

**Technical Data Sheet - Preliminary**

**Full Color Top View LEDs**

**67-03/BHGHR6W-B11/2T/MS**

**Features**

- P-LCC-4 package.
- White package and black surface.
- Optical indicator.
- Ideal for backlight and light pipe application.
- Inter reflector.
- Wide viewing angle.
- Suitable for vapor-phase reflow, Infrared reflow and wave solder processes.
- Available on tape and reel (8mm Tape).
- Pb-free.
- The product itself will remain with RoHS compliant version



**Descriptions**

- The 67-03 series is available in soft orange, green, blue and yellow. Due to the package design, the LED has wide viewing angle and optimized light coupling by inter reflector. This feature makes the LED ideal for light pipe application. The low current requirement makes this device ideal for portable equipment or any other application where power is at a premium.

**Applications**

- Telecommunication: indicator and backlighting in telephone and fax.
- Flat backlight for LCD's, switches and symbols.
- Light pipe application.
- General use.

**Device Selection Guide**

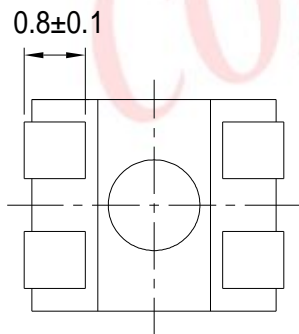
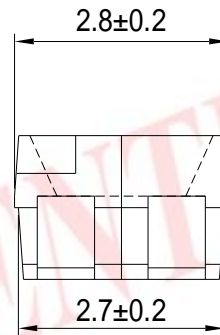
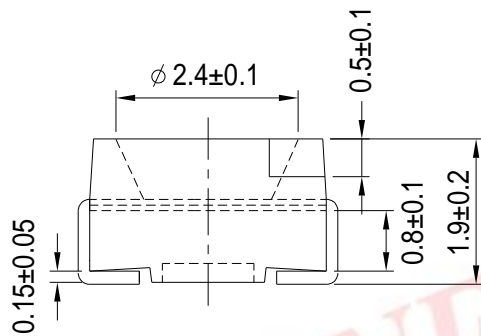
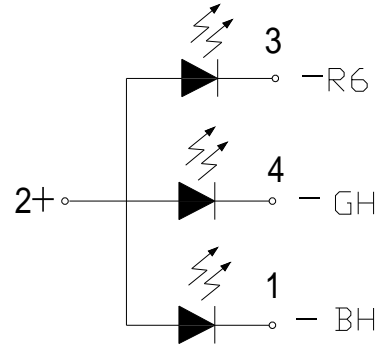
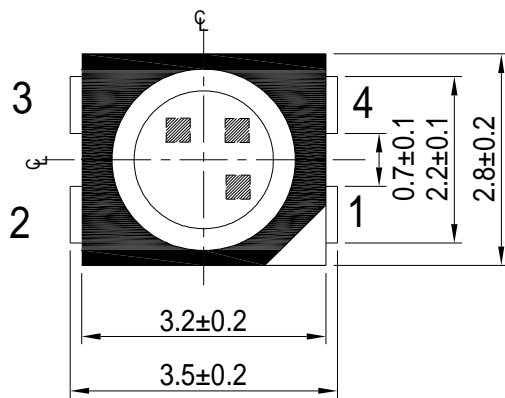
Chip		Emitted Color	Resin Color
Type	Material		
R6	AlGaInP	Brilliant Red	White Diffuse
GH	InGaN	Brilliant Green	
BH	InGaN	Blue	

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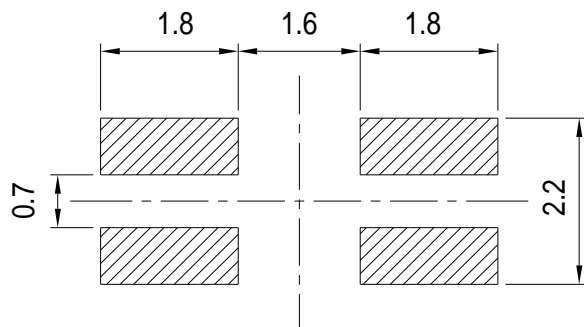
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**Package Outline Dimensions**



