EVERLIGHT AUTOMOTIVE

DATASHEET

EL ALFS series

ALFS1G-PA10001H-AM



Features

- Package：SMD ceramic package
- Typ. Luminous Flux：250 lm @1000mA
- Viewing angle：120º
- ESD：up to 8KV
- MSL：2
- Qualifications：According to AEC-Q102
- Sulfur robustness：Class A1
- The product itself will remain within RoHS compliant version.
- Compliance with EU REACH.
- Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm).

Applications

- Automotive Exterior Lighting
- Signalling

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1. Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Forward current[1]	I_F	50	1000	1500	mA	
Luminous Flux[2][3]	Φ_v	180	250	300	lm	I_F=1000mA
Forward Voltage[4][5]	V_F	2.90	3.30	3.80	V	I_F=1000mA
Viewing Angle	ϕ	---	120	---	deg	I_F=1000mA
Chromaticity Coordinates	CIE X	---	0.565	---	---	I_F=1000mA
	CIE Y	---	0.417	---		
Thermal Resistance (Junction to Solder)	$R_{th\ JS\ real}$	---	4.4	5.3	K/W	I_F=1000mA
	$R_{th\ JS\ el}$	---	3.3	4.0		

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

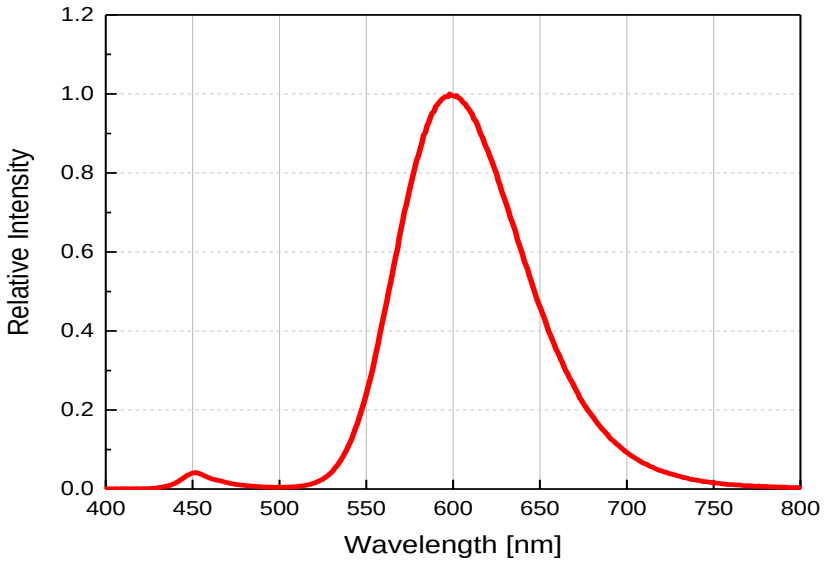
Parameter	Symbol	Ratings	Unit
Reverse Voltage	V_R	Not designed for reverse operation	V
Power Dissipation	P_d	5700	mW
Forward Current	I_F	1500	mA
Junction Temperature	T_J	150	°C
Operating Temperature	T_{opr}	-40 ~ +125	°C
Storage Temperature	T_{stg}	-40 ~ +125	°C
ESD Sensitivity (R=1.5kΩ, C= 100pF)	ESD_{HBM}	8	KV
Soldering Temperature	Reflow	260	°C

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3. Characteristics Graph

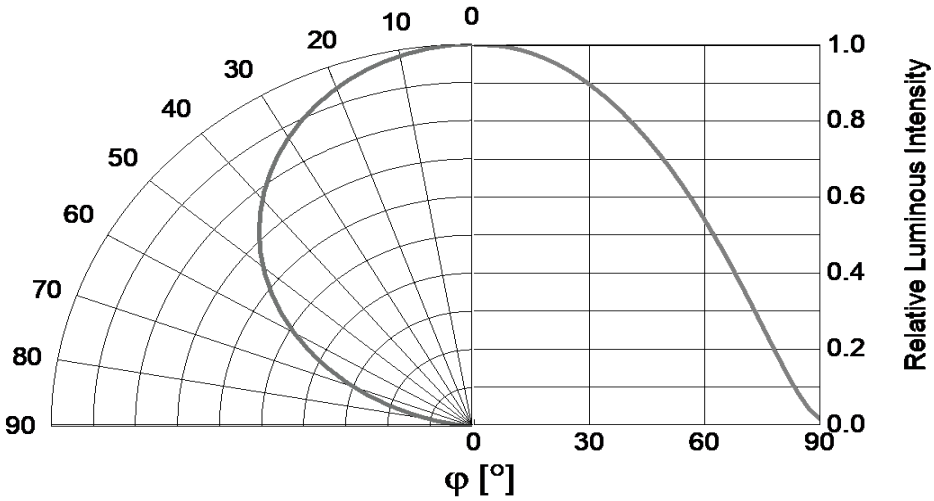
Wavelength Characteristics Relative Spectral Distribution @ T_S = 25°C、I_F = 1000mA

