EVERLIGHT ELECTRONICS CO., LTD.

Technical Data Sheet

1206 Package Chip LED

15-21-S2SC-H6D9K2L2A0A-2T8-AM

Feature

- RoHS compliant.
- Chip LED package.
- Wide viewing angle 130°.
- Colorless clear resin.
- Wavelength: 605nm
- Brightness: 9 to 18 mcd at 2mA
- Inner reflector and white package.
- Useable in severe lead free processes with automotive reflow profile (IR reflow or wave soldering)

Applications

- Automotive audio and video equipments.
- 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
AlGaInP	Brilliant Orange	Water Clear

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Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	10	V
Forward Current	I_F	50	mA
Peak Forward Current (Duty 1/10 @1KHz)	I_{FP}	100	mA
Power Dissipation	Pd	120	mW
Junction Temperature	T_j	115	℃
Operating Temperature	T_{opr}	-40 ~ +100	℃
Storage Temperature	T_{stg}	-40 ~ +110	℃
Thermal resistance	Rth $_{J-A}$	800	K/W
	Rth $_{J-S}$	450	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	9.0	-----	18.0	mcd	I_F=2mA
Viewing Angle	$2\theta_{1/2}$	-----	130	-----	deg	I_F=2mA
Peak Wavelength	λ_p	-----	611	-----	nm	I_F=2mA
Dominant Wavelength	λ_d	604	----	610	nm	I_F=2mA
Spectrum Radiation Bandwidth	$\Delta\lambda$	-----	17	-----	nm	I_F=2mA
Forward Voltage	V_F	1.55	----	2.15	V	I_F=2mA
Reverse Current	I_R	-----	-----	10	μA	V_R=10V
Temperature coefficient of λp	$TC_{\lambda p}$	-----	0.13	-----	nm/K	I_F=2mA
Temperature coefficient of λd	$TC_{\lambda d}$	-----	0.08	-----	nm/K	I_F=2mA
Temperature coefficient of V_F	TC_V	-----	-4.3	-----	mV/K	I_F=2mA

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 Code	Min.	Max.	Unit	Condition
K2	9.00	11.5	mcd	I_F=2mA
L1	11.5	14.5		
L2	14.5	18.0		