**Recommended soldering pad design**



**Notes:**

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

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

Parameter	Symbol	Rating		Unit
Reverse Voltage	V <sub>R</sub>	5		V
Forward Current	I <sub>F</sub>	R6	50	mA
		GH	25	
		BH	25	
Peak Forward Current (Duty 1/10 @ 1KHz)	I <sub>FP</sub>	R6	100	mA
		GH	100	
		BH	100	
Power Dissipation	Pd	R6	120	mW
		GH	95	
		BH	95	
Electrostatic Discharge(HBM)	ESD	R6	2000	V
		GH	2000	
		BH	2000	
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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#### Electro-Optical Characteristics (Ta=25 )

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition	
Luminous Intensity	I <sub>v</sub>	R6	210	-----	300	mcd	I <sub>F</sub> =20mA
		GH	575	-----	825		
		BH	210	-----	300		
Peak Wavelength	λ <sub>p</sub>	R6	-----	632	-----	nm	I <sub>F</sub> =20mA
		GH	-----	518	-----		
		BH	-----	468	-----		
Dominant Wavelength	λ <sub>d</sub>	R6	618	-----	627	nm	I <sub>F</sub> =20mA
		GH	524	-----	531.5		
		BH	466.5	-----	474		
Spectrum Radiation Bandwidth	λ	R6	-----	20	-----	nm	I <sub>F</sub> =20mA
		GH	-----	35	-----		
		BH	-----	35	-----		
Forward Voltage	V <sub>F</sub>	R6	1.75	-----	2.35	V	I <sub>F</sub> =20mA
		GH	2.9	-----	3.5		
		BH	2.9	-----	3.5		
Viewing Angle	201/2	-----	120	-----	deg	I <sub>F</sub> =20mA	
Reverse Current	I <sub>R</sub>	R6	-----	-----	10	μA	V <sub>R</sub> =5V
		GH	-----	-----	50		
		BH	-----	-----	50		

**Note:**

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

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**Bin Range of Luminous Intensity**

Symbol		Bin Code	Min.	Max.	Unit	Condition
Iv	R6	5a	210	230	mcd	I <sub>F</sub> =20mA
		5b	230	252		
		6a	252	275		
		6b	275	300		
	GH	10b	575	630		
		11a	630	690		
		11b	690	756		
		12a	756	825		
	BH	5a	210	230		
		5b	230	252		
		6a	252	275		
		6b	275	300		

**Note:**

1. Tolerance of Luminous Intensity: ±10%

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#### 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		
		B2	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	11	2.90	3.10		
		12	3.10	3.30		
		13	3.30	3.50		