$$\Phi_V/\Phi_V\,(Max.) = f(\lambda)$$



Typical Diagram Characteristics of Radiation

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

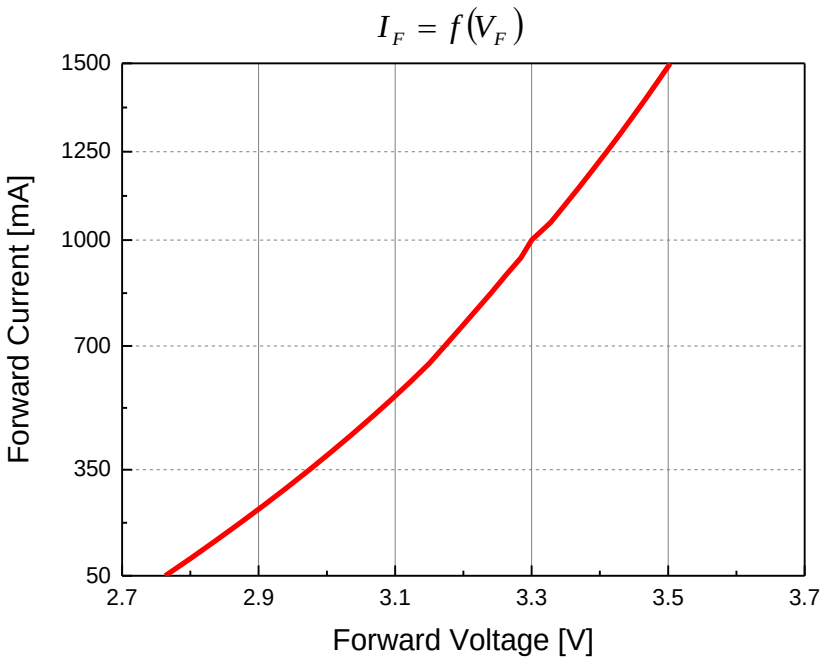


Notes:

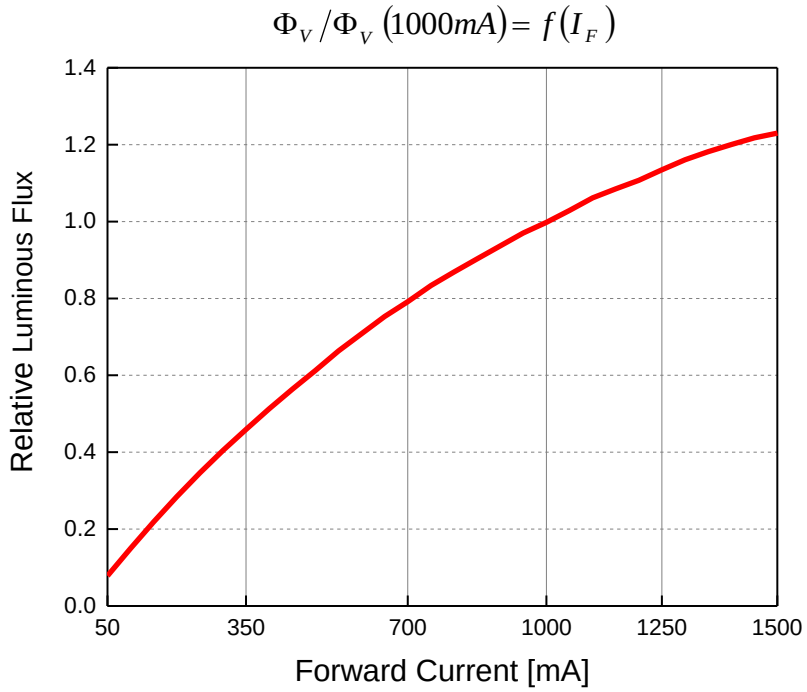
1. φ is the off axis angle from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is ± 5°

