



# Technical Data Sheet

## Luminosity Full Color LED

**61-136/RSGHBHC-B02/ET**

### Features

- Super-luminosity chip LED.
- White SMT package.
- Built in Red, Green, and Blue chips.
- Lead frame package with individual 6 pins.
- Wide viewing angle.
- Soldering methods: IR reflow soldering.
- ESD protection.
- Pb-free.
- The product itself will remain within RoHS compliant version.



### Descriptions

- Due to the package design, 61-136 has wide viewing angle , low power consumption and adjusting each color is possible thanks to serial connection by 6 terminal connection (Individual driving by each terminal) in case of using several number of LED. And makes it ideal for light pipe application.

### Applications

- Amusement equipment.
- Information boards.
- Flashlight for digital camera of cellular phone.

### Device Selection Guide

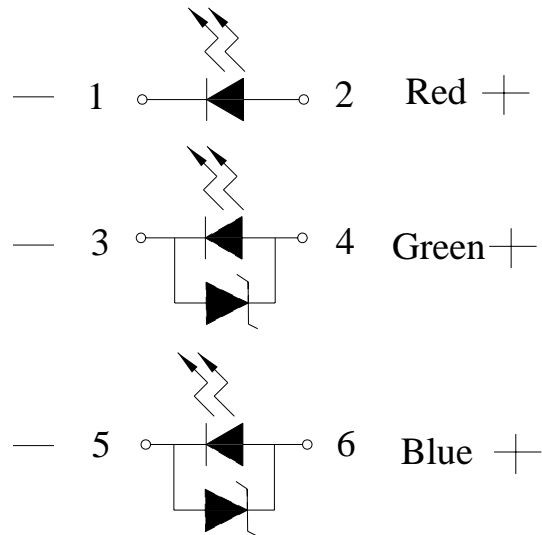
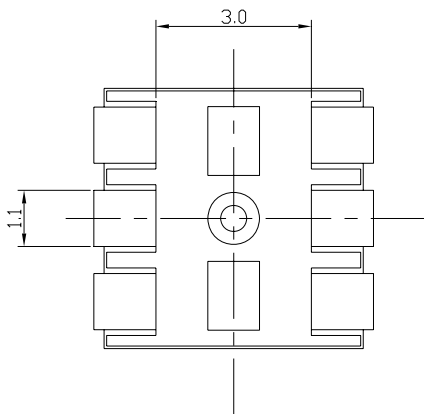
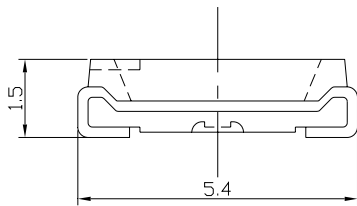
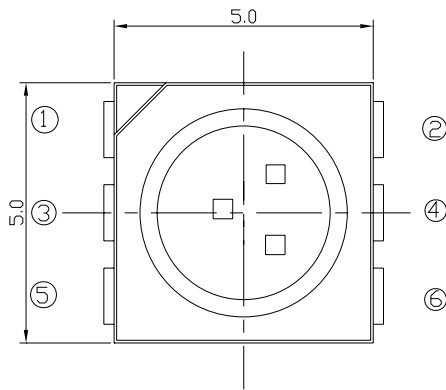
Chip			Lens Color
Type	Material	Emitted Color	
RS	AlGaInP	Brilliant Red	Water Clear
GH	InGaN	Brilliant Green	
BH	InGaN	Blue	

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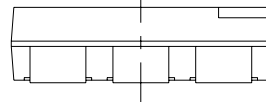
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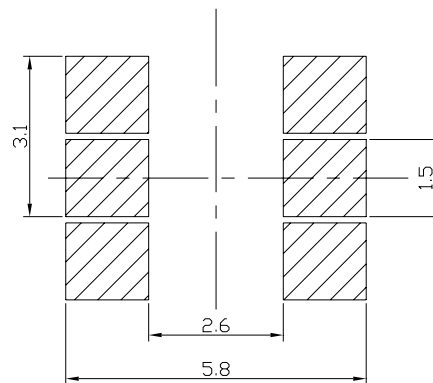
Package Outline Dimensions



