BRIGHT LED ELECTRONICS CORP.

SINCE 1981

Specification for Approval

- DEVICE NUMBER: BL-HUBGE32M

SAMPLES ATTACHED AREA

PAGE / DATE	1	2	3	4	5	6	7	8			CONTENTS
2017.10.18	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0			Initial Released
2017.11.13		1.1		1.1							Modify GE Intensity Bin

FOR CUSTOMER'S APPROVAL STAMP OR SIGNATURE

APPROVED	PURCHASE	MANUFACTURE	QUALITY	ENGINEERING

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ISSUED	APPROVED	PREPARED
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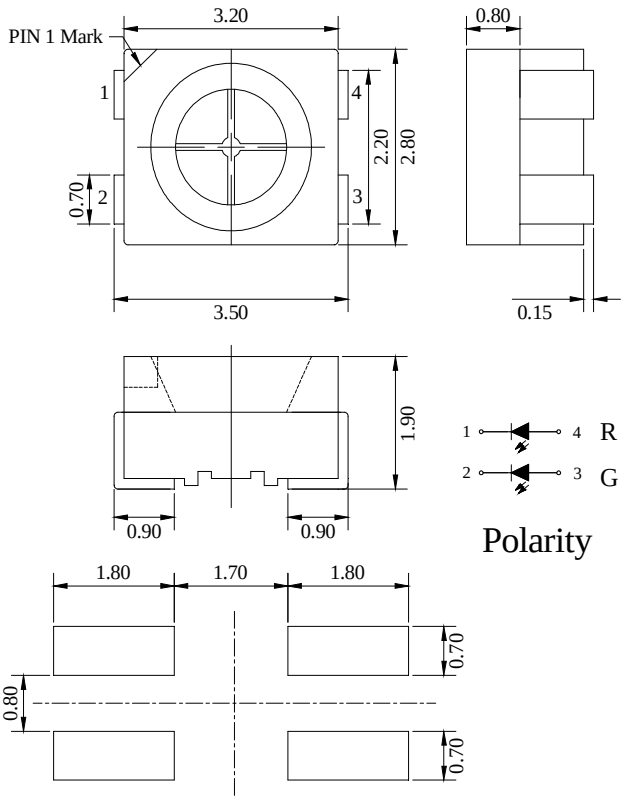
● Features:

1. Emitted Color: Red and Yellow Green
2. Lens Appearance: Water Clear.
3. 3.5x2.8x1.9mm standard package.
4. Suitable for all SMT assembly methods.
5. Compatible with infrared and vapor phase reflow solder process.
6. Compatible with automatic placement equipment.
7. This product doesn't contain restriction Substance, comply ROHS standard.

● Applications:

1. Automotive lighting.
2. Backlighting: LCDs, Key pads advertising.
3. Status indicators: Consumer & industrial electronics.
4. General use.

●Package Dimensions:



NOTES:
1.All dimensions are in millimeters (inches).
2.Tolerance is ±0.10mm (0.004") unless otherwise specified.
3.Specifications are subject to change without notice.

● Absolute Maximum Ratings(Ta=25℃)

Parameter	Symbol	Color	Rating	Unit
Power Dissipation	P_D	Red	75	mW
		Yellow Green	75	
Forward Current	I_F		30	mA
Peak Forward Current*[1]	I_{FP}		100	mA
Reverse Voltage	V_R		5	V
Operating Temperature	Topr		-40℃~85℃	-
Storage Temperature	Tstg		-40℃~100℃	-
Soldering Temperature	Tsol		See Page 7	-

*[1]Condition for I_{FP} is pulse of 1/10 duty and 3 msec width.

● Electrical and optical characteristics(Ta=25℃)

Parameter	Symbol	Condition	Color	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	I_F=20mA	Red	1.8	2.0	2.5	V
			Yellow Green	1.8	2.0	2.5	
Luminous Intensity	Iv	I_F=20mA	Red	-	150	-	mcd
			Yellow Green	-	50	-	
Peak Wavelength	λp	I_F=20mA	Red	-	640	-	nm
			Yellow Green	-	570	-	
Dominant Wavelength	λd	I_F=20mA	Red	627	-	637	nm
			Yellow Green	566	-	576	
Spectral Line Half-width	Δλ	I_F=20mA	Red	-	50	-	nm
			Yellow Green	-	30	-	
Reverse Current	I_R	V_R=5V		-	-	10	μA
Viewing Angle	$2\theta_{1/2}$	I_F=20mA		-	120	-	degree

● Typical Electro-Optical Characteristics Curves.

