EVERLIGHT AMERICAS

DATASHEET

Top View LED
EAPL3014WA0



Features

- Top view white LED
- White SMT package
- Lead frame package with individual 2 pins
- Wide viewing angle
- Soldering methods: IR reflow soldering
- Pb-free
- The product itself will remain within RoHS compliant version.

Descriptions

Due to the package design, this part has wide viewing angle and low power consumption. White LEDs are devices that are materialized by combing blue chips and special phosphor. This feature makes the LED ideal for light guide application.

Applications

- LCD Back Light
- Mobile Phones
- Indicators
- Illuminations
- Switch Lights

Device Selection Guide

Chip Material	Emitted Color	Resin Color
InGaN	Pure White	Water Clear

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
DC Forward Current	I_F	30	mA
Pulse Forward Current (Duty 1/10 @1KHz)	I_{FP}	100	mA
Electrostatic Discharge(HBM)*1	ESD	2000	V
LED Junction Temperature	Tj	125	℃
Operating Temperature	T_{opr}	-30 ~ +100	℃
Storage Temperature	T_{stg}	-40 ~ +100	℃
Soldering Temperature	T_{sol}	Reflow Soldering: 260℃ for 10sec. Hand Soldering: 350℃ for 3sec.	

Note*1: The products are sensitive to static electricity and must be carefully taken when handling products.

Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_V	1400	---	2200	mcd	I_F=20mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F=20mA
Forward Voltage	V_F	2.95	---	3.55	V	I_F=20mA
Reverse Current	I_R	---	---	50	μA	V_R=5V

Notes:

1. Tolerance of Luminous Intensity: ± 11%
2. Tolerance of Forward Voltage: ± 0.05V

Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
26	1400	1450	mcd	I_F=20mA
27	1450	1500		
28	1500	1550		
29	1550	1600		
30	1600	1650		
31	1650	1700		
32	1700	1750		
33	1750	1800		
34	1800	1850		
35	1850	1900		
36	1900	1950		
37	1950	2000		
38	2000	2050		
39	2050	2100		
40	2100	2150		
41	2150	2200		

Note: Tolerance of Luminous Intensity: ±11%

Bin Range of Forward Voltage

Group	Bin Code	Min.	Max.	Unit	Condition
0 1 2 3 4 5 6 7 8	6-1	2.95	3.05	V	I_F=20mA
	6-2	3.05	3.15		
	7-1	3.15	3.25		
	7-2	3.25	3.35		
	8-1	3.35	3.45		
	8-2	3.45	3.55		

Group	Bin Code	Min.	Max.	Unit	Condition
9	6-11	3.00	3.05	V	I_F=20mA
	6-2	3.05	3.15		
	7-1	3.15	3.25		
	7-2	3.25	3.35		
	8-1	3.35	3.45		
	8-11	3.45	3.50		

Group	Bin Code	Min.	Max.	Unit	Condition
A	6-1-1	2.95	3.00	V	I_F=20mA
	6-1-2	3.00	3.05		
	6-2-1	3.05	3.10		
	6-2-2	3.10	3.15		
	7-1-1	3.15	3.20		
	7-1-2	3.20	3.25		
	7-2-1	3.25	3.30		
	7-2-2	3.30	3.35		
	8-1-1	3.35	3.40		
	8-1-2	3.40	3.45		

Note: Tolerance of Forward Voltage: ± 0.05V

Bin Range of Chromaticity Coordinates Block (I_F=20mA)