Polarity



Recommended soldering pad design



**Note:** The tolerances unless mentioned is  $\pm 0.1\text{mm}$ , Unit = mm



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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>	RS	30	mA
		GH	30	
		BH	30	
Peak Forward Current (Duty 1/10 @ 1KHz)	I <sub>FP</sub>	V	120	mA
		GH	110	
		BH	110	
Power Dissipation	P <sub>d</sub>	RS	80	mW
		GH	110	
		BH	110	
Electrostatic Discharge(HBM)	ESD	2000		V
Operating Temperature	T <sub>opr</sub>	-40 ~ +85		°C
Storage Temperature	T <sub>stg</sub>	-40~ +90		°C
Soldering Temperature	T <sub>sol</sub>	Reflow Soldering : 260 °C for 10 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>	RS	450	-----	715	mcd	I <sub>F</sub> =20mA
		GH	715	-----	1420		
		BH	225	-----	450		
Viewing Angle	$2\theta_{1/2}$	-----	120	-----	deg	I <sub>F</sub> =20mA	
Peak Wavelength	$\lambda_p$	RS	-----	632	-----	nm	I <sub>F</sub> =20mA
		GH	-----	518	-----		
		BH	-----	468	-----		
Dominant Wavelength	$\lambda_d$	RS	617.5	-----	633.5	nm	I <sub>F</sub> =20mA
		GH	523.5	-----	535.5		
		BH	466	-----	472		
Spectrum Radiation Bandwidth	$\Delta\lambda$	RS	-----	20	-----	nm	I <sub>F</sub> =20mA
		GH	-----	35	-----		
		BH	-----	35	-----		
Forward Voltage	V <sub>F</sub>	RS	1.75	-----	2.35	V	I <sub>F</sub> =20mA
		GH	2.75	-----	3.95		
		BH	2.75	-----	3.95		
Reverse Current	I <sub>R</sub>	RS	-----	-----	10	$\mu A$	V <sub>R</sub> =5V

**Notes:**

- 1.Tolerance of Luminous Intensity  $\pm 10\%$
- 2.Tolerance of Dominant Wavelength  $\pm 1$  nm
- 3.Tolerance of Forward Voltage  $\pm 0.1V$



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**61-136/RSGHBHC-B02/ET****Bin Range Of Luminous Intensity**

Symbol	Bin Code	Min.	Max.	Unit	Condition
RS	U1	450	565	mcd	I <sub>F</sub> =20mA
	U2	565	715		
GH	V1	715	900		
	V2	900	1120		
	W1	1120	1420		
BH	S2	225	285		
	T1	285	360		
	T2	360	450		

**Bin Range Of Dominant Wavelength**

Symbol	Groups	Bin Code	Min.	Max.	Unit	Condition
RS	A	E4	617.5	621.5	nm	I <sub>F</sub> =20mA
		E5	621.5	625.5		
		E6	625.5	629.5		
		E7	629.5	633.5		
GH	B	B13	523.5	525.5		
		B14	525.5	527.5		
		B15	527.5	529.5		
		B16	529.5	531.5		
		B17	531.5	533.5		
		B18	533.5	535.5		
BH	D	AA2	466	468		
		AA3	468	470		
		AA4	470	472		

**Notes:****1.Tolerance of Luminous Intensity  $\pm 10\%$** **2.Tolerance of Dominant Wavelength  $\pm 1$  nm**

**Technical Data Sheet****Luminosity Full Color LED****61-136/RSGHBHC-B02/ET****Bin Range of Forward Voltage**

Symbol	Groups	Bin Code	Min.	Max.	Unit	Condition
RS	B	1	1.75	1.95	V	I <sub>F</sub> =20mA
		2	1.95	2.15		
		3	2.15	2.35		
GH	M	5	2.75	3.05		
		6	3.05	3.35		
		7	3.35	3.65		
		8	3.65	3.95		
BH	M	5	2.75	3.65		
		6	3.05	3.05		
		7	3.35	3.65		
		8	3.65	3.95		

**Notes:****1.Tolerance of Forward Voltage  $\pm 0.1V$**

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Typical Electro-Optical Characteristics Curves

Typical curve of spectral distribution:

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

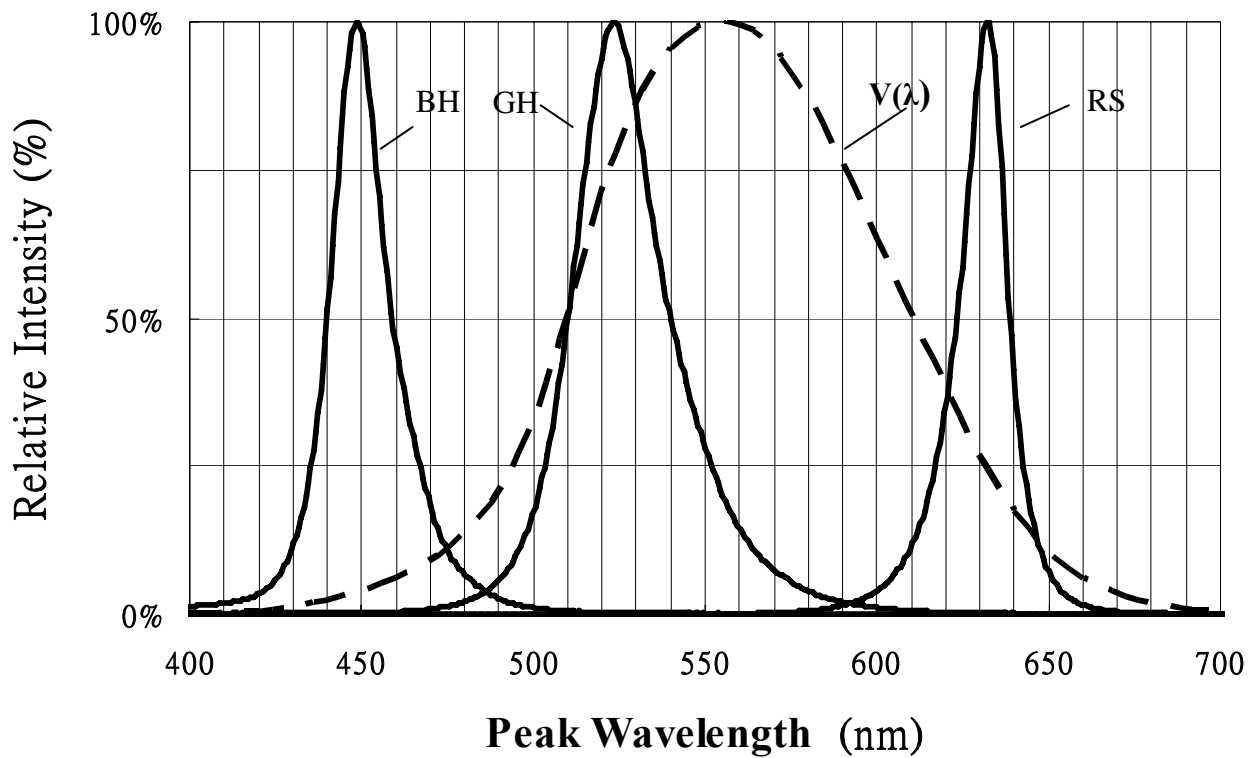


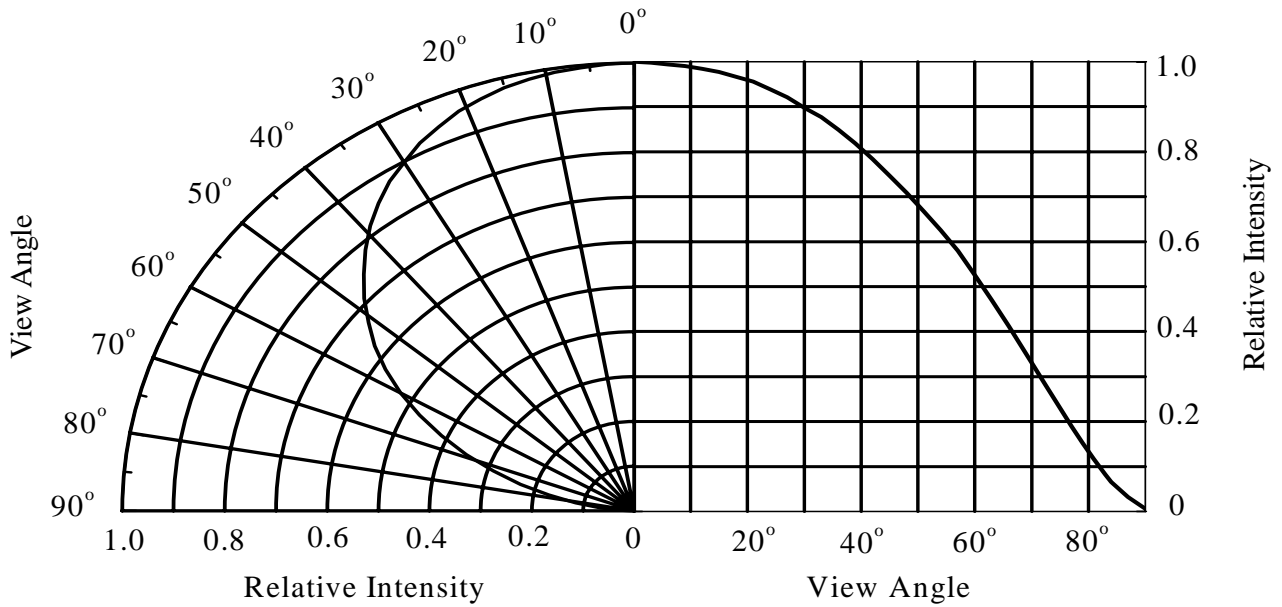
Diagram characteristics of radiation:



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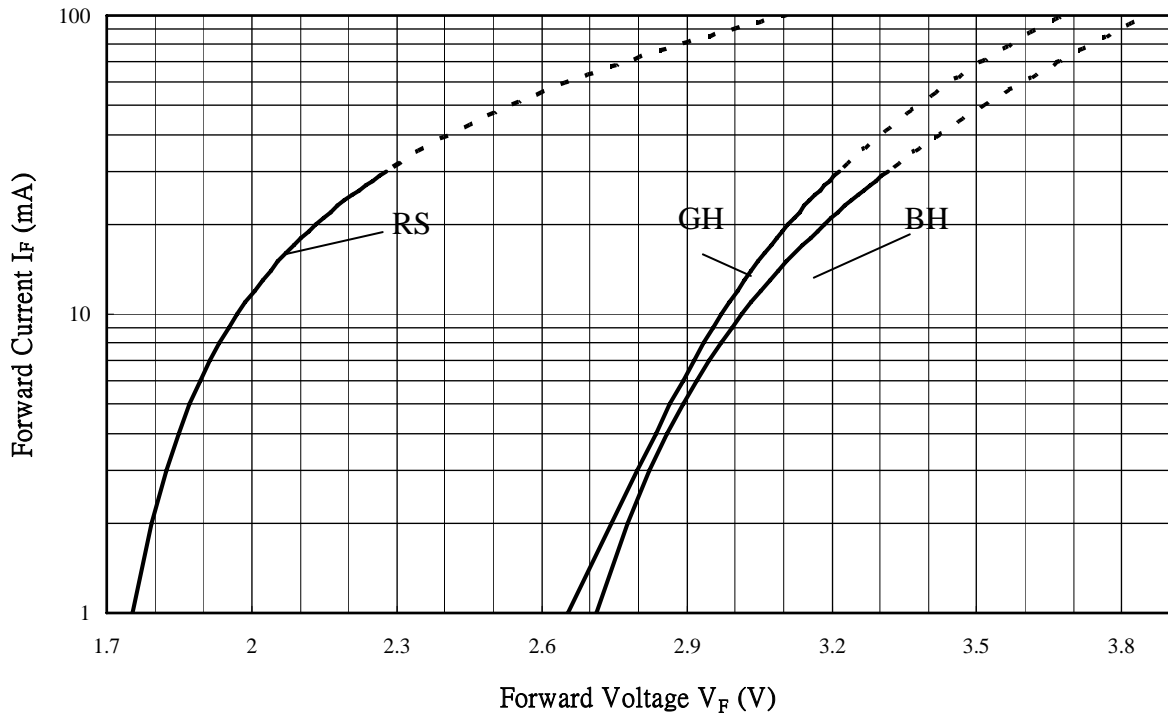


