

## Technical Data Sheet

### Luminosity Full Color LED

**61-236/GBRSB7C-B23/ET**

#### Features

- Optical indicator.
- Colorless clear window.
- Ideal for backlight and light pipe application.
- Interior reflector.
- Wide viewing angle.
- Suitable for vapor-phase reflow, infrared reflow and wave solder processes.
- Computable with automatic placement equipment.
- Pb-free.
- The product itself will remain within RoHS compliant version.



#### Descriptions

- Due to the package design, 61-236 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

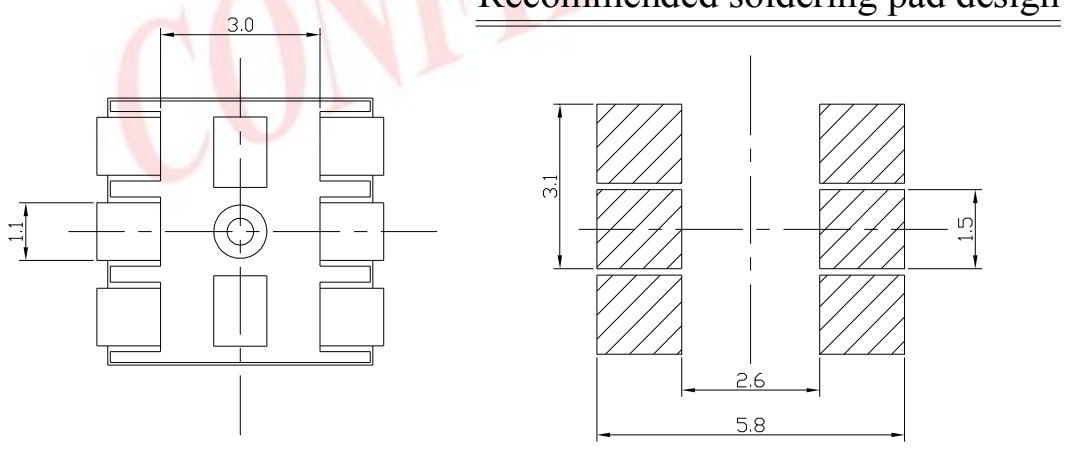
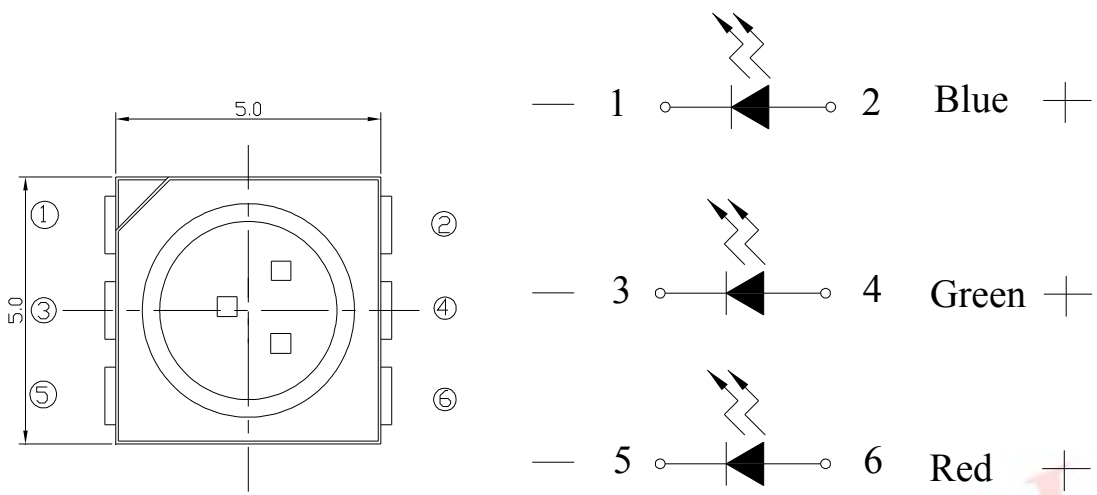
Chip		Emitted Color	Resin Color
Type	Material		
RS	AlGaInP	Brilliant Red	Water Clear
GB	InGaN	Brilliant Green	
B7	InGaN	Blue	