Group	Range	I_V Rank*	Group	Range	I_V Rank*
01	B5-1,B5-2,B5-3,B5-4	36	26	A0-1, A0-3, A0-4	34
02	B5-1~B5-4,A0-2,A0-4	36	27	A0-1, A0-2, A0-3	34
07	B5-1,B5-3,A0-4	35	28	A0-2, A0-3, A0-4	34
08	A0-2,A0-3,A0-4	34	29	A0-2, B5-1, B5-3	35
09	A0-1,A0-3,A0+4	33	30	A0-2, A0-4, B5-3	35
10	A0+1, A0+2, A0-1	33	31	B5-1, A0-2, A0-4	35
11	A0+2, A0-1, A0-2	34	32	B5-1, B5-3, A0-4	35
12	A0-1, A0-2, B5-1	35	33	B5-1, B5-2, B5-4	36
13	A0-2, B5-1, B5-2	36	34	B5-1, B5-3, B5-4	36
14	A0+3, A0+4, A0-3	33	35	B5-1, B5-2, B5-3	36
15	A0+4, A0-3, A0-4	34	36	B5-2, B5-3, B5-4	36
16	A0-3, A0-4, B5-3	35	37	B5-1, B5-2	36
17	A0-4, B5-3, B5-4	36	38	A0-1, A0-3	33
18	A0+1, A0+2, A0+4	32	39	A0-2, A0-4, B5-1, B5-3	35
19	A0+1, A0+3, A0+4	32	40	A0-3,A0-4	34
20	A0+1, A0+2, A0+3	32	41	A0-4, B5-1, B5-3, B5-4	36
21	A0+2, A0-1, A0-3	33	42	A0-4, B5-3	35
22	A0+2, A0+4, A0-3	33	43	B5-2,B5-4	36
23	A0-1, A0+2, A0+4	33	44	A0-1, A0-2, A-4, B5-3	35
24	A0-1, A0-3, A0+4	33	45	B5-1, B5-3	35
25	A0-1, A0-2, A0-4	34	46	A0+1, A0+2	32

Bin Range of Chromaticity Coordinates Block (I_F=20mA)

Group	Range	I_V Rank*	Group	Range	I_V Rank*
47	B6-1, B6-2, B6-3, B6-4	37	65	A0-2, A0-3, A0-4, B5-3	35
48	B6-2,B6-4	37	66	A0-3-1~A0-3-4, A0-4-1~A0-4-4	34
49	A0-2, B5-1, B5-3, B5-4	36	67	A0+2, A0-1, A0-3, A0-4	34
50	A0-1~A0-4, B5-1~B5-4	36	68	A0+4-R, A0-3, A0-4-L	34
51	A0-1, A0-3, A0-4-1,A0-4-3	31	69	B5-l, 2, 3, 4 subdivision	36
52	A0+3, A0+4	32	70	A0+4-2, A0+4-4, A0-3 subdivision, A0-4-1, A0-4-3	34
53	B6-1, B6-2, B6-3	37	71	A0-3 non-division, A0-4 subdivision	34
54	B6-1, B6-3	37	72	A0+1~+4, A0-1~-4, B5-1~-4, B6-1~-4	37
55	B5-2, B5-4, B6-1, B6-3	37	73	A0-4, B5-1, B5-3 subdivision	35
56	B5-2, B6-1	37	74	A0-4	34
57	A0-2, B5-1	35	75	B5-2	36
58	A0-1, A0-2	34	76	A0-1~A0-4; B5-1~B5-4	36
59	A0-1, A0-2, A0-3, A0-4, B5-1	35	77	B5-3, B5-4 subdivision	36
60	A0+2, A0+4, A0-1, A0-3	33	78	A0-3,A0+4	33
61	B5-2-1~B5-2-4, 6-1-1~B6-1-4	37	79	B5-l, B5-2, B5-3, B5-4, B6-3 subdivision	37
62	B5-3, B5-4	36	80	A0-3, A0-4, B5-3 subdivision	35
63	A0-1~A0-4, B5-1, B5-3	35	81	A0-3, A0-4, B5-3 divide into 8 parts (each)	35
64	A0-2, A0-4	34	82	A0-1~A0-4, A0+2, A0+4	34

Bin Range of Chromaticity Coordinates Block (I_F=20mA)