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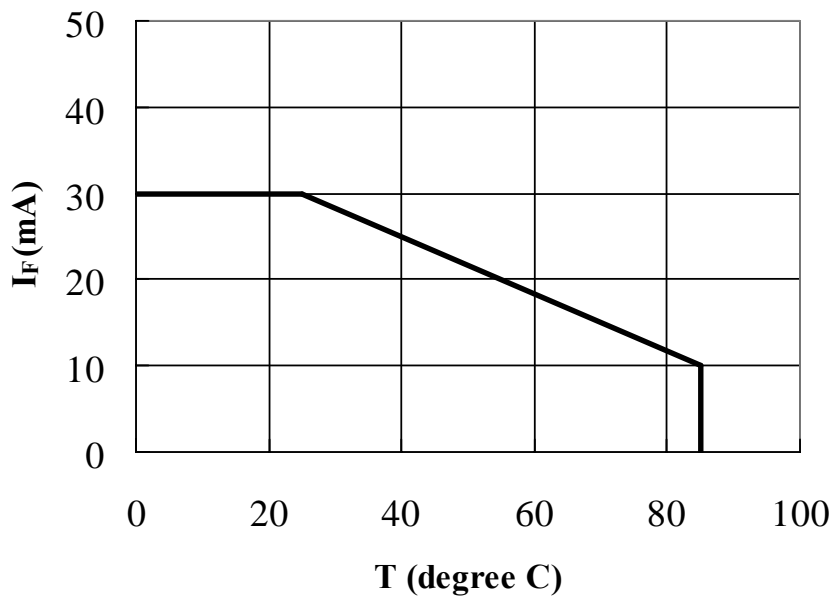
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Forward Current vs. Forward Voltage  $T_a=25^\circ\text{C}$



Forward Current v.s. Ambient Temp.





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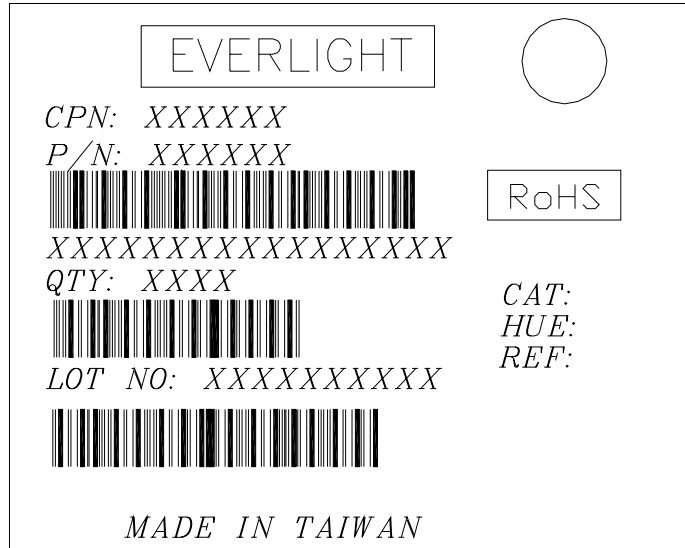
**61-136/RSGHBHC-B02/ET**

