Technical Data Sheet

Top View LEDs

67-11-BHC-F0Q2S1M0E-2T8-AM

Feature

- RoHS compliant.
- P-LCC-2 package.
- Colorless clear resin.
- Wide viewing angle 120°.
- Inner reflector and white package.
- Brightness: 90 to 224 mcd at 20mA.
- Qualification according to AEC-Q101.
- Precondition: Bases on JEDEC J-STD 020 Level 2.
- 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.
- General applications.

Device Selection Guide

Chip Material	Emitted Color	Resin Color
InGaN	Blue	Water Clear

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Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Rating	Unit
Reverse Voltage	V_R	5	V
Forward Current	I_F	25	mA
Peak Forward Current (Duty 1/10 @1KHz)	I_{FP}	100	mA
Power Dissipation	Pd	95	mW
Junction Temperature	T_j	115	℃
Operating Temperature	T_{opr}	-40 ~ +100	℃
Storage Temperature	Tstg	-40 ~ +110	℃
Thermal Resistance	Rth $_{J-A}$	500	K/W
	Rth $_{J-S}$	300	K/W
ESD (Classification acc. AEC Q101)	ESD_{HBM}	2000	V
	ESD_{MM}	200	V
Soldering Temperature	T_{sol}	Reflow Soldering : 260 ℃ for 30 sec. Hand Soldering : 350 ℃ for 3 sec.	

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Electro-Optical Characteristics (Ta=25℃)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	I_v	90	---	224	mcd	I_F =20mA
Viewing Angle	$2\theta_{1/2}$	---	120	---	deg	I_F =20mA
Peak Wavelength	λ_p	---	468	---	nm	I_F =20mA
Dominant Wavelength	λ_d	464	---	472	nm	I_F =20mA
Spectrum Radiation Bandwidth	$\Delta\lambda$	---	25	---	nm	I_F =20mA
Forward Voltage	V_F	2.75	---	3.95	V	I_F =20mA
Reverse Current	I_R	---	---	50	μA	V_R =5V
Temperature coefficient of λp	$TC_{\lambda p}$	---	0.11	---	nm/K	I_F =20mA
Temperature coefficient of λd	$TC_{\lambda d}$	---	0.04	---	nm/K	I_F =20mA
Temperature coefficient of V_F	TC_V	---	-1.7	---	mV/K	I_F =20mA

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

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Bin Range of Luminous Intensity

Bin Code	Min.	Max.	Unit	Condition
Q2	90	112	mcd	I_F =20mA
R1	112	140		
R2	140	180		
S1	180	224		

