

Hyper Mini Top View LEDs

45-11-BFSB-42374602E-2T8-AM



Features

- P-LCC-2 package.
- Colored diffused resin.
- Wide viewing angle 120°.
- Inner reflector and white package.
- Brightness: 1950 to 2450 mcd at 20 mA
- Precondition: Bases on JEDEC J-STD 020D Level 3.
- Qualifications according to AEC-Q101 rev C.
- Automotive reflow profile (IR reflow or wave soldering)
- Compliance with EU REACH
- Compliance Halogen Free (Br<900 ppm ,Cl <900 ppm, Br+Cl <1500 ppm)

Applications

- Automotive backlighting or indicator: Interior and exterior lighting, dashboard, switch, reading lamp, audio and video equipments...etc.
- Backlight: LCD, switches, symbol, mobile phone and illuminated advertising.
- Display for indoor and outdoor application.
- Ideal for coupling into light guides.
- Substitution of traditional light.
- Optical indicator.
- General applications.

Device Selection Guide

Chip Materials	Emitted Color	Resin Color
InGaN	White	Yellowish

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Forward Current	I_F	30	mA
Power Dissipation	P_d	103.5	mW
Junction Temperature	T_j	125	°C
Operating Temperature	T_{opr}	-40 ~ +100	°C
Storage Temperature	T_{stg}	-40 ~ +110	°C
Thermal Resistance	$R_{th\ J-A}$	300	K/W
	$R_{th\ J-S}$	200	K/W
ESD (Classification acc. AEC Q101)	ESD_{HBM}	2000	V
	ESD_{MM}	200	V
Soldering Temperature	T_{sol}	Reflow Soldering : 260 °C for 30 sec. Hand Soldering : 350 °C for 3 sec.	

Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I _v	1950	-----	2450	mcd	I _F =20mA
Viewing Angle	2θ _{1/2}	-----	120	-----	deg	I _F =20mA
Forward Voltage	V _F	2.6	----	3.5	V	I _F =20mA

Note:

1. Tolerance of Luminous Intensity: ±5%
2. Tolerance of Forward Voltage: ±0.05V

Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
37	1950	2000		
38	2000	2050		
39	2050	2000		
40	2100	2150		
41	2150	2200	mcd	IF=20mA
42	2200	2250		
43	2250	2300		
44	2300	2350		
45	2350	2400		
46	2400	2450		

Note:

