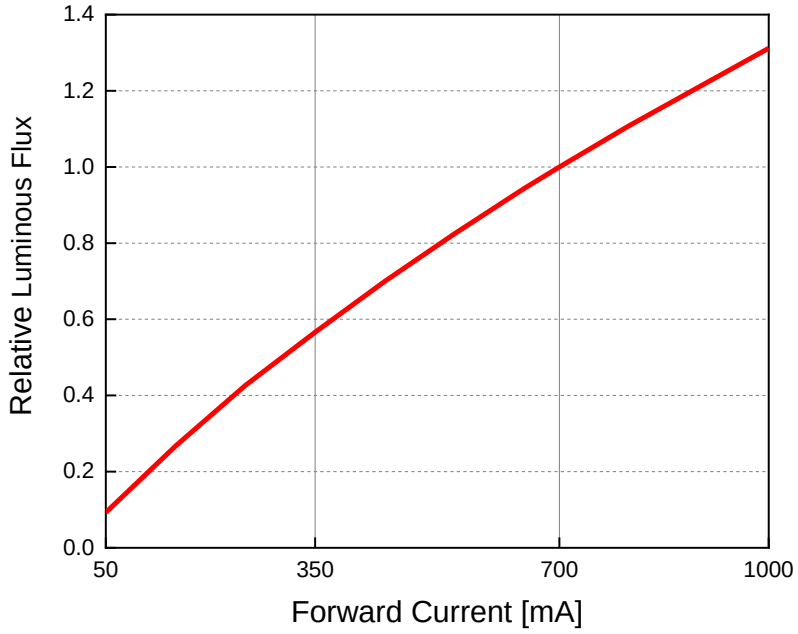
Relative Luminous Flux vs. Forward Current @ T_S = 25°C (CW)

$$\Phi_V / \Phi_V\,(700mA) = f(I_F)$$



Relative Luminous Flux vs. Forward Current @ T_S = 25°C (PC Amber)

$$\Phi_V / \Phi_V\,(700mA) = f(I_F)$$



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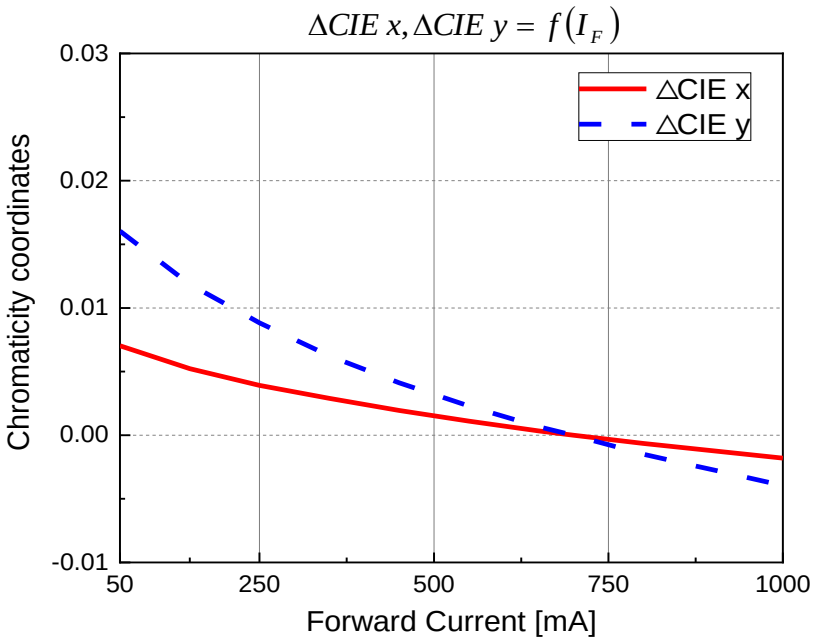
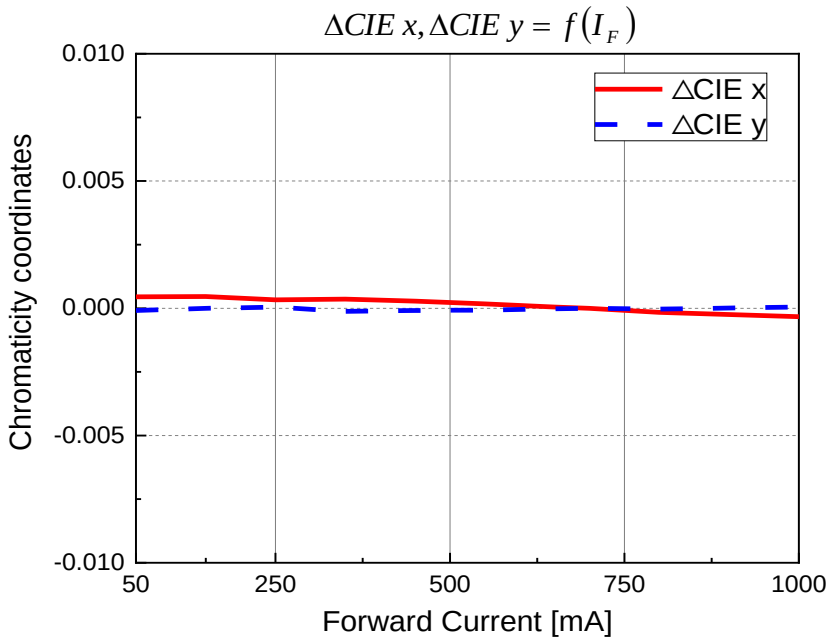
Chromaticity Coordinates Shift vs. Forward Current @ T_S = 25°C (CW)



