Technical Data Sheet

Customer Part No.:

Inhere Part No.: E3014CPW000D-Z01-AM-PN

Part Name: EMC 3014 高色域白光加齐纳 LED

Spec Issue Date: 2025-03-20

Revision No.: D

Product Gradation : AEC-Q102 Certified

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To Customer:

We submit herewith the following information for your approval:

■Sample ☐OQC Inspection Record ■LED Dimension

■Electrical Characteristics Curve ■Internal Circuit Diagram

■Soldering recommendation

Prepared by : Lily	Checked by : Tom	Approved by : Ares
Date : 2025-03-20	Date : 2025-03-20	Date : 2025-03-20

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Customer Opinion

☐ Approve and no objection

☐ Reject with the following reason:

_____

东莞市银河光电有限公司
Dongguan Inhere Opto Co.,Ltd.
地址:东莞市莞城科技园 D 幢
ADD: Building D, Guancheng Science & Technology Park,Dongguan
TEL: 0769-23320868 FAX: 0769-23320878
E-mail: bill@inhereopto.com
Http://www.inhereopto.com

Features

3.00mm × 1.40mm SMD LED, 0.52mm thickness

Low power consumption

Wide view angle

Package : 4000pcs/reel

RoHS compliant

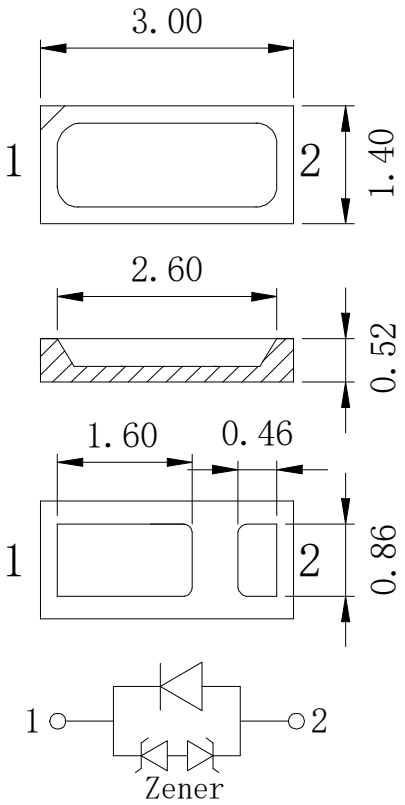
Applications

Automotive backlighting or lighting

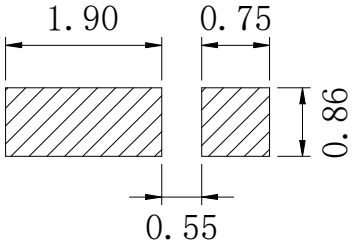
Ideal for back light and lighting

Welcome to ask for any other applications

Package Outlines



Recommend Soldering Pad Layout



Part No.	Emitted color	Dice	Lens color
E3014CPW000D-Z01-AM-PN	White	InGaN/GaN	Yellow Diffused

Notes:

All dimensions are in millimeters.

Tolerances are ± 0.1mm unless otherwise specified.

Absolute Maximum Ratings (Ta=25℃)

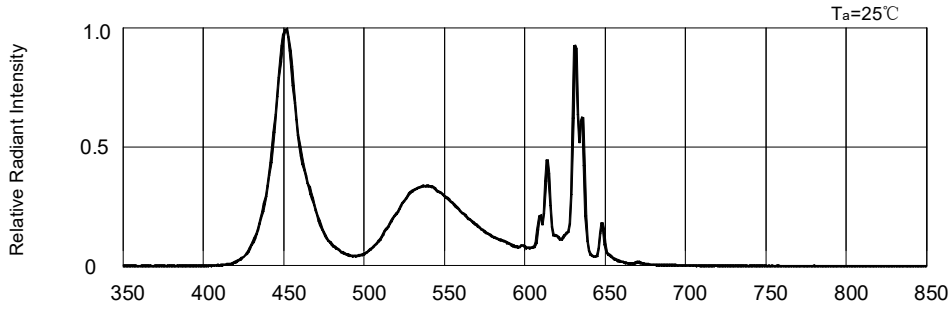
Parameter	Symbol	Value	Unit
Forward Current	If	200	mA
Peak Pulsing Current (1/10 duty f=1kHz)	Ifp	400	mA
Power Dissipation	Pd	680	mW
Electric Static Discharge Threshold(BHM)	ESD	8000	V
Reverse Voltage	Vr	5	V
Operating Temperature	Top	-40 ~+105	℃
Storage Temperature	Tstg	-40 ~+105	℃
Junction Temperature	T_J	125	℃
Humidity Sensitive Level	MSL	2a	--