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

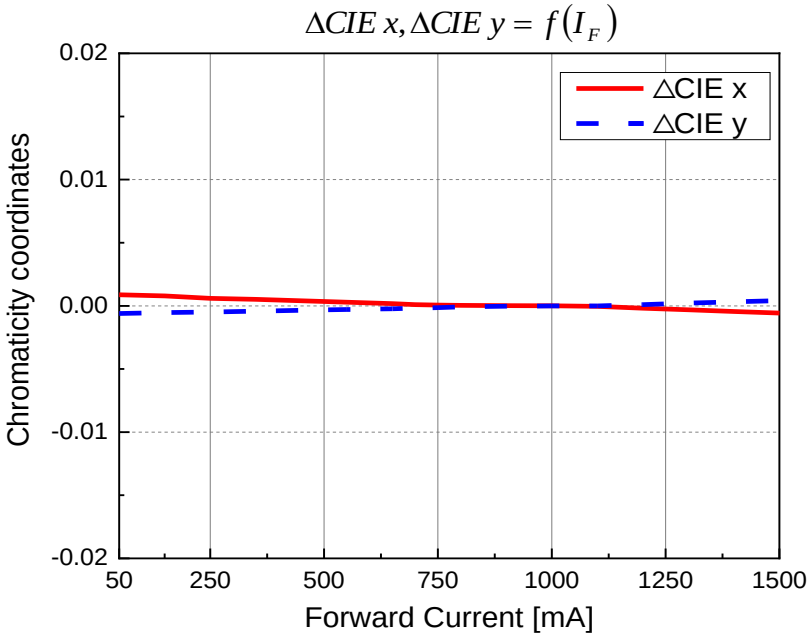


Relative Luminous Flux vs. Forward Current @ T_S = 25°C

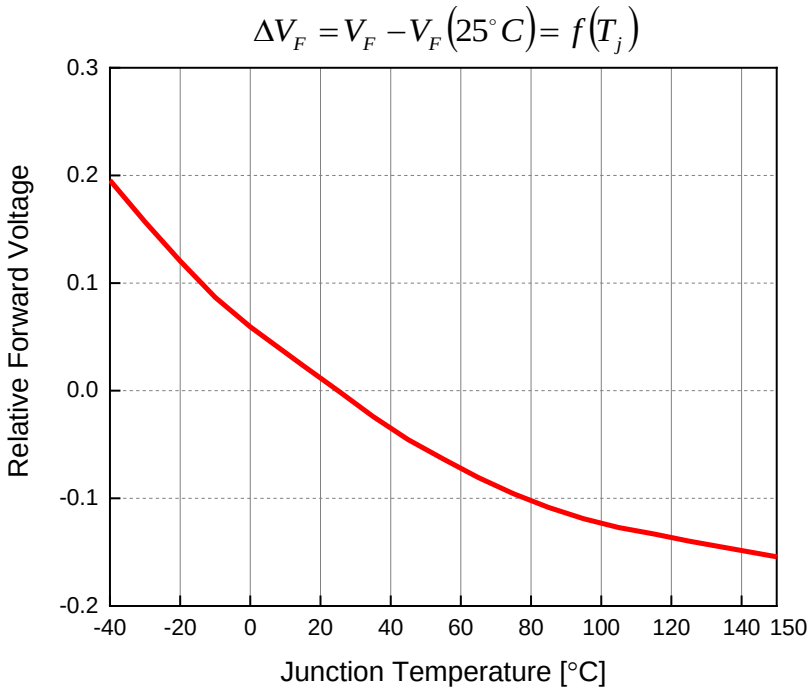


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Chromaticity Coordinates vs. Forward Current @ T_S = 25°C



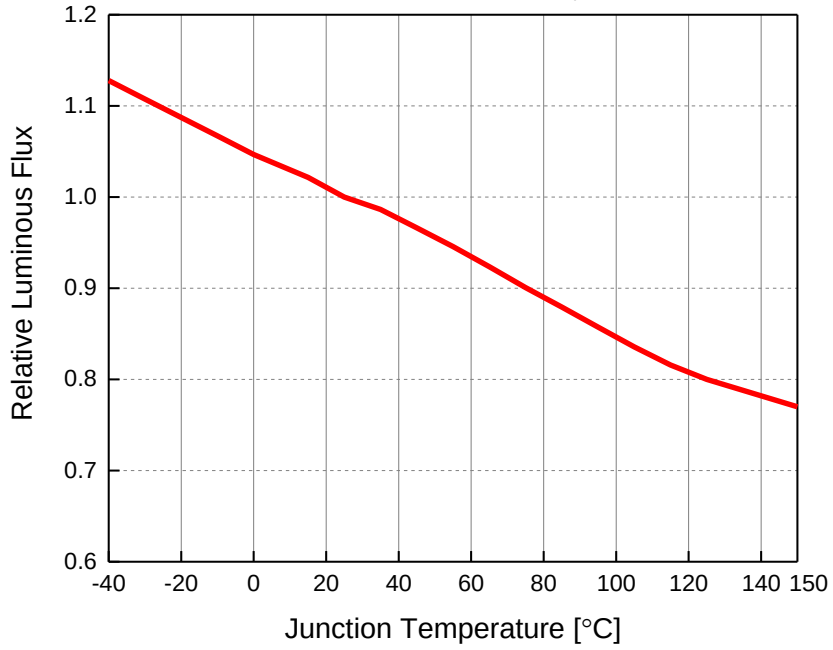
Relative Forward Voltage vs. Junction Temperature @ I_F = 1000mA



