DATASHEET

FC2016GF14MP-F405025402839E-2T(AES)

Received
■MASS PRODUCTION
□ PRELIMINARY
□ CUSTOMER DESIGN
DEVICE NO. : DHE-0004377
PAGE : 13

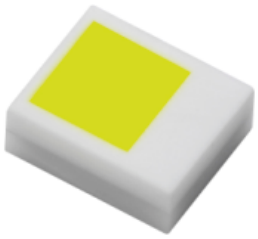
Revised record

REV.	DESCRIPTION	RELEASE DATE
1	New spec	May.07.2024
2	New spec by PRD*86553	Feb.26.2025

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Ver.:2 Release Date:03/03/2025 狀態:Approved(正式發行)

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Features

• Feature of the device：small package with high efficiency

• Typical luminous flux@ 1A：280 lm

• Optical efficiency@1A：82.35 lm/W

• ESD protection (according to JEDEC 3b) (HBM air or contact discharge)up to 8KV

• 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, 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

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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	8000	V
Reverse Voltage	V_R	Note 1	V
Junction Temperature	T_J	150	℃
Operating Temperature	T_{Opr}	-40 ~ +85	℃
Storage Temperature	T_{Stg}	-40 ~ +100	℃
Soldering Temperature	T_{Sol}	260	℃
Allowable Reflow Cycles	n/a	2	Cycles
Viewing Angle$_{(2)}$	$2\theta_{1/2}$	120	Deg

Notes:

1. The Chin series LEDs are not designed for reverse bias used.
2. View angle measurement tolerance±5°
3. Avoid operating Chin 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 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.

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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	280	350	lm	I_F=1000mA
Forward Voltage(2)(3)	V_F	2.85	3.40	3.95	V	
Color Temperature	CCT	4000	4500	5000	K	
Color Rendering Index(4)	CRI	80	83	----		

Forward Voltage Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
2839	V_F	2.85	----	3.95	V	I_F=1000mA

Luminous Flux Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
2535	Iv	250	----	350	lm	I_F=1000mA

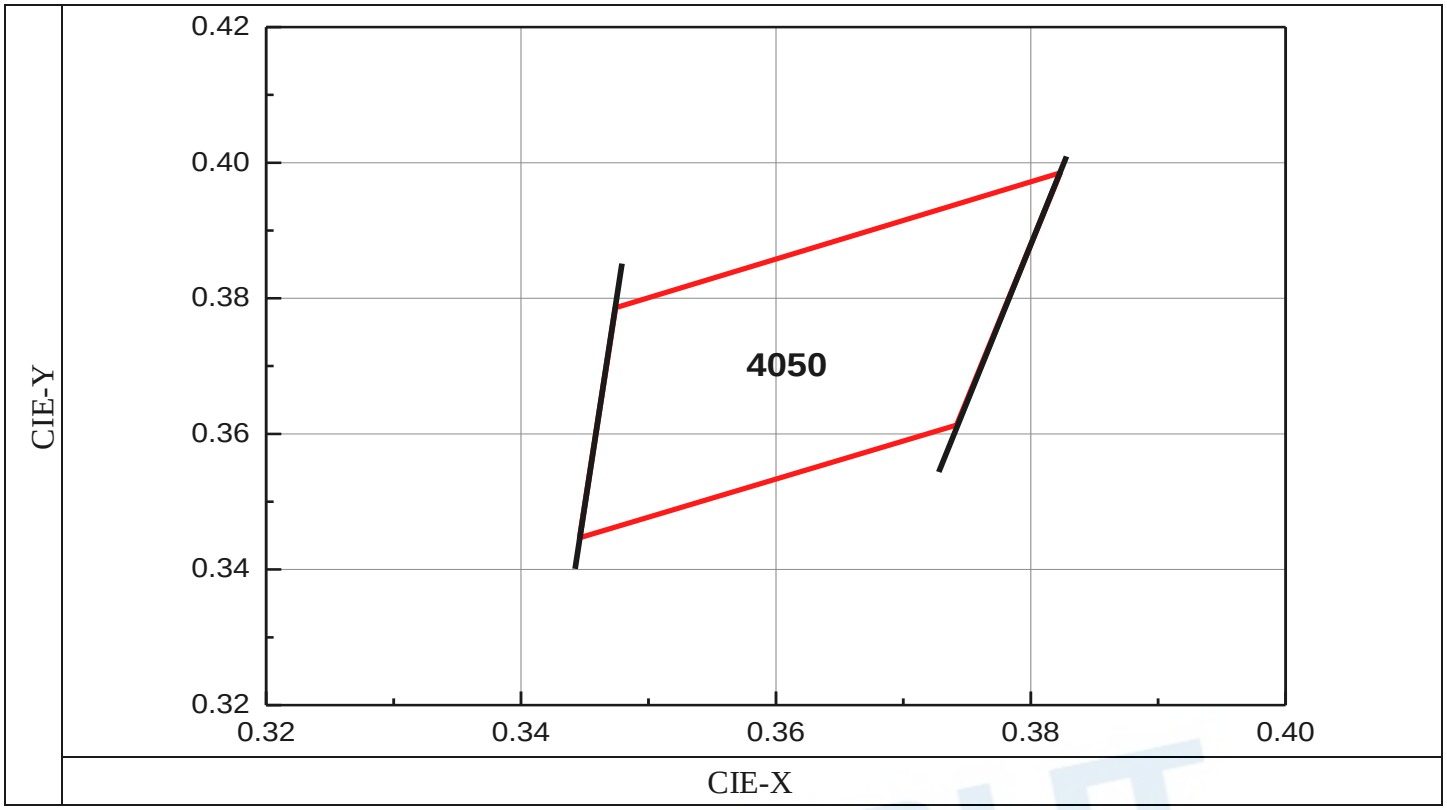
Notes:

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. Temperature of solder pad：25℃

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White Bin Structure



Bin	CIE-X	CIE-Y	Reference Range
4050	0.3474	0.3786	4000~5000K
	0.3823	0.3985	
	0.3742	0.3613	
	0.3446	0.3447	

Notes:

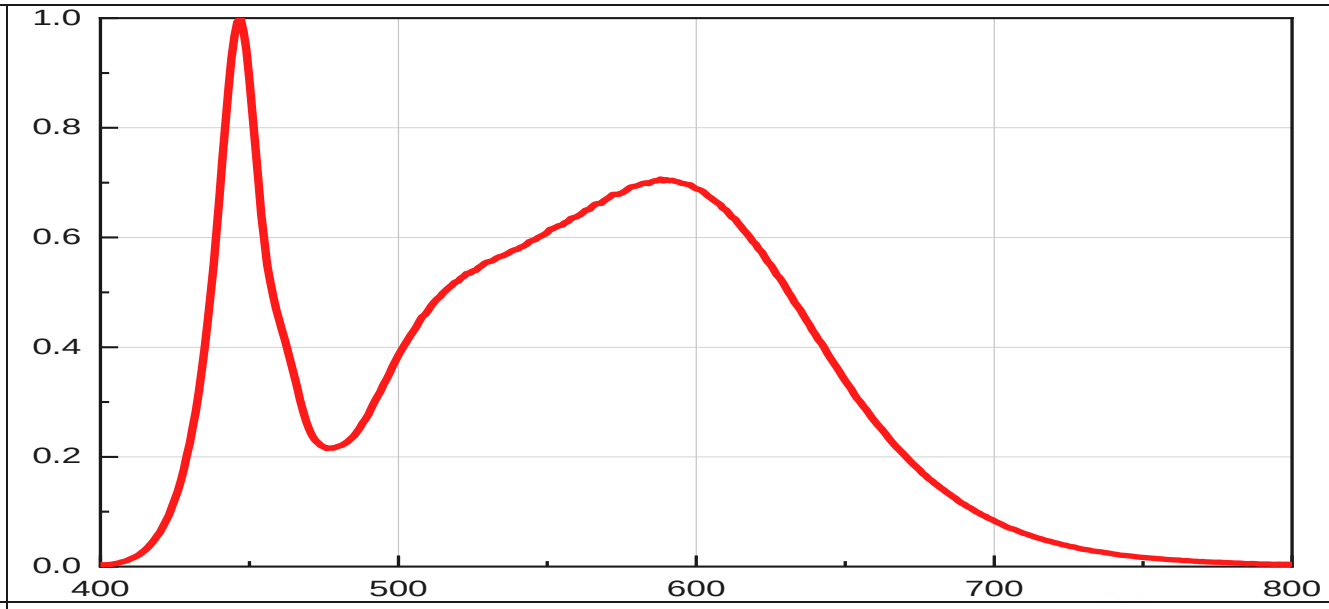
1. Color coordinates measurement allowance：±0.01
2. Color bins are defined at I_F=1000mA operation.

