

DATASHEET

EVERLIGHT AUTOMOTIVE

EL ALFS series

Preliminary

ALFS1E-C07001H-AM



Features

- Package : SMD ceramic package
- Typ. Color Temperature : 5850K
- Typ. Luminous Flux : 220 lm @ 700mA
- 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

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1. Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward current ^[1]	I_F	50	700	1000	mA	
Luminous Flux ^{[2][3]}	Φ_v	180	220	240	lm	$I_F=700\text{mA}$
Average Luminance ^[4]	L_v	---	110	---	Cd/mm ²	$I_F=700\text{mA}$
Forward Voltage ^{[5][6]}	V_F	2.90	3.20	3.80	V	$I_F=700\text{mA}$
Viewing Angle	ϕ	---	120	---	deg	$I_F=700\text{mA}$
Color	K	5180	---	6680	K	$I_F=700\text{mA}$
Thermal Resistance (Junction to Solder)	$R_{th JS real}$	---	4.2	5.1	K/W	$I_F=700\text{mA}$
	$R_{th JS el}$	---	3.3	4.0		

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

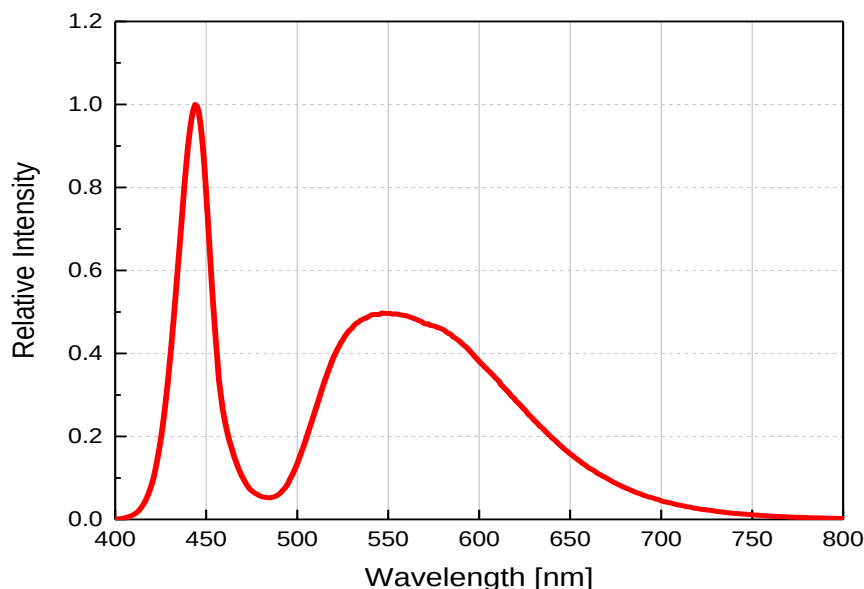
Parameter	Symbol	Ratings	Unit
Reverse Voltage	V_R	Not designed for reverse operation	V
Power Dissipation	P_d	3800	mW
Forward Current	I_F	1000	mA
Junction Temperature	T_J	150	°C
Operating Temperature	T_{opr}	-40 ~ +125	°C
Storage Temperature	T_{stg}	-40 ~ +125	°C
ESD Sensitivity (R=1.5kΩ, C= 100pF)	ESD_{HBM}	8	KV
Soldering Temperature	Reflow	260	°C

3. Characteristics Graph

Wavelength Characteristics Relative Spectral Distribution

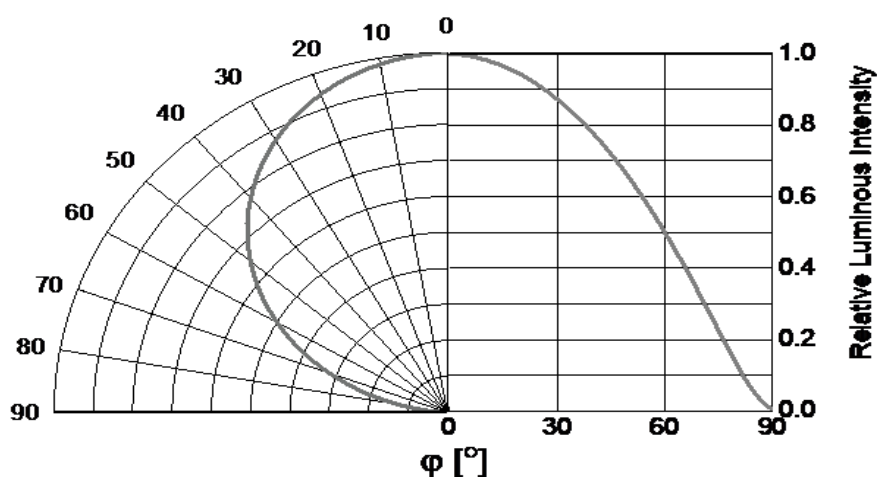
@ $T_S = 25^\circ\text{C}$ 、 $I_F = 700\text{mA}$