Electro-Optical Characteristics (Ta=25℃)

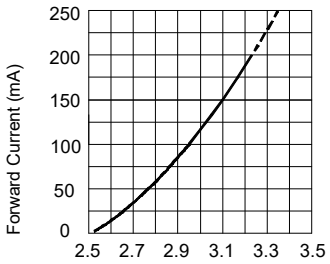
Parameter	Test Condition	Symbol	Value			Unit
			Min	Typ	Max	
CIE Coordinates	If=80mA	X Y	0.2284 0.1900	-- --	0.2944 0.3000	--
Forward Voltage	If=80mA	Vf	2.8	--	3.4	V
Luminous Flux	If=80mA	Φ	26	--	34	lm
Viewing Angle	If=80mA	2θ1/2	--	120	--	Deg
Reverse Current	Vr=5V	Ir	--	--	10	μA

Note: Product with zener diode is needed to discriminate the characteristics of product by fixing current and measuring voltage.

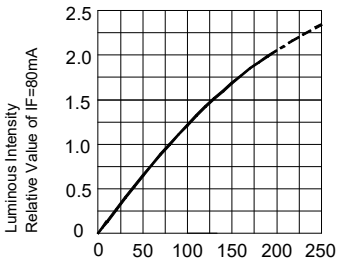
Optical Characteristic Curves



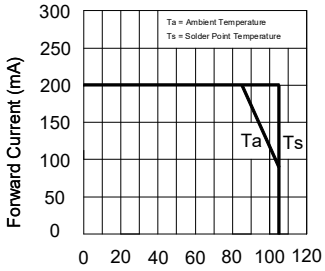
RELATIVE INTENSITY Vs.WAVELENGTH



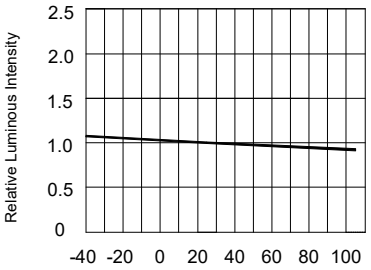
FORWARD CURRENT Vs.
FORWARD VOLTAGE



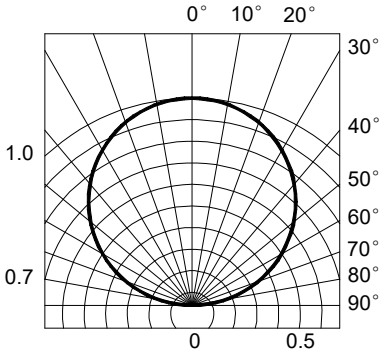
LUMINOUS INTENSITY Vs.
FORWARD CURRENT



FORWARD CURRENT Vs.
TEMPERATURE



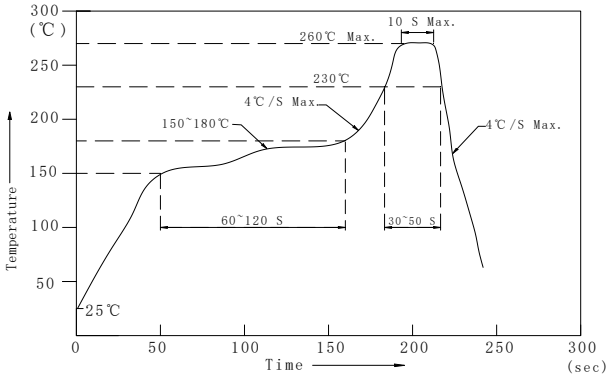
LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE



SPATIAL DISTRIBUTION

Reflow Profile

■ Reflow Temp/Time



Notes:

1. We recommend the reflow temperature 245℃ (±5℃).The maximum soldering temperature should be not higher than 260℃.
2. Don't apply external stress to the epoxy resin while it is exposed to high temperature.
3. Number of reflow process shall be 2 times or less.

■ Soldering iron

Soldering process is ≤ 5sec when 320℃ (±20℃).