Tolerance of Luminous Intensity: ±5%

Bin Code of Chromaticity Coordinates

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

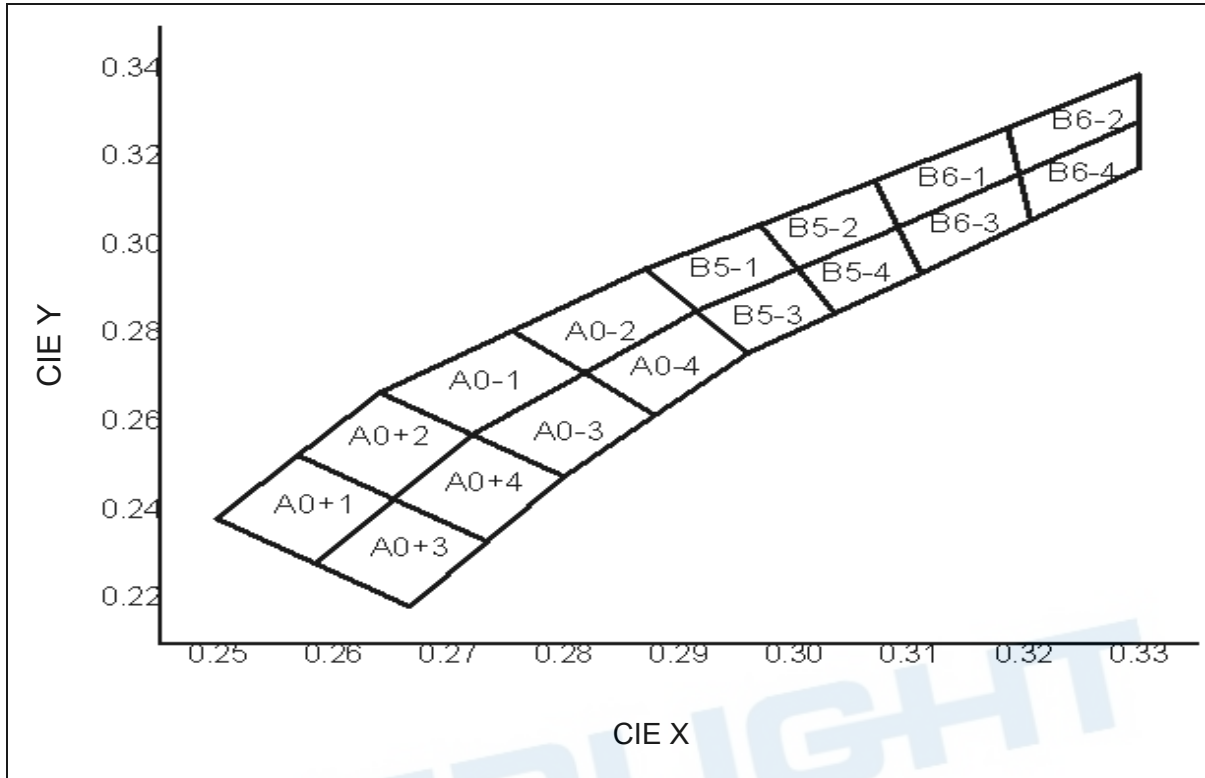
Note:
 Tolerance of Chromaticity Coordinates: ± 0.01