**Technical Data Sheet**

**Luminosity Full Color LED**

**61-236/GBRSB7C-B23/ET**

**Package Outline Dimensions**



**Notes:**

1. All dimensions are in millimeters
2. Tolerance unless mentioned is  $\pm 0.1$ mm

**Technical Data Sheet**

**Luminosity Full Color LED**

**61-236/GBRSB7C-B23/ET**

**Absolute Maximum Ratings (Ta=25 )**

Parameter	Symbol	Rating		Unit
Reverse Voltage	$V_R$	5		V
Forward Current	$I_F$	RS	50	mA
		GB	30	
		B7	30	
Peak Forward Current (Duty 1/10 @ 1KHz)	$I_{FP}$	RS	100	mA
		GB	100	
		B7	100	
Power Dissipation	Pd	RS	120	mW
		GB	110	
		B7	110	
Electrostatic Discharge(HBM)	ESD	RS	2000	V
		GB	1000	
		B7	1000	
Operating Temperature	Topr	-40 ~ +85		
Storage Temperature	Tstg	-40~ +90		
Soldering Temperature	Tsol	Reflow Soldering : 260 for 10 sec. Hand Soldering : 350 for 3 sec.		

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### Luminosity Full Color LED

#### 61-236/GBRSB7C-B23/ET

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition	
Luminous Intensity	I <sub>v</sub>	RS	525	-----	756	mcd	I <sub>F</sub> =20mA
		GB	1000	-----	1450		
		B7	252	-----	360		
Viewing Angle	2 1/2	-----	120	-----	deg	I <sub>F</sub> =20mA	
Peak Wavelength	p	RS	-----	632	-----	nm	I <sub>F</sub> =20mA
		GB	-----	518	-----		
		B7	-----	468	-----		
Dominant Wavelength	d	RS	618	-----	627	nm	I <sub>F</sub> =20mA
		GB	524	-----	531.5		
		B7	466.5	-----	474		
Spectrum Radiation Bandwidth		RS	-----	20	-----	nm	I <sub>F</sub> =20mA
		GB	-----	35	-----		
		B7	-----	35	-----		
Forward Voltage	V <sub>F</sub>	RS	1.75	-----	2.35	V	I <sub>F</sub> =20mA
		GB	2.9	-----	3.5		
		B7	2.75	-----	3.35		
Reverse Current	I <sub>R</sub>	RS	-----	-----	10	μ A	V <sub>R</sub> =5V
		GB	-----	-----	50		
		B7	-----	-----	50		

#### Note:

1. Tolerance of Luminous Intensity: ±10%
2. Tolerance of Dominant Wavelength: ±1nm
3. Tolerance of Forward Voltage: ±0.1V

**Technical Data Sheet**

**Luminosity Full Color LED**

**61-236/GBRSB7C-B23/ET**

**Bin Range of Luminous Intensity**

Symbol		Bin Code	Min.	Max.	Unit	Condition
I <sub>v</sub>	RS	10a	525	575	mcd	I <sub>F</sub> =20mA
		10b	575	630		
		11a	630	690		
		11b	690	756		
	GB	13b	1000	1100		
		14a	1100	1200		
		14b	1200	1320		
		15a	1320	1450		
	B7	6a	252	275		
		6b	275	300		
		7a	300	330		
		7b	330	360		

**Note:**

1. Tolerance of Luminous Intensity: ±10%

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**Technical Data Sheet**

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**61-236/GBRSB7C-B23/ET**

**Bin Range of Dominant Wavelength**

Symbol		Bin Code	Min.	Max.	Unit	Condition
d	RS	R1	618	621	nm	I <sub>F</sub> =20mA
		R2	621	624		
		R3	624	627		
	GB	G1	524	526.5		
		G2	526.5	529		
		G3	529	531.5		
	B7	B1	466.5	469		
		B2	469	471.5		
		B3	471.5	474		