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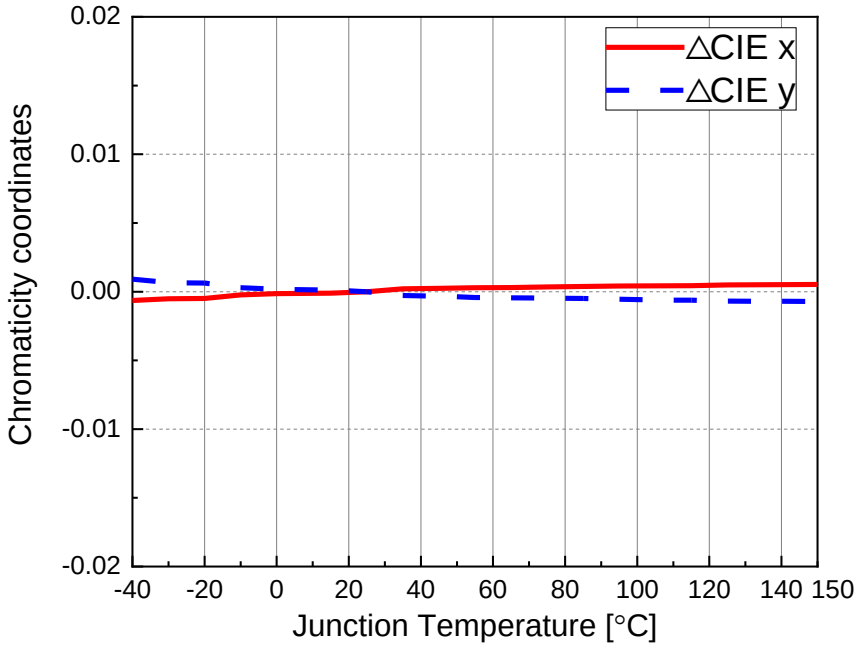
Relative Luminous Flux vs. Junction Temperature @ I_F = 1000mA

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



Chromaticity Coordinates Shift vs. Junction Temperature @ I_F =1000mA

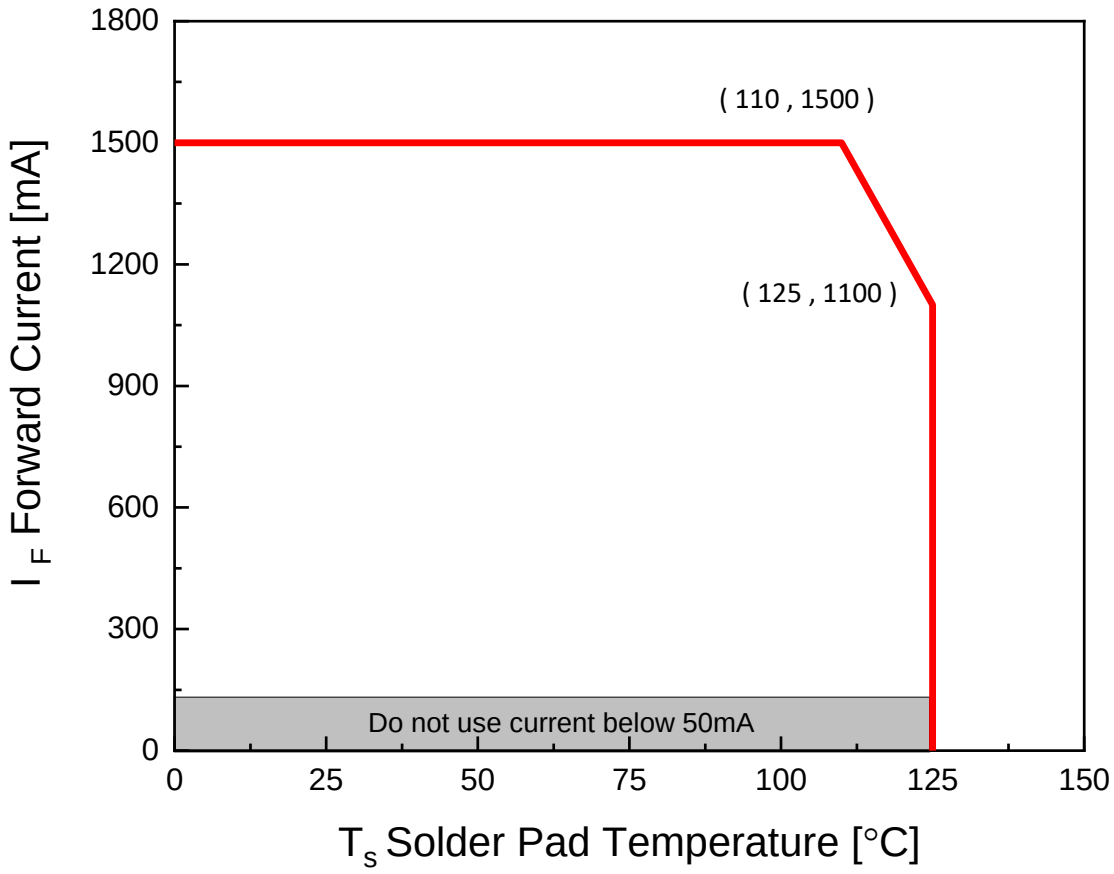
$$\Delta CIE\ x, \Delta CIE\ y = f(T_j)$$