Bin Code of Chromaticity Coordinates

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

Note:
 Tolerance of Chromaticity Coordinates: ± 0.01

The C.I.E. 1931 Chromaticity Diagram

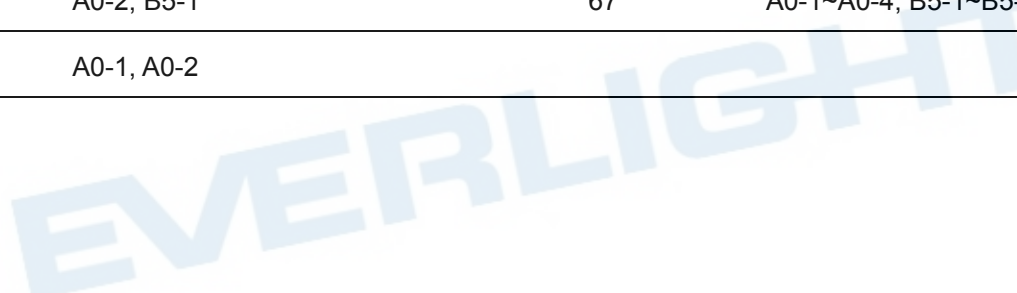


Bin Range of Chromaticity Coordinates Block

Group	Range	Group	Range
01	B5-1,B5-2,B5-3,B5-4	27	A0-2, A0-1, A0-3
02	B5-1~B5-4,A0-2,A0-4	28	A0-2, A0-4, A0-3
07	B5-1,B5-3,A0-4	29	A0-2, B5-1, B5-3
08	A0-2,A0-3,A0-4	30	A0-2, A0-4, B5-3
09	A0-1,A0-3,A0+4	31	B5-1, A0-2, A0-4
10	A0+1, A0+2, A0-1	32	B5-1, B5-3, A0-4
11	A0+2, A0-1, A0-2	33	B5-1, B5-2, B5-4
12	A0-1, A0-2, B5-1	34	B5-1, B5-3, B5-4
13	A0-2, B5-1, B5-2	35	B5-2, B5-1, B5-3
14	A0+3, A0+4, A0-3	36	B5-2, B5-4, B5-3
15	A0+4, A0-3, A0-4	37	B5-1, B5-2
16	A0-3, A0-4, B5-3	38	A0-1, A0-3
17	A0-4, B5-3, B5-4	39	A0-2,A0-4,B5-1,B5-3
18	A0+1, A0+2, A0+4	40	A0-3,A0-4
19	A0+1, A0+3, A0+4	41	A0-4,B5-1,B5-3,B5-4
20	A0+2, A0+1, A0+3	42	A0-4, B5-3
21	A0+2, A0-1, A0-3	43	B5-2,B5-4
22	A0+2, A0+4, A0-3	44	A0-1,A0-2,A-4,B5-3
23	A0-1, A0+2, A0+4	45	B5-1, B5-3
24	A0-1, A0-3, A0+4	46	A0+1, A0+2
25	A0-1, A0-2, A0-4	47	B6-1, B6-2, B6-3, B6-4
26	A0-1, A0-3, A0-4	48	B6-2,B6-4

Bin Range of Chromaticity Coordinates Block

Group	Range	Group	Range
49	B5-3, B5-4	59	A0-1, A0-2, A0-3, A0-4, B5-1
50	A0-1, A0-2, A0-3, A0-4	60	A0+2, A0+4, A0-1, A0-3
51	A0+1, A0+2, A0+3, A0+4	61	A0+4, A0-3, A0-4
52	A0+3, A0+4	62	A0-2, B5-1, B5-3, B5-4
53	B6-1, B6-2, B6-3	63	A0-1~A0-4, B5-1, B5-3
54	B6-1, B6-3	64	A0-2, A0-4
55	B5-2, B5-4, B6-1, B6-3	65	A0-1~A0-4, B5-1~B5-4
56	B5-2, B6-1	66	A0-1, A0-3, A0-4, A0+2
57	A0-2, B5-1	67	A0-1~A0-4, B5-1~B5-4, B6-1, B6-3
58	A0-1, A0-2		



Bin Range of Forward Voltage

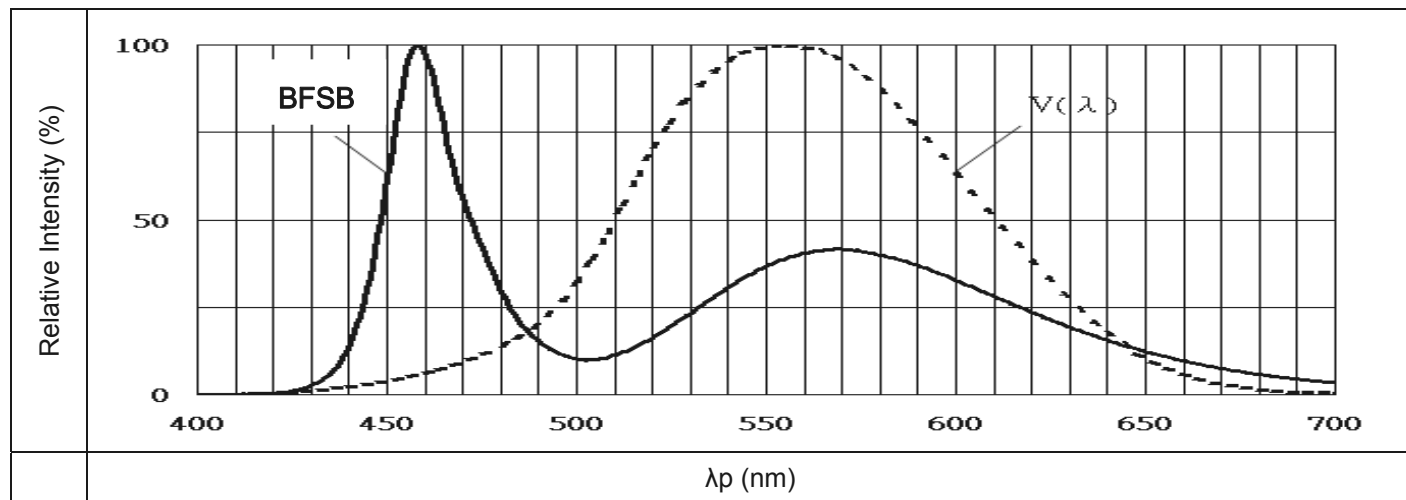
Group	Bin Code	Min.	Max.	Unit	Condition
02	01	2.6	2.7	V	IF=20mA
	02	2.7	2.8		
	03	2.8	2.9		
	04	2.9	3.0		
	05	3.0	3.1		
	06	3.1	3.2		
	07	3.2	3.3		
	08	3.3	3.4		
	09	3.4	3.5		

