

### SMD ■ Side View LEDs EAPL4040WA1-AM

PRELIMINARY



#### Features

- RoHS compliant.
- P-LCC-4 package.
- Color diffused resin.
- Wide viewing angle 120°.
- Inner reflector and white package.
- Brightness: 1120 to 2240 mcd at 20mA.
- Qualification according to AEC-Q101.
- Precondition: Bases on JEDEC J-STD 020 Level 3.
- Useable in severe lead free processes with automotive reflow profile (IR reflow or wave soldering)

#### Applications

- Automotive backlighting or indicator: Dashboard, LCD, signal switch, keys, display, symbol luminaire, 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
Reverse Voltage	VR	5	V
Forward Current	IF	30	mA
Peak Forward Current (Duty 1/10 @1KHz)	IFP	100	mA
Power Dissipation	Pd	110	mW
Electrostatic Discharge(HBM)	ESD	2000	V
Operating Temperature	Topr	-40 ~ +100	°C
Storage Temperature	Tstg	-40 ~ +110	°C
Soldering Temperature	Tsol	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.	Units	Condition
Luminous Intensity	I <sub>v</sub>	1120	-----	2240	mcd	I <sub>F</sub> =20mA
Viewing Angle	2θ1/2	--	120	--	deg	I <sub>F</sub> =20mA
Forward Voltage	V <sub>F</sub>	2.75	-----	3.65	V	I <sub>F</sub> =20mA

Note:

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

### Bin Range of Luminous Intensity

Bin	Min	Max	Unit	Condition
AA	1120	1400	mcd	I <sub>F</sub> =20mA
AB	1400	1800		
BA	1800	2240		

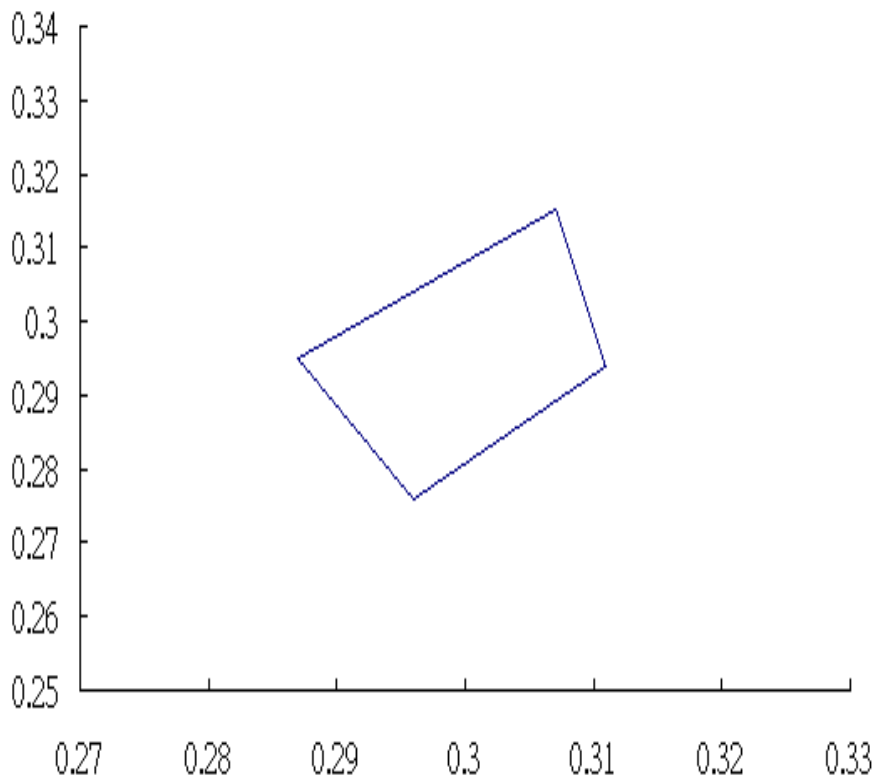
Note:

Tolerance of Luminous Intensity: ±11%

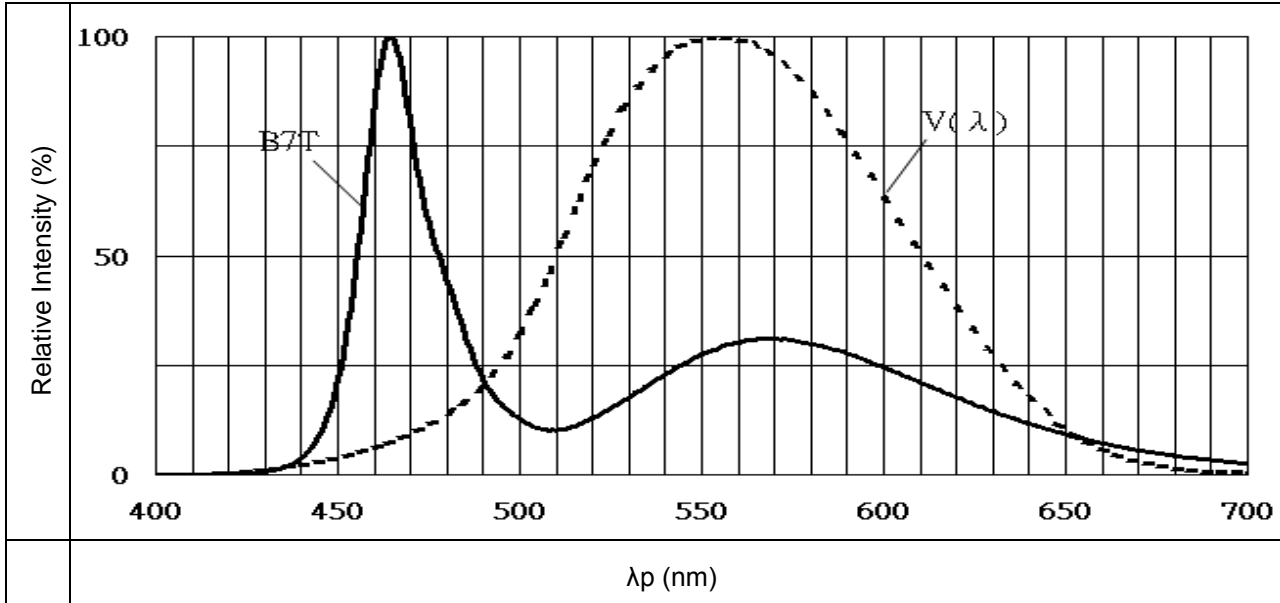
**Bin Range Of Chromaticity Coordinates**

Bin Code	CIE_x	CIE_y	Condition
BE	0.296	0.276	I <sub>F</sub> =20mA
	0.287	0.295	
	0.307	0.315	
	0.311	0.294	

