

**Technical Data Sheet****Top View LEDs****67-21-B3T-Q8R1S2M0E-2T8-AM****Lead (Pb) Free Product - RoHS Compliant****Feature**

- RoHS compliant.
- P-LCC-2 package.
- Color diffused resin.
- Wide viewing angle 120°.
- Inner reflector and white package.
- Brightness: 112 to 280 mcd at 20mA.
- Qualification according to AEC-Q101.
- Precondition: Bases on JEDEC J-STD 020 Level 2.
- 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		
InGaN	White	Yellowish



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## Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V <sub>R</sub>	5	V
Forward Current	I <sub>F</sub>	30	mA
Peak Forward Current (Duty 1/10 @1KHz)	I <sub>FP</sub>	100	mA
Power Dissipation	P <sub>d</sub>	120	mW
Junction Temperature	T <sub>j</sub>	125	°C
Operating Temperature	T <sub>opr</sub>	-40 ~ +100	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ +110	°C
Thermal Resistance	R <sub>th J-A</sub>	500	K/W
	R <sub>th J-S</sub>	300	K/W
ESD (Classification acc. AEC Q101)	ESD <sub>HBM</sub>	2000	V
	ESD <sub>MM</sub>	200	V
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering : 260 °C for 30 sec. Hand Soldering : 350 °C for 3 sec.	



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## Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I <sub>v</sub>	112	---	280	mcd	I <sub>F</sub> =20mA
Viewing Angle	2θ <sub>1/2</sub>	---	120	---	deg	I <sub>F</sub> =20mA
Forward Voltage	V <sub>F</sub>	2.75	---	3.95	V	I <sub>F</sub> =20mA
Reverse Current	I <sub>R</sub>	---	---	50	μA	V <sub>R</sub> =5V
Temperature coefficient of V <sub>F</sub>	TC <sub>V</sub>	---	-1.7	---	mV/K	I <sub>F</sub> =20mA

Note:

1. Tolerance of Luminous Intensity: ±11%
2. Tolerance of Forward Voltage: ±0.1V



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## Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
R1	112	140	mcd	I <sub>F</sub> =20mA
R2	140	180		
S1	180	224		
S2	224	280		

Note:

Tolerance of Luminous Intensity: ±11%



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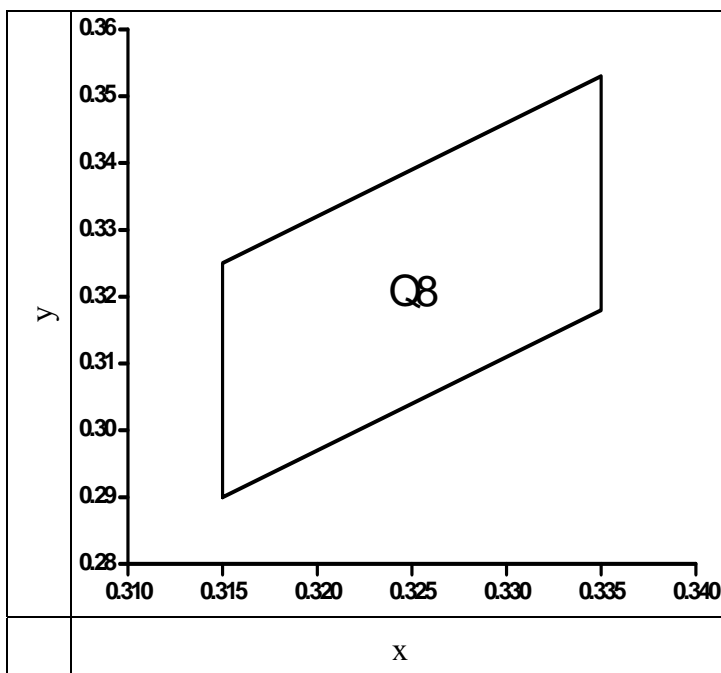
Bin Range of Chromaticity Coordinates

Bin Code	CIE_x	CIE_y	Condition
1	0.315	0.290	I <sub>F</sub> =20mA
	0.315	0.325	
	0.335	0.353	
	0.335	0.318	

Note:

Tolerance of Chromaticity Coordinates: ±0.01.