#### Note:

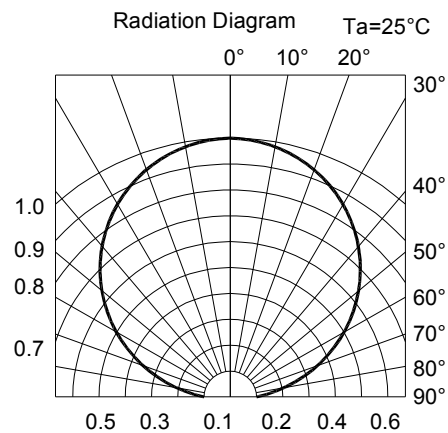
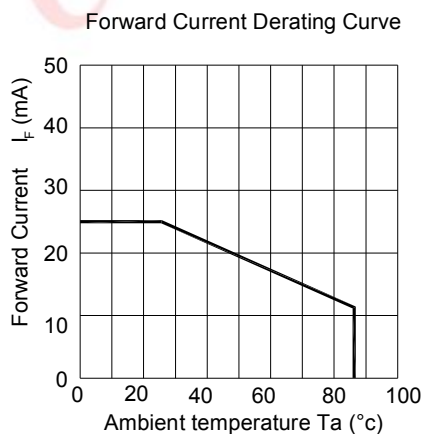
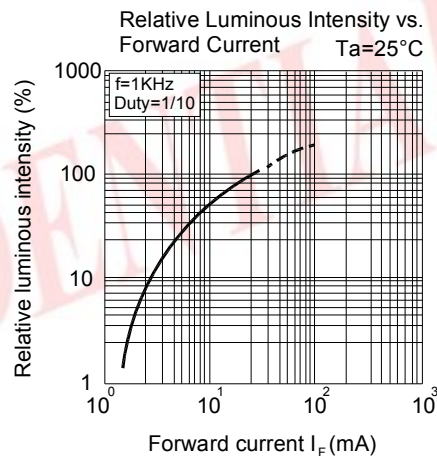
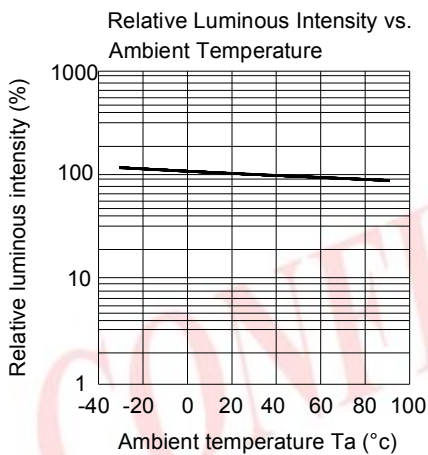
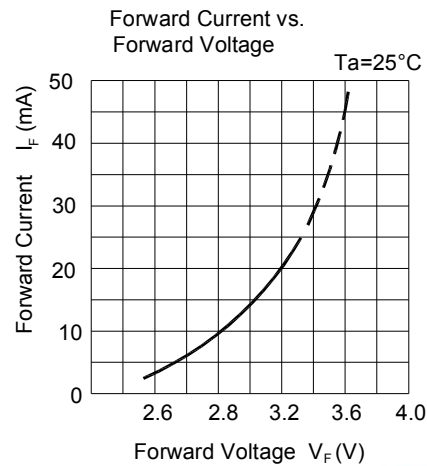
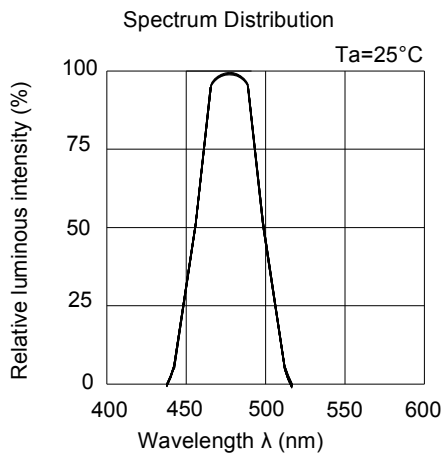
1. Tolerance of Dominant Wavelength:  $\pm 1$ nm
2. Tolerance of Forward Voltage:  $\pm 0.1$ V