Note:
Tolerance of Luminous Intensity: ±11%

Bin Range of Dominant Wavelength

Bin Code	Min.	Max.	Unit	Condition
1	604	607	nm	I_F=2mA
2	607	610		

Note:
Tolerance of Dominant Wavelength: ±1nm

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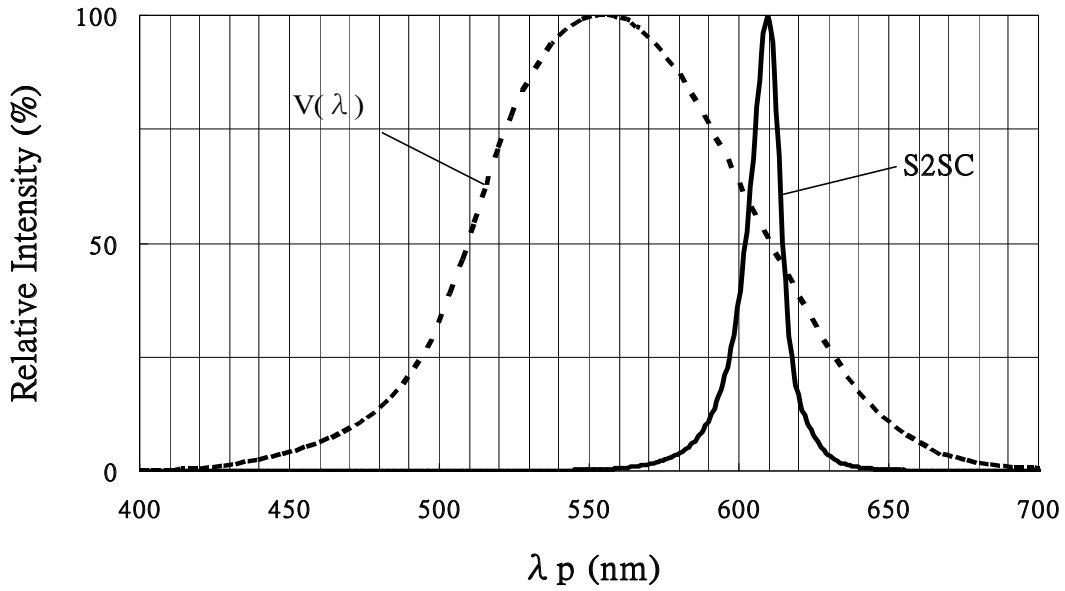
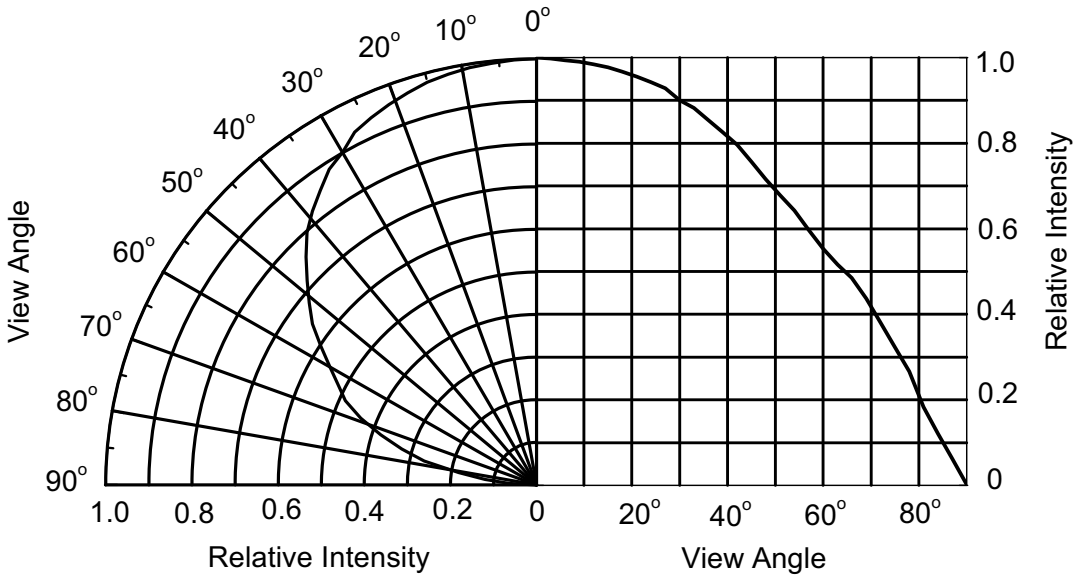
Typical Electro-Optical Characteristics Curves

Typical curve of spectral distribution:



Note: V(λ)=Standard eye response curve

Diagram characteristics of radiation



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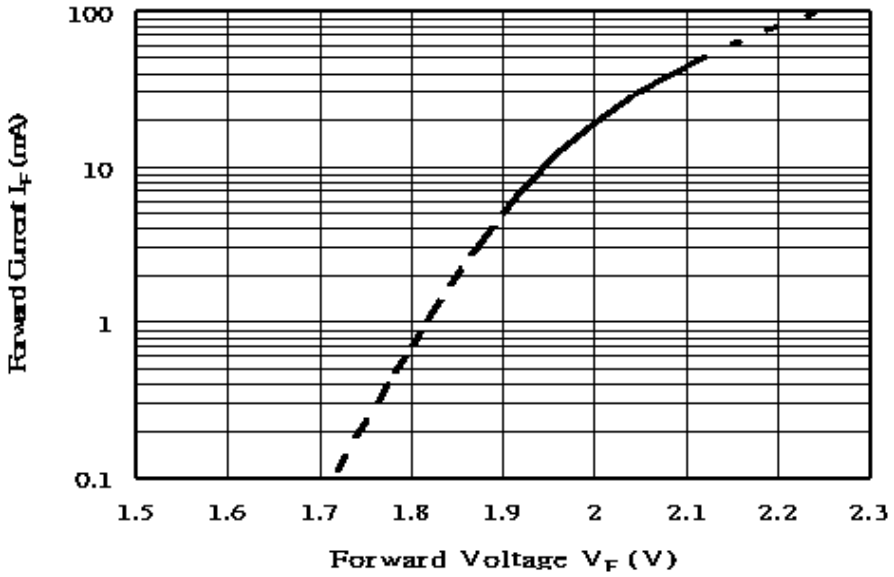
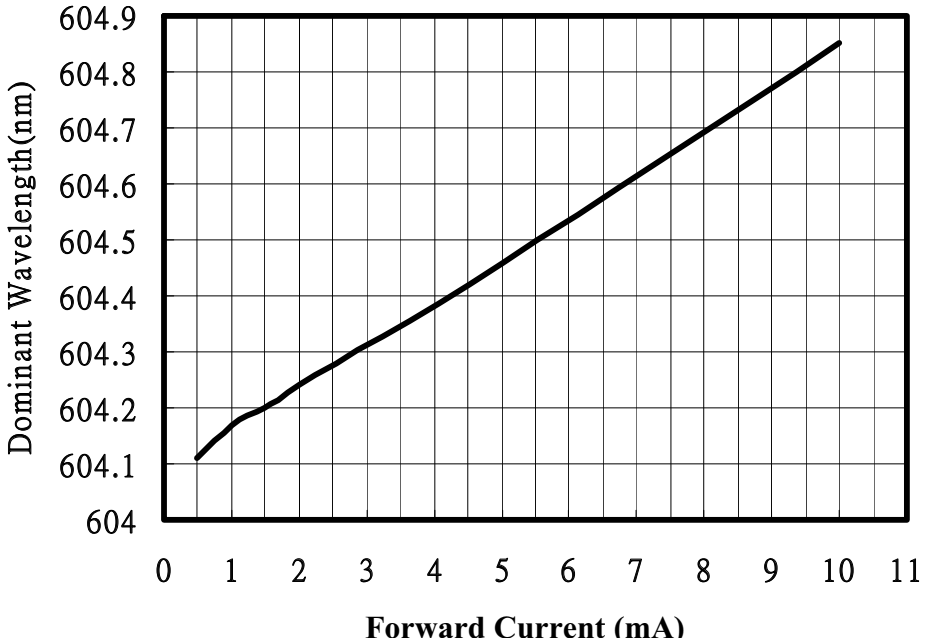
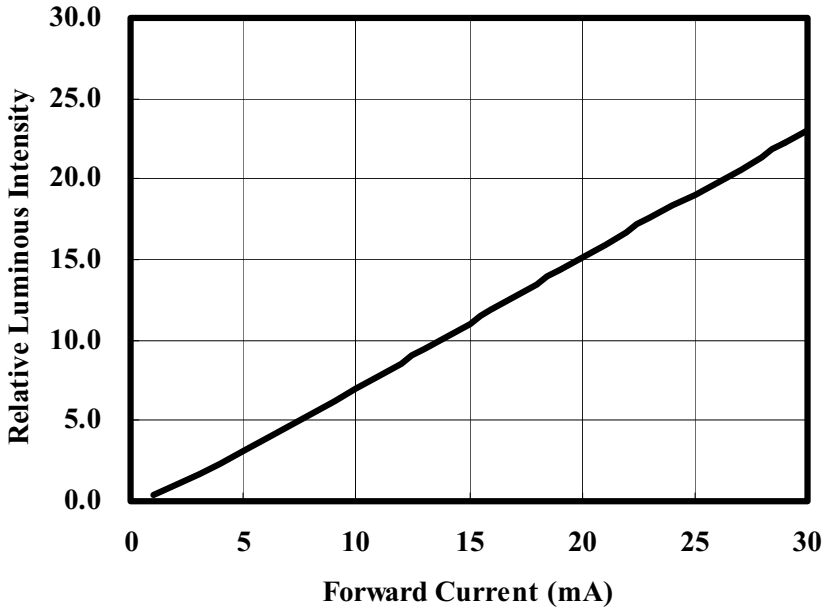
Forward Current vs. Forward Voltage (Ta=25℃)



