

## Technical Data Sheet

### Reverse Package Chip LED

**23-21-S2C-E0N1P1L0B-2A-AM(ELJ)**

#### Lead (Pb) Free Product - RoHS Compliant



#### Feature

- RoHS compliant.
- Chip LED package.
- Colorless clear resin.
- Wide viewing angle 130°.
- Brightness: 28.0 to 56.0 mcd at 5 mA.
- Qualification according to AEC-Q101.
- Precondition: Bases on JEDEC J-STD 020 Level 3.
- 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.
- General applications.

#### Device Selection Guide

Chip	Emitted Color	Resin Color
Material		
AlGaInP	Brilliant Orange	Water Clear

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#### Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse Voltage	$V_R$	12	V
Forward Current	$I_F$	30	mA
Peak Forward Current (Duty 1/10 @1KHz)	$I_{FP}$	60	mA
Power Dissipation	$P_d$	60	mW
Junction Temperature	$T_j$	125	°C
Operating Temperature	$T_{opr}$	-40 ~ +100	°C
Storage Temperature	$T_{stg}$	-40 ~ +110	°C
Thermal resistance	$R_{th\ J-A}$	800	K/W
	$R_{th\ J-S}$	450	K/W
Soldering Temperature	$T_{sol}$	Reflow Soldering : 260 °C for 30 sec. Hand Soldering : 350 °C 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°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	$I_v$	28.0	-----	56.0	mcd	$I_F=5mA$
Viewing Angle	$2\theta_{1/2}$	-----	130	-----	deg	$I_F=5mA$
Peak Wavelength	$\lambda_p$	-----	611	-----	nm	$I_F=5mA$
Dominant Wavelength	$\lambda_d$	600.5	-----	609.5	nm	$I_F=5mA$
Spectrum Radiation Bandwidth	$\Delta\lambda$	-----	17	-----	nm	$I_F=5mA$
Forward Voltage	$V_F$	1.70	-----	2.30	V	$I_F=5mA$
Reverse Current	$I_R$	-----	-----	10	$\mu A$	$V_R=12V$
Temperature coefficient of $\lambda_p$	$TC_{\lambda_p}$	-----	0.06	-----	nm/K	$I_F=5mA$
Temperature coefficient of $\lambda_d$	$TC_{\lambda_d}$	-----	0.4	-----	nm/K	$I_F=5mA$
Temperature coefficient of $V_F$	$TC_V$	-----	-2.3	-----	mV/K	$I_F=5mA$

Note:

Tolerance of Luminous Intensity:  $\pm 11\%$

Tolerance of Dominant Wavelength:  $\pm 1nm$

Tolerance of Forward Voltage:  $\pm 0.1V$

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#### Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
N1	28.0	35.5	mcd	I <sub>F</sub> =5mA
N2	35.5	45.0		
P1	45.0	56.0		

Note

Tolerance of Luminous Intensity : ±11%

#### Bin Range of Dominant Wavelength

Bin Code	Min.	Max.	Unit	Condition
D8	600.5	603.5	nm	I <sub>F</sub> =5mA
D9	603.5	606.5		
D10	606.5	609.5		

Note:

Tolerance of Dominant Wavelength: ±1nm

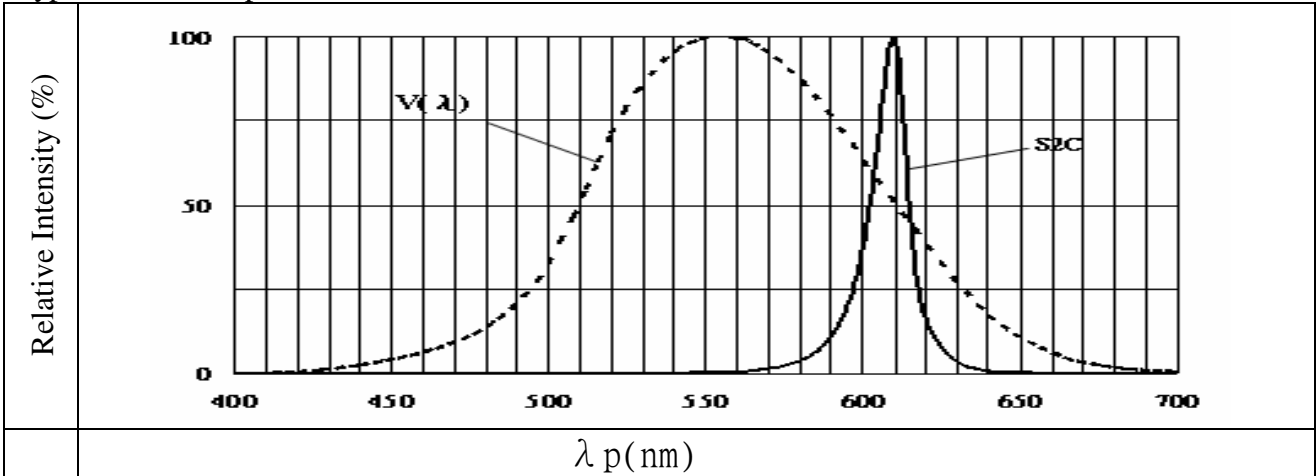
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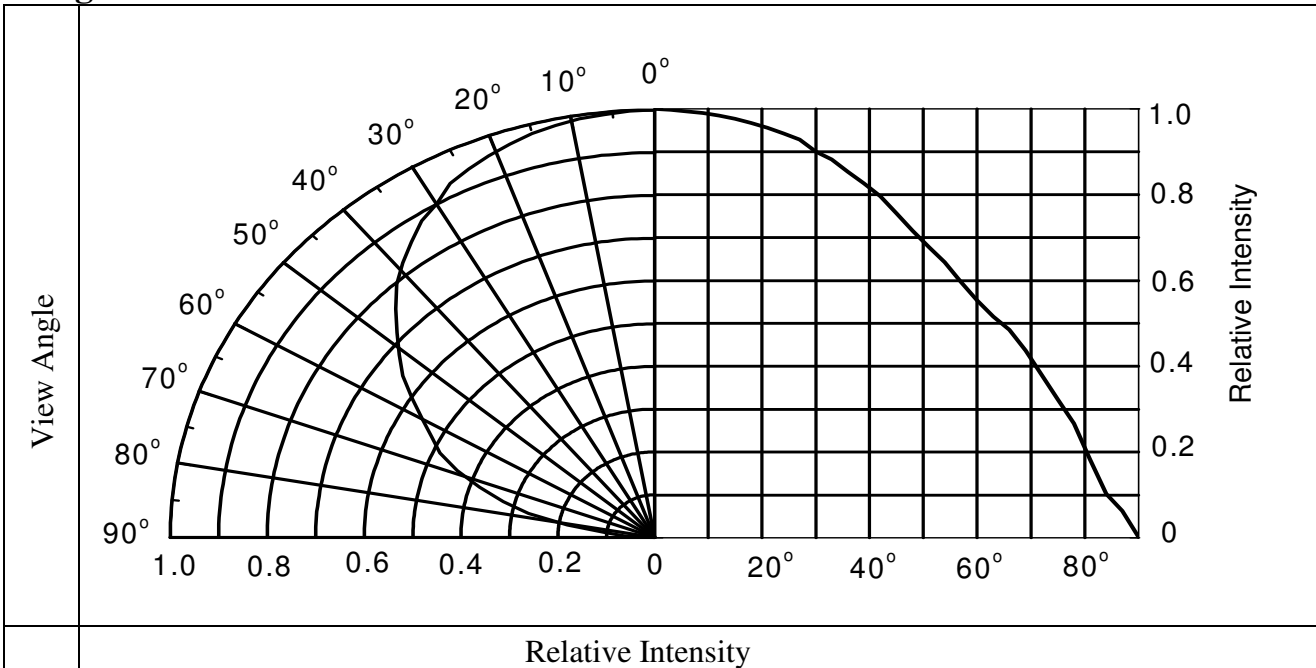
**Typical Electro-Optical Characteristics Curves**

Typical curve of spectral distribution:



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

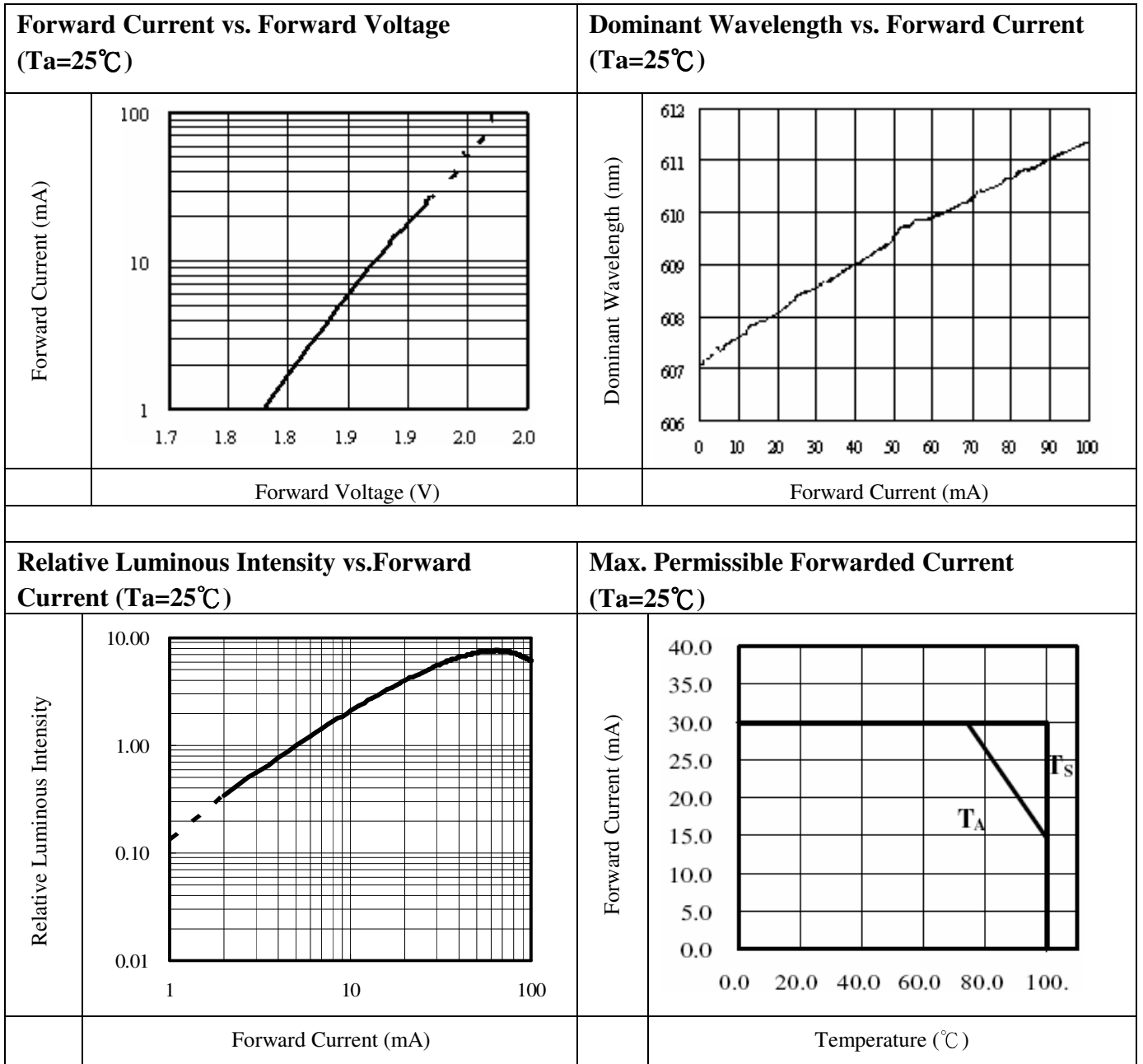
**Diagram characteristics of radiation**



