DATASHEET

SMD ▪ Side View LEDs

99-213UMC/S1099-4/TR8

Features

.Side 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.
.Compliance with EU REACH.
.Compliance Halogen Free .(Br <900 ppm ,Cl <900 ppm , Br+Cl < 1500 ppm).

Description

Due to the package design, 99-213 has wide viewing angle, low power consumption and white LEDs are devices which 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 Materials	Emitted Color	Resin Color
InGaN	Pure White	Water Clear

Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	30	mA
Peak Forward Current (Duty 1/10 @10ms)	I_{FP}	60	mA
Power Dissipation	P_d	110	mW
Operating Temperature	T_{opr}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-40 ~ +90	℃
Soldering Temperature	T_{sol}	Reflow Soldering : 260 ℃ for 10 sec. Hand Soldering : 350 ℃ for 3 sec.	

Notes: *1The 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	Φ	1800	-----	2000	lm	I_F=20mA
Forward Voltage	V_F	2.95	-----	3.45	volt	I_F=20mA
Forward Voltage	V_F	2.50	-----	3.20	volt	I_F=2mA
Viewing Angle	$2\theta_{1/2}$	-----	110	-----	deg	I_F=20mA
Reverse Current	I_R	-----	-----	50	μA	V_R=5V

Notes:

1. Tolerance of Luminous Intensity: ±7%.
2. Tolerance of Forward Voltage: ±0.05V.

Bin Range of Luminous Intensity

Bin Code	Condition	lm(Min.)	lm(Max.)	Unit
36	I_F=20mA	5.32	5.46	lm
37		5.46	5.60	
38		5.60	5.74	
39		5.74	5.88	
40		5.88	6.02	

Notes: Tolerance of Luminous Intensity、Luminous Flux: ±7%.

The spec. for intensity is quantified in lm, mcd is for reference only.

Bin Range of Forward Voltage (I_F=20mA)

Group	Bin Code	Min.	Max.	Unit	Condition
6	6-1	2.95	3.05	volt	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		

Note: Tolerance of Forward Voltage: ±0.05V

Bin Range of Forward Voltage (I_F=2mA)

Bin Code	Min.	Max.	Unit	Condition
0C	2.50	2.55	V	IF=2mA
0B	2.55	2.60		
0A	2.60	2.65		
00	2.65	2.70		
01	2.70	2.75		
02	2.75	2.80		
03	2.80	2.85		
04	2.85	2.90		
05	2.90	2.95		
06	2.95	3.00		
07	3.00	3.05		
08	3.05	3.10		
09	3.10	3.15		
10	3.15	3.20		

