DATASHEET

CHIN Series
ELCH07-4149J6J7283910-F0(SOMC)

Received
■ MASS PRODUCTION
□ PRELIMINARY
□ CUSTOMER DESIGN
DEVICE NO. : DHE-0002409
PAGE : 14

Revised record

REV.	DESCRIPTION	RELEASE DATE
1	New spec	2014.04.21
2	Change Product Labeling	2015.09.25

ELCH07-4149J6J7283910-F0(SOMC)

Features

• Feature of the device：small package with high efficiency

•Typical luminous flux@ 1A：250 lm

•Optical efficiency@1A：64 lm/W

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

• Binning Parameters：Brightness, Forward Voltage and Chromaticity

• Moisture Sensitivity(MSL) Class Level 1

• Grouping parameter: total luminous flux, color coordinates.

• RoHS compliant & Pb free.

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 Operating Current (Torch Mode)	I_F	350	mA
Pulsed Forward Current	I_{Pulse}	1500	mA
ESD Resistance (JEDEC 3b)	V_B	8000	V
Reverse Voltage	VR	[1]	V
DC mode Junction Temperature	T_j	150	℃
Pulse mode Junction Temperature	T_j	175	℃
Operating Temperature	T_{op}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-40 ~ +100	℃
Soldering Temperature	T_{sol}	260	℃
Allowable Reflow Cycles	*n/a*	3	cycles
Viewing Angle[(2)]	$2\theta_{1/2}$	120	Deg
Power Dissipation (Pulse Mode)	P_d	6.5	W

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. For 1500mA all reliability item are tested under good thermal management with 1.0 x 1.0 cm^2 MCPCB
6. Peak pulse current shall be applied under conditions as max duration time 50 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	110	140	170	lm	I_F=500mA(4)
Forward Voltage(2)(3)	V_F	2.85	2.85	3.56	V	
Color Temperature	CCT	4050	4420	4870	K	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux(1)	Iv	130	165	200	lm	I_F=600mA(4)
Forward Voltage(2)(3)	V_F	2.85	2.88	3.63	V	
Color Temperature	CCT	4080	4450	4900	K	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux(1)	Iv	200	250	300	lm	I_F=1000mA
Forward Voltage(2)(3)	V_F	2.85	3.20	3.95	V	
Color Temperature	CCT	4130	4500	4950	K	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux(1)	Iv	260	330	399	lm	I_F=1500mA(4)
Forward Voltage(2)(3)	V_F	3.15	3.50	4.25	V	
Color Temperature	CCT	4180	4550	5000	K	

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Flux(1)	Iv	310	520	470	lm	I_F=2000mA(4)
Forward Voltage(2)(3)	V_F	3.45	3.80	4.50	V	
Color Temperature	CCT	4230	4500	5050	K	

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. The condition I_F = 500mA ,600mA ,1500mA ,2000mA are only for reference.