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Forward Current Derating Curve

$$I_F = f(T_S)$$



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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
	8	240	260
	9	260	280
	10	280	300

Notes:

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

Forward Voltage Bins

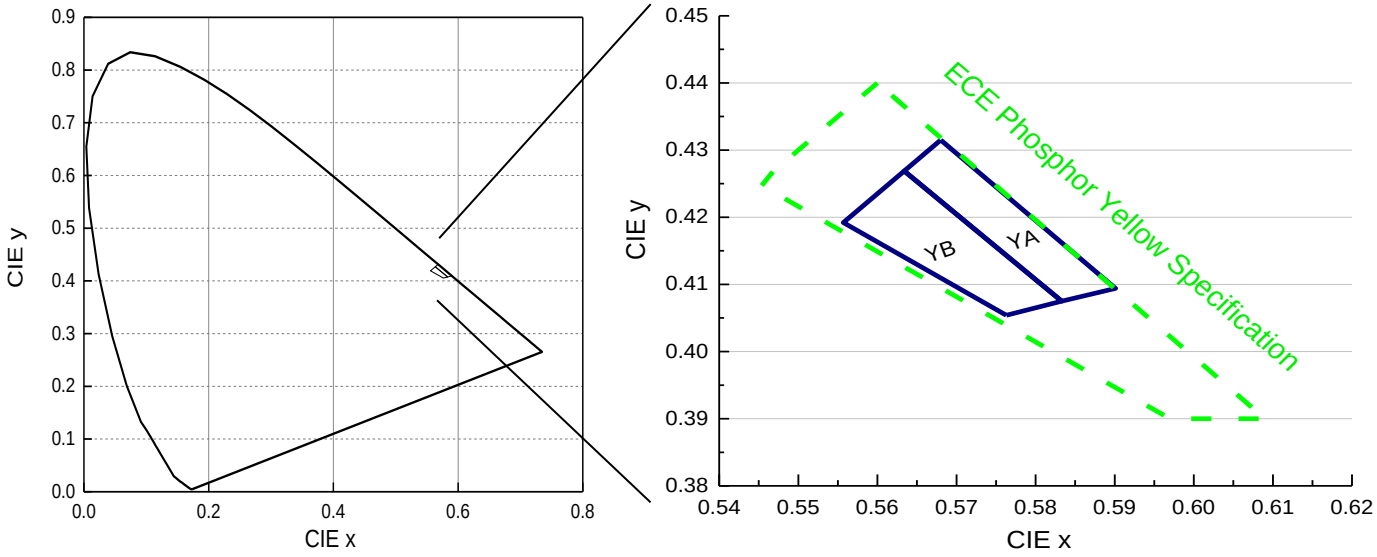
Group	Minimum Forward Voltage(V)	Maximum Forward Voltage(V)
1A	2.90	3.20
1B	3.20	3.50
1C	3.50	3.80

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
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

ALFS1G-PA10001H-AM

Part number is designated with below details.

ALFS = product family name.

1 = chip number

G = Product type

PA = Color [1]

1000 = 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

ALFS1G-PA10001H-ABCDEFGHIJKLMN-OP-AM

Part Number of the ALFS	Order Code
ALFS1G-PA10001H-AM	ALFS1G-PA10001H-ABCDEFGHIJKLMN-OP-AM

Order code contains information with below details：

ABCDEF= min/max wavelength or CCT

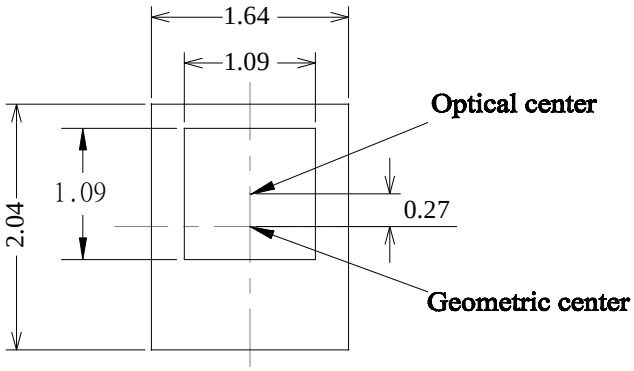
GHIJ= min./max. luminous flux in [lm] or luminous intensity in [mcd]

KLMN = min./max. Forward Voltage

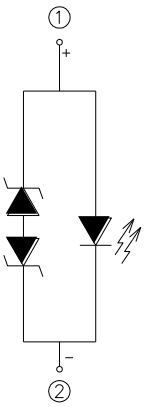
OP = Packing quantity (Minimum package)

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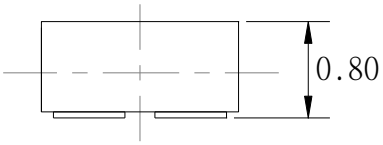
7. Mechanical Dimension