**Bin Range of Forward Voltage**

Symbol		Bin Code	Min.	Max.	Unit	Condition
V <sub>F</sub>	RS	0	1.75	1.95	V	I <sub>F</sub> =20mA
		1	1.95	2.15		
		2	2.15	2.35		
	GB	11	2.90	3.10		
		12	3.10	3.30		
		13	3.30	3.50		
	B7	A	2.75	2.95		
		B	2.95	3.15		
		C	3.15	3.35		

**Note:**

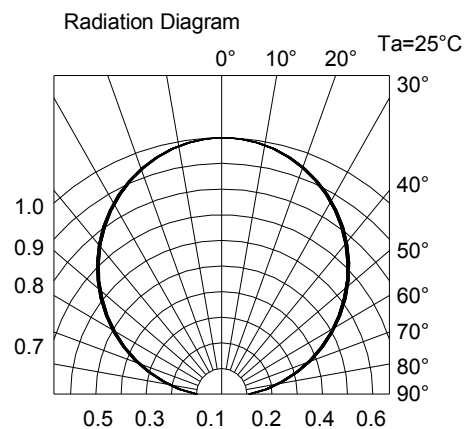
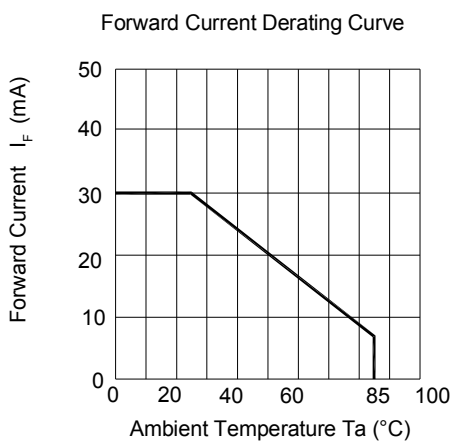
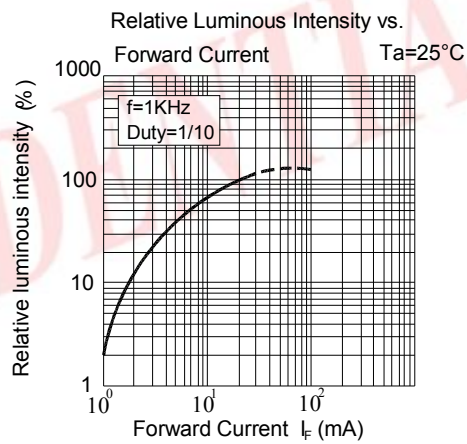
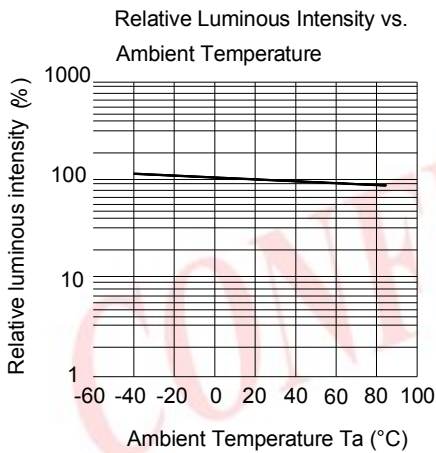
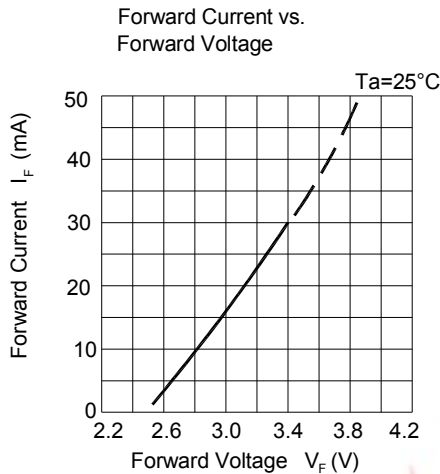
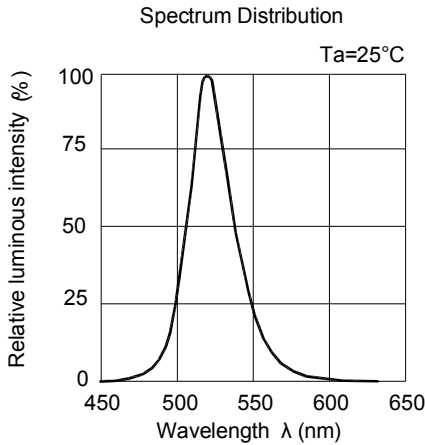
1. Tolerance of Dominant Wavelength: ±1nm
2. Tolerance of Forward Voltage: ±0.1V