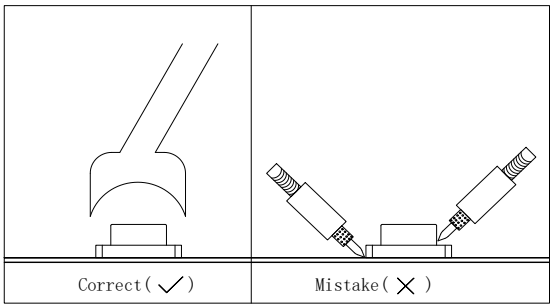
If temperature is higher, time should be shorter (+10℃→ -1sec).

Power dissipation of iron should be smaller than 20W, and its temperature should be controllable.

Surface temperature of the device should be under 350℃.

■ Rework

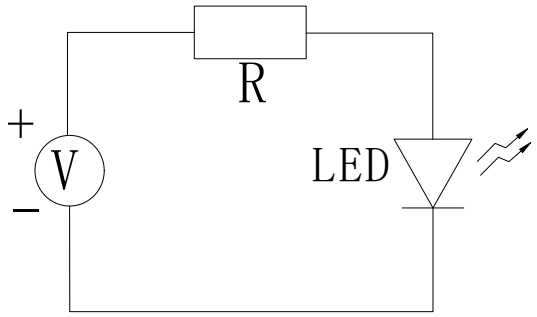
1. Customer must finish rework within 5 sec under 340℃.
2. The head of iron cannot touch copper foil.
3. Twin-head type is preferred.



■ Prevent rubbing or scraping the resin by any object, while under high temperature situation, for example reflow solder etc.

Test Circuit and Handling Precautions

■ Test circuit



■ Handling precautions

1. Over-current-proof

Customer must apply resistors for protection purpose; otherwise slight voltage shift will cause big current change (LED unit burn out will happen).

2. Storage

2.1 It is recommended to store the products under the following conditions :

Humidity : 60% R.H. Max.

Temperature : 5℃~30℃

2.2 Shelf life in sealed bag : 12 month at ＜5℃~30℃ and ＜30% R.H.

After the package is opened, the products should be used within 4 weeks or they should be keeping to stored at≦20 R.H. with zip-lock sealed.

3. Baking

It is recommended to baking before soldering when the pack is unsealed after 4 weeks.

The Condition is: 65±5℃/24hrs.

Test Items and Results of Reliability (1)

TEST GROUP A: ACCELERATED ENVIRONMENT STRESS TESTS

Item No.	Test Item	Standard	Test Condition	Qty	Conclusion
A1	Pre-conditioning (PC)	JEDEC JESD22-A113H-2016 JEDEC J-STD-020E : 2015	125℃ 24 hrs,60℃/60%RH 120hrs,3X reflow	312 pcs	Pass
A2a	Wet High Temperature Operating Life1 (WHTOL1)	JEDEC JESD22-A101D.01-2021	Pre-conditioning,85℃/85%RH,1000hrs,IF=80mA, 30min ON/OFF	26pcs *3	Pass
A2b	Wet High Temperature Operating Life2 (WHTOL2)	JEDEC JESD22-A101D.01-2021	Pre-conditioning,85℃/85%RH,1000hrs,IF=80mA	26pcs *3	Pass
A3a	Power Temperature Cycling (PTC)	JEDEC JESD22-A105C-2004 R2011	Pre-conditioning,-40℃~100℃,Transfer time 20min,Dwell time 10min,5min ON/OFF,1000cycles,IF=80mA	26pcs *3	Pass
A4	Temperature Cycling (TC)	JEDEC JESD22-A104F-2020	Pre-conditioning,-40℃~100℃,transfer time <10Sec,dwell time 15min,1000cycles	26pcs *3	Pass

TEST GROUP B – ACCELERATED LIFETIME STRESS TESTS

Item No.	Test Item	Standard	Test Condition	Qty	Conclusion
B1a	High Temperature Operating Life1 (HTOL1)	JEDEC JESD22-A108F-2017	Tsolder=101℃,Ta=100℃,1000hrs,IF=80mA	26pcs *3	Pass
B1b	High Temperature Operating Life2 (HTOL2)	JEDEC JESD22-A108F-2017	Tsolder=102℃,Ta=100℃,1000hrs,IF=100mA	26pcs *3	Pass
B3	Pulsed Life (PLT)	JEDEC JESD22-A108F-2017	Tsolder=55℃,Ta=53℃,IF=150mA,tp=100μs, D=3%,1000hrs	26pcs *3	Pass