Note:
Tolerance of Luminous Intensity: ±11%

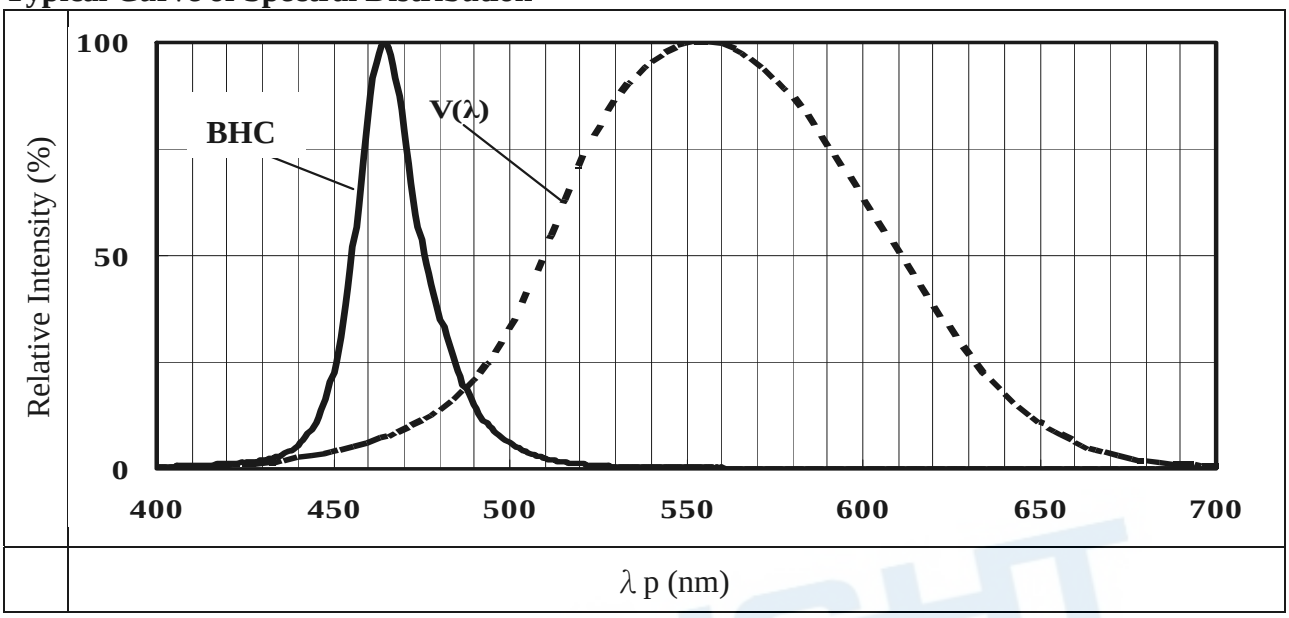
Bin Range of Dominant Wavelength

Bin Code	Min.	Max.	Unit	Condition
AA1	464	466	nm	I_F =20mA
AA2	466	468		
AA3	468	470		
AA4	470	472		

Note:
Tolerance of Dominant Wavelength: ±1nm

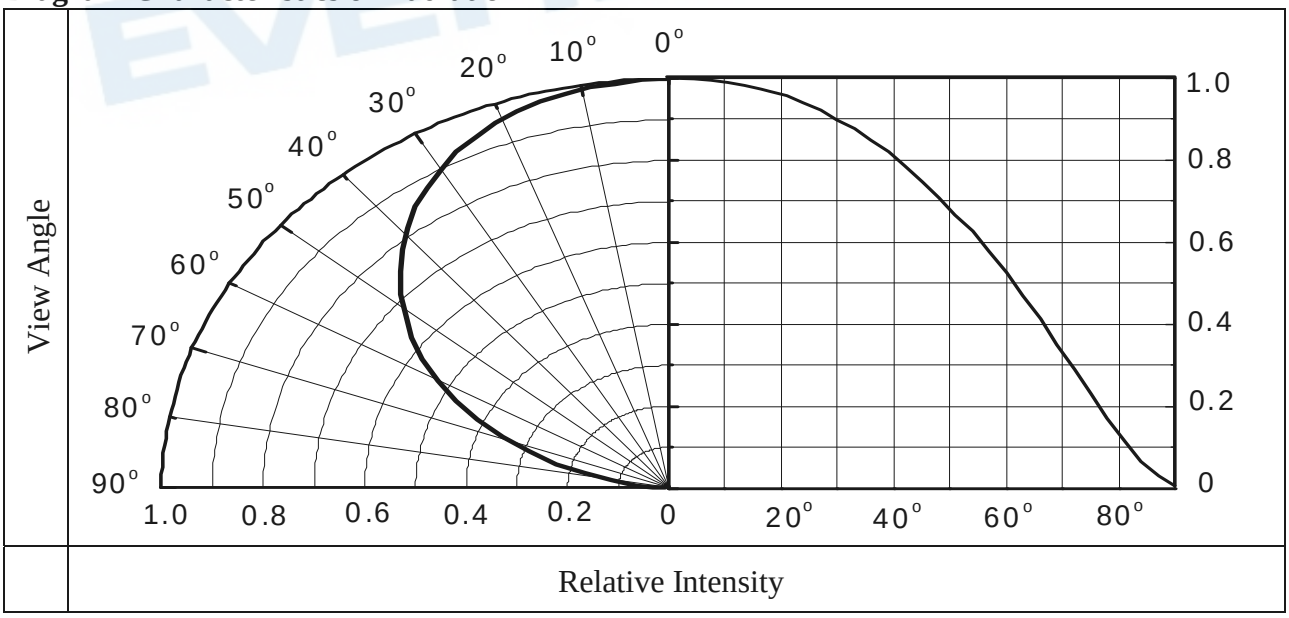
Typical Electro-Optical Characteristics Curves