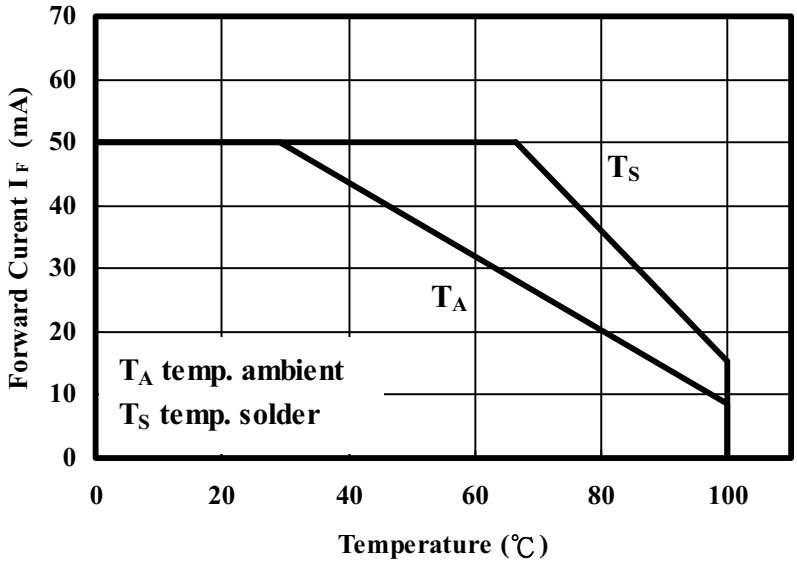
Dominant Wavelength vs. Forward Current (Ta=25℃)



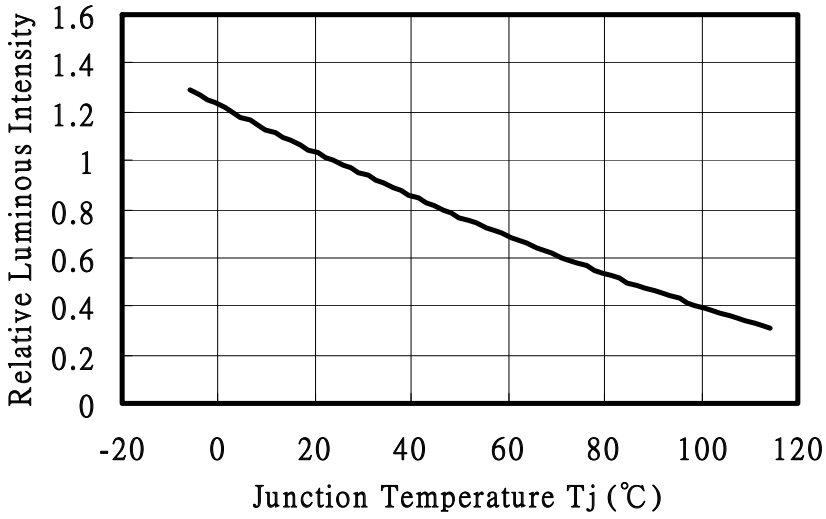
Relative Luminous Intensity vs. Forward Current (Ta=25℃)