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

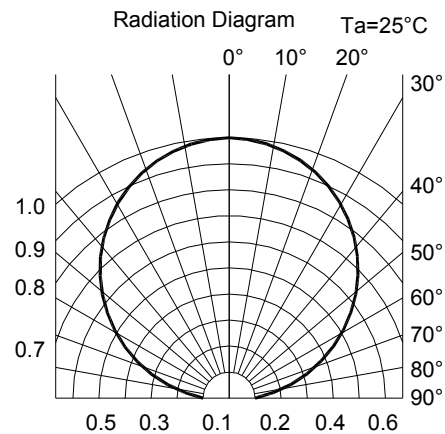
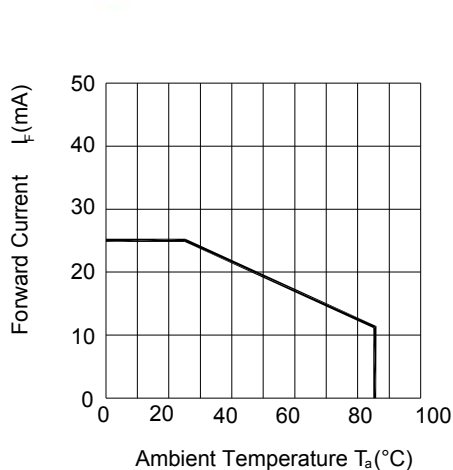
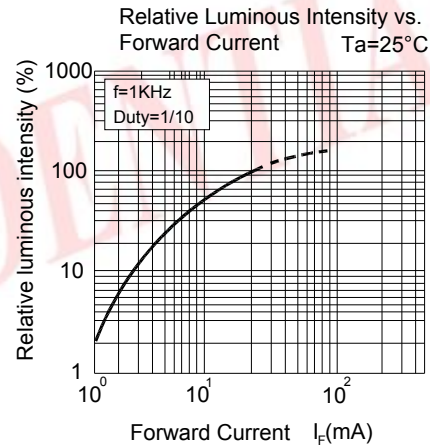
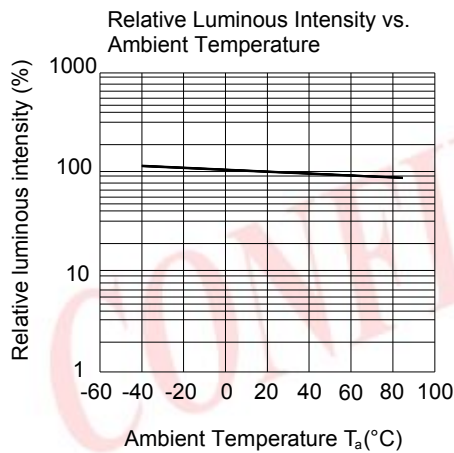
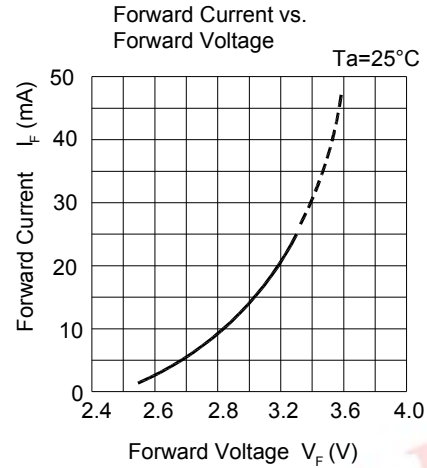
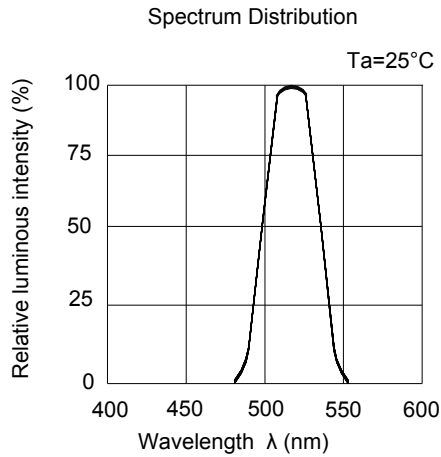