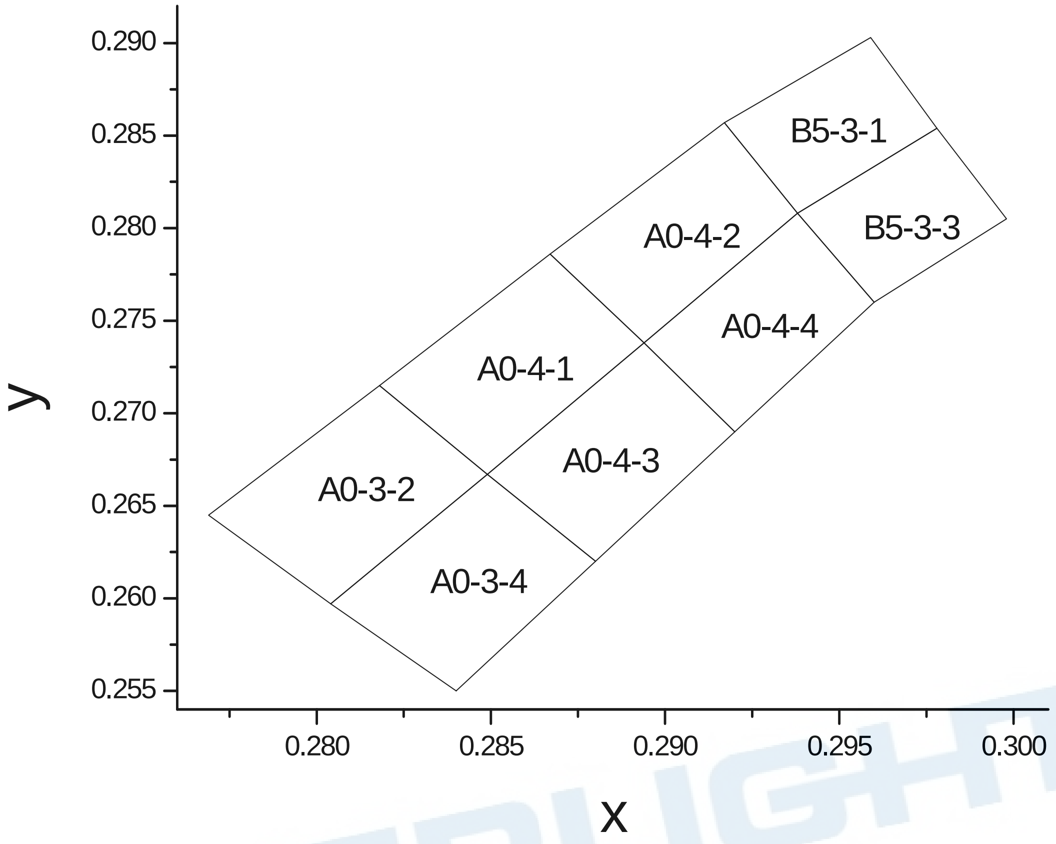
Note: Tolerance of Forward Voltage: ±0.05V

Bin Range of Chromaticity Coordinate

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y
A0-3-2	0.2804	0.2597	A0-3-4	0.2840	0.2550
	0.2769	0.2645		0.2804	0.2597
	0.2818	0.2715		0.2849	0.2667
	0.2849	0.2667		0.2880	0.2620
A0-4-1	0.2849	0.2667	A0-4-2	0.2894	0.2738
	0.2818	0.2715		0.2867	0.2786
	0.2867	0.2786		0.2917	0.2857
	0.2894	0.2738		0.2938	0.2808
A0-4-3	0.2880	0.2620	A0-4-4	0.2920	0.2690
	0.2849	0.2667		0.2894	0.2738
	0.2894	0.2738		0.2938	0.2808
	0.2920	0.2690		0.2960	0.2760
B5-3-1	0.2938	0.2808	B5-3-3	0.2960	0.2760
	0.2917	0.2857		0.2938	0.2808
	0.2959	0.2903		0.2978	0.2854
	0.2978	0.2854		0.2998	0.2805

Notes: Tolerance of Chromaticity Coordinates : ±0.01.

