

**ELCS14B-KB4050J6J9283910-F4Z**

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<input type="checkbox"/>	MASS PRODUCTION
<input checked="" type="checkbox"/>	PRELIMINARY
<input type="checkbox"/>	CUSTOMER DESIGN
DEVICE NO. : DHE-000XXXX	
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<b>Revised record</b>		
REV.	DESCRIPTION	RELEASE DATE
1	New spec	Jan.09.2017

## ELCS14B-KB4050J6J9283910-F4Z

PRELIMINARY

### Features

- Feature of the device : small package with high efficiency
- Typical luminous flux@ 1A : 250 lm
- Optical efficiency@1A : 73.5 lm/W
- ESD protection (according to JEDEC 3b) (HBM air or contact discharge) up to 2KV
- Binning Parameters : Brightness, Forward Voltage and Chromaticity
- Grouping parameter: total luminous flux, color coordinates.
- RoHS compliant & Pb free.
- Compliance with EU REACH
- Compliance Halogen Free (Br<900 ppm, Cl<900ppm , Br+Cl<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)	$I_F$	350	mA
Peak Pulse Current	$I_{Pulse}$	1500	mA
ESD Resistance (JEDEC 3b)	$V_B$	2	KV
Reverse Voltage	$V_R$	Note 1	V
Junction Temperature	$T_j$	150	°C
Operating Temperature	$T_{Opr}$	-40 ~ +85	°C
Storage Temperature	$T_{Stg}$	-40 ~ +100	°C
Soldering Temperature	$T_{Sol}$	260	°C
Allowable Reflow Cycles	n/a	2	Cycles
Substrate Temperature	$T_s$	70( $I_F=1000mA$ )	°C
Viewing Angle $_{\theta(2)}$	$2\theta_{1/2}$	120	Deg
Power Dissipation (Pulse Mode)	$P_d$	5.9	W

### Notes:

1. The CSP series LEDs are not designed for reverse bias used.
2. View angle measurement tolerance $\pm 5^\circ$
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 1.0 x 1.0 cm<sup>2</sup> MCPCB
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°C / 85% RH	168 (+5/-0)	85°C / 85% RH

## Electro-Optical Characteristics (Ts=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux <sub>(1)</sub>	I <sub>v</sub>	220	250	----	lm	I <sub>F</sub> =1000mA
Forward Voltage <sub>(2)(3)</sub>	V <sub>F</sub>	2.85	----	3.95	V	
Color Temperature	CCT	4000	4500	5000	K	
Color Rendering Index <sub>(6)</sub>	CRI	80	83	----		

## Forward Voltage Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
2832	V <sub>F</sub>	2.85	----	3.25	V	I <sub>F</sub> =1000mA
3235	V <sub>F</sub>	3.25	----	3.55		
3539	V <sub>F</sub>	3.55	----	3.95		