**Technical Data Sheet**

**Luminosity Full Color LED**

**61-236/GBRSB7C-B23/ET**

**Typical Electro-Optical Characteristics Curves (GB)**

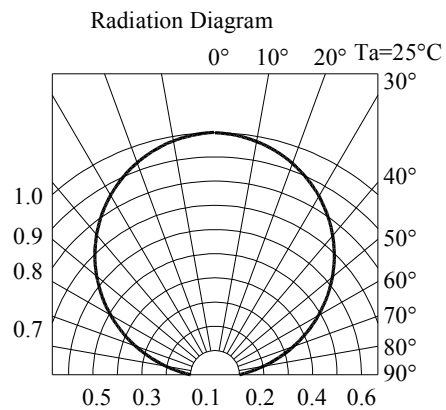
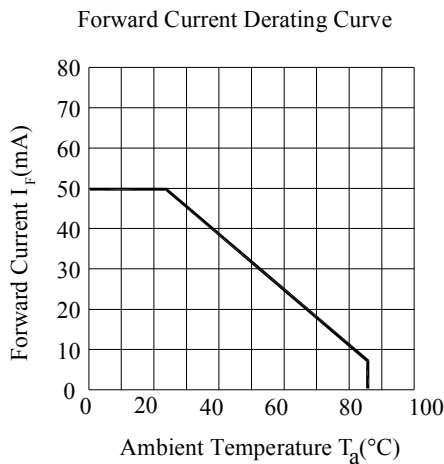
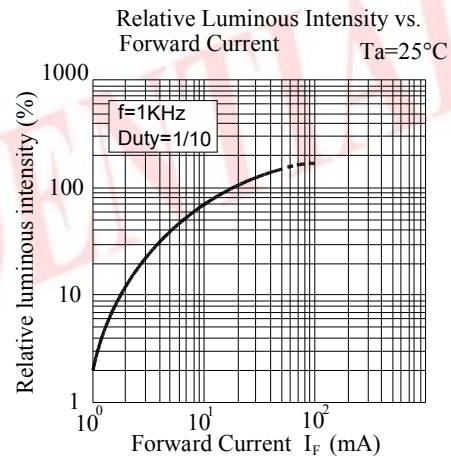
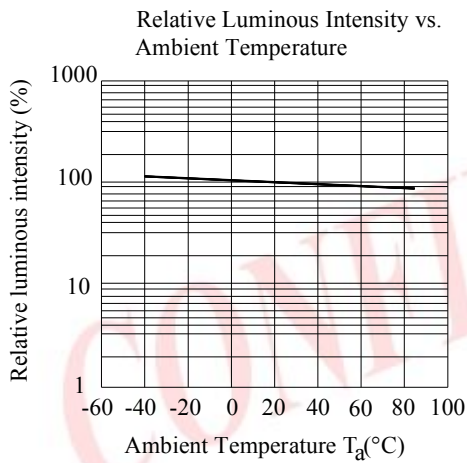
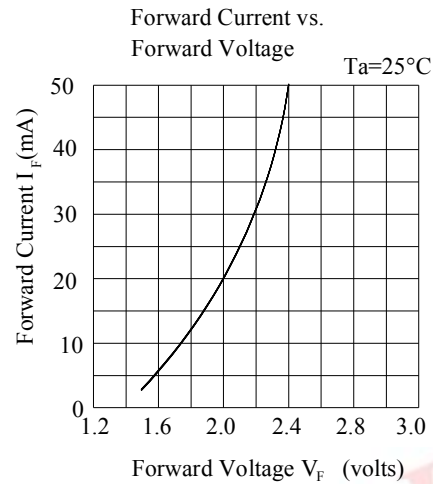
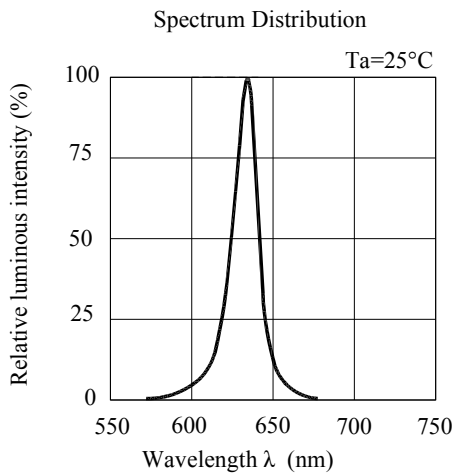