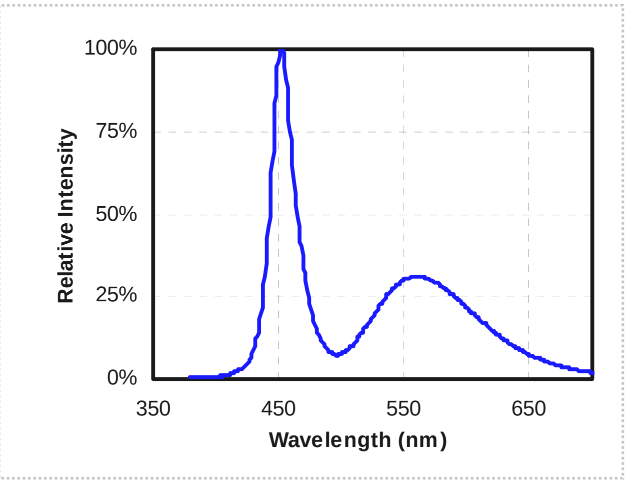
The C.I.E. 1931 Chromaticity Diagram



Typical Electro-Optical Characteristics Curves

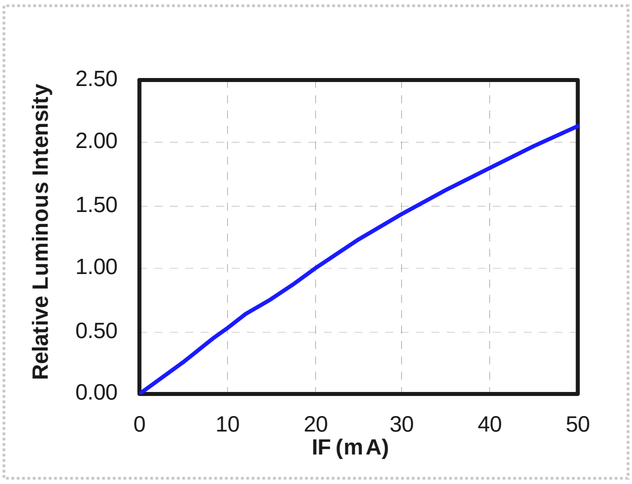
1. Spectrum Distribution

(T_A=25℃, I_F=20mA)



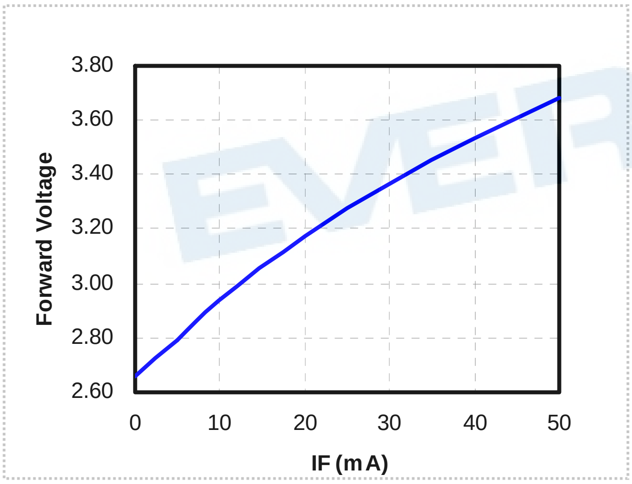
2. Relative Luminous Intensity vs. Forward Current

(T_A=25℃)



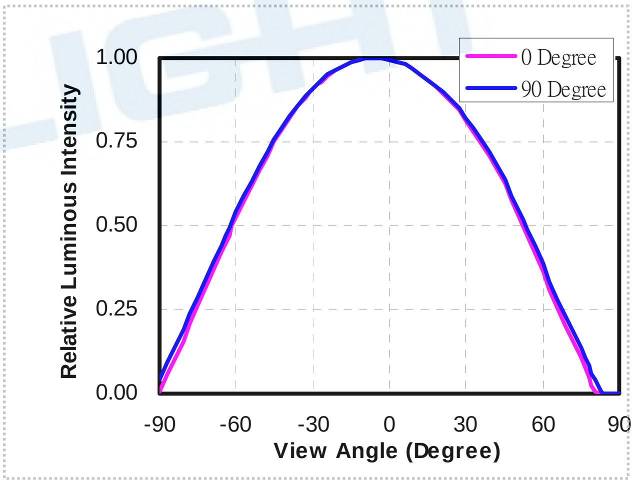
3. Relative Forward Voltage vs. Forward Current

(T_A=25℃)



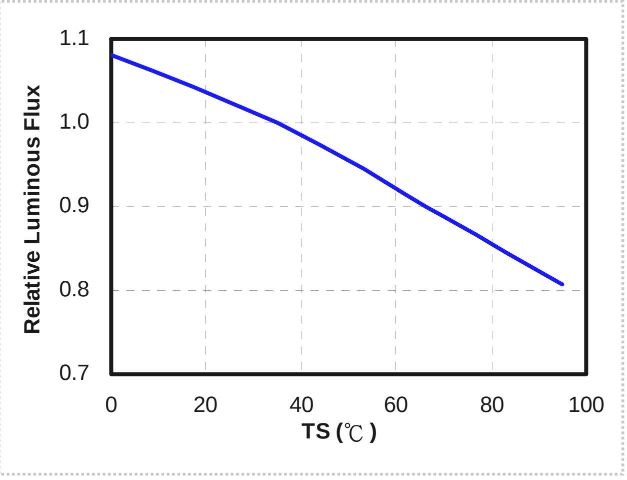
4. Radiation Diagram

(T_A=25℃, I_F=20mA)

