DATASHEET

ELCS14B-KB4148J7J8283710-FCZ(OPPO)

Received
■ MASS PRODUCTION
□ PRELIMINARY
□ CUSTOMER DESIGN
DEVICE NO. : DHE-0003514
PAGE : 13

Revised record

REV.	DESCRIPTION	RELEASE DATE
1	New Spec	Oct.01.2018
2	Change the DC current 350mA to 500mA by ECR68446	Jun.17.2019
3	Change the VF 3.75V to 3.60V by ECR*69137	Aug.08.2019

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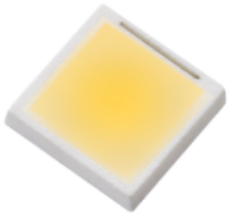


Features

• Feature of the device：small package with high efficiency

• Typical luminous flux@ 1A：270 lm

• Optical efficiency@1A：83.59 lm/W

• ESD protection passed JESD22-A114F Class 3B ；Reverse ESD protection pass JESD22-A114F Class 2.

• Binning Parameters：Brightness, Forward Voltage and Chromaticity

• Grouping parameter: total luminous flux, color coordinates.

• RoHS compliant & Pb free.

•Compliance with EU REACH (SVHC substances < 0.1%)

•Compliance Halogen Free (Br<900 ppm, CI<900ppm , Br+CI<1500 ppm)

Applications

• Mobile Phone Camera Flash(Camera flash light /strobe light for mobile devices)

• Torch light for DV(Digital Video) application

• Indoor lighting applications

• Signal and symbol luminaries for orientation maker lights (e.g. steps, exit ways, etc.)

• TFT backlighting

• Exterior and interior illumination applications

• Decorative and Entertainment Lighting

• Exterior and interior automotive illumination

Device Selection Guide

Chip Materials	Emitted Color
InGaN	White

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
DC Forward Current (Torch Mode)	I_F	500	mA
Peak Pulse Current	I_{Pulse}	1500	mA
ESD Sensitivity	V_B	Passed +8KV & -2KV HBM (JESD22-A114F)	V
Reverse Voltage	V_R	Note 1	V
Junction Temperature	T_j	125	℃
Operating Temperature	T_{Opr}	-40 ~ +85	℃
Storage Temperature	T_{Stg}	-40 ~ +100	℃
Viewing Angle$_{(2)}$	$2\theta_{1/2}$	120	Deg

Notes:

1. The CSP series LEDs are not designed for reverse bias used.
2. View angle measurement tolerance ±5°
3. Avoid operating CSP series LEDs at maximum operating temperature exceed 1 hour.
4. All specification are assured by reliability test for 1000hr, IV degradation less than 30%.
5. All reliability item are tested under good thermal management with PCBs
6. Peak pulse current shall be applied under conditions as max duration time 400 ms and max duty cycle 10%
7. Operate LED component at maximum rating conditions continuously will cause possible permanent damage and de-rating parameters. Exercise multiple maximum rating parameters simultaneously should not be allowed. When maximum rating parameters are applied over a long period will result potential reliability issue.

JEDEC Moisture Sensitivity

Level	Floor Life		Soak Requirements Standard	
	Time (hours)	Conditions	Time (hours)	Conditions
1	Unlimited	≦30℃ / 85% RH	168 (+5/-0)	85℃ / 85% RH

Electro-Optical Characteristics (Ts=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux(1)	Iv	250	270	330	lm	I_F=1000mA
Forward Voltage(2)(3)	V_F	2.85	3.23	3.60	V	
Color Temperature	CCT	4150	4500	4850	K	
Color Rendering Index(4)	CRI	80	83	----		
	R9	----	10	----		

Forward Voltage Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
2836	V_F	2.85	----	3.60	V	I_F=1000mA