Chromaticity Coordinates Shift vs. Forward Current @ T_S = 25°C (PC Amber)



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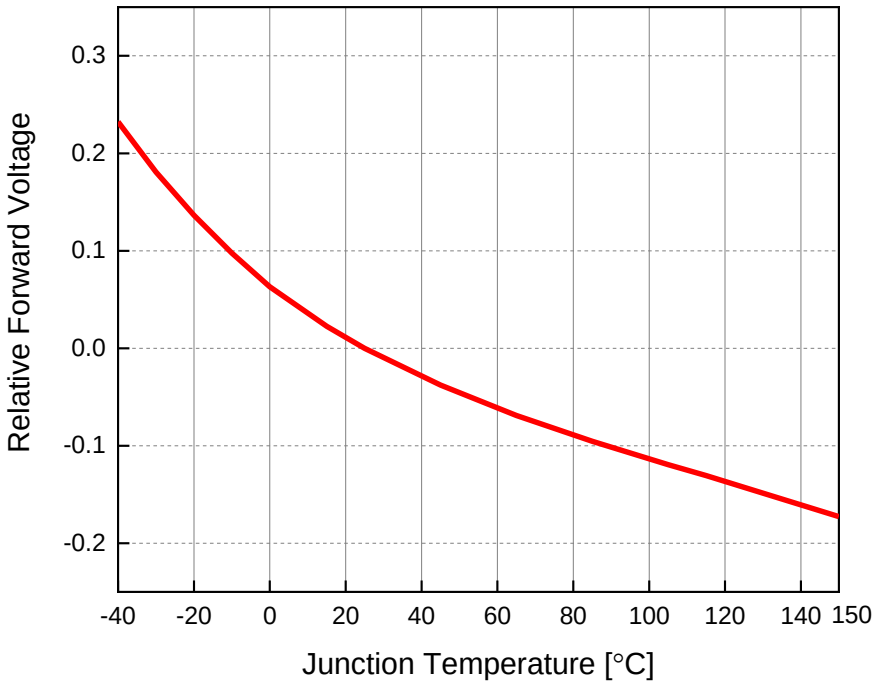
Relative Forward Voltage vs. Junction Temperature

@ I_F = 700mA (CW / PC Amber)

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



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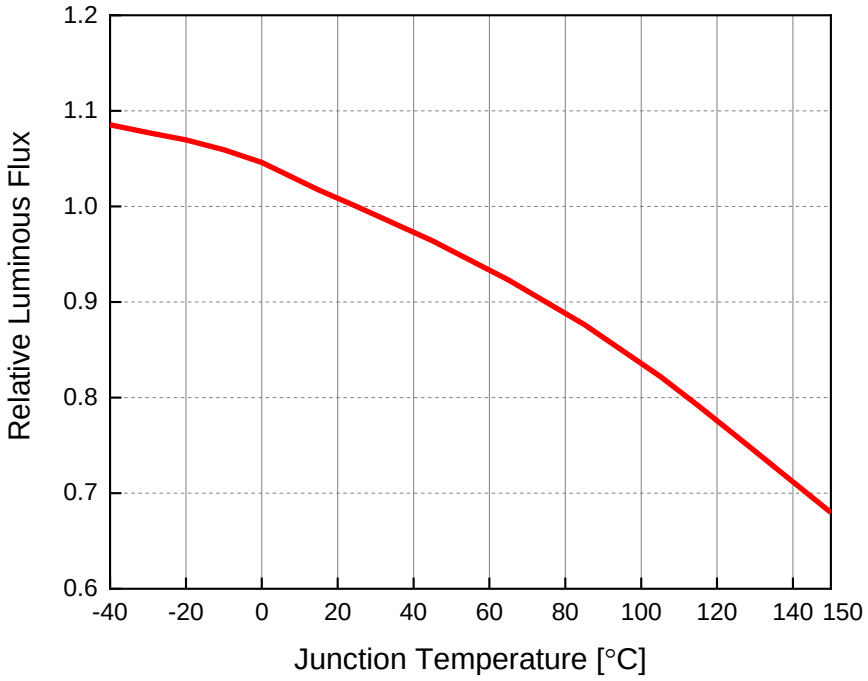
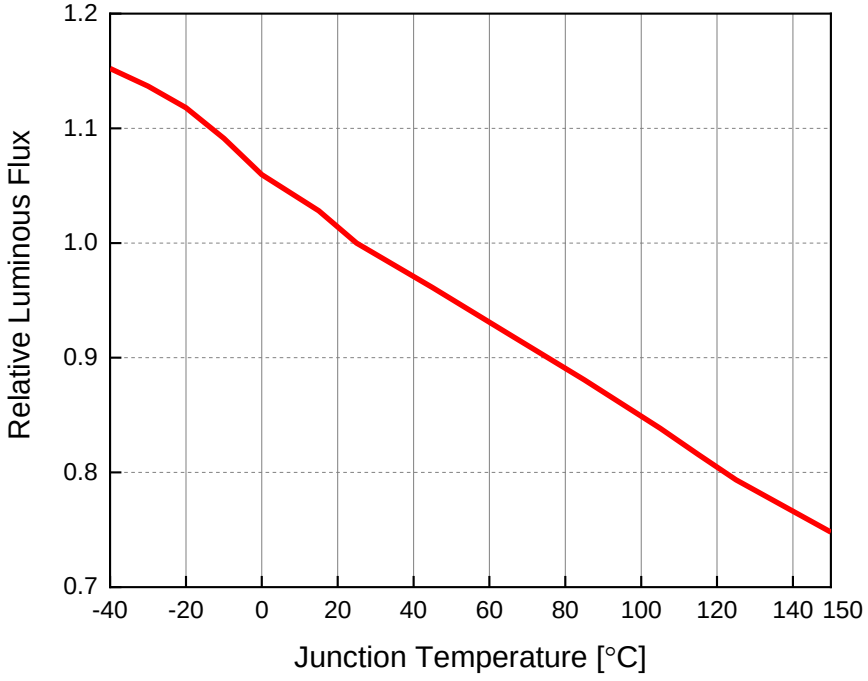
Relative Luminous Flux vs. Junction Temperature @ I_F = 700mA (CW)