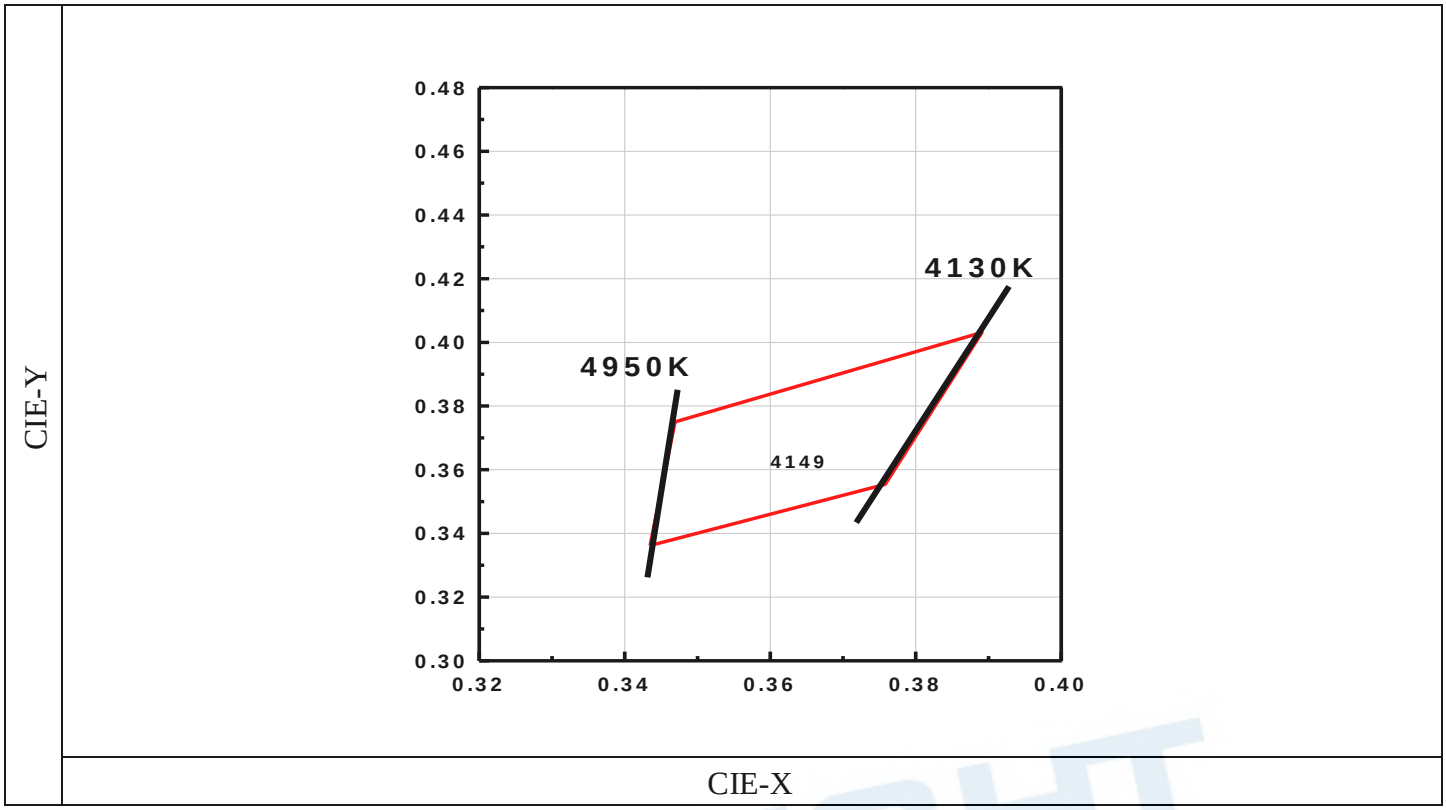
Forward Voltage Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
2832	V_F	2.85	----	3.25	V	I_F=1000mA
3235	V_F	3.25	----	3.55		
3539	V_F	3.55	----	3.95		

Luminous Flux Binning

Bin	Symbol	Min.	Typ.	Max.	Unit	Condition
J6	Iv	200	----	250	lm	I_F=1000mA
J7	Iv	250	----	300		

White Bin Structure



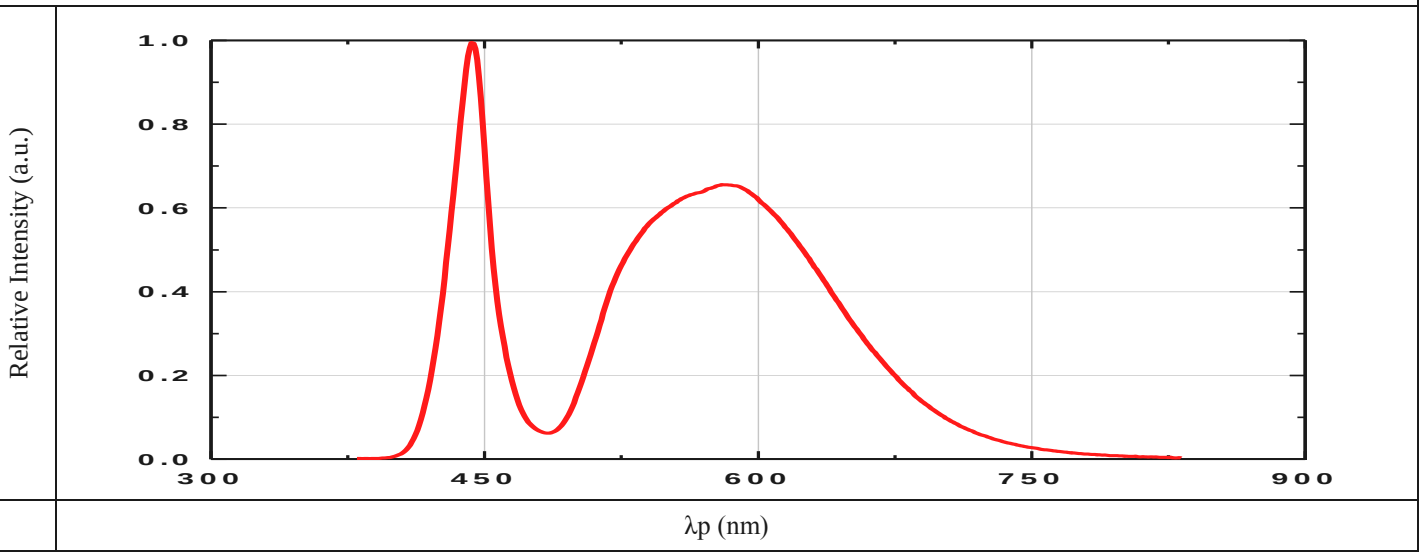
Bin	CIE-X	CIE-Y	Reference Range
4149	0.3435	0.3362	4130 ~ 4950K
	0.3469	0.3750	
	0.3891	0.4031	
	0.3758	0.3554	