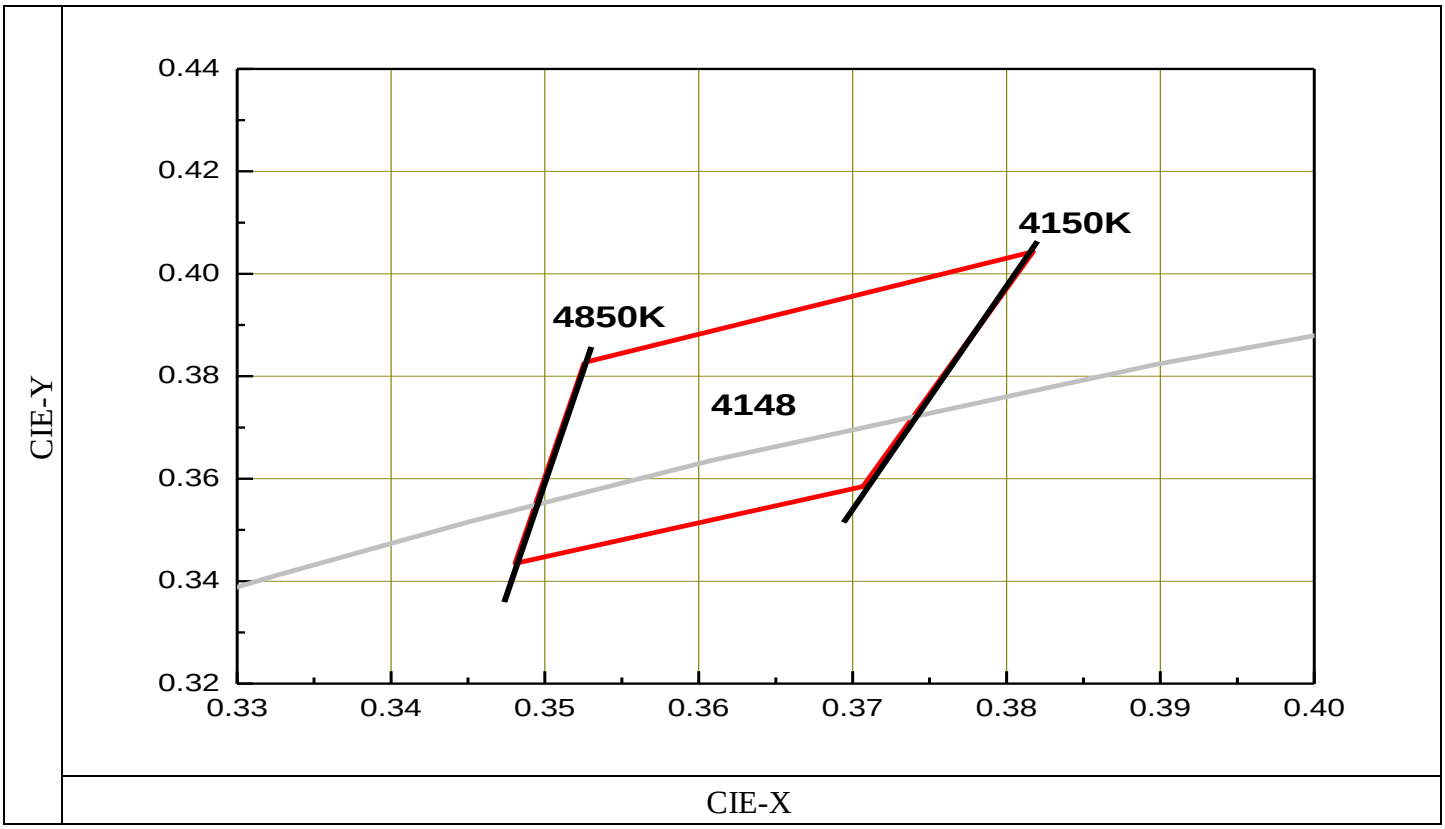
Luminous Flux Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
J7	Iv	250	----	300	lm	I_F=1000mA
J8	Iv	300	----	330		

Notes:

1. Luminous Flux, illuminance measurement tolerance：±10%
2. Forward voltage measurement tolerance：±0.1V
3. Electric and optical data is tested at 25 ms pulse condition.
4. Color Rendering Index measurement tolerance: ± 2

