THE DATASHEET OF

67-21-B3P-B3Q2R2M0C-2T8-AM

EVERLIGHT ELECTRONICS CO., LTD.

Technical Data Sheet

Top View LEDs

67-21-B3P-B3Q2R2M0C-2T8-AM

Feature

- RoHS compliant.
- P-LCC-2 package.
- Wide viewing angle 120°.
- Colored diffused resin
- Brightness: 90 to 180mcd at 10mA
- Inner reflector and white package.
- Precondition: Bases on JEDEC J-STD 020D Level 3.
- Qualification according to AEC-Q101 rev C.
- Useable in severe lead free processes with automotive reflow profile (IR reflow or wave soldering)

Applications

- Automotive backlighting or indicator: Dashboard, switch, 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.

Device Selection Guide

Chip Material	Emitted Color	Resin Color
InGaN/SiC	Pastel Emerald Green	Slightly Green Dotted

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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 @1KHz)	I_{FP}	100	mA
Power Dissipation	Pd	120	mW
Junction Temperature	T_j	125	℃
Operating Temperature	T_{opr}	-40 ~ +100	℃
Storage Temperature	T_{stg}	-40 ~ +110	℃
Thermal resistance	Rth $_{J-A}$	500	K/W
	Rth $_{J-S}$	300	K/W
Soldering Temperature	T_{sol}	Reflow Soldering : 260 ℃ for 30 sec. Hand Soldering : 350 ℃ for 3 sec.	
ESD Classification acc. AEC Q101	ESD_{HBM}	2000	V
	ESD_{MM}	200	V

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Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_v	90	-----	180	mcd	I_F=10mA
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	I_F=10mA
Forward Voltage	V_F	2.75	3.0	3.95	V	I_F=10mA
Reverse Current	I_R	-----	0.01	10	μA	V_R=5V
Temperature coefficient of λp	$TC_{\lambda p}$	-----	0.03	-----	nm/K	I_F=10mA
Temperature coefficient of λd	$TC_{\lambda d}$	-----	0.04	-----	nm/K	I_F=10mA
Temperature coefficient of V_F	TC_V	-----	-2.6	-----	mV/K	I_F=10mA

Note:

Tolerance of Luminous Intensity: ±11%
Tolerance of Dominant Wavelength: ±1nm
Tolerance of Forward Voltage: ±0.1V

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Bin Range of Luminous Intensity

Bin	Min.	Max.	Unit	Condition
Q2	90	112	mcd	I_F=10mA
R1	112	140		
R2	140	180		

Note:

Tolerance of Luminous Intensity：±11%

Bin Range of Forward Voltage

Group	Bin	Min.	Max.	Unit	Condition
M	5	2.75	3.05	V	I_F=10mA
	6	3.05	3.35		
	7	3.35	3.65		
	8	3.65	3.95		

Note:

Tolerance of Forward Voltage: ±0.1V

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Bin Range of Chromatic Coordinates

Bin Code	CIE_x	CIE_y	Bin Code	CIE_x	CIE_y	Condition
13S-1	0.135	0.308	13S-2	0.143	0.307	I_F=10mA
	0.141	0.350		0.149	0.349	
	0.149	0.349		0.158	0.348	
	0.143	0.307		0.152	0.306	
13S-3	0.152	0.306	13S-4	0.160	0.305	
	0.158	0.348		0.166	0.347	
	0.166	0.347		0.175	0.346	
	0.160	0.305		0.169	0.304	
13S-5	0.129	0.266	13S-6	0.137	0.265	
	0.135	0.308		0.143	0.307	
	0.143	0.307		0.152	0.306	
	0.137	0.265		0.146	0.264	
13S-7	0.146	0.264	13S-8	0.154	0.263	
	0.152	0.306		0.160	0.305	
	0.160	0.305		0.169	0.304	
	0.154	0.263		0.163	0.262	

Note:

1. Tolerance of Chromaticity Coordinates：±0.01.

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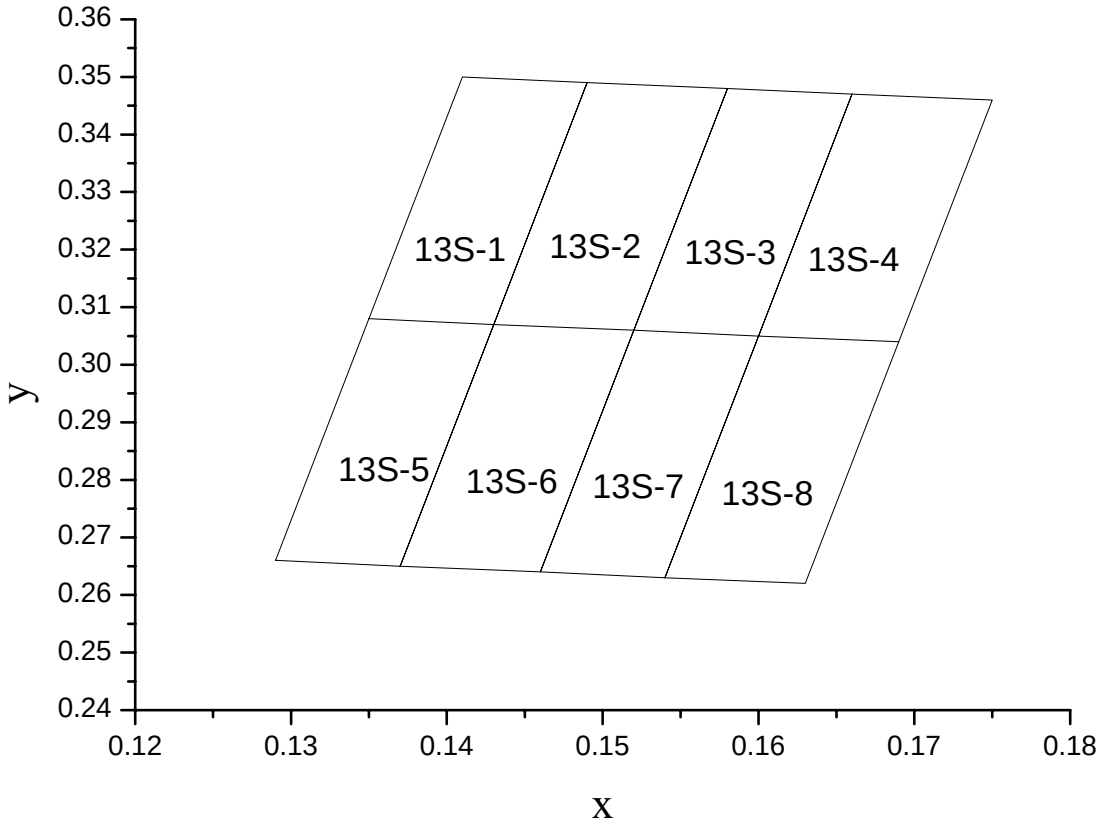
The C.I.E. 1931 chromaticity diagram



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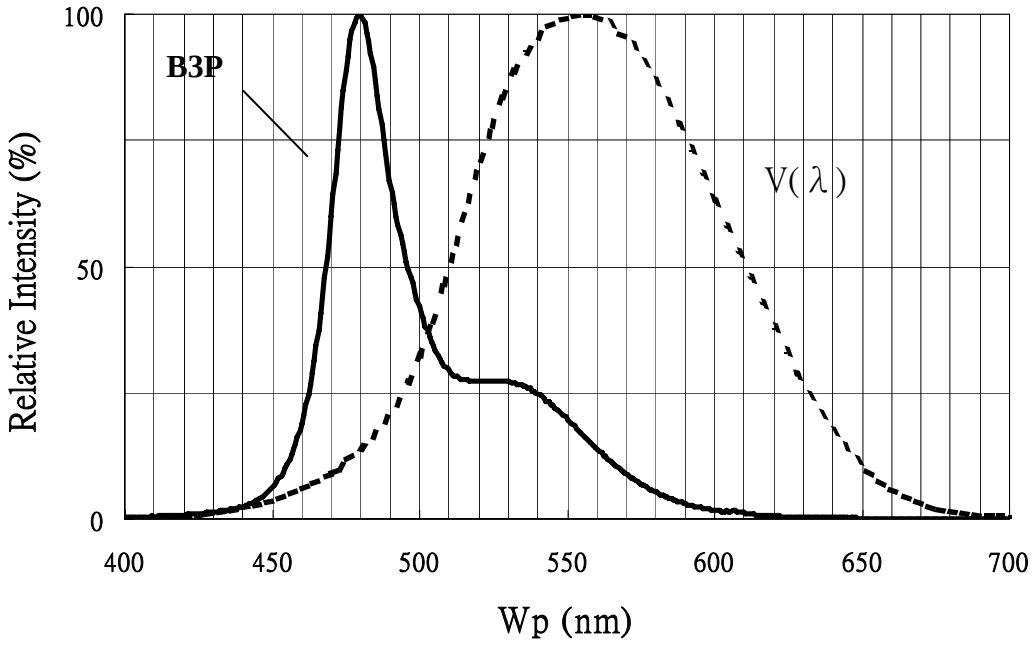
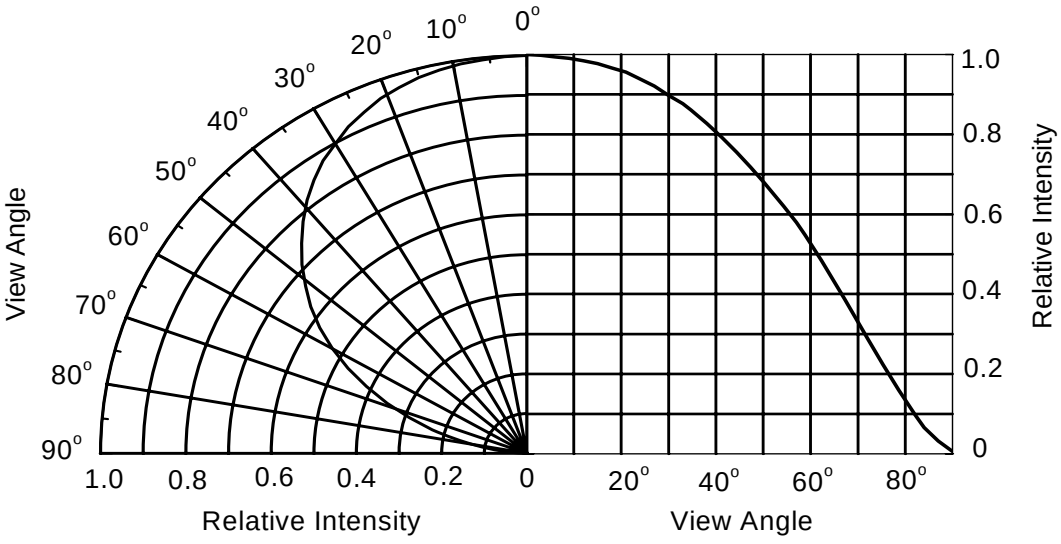
Typical Electro-Optical Characteristics Curves(Ta=25℃)