**Technical Data Sheet**

**Luminosity Full Color LED**

**61-236/GBRSB7C-B23/ET**

**Typical Electro-Optical Characteristics Curves (RS)**



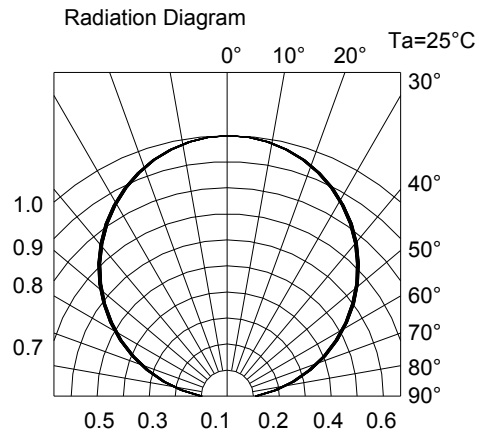
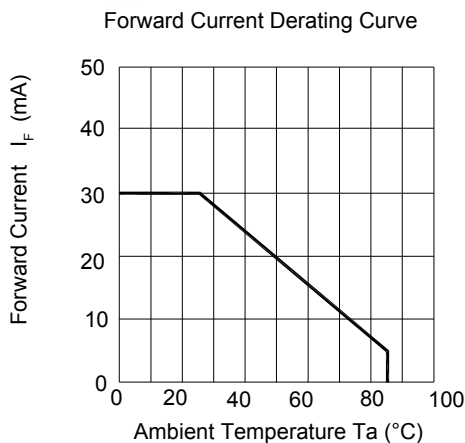
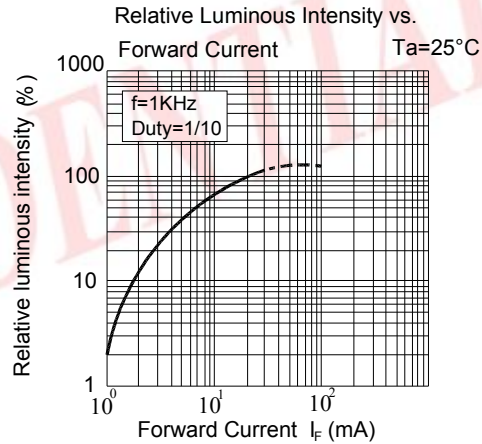
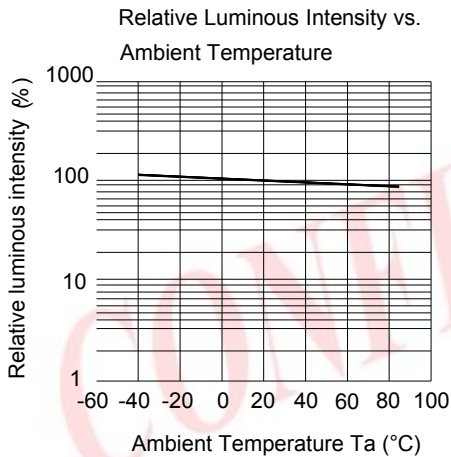
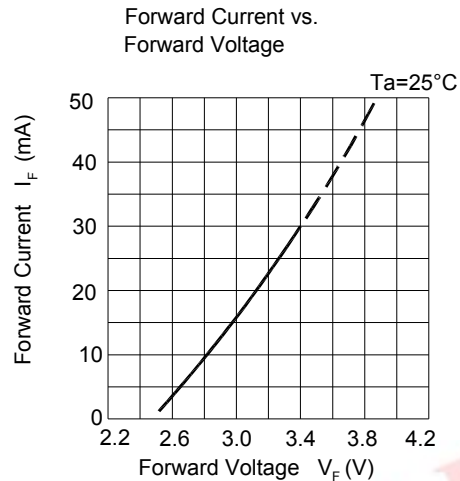
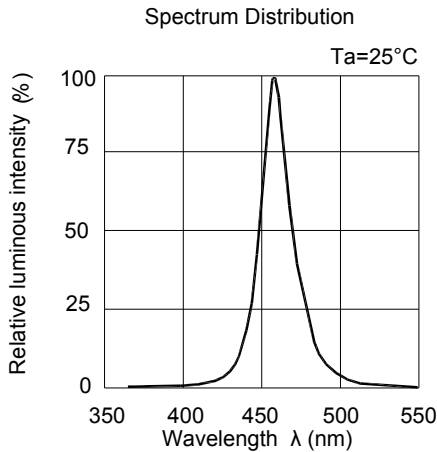