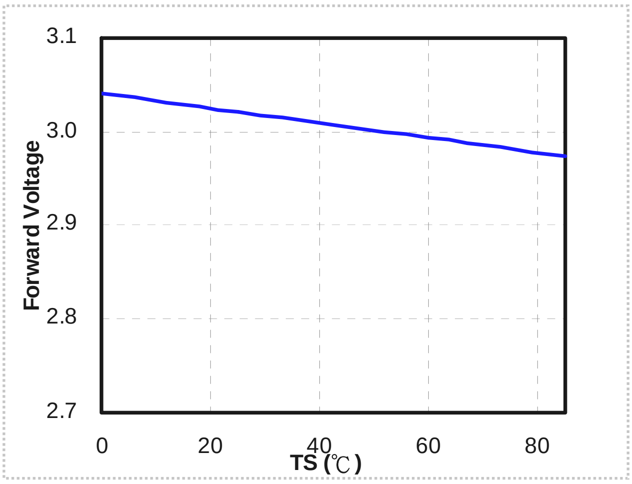


Typical Electro-Optical-Thermal Characteristics Curves

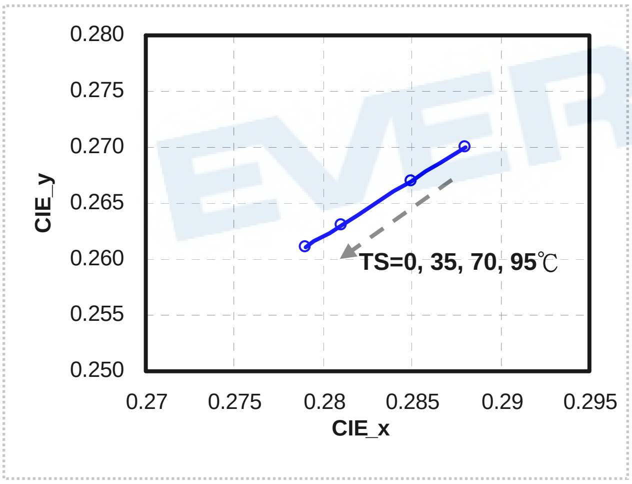
5. Relative Luminous Flux vs. Ambient Temperature (I$_F$=20mA)



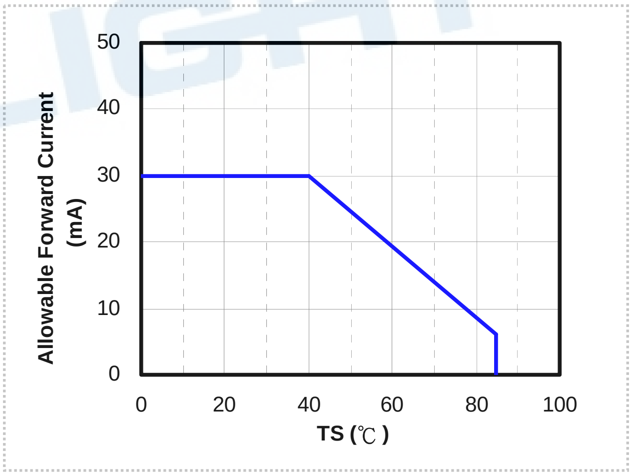
6. Forward Voltage vs. Ambient Temperature (I$_F$=20mA)



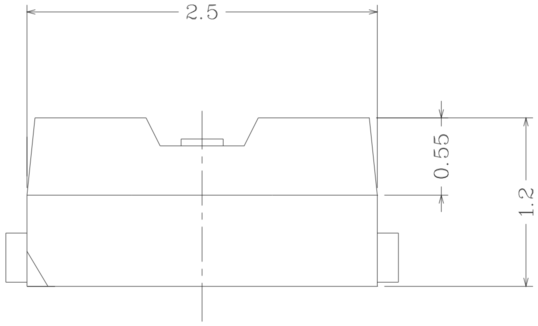
7. Chromaticity Coordinates vs. Ambient Temperature (I$_F$=20mA)