Typical Curve of Spectral Distribution:



Note: V(λ)=Standard eye response curve；I_F=10mA

Diagram characteristics of radiation



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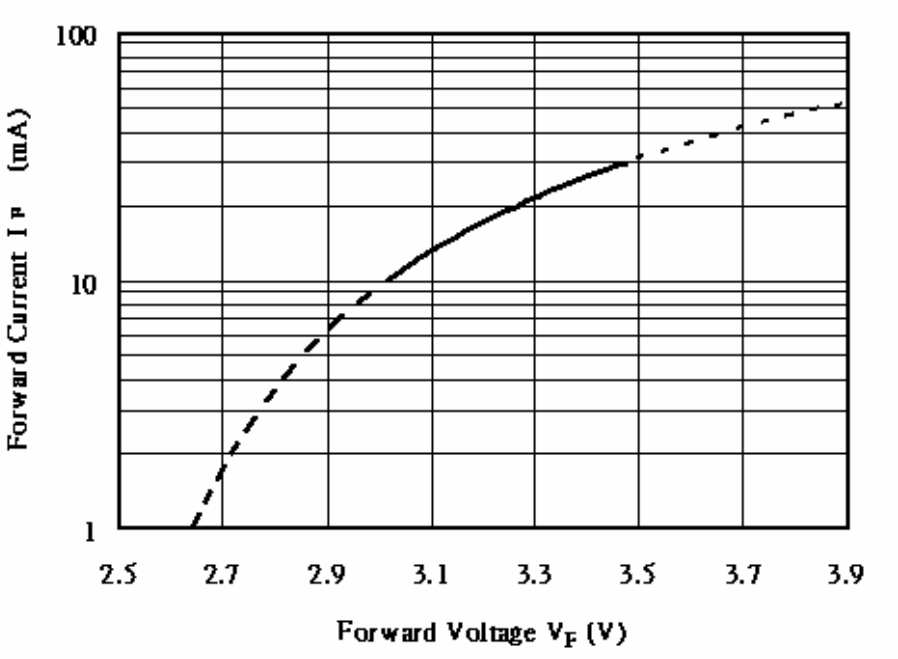
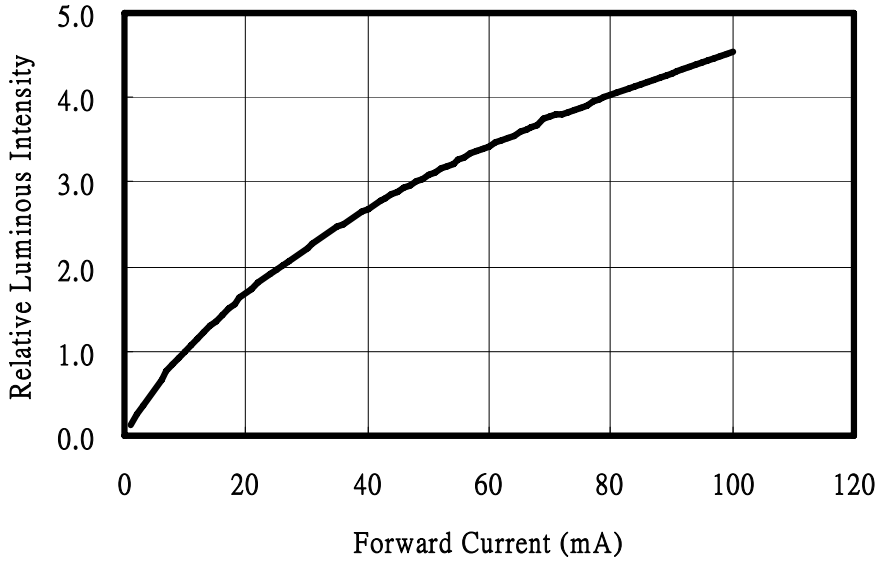
Forward Current vs. Forward Voltage (Ta=25℃)



