

EL ALFS series

ALFS1E-C03501H-AM

Preliminary



Features

- Package : SMD ceramic package
- Typ. Color Temperature : 5850K
- Typ. Luminous Flux : 140 lm @ 350mA
- 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
- Headlamp
- Daytime running light (DRL)
- Fog lamp

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	168
9. Reflow Soldering Profile.....	16
10. Packaging Information.....	17
11. Precaution for Use	19

1. Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward current ^[1]	I_F	50	350	700	mA	
Luminous Flux ^{[2][3]}	Φ_v	100	140	180	lm	$I_F=350\text{mA}$
Average Luminance ^[4]	L_v	---	125	---	Cd/mm ²	$I_F=350\text{mA}$
Forward Voltage ^{[5][6]}	V_F	2.90	3.20	3.80	V	$I_F=350\text{mA}$
Viewing Angle	ϕ	---	120	---	deg	$I_F=350\text{mA}$
Color	K	5180	---	6680	K	$I_F=350\text{mA}$
Thermal Resistance (Junction to Solder)	$R_{th JS real}$	---	8.7	9.3	K/W	$I_F=350\text{mA}$
	$R_{th JS el}$	---	8.1	8.6		

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. The Average Luminanace has a linear correlation with the Luminous Flux for LED
5. Forward voltage measurement tolerance: $\pm 0.05\text{V}$
6. The Vf range shown in the table above indicates 99% output.

2. Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Reverse Voltage	V_R	Not designed for reverse operation	V
Power Dissipation	P_d	2660	mW
Forward Current	I_F	700	mA
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

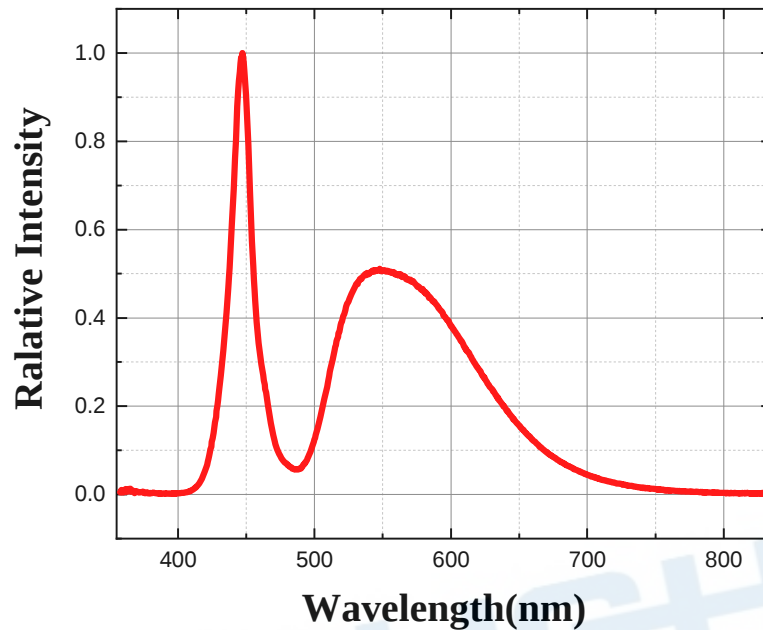
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3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution

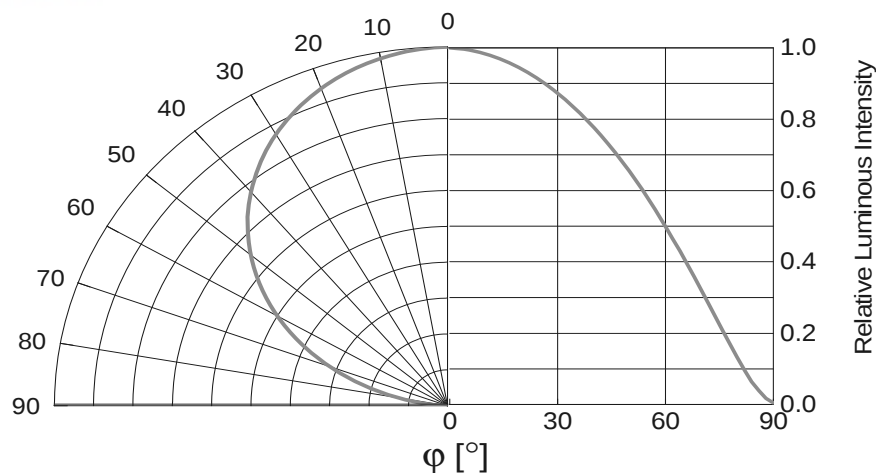
@ $T_S = 25^\circ\text{C}$ 、 $I_F = 350\text{mA}$