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



Typical Diagram Characteristics of Radiation

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

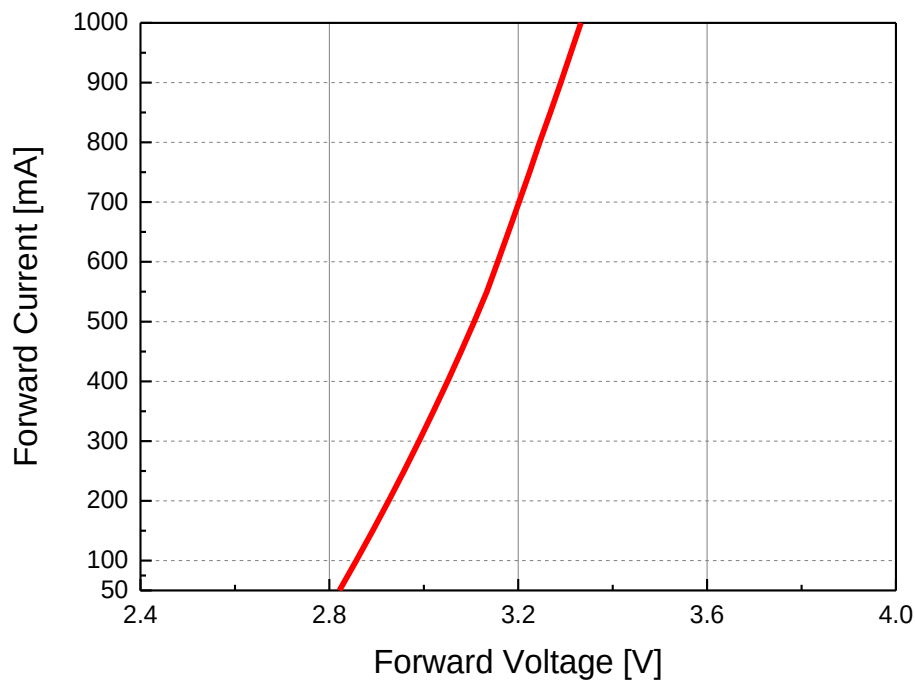


Notes:

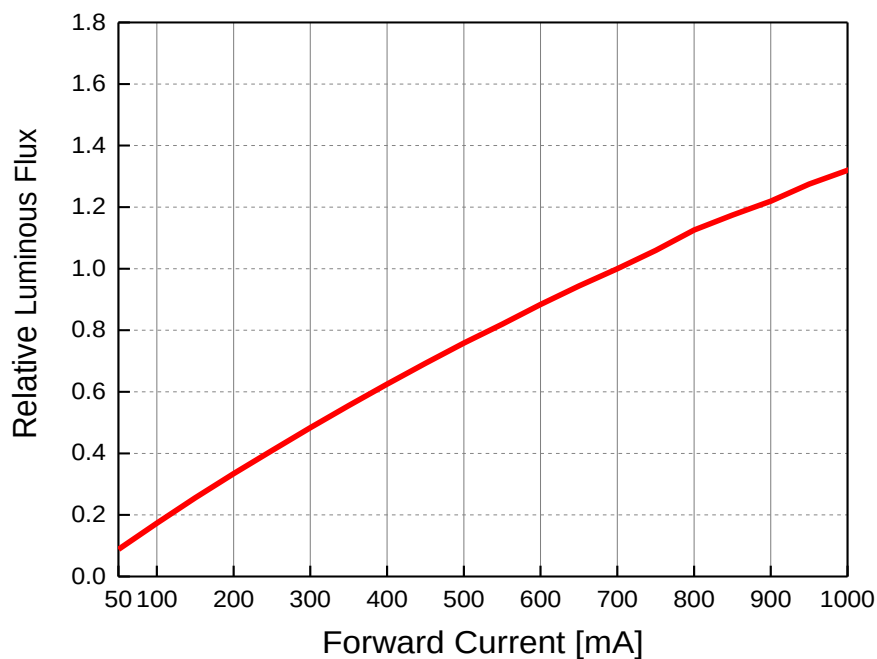
1. φ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is $\pm 5^\circ$