Notes:

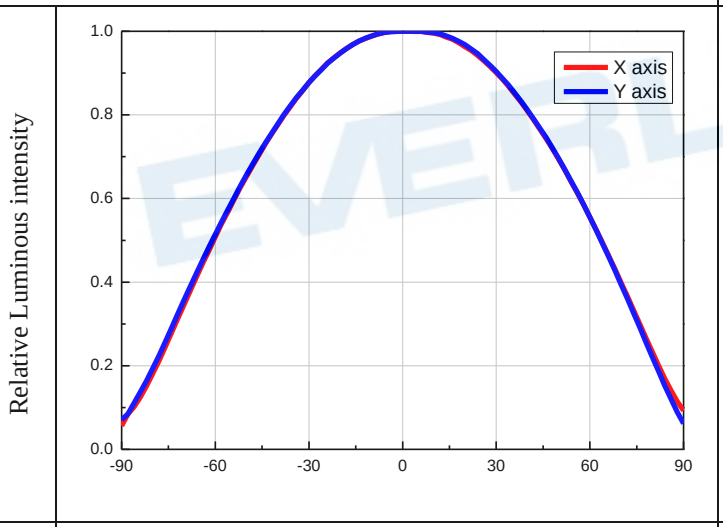
1. Color coordinates measurement allowance：±0.01
2. Color bins are defined at I_F=1000mA operation.

Typical Electro-Optical Characteristics Curves

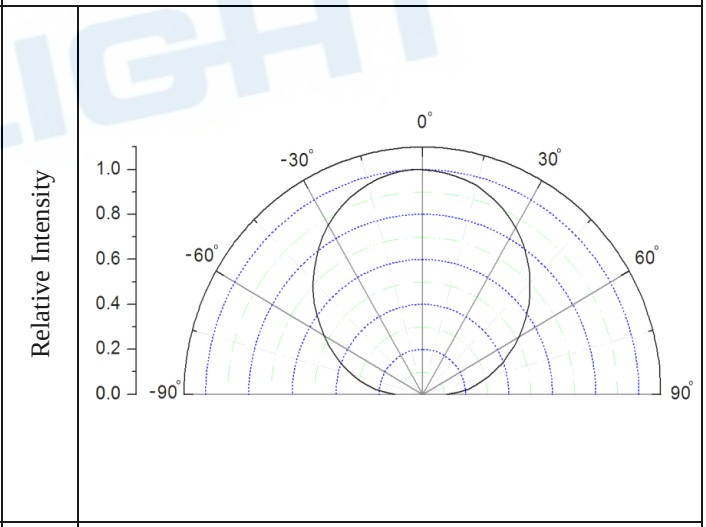
Relative Spectral Distribution , I_F=1000mA @ 50ms, $T_{solder\ pad}$=25℃