TEST GROUP C – PACKAGE ASSEMBLY INTEGRITY TESTS

Item No.	Test Item	Standard	Test Condition	Qty	Conclusion
C1	Destructive Physical Analysis (DPA)	AEC-Q102 : 2020 Appendix 6	Check the internal state of LED with microscope after De-Cap.	16pcs	Pass
C2	Physical Dimension (PD)	JESD22-B100B-2003 (R2016)	Measure the external physical dimensions of the LED by Microscope.	10pcs *3	Pass
C3	Wire Bond Pull (WBP)	MIL-STD-750-2A w/CHANGE 4 : 2020,Method 2037.1 Condition C	Test Speed : 300 μm/s	10pcs *3	Pass
C4	Wire Bond Shear (WBS)	JEDEC JESD22-B116B-2017	Shear Speed : 300 μm/s Shear Height: 2 μm Ball bond areas : 7.78mil^2	10pcs *3	Pass
C5	Die Shear (DS)	MIL-STD-750-2A w/CHANGE 4 : 2020,Method 2017.3 Condition A	Shear Speed : 300 μm/s Shear Height : 50 μm Die areas : 0.35 mm^2	5pcs *3	Pass
C7	Dew (DEW)	AEC-Q102-001 : 2020	IF=80mA,65hrs	26pcs *3	Pass

Test Items and Results of Reliability (2)

TEST GROUP C – PACKAGE ASSEMBLY INTEGRITY TESTS

No.	Test Item	Standard	Test Condition	Qty	Conclusion
C9	Thermal resistance (TR) *	JESD51-50-2012	Implementation of the Electrical Test Method for the Measurement of Real Thermal Resistance and Impedance of Light-Emitting Diodes with Exposed Cooling.	10pcs *3	Pass
C10	Solderability (SD)	Solderability (SD) 2017 Test S1	Test type : Pb-free solderability, Pretreatment Conditions : 155℃,4 hours, Oven : 250℃,3min	10 pcs*3	Pass
C12	Hydrogen Sulphide (H2S) *	IEC60068-2-43 : 2003	Ta=40℃,RH=90%,336 hrs H_2S concentration : 15x 10^{-6}	26pcs*3	Pass
C13	Flowing Mixed Gas (FMG)*	IEC 60068-2-60 : 2015	500hrs at 25℃/75%RH H_2S concentration : 10 x 10^{-9} SO_2 concentration : 200 x 10^{-9} NO_2 concentration : 200 x 10^{-9} Cl_2 concentration : 10 x 10^{-9}	26pcs*3	Pass
C14	Board Flex (BF)	AEC-Q102-002-Rev-2020	Testing speed : 50mm/min Span : 90mm Radius of loading and supports edge : 10mm Compress 2mm and keep 5s Status : Powered on	10pcs*3	Pass

TEST GROUP E – ELECTRO-OPTICAL VERIFICATION TESTS

No.	Test Item	Standard	Test Condition	Qty	Conclusion
E0	External Visual (EV)	JEDEC JESD22-B101C-2015	Visual inspection	1093pcs	Pass
E1	Pre- and Post- Stress Electrical and Photometric Test (TEST)	AEC-Q102-Rev_A-2020 appendix 5	Measure Vf,Φv,Cx,Cy at IF=80mA	870pcs	Pass
E2	Parametric Verification (PV)	Client's specification	Test Temp. : -40℃,100℃ Test Current : IF=80mA	26pcs*3	Pass
E3	Electrostatic Discharge Human Body Model (HBM)	ANSI/ESDA/JEDEC JS-001-2017	Test voltage : ±8000V Number of Pulses : 1 Times Interval time : 0.3 sec	10pcs*3	Pass
E4	Electrostatic Discharge Charged Device Model (CDM)	AEC-Q101-005-REV-A-2019 option 3	±500V,±750V,±1000V Zap 3 times	10pcs*3	Pass

TEST GROUP G – CAVITY PACKAGE INTEGRITY TESTS

No.	Test Item	Standard	Test Condition	Qty	Conclusion
G2	Vibration Variable Frequency (VVF)	JEDEC JESD22-B103B.01 : 2016 condition 1	Frequency Range : (20Hz~2000Hz) Amplitude(p-p) : 1.5 mm (20Hz~81.3Hz) Acceleration : 20g (81.3Hz~2000Hz) Sweep Rate : 4 min/cycle Orientation : X axis,Y axis,Z axis 4 cycles.	10pcs*3	Pass
G3	Mechanical Shock (MS)	JEDEC JESD22-B110B01 : 2019	Pulse Shape : Half-sine Acceleration : 1500g Pulse Width : 0.5ms Orientation : ±X axis,±Y axis,±Z axis Shock Times : 5 times/direction,total 30 times	10pcs*3	Pass