Note:
 Tolerance of Forward Voltage: $\pm 0.05V$



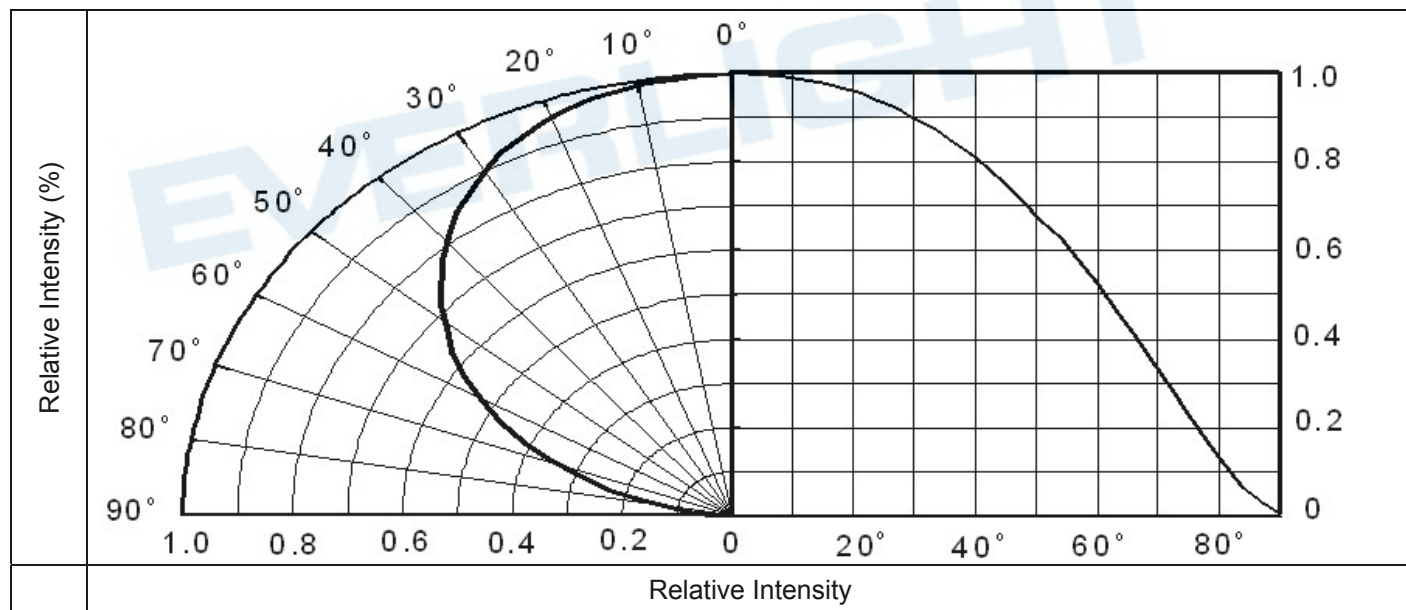
Typical Electro-Optical Characteristics Curves