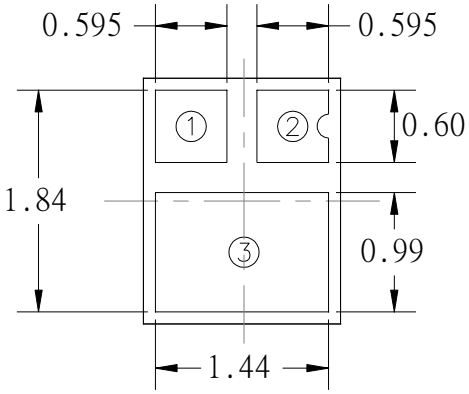
Top view



Polarity



Side view



Bottom view

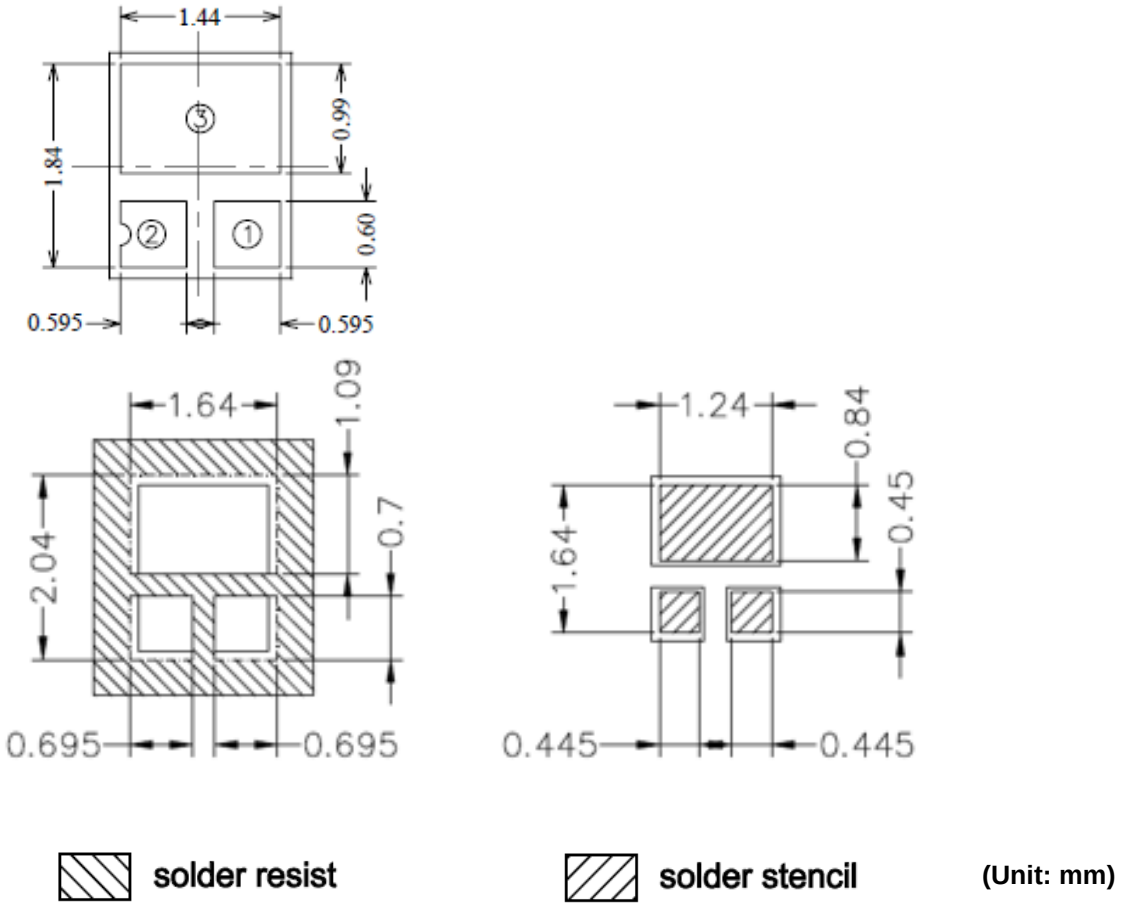
①	Anode
②	Cathode
③	Thermal pad

Notes:

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

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Recommended Soldering Pad

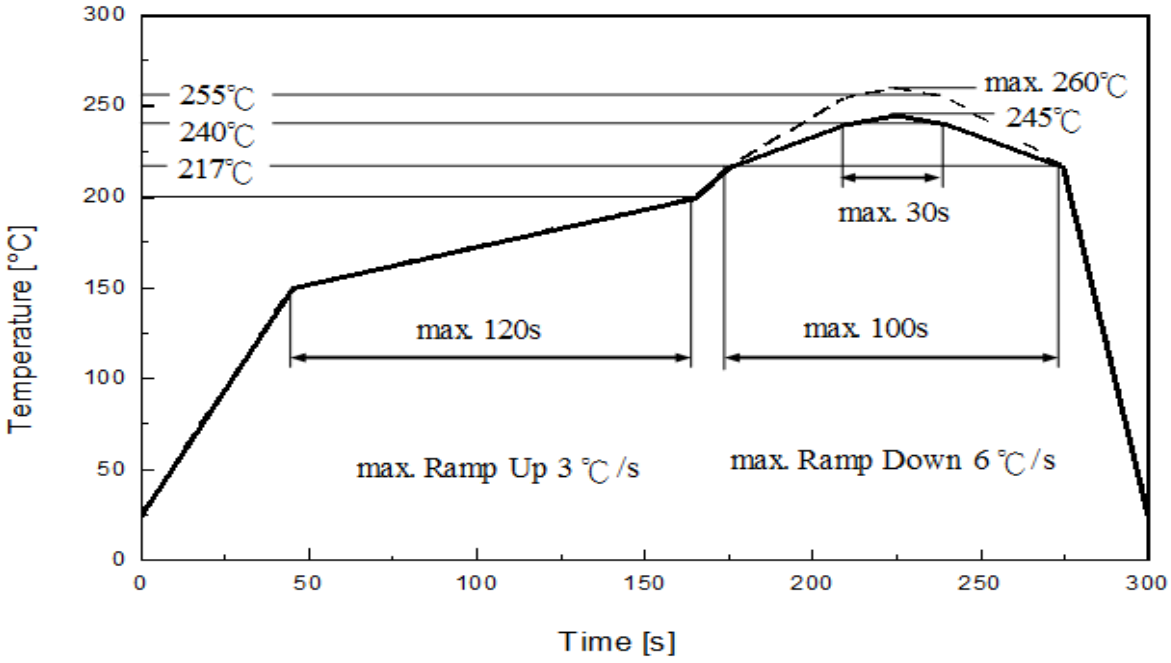


solder resist solder stencil (Unit: mm)

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9. Reflow Soldering Profile

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

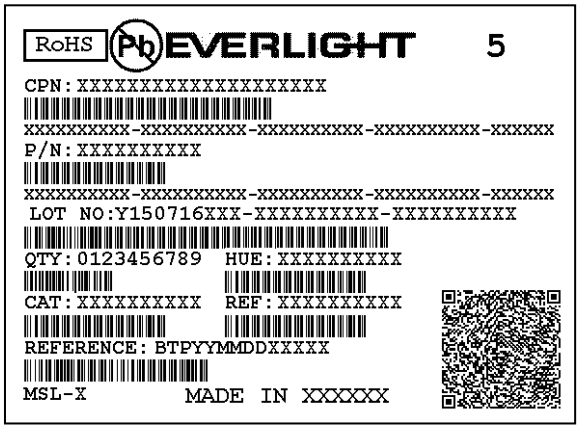


Profile Feature	Pb-Free Assembly	Unit Einheit
Ramp-up rate to preheat 25 °C to 150 °C	3	°C /sec
Time of soaking zone 150 °C to 200 °C	120	sec
Ramp-up rate to peak	3	°C /sec
Liquidus temperature	217	°C
Time above liquidus temperature	100	sec
Peak temperature (max.)	260	°C
Time within 5°C of the specified peak temperature	30	sec
Ramp-down Rate (max.)	6	°C /sec