Fig.1 Relative intensity vs. wavelength

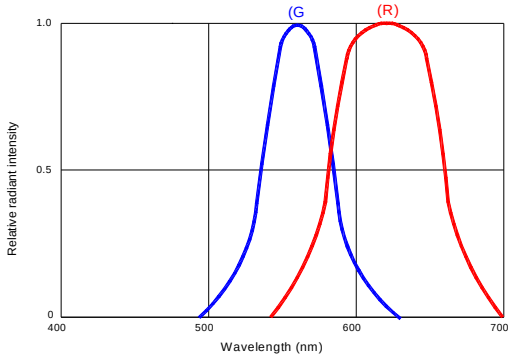


Fig.2 Forward current derating curve vs. ambient temperature

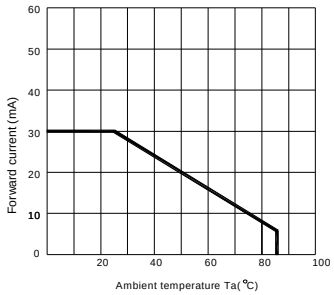


Fig.3 Forward current vs. forward voltage

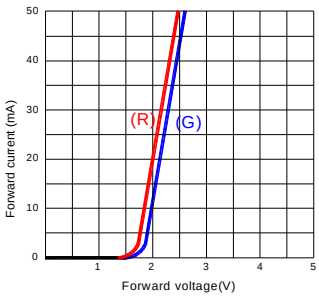


Fig.4 Relative luminous intensity vs. ambient temperature

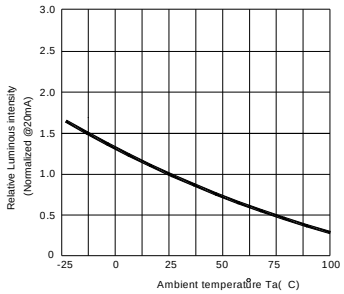


Fig.5 Relative luminous intensity vs. forward current

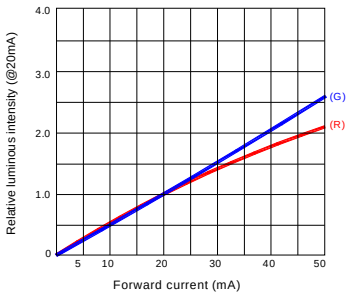
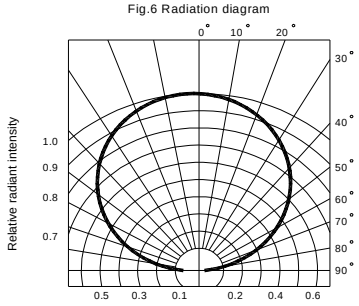
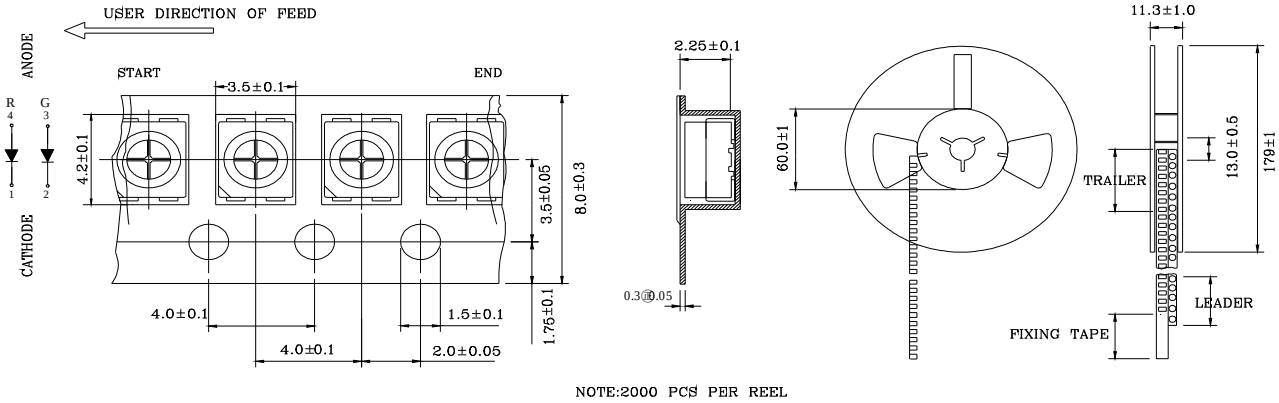