Forward Voltage Rank Combination (IF=80mA)

Rank	Min.	Max.	Unit
H	2.8	2.9	V
I	2.9	3.0	
J	3.0	3.1	
K	3.1	3.2	
L	3.2	3.3	
M	3.3	3.4	

Luminous Flux Rank Combination (IF=80mA)

Rank	Min.	Max.	Unit
L26	26	28	lm
L28	28	30	
L30	30	32	
L32	32	34	

Chromaticity Coordinates Ranks Combination (IF=80mA)

Rank	Chromaticity coordinates				
ENB	X	0.2493	0.2547	0.2503	0.2449
	Y	0.2000	0.2000	0.1900	0.1900
ENA	X	0.2537	0.2592	0.2547	0.2493
	Y	0.2100	0.2100	0.2200	0.2200
EN0	X	0.2581	0.2636	0.2592	0.2537
	Y	0.2200	0.2200	0.2100	0.2200
EN1	X	0.2625	0.2680	0.2636	0.2581
	Y	0.2300	0.2300	0.2200	0.2200
EN2	X	0.2669	0.2724	0.2680	0.2625
	Y	0.2400	0.2400	0.2300	0.2300
EN3	X	0.2713	0.2768	0.2724	0.2669
	Y	0.2500	0.2500	0.2400	0.2400
EN4	X	0.2757	0.2812	0.2768	0.2713
	Y	0.2600	0.2600	0.2500	0.2500
EN5	X	0.2801	0.2856	0.2812	0.2757
	Y	0.2700	0.2700	0.2600	0.2600
EN6	X	0.2845	0.2900	0.2856	0.2801
	Y	0.2800	0.2800	0.2700	0.2700
EN7	X	0.2889	0.2944	0.2900	0.2845
	Y	0.2900	0.2900	0.2800	0.2800
FNB	X	0.2438	0.2493	0.2449	0.2394
	Y	0.2000	0.2000	0.1900	0.1900
FNA	X	0.2482	0.2537	0.2493	0.2438
	Y	0.2100	0.2100	0.2000	0.2000
FN0	X	0.2526	0.2581	0.2537	0.2482
	Y	0.2200	0.2200	0.2100	0.2100
FN1	X	0.2570	0.2625	0.2581	0.2526
	Y	0.2300	0.2300	0.2200	0.2200
FN2	X	0.2614	0.2669	0.2625	0.2570
	Y	0.2400	0.2400	0.2300	0.2300
FN3	X	0.2658	0.2713	0.2669	0.2614
	Y	0.2500	0.2500	0.2400	0.2400
FN4	X	0.2702	0.2757	0.2713	0.2658
	Y	0.2600	0.2600	0.2500	0.2500
FN5	X	0.2746	0.2801	0.2757	0.2702
	Y	0.2700	0.2700	0.2600	0.2600
FN6	X	0.2790	0.2845	0.2801	0.2746
	Y	0.2800	0.2800	0.2700	0.2700
FN7	X	0.2834	0.2889	0.2845	0.2790
	Y	0.2900	0.2900	0.2800	0.2800