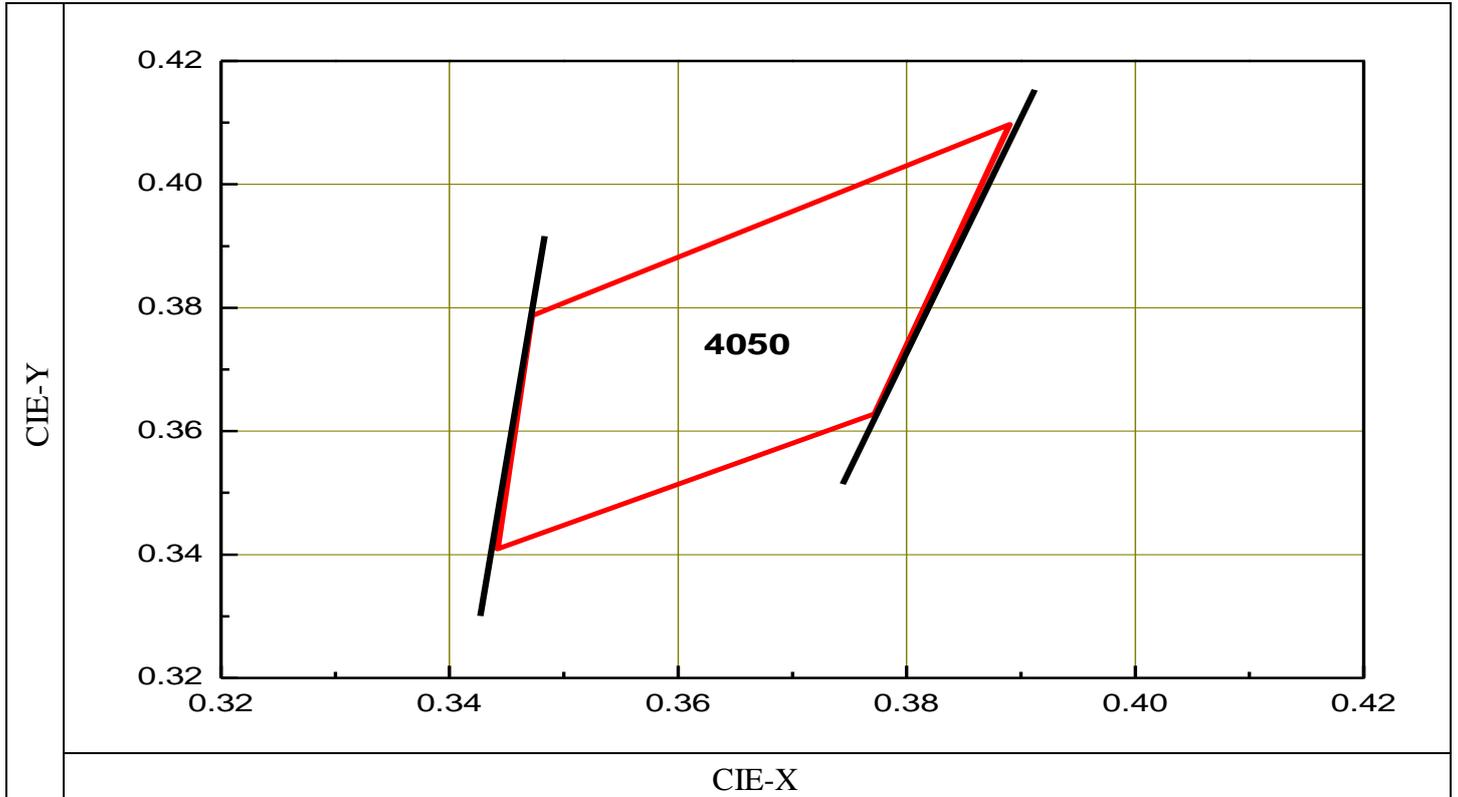
## Luminous Flux Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
J6	I <sub>v</sub>	220	----	250	I <sub>v</sub>	I <sub>F</sub> =1000mA
J7	I <sub>v</sub>	250	----	300		
J8	I <sub>v</sub>	300	----	330		
J9	I <sub>v</sub>	330	----	360		

### Notes:

1. Luminous Flux, illuminance measurement tolerance : ±10%
2. Forward voltage measurement tolerance : ±0.1V
3. Electric and optical data is tested at 50 ms pulse condition.
4. Temperature of solder pad : 25°C
5. Color Rendering Index measurement tolerance: ± 2