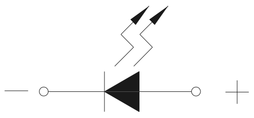


8. Forward Current De-rating Curve

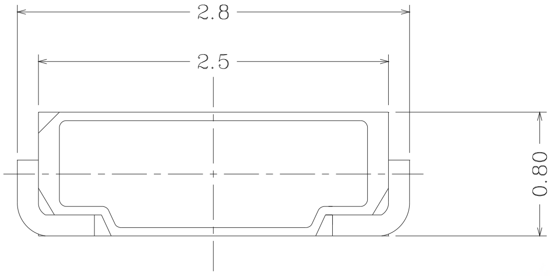


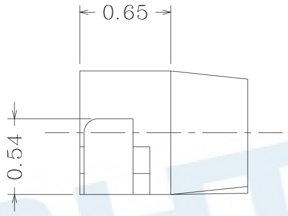
Package Dimension

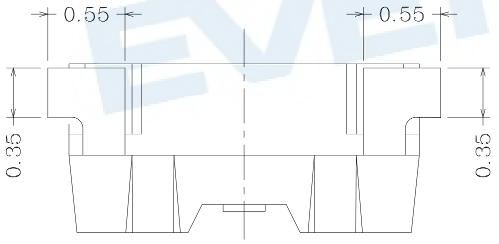




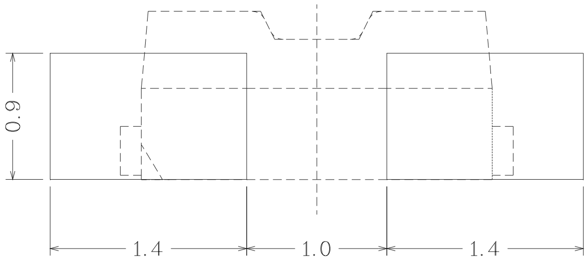
Polarity







Recommended soldering pad design



Note: Tolerances unless dimension are ±0.1mm, unit = mm.