Typical Curve of Spectral Distribution



Note: V(λ)=Standard eye response curve; I_F =20mA

Diagram Characteristics of Radiation



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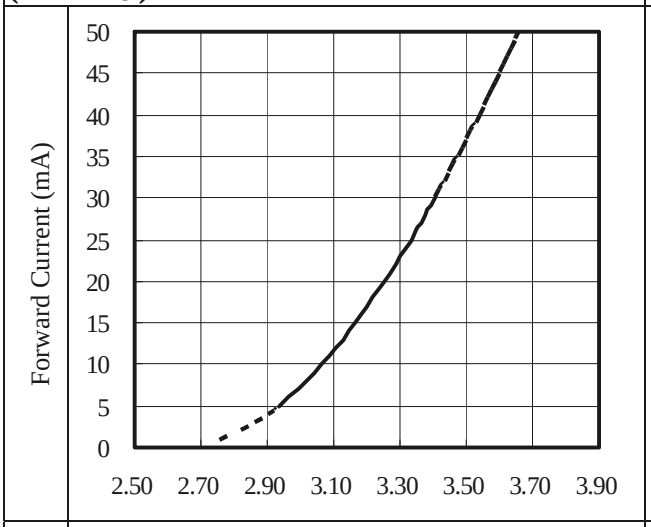
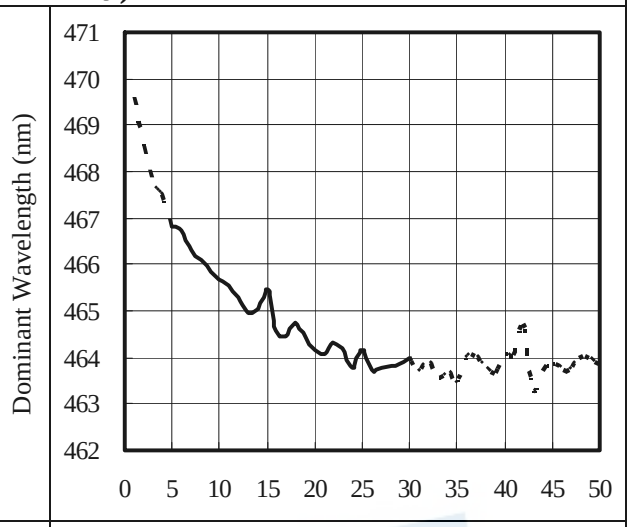
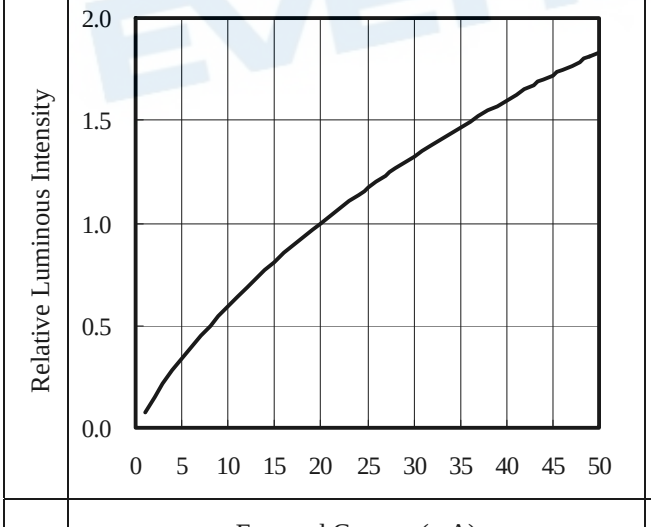
Forward Current vs. Forward Voltage (Ta=25℃)



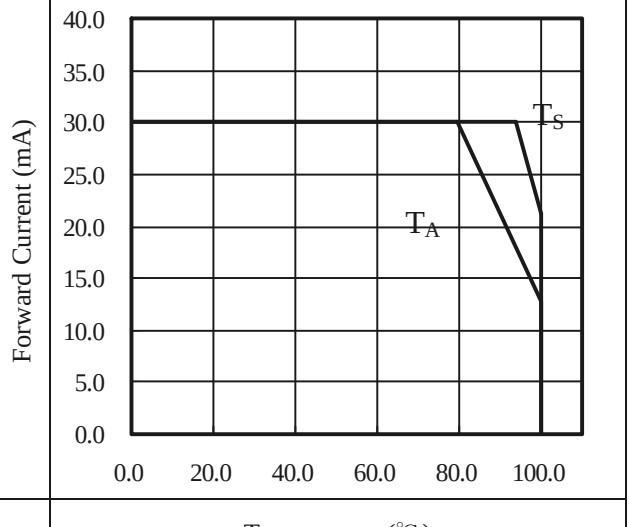
Dominant Wavelength vs. Forward Current (Ta=25℃)