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



Typical Diagram Characteristics of Radiation

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



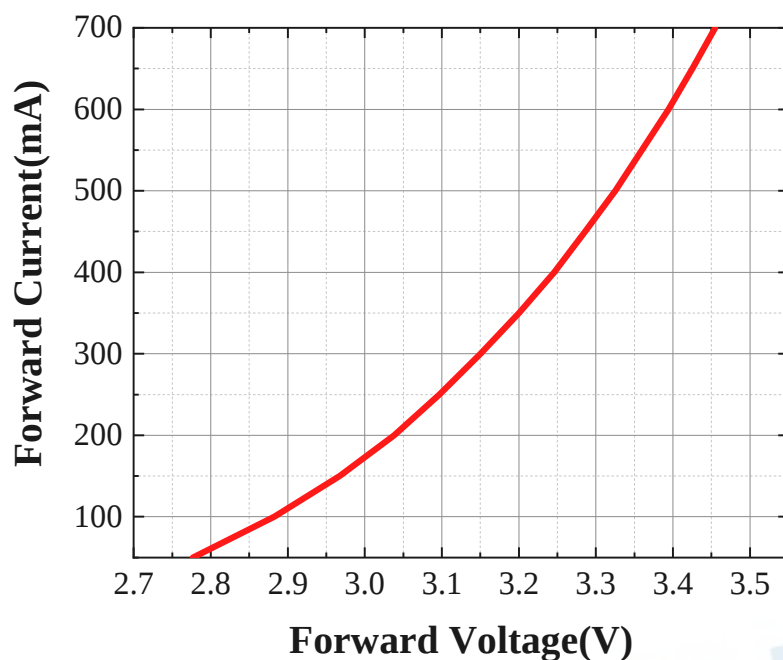
Notes:

1. 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

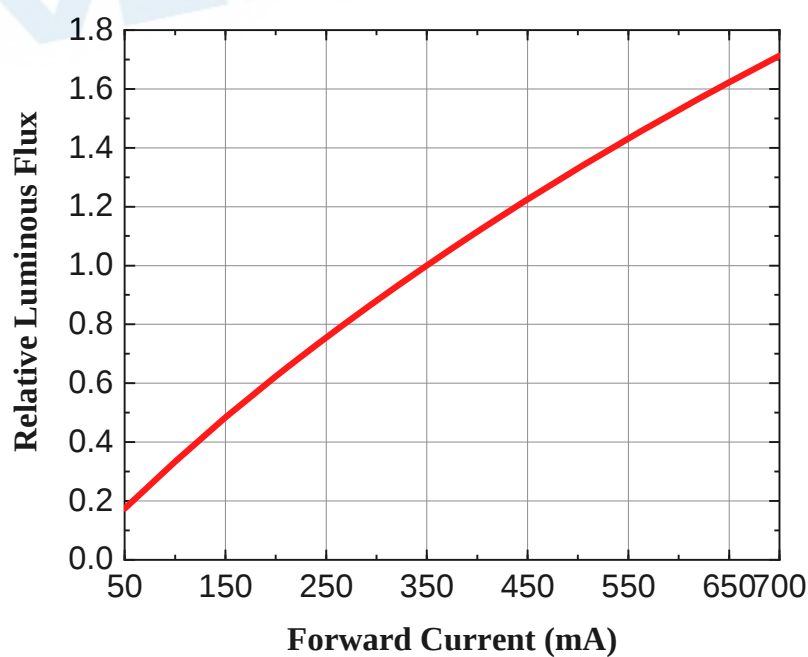
$$I_F = f(V_F)$$



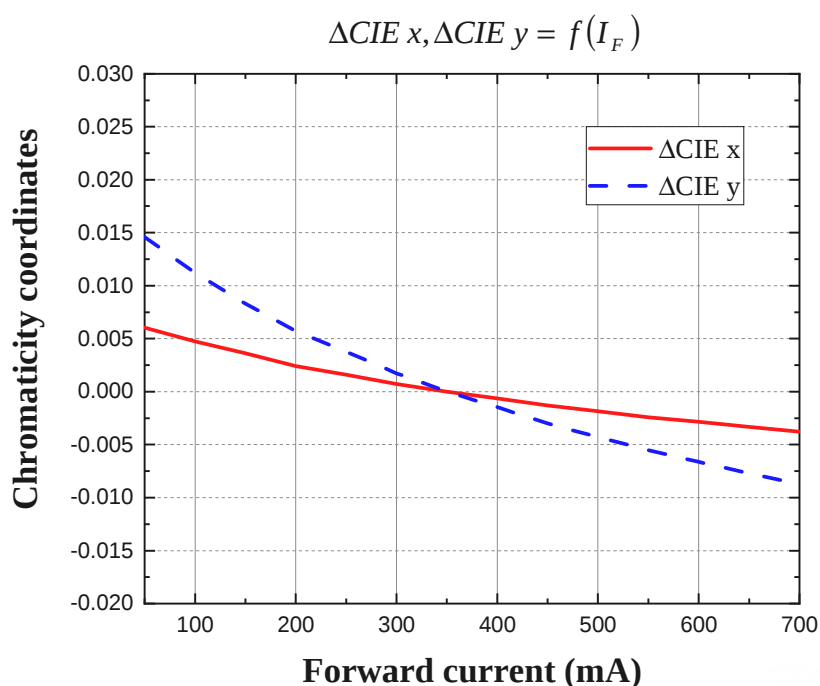
Relative Luminous Flux vs. Forward Current