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10. Packaging Information

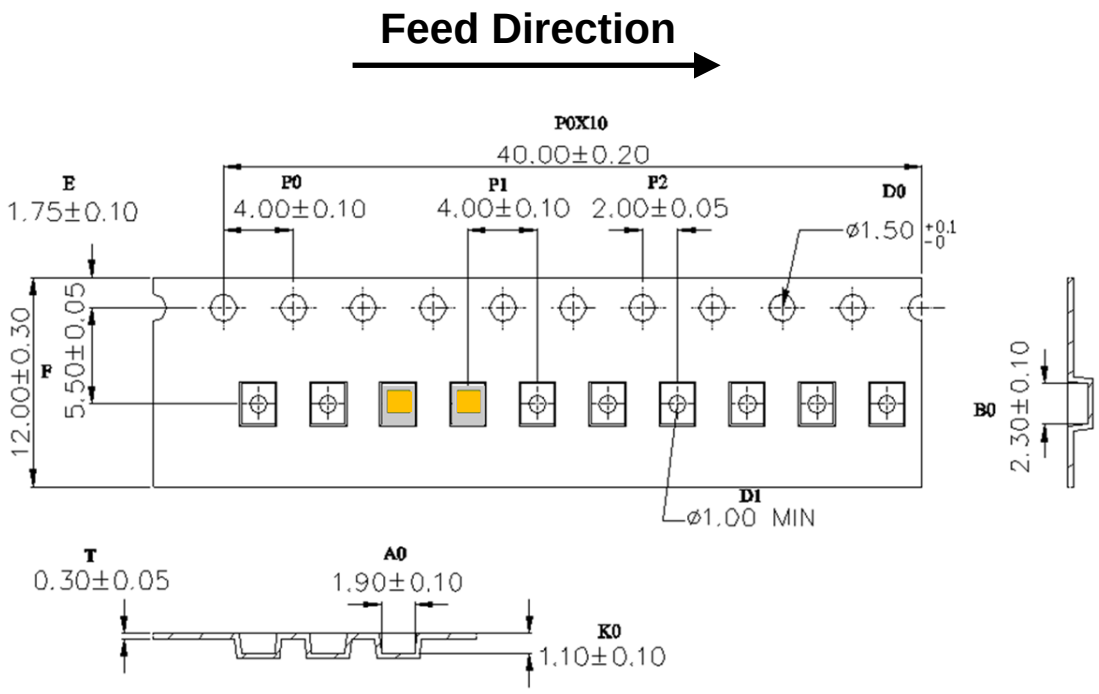
• Product Labeling



- 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: 1000pcs, MOQ≥ 100pcs (has to be a multiple of 100pcs)

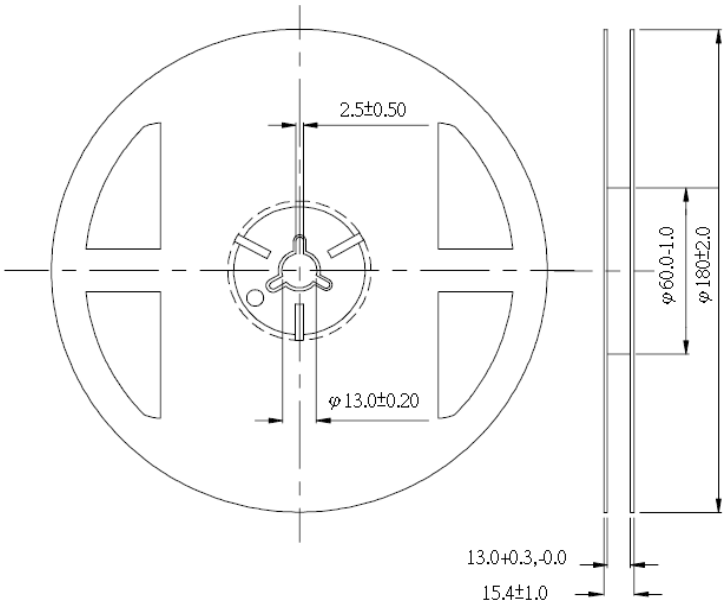


Notes:

1. Dimensions are in millimeters.

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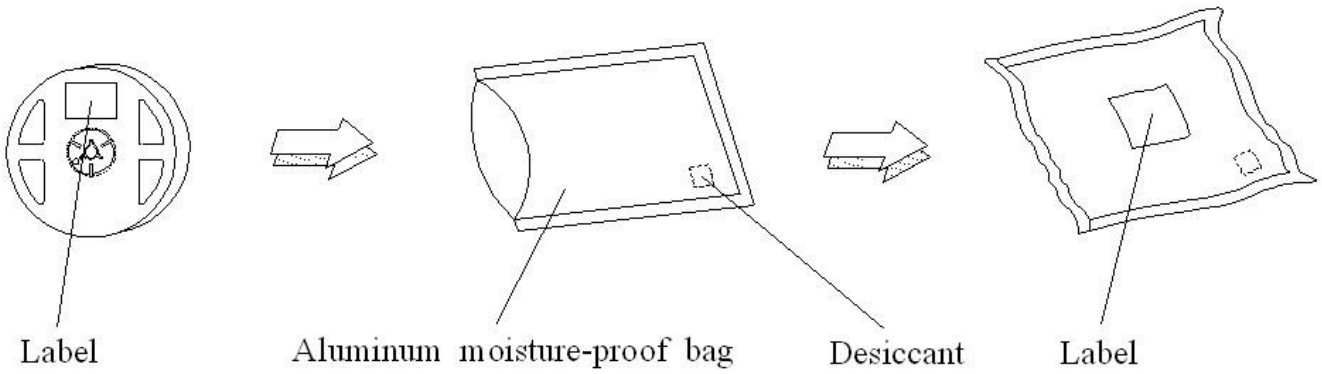
Reel Dimensions



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

	Grade A0	Grade A1	Grade B0	Grade B1
C12 H2S Class A C13 FMG	No corrosion	Corrosion without the impact on reliability and life time, following AEC-Q102 rev. A		
C12 H2S Class B C13 FMG			No corrosion	Corrosion without the impact on reliability and life time, following AEC-Q102 rev. A

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.	

Class for H2S Test & FMG	Description
0	No corrosion found
1	Corrosion without the impact on reliability and life time, following AEC-Q102 rev. A

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Revision History

Current version: Dec, 9, 2024

Issue No: DHE-0003829

Version: 4

Created by : Chris Chuang

Rev.	Subjects (major change in previous version)	Modified date
1	Standard data sheet	2021/03/05
2	Add B8 bin in P.10 binning informaion	2022/03/08
3	Revise 7. Mechanical Dimension	2022/07/20
4	Update Luminous Intensity Bins	2024/12/9

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