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**67-03/BHGHR6W-B11/2T/MS**

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



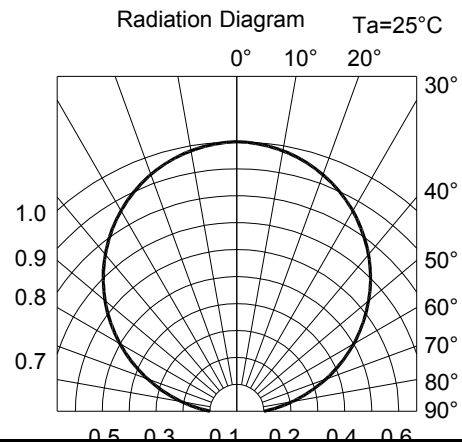
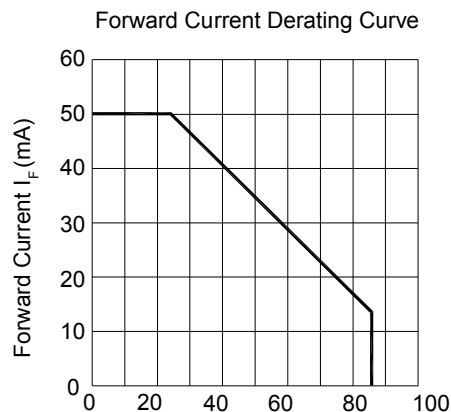
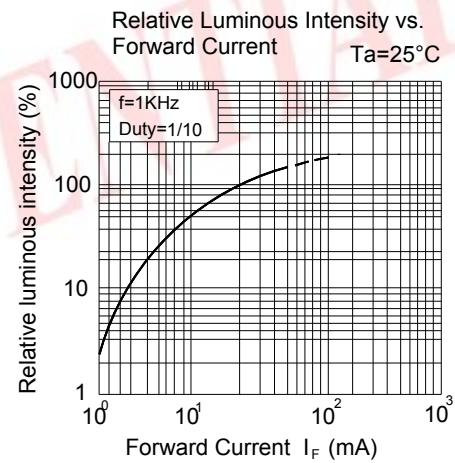
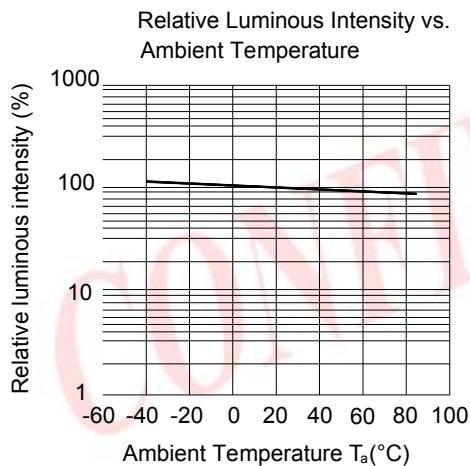
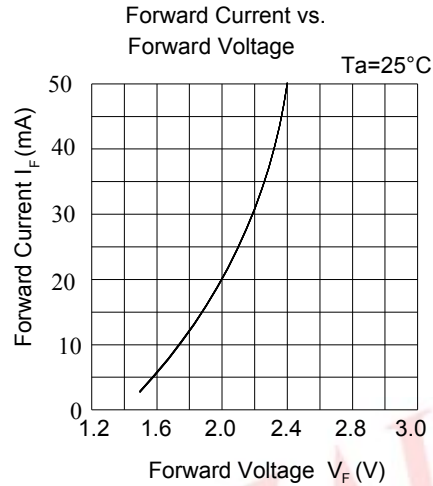
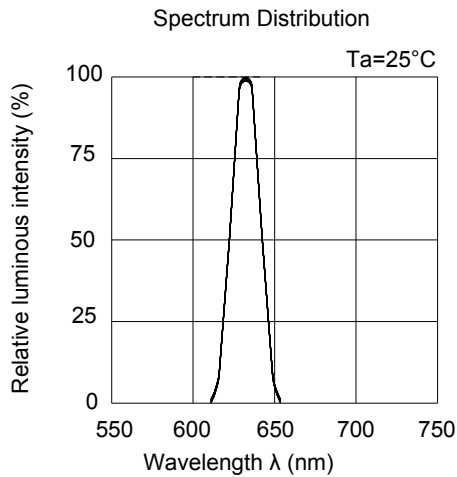


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**Full Color Top View LEDs**