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

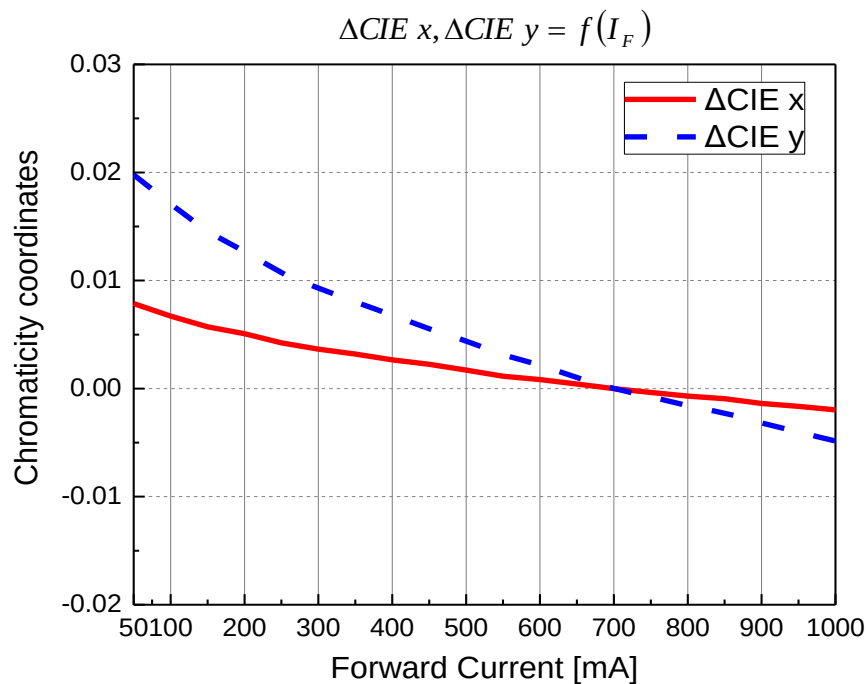
$$I_F = f(V_F)$$



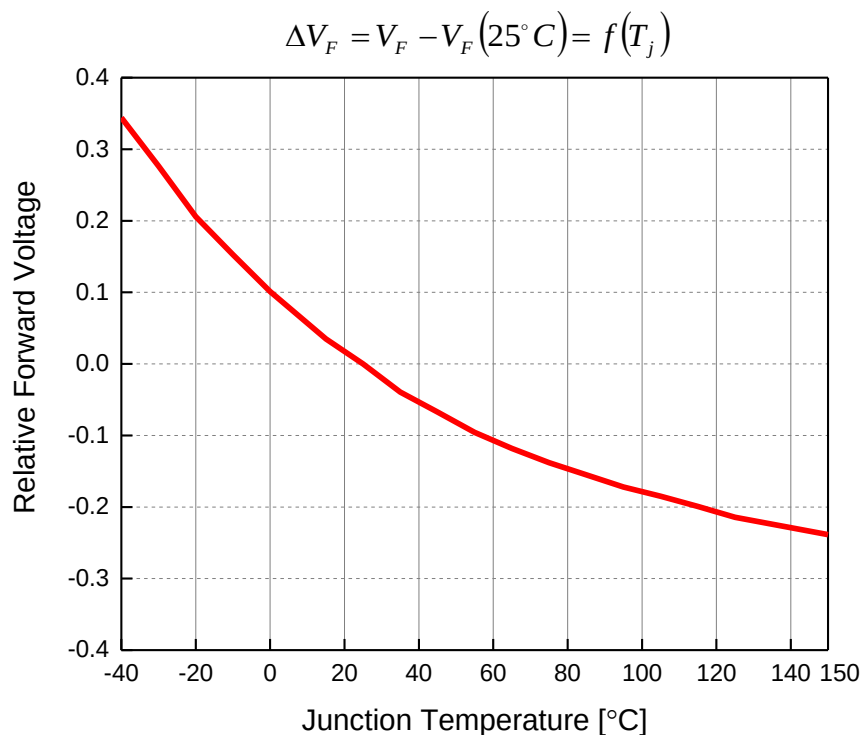
Relative Luminous Flux vs. Forward Current
@ T_s = 25°C