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



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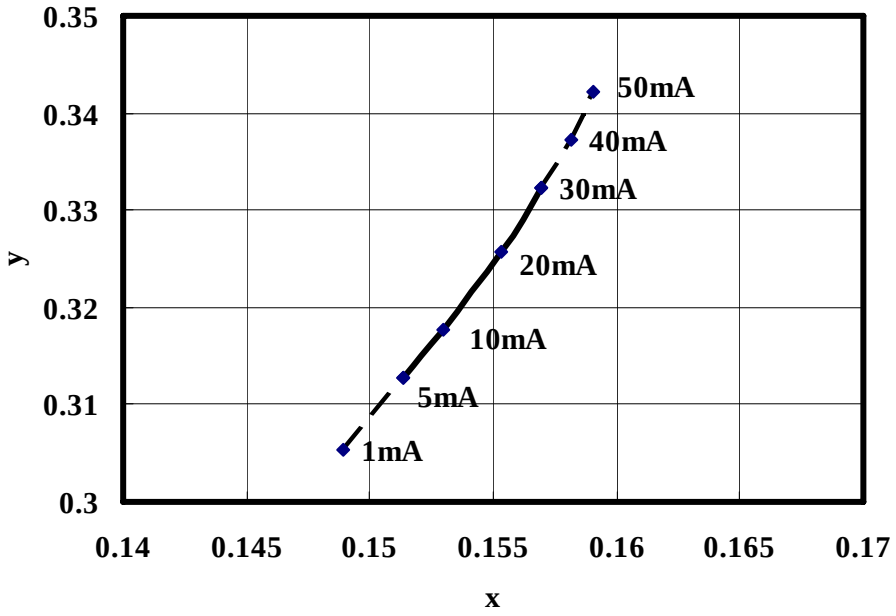
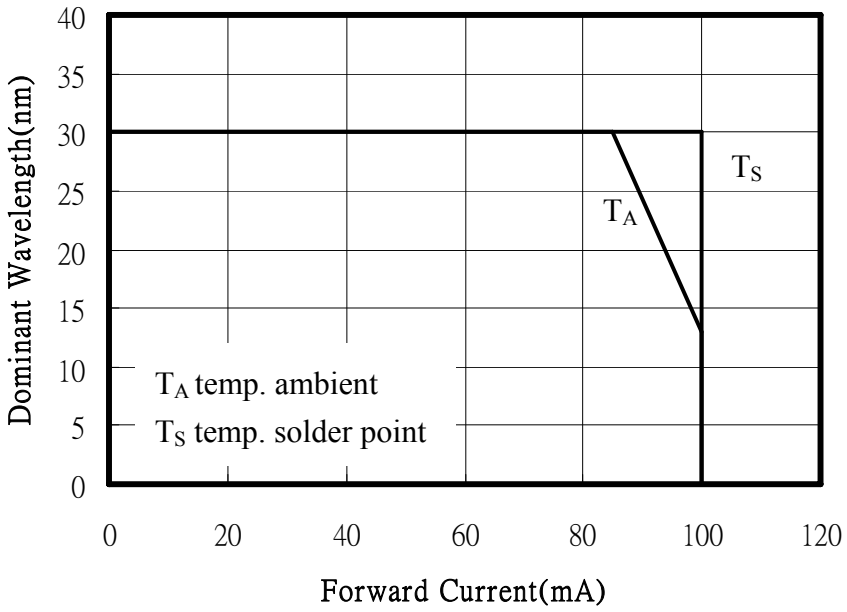
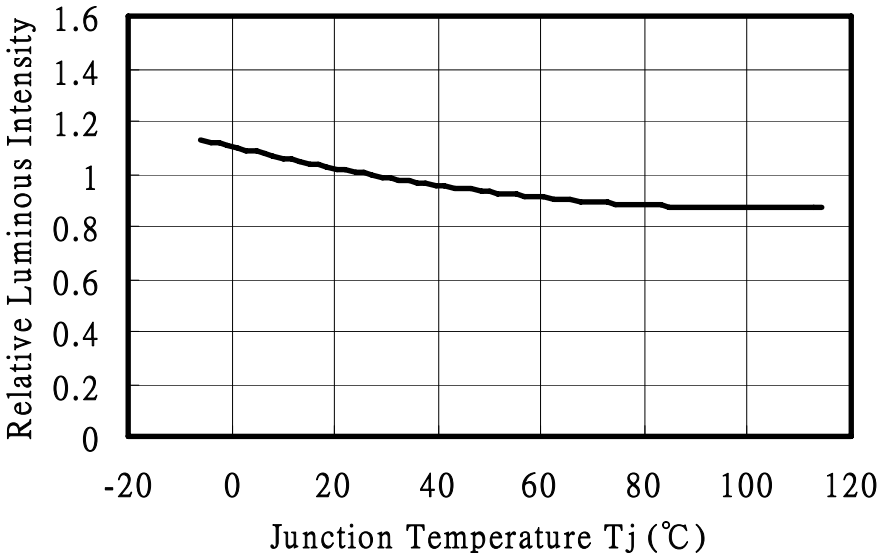
Chromaticity Coordinate Shift vs. Forward Current (Ta=25℃)