Fig.6 Radiation diagram

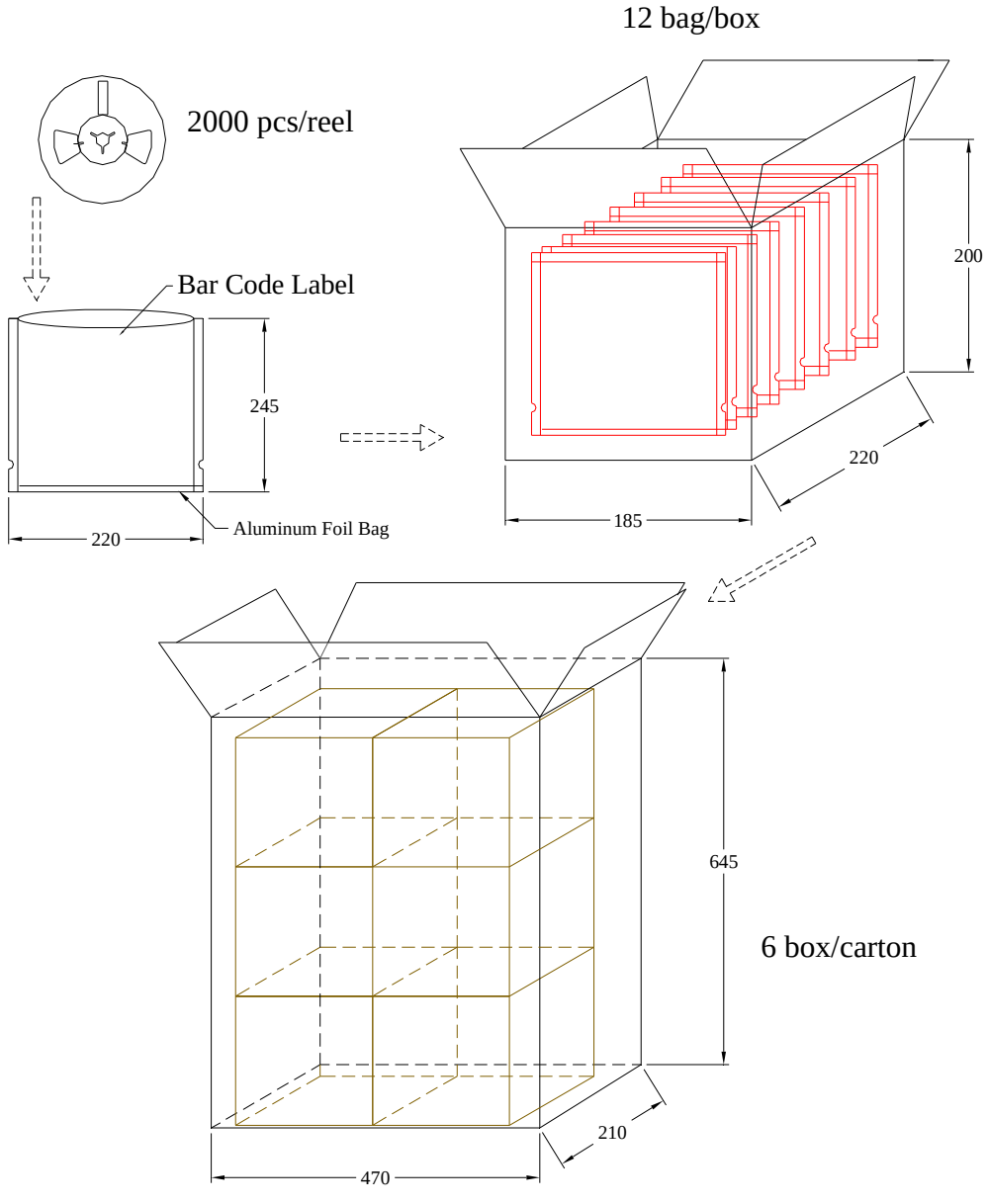


● Tapping and packaging specifications(Units: mm)



NOTE:2000 PCS PER REEL

●Package Method:(unit:mm)



● Bin Limits (At 20mA)