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



Relative Luminous Flux vs. Junction Temperature @ I_F = 700mA (PC Amber)

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



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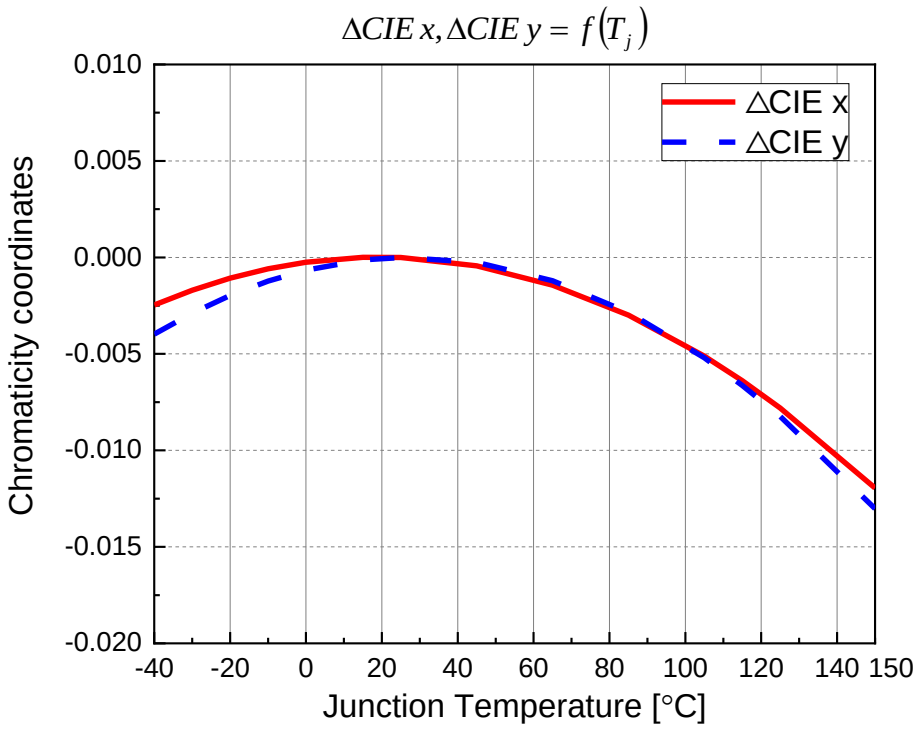
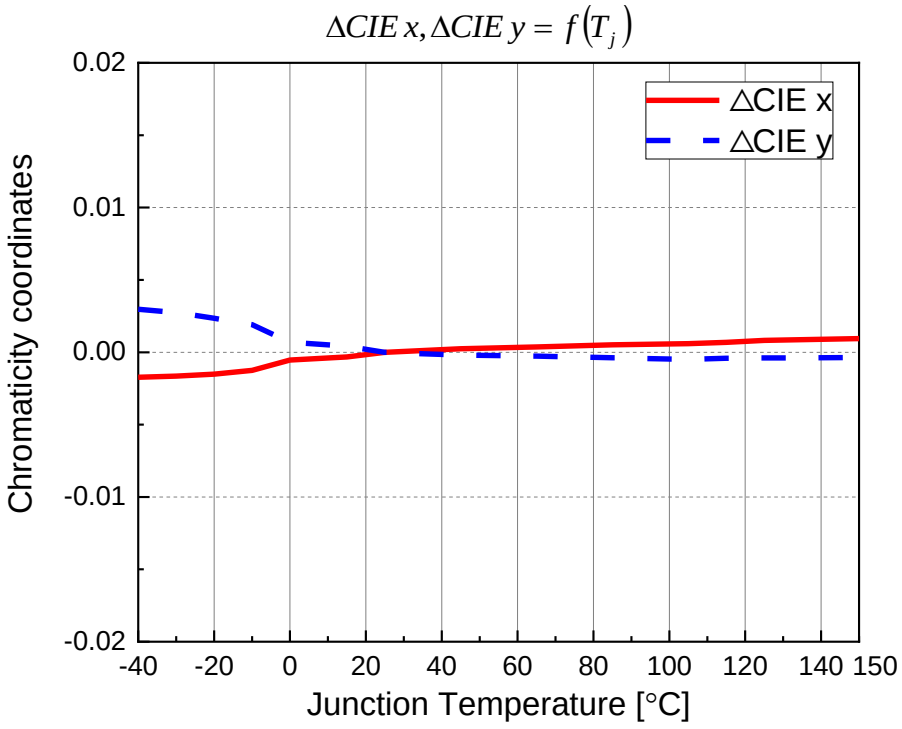
Chromaticity Coordinates Shift vs. Junction Temperature @ I_F = 700mA (CW)