Typical Radiation Patterns



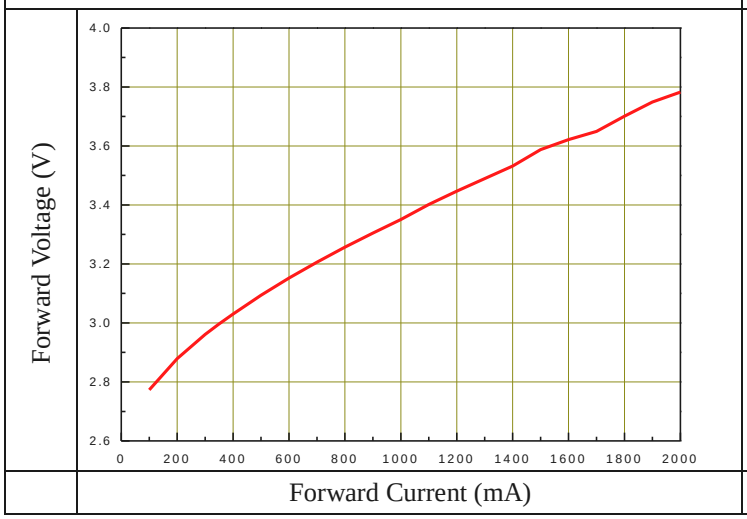
Typical Polar Radiation Pattern for Lambertian



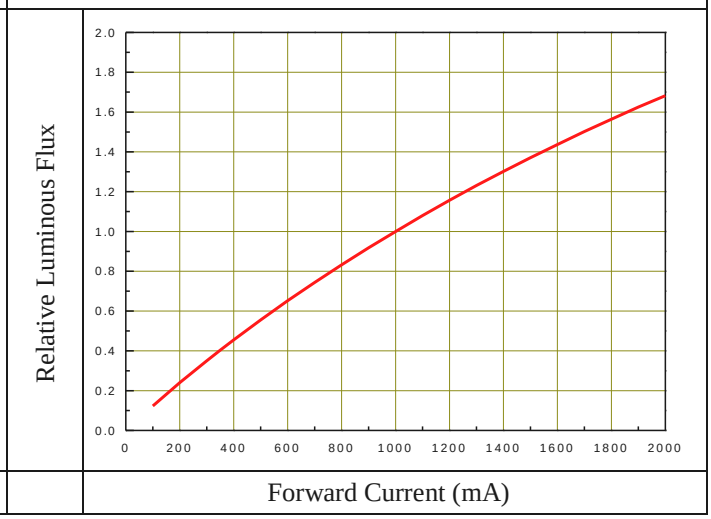
Notes:

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∘

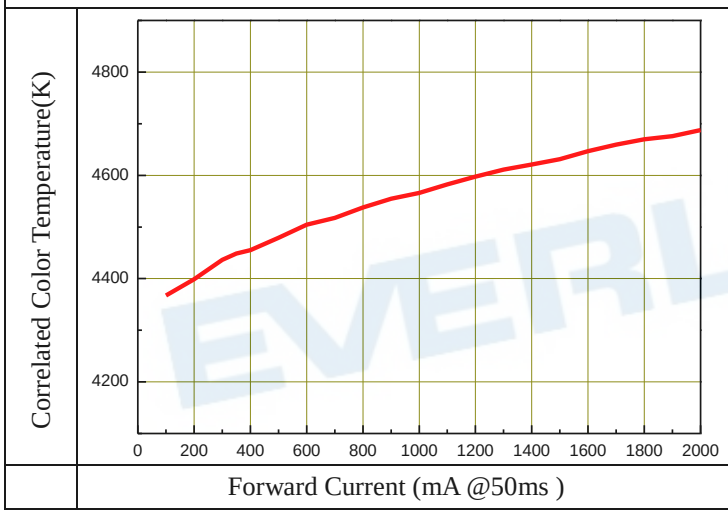
Forward Voltage vs. Forward Current ($T_{solder\ pad}$=25℃)



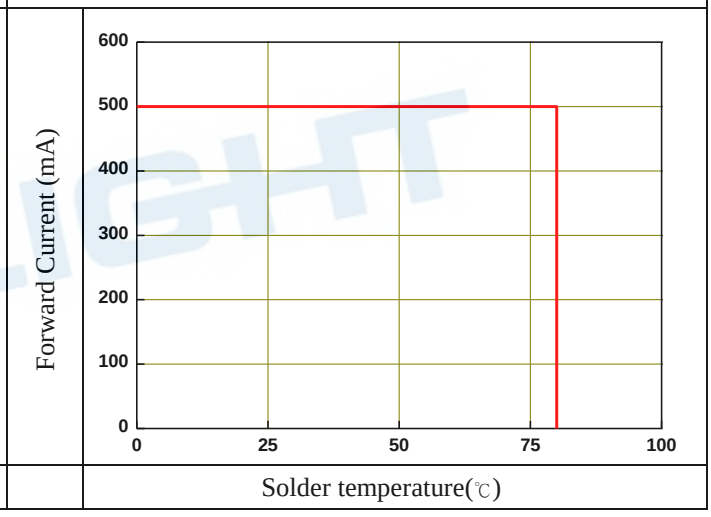
Relative Luminous Flux vs. Forward Current ($T_{solder\ pad}$=25℃)