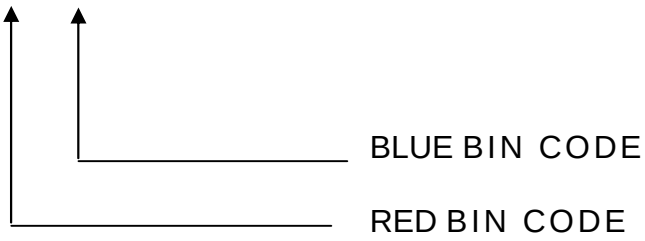
Intensity Bin Limits (At 20 mA) (UB)

COLOR	RED			
ITEM	Iv (mcd)		λd (nm)	
Spec	93-317		627-637	
BIN	MIN	MAX	MIN	MAX
Q	93	140	627	637
R	140	210		
S	210	317		

Intensity Bin Limits (At 20 mA) (GE)

COLOR	Yellow Green			
ITEM	Iv (mcd)		λd (nm)	
Spec	28-94		566-576	
BIN	MIN	MAX	MIN	MAX
M4	28	42	566	568
M5			568	570
M6			570	572
M7			572	574
M8			574	576
N4	42	63	566	568
N5			568	570
N6			570	572
N7			572	574
N8			574	576
P4	63	94	566	568
P5			568	570
P6			570	572
P7			572	574
P8			574	576

● BIN : x x



Notes:

1. Iv：Tolerance for each Bin limit is ± 15 %
2. λd：Tolerance for each Bin limit is ± 1nm
3. Bin categories are established for classification of products. Products may not be available in all bin categories.

● Reliability Test

Classification	Test Item	Reference Standard	Test Conditions	Result
Endurance Test	Operation Life	MIL-STD-750:1026 MIL-STD-883:1005 JIS-C-7021 :B-1	I_F=20mA Ta=Under room temperature Test time=1,000hrs	0/20
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	Ta=+65℃±5℃ RH=90%-95% Test time=240hrs	0/20
	High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High Ta=+85℃±5℃ Test time=1,000hrs	0/20
	Low Temperature Storage	JIS-C-7021 :B-12	Low Ta=-35℃±5℃ Test time=1,000hrs	0/20
Environmental Test	Temperature Cycling	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4	-35℃ ~ +25℃ ~ +85℃ ~ +25℃ 60min 20min 60min 20min Test Time=5cycle	0/20
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	-35℃±5℃ ~+85℃±5℃ 20min 20min Test Time=10cycle	0/20
	Solder Resistance	MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1	Preheating： 140℃-160℃,within 2 minutes. Operation heating： 260℃(Max.), within 10seconds. (Max.)	0/20

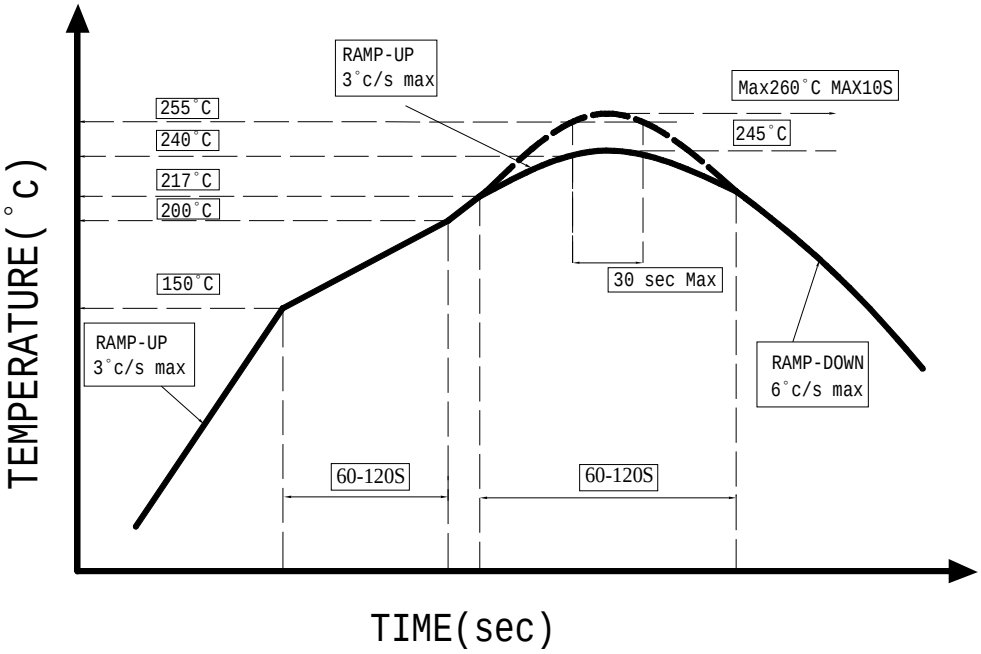
● Judgment criteria of failure for the reliability

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	V_F (V)	I_F=20mA	Over U^1x1.2
Reverse current	I_R (uA)	V_R=5V	Over U^1x2
Luminous intensity	Iv (mcd)	I_F=20mA	Below S^1X0.5

Note: 1. U means the upper limit of specified characteristics. S means initial value.