Typical Curve of Spectral Distribution

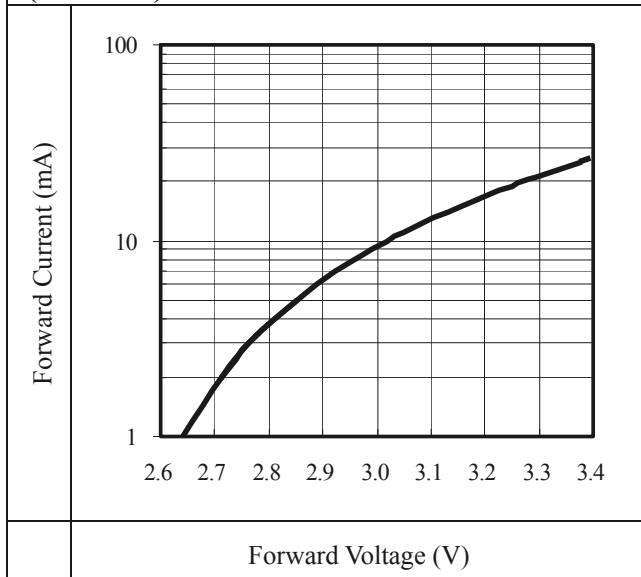


Note: $V(\lambda)$ =Standard eye response curve;

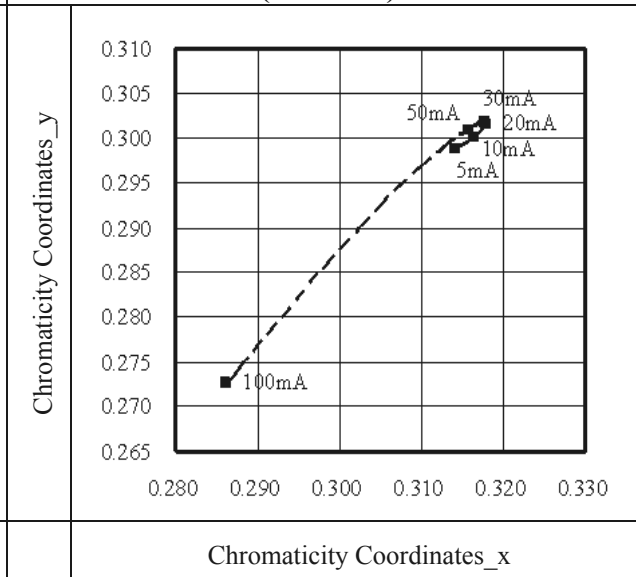
Diagram Characteristics of Radiation



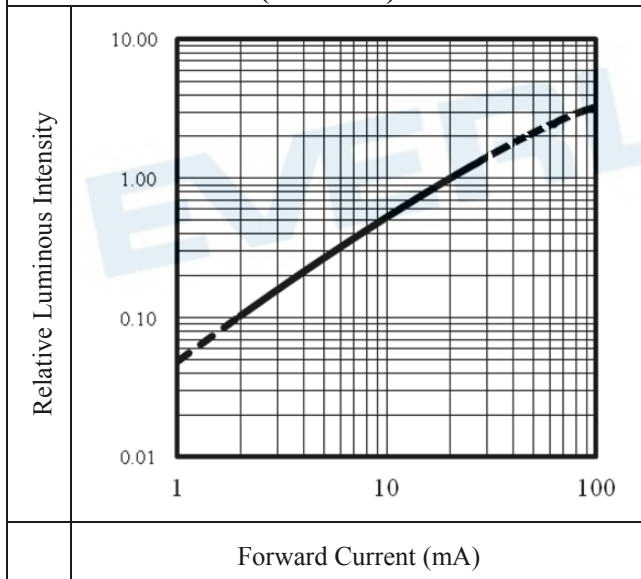
Forward Current vs. Forward Voltage
 (Ta=25°C)