The C.I.E. 1931 Chromaticity Diagram



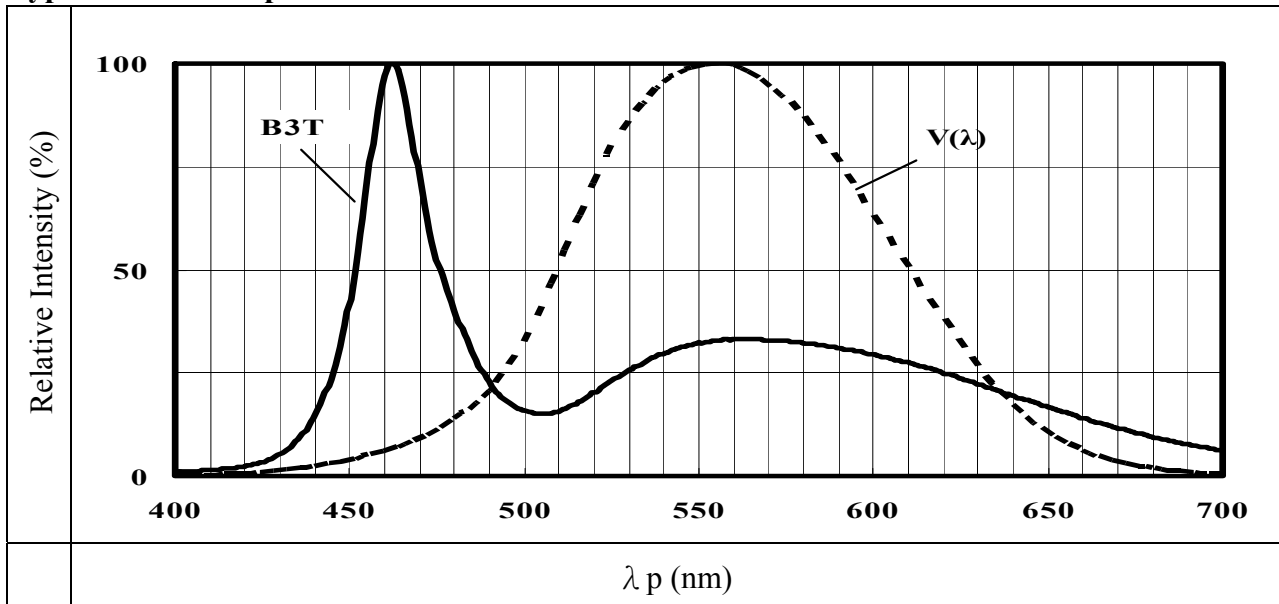
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**67-21-B3T-Q8R1S2M0E-2T8-AM**