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



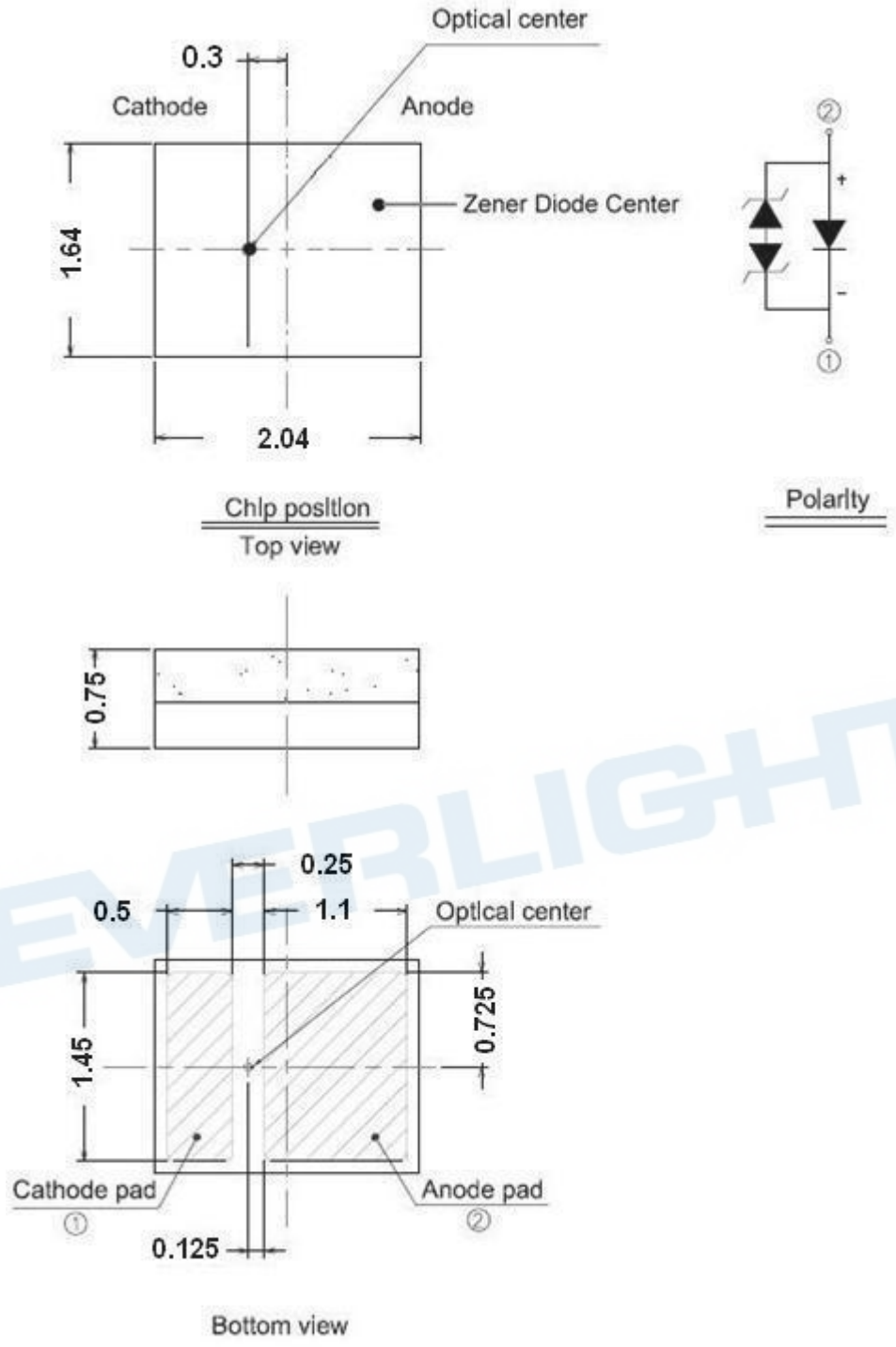
Forward Current Derating Curve,Derating based on $T_{j\ MAX}$=125℃ at torch mode