**67-03/BHGHR6W-B11/2T/MS**

**Typical Electro-Optical Characteristics Curves (R6)**



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**Label Explanation**

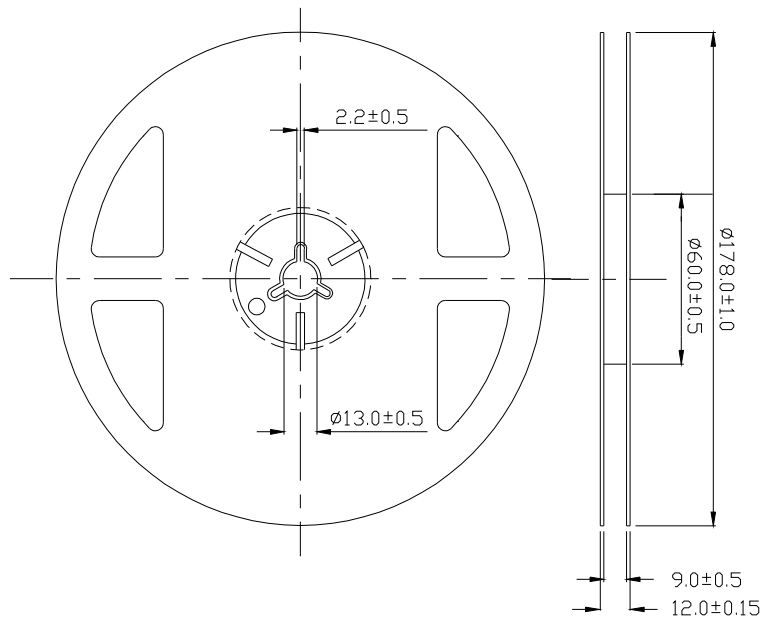
**CAT: Luminous Intensity Rank**

**HUE: Dom. Wavelength Rank**

**REF: Forward Voltage Rank**



**Reel Dimensions**



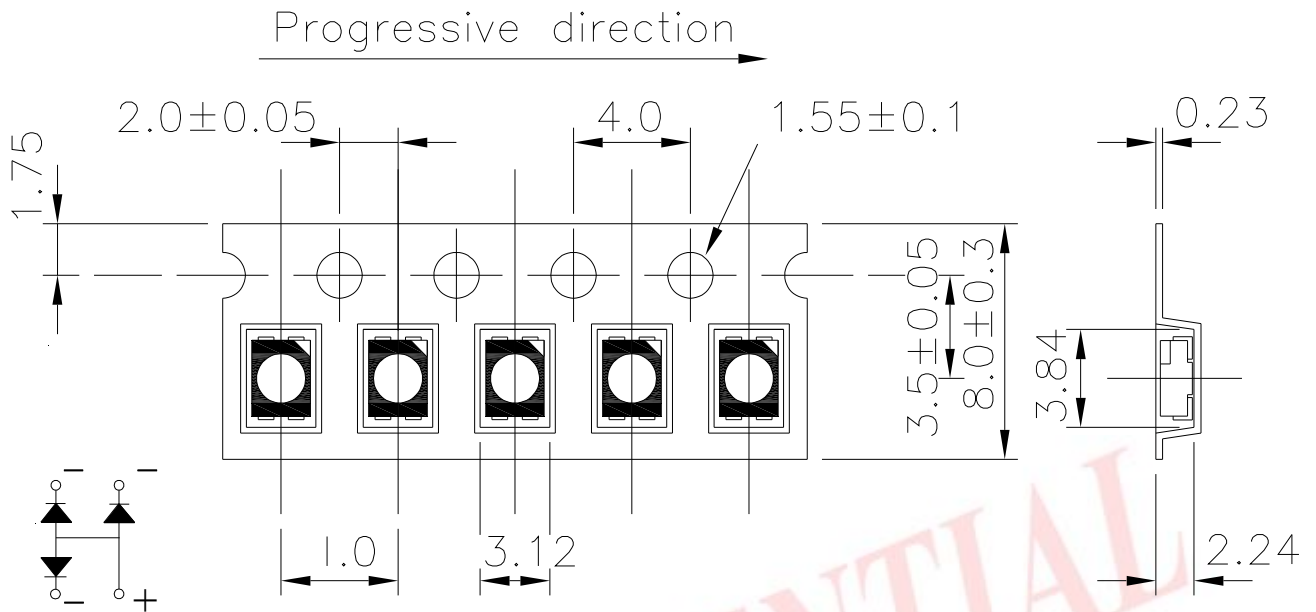
**Note:** Tolerance unless mentioned is  $\pm 0.1$ mm; Unit = mm

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**Full Color Top View LEDs**