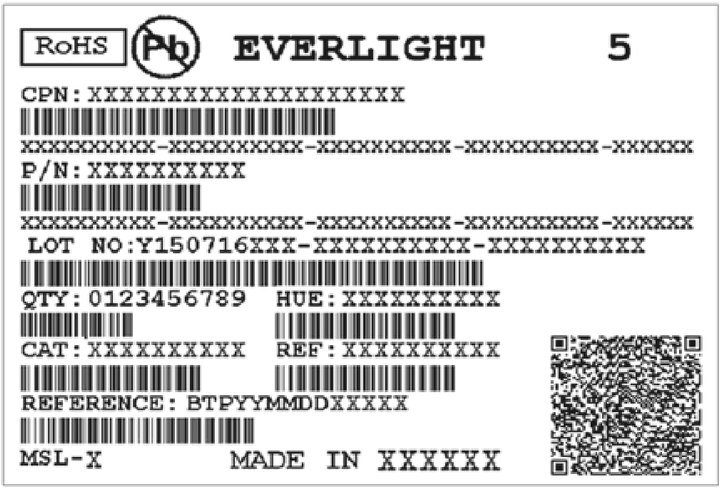
Moisture Resistant Packing Materials

Label Explanation

CAT: Luminous Intensity Rank

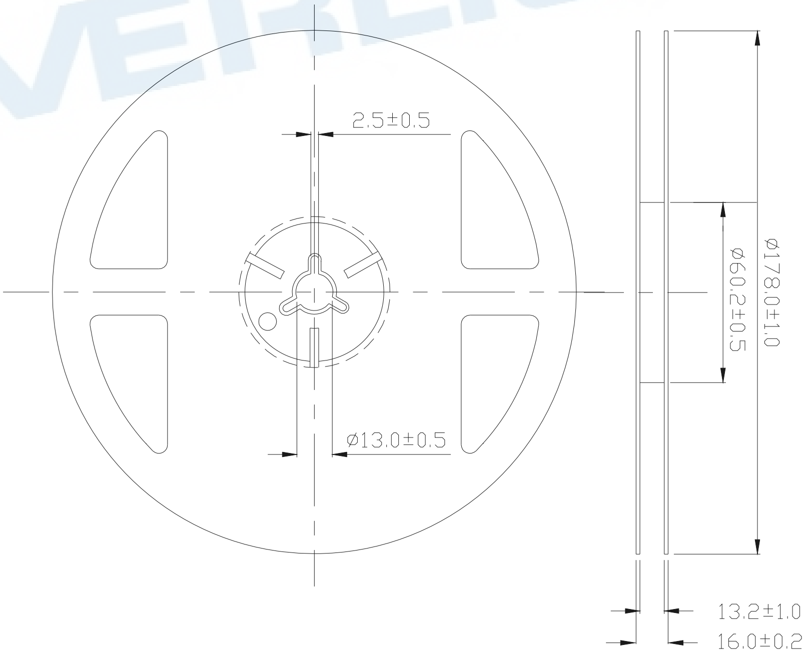
HUE: Chromaticity Coordinates

REF: Forward Voltage Rank



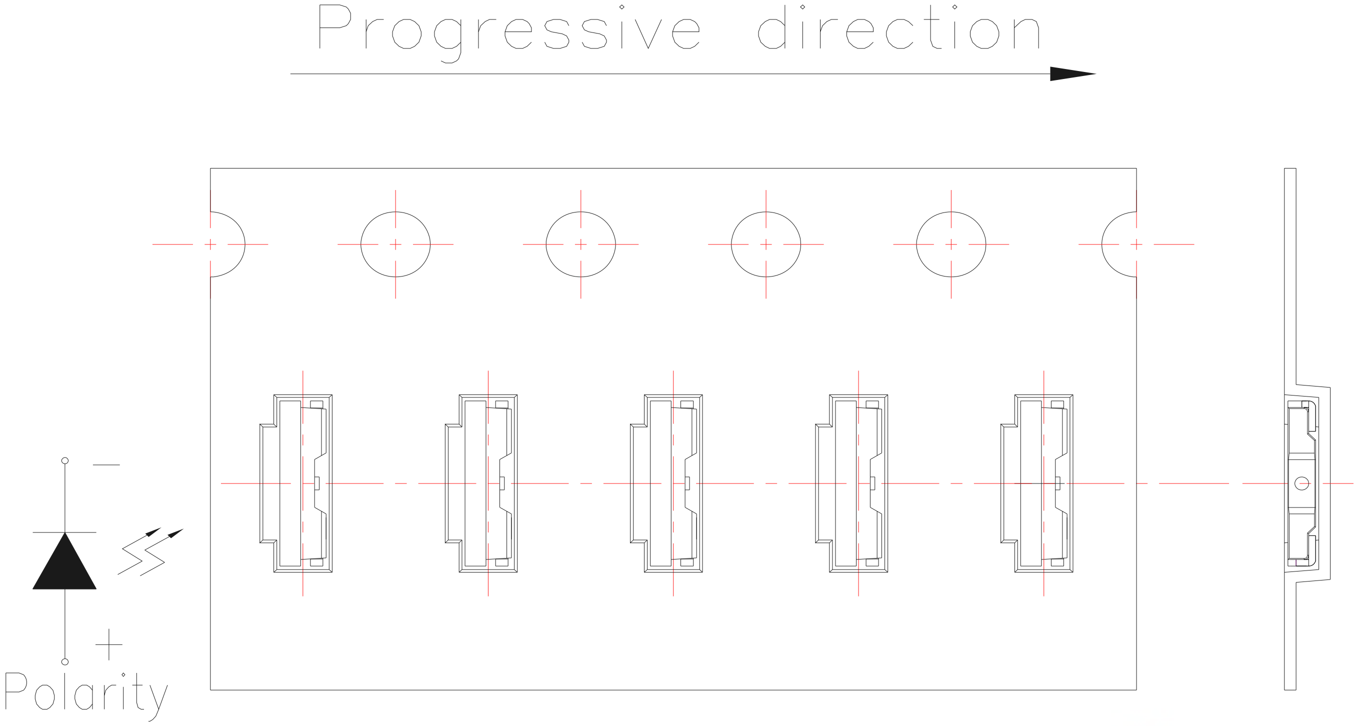
RoHS Pb EVERLIGHT 5
CPN: XXXXXXXXXXXXXXXXXXXX
XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX
P/N: XXXXXXXXXX
XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXXXXXX-XXXXXX
LOT NO:Y150716XXX-XXXXXXXXXX-XXXXXXXXXX
QTY: 0123456789 HUE: XXXXXXXXXX
CAT: XXXXXXXXXX REF: XXXXXXXXXX
REFERENCE: BTPYYMMDDXXXXX
MSL-X MADE IN XXXXXX