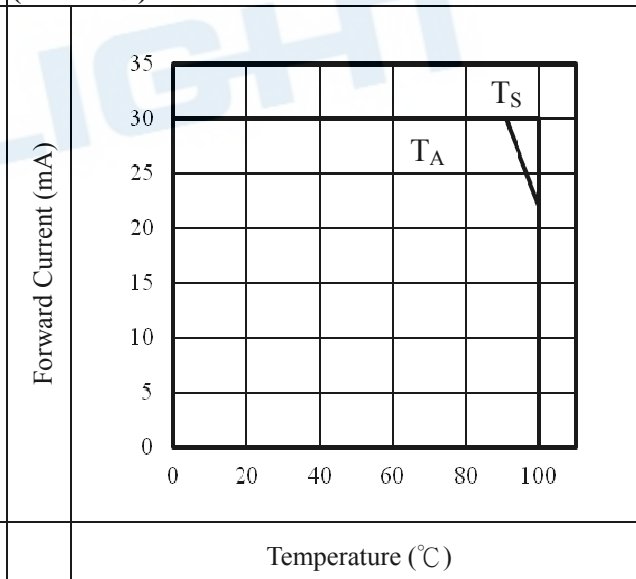
Chromaticity Coordinates vs. Forward Current
 (Ta=25°C)



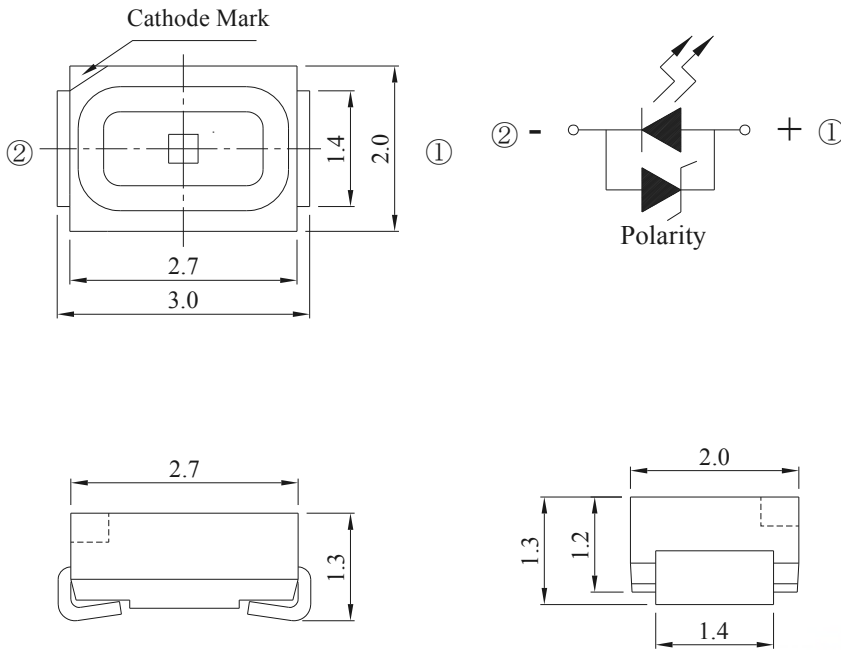
Relative Luminous Intensity vs. Forward Current
 (Ta=25°C)



Max. Permissible Forwarded Current
 (Ta=25°C)