Label Explanation

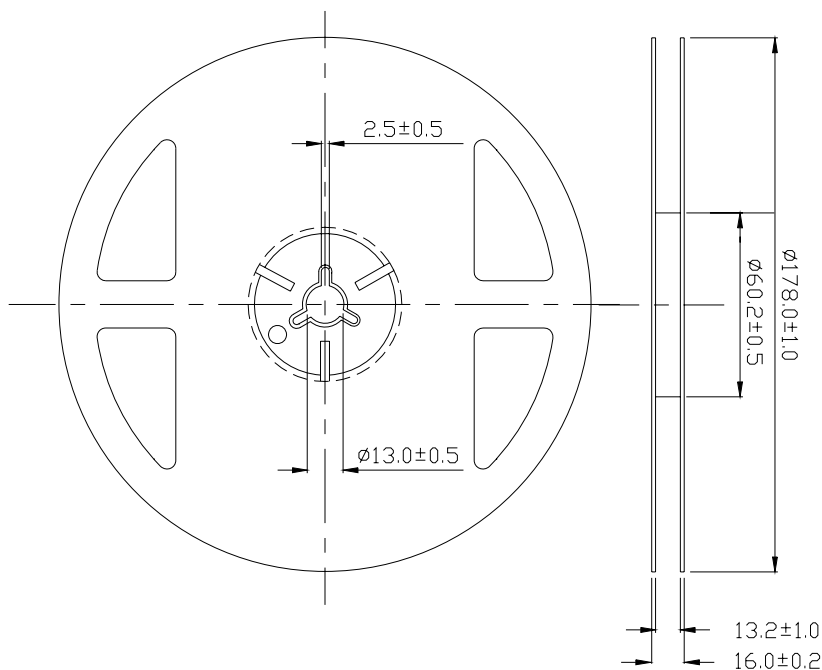
**CAT:** Luminous Intensity Rank

**HUE:** Dom. Wavelength Rank

**REF:** Forward Voltage Rank



Reel Dimensions



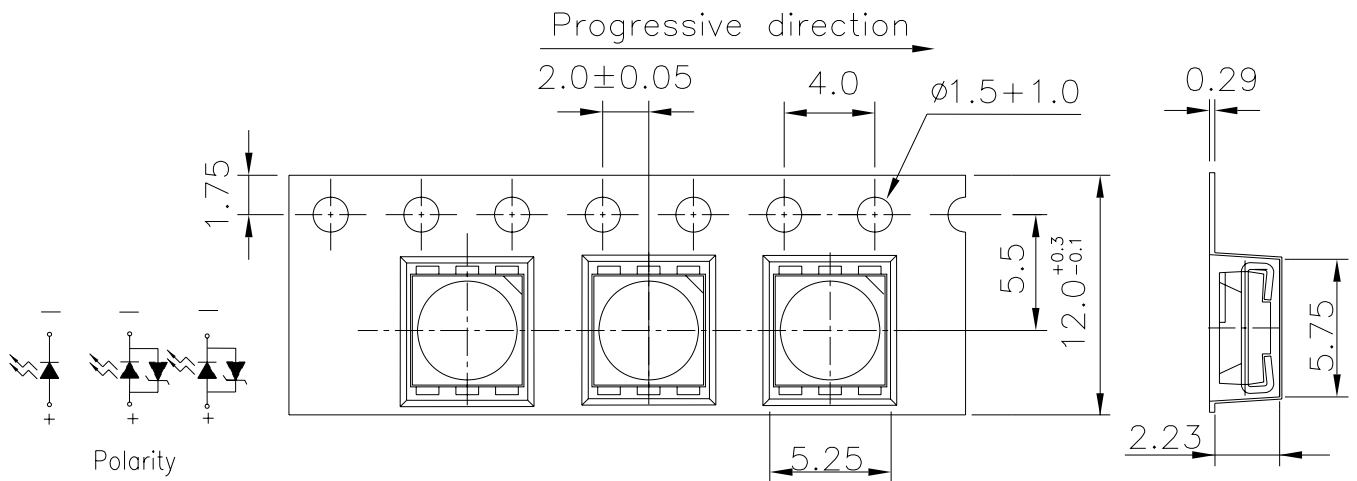
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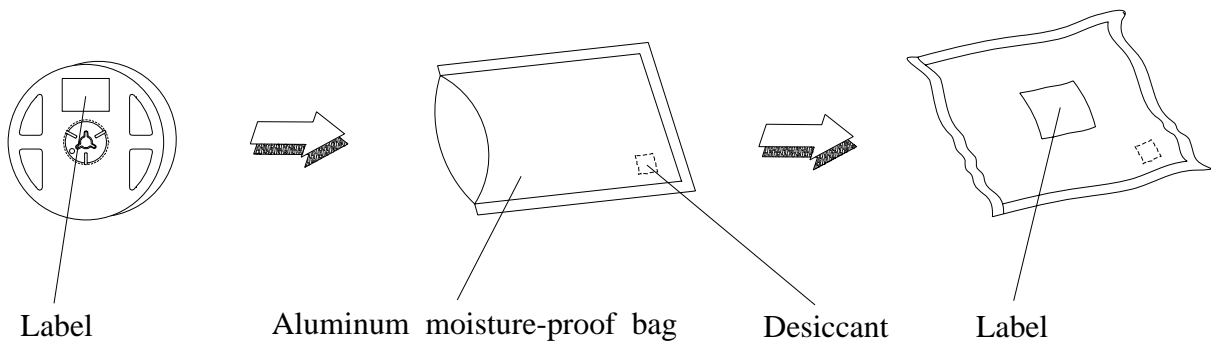
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Carrier Tape Dimensions; Loaded quantity per reel 800 PCS/reel



**Note:** The tolerances unless mentioned is  $\pm 0.1\text{mm}$ , Unit = mm

Moisture Resistant Packaging



**Technical Data Sheet****Luminosity Full Color LED****61-136/RSGHBHC-B02/ET****Reliability Test Items And Conditions**

The reliability of products shall be satisfied with items listed below.