## White Bin Structure



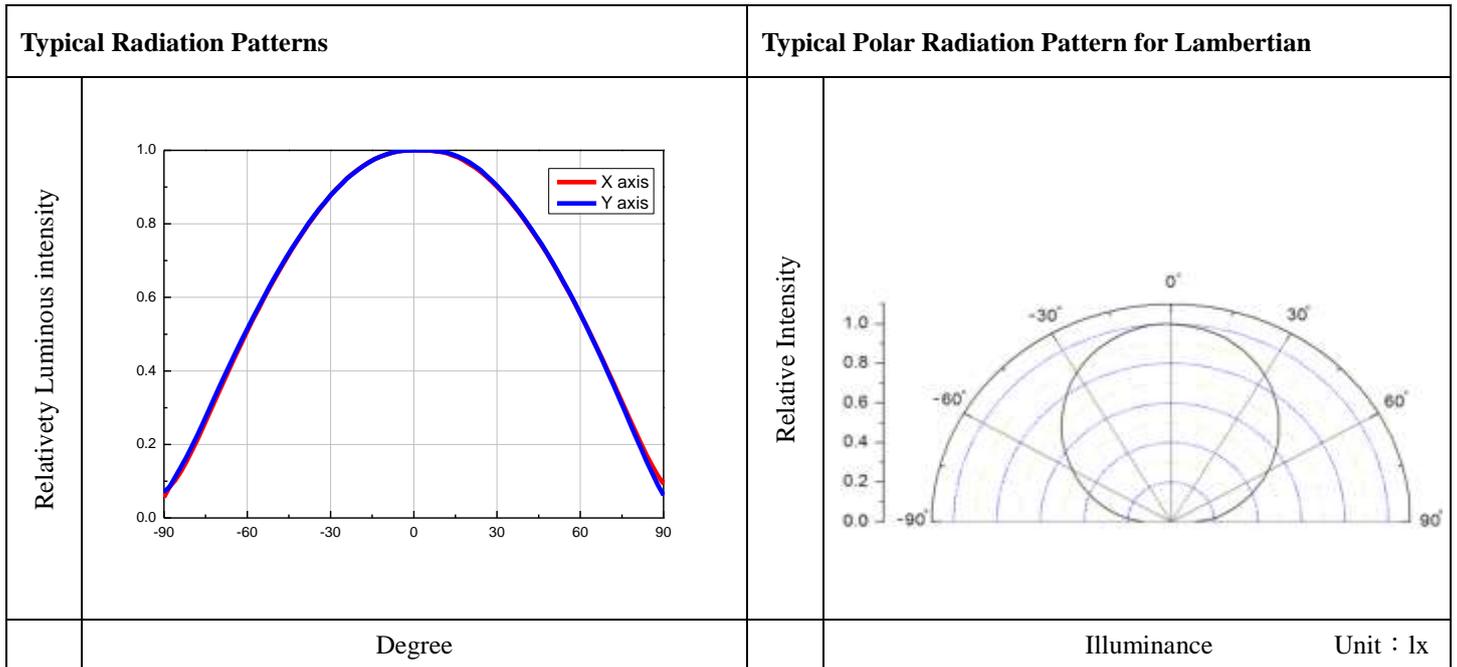
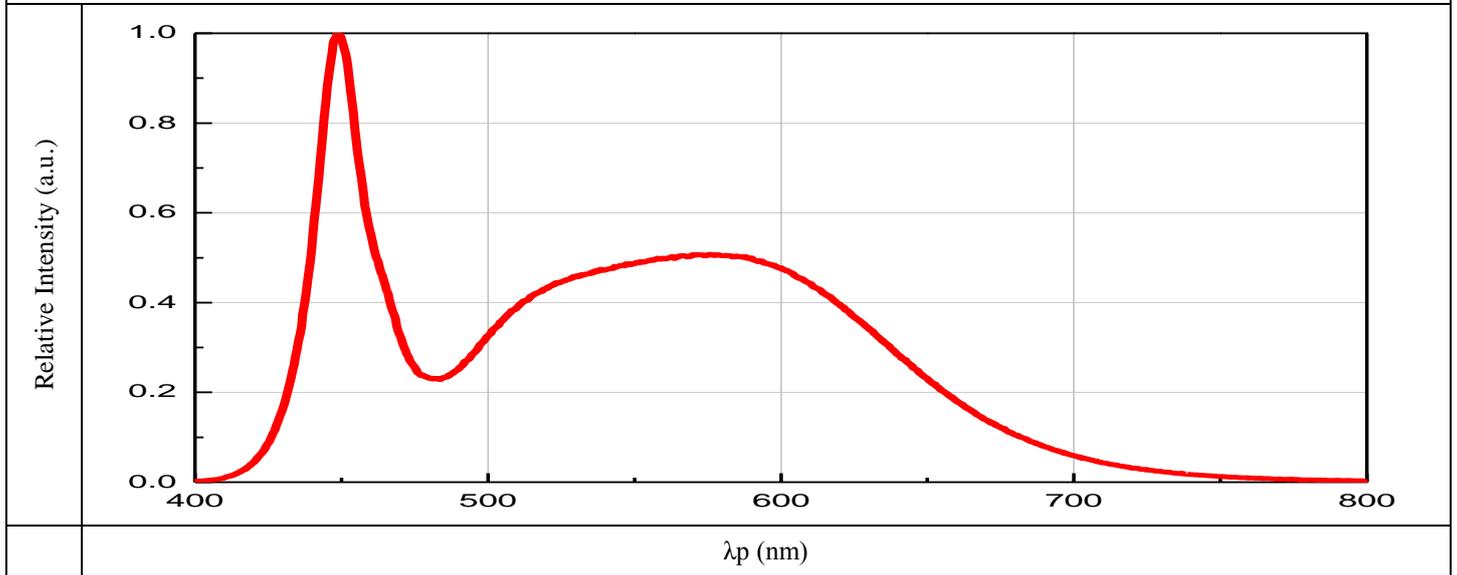
Bin	CIE-X	CIE-Y	Reference Range
4050	0.3472	0.3787	4000 ~ 5000K
	0.3890	0.4097	
	0.3772	0.3628	
	0.3442	0.3409	