Group	Range	I_V Rank*	Group	Range	I_V Rank*
83	B5-4, B6-3	37	99	B5-2,B5-4,B6-1,B6-3(全細分四塊)	37
84	B6-1, B6-2	37	A	A0+1, A0+2, A0+3, A0+4	32
85	A0-4, B5-2, B5-3, B5-4	36	B	A0+4, A0-3, A0-4	34
86	B5 & B6 subdivision	37	C	A0-1,A0-2,A0-3,A0-4	34
87	B5-3	35	S1	NA0-3,NA0-4,NB5-3,NB5-4,NB6-3,A0-3a,A0-3b,A0-4a,A0-4b,B5-3a,B5-3b, B5-4a,B5-4b,B6-3a,B6-3b	37
88	B5-2-3/ B5-2-4/ B5-4 subdivision/ B6-1-2/ B6-1-3/ B6-1-4/ B6-3 subdivision/ B6-4-1	37	S2	A0-3a,NA0-3,A0-3b,A0-4a,NA0-4,A0-4b	34
89	A0-4, B5-3 subdivision	35	S3	B5-3a,NB5-3,B5-3b,B5-4a,NB5-4,B5-4b	36
90	A0-4-R, B5-3 subdivision	35	S4	NB5-4, B5-4b, NB6-3, B6-3b subdivision	37
91	A0-3-2, A0-3-4, A0-4 subdivision, B5-3-1,B5-3-3	35	S5	NB5-3,NB5-4	36
92	B5-2 , B6-1-1, B6-4-1, B5-3-2, B6-1-3, B6-4-3, B6-1-4, B6-4-4, B5-4, B6-3	37	S6	NA0-4,B5-3b,NB5-3	35
93	A0+4, A0-3 subdivision	33	S7	NA0-3,NA0-4 subdivision	34
94	A0-4-R, B5-3, B5-4 subdivision	36			
95	B5-4, B6-3 subdivision	37			
96	A0-4, B5-3, B5-4 subdivision	36			
97	B6-1, B6-3, B6-4	37			
98	A0+1~A0+4;A0-1~A0-4;B5-1~B5-4;B6-1~B6-4; NA0-3~NB6-3(全區)	37			

Note: The I_V rank is the highest one for relative bin range of chromaticity coordinates

Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
A0+1	0.2569	0.2528	A0+3	0.2652	0.2429
	0.2498	0.2385		0.2584	0.2283
	0.2584	0.2283		0.2666	0.2185
	0.2652	0.2429		0.2733	0.2333
A0+2	0.2640	0.2670	A0+4	0.2720	0.2575
	0.2569	0.2528		0.2652	0.2429
	0.2652	0.2429		0.2733	0.2333
	0.2720	0.2575		0.2800	0.2480
A0-1	0.2720	0.2575	A0-3	0.2800	0.2480
	0.2640	0.2670		0.2720	0.2575
	0.2755	0.2810		0.2818	0.2715
	0.2818	0.2715		0.2879	0.2619
A0-2	0.2818	0.2715	A0-4	0.2879	0.2619
	0.2755	0.2810		0.2818	0.2715
	0.2870	0.2950		0.2915	0.2855
	0.2915	0.2855		0.2960	0.2760

Note: Tolerance of Chromaticity Coordinates: ±0.01

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Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
B5-1	0.2915	0.2855	B5-3	0.2960	0.2760
	0.2870	0.2950		0.2915	0.2855
	0.2970	0.3050		0.3003	0.2950
	0.3003	0.2950		0.3035	0.2850
B5-2	0.3003	0.2950	B5-4	0.3035	0.2850
	0.2970	0.3050		0.3003	0.2950
	0.3070	0.3150		0.3090	0.3045
	0.3090	0.3045		0.3110	0.2940
B6-1	0.3090	0.3045	B6-3	0.3110	0.2940
	0.3070	0.3150		0.3090	0.3045
	0.3185	0.3270		0.3195	0.3165
	0.3195	0.3165		0.3205	0.3060
B6-2	0.3195	0.3165	B6-4	0.3205	0.3060
	0.3185	0.3270		0.3195	0.3165
	0.3300	0.3390		0.3300	0.3285
	0.3300	0.3285		0.3300	0.3180

Note: Tolerance of Chromaticity Coordinates: ±0.01

Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
NA0-3	0.2800	0.2480	NB5-3	0.2960	0.2760
	0.2720	0.2580		0.2910	0.2870
	0.2820	0.2720		0.2990	0.3010
	0.2880	0.2620		0.3040	0.2900
NA0-4	0.2880	0.2620	NB5-4	0.3040	0.2900
	0.2820	0.2720		0.2990	0.3010
	0.2910	0.2870		0.3070	0.3150
	0.2960	0.2760		0.3120	0.3040
NB6-3	0.3120	0.3040			
	0.3070	0.3150			
	0.3150	0.3290			
	0.3200	0.3180			