**Technical Data Sheet**

**Luminosity Full Color LED**

**61-236/GBRSB7C-B23/ET**

**Typical Electro-Optical Characteristics Curves (B7)**



**Technical Data Sheet**

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**61-236/GBRSB7C-B23/ET**

**Label Explanation**

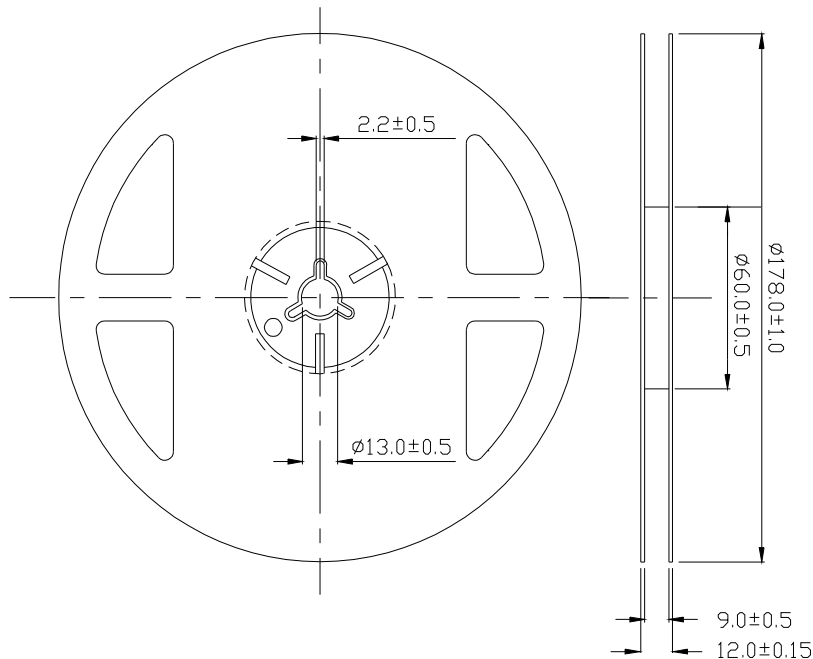
**CAT: Luminous Intensity Rank**

**HUE: Dom. Wavelength Rank**

**REF: Forward