Package Dimension

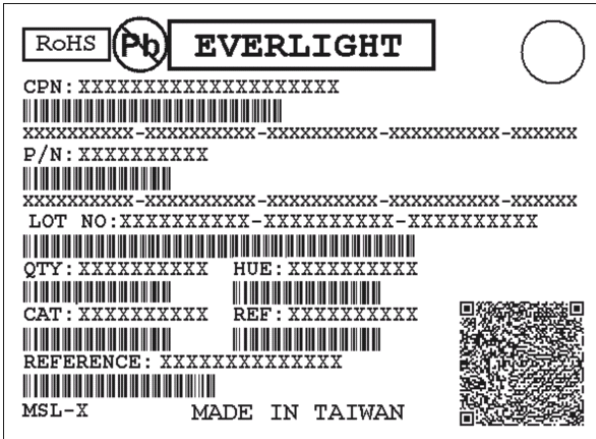


Note: Tolerances unless mentioned $\pm 0.05\text{mm}$. Unit = mm

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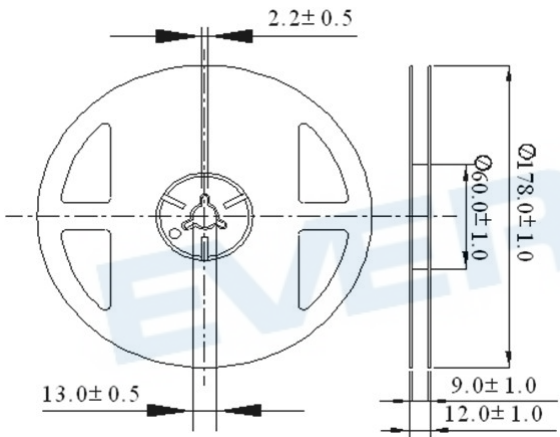
Moisture Resistant Packing Materials

Label Explanation

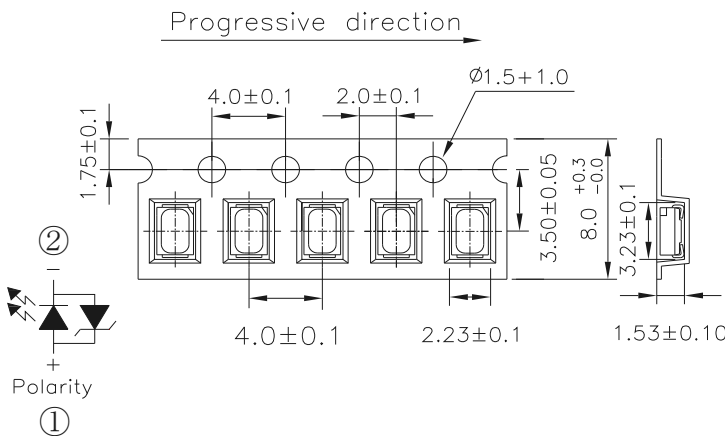


- CPN: Customer's Product Number
- P/N: Product Number
- QTY: Packing Quantity
- CAT: Luminous Intensity Rank
- HUE: Dom. Wavelength Rank
- REF: Forward Voltage Rank
- LOT No: Lot Number