@ T_S = 25°C

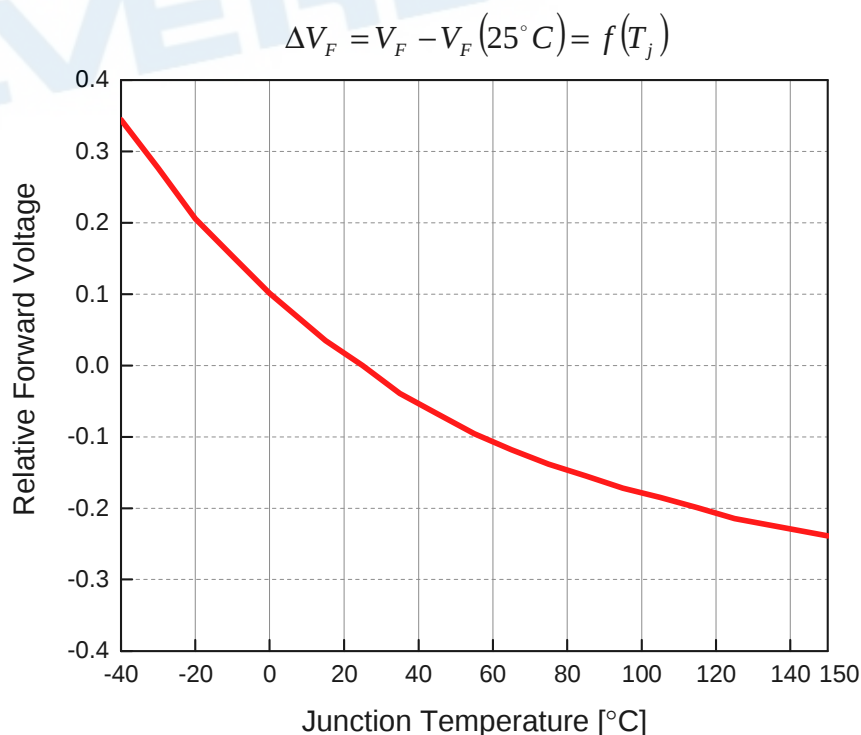
$$\Phi_V / \Phi_V(350mA) = f(I_F)$$



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



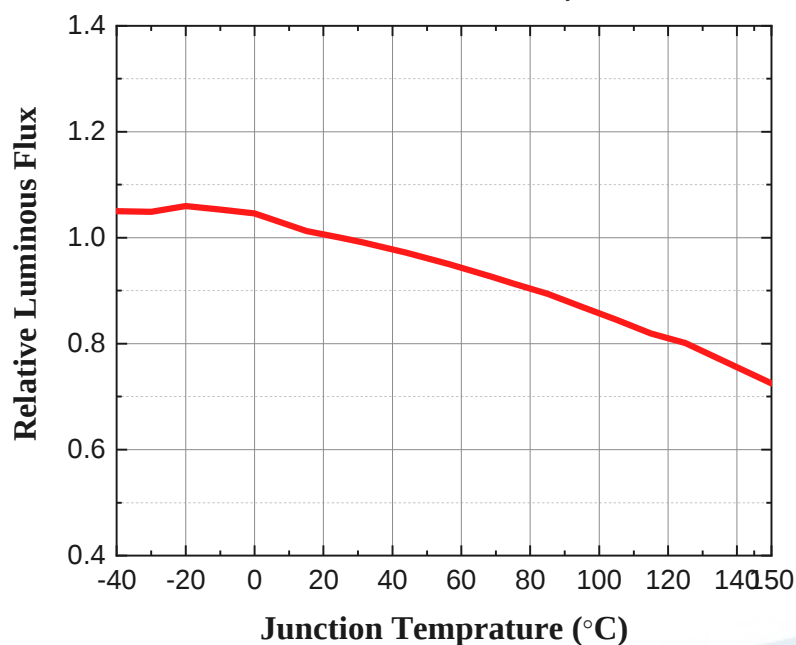
Relative Forward Voltage vs. Junction Temperature @ $I_F = 350\text{mA}$



Relative Luminous Flux vs. Junction Temperature

@ $I_F = 350\text{mA}$

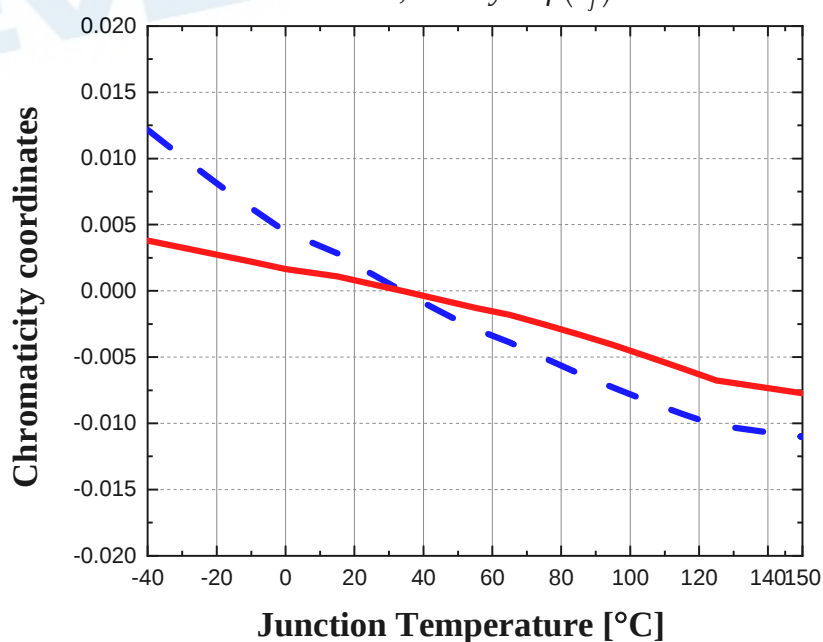
$$\Phi_V / \Phi_V(25^\circ\text{C}) = f(T_j)$$