**Notes:**  
 Tolerance of Chromaticity Coordinates: ±0.01

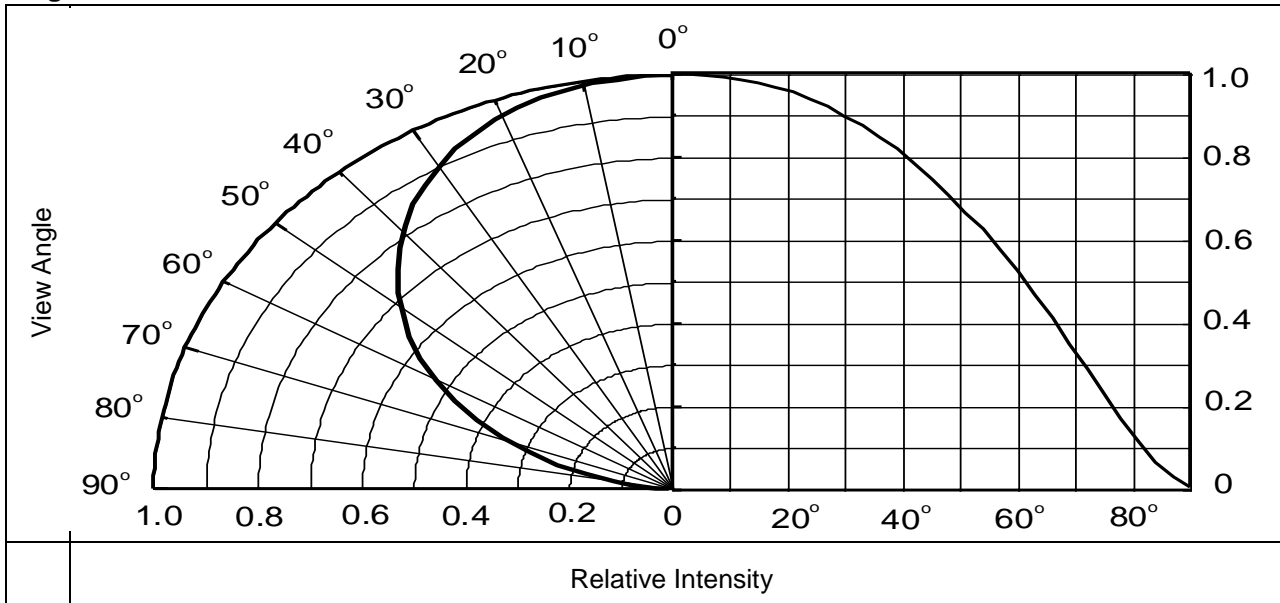