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

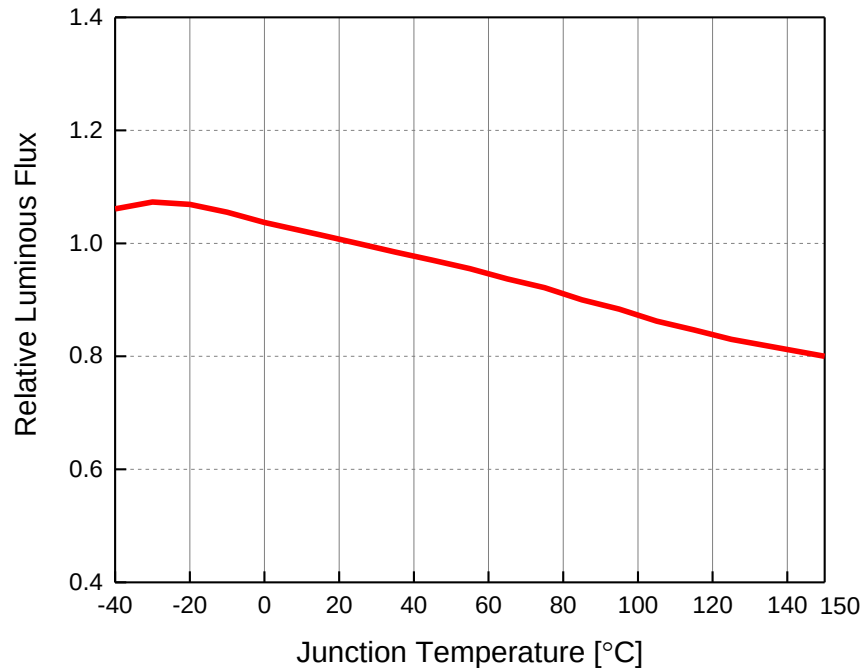


Relative Forward Voltage vs. Junction Temperature @ $I_F = 700\text{mA}$



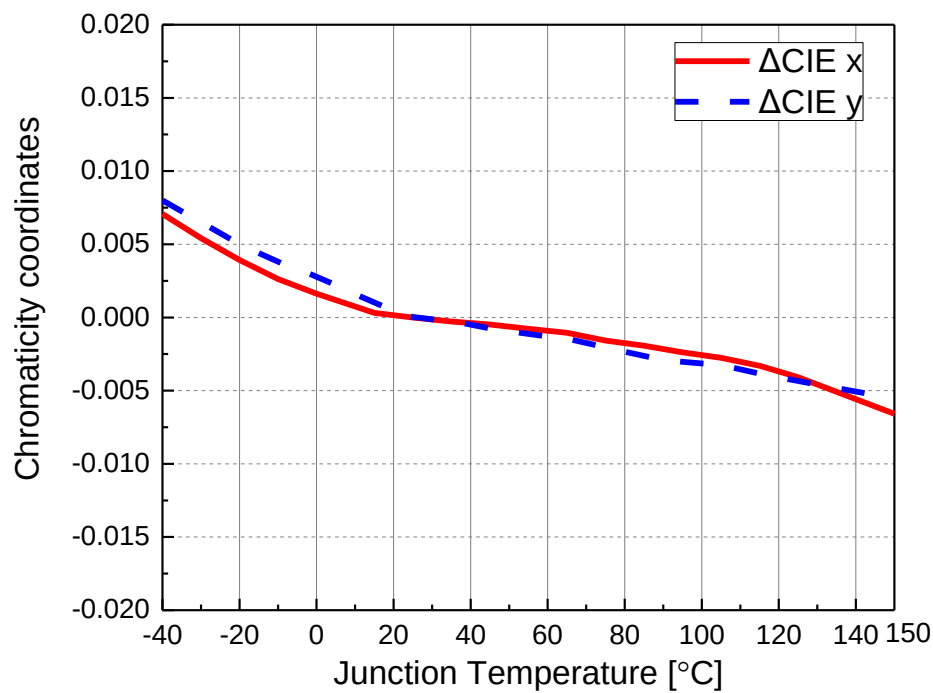
Relative Luminous Flux vs. Junction Temperature @ $I_F = 700\text{mA}$