White Bin Structure



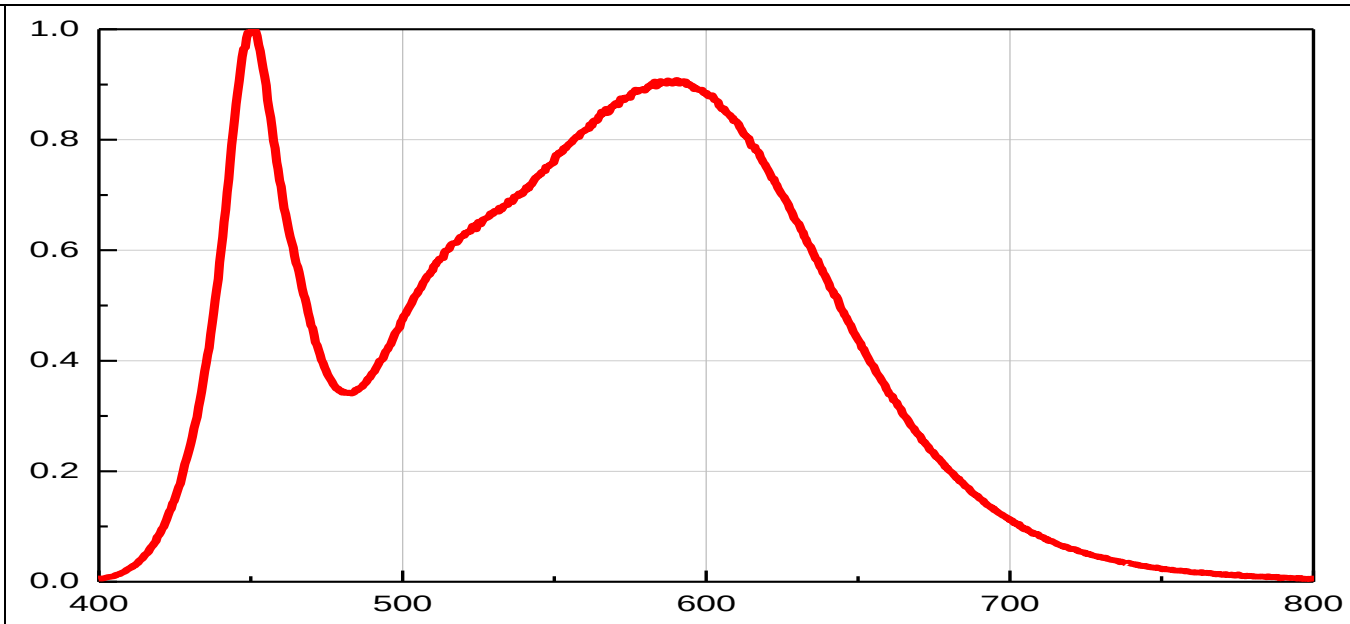
Bin	CIE-X	CIE-Y	Reference Range
4148	0.3526	0.3827	4150 ~ 4850K
	0.3817	0.4043	
	0.3707	0.3585	
	0.3481	0.3435	

Notes:

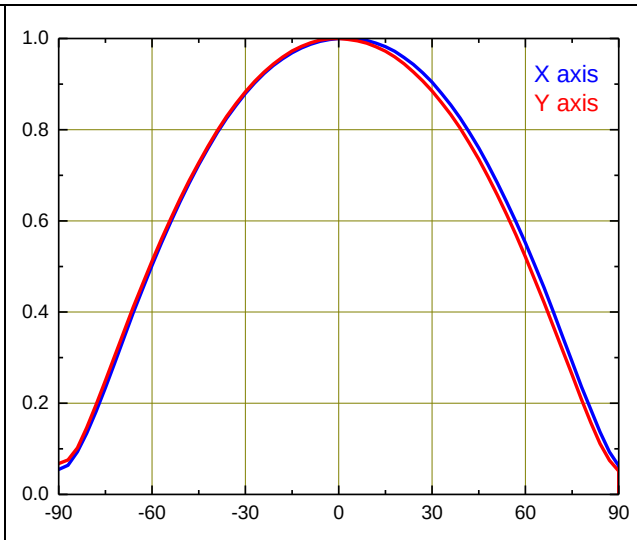
1. Color coordinates measurement allowance：±0.01
2. Color bins are defined at I_F=1000mA operation.