Reel Dimensions

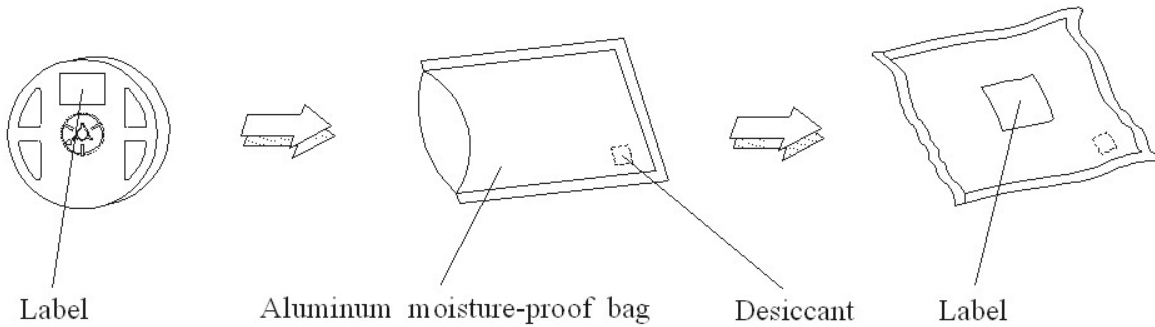


Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel



Note: Tolerances unless mentioned ±0.1mm. Unit = mm

Moisture Resistant Packing Process

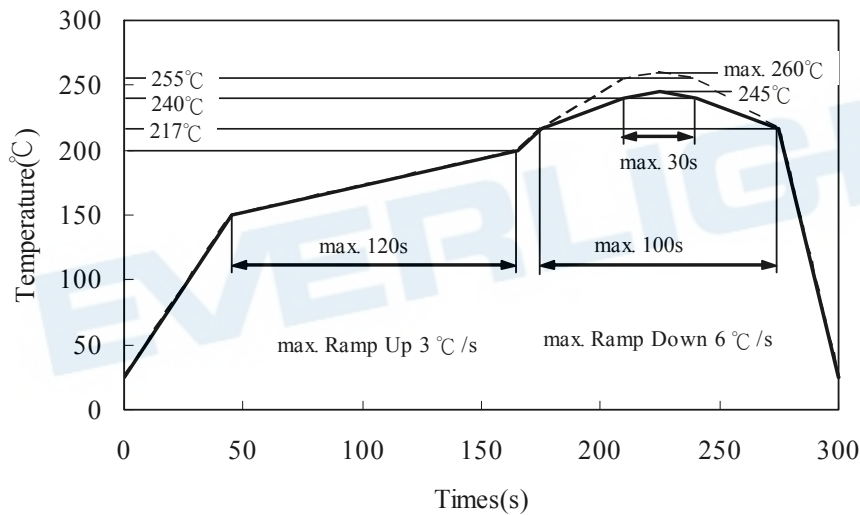


Note: Tolerances unless mentioned $\pm 0.1\text{mm}$. Unit = mm

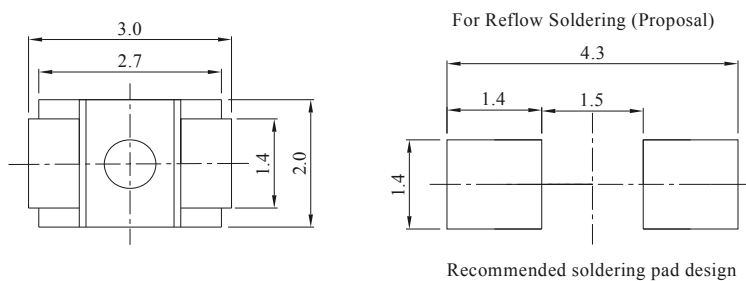
Precautions for Use

1. Soldering Condition

1.1 (A) Maximum Body Case Temperature Profile for evaluation of Reflow Profile



1.2 (B) Recommend soldering pad



Note: Tolerances unless mentioned $\pm 0.1\text{mm}$. Unit = mm

2. Current limiting

A resistor should be used to limit current spikes that can be caused by voltage fluctuations. Otherwise damage could occur.

3. Storage

3.1 Moisture proof bag should only be opened immediately prior to usage.

3.2 Environment should be less than 30°C and 60% RH when moisture proof bag is opened.

3.3 After opening the package MSL Conditions stated on page 1 of this spec should not be exceeded.

3.4 If the moisture sensitivity card indicates higher than acceptable moisture, the component should be baked at min. 60deg +/-5deg for 24 hours.

4. Iron Soldering

Hand soldering is not recommended for regular production. These guidelines are for rework only. Soldering iron tip should contact each terminal no more than 3 sec at 350°C, using soldering iron with nominal power less than 25W. Allow min. 2 sec. between soldering intervals.

5. Usage

Do not exceed the values given in this specification.

Application Restrictions

High reliability applications such as military/aerospace, security systems, and medical equipment may require different product. If you have any concerns, please contact Everlight before using this product in your application. This specification guarantees the quality and performance of the product as an individual component. Do not use this product beyond the specification described in this document.

Revision History:

Rev.	Modified date	File modified contents
1	2015/10/19	New Spec.
2	2016/10/19	Modify Vf bin