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



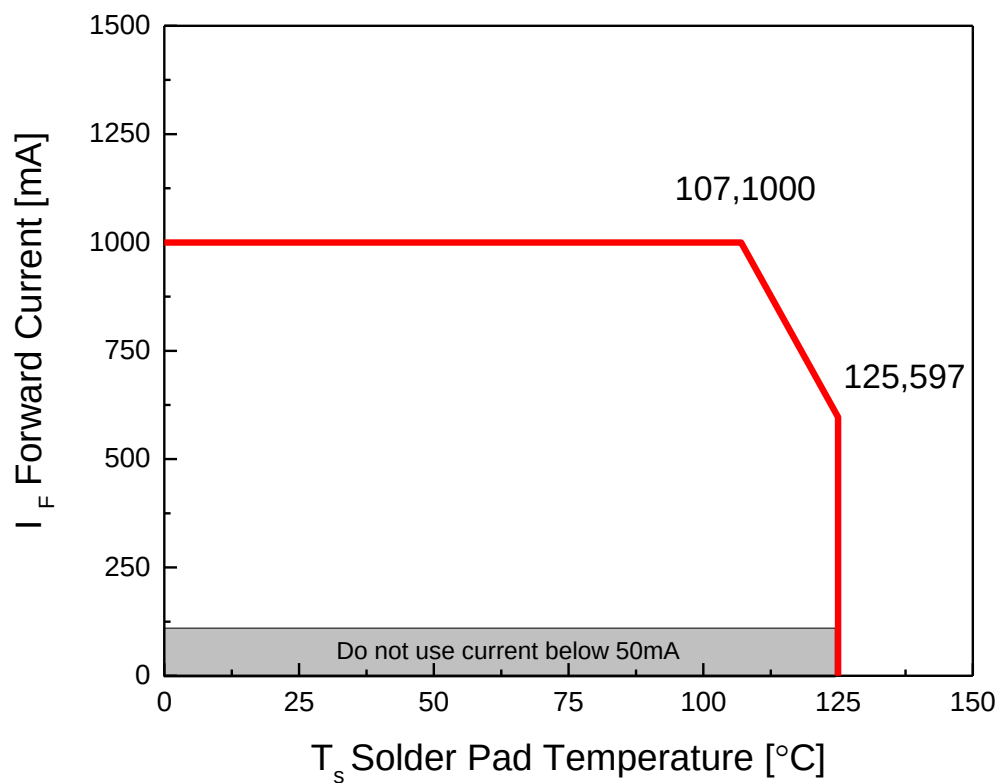
Chromaticity Coordinates Shift vs. Junction Temperature @ $I_F = 700\text{mA}$

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



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	5	180	200
	6	200	220
	7	220	240

Notes:

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

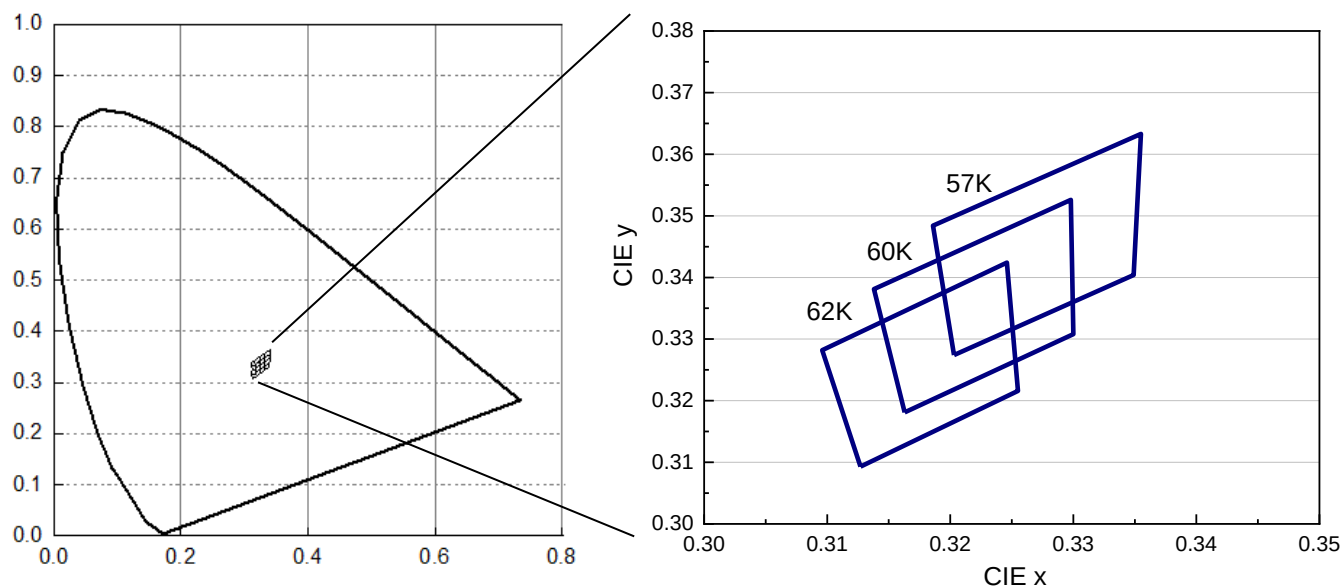
Forward Voltage Bins

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: $\pm 0.05V$.

Color Bin Structure ECE Bin Structure



Cool White Bin Coordinates

Bin	CIE x	CIE y
62K	0.3127	0.3093
	0.3255	0.3216
	0.3246	0.3424
	0.3096	0.3282
Reference Range: 5850~6680K		

Bin	CIE x	CIE y
60K	0.3163	0.3181
	0.3300	0.3308
	0.3298	0.3526
	0.3138	0.3381
Reference Range: 5600~6390K		

Bin	CIE x	CIE y
57K	0.3203	0.3274
	0.3349	0.3404
	0.3355	0.3633
	0.3186	0.3484
Reference Range: 5380~6110K		

Notes:

1. Color coordinates measurement tolerance: ± 0.005 .

5. Part Number

ALFS1E-C07001H-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)

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

6. Ordering Information

ALFS1E-C07001H-ABC-DE-AM

Part Number of the ALFS	Order Code
ALFS1E-C07001H-AM	ALFS1E-C07001H-ABC-DE-AM

Order code contains information with below details :

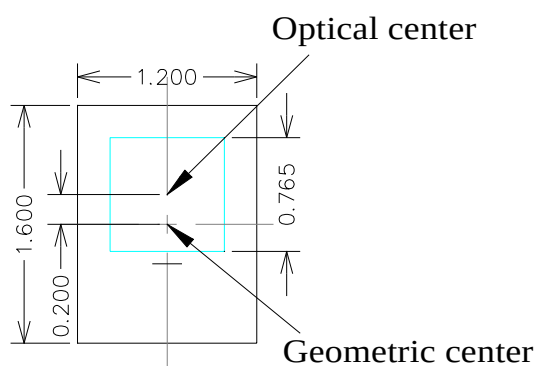
A= min/max wavelength or CCT

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

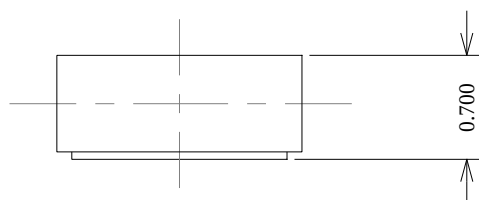
C = min./max. Forward Voltage

DE = Packing quantity (Minimum package)

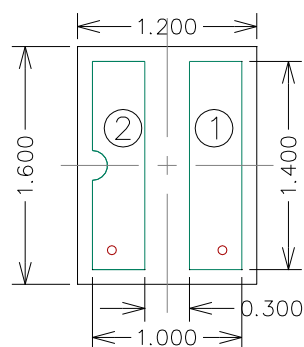
7. Mechanical Dimension



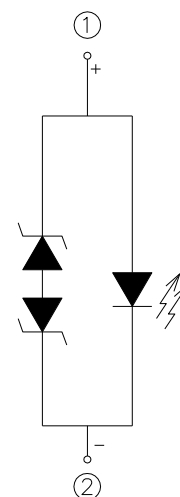
Top view



Side view



Bottom view



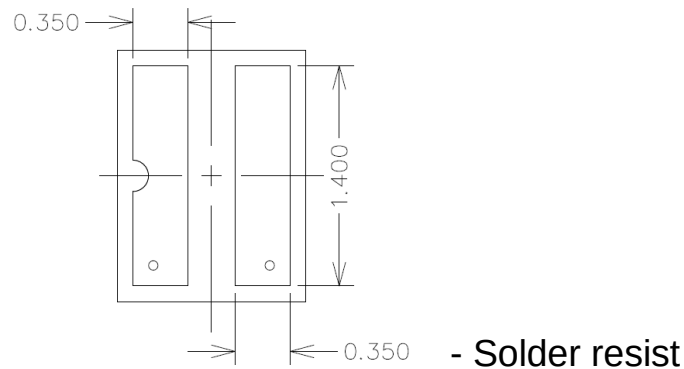
Polarity

①	Anode
②	Cathode

Notes:

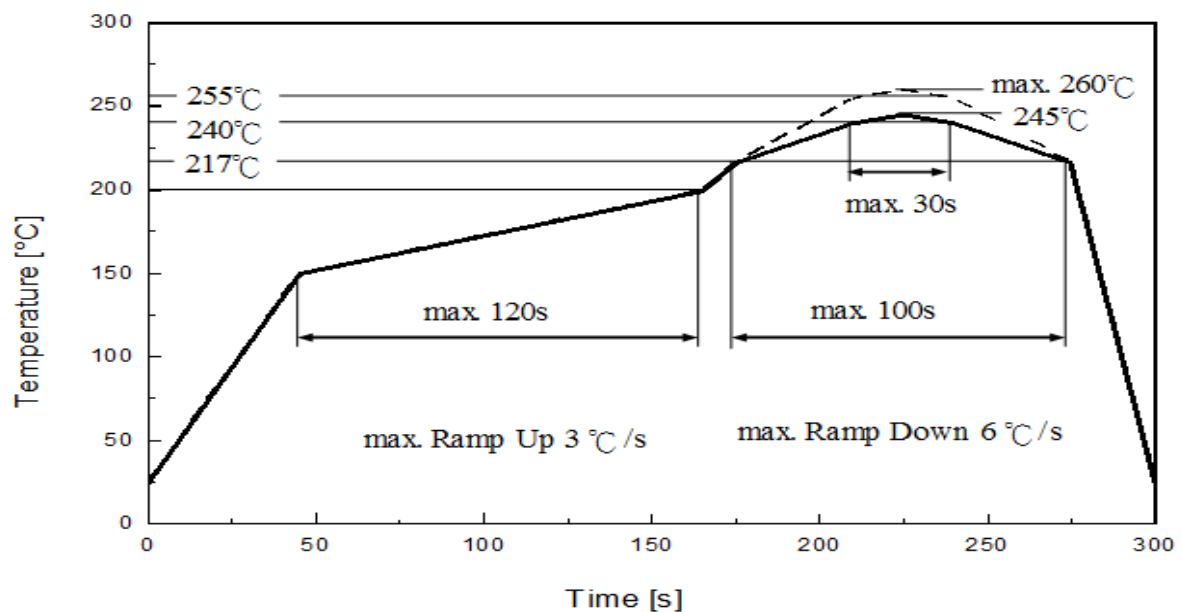
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are $\pm 0.1\text{mm}$.

8. Recommended Soldering Pad



9. Reflow Soldering Profile

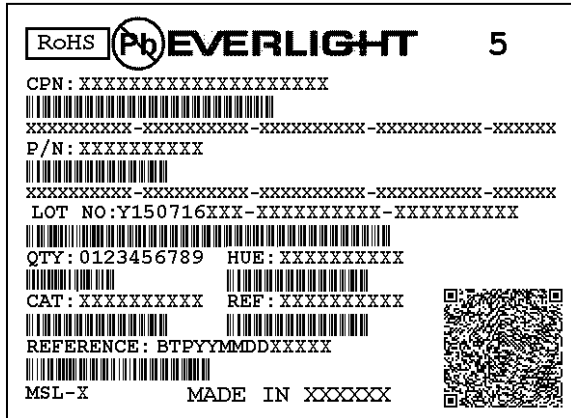
Soldering Condition (Reference: IPC/JEDEC J-STD-020D)