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



Max. Permissible Forwarded Current (Ta=25℃)



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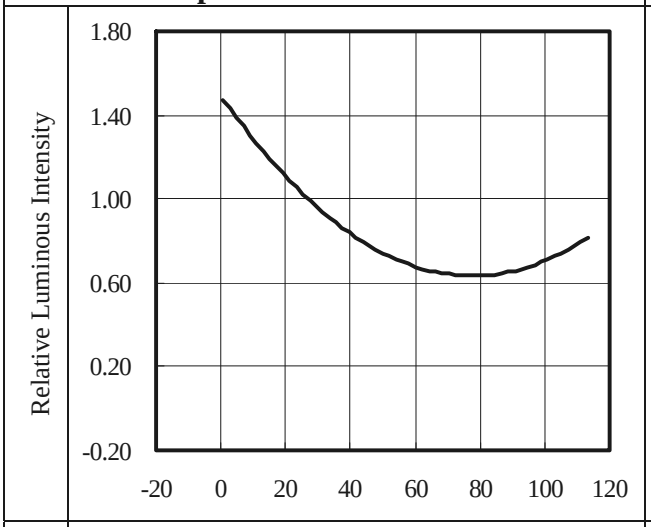
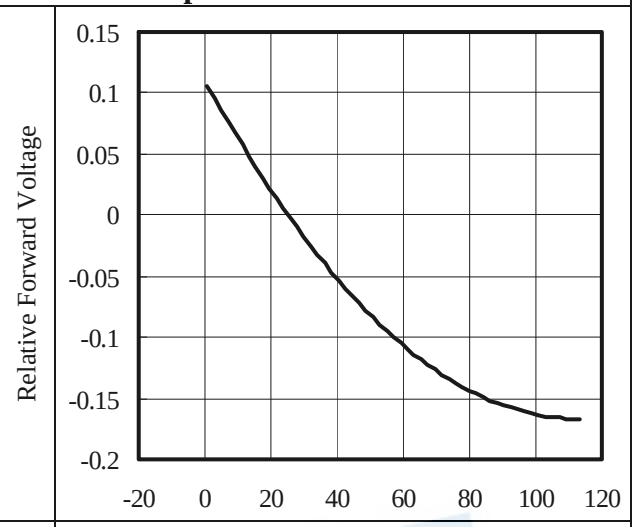
Relative Luminous Intensity vs. Junction Temperature	Relative Forward Voltage vs. Junction Temperature
	
Note: f(Tj) = Iv / Iv(25℃); I_F =20mA	Note: △ V_F = V_F - V_F(25 ℃) = f(Tj); I_F =20mA