Typical Electro-Optical Characteristics Curves

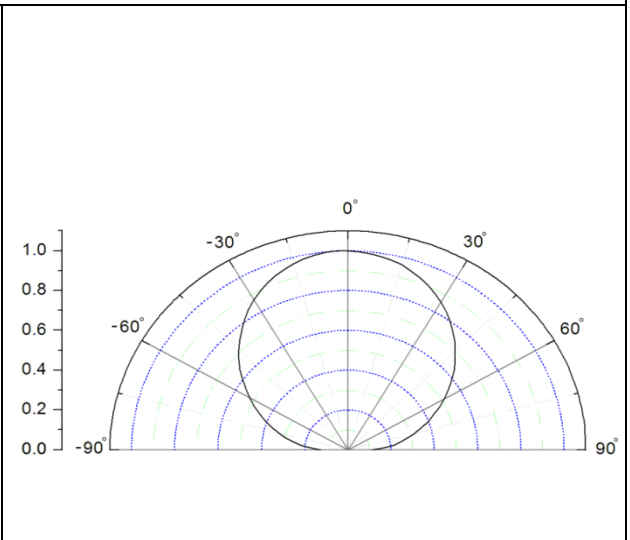
Relative Spectral Distribution , I_F=1000mA @ 25ms, $T_{solder\ pad}$=25℃



Typical Radiation Patterns



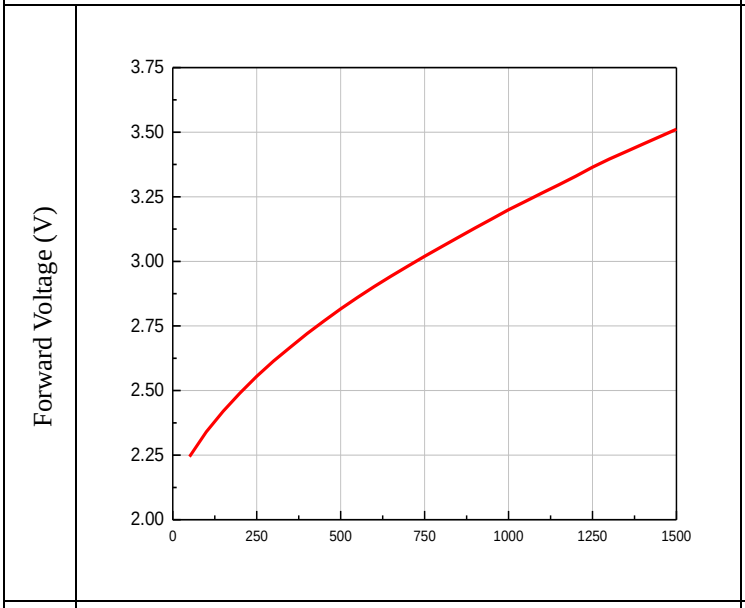
Typical Polar Radiation Pattern for Lambertian



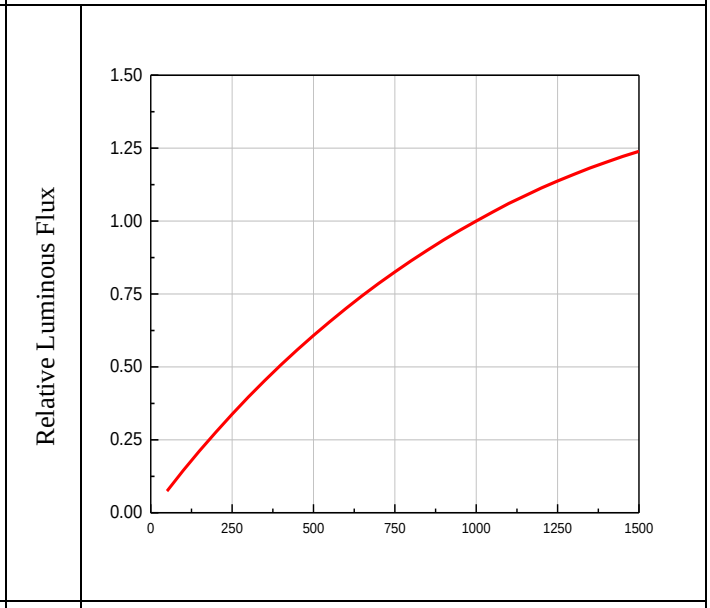
Notes:

1. $2\theta_{1/2}$ is the off axis from lamp centerline where the luminous intensity is 1/2 of the peak value.
2. View angle tolerance is ± 5∘

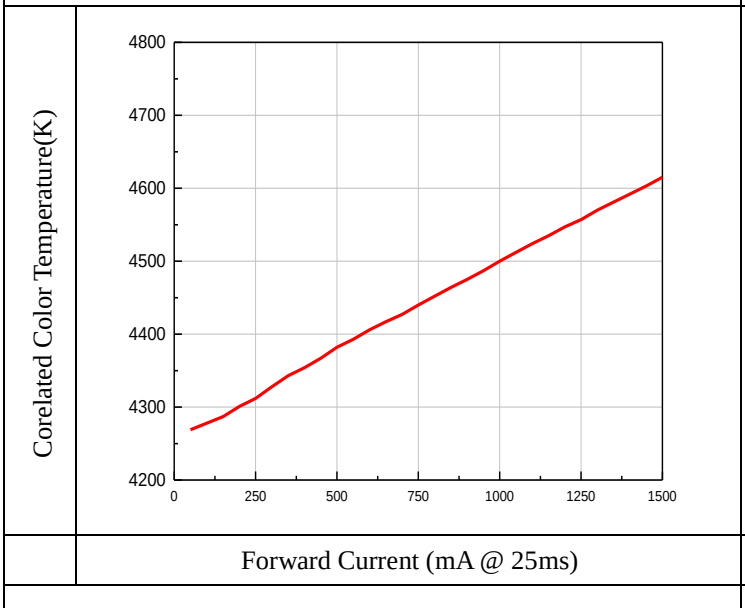
Forward Voltage vs. Forward Current ($T_{solder\ pad}$=25℃)



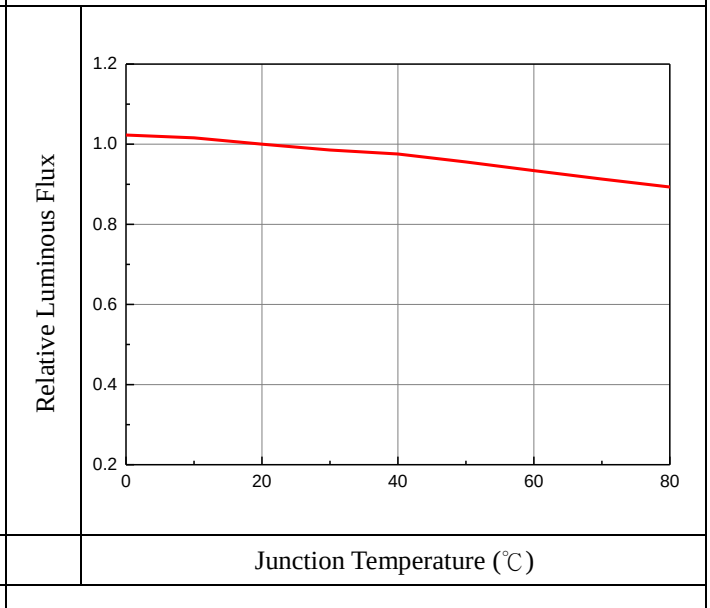
Relative Luminous Flux vs. Forward Current ($T_{solder\ pad}$=25℃)



CCT vs. Forward Current ($T_{soldering\ pad}$=25℃)



Relative Luminous Flux vs. Junction Temperature ($T_{soldering\ pad}$=25℃)