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

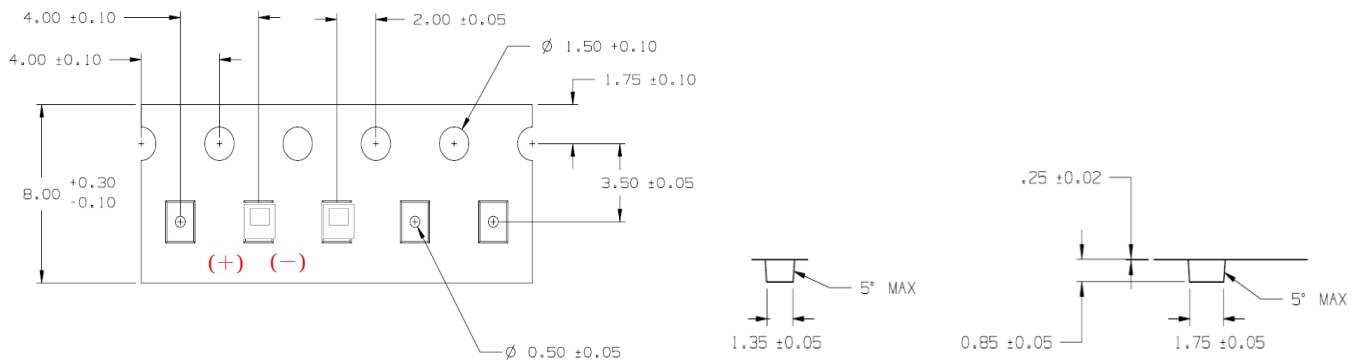


- CPN : Customer's Product Number
- P/N : Everlight Part Number
- LOT NO : Lot Number
- QTY : Packing Quantity
- HUE : Color Bin
- CAT : Luminous Flux (Brightness) Bin
- REF : Forward Voltage Bin

• Carrier Tape Dimensions as the following

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

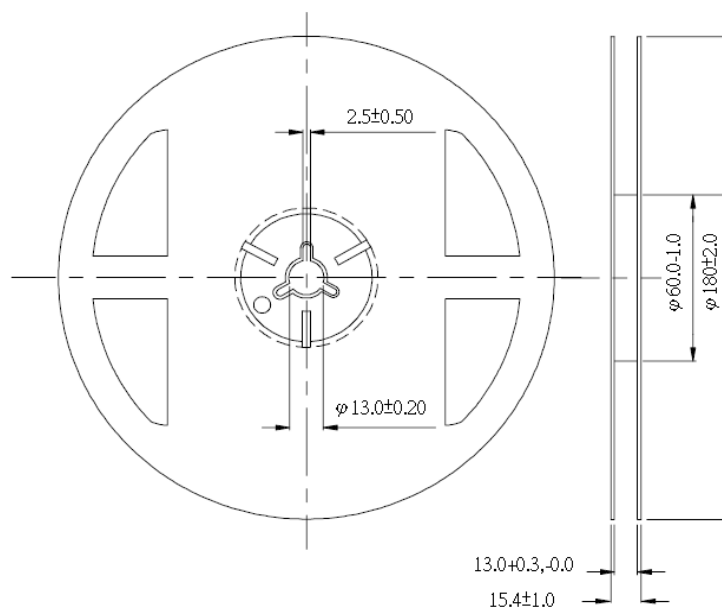
Feed Direction →



Notes:

1. Dimensions are in millimeters.

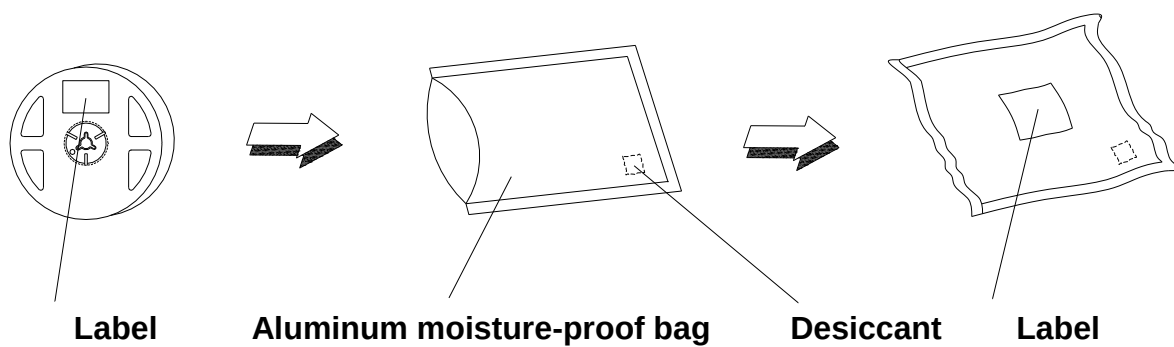
● Reel Dimensions



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.