Chromaticity Coordinates Shift vs. Junction Temperature @ I_F = 700mA (PC Amber)



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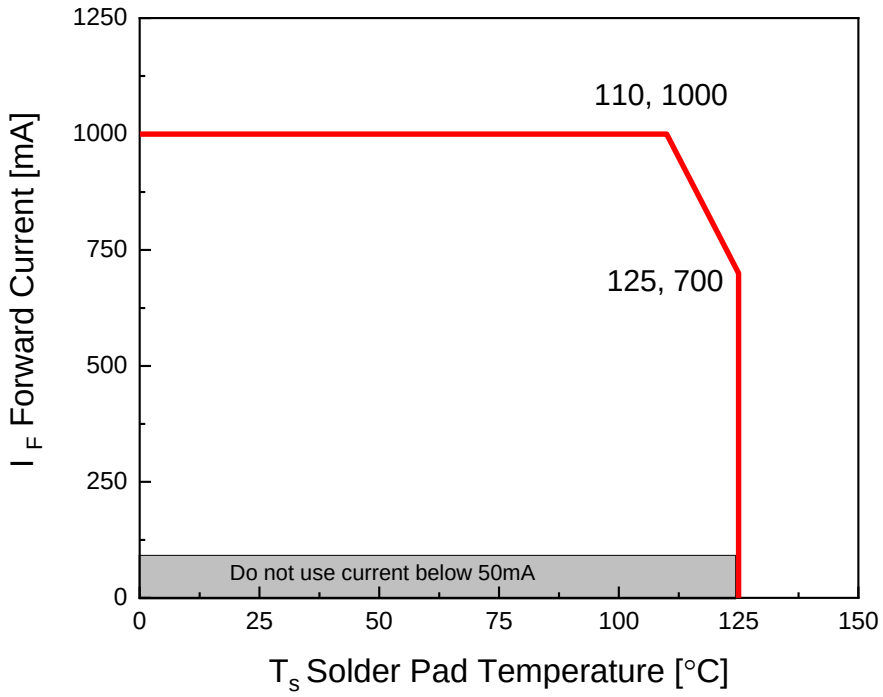
Forward Current Derating Curve

$$I_F = f(T_S)$$



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4. Binning Information

Luminous Flux Bins (Cold white)

Group Bin		Minimum Luminous Flux (lm)	Maximum Luminous Flux (lm)
B	9	260	280
	10	280	300
C	1	300	320

Luminous Flux Bins (PC amber)

Group Bin		Minimum Luminous Flux (lm)	Maximum Luminous Flux (lm)
B	4	160	180
	5	180	200
	6	200	220

Notes:

1. Luminous flux measurement tolerance: ±8%
2. Test current: Typical forward current
3. Current pulse time: 25ms

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Forward Voltage Bins

Group	Minimum Forward Voltage(V)	Maximum Forward Voltage(V)
1A	2.90	3.20
1B	3.20	3.50
1C	3.50	3.80

Notes:

1. Forward Voltage measurement tolerance: ±0.05V
2. Test current: Typical forward current
3. Current pulse time: 25ms

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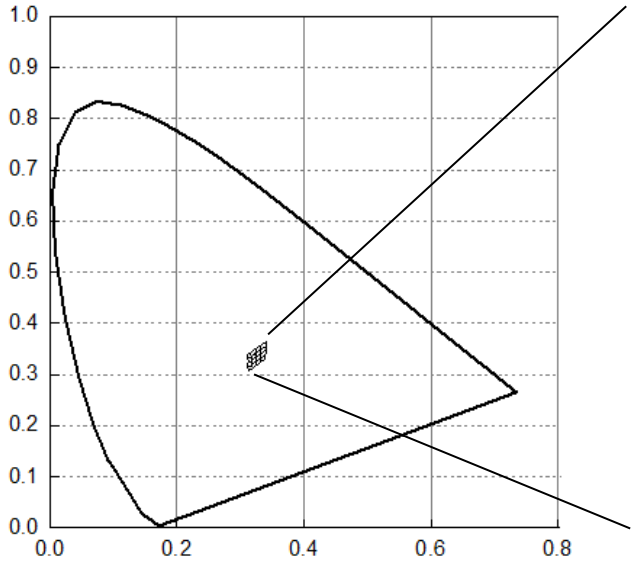
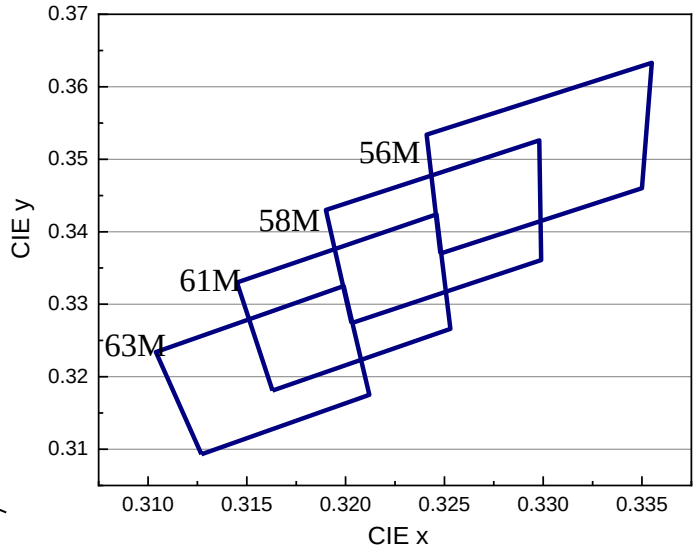
Color Bin Structure





Cool White Bin Coordinates

Bin	CIE x	CIE y
63M	0.3127	0.3093
	0.3212	0.3175
	0.3199	0.3325
	0.3104	0.3234

Bin	CIE x	CIE y
61M	0.3163	0.3181
	0.3253	0.3266
	0.3246	0.3424
	0.3145	0.333

Bin	CIE x	CIE y
58M	0.3203	0.3274
	0.3299	0.3361
	0.3298	0.3526
	0.319	0.343

Bin	CIE x	CIE y
56M	0.3248	0.337
	0.335	0.346
	0.3355	0.3633
	0.3241	0.3534

Notes:

1. Color coordinates measurement tolerance: ±0.005.

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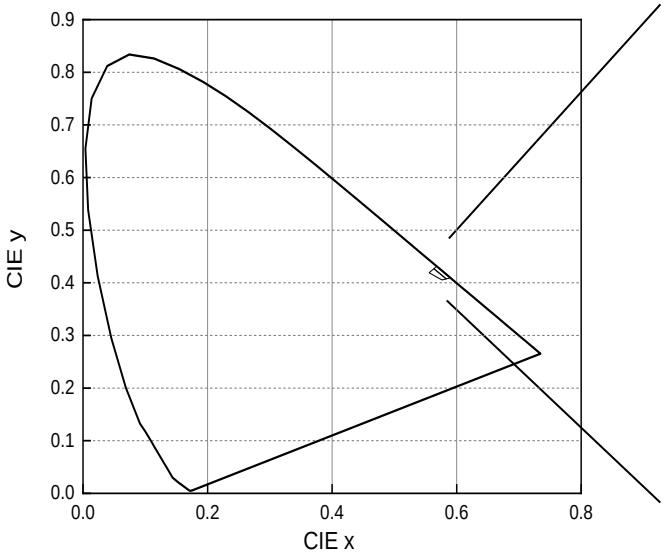
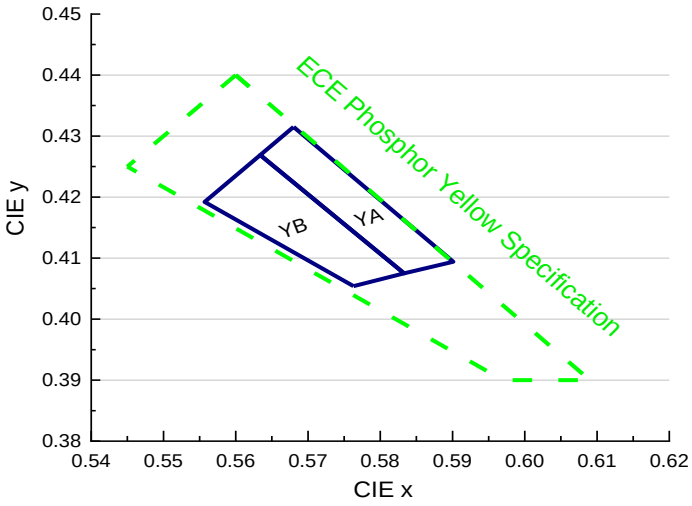
Color Bin Structure
ECE Bin Structure





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
2. Test current: Typical forward current
3. Current pulse time: 25ms

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5. Part Number

ALFS2BD-C0PA07001H-AM

Part number is designated with below details.