Voltage Rank**



**Reel Dimensions**



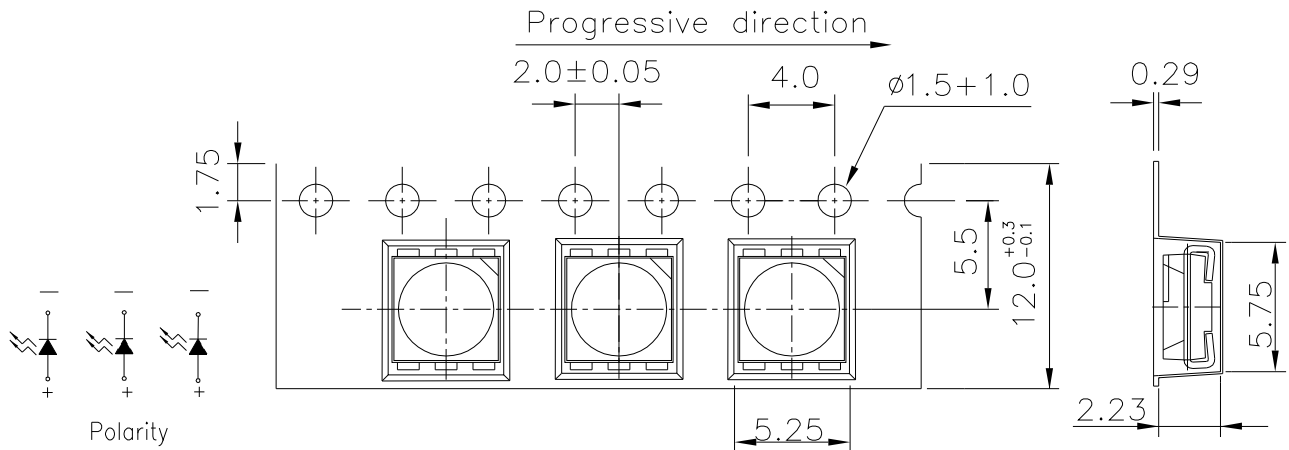
**Note:** Tolerance unless mentioned is  $\pm 0.1$ mm; Unit = mm

**Technical Data Sheet**

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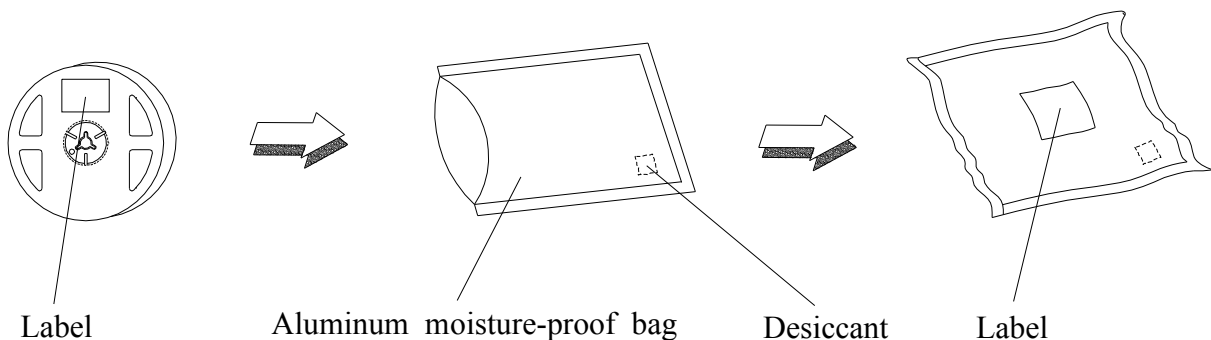
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**Carrier Tape Dimensions: Loaded Quantity 800 pcs Per Reel**