Note: Tolerance of Chromaticity Coordinates: ±0.01

Bin Range of Forward Voltage

Group									Bin Code	Min.	Max.	Unit	Condition
L	N								5-1-3	2.80	2.90	V	I_F=20mA
				K		E			5-2-3	2.90	3.00		
		B			H			F	6-1-3	3.00	3.10		
			C				Q		6-2-3	3.10	3.20		
									7-1-3	3.20	3.30		
									7-2-3	3.30	3.40		
									8-1-3	3.40	3.50		

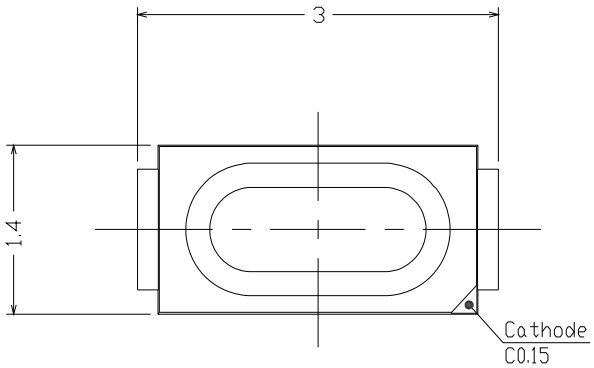
Note: Tolerance of Forward Voltage: ± 0.05V

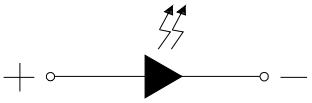
Chromaticity Coordinates of Bin Code

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
A0-3a	0.2720	0.2580	B5-3b	0.2980	0.2710
	0.2793	0.2755		0.2960	0.2760
	0.2820	0.2720		0.3040	0.2900
				0.3062	0.2853
A0-3b	0.2830	0.2440	B5-4a	0.2990	0.3010
	0.2800	0.2480		0.2968	0.3058
	0.2880	0.2620		0.3048	0.3198
	0.2910	0.2580		0.3070	0.3150
A0-4a	0.2820	0.2720	B5-4b	0.3062	0.2853
	0.2793	0.2755		0.3040	0.2900
	0.2887	0.2916		0.3120	0.3040
	0.2910	0.2870		0.3142	0.2993
A0-4b	0.2910	0.2580	B6-3a	0.3070	0.3150
	0.2880	0.2620		0.3048	0.3198
	0.2960	0.2760		0.3128	0.3338
	0.2980	0.2710		0.3150	0.3290
B5-3a	0.2910	0.2870	B6-3b	0.3142	0.2993
	0.2887	0.2916		0.3120	0.3040
	0.2968	0.3058		0.3200	0.3180
	0.2990	0.3010		0.3222	0.3133

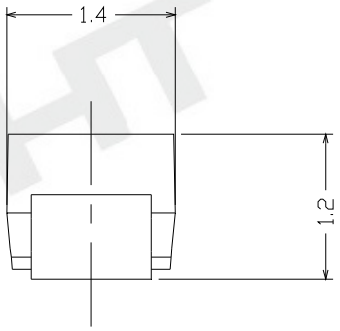
Note: Tolerance of Chromaticity Coordinates: ±0.01