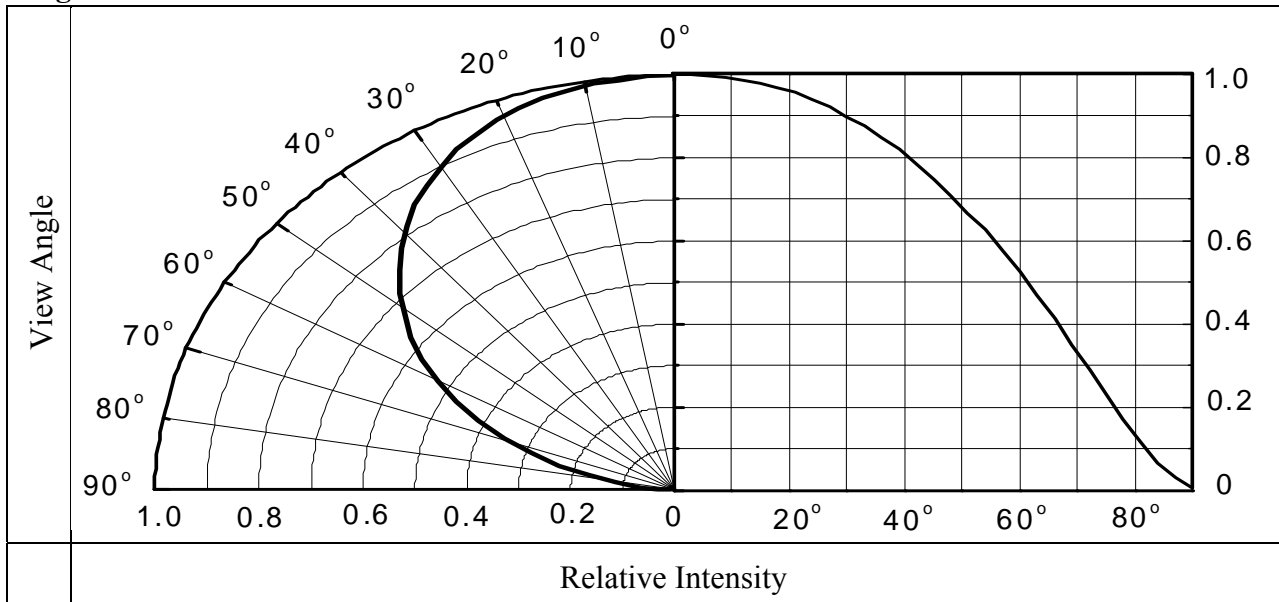
Typical Electro-Optical Characteristics Curves