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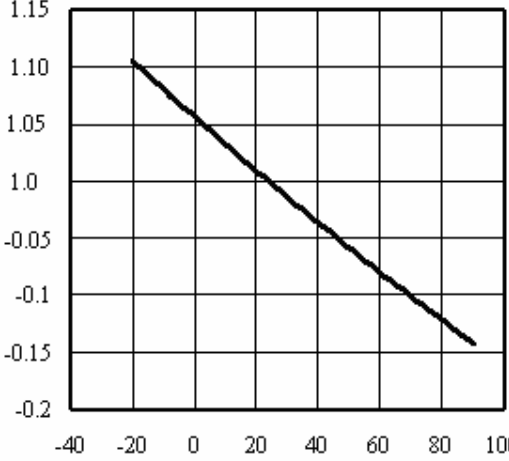
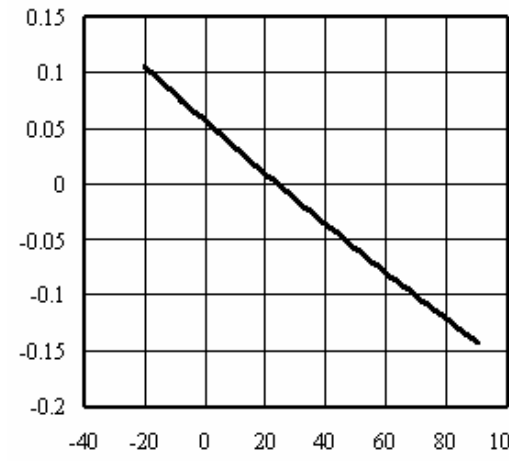
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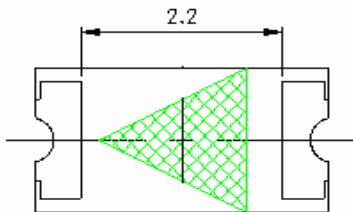
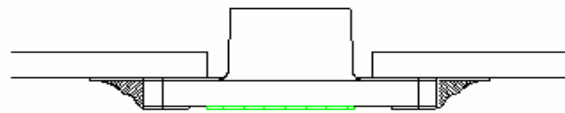
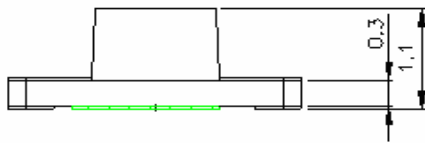
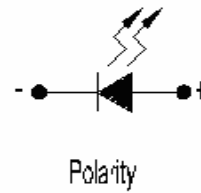
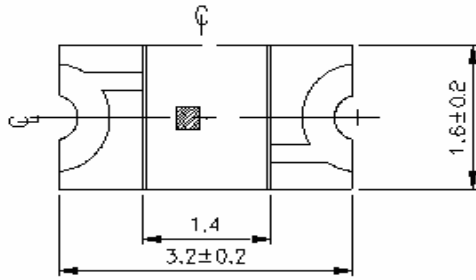
Relative Luminous Intensity vs. Junction Temperature		Relative Forward Voltage vs. Junction Temperature	
Relative Luminous Intensity		Relative Forward Voltage	
	Junction Temperature (°C)		Junction Temperature (°C)
Note: $f(T_j) = I_v / I_v(25^\circ\text{C}); I_F = 20\text{mA}$		Note: $\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 20\text{mA}$	

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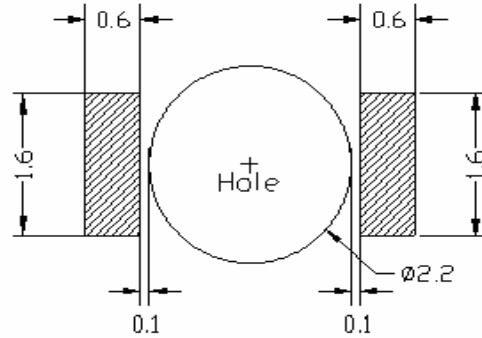
**Reverse Package Chip LED**

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**Package Dimension**



For reflow soldering (Propose)