ALFS = product family name.

2 = chip number

BD = Product type

C = Color [1]

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

PA= color [1]

700 = test current [mA]

1 = Internal code

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
UYG	Brilliant Yellow Green
UPG	Pale Green
UA	Amber
UR	Red
SR	Super Red
RGB	RGB-Color

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6. Ordering Information

ALFS2BD-C0PA07001H-ABCDEFG-HI-AM

Part Number	Order Code
ALFS2BD-C0PA07001H-AM	ALFS2BD-C0PA07001H-ABCDEFG-HI-AM

ABC= Group Code

DE= min./max. luminous flux in [lm] (CW)

FG = min./max. luminous flux in [lm] (PC Amber)

HI = Packing quantity (Minimum package)

AM = Automotive Application

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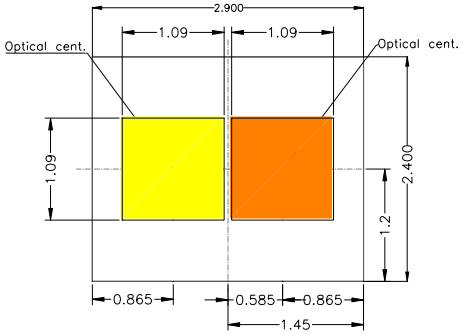
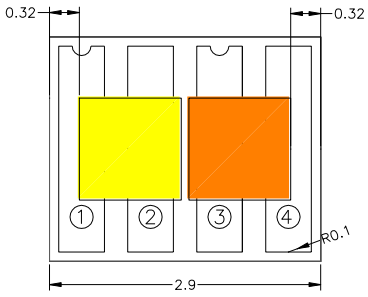
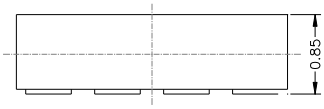
7. Mechanical Dimension



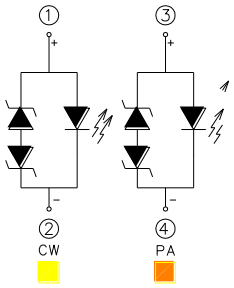
Top View



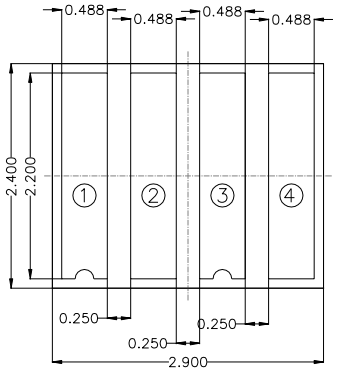
X-ray View



Side View



Polarity



Bottom view

①	Cathode
②	Anode
③	Cathode
④	Anode

Notes:

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

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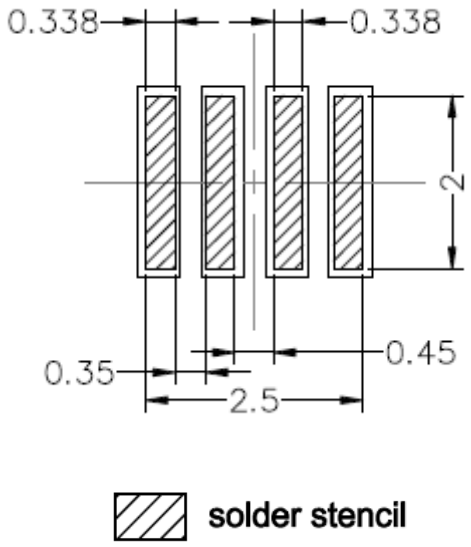
8. Recommended Soldering Pad