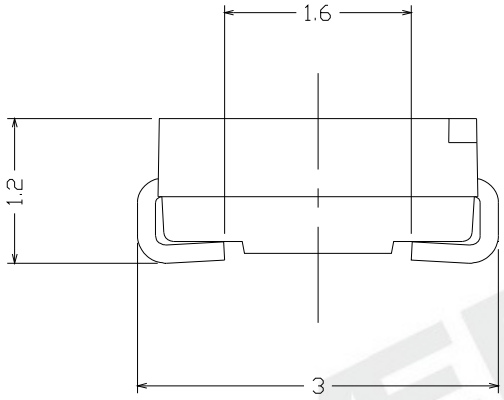
Package Outline Dimensions



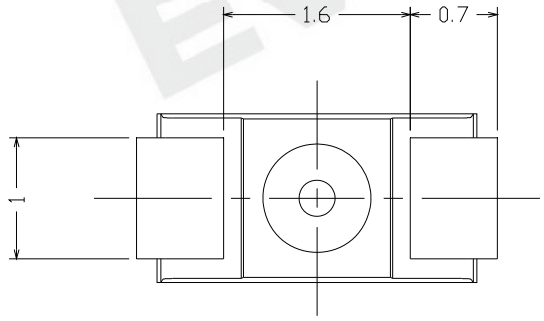


PAD output

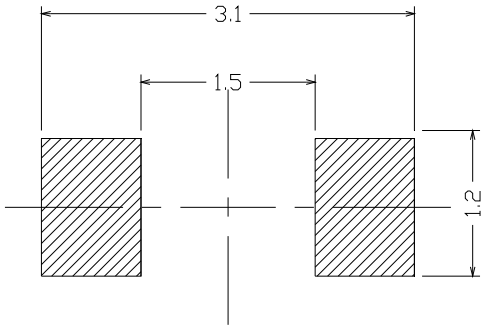




Bot. view

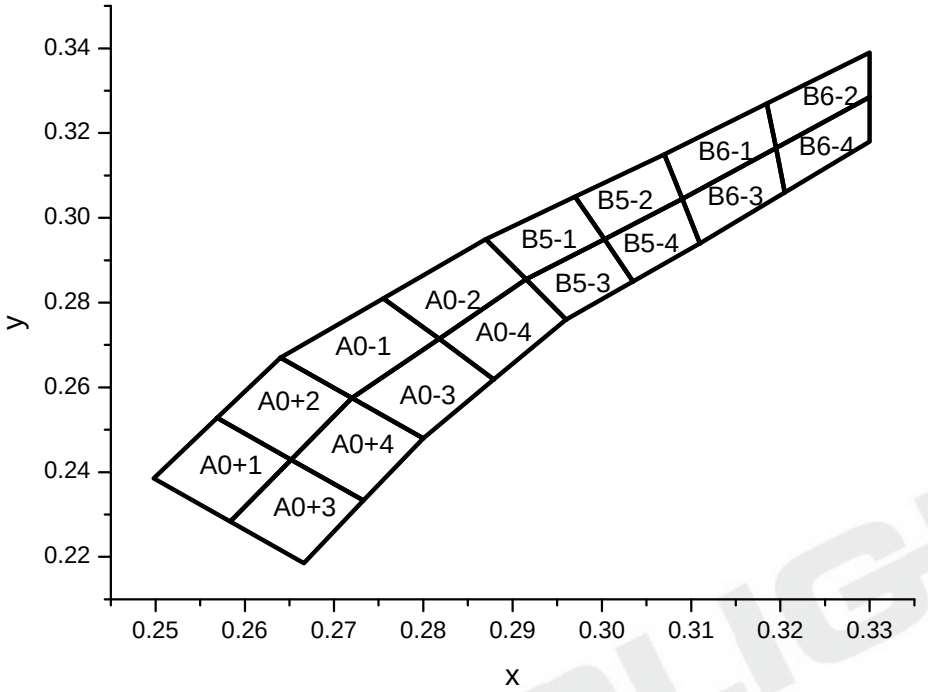


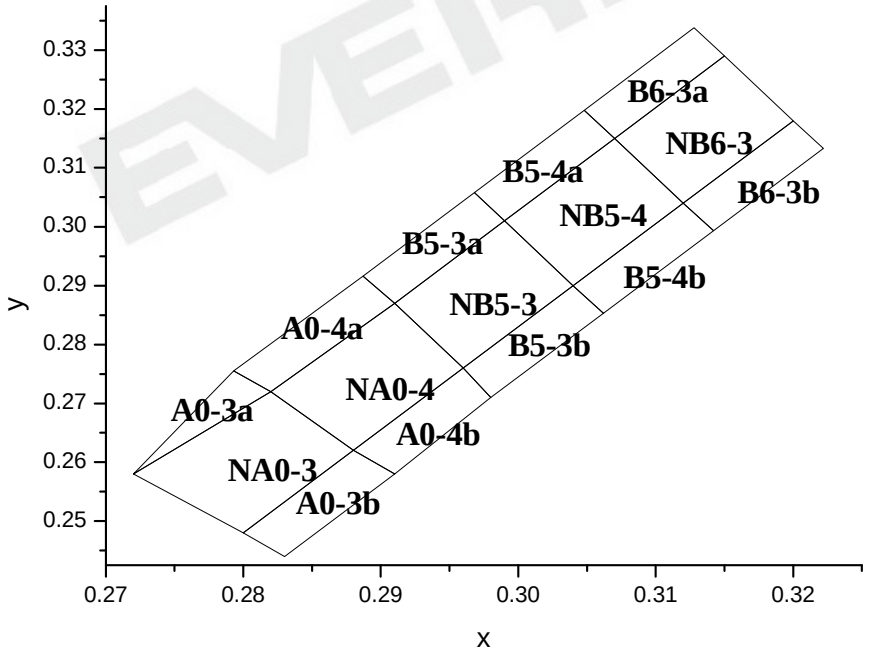
Soldering patterns



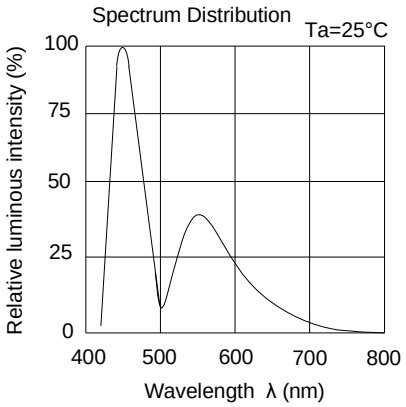
Note: The tolerances unless dimension are ± 0.1mm.