Forward Current vs. Ambient and Solder Temperature

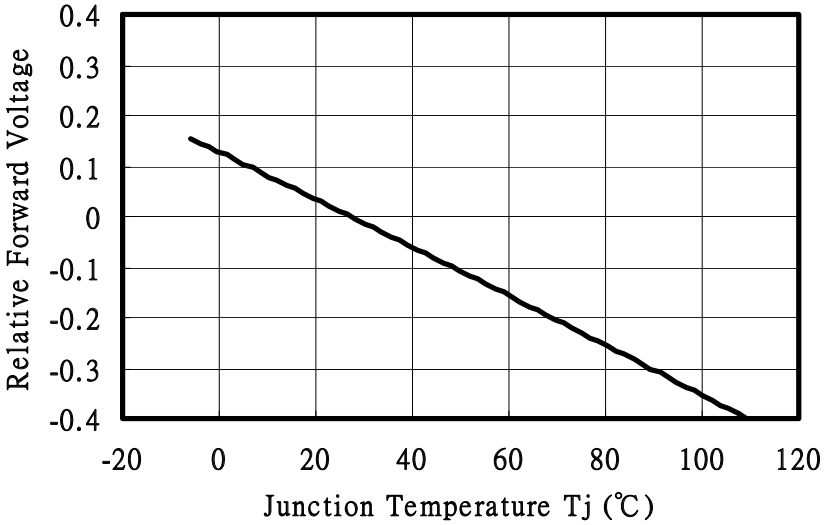


Relative Luminous Intensity vs. Junction Temperature



Note: f(Tj) = Iv / Iv(25℃)；IF=2mA

Relative Forward Voltage vs. Junction Temperature



Note：$\triangle V_F = V_F - V_F$ (25 ℃) = f(Tj); IF=2mA

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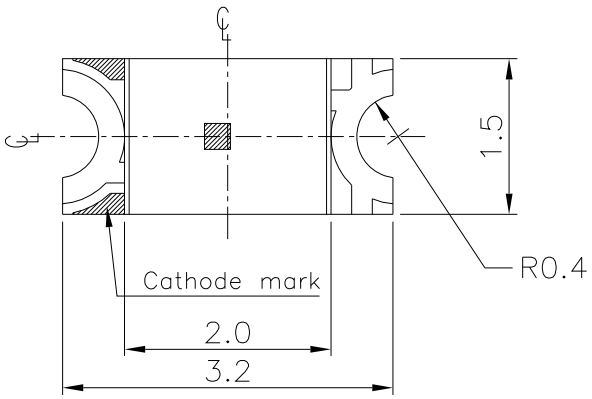
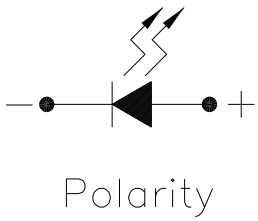
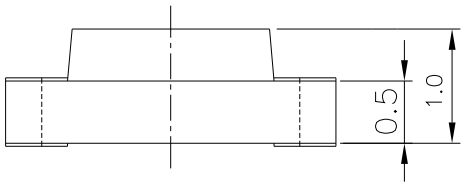
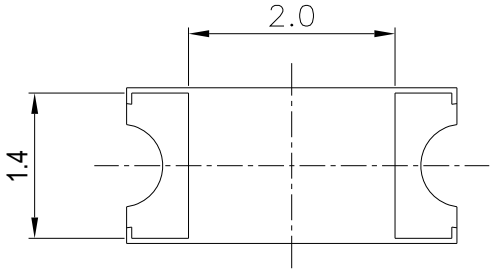
Package Dimension

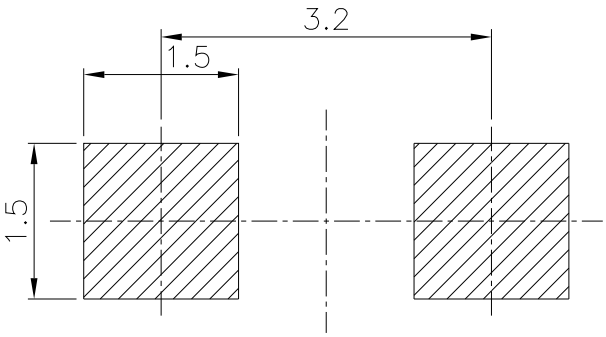








For reflow soldering (propose)



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

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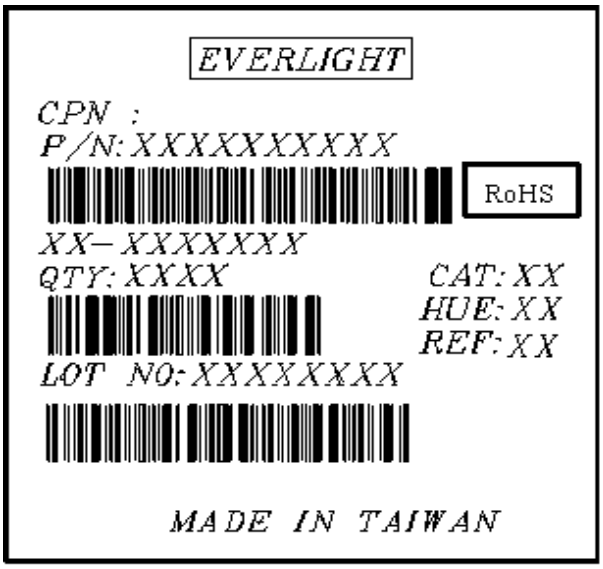
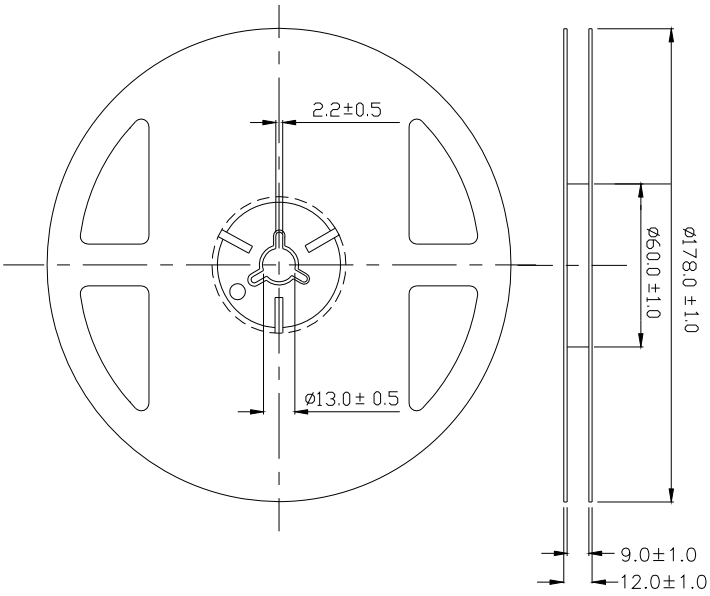
Label Explanation