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

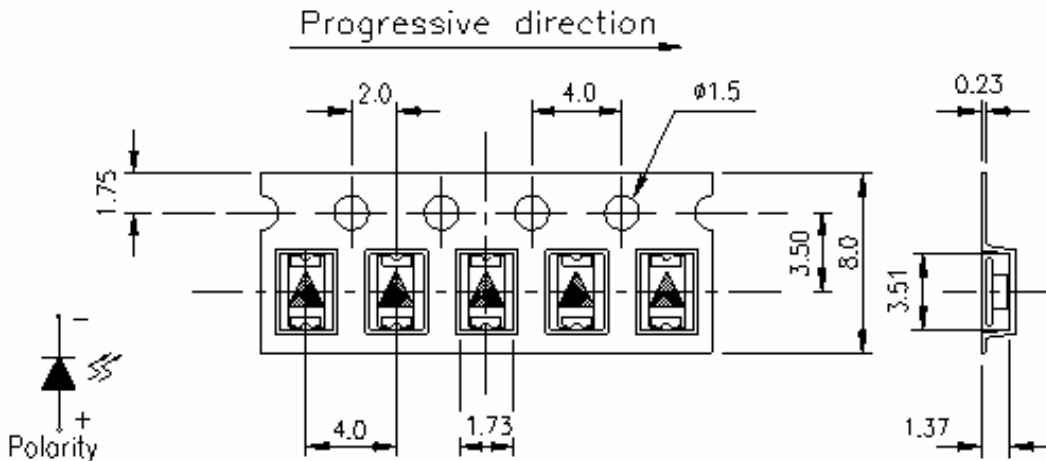


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**Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel**



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

**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

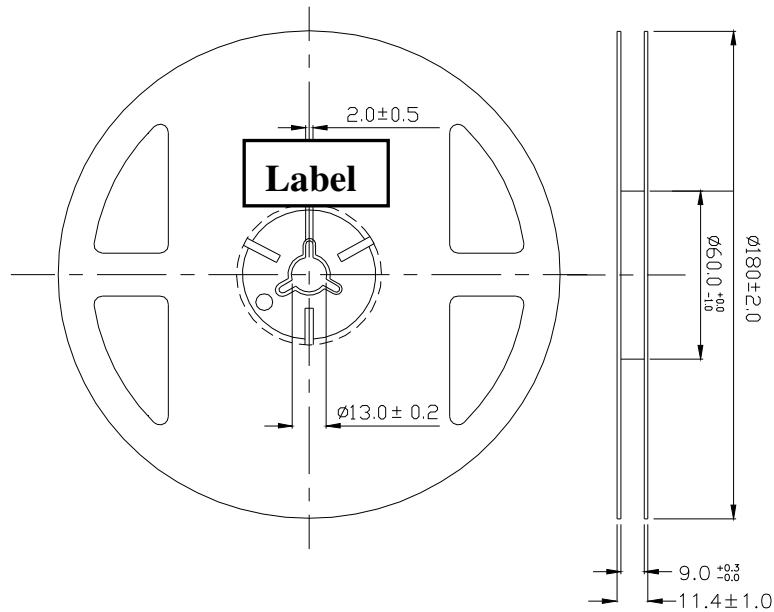


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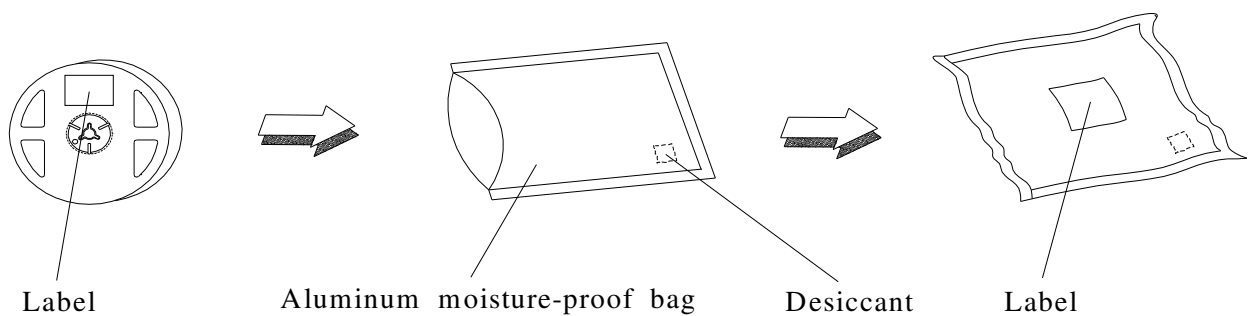
**23-21-S2C-E0N1P1L0B-2A-AM(ELJ)**