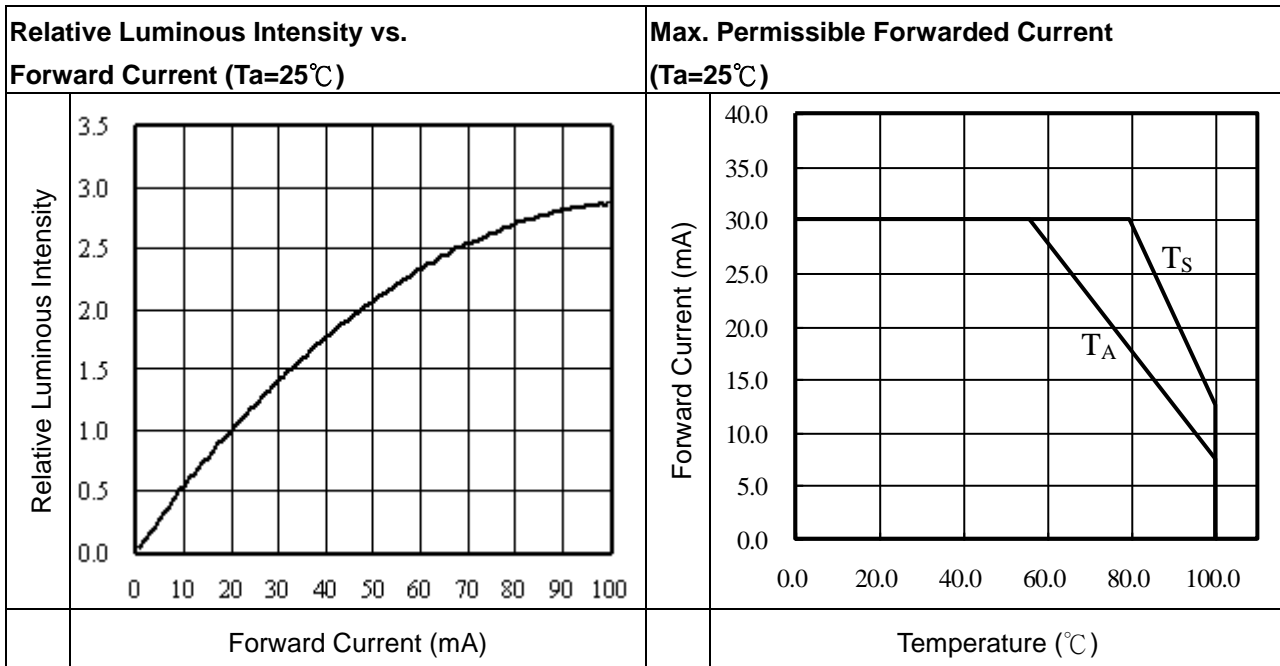
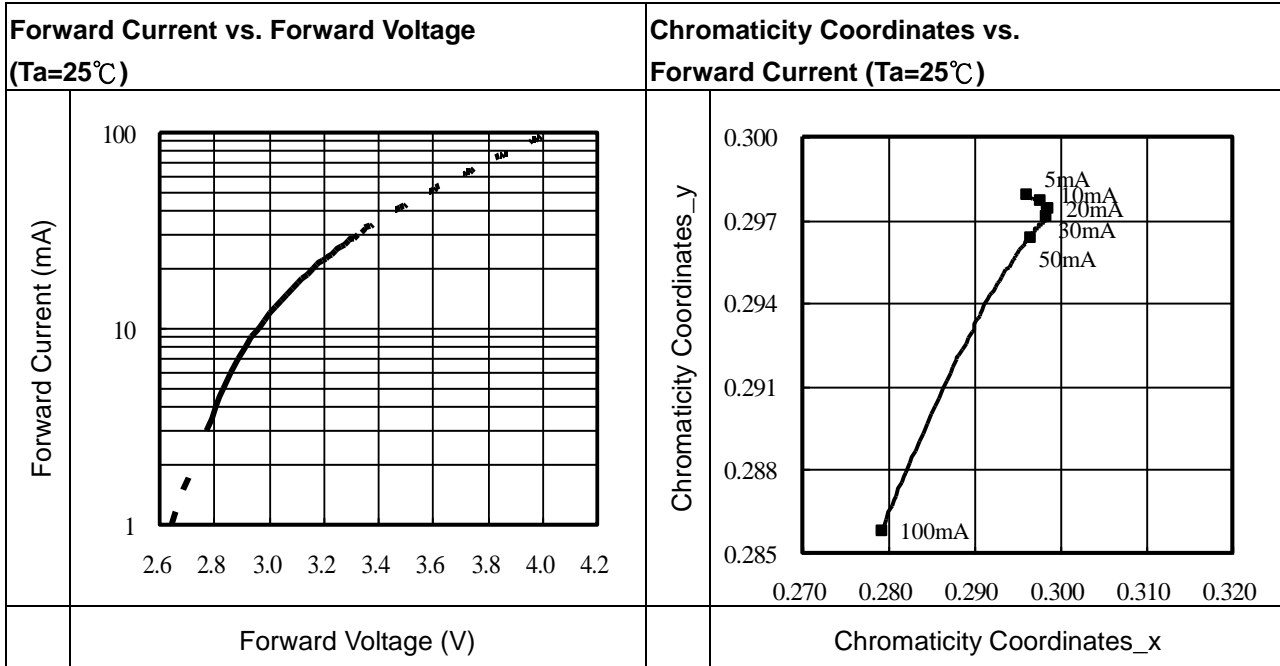
**Typical Electro-Optical Characteristics Curves**