**Notes:**

1. Color coordinates measurement allowance :  $\pm 0.01$
2. Color bins are defined at  $I_F=1000\text{mA}$  operation.

### Typical Electro-Optical Characteristics Curves

Relative Spectral Distribution ,  $I_F=1000\text{mA}$  @  $50\text{ms}$ ,  $T_{\text{solder pad}}=25^\circ\text{C}$



**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  $\pm 5^\circ$

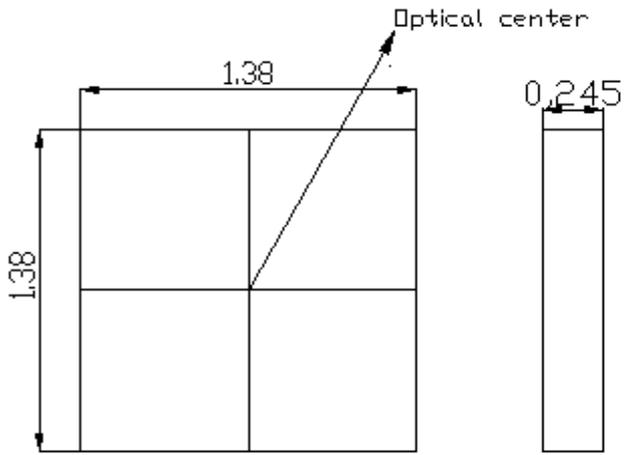
Forward Voltage vs. Forward Current ( $T_{\text{solder pad}}=25^{\circ}\text{C}$ )		Relative Luminous Flux vs. Forward Current ( $T_{\text{solder pad}}=25^{\circ}\text{C}$ )	
Forward Voltage (V)	TBD	Relative Luminous Flux	TBD
Forward Current (mA @ 50ms)		Forward Current (mA @ 50ms)	

CCT vs. Forward Current ( $T_{\text{soldering pad}}=25^{\circ}\text{C}$ )	
Corelated Color Temperature(K)	TBD
Forward Current (mA @ 50ms)	