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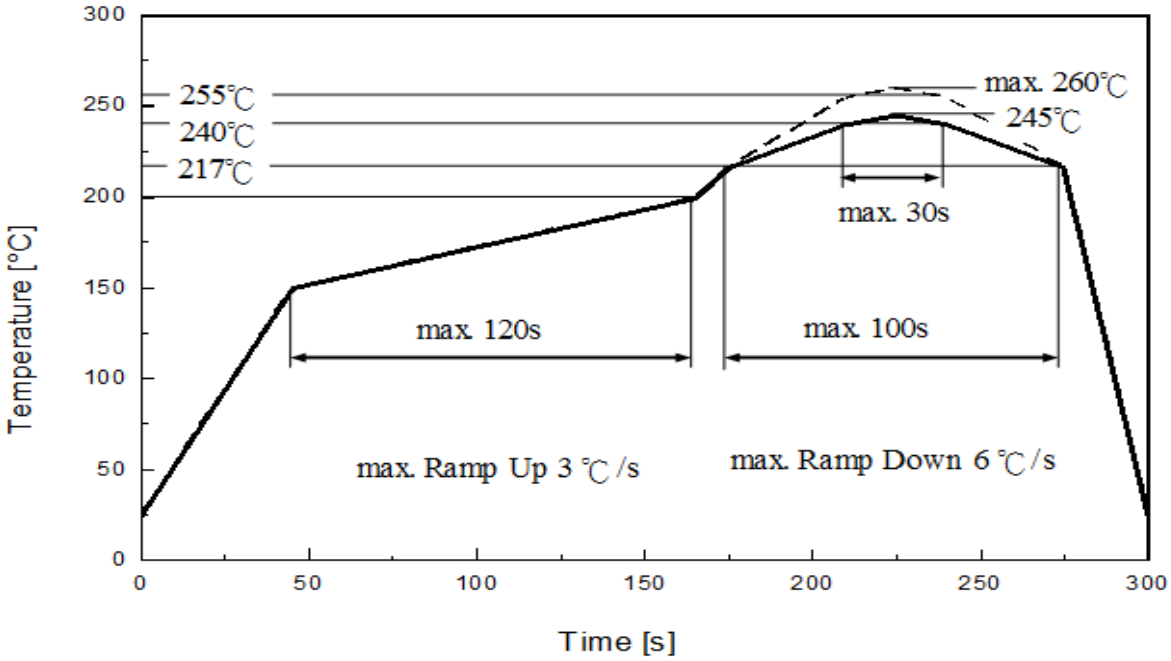
9. Reflow Soldering Profile

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

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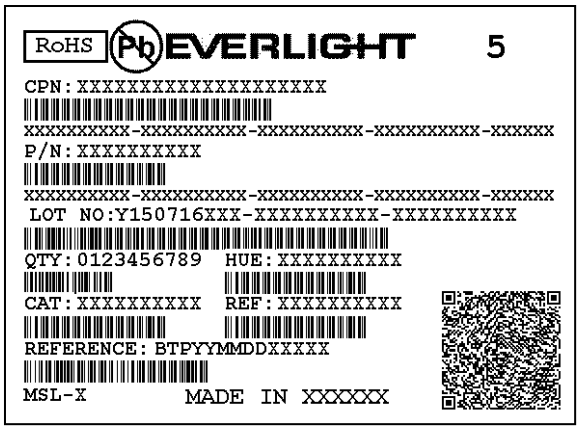
10. Packaging Information