Typical Curve of Spectral Distribution



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

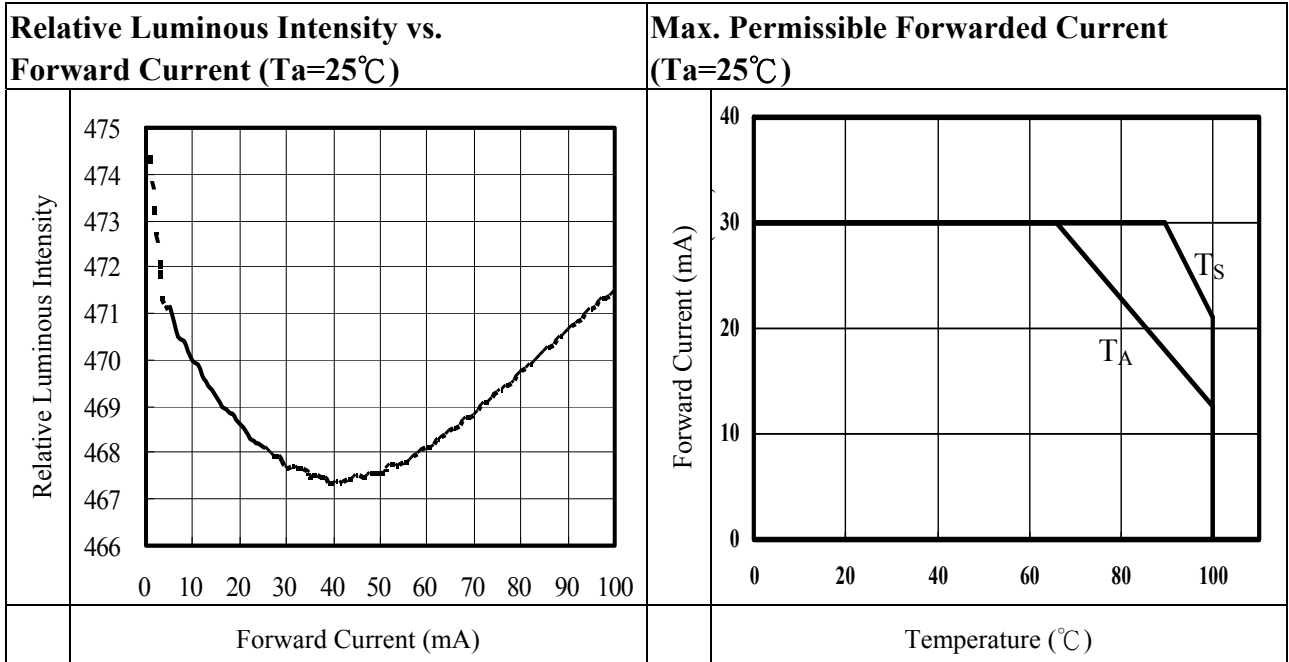
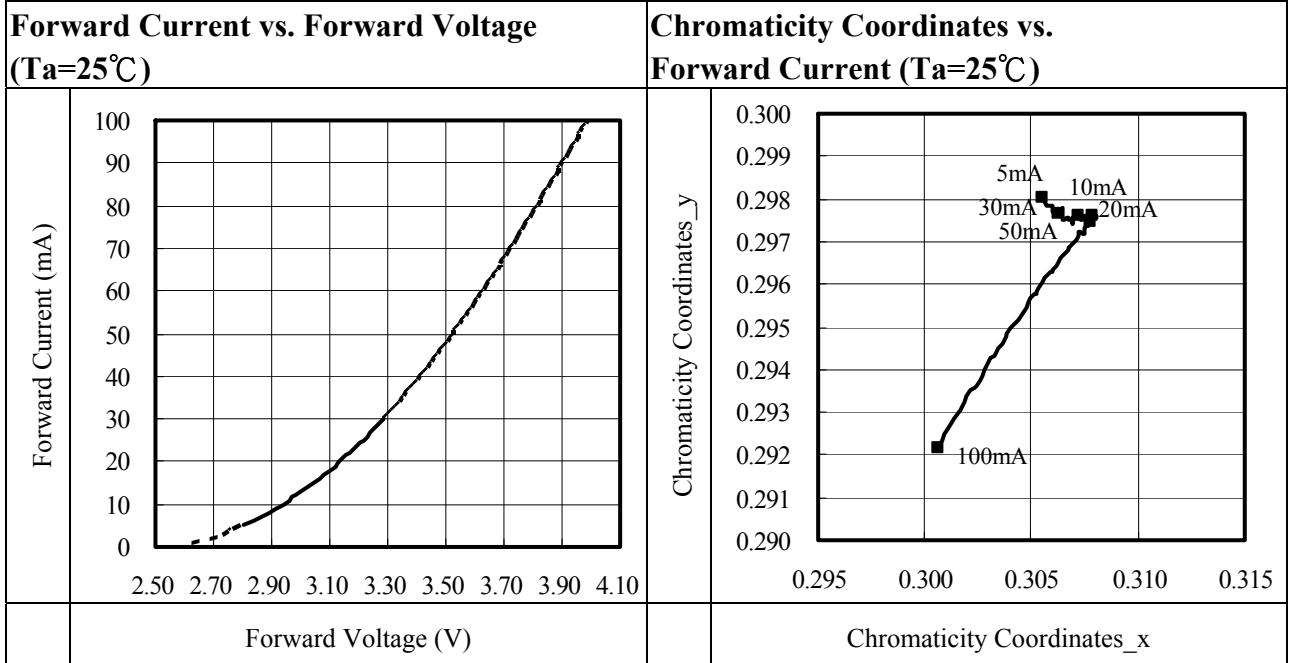
Diagram Characteristics of Radiation



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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: $\Delta V_F = V_F - V_F(25^\circ\text{C}) = f(T_j); I_F = 20\text{mA}$	