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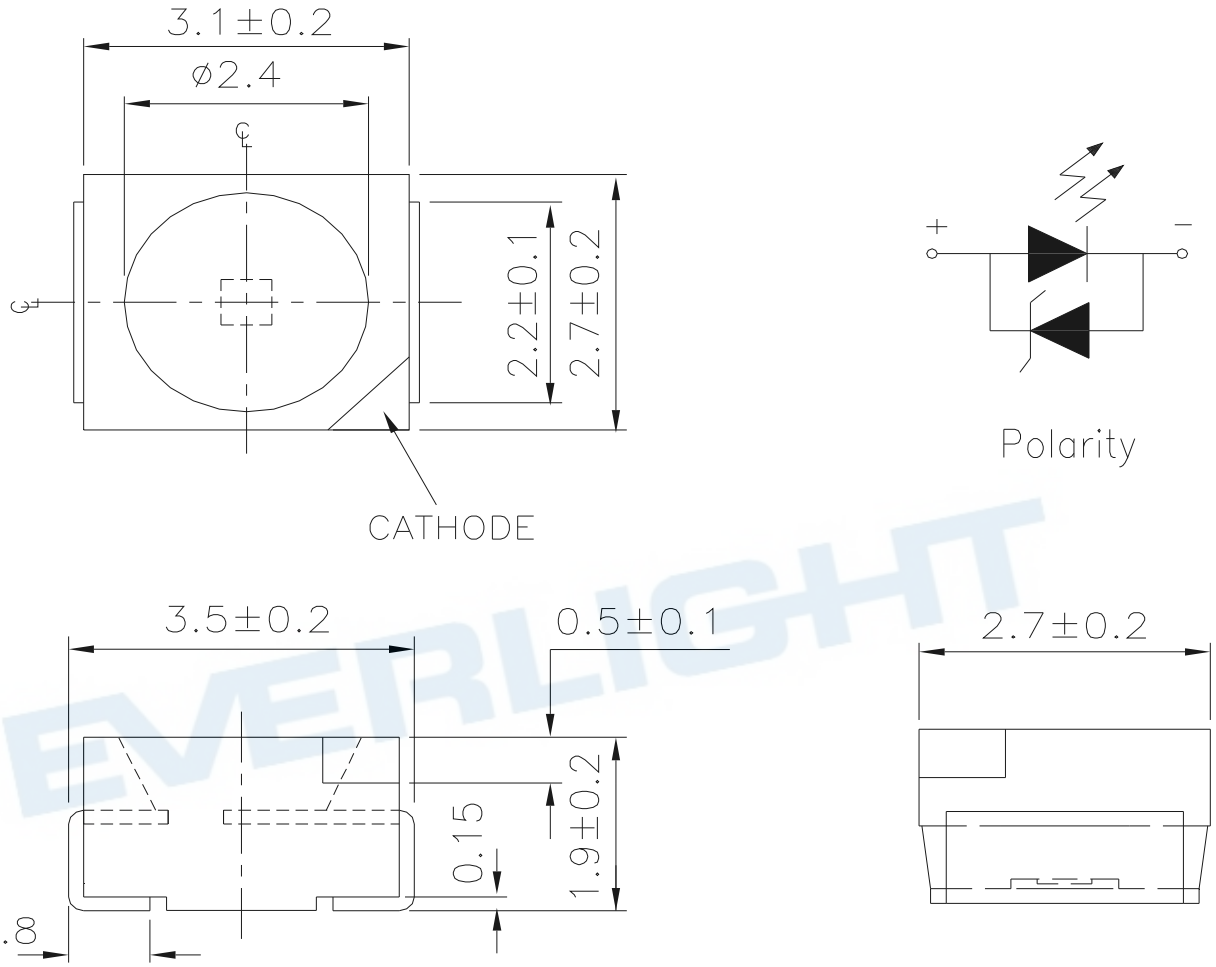
Package Dimension



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

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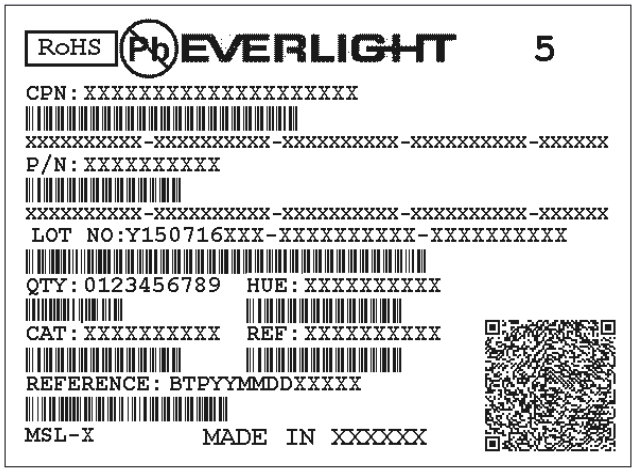
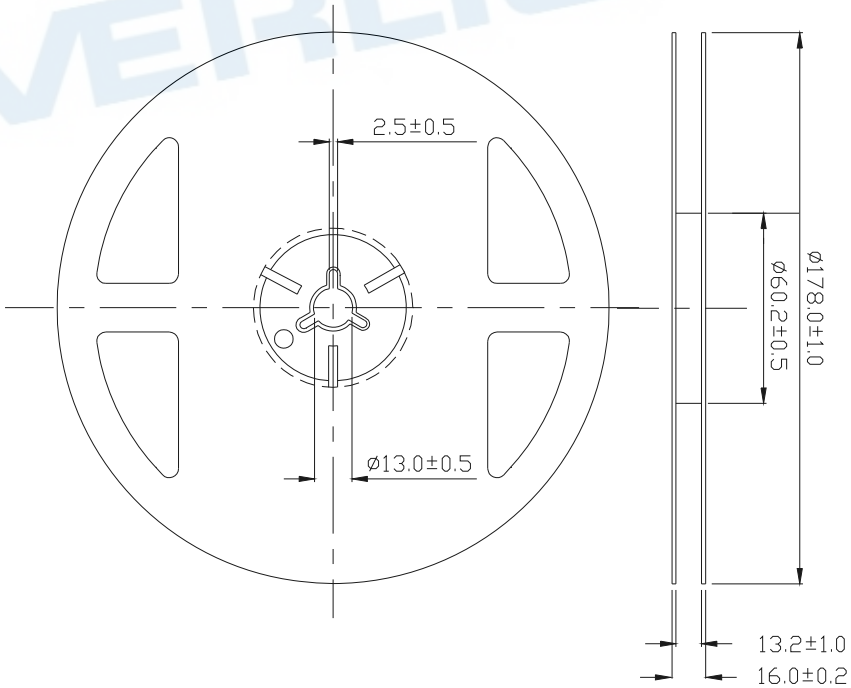
Moisture Resistant Packing Materials