Chromaticity Coordinates Shift vs. Junction Temperature

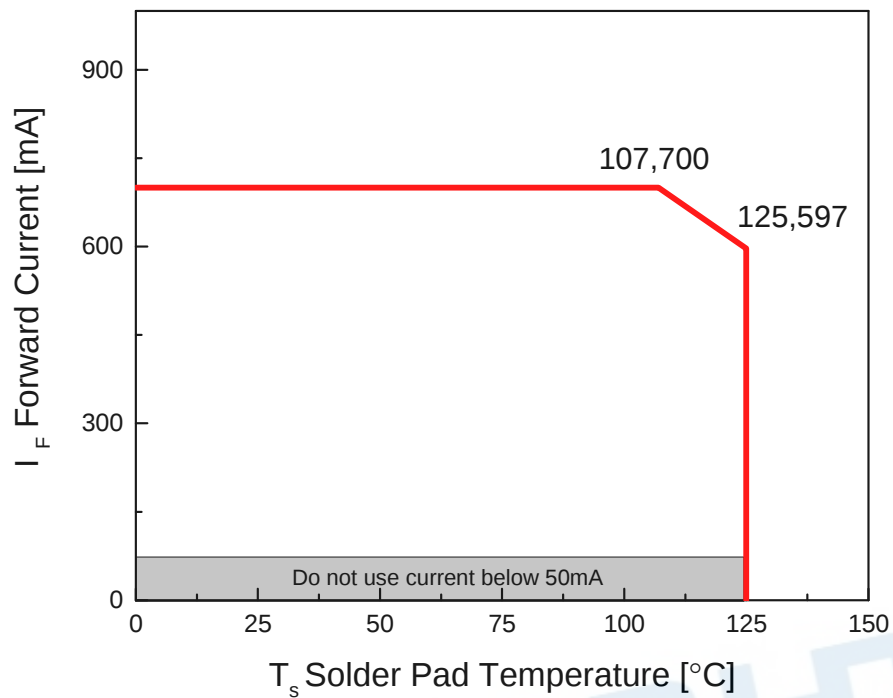
@ $I_F = 350\text{mA}$

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



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)
B	1	100	120
	2	120	140
	3	140	160
	4	160	180

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	2.90	3.20
1B	3.20	3.50
1C	3.50	3.80

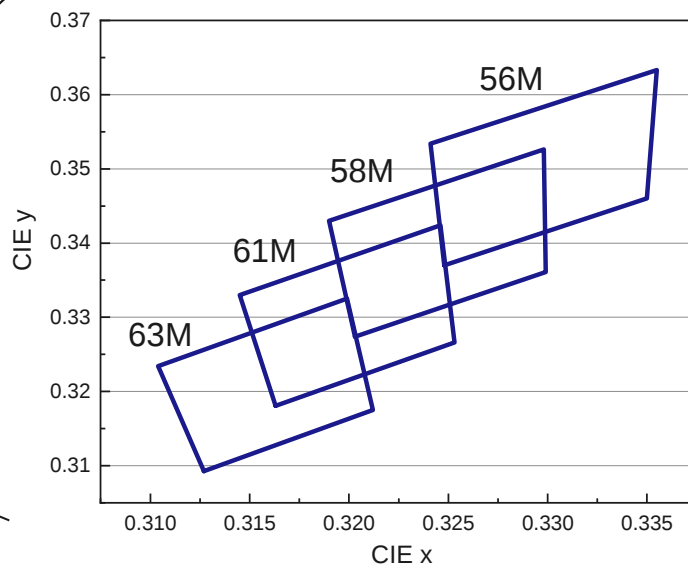
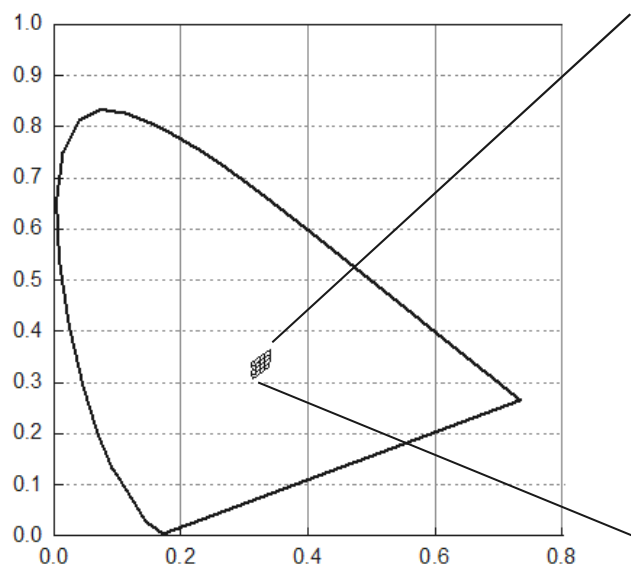
Notes:

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
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 .

5. Part Number

ALFS1E-C03501L-AM

Part number is designated with below details.

ALFS = product family name.