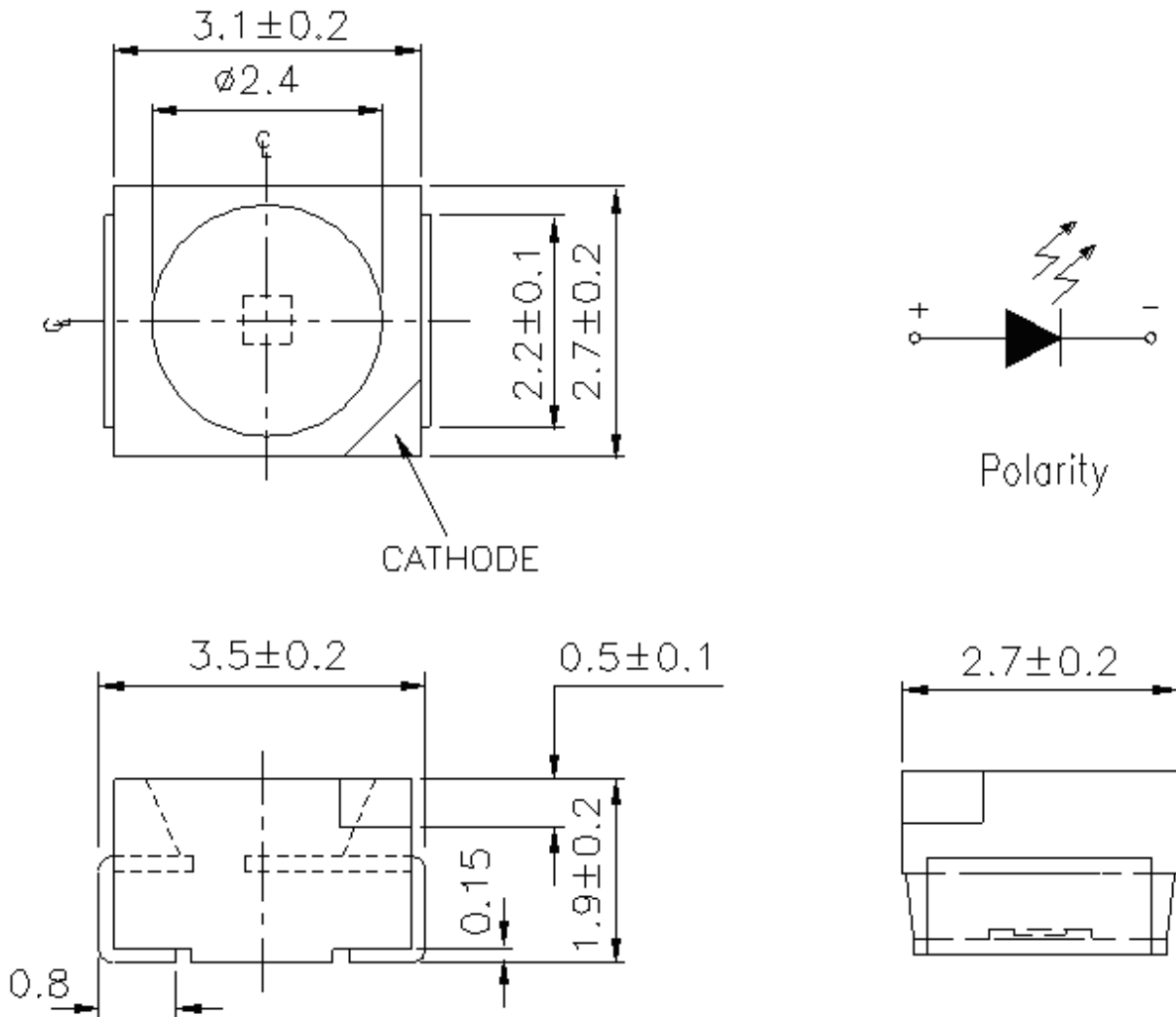


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Package Dimension



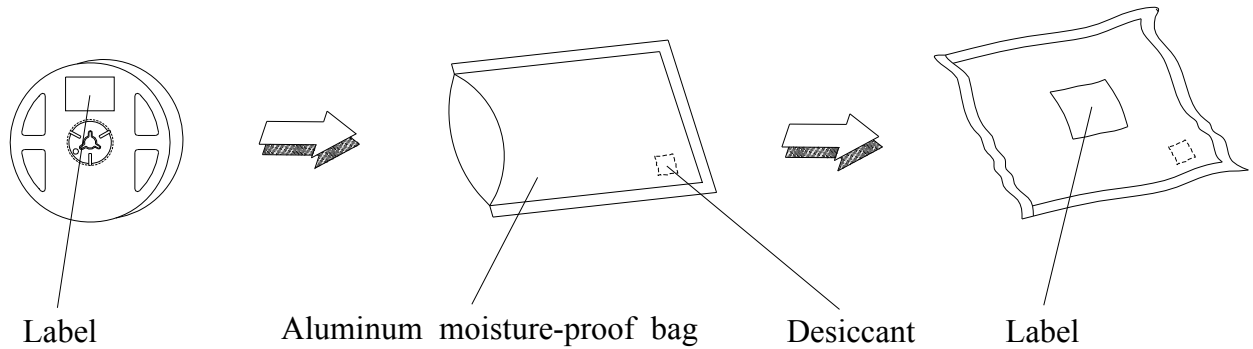
Note: Tolerances unless mentioned  $\pm 0.1$ mm. Unit = mm