**Reel Dimensions**



Note: Unit = mm

**Moisture Resistant Packaging Process and Materials**



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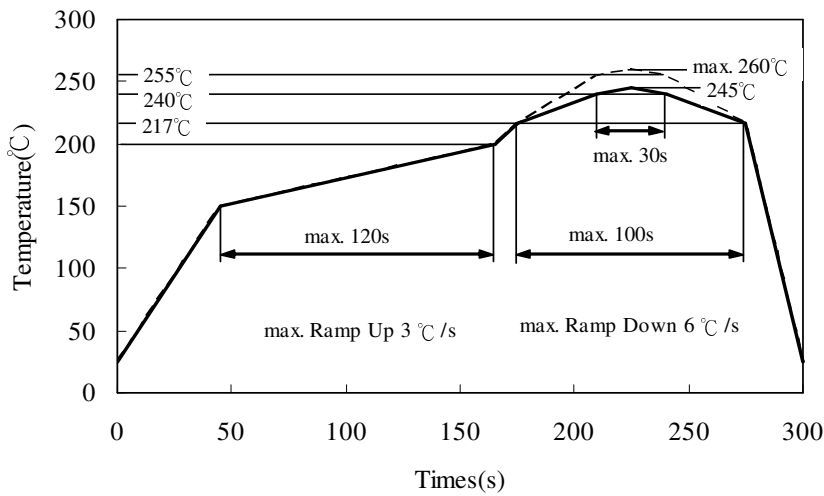
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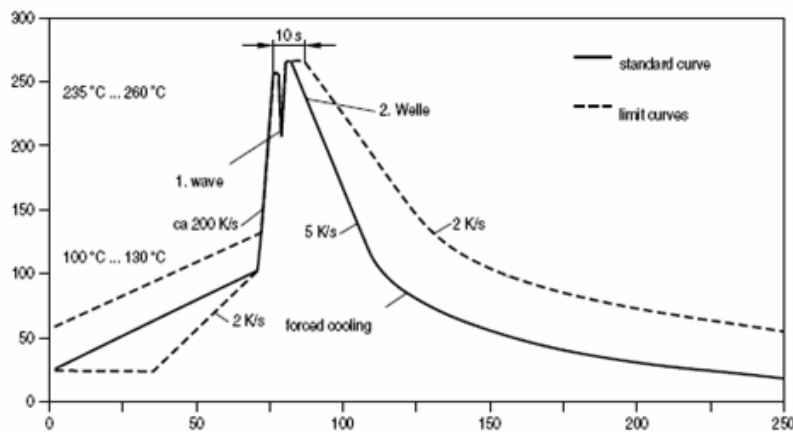
**Precautions for Use**

**1. Soldering Condition (Reference: IPC/JEDEC J-STD-020D)**

**a. IR reflow**



**b. Wave soldering reflow**

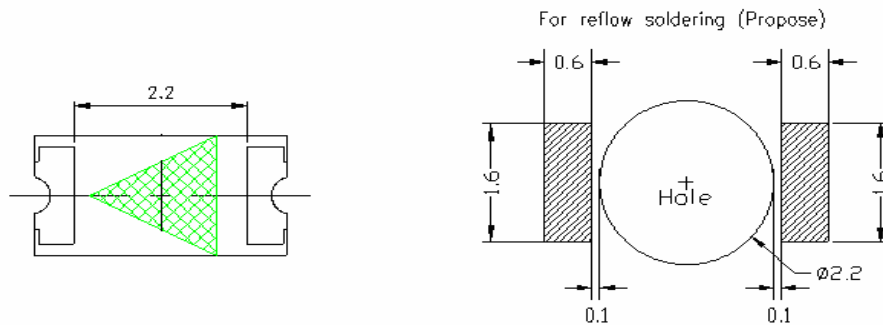


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(B) Recommend soldering pad



Note: Tolerances unless mentioned  $\pm 0.1$ 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  $30^{\circ}\text{C}$  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.  $60^{\circ}\text{deg}$   $\pm 5^{\circ}\text{deg}$  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  $350^{\circ}\text{C}$ , 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

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.

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#### Revision History:

Rev.	Modified date	File modified contents
1	2010/11/17	New Spec
2	2010/12/7	Customers have recognized that the official version was replaced.