1 = chip number

E = Product type

C = Color ^[1]

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

350 = 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

6. Ordering Information

ALFS1E-C03501H-ABC-DE-AM

Part Number of the ALFS	Order Code
ALFS1E-C03501H-AM	ALFS1E-C03501H-ABC-DE-AM

Order code contains information with below details :

A= min/max wavelength or CCT

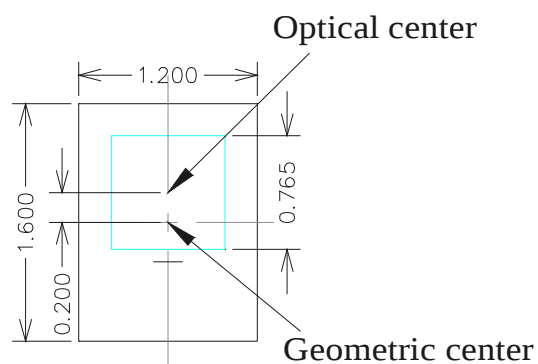
B= min./max. luminous flux in [lm] or luminous intensity in [mcd]

C = min./max. Forward Voltage

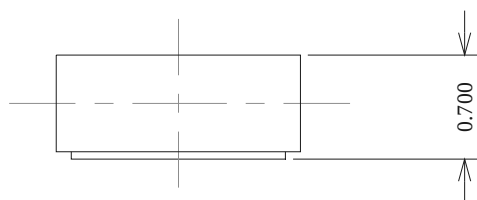
DE = Packing quantity (Minimum package)

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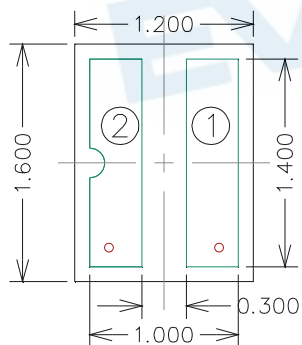
7. Mechanical Dimension



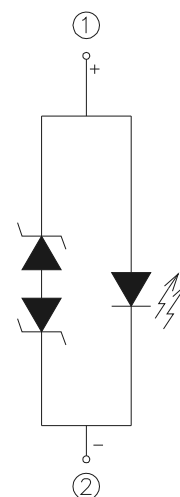
Top view



Side view



Bottom view



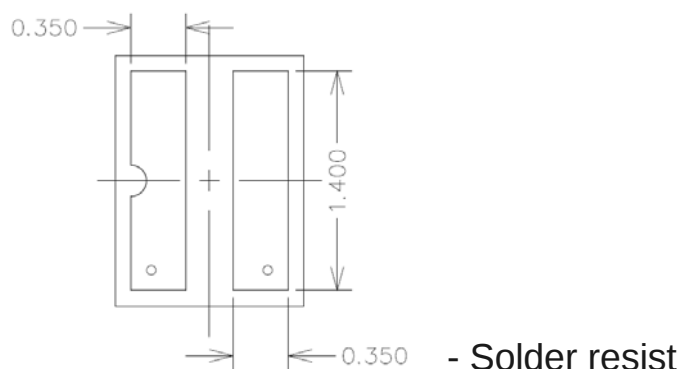
Polarity

①	Anode
②	Cathode

Notes:

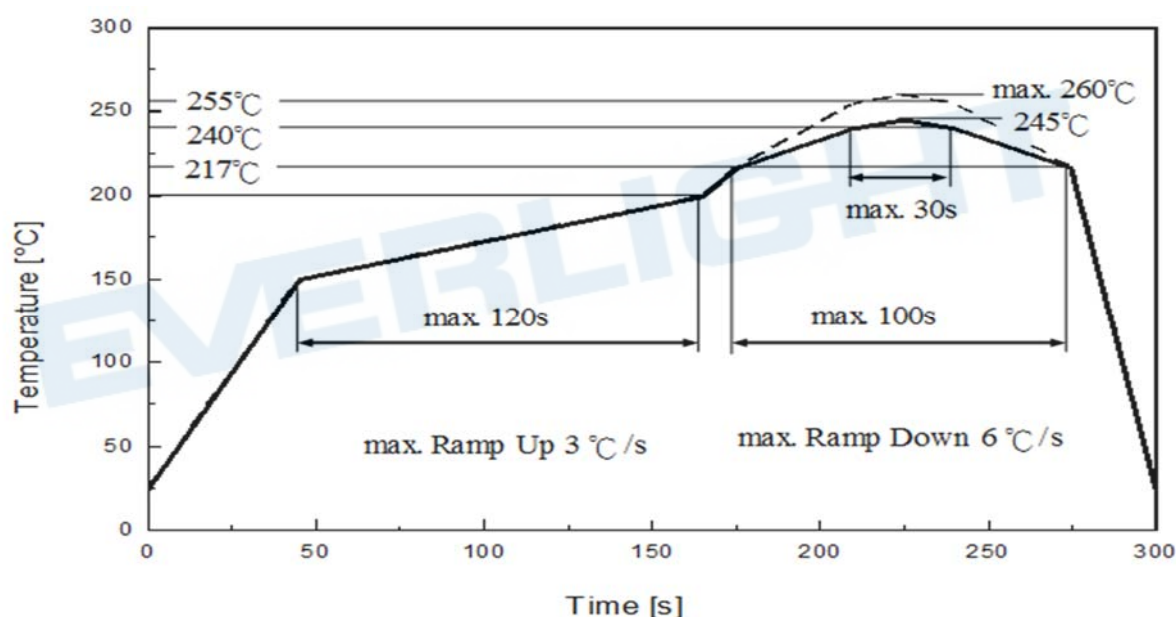
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.