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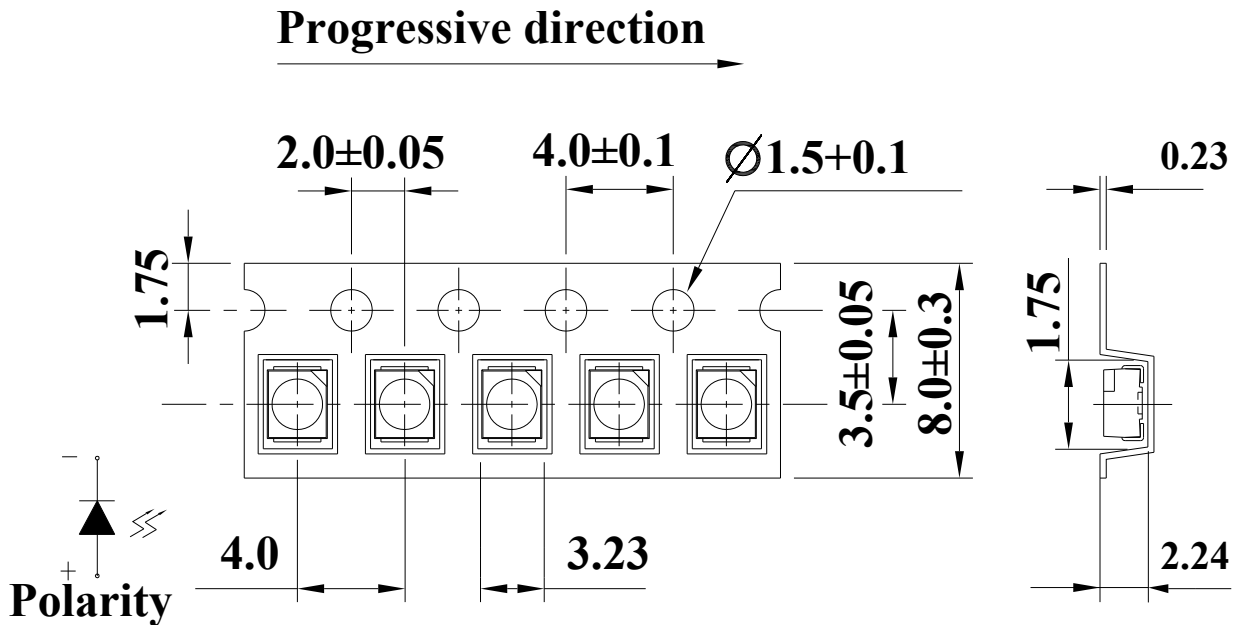
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**Moisture Resistant Packing Process and Materials Process**