Forward Current vs. Ambient and Solder Temperature

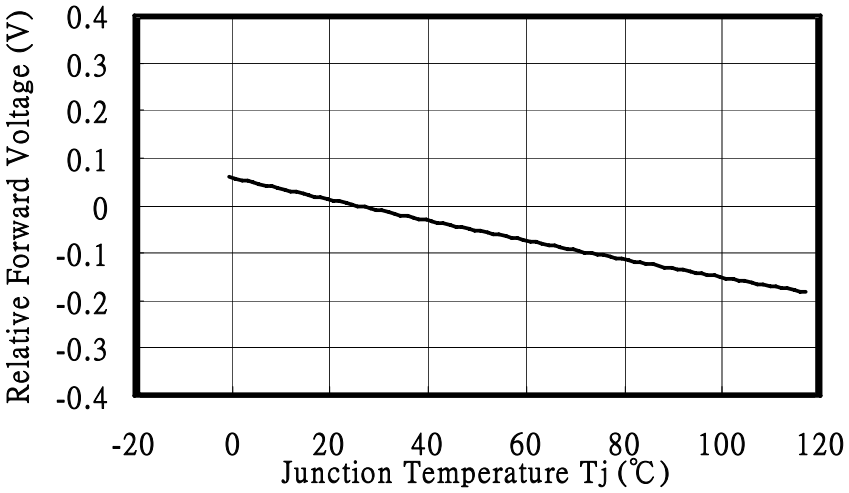


Relative Luminous Intensity vs. Junction Temperature



Note: f(Tj) = Iv / Iv(25℃)；I_F=10mA

Relative Forward Voltage vs. Junction Temperature



Note: $\triangle V_F = V_F - V_F$ (25 ℃) = f(Tj)；I_F=10mA

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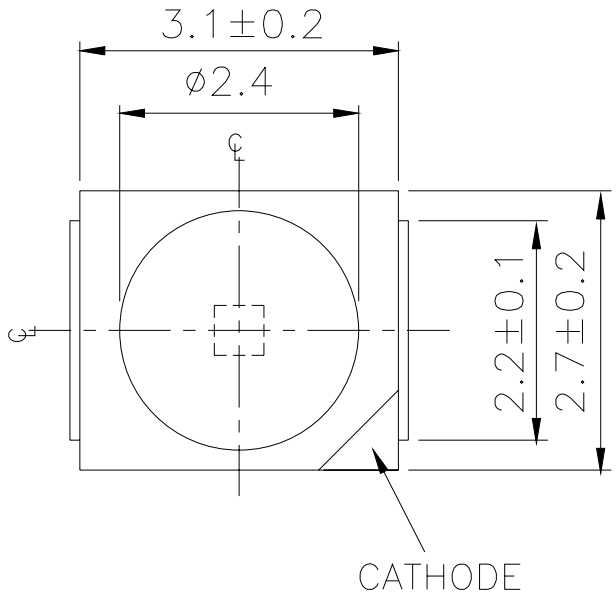