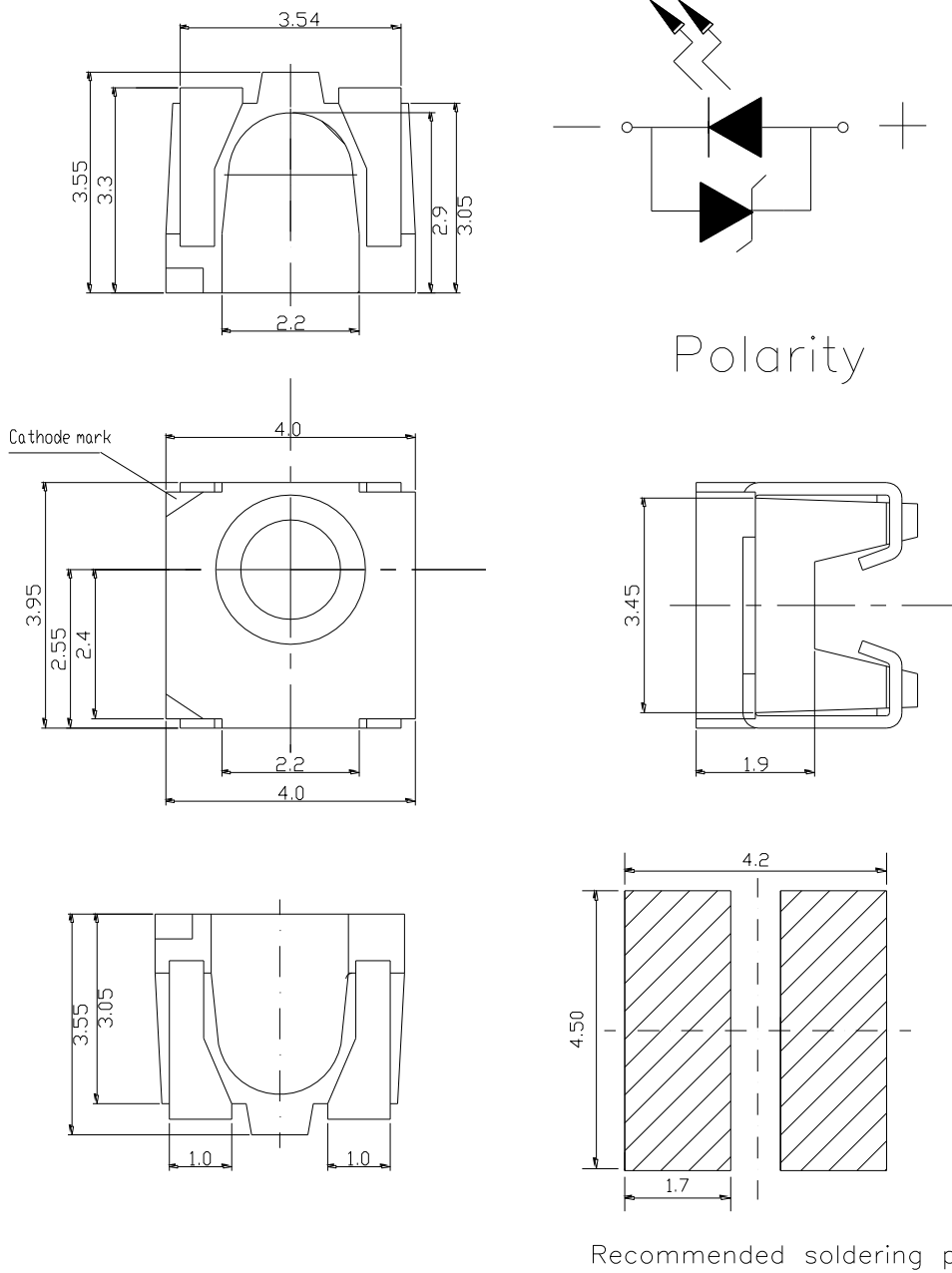
Note:  $V(\lambda)$ =Standard eye response curve;  $I_F = 20\text{mA}$