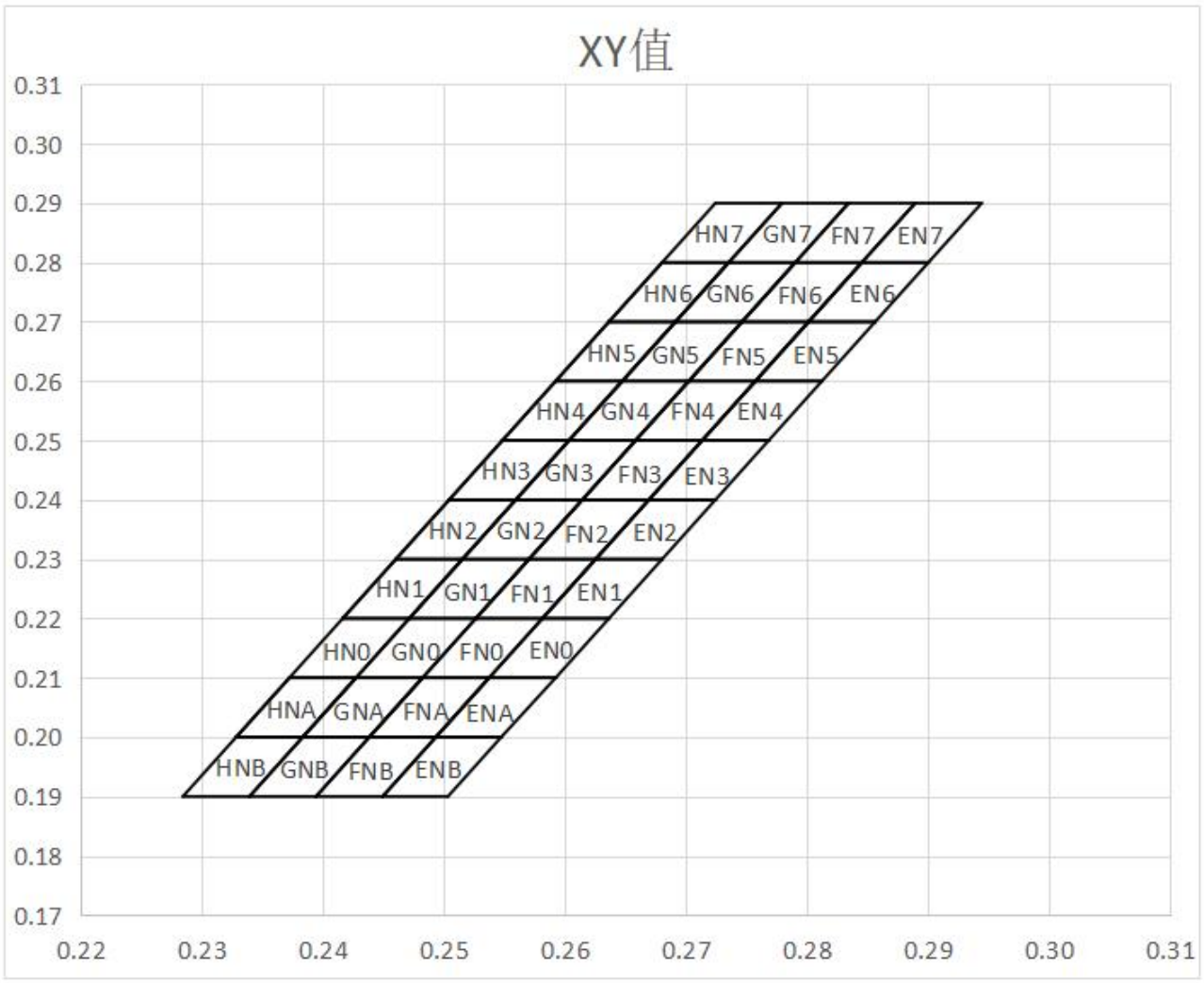
Chromaticity Coordinates Ranks Combination (IF=80mA)

Rank	Chromaticity coordinates				
GNB	X	0.2383	0.2438	0.2394	0.2339
	Y	0.2000	0.2000	0.1900	0.1900
GNA	X	0.2427	0.2482	0.2438	0.2383
	Y	0.2100	0.2100	0.2000	0.2000
GN0	X	0.2471	0.2526	0.2482	0.2427
	Y	0.2200	0.2200	0.2100	0.2100
GN1	X	0.2515	0.2570	0.2526	0.2471
	Y	0.2300	0.2300	0.2200	0.2200
GN2	X	0.2559	0.2614	0.2570	0.2515
	Y	0.2500	0.2500	0.2400	0.2400
GN3	X	0.2603	0.2658	0.2614	0.2559
	Y	0.2500	0.2500	0.2400	0.2400
GN4	X	0.2647	0.2702	0.2658	0.2603
	Y	0.2600	0.2600	0.2500	0.2500
GN5	X	0.2691	0.2746	0.2702	0.2647
	Y	0.2700	0.2700	0.2600	0.2600
GN6	X	0.2735	0.2790	0.2746	0.2691
	Y	0.2800	0.2800	0.2700	0.2700
GN7	X	0.2779	0.2834	0.2790	0.2735
	Y	0.2900	0.2900	0.2800	0.2800
HNB	X	0.2328	0.2383	0.2339	0.2284
	Y	0.2000	0.2000	0.1900	0.1900
HNA	X	0.2372	0.2427	0.2383	0.2328
	Y	0.2100	0.2100	0.2000	0.2000
HN0	X	0.2416	0.2471	0.2427	0.2372
	Y	0.2200	0.2200	0.2100	0.2100
HN1	X	0.2460	0.2515	0.2471	0.2416
	Y	0.2300	0.2300	0.2200	0.2200
HN2	X	0.2504	0.2559	0.2515	0.2460
	Y	0.2400	0.2400	0.2300	0.2300
HN3	X	0.2548	0.2603	0.2559	0.2504
	Y	0.2500	0.2500	0.2400	0.2400
HN4	X	0.2592	0.2647	0.2603	0.2548
	Y	0.2600	0.2600	0.2500	0.2500
HN5	X	0.2636	0.2691	0.2647	0.2592
	Y	0.2700	0.2700	0.2600	0.2600
HN6	X	0.2680	0.2735	0.2691	0.2636
	Y	0.2800	0.2800	0.2700	0.2700
HN7	X	0.2724	0.2779	0.2735	0.2680
	Y	0.2900	0.2900	0.2800	0.2800