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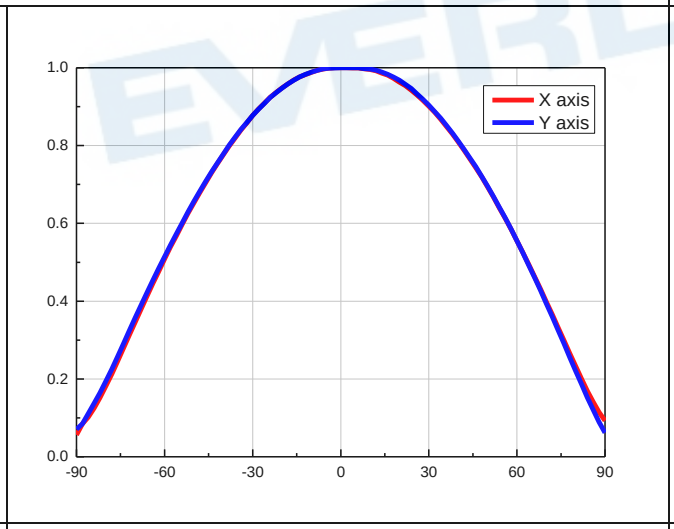
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Typical Electro-Optical Characteristics Curves

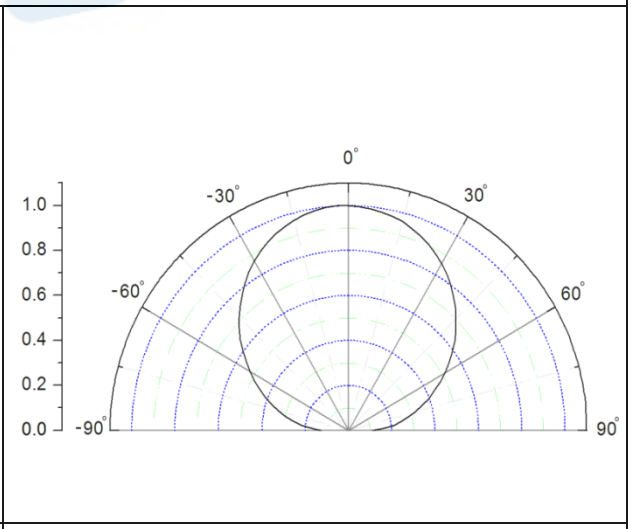
Relative Spectral Distribution , I_F=1000mA @ 25ms, $T_{solder\ pad}$=25℃



Typical Radiation Patterns



Typical Polar Radiation Pattern for Lambertian



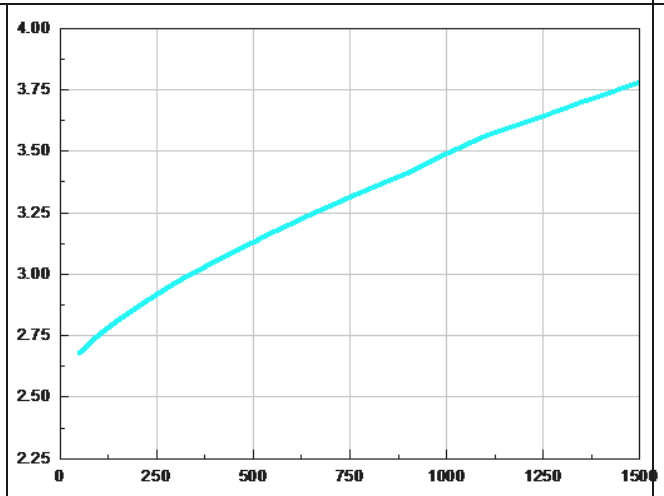
Notes:

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∘

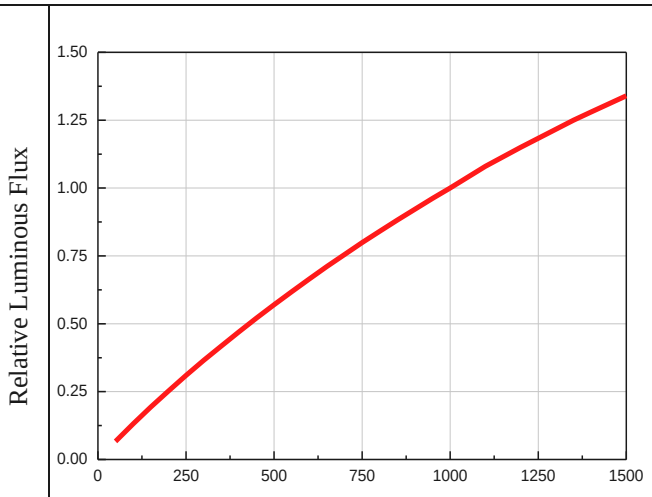
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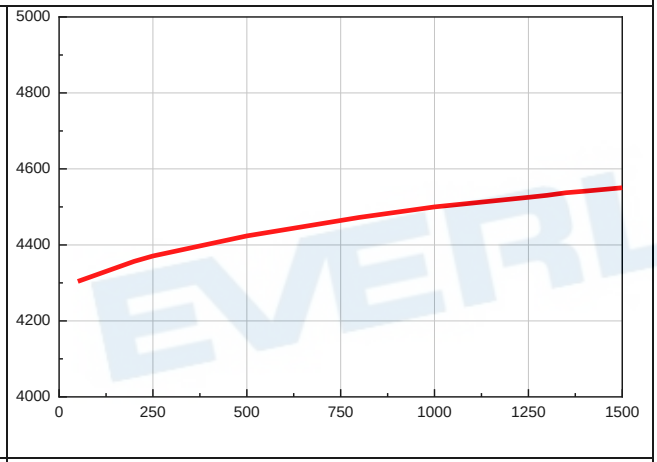
Forward Voltage vs. Forward Current ($T_{solder\ pad}$=25℃)



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



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



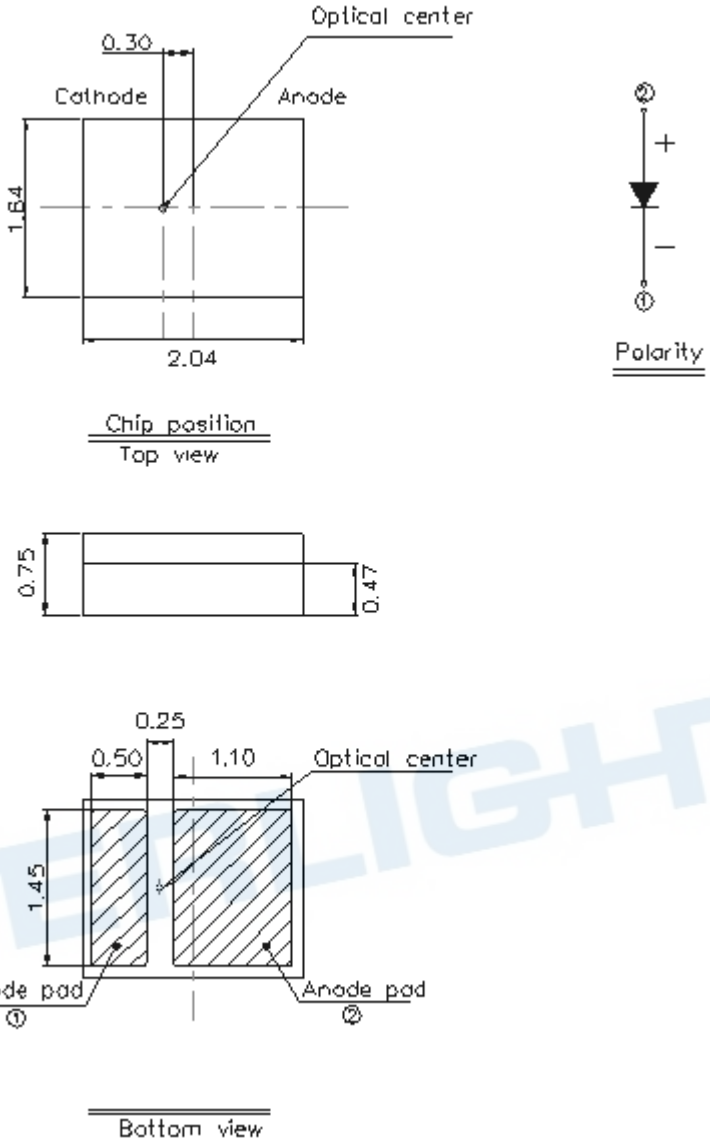
Notes:

1. All correlation data is tested under superior thermal management with MCPCB.

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Package Dimension



Notes:

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

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Moisture Resistant Packing Materials

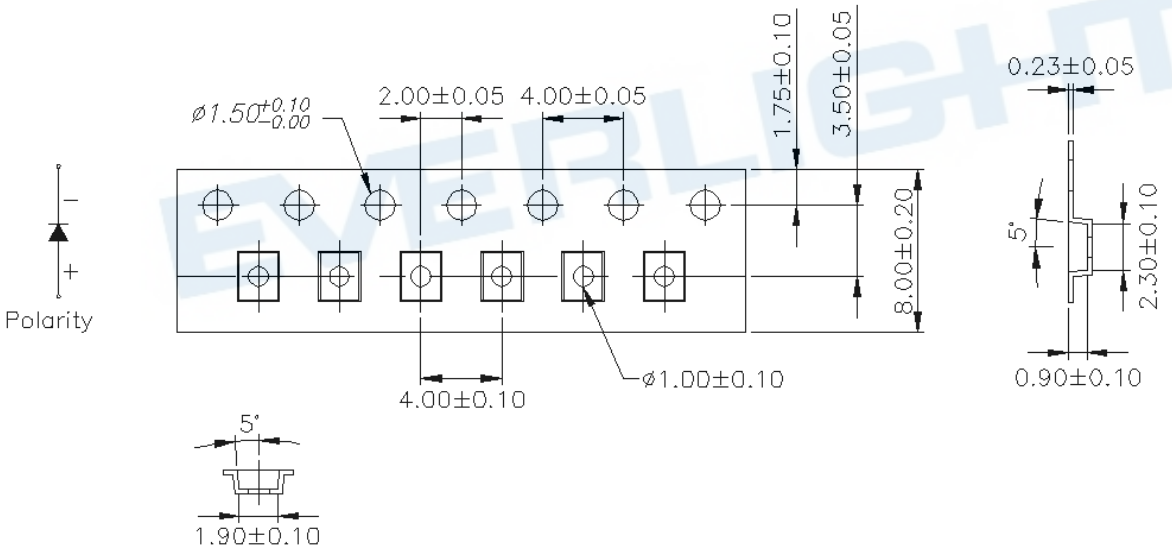
Product Labeling



- 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 2000 pcs Per Reel

(Minimum Package Quantity :1000 PCS)



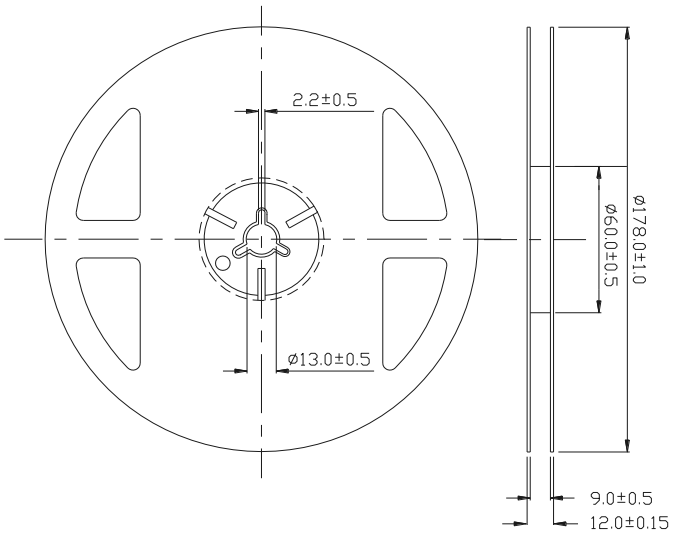
Notes:

1. Dimensions are in millimeters.

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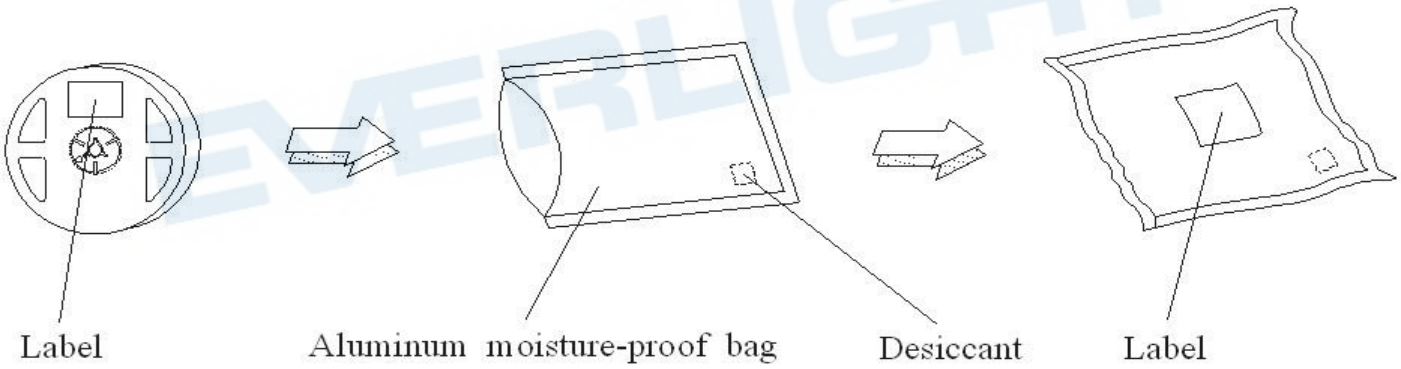
Emitter Reel Dimensions



Notes:

1. Dimensions are in millimeters.

Moisture Resistant Packing Process



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Reflow Soldering Characteristics

Soldering and Handling

1. Over-current-proof

Though CHIN series has conducted ESD protection mechanism, customers must not use the device in reverse and should apply resistors for extra protection. Otherwise, slight voltage shift may cause enormous current shift and burn out failure would happen.

2. Storage

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

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

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

3.Thermal Management

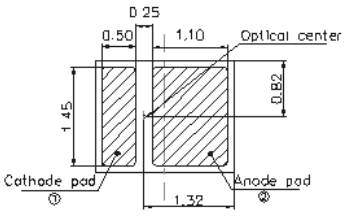
3.1 For maintaining the high flux output and achieving reliability, EHP-C04 series LEDs should be mounted on a metal core printed circuit board (MCPCB), with proper thermal connection to dissipate approximately 1W to 5W of thermal energy under normal operation.

3.2 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

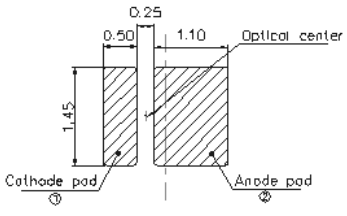
3.3 When operating , the solder pad temperature (or the board temperature nearby the LED) must be controlled under 70℃.

4. Soldering Condition

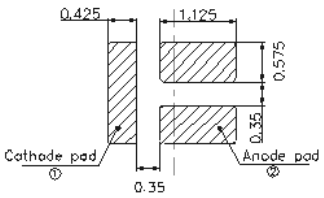
4.1 Soldering Pad



Component bottom view



Recommended soldering pattern layout



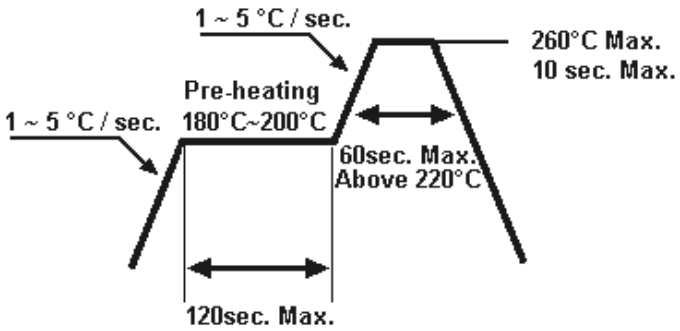
Recommended soldering pattern layout –2

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4.2 For Reflow Process

4.2.1 Lead reflow soldering temperature profile



4.2.2 Reflow soldering should not be done more than three times.

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

4.2.4 After soldering, do not warp the circuit board.

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