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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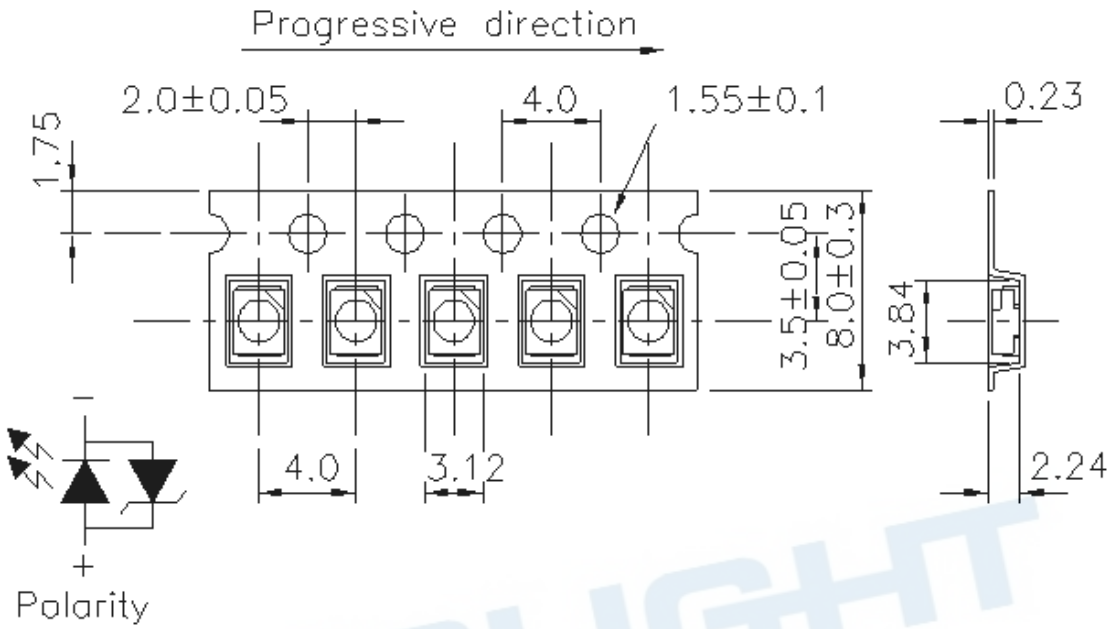
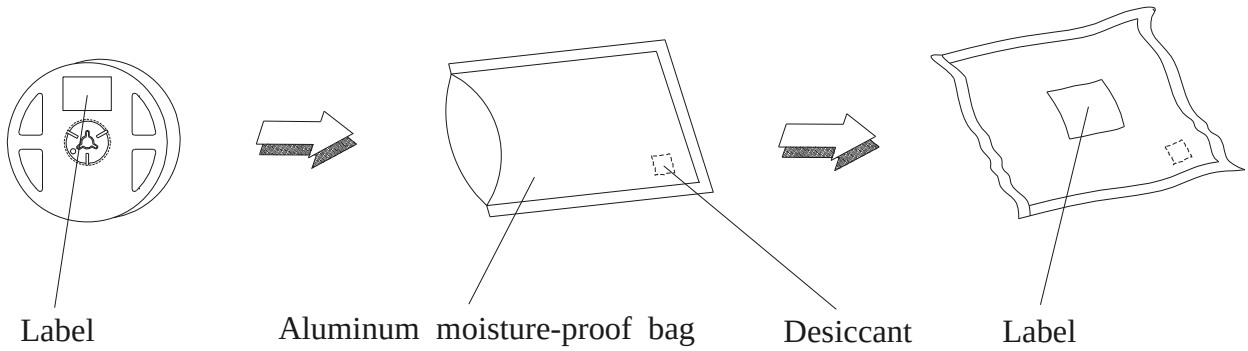
Carrier Tape Dimensions: Loaded Quantity 2000 pcs Per Reel