Notes:

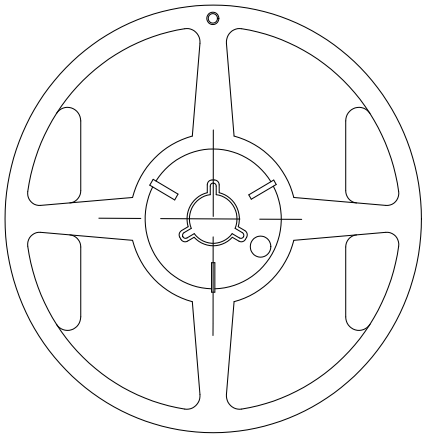
1. The tolerance of forward voltage is ± 0.06.
2. The tolerance of luminous flux (ϕ) is ± 3%.
3. The tolerance of CIE coordinates(X,Y) is ± 0.005.
4. This specification is preliminary.
5. This specification is a standard specification of our factory, can make in accordance with customer's special requirement.

XY Chromaticity Coordinate

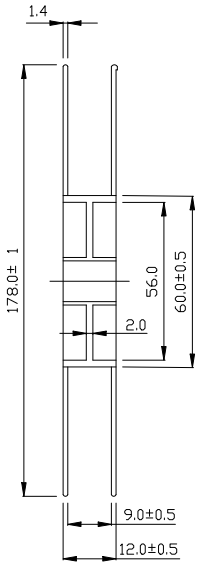


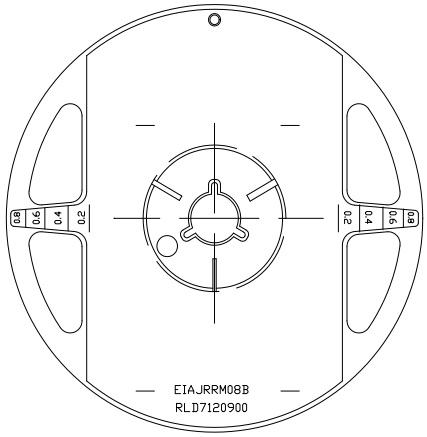
EMC 3014 Series SMD Top LED Lamps Packaging Specifications