Notes:

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

Package Dimension



Notes:

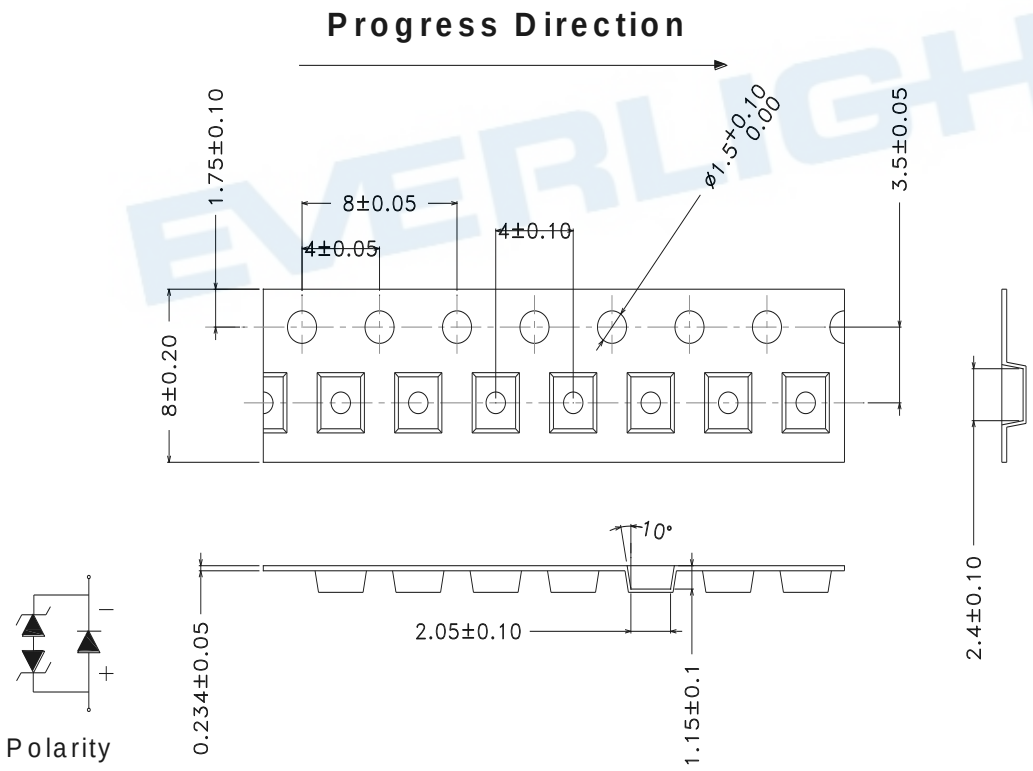
1. Dimensions are in millimeters.
2. Tolerances unless mentioned are ± 0.1mm.

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

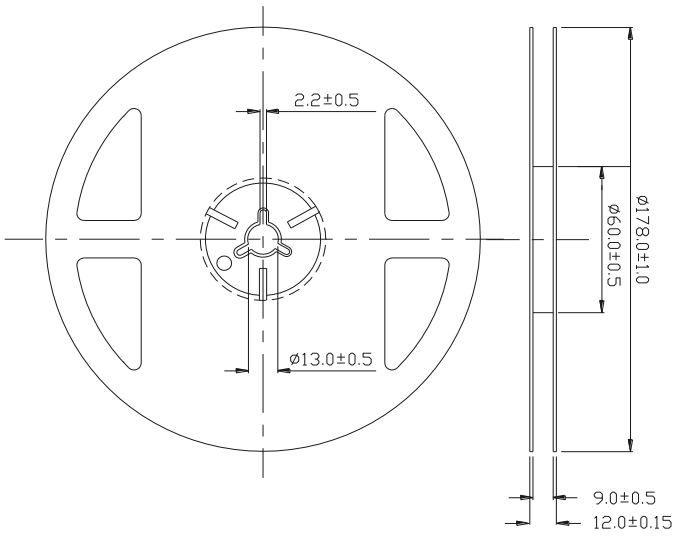
Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel



Notes:

1. Dimensions are in millimeters.

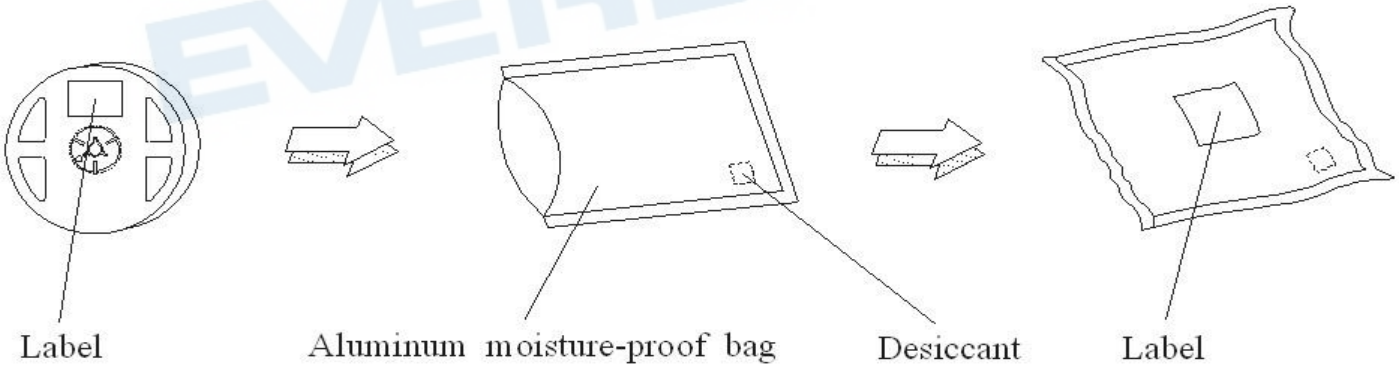
Emitter Reel Dimensions



Notes:

1. Dimensions are in millimeters.

Moisture Resistant Packing Process



Reflow Soldering Characteristics

Soldering and Handling

1. 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 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%.

2.4 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.

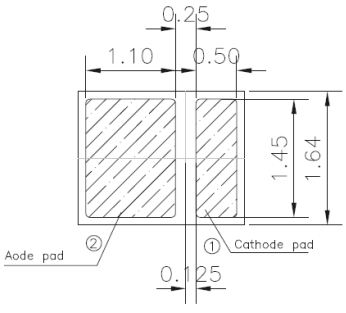
3. Thermal Management

3.1 For maintaining the high flux output and achieving reliability, Chin 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.

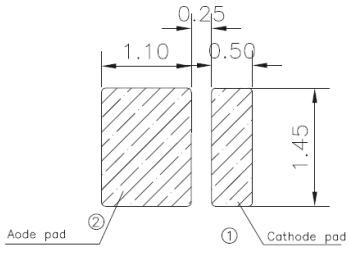
3.2 Sufficient thermal management must be conducted, or the die junction temperature will be over the limit under large electronic driving and LEDs lifetime will decrease critically.