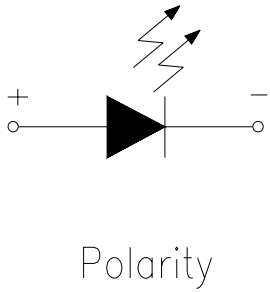
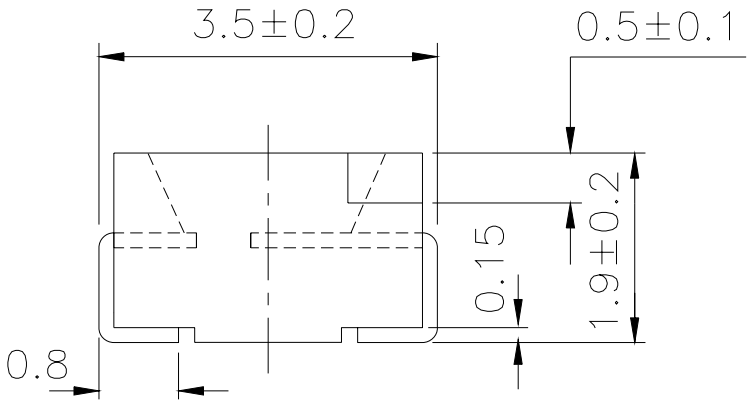
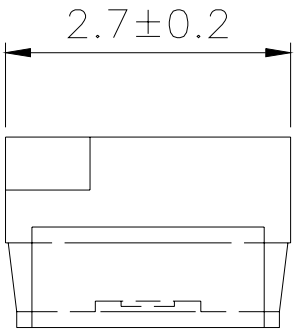
Package Dimension









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

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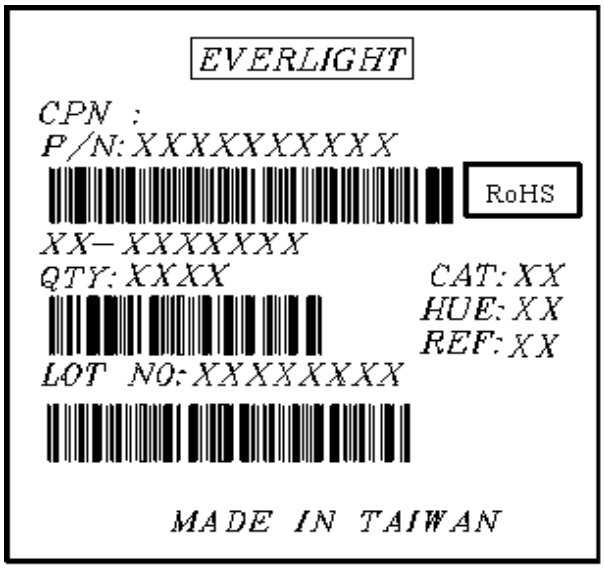
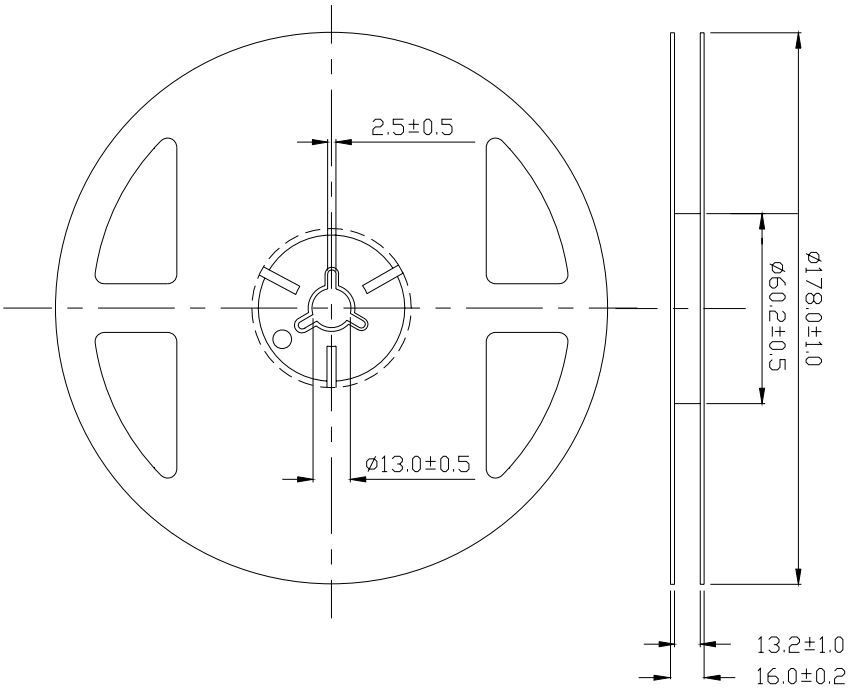
Label Explanation