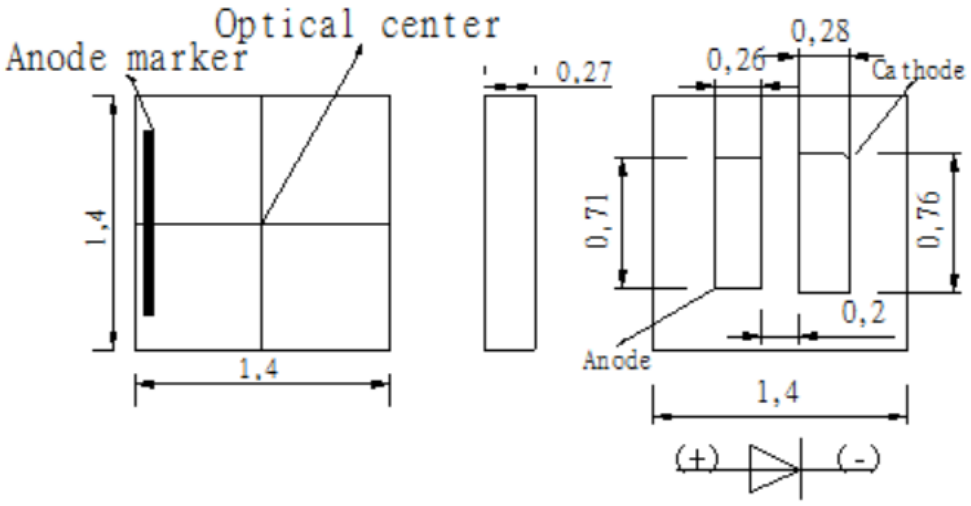
Forward Voltage vs. Forward Current ($T_{solder\ pad}$=25℃)

Relative Luminous Flux vs. Forward Current ($T_{solder\ pad}$=25℃)

Notes:

1. All correlation data is tested under superior thermal management with 1 x 1 cm^2 PCB.

Package Dimension



Top view

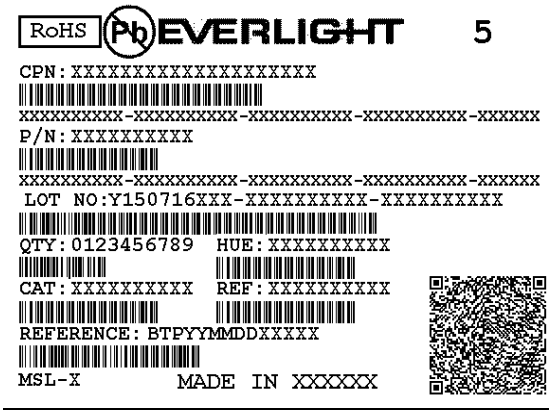
Bottom view

Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.05mm

Moisture Resistant Packing Materials

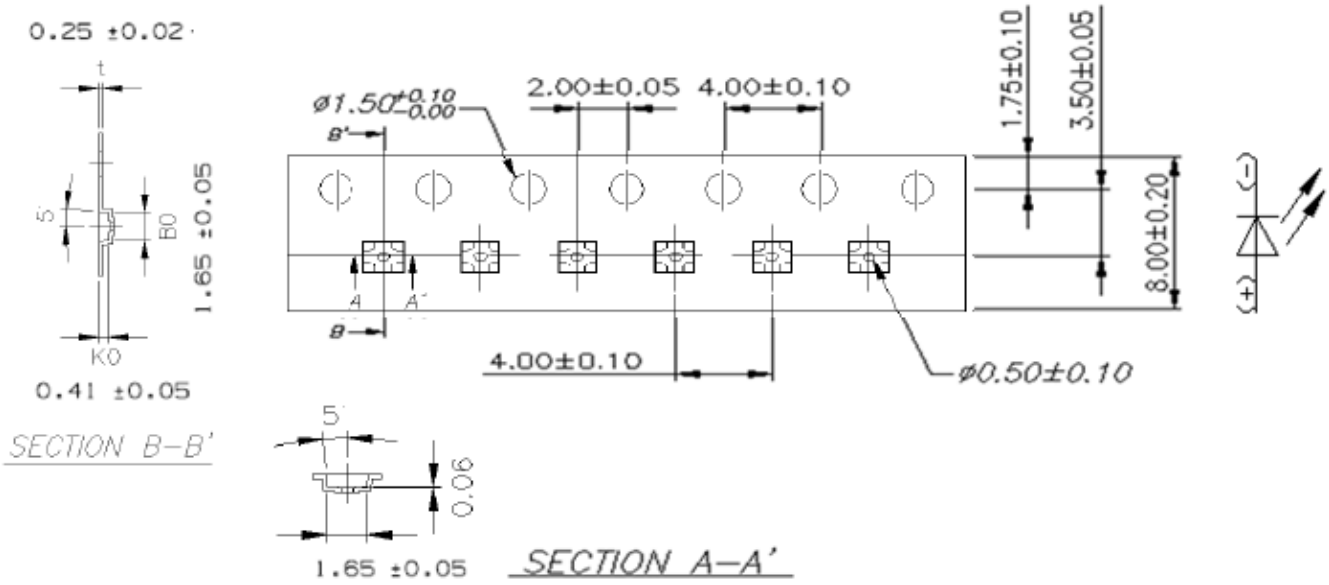
Product Labeling



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

Carrier Tape Dimensions: Loaded Quantity 3000 pcs Per Reel

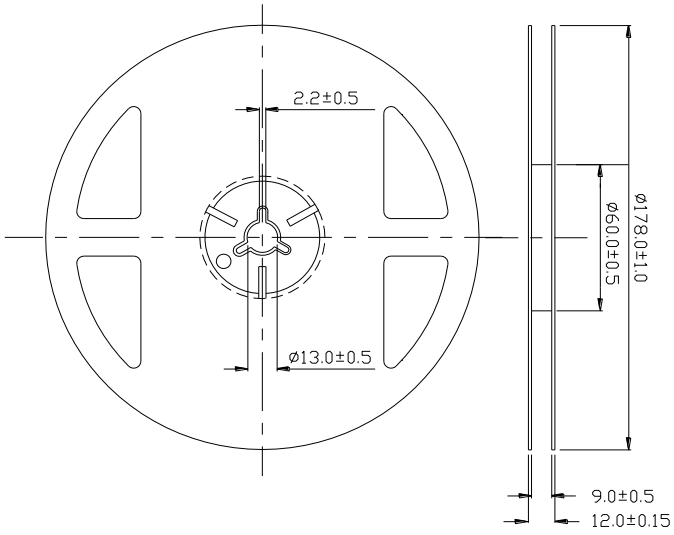
(Minimum Package Quantity :1000 PCS)



Notes:

1. Dimensions are in millimeters.

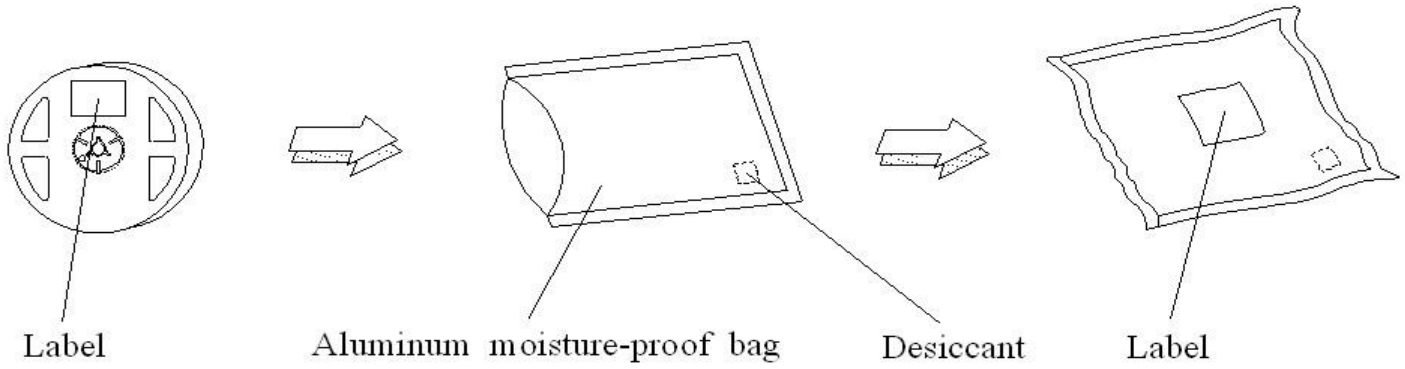
Emitter Reel Dimensions



Notes:

1. Dimensions are in millimeters.

Moisture Resistant Packing Process



Reflow Soldering Characteristics

Soldering and Handling

1. Storage

1.1 Do not open the moisture proof bag before the products are ready to use.

1.2 Before opening the package, the LEDs should be stored at temperature less than 30℃ and relative humidity less than 90%

1.3 After opening the package, the LEDs should be stored at temperature less than 30℃ and relative humidity less than 85%.