Reel Dimensions



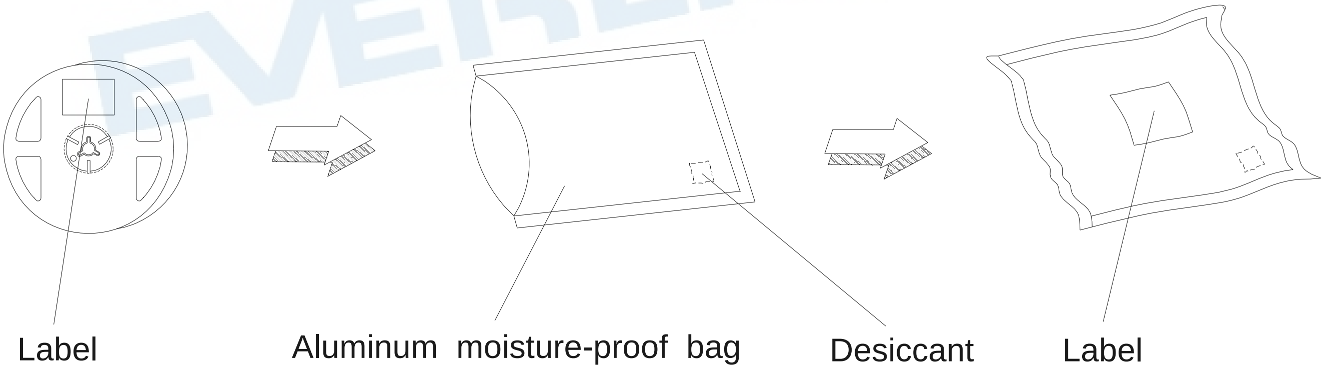
Note: The tolerances unless mentioned is ±0.1mm, Unit = mm

Carrier Tape Dimensions: Loaded Quantity 1000/2000 pcs. Per Reel



Note: Tolerance unless mentioned is ±0.1mm; Unit = mm

Moisture Resistant Packing Process



Reliability Test Items and Conditions

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

Confidence level：90%

LTPD：10%

NO	Item	Test Condition		Test Hours / Times	Criteria	
		Temp./ Humidity	I_F (mA)		Iv @ 20mA	V_F @ 20mA
1	Reflow Soldering	T = 260℃, Max. 10sec.		2 times	<±10%	<±10%
2	Temperature Cycle	-40℃ ~ 100℃ 30min. (5min.) 30min.		200 cycles	Iv > 70%, VF < 110%,	
3	Thermal Shock	-10℃ ~ 100℃ 20min. (<15sec.) 20min.		200 cycles		
4	Low Temp. Storage	Ta= -40℃	--	1000 hrs		
5	High Temp. Storage	Ta= 100℃	--	1000 hrs		
6	Temp. Humidity Storage	Ta= 60℃/ 90%RH	--	1000 hrs		
7	Steady State Operating Life of Low Temp.	Ta= -40℃	20	1000 hrs		
8	Steady State Operating Life Condition 1	Ta= 25℃/ Room Humidity	20	1000 hrs		
9	Steady State Operating Life Condition 2	Ta= 60℃	20	1000 hrs		
10	Steady State Operating Life of High Temp.	Ta= 85℃	5	1000 hrs		
11	Steady State Operating Life of High Humidity Heat	Ta= 60℃/ 90%RH	20	1000 hrs		