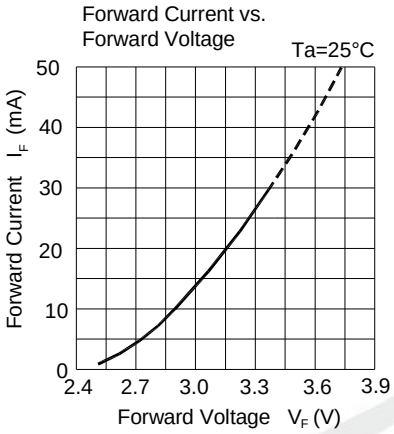
The C.I.E. 1931 Chromaticity Diagram

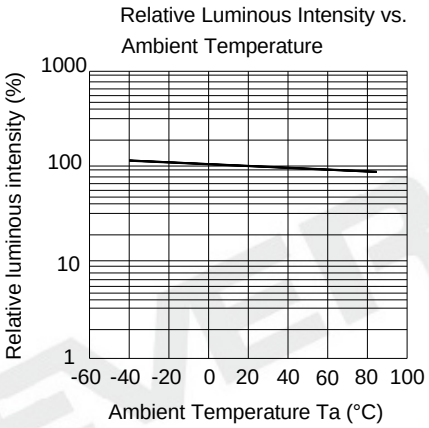


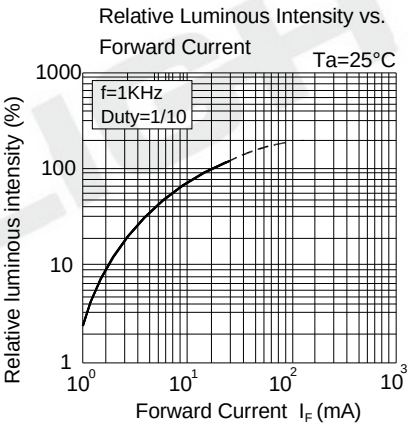


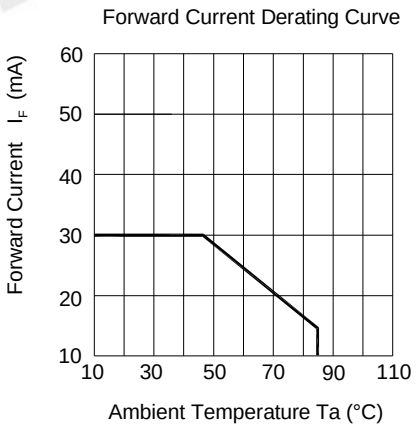
Typical Electro-Optical Characteristics

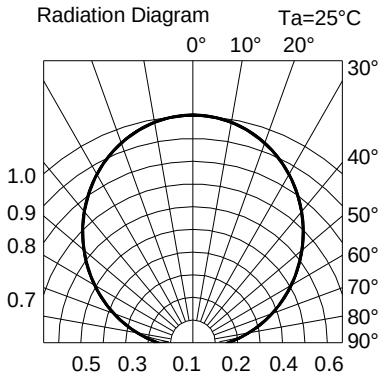












Label Explanation

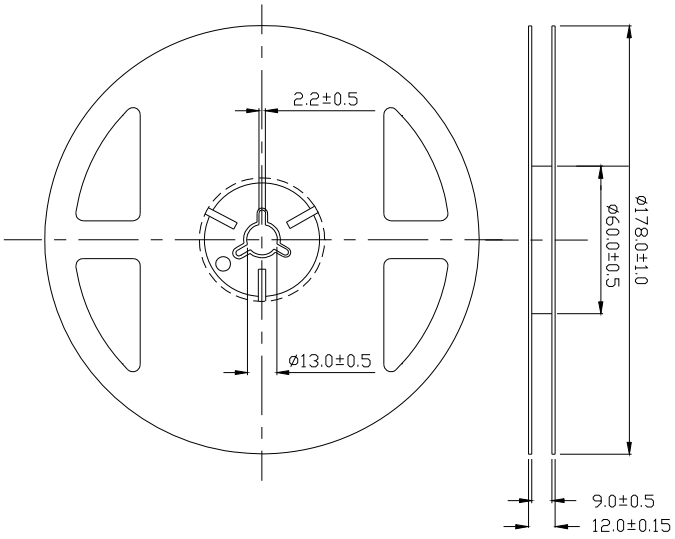
CAT: Luminous Intensity Rank

HUE: Chromaticity Coordinates

REF: Forward Voltage Rank

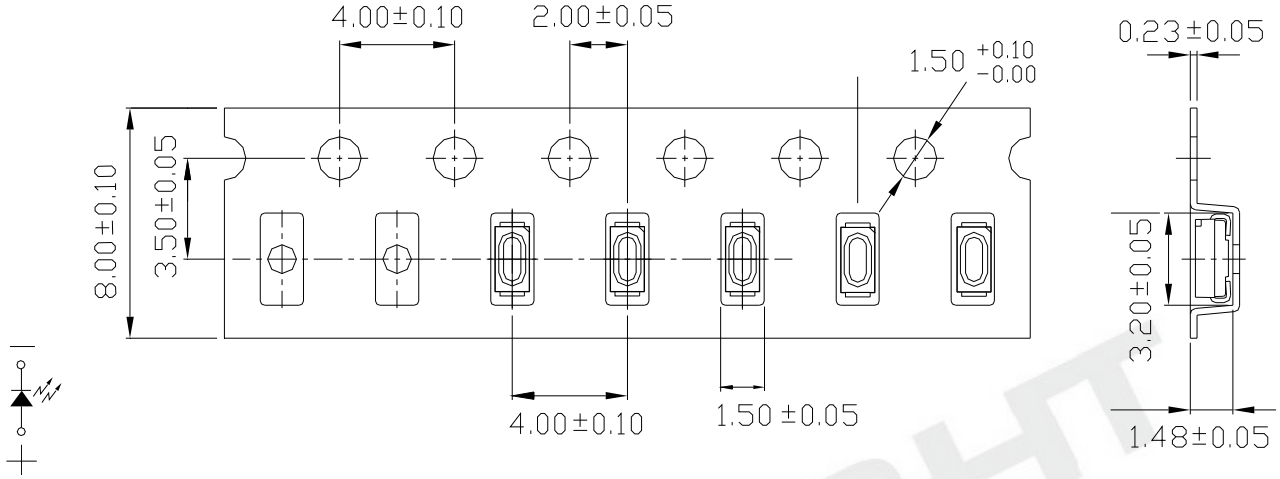


Reel Dimensions



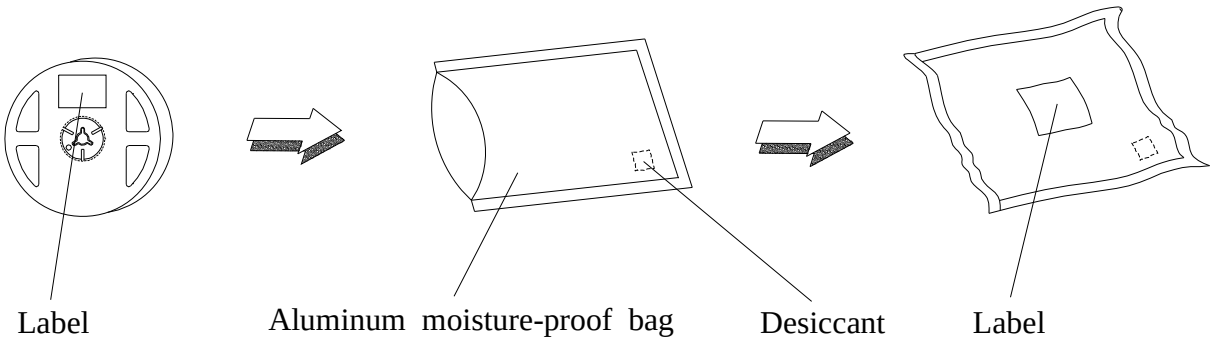
Note: The tolerances unless dimension are ± 0.1mm.

Carrier Tape Dimensions: Loaded Quantity 2000 pcs. Per Reel



Note: The tolerances unless dimension are ± 0.1mm.

Moisture Resistant Packaging



Reliability Test Items and Conditions