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

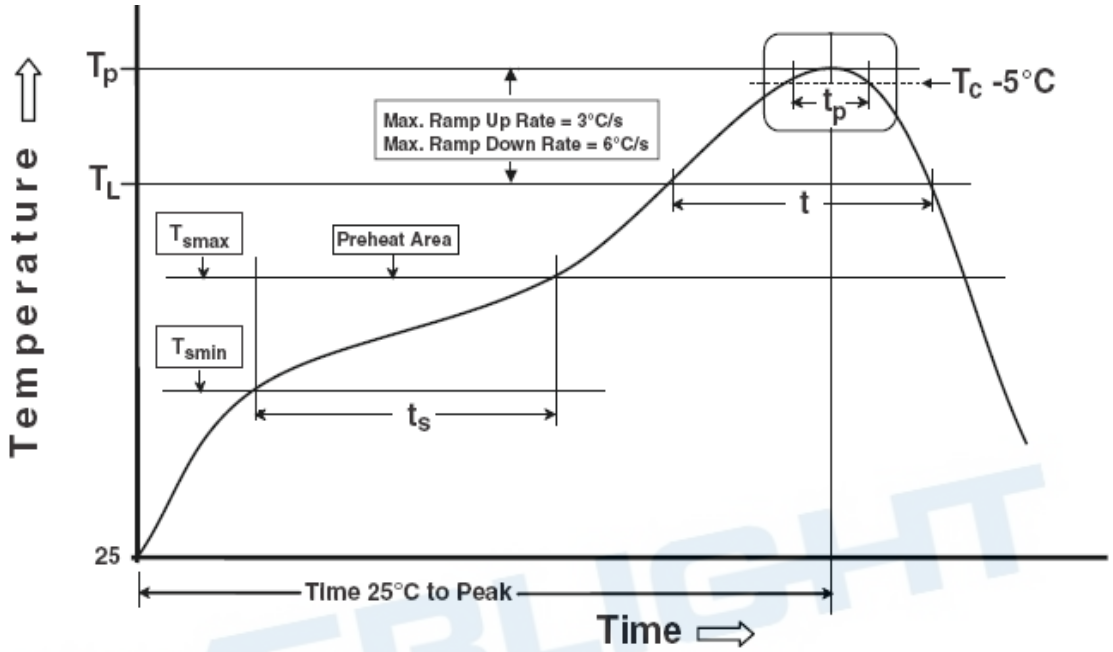
Moisture Resistant Packing Process



Precautions for Use

1. Soldering Condition

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

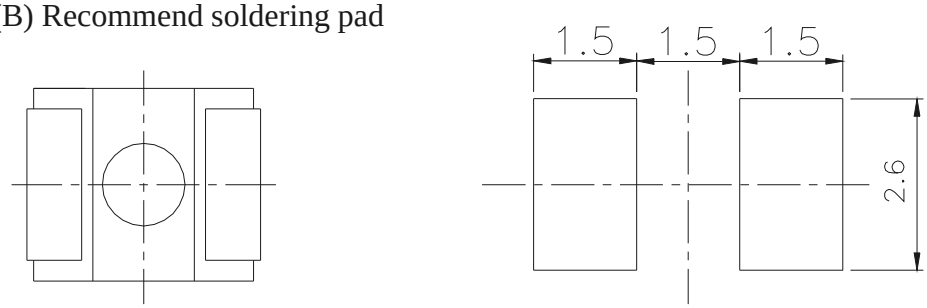


Note: Reference: IPC/JEDEC J-STD-020D

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 case temperature was measured by soldering a thermal couple to the soldering point of LEDs.

(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 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℃, 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.