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



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

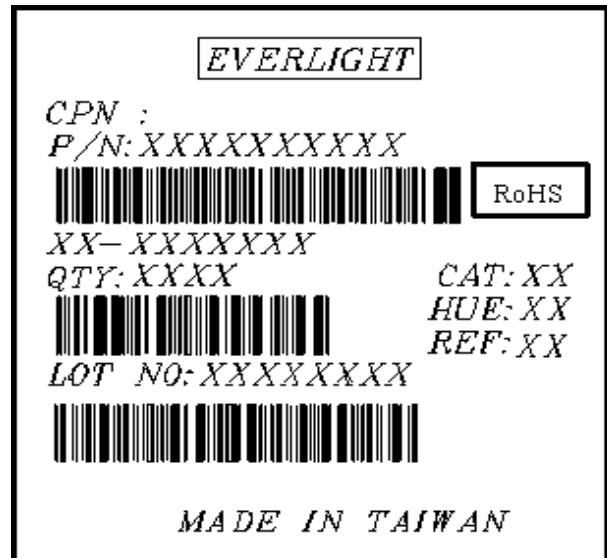
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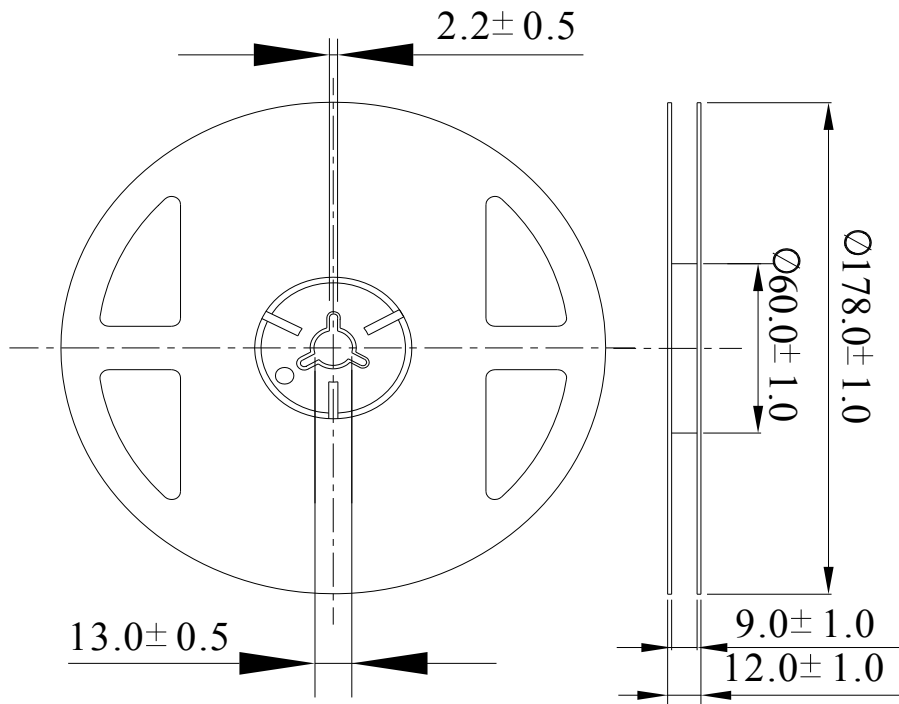
**67-21-B3T-Q8R1S2M0E-2T8-AM**