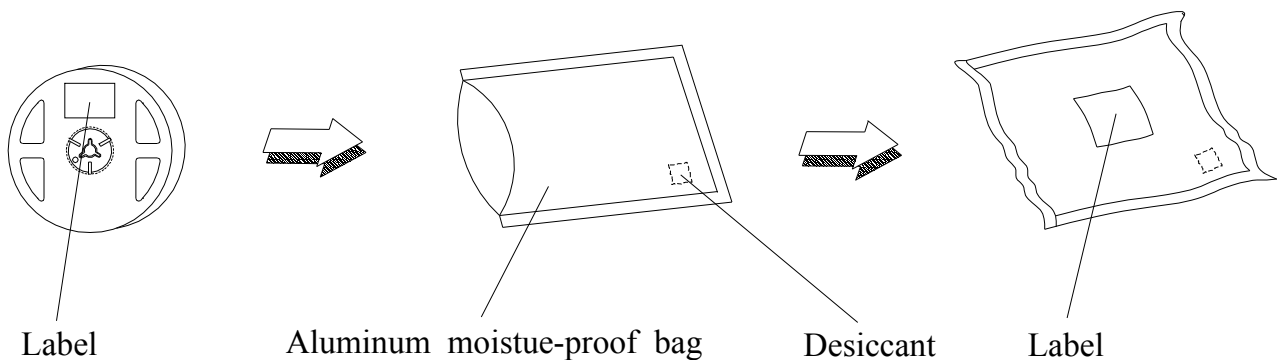
**67-03/BHGHR6W-B11/2T/MS**

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



**Note:** Tolerance unless mentioned is  $\pm 0.1$ mm; 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 °C or less and 90%RH or less.

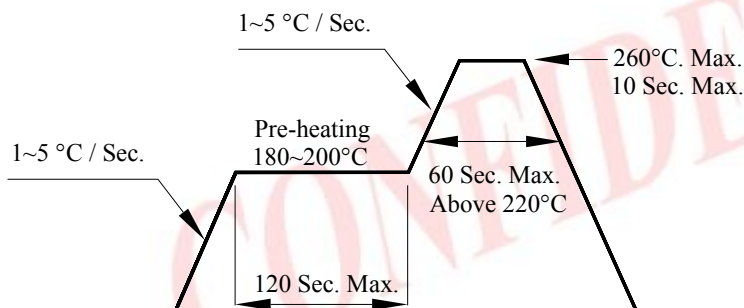
2.3 After opening the package: The LED's floor life is 1 year under 30 °C or less and 60% RH or less. If unused LEDs remain, it should be stored in moisture proof packages.

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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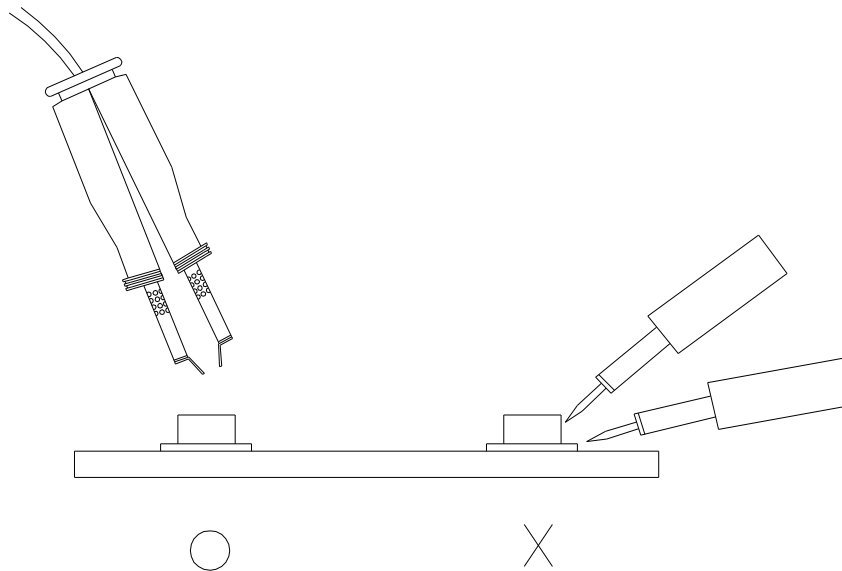
**67-03/BHGH6W-B11/2T/MS**

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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