8. Recommended Soldering Pad



9. Reflow Soldering Profile

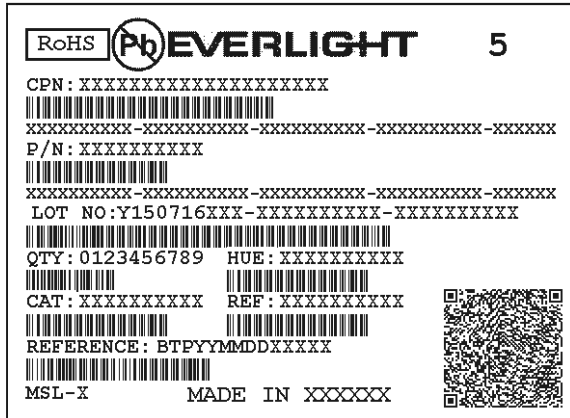
Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



Profile Feature	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

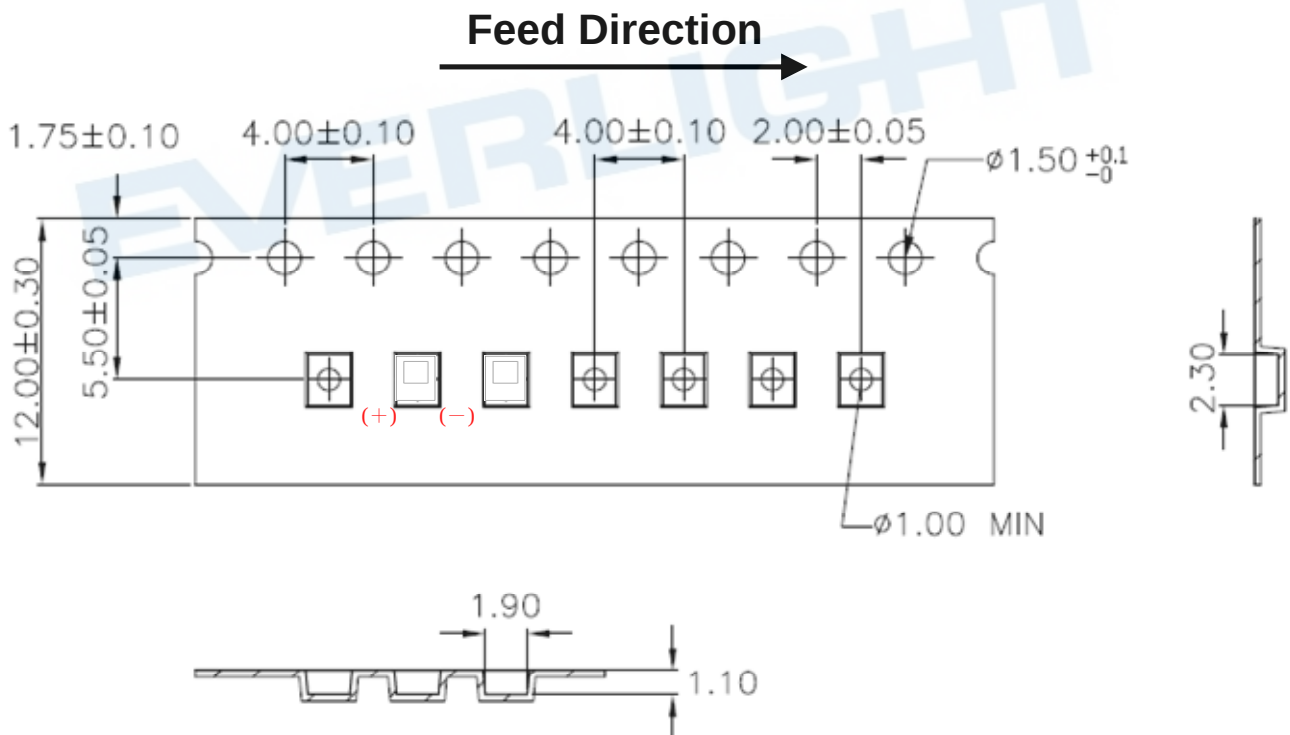
• Product Labeling



- 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

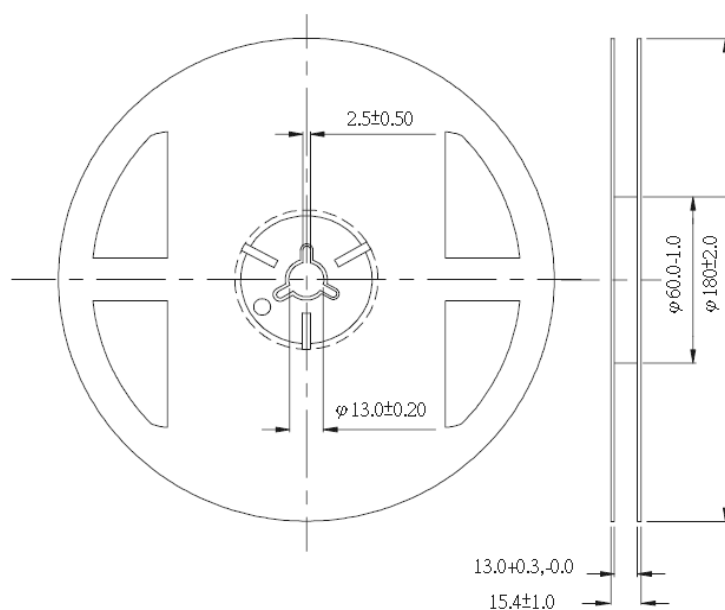