**Note:** The tolerances unless mentioned is ±0.1mm; Unit = mm

**Moisture Resistant Packaging**



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#### 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 ±5 Min. 5sec.	6 Min.	22 PCS.	0/1
2	Temperature Cycle	H : +100 15min 5 min L : -40 15min	300 Cycles	22 PCS.	0/1
3	Thermal Shock	H : +100 5min 10 sec L : -10 5min	300 Cycles	22 PCS.	0/1
4	High Temperature Storage	Temp. : 100	1000 Hrs.	22 PCS.	0/1
5	Low Temperature Storage	Temp. : -40	1000 Hrs.	22 PCS.	0/1
6	DC Operating Life	I <sub>F</sub> = 20 mA	1000 Hrs.	22 PCS.	0/1
7	High Temperature / High Humidity	85 / 85%RH	1000 Hrs.	22 PCS.	0/1

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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% or less and 90%RH or less.

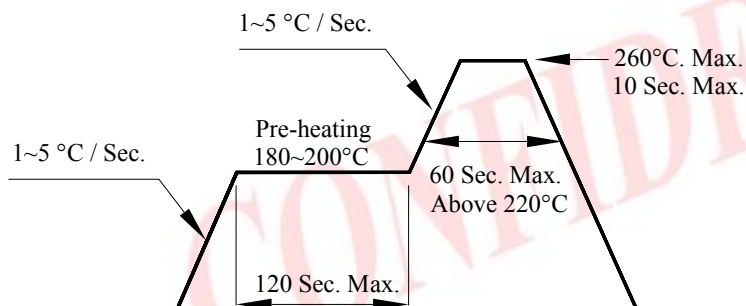
2.3 After opening the package: The LED's floor life is 1 year under 30% or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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% 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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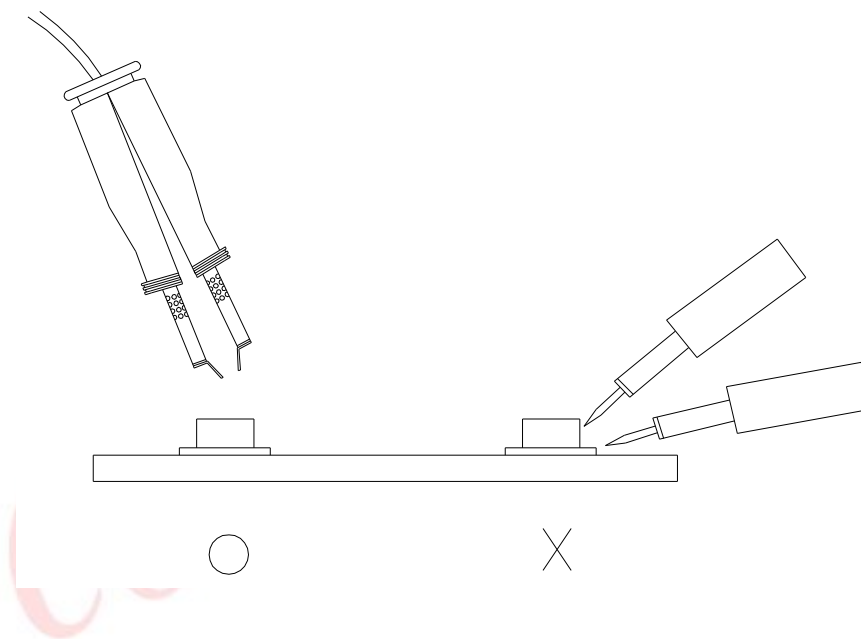
**61-236/GBRSB7C-B23/ET**

#### 4. Soldering Iron

Each terminal is to go to the tip of soldering iron temperature less than 350 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.



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