• Product Labeling



□CPN：Customer's Product Number

□P/N：Everlight Part Number

□LOT NO：Lot Number

□QTY：Packing Quantity

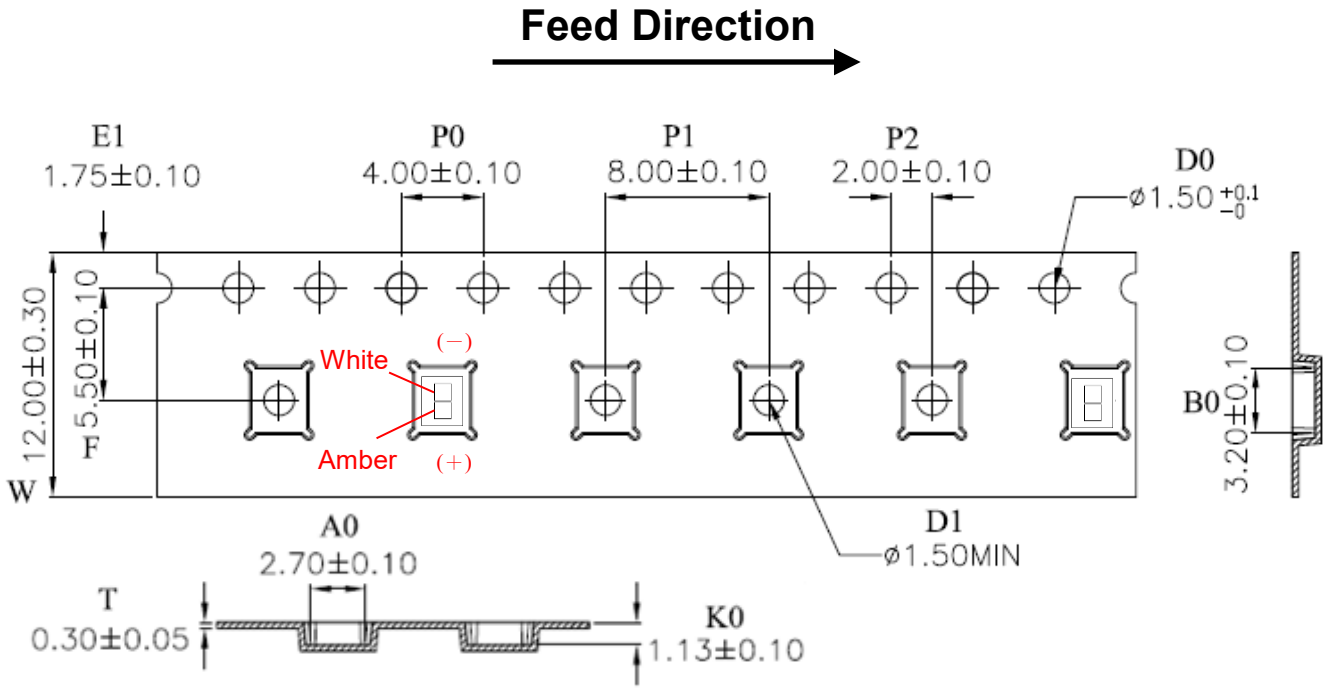
□HUE：Color Bin

□CAT：Luminous Flux (Brightness) Bin

□REF：Forward Voltage Bin

• Carrier Tape Dimensions as the following

Reel: 500pcs, MOQ≥ 100pcs (has to be a multiple of 100pcs)



Notes:

1. Dimensions are in millimeters.

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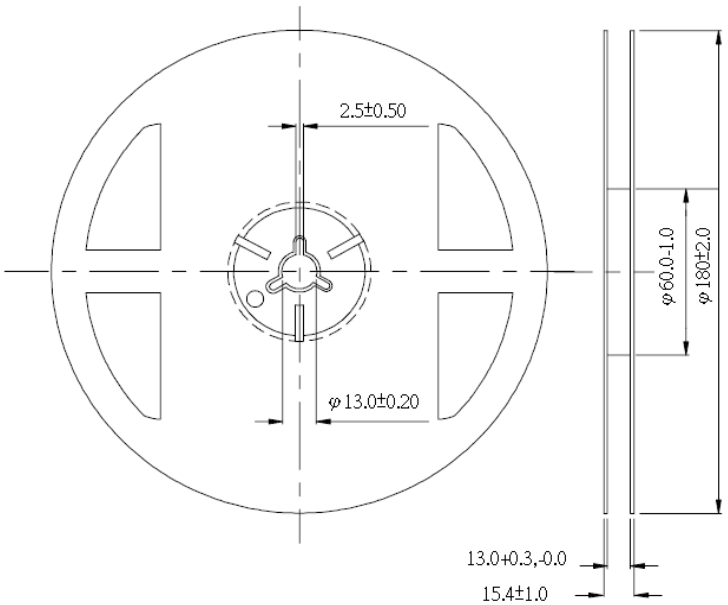
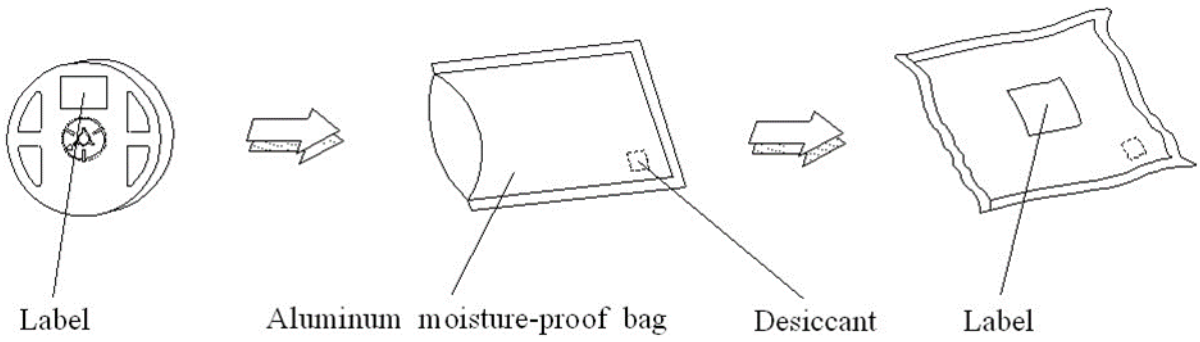
• Reel Dimensions



Notes:

1. Dimensions are in millimeters.

• Moisture Resistant Packing Process



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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℃ 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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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 discolor, please refer to the Frame blackening after Grade of H2S and FMG test defect under Everlight's inspection criteria

H2S test	Grade A0	Grade A1	Grade B0	Grade B1
Class A	Pass ΔIV, ΔColor, ΔVF criteria No discoloration	Pass ΔIV, ΔColor, ΔVF criteria Discoloration		
Class B			Pass ΔIV, ΔColor, ΔVF criteria No discoloration	Pass ΔIV, ΔColor, ΔVF criteria 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.	

Grade for H2S Test	Description
0	No discoloration
1	Discoloration

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