Reel: 1000pcs, MOQ_≥ 100pcs (has to be a multiple of 100pcs)



Notes:

1. Dimensions are in millimeters.

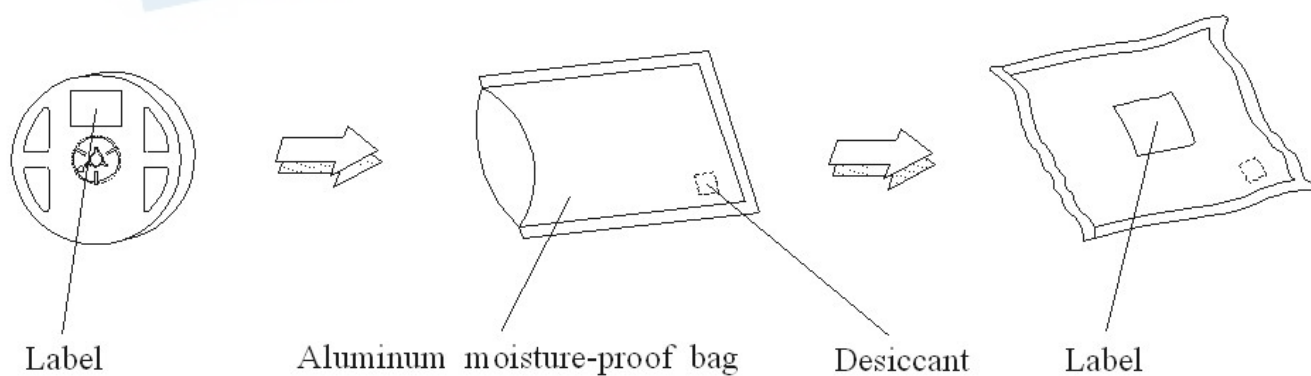
● Reel Dimensions



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: Jun.07.2022

Issue No: DHE-0004057

Version: 1

Created by : Chris Chuang

Rev.	Subjects (major change in previous version)	Modified date
1	Standard data sheet	2022/06/07

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