Confidence level : 90%

LTPD : 10%

No.	Items	Test Condition	Test Hours/Cycles	Sample Size	Ac/Re
1	Reflow Soldering	Temp. : 260°C ±5°C Min. 5sec.	6 Min.	22 PCS.	0/1
2	Temperature Cycle	H : +100°C 15min ∫ 5 min L : -40°C 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100°C 5min ∫ 10 sec L : -10°C 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100°C	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40°C	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	IF = 20 mA	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85°C / 85%RH	1000 Hrs.	22 PCS.	0/1

\* For each die

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#### Precautions For Use

##### 1. Over-current-proof

Customer must apply resistors for protection, otherwise slight voltage shift will cause big current change ( Burn out will happen ).

##### 2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package: The LEDs should be kept at 30°C or less and 90%RH or less.

2.3 After opening the package: The LED's floor life is 1 year under 30°C or less and 60% RH or less.

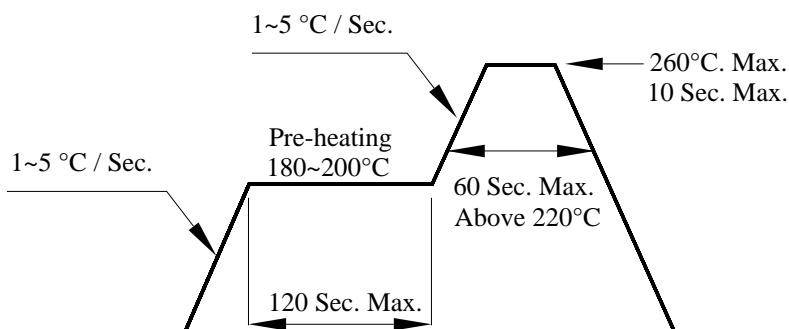
If unused LEDs remain, it should be stored in moisture proof packages.

2.4 If the moisture absorbent material (silica gel) has faded away or the LEDs have exceeded the storage time, baking treatment should be performed using the following conditions.

Baking treatment : 60±5°C for 24 hours.

##### 3. Soldering Condition

###### 3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.

3.3 When soldering, do not put stress on the LEDs during heating.

3.4 After soldering, do not warp the circuit board.

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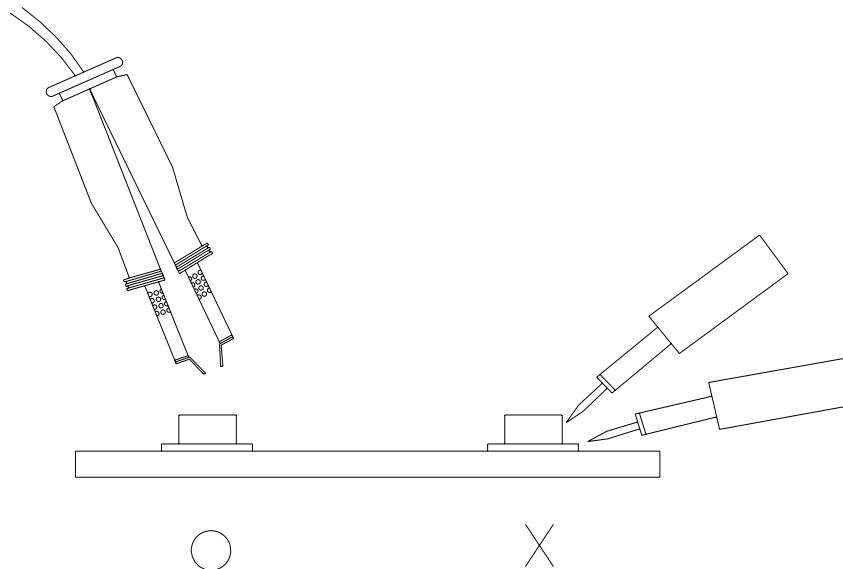
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#### 4.Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350°C for 3 seconds within once in less than the soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful because the damage of the product is often started at the time of the hand solder.

#### 5.Repairing

Repair should not be done after the LEDs have been soldered. When repairing is unavoidable, a double-head soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the LEDs will or will not be damaged by repairing.





EVERLIGHT ELECTRONICS CO.,LTD.

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