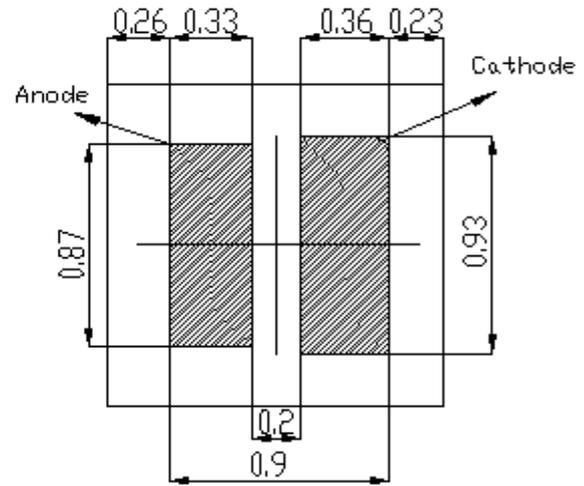
**Notes:**

1. All correlation data is tested under superior thermal management with 1 x 1 cm<sup>2</sup> MCPCB.

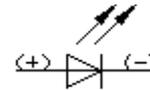
## Package Dimension



Top view



Bottom view



### Notes:

1. Dimensions are in millimeters.
2. Tolerances unless mentioned are  $\pm 0.05\text{mm}$

## Moisture Resistant Packing Materials

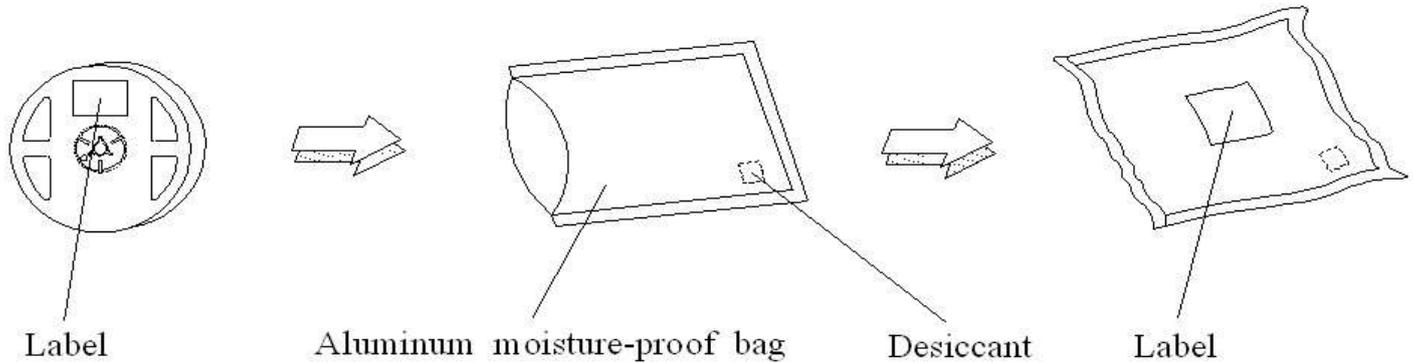
### Product Labeling



- 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



## Moisture Resistant Packing Process



## Reflow Soldering Characteristics

### Soldering and Handling

#### 1. Storage

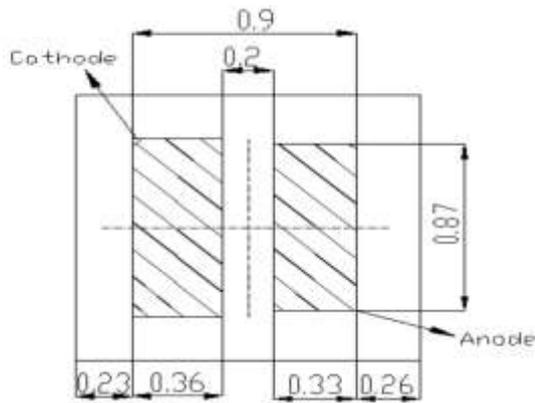
- 1.1 Do not open the moisture proof bag before the products are ready to use.
- 1.2 Before opening the package, the LEDs should be stored at temperature less than 30°C and relative humidity less than 90%
- 1.3 After opening the package, the LEDs should be stored at temperature less than 30°C and relative 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°C 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°C.

### 3. Soldering Condition

#### 3.1 Soldering Pad

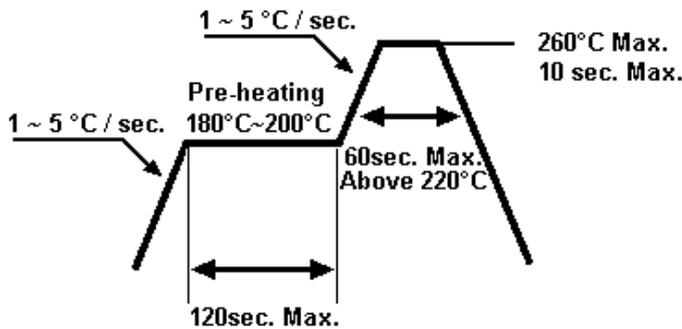


Recommended soldering pattern layout



#### 3.2 For Reflow Process

##### 3.2.1 Lead 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.
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