The reliability of products shall be satisfied with items listed below.

Confidence level: 90%

LTPD: 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Qty'	Ac/Re
1	Reflow Soldering	Temp.: 260℃±5℃ Max. 10 sec.	6 Min.	22 pcs.	0/1
2	Temperature Cycle	H: +100℃ 15min. ∫ 5 min. L: -40℃ 15min.	300 cycles	22 pcs.	0/1
3	Thermal Shock	H: +100℃ 5min. ∫ 10 sec. L: -10℃ 5min.	300 cycles	22 pcs.	0/1
4	High Temperature Storage	Temp.: 100℃±5℃	1000 hrs.	22 pcs.	0/1
5	Low Temperature Storage	Temp.: -40℃±5℃	1000 hrs.	22 pcs.	0/1
6	DC Operating Life	I_F = 20 mA / 25℃	1000 hrs.	22 pcs.	0/1
7	High Temperature / High Humidity	85℃±5℃ / 85%RH	1000 hrs.	22 pcs.	0/1

Precautions for Use

1. Over-current-proof

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

2. Storage

   2.1 Don’t open moisture proof bag before the products are ready to use.

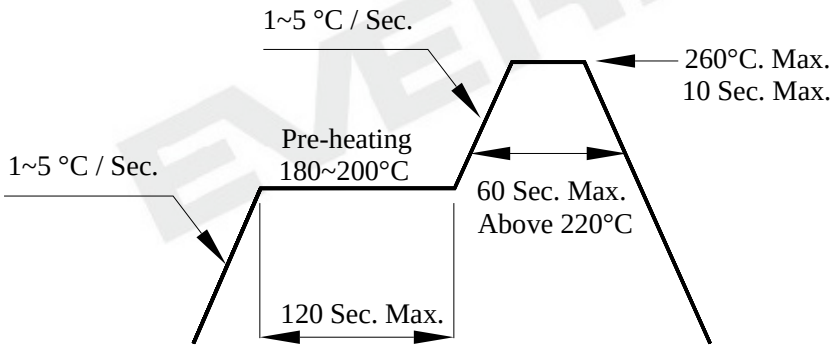
   2.2 Before opening the package: The LEDs should be kept at 30℃ or less and 90%RH or less.

   2.3 After opening the package: The LED's floor life are 72 hours under 30℃ or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

   2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.
   baking treatment: 60±5℃ for 24 hours

3. Soldering Condition

   3.1 Pb-free solder temperature profile:



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

   3.3 When soldering, do not put stress on the LEDs during heating.

   3.4 After soldering, do not warp the circuit board.

4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350℃ for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

5. Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.