4. Soldering Condition

4.1 Soldering Pad



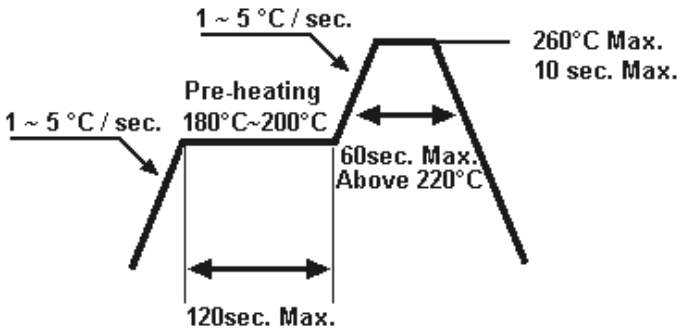
Bot.view



Soldering patterns

4.2 For Reflow Process

4.2.1 Lead reflow soldering temperature profile

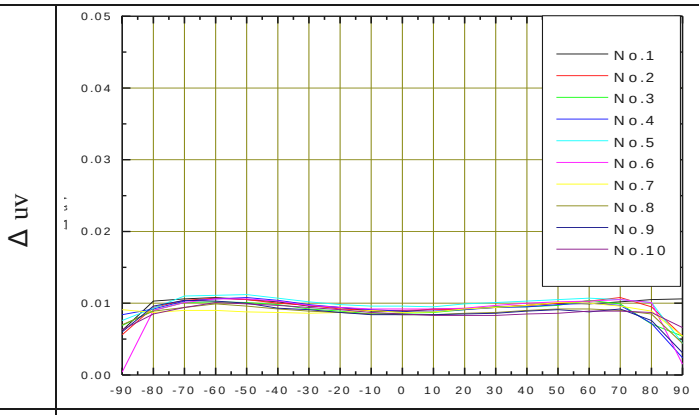
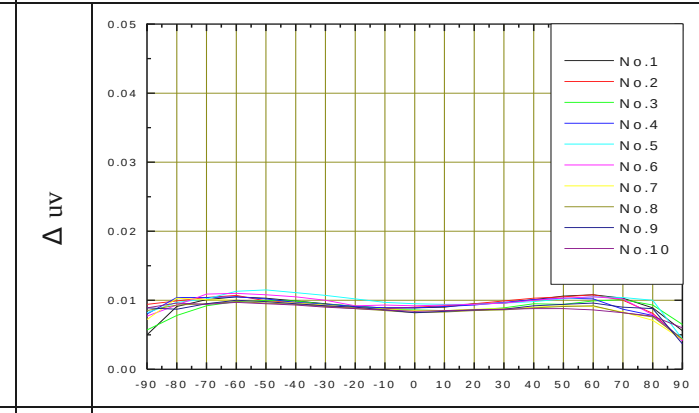


4.2.2 Reflow soldering frequency is based on JEDEC-020D.

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

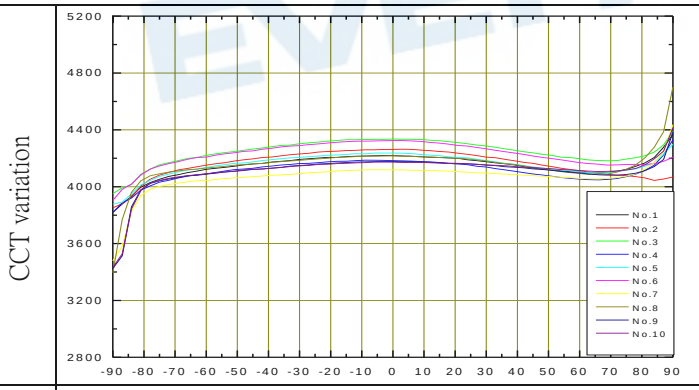
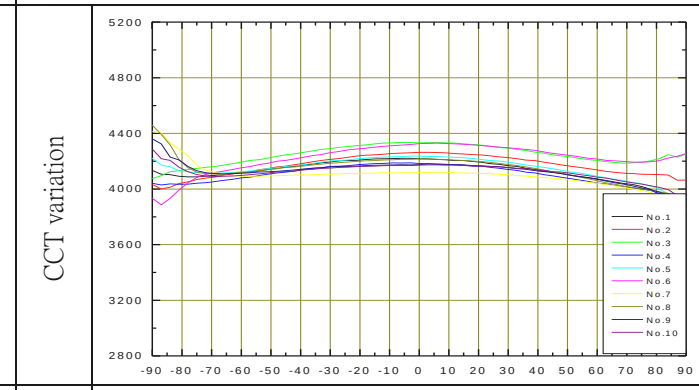
4.2.4 After soldering, do not warp the circuit board.

Appendix A : Δuv vs Angle

Δuv vs Angle (horizontal)	Δuv vs Angle(vertical)
	
Degree(°)	Degree(°)

Notes:
1.Test current:70mA.
2.Test equipment: Lux meter (distance 1M).
3.Central Δuv 0.01.
4.All Δuv < 0.02 from +90~-90 degree.
5.All samples test result only for reference.

Appendix B :CCT Variation v.s. Angle

CCT Variation v.s. Angle (horizontal)	CCT Variation v.s. Angle (vertical)
	
Degree(°)	Degree(°)

Notes:
1.Test current:70mA.
2.Test equipment: Goniophotometer(distance 30cm).
3.All CCT variation from +90 ~ -90 degree in both vertical and horizontal directions is within 10%.
4.All samples test result only for reference.