- **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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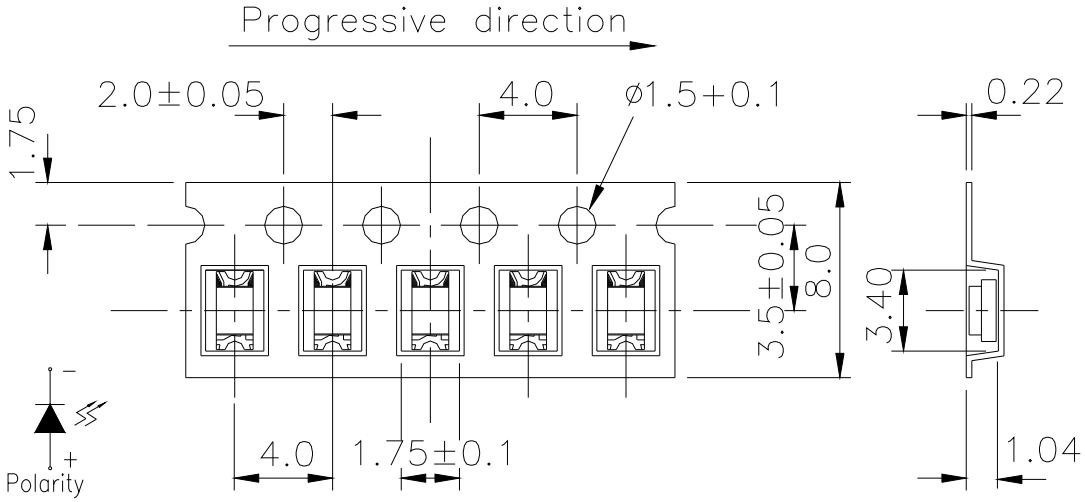
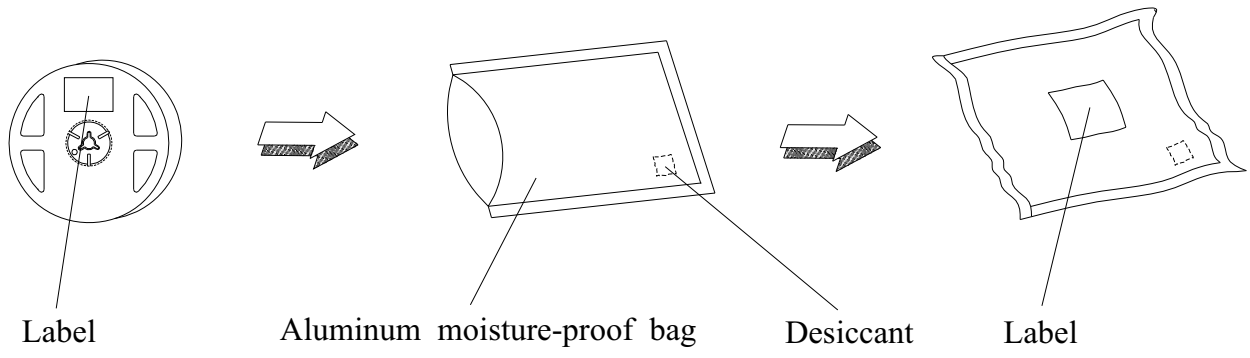
Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel



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

Moisture Resistant Packaging Process and Materials



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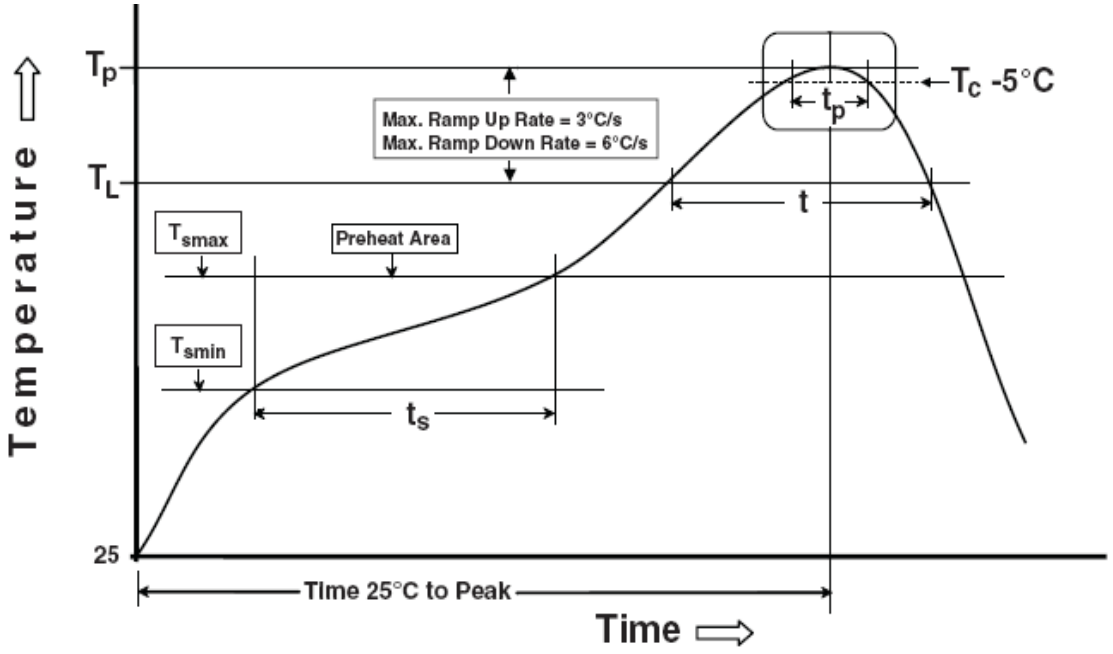
Precautions for Use

1. Soldering Condition

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

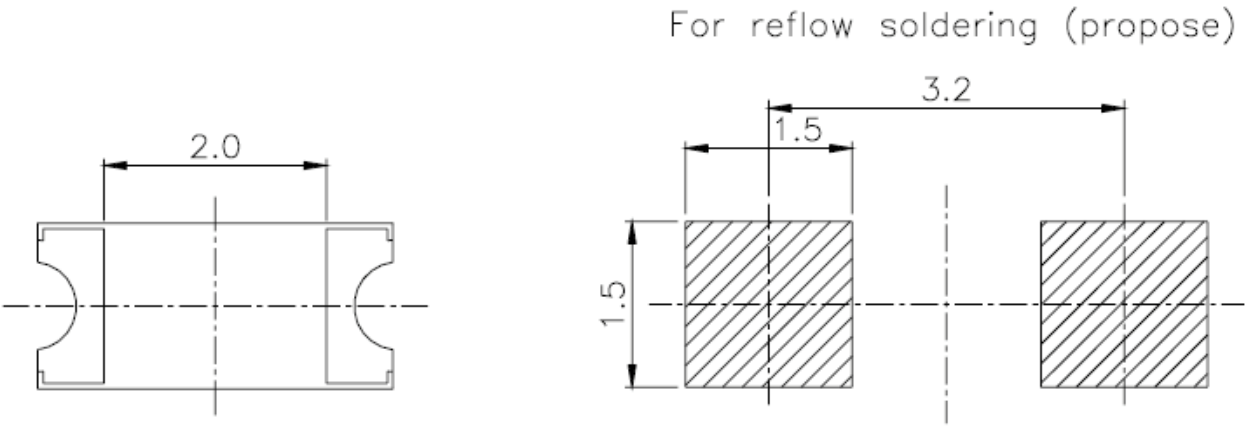


Note: Reference: IPC/JEDEC J-STD-020D

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.

(B) Recommend soldering pad



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

1. 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.