- **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



Note: Unit = mm

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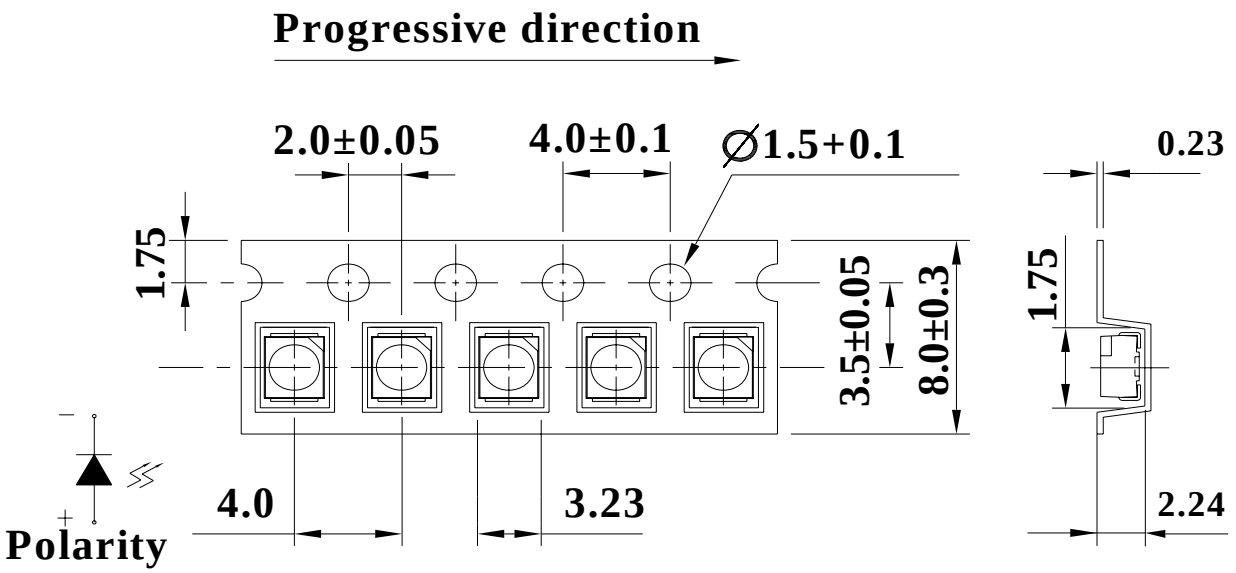
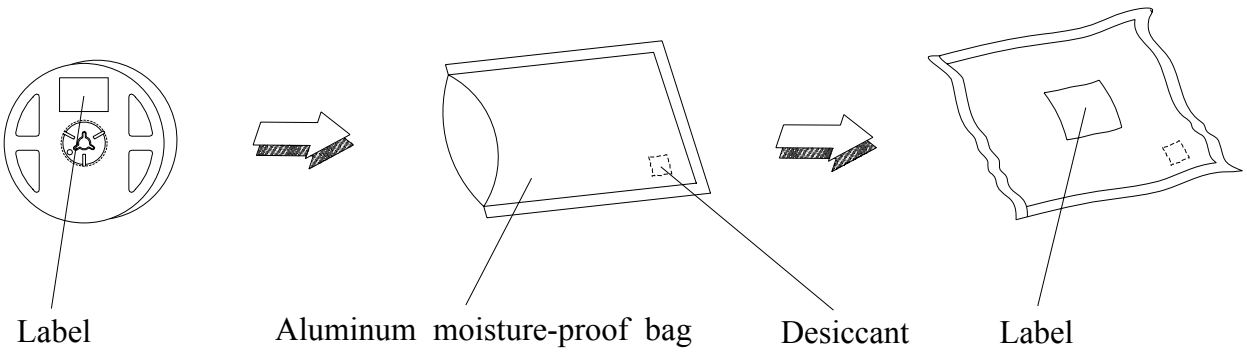
Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel



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

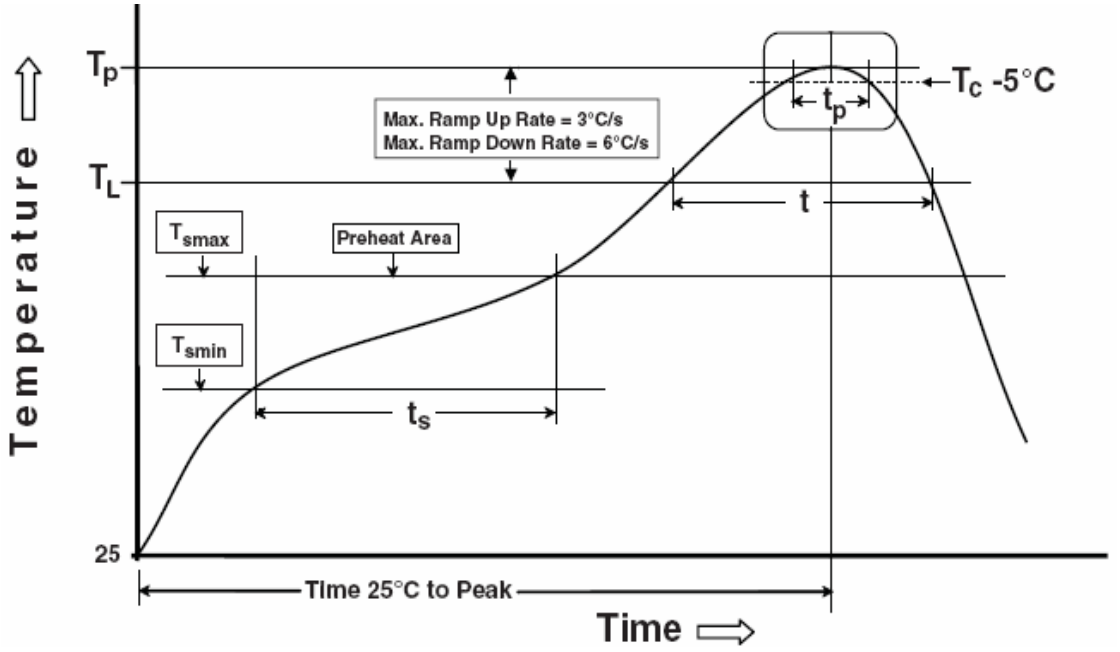
Moisture Resistant Packaging Process and Materials



Precautions for Use

1. Soldering Condition

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



Note: Reference: IPC/JEDEC J-STD-020D

Preheat	
Temperature min (T_{smin})	150 °C
Temperature max (T_{smax})	200°C
Time (T_{smin} to T_{smax}) (t_s)	60-120 seconds
Average ramp-up rate (T_{smax} to T_p)	3 °C/second max.
Other	
Liquidus Temperature (T_L)	217 °C
Time above Liquidus Temperature (t_L)	60-150 sec
Peak Temperature (T_P)	260°C
Time within 5 °C of Actual Peak Temperature: T_P - 5°C	30 s
Ramp- Down Rate from Peak Temperature	6°C /second max.
Time 25°C to peak temperature	8 minutes max.
Reflow times	3 times

All parameters are maximum body case temperature values and cannot be considered as a soldering profile. The body temperature was measured by soldering a thermal couple to the soldering point of LEDs.

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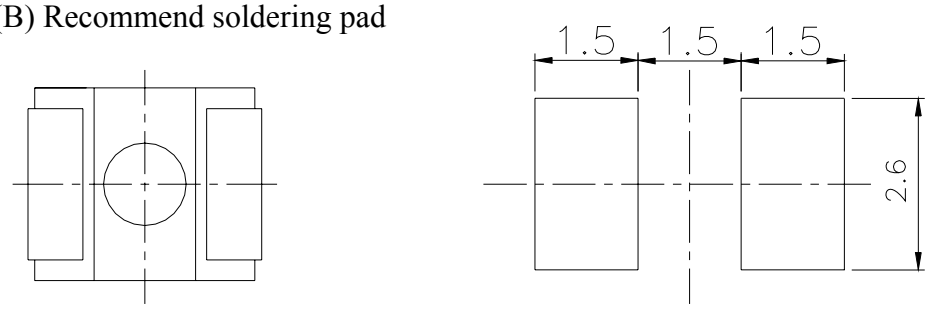
(B) Recommend soldering pad



Note: Tolerances unless mentioned ±0.1mm. 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℃ and 90% 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 25 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℃, 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, automotive safety/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.

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