1.4 If the moisture absorbent material (silicone gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be implemented based on the following conditions: Pre-curing at 60±5℃ for 24 hours

2.Thermal Management

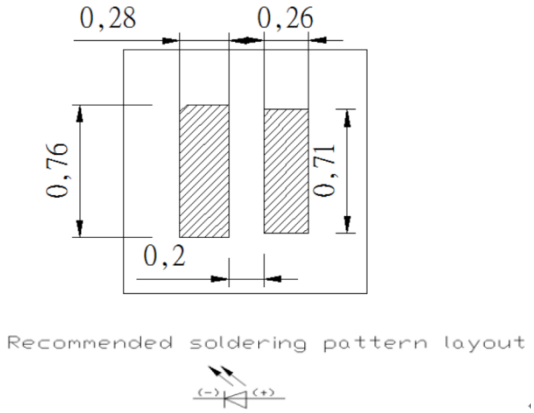
2.1 For maintaining the high flux output and achieving reliability, CSP series LEDs should be mounted on a metal core printed circuit board (MCPCB), with proper thermal connection to dissipate approximately 1W to 5W of thermal energy under normal operation.

2.2 Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LEDs lifetime will decrease critically.

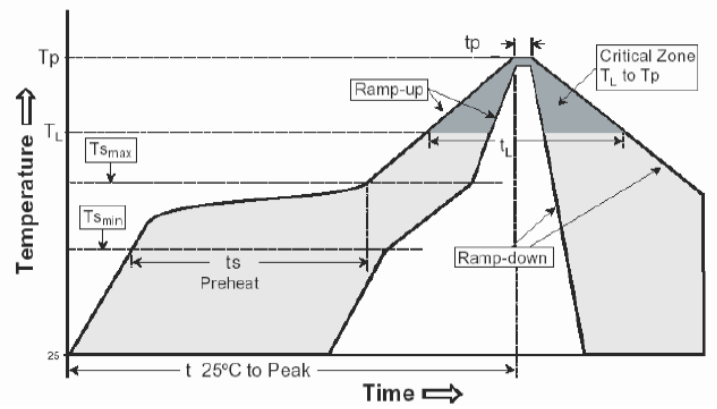
2.3 When operating , the solder pad temperature (or the board temperature nearby the LED) must be controlled under 70℃.

3. Soldering Condition

3.1 Soldering Pad



3.2 For Reflow Process



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (TSmax to Tp)	3 ℃/second max.
Preheat Temp. min (Tsmin)	150
Preheat Temp. Max (Tsmax)	200
Preheat Time (tsmin to tsmax)	60-
Time Maintained Above.Temp.(TL)	210~220
Time Maintained Above.Temp.(tL)	60~180 sec.
Peak Temp. (Tp)	260
Time Within 5℃ of Actual Peak Temp. (tp)	10~30 sec
Ramp-Down Rate	6℃/ sec max.
Time 25℃ to Peak Temp.	8 minutes max.

3.2.1 Reflow soldering temperature profile

3.2.2 Reflow soldering should not be done more than two times.

3.2.3 While soldering, do not put stress on the LEDs during heating.

3.2.4 After soldering, do not warp the circuit board.

DISCLAIMER

1. EVERLIGHT reserves the right(s) on the adjustment of product material mix for the specification.
2. The product meets EVERLIGHT published specification for a period of twelve (12) months from date of shipment.
3. The graphs shown in this datasheet are representing typical data only and do not show guaranteed values.
4. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. EVERLIGHT assumes no responsibility for any damage resulting from the use of the product which does not comply with the absolute maximum ratings and the instructions included in these specification sheets.
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