Notes:

1. Sampling for each test item: 22 (pcs.)
2. Test board: PCB board thickness=1.0mm, copper layer thickness=0.07mm, Rth j-a=380℃/W.
3. Measurements are performed after allowing the LEDs to return to room temperature.

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

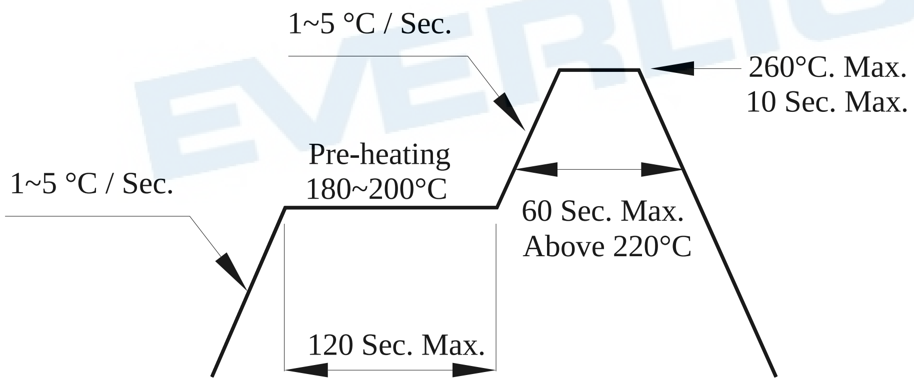
2.2 Before opening the package: The LEDs should be used within one year and kept at 30℃ or less and 70%RH or less.

2.3 After opening the package: We recommend that the LED should be soldered quickly (within 3 days). The soldering condition is 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. (One time only)

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.

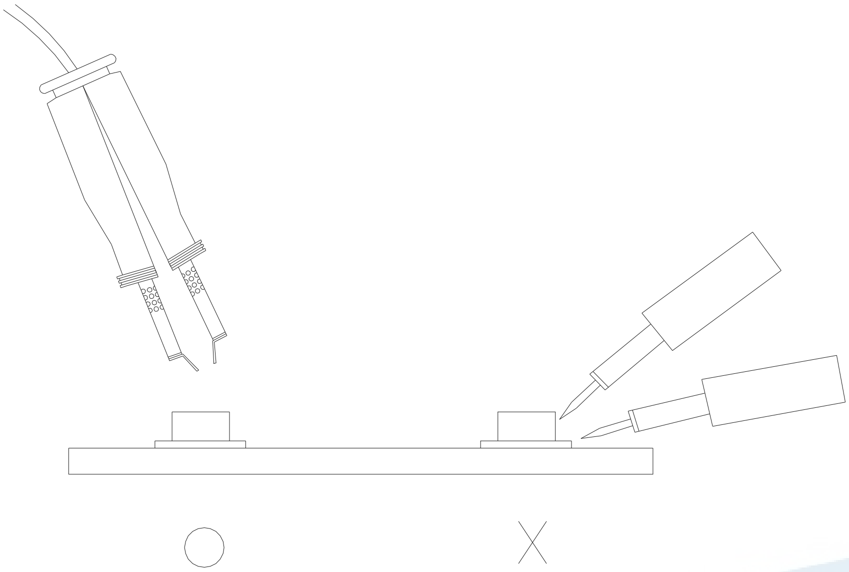
3.4 After soldering, do not warp the circuit board.

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.



6. Handling Indications

During processing, mechanical stress on the surface should be minimized as much as possible. Sharp objects of all types should not be used to pierce the sealing compound.