- **Feeding Direction**

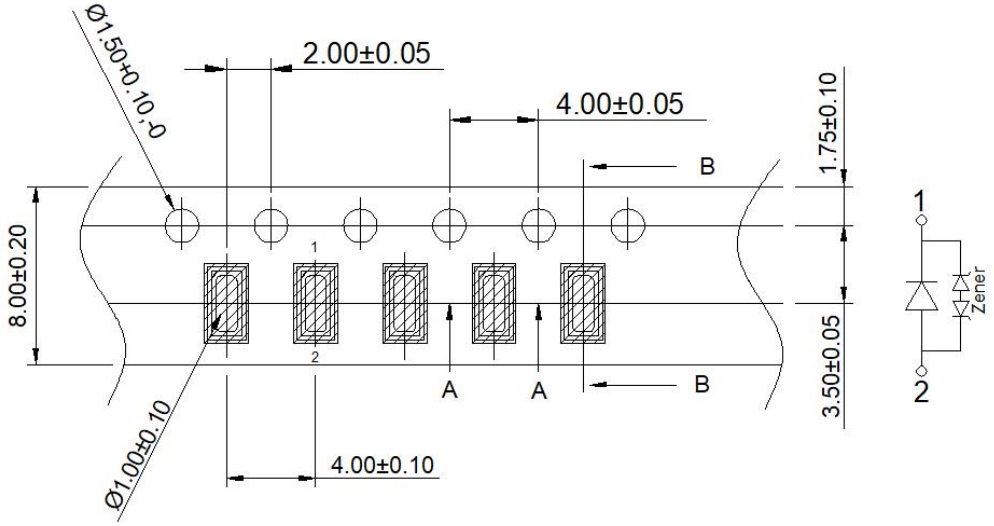


- **Dimensions of Reel (Unit: mm)**





- **Dimensions of Tape (Unit: mm)**

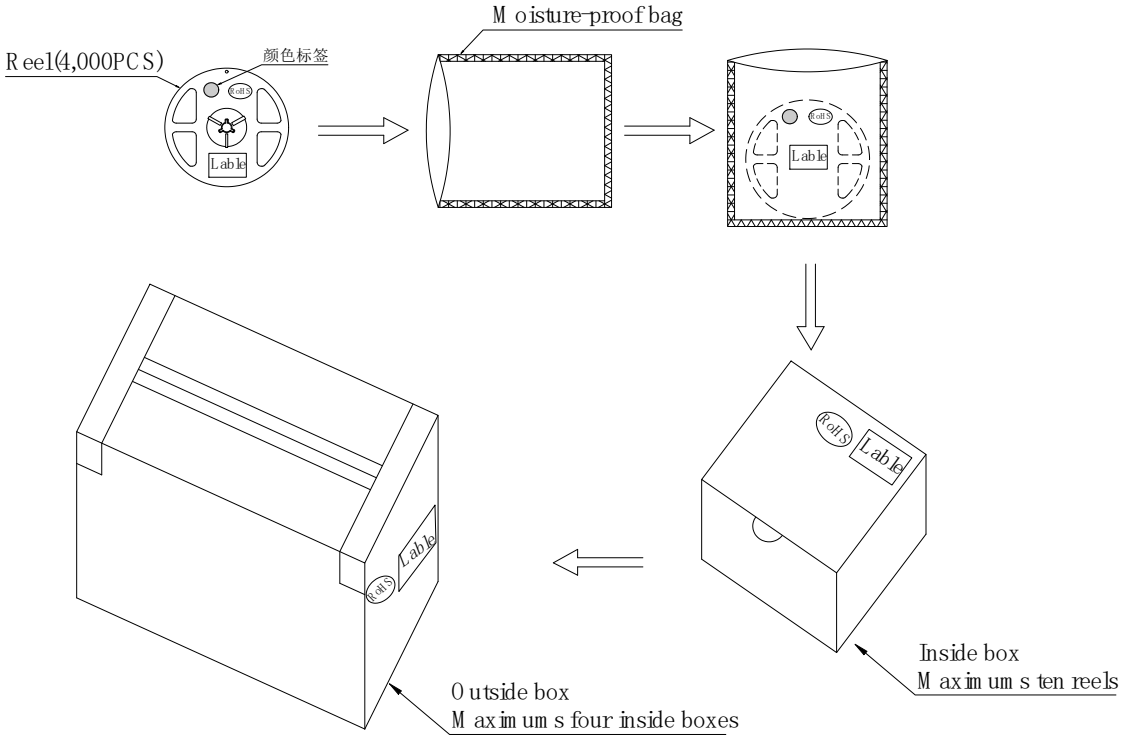


Notes:

1. Empty component pockets are sealed with top cover tape.
2. The maximum number of missing lamps is two.
3. The cathode is oriented towards the tape sprocket hole in accordance with ANSI/EIA RS-481 specifications.
4. 4000pcs/Reel.

EMC 3014 Series SMD Chip LED Lamps Packaging Specifications

- **Packaging specifications**



Notes:

Reeled products (numbers of products are 4,000pcs) packed in a seal off moisture-proof bag along with a desiccant one by one, ten moisture-proof bag of maximums (total maximum number of products are 40,000pcs) packed in an inside box (about size: 240x 230x 130mm) and four inside boxes of maximums are put in the outside box (about size : 545mm x 260mm x 250mm) Together with buffer material, and it is packed. (Part No., Lot No., quantity should appear on the label on the moisture-proof bag, part No. And quantity should appear on the label on the cardboard box.) The number of the loading steps of outside box (cardboard box) has it to three steps.