**Diagram Characteristics of Radiation**





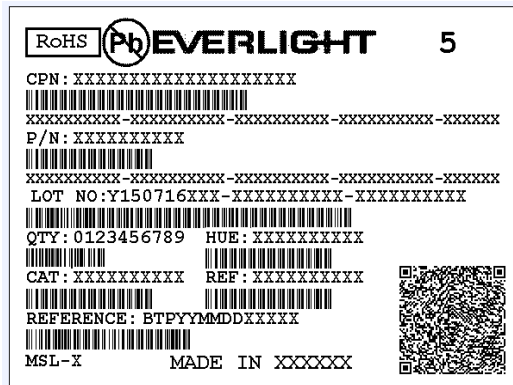
## Package Dimension



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

## Moisture Resistant Packing Materials

### Label Explanation



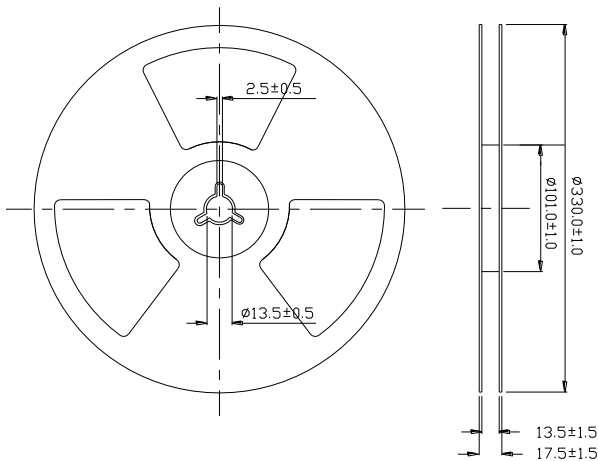
Label explanation

CAT: Luminous Intensity Rank

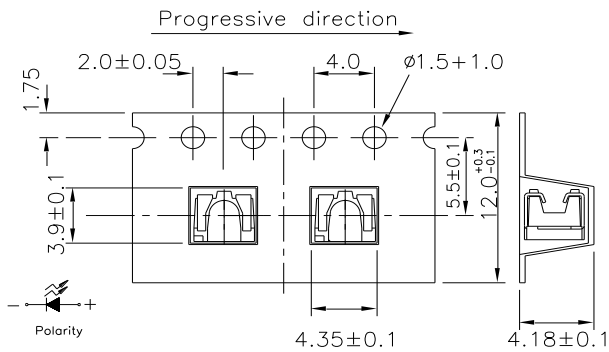
HUE: Chromaticity Coordinates

REF: Forward Voltage Rank

### Reel Dimensions



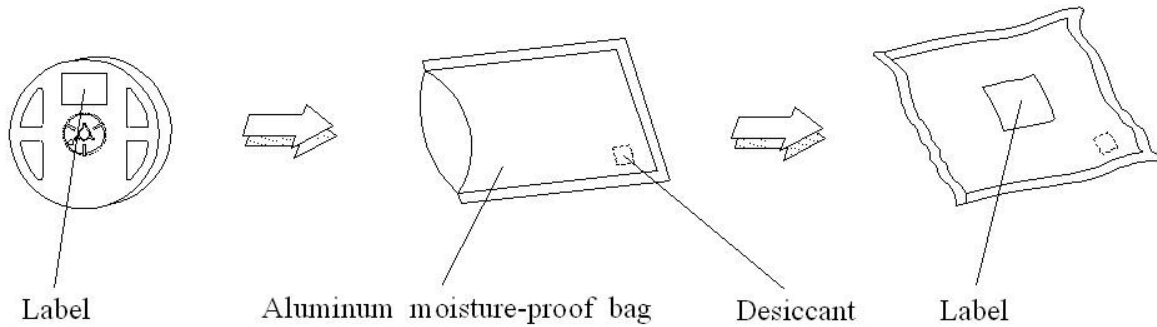
### Carrier Tape Dimensions: Loaded Quantity 500 pcs Per Reel



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



## Moisture Resistant Packing Process

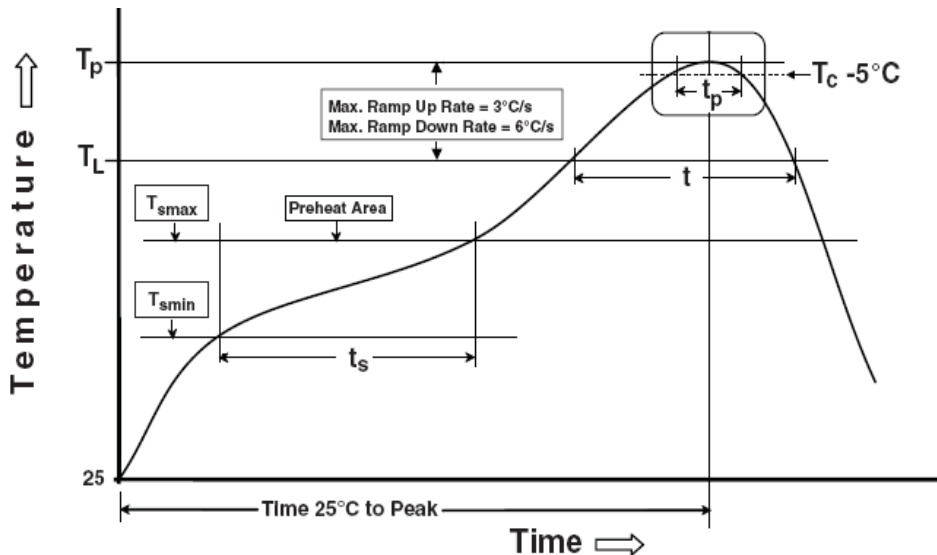


Note: Tolerances unless mentioned  $\pm 0.1\text{mm}$ . Unit = mm

### Precautions for Use

#### 1. Soldering Condition

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



Note:

#### 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:  $T_p - 5^\circ\text{C}$

30 s

Ramp- Down Rate from Peak Temperature

6°C /second max.

Time 25°C to peak temperature

8 minutes max.

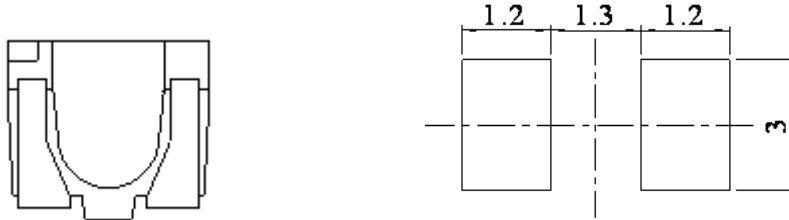
Reflow times

3 times

Reference: IPC/JEDEC J-STD-020D

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

(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°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.