**Label Explanation**

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



**Reel Dimensions**



Note: Unit = mm

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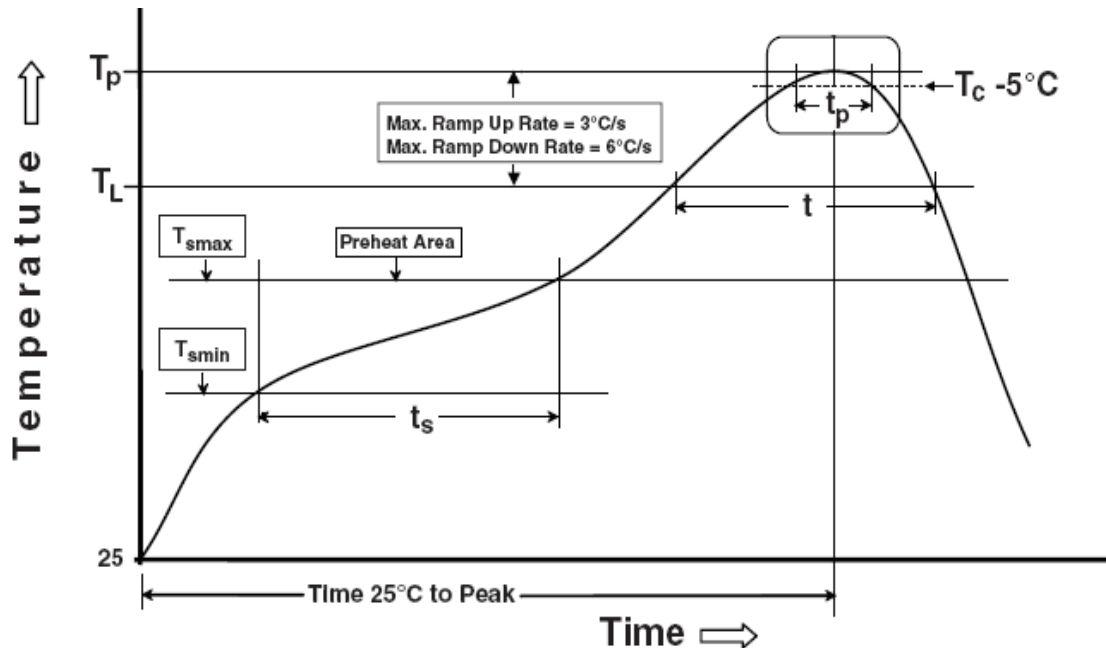
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Precautions for Use

1. Soldering Condition

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



Note:

**Preheat**

Temperature min ( $T_{smin}$ )

Temperature max ( $T_{smax}$ )

Time ( $T_{smin}$  to  $T_{smax}$ ) ( $t_s$ )

Average ramp-up rate ( $T_{smax}$  to  $T_p$ )

**Other**

Liquidus Temperature ( $T_L$ )

Time above Liquidus Temperature ( $t_L$ )

Peak Temperature ( $T_p$ )

Time within 5 °C of Actual Peak Temperature:  $T_p - 5^\circ\text{C}$

Ramp- Down Rate from Peak Temperature

Time 25°C to peak temperature

Reflow times

Reference: IPC/JEDEC J-STD-020D

150 °C

200°C

60-120 seconds

3 °C/second max

217 °C

60-150 sec

260°C

30 s

6°C /second max.

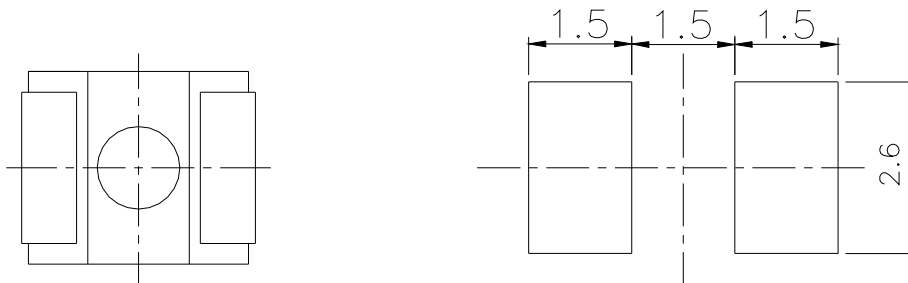
8 minutes max.

3 times

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.

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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**

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.