2. After each test, remove test pieces, wait for 2 hours and test pieces have returned to ambient temperature, then take next measurement.

●**IR-Reflow**



1、Avoid any external stress applied to the resin while the LEDs are at high temperature, especially during soldering.

2、Avoid rapid cooling or any excess vibration during temperature ramp-down process

3、Although the soldering condition is recommended above,
soldering at the lowest possible temperature is feasible for the LEDs

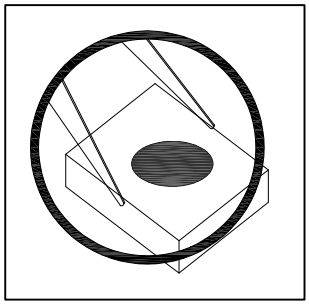
●IRON Soldering

350℃ Within 3 sec, one time only.

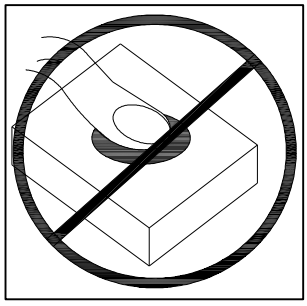
Handling Precautions

Compare to epoxy encapsulant that is hard and brittle, silicone is softer and flexible.
Although its characteristic significantly reduces thermal stress, it is more susceptible to damage by external mechanical force.
As a result, special handling precautions need to be observed during assembly using silicone encapsulated LED products. Failure to comply might lead to damage and premature failure of the LED.

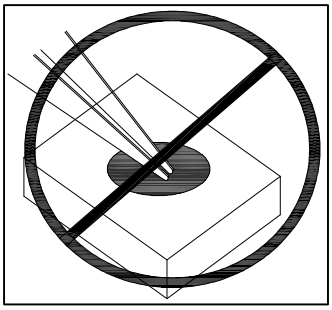
1. Handle the component along the side surfaces by using forceps or appropriate tools.(pic.1)
2. Do not directly touch or handle the silicone lens surface. It may damage the internal circuitry. (pic.2,pic.3)
3. Do not stack together assembled PCBs, containing exposed LEDs. Impact may scratch the silicone lens or damage the internal circuitry. (pic.4)
4. The outer diameter of the SMD pickup nozzle should not exceed the size of the LED to prevent air leaks. The inner diameter of the nozzle should be as large as possible. (pic.5)
5. A pliable material is suggested for the nozzle tip to avoid scratching or damaging the LED surface during pickup. (pic.5)
6. The dimensions of the component must be accurately programmed in the pick-and-place machine to insure precise pickup and avoid damage during production. (pic.5)



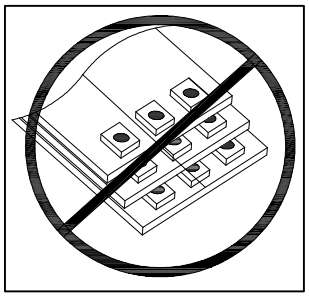
Pic.1



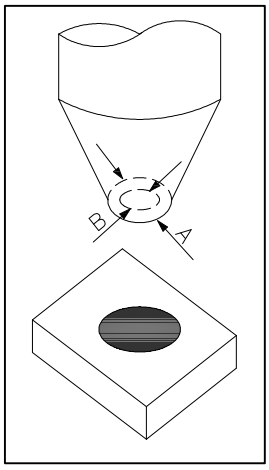
Pic.2



Pic.3



Pic.4



Pic.5

● Notes for designing:

Care must be taken to provide the current limiting resistor in the circuit so as to drive the LEDs within the rated figures. Also, caution should be taken not to overload LEDs with instantaneous voltage at the turning ON and OFF of the circuit.

When using the pulse drive care must be taken to keep the average current within the rated figures. Also, the circuit should be designed so as be subjected to reverse voltage when turning off the LEDs.

● Storage:

In order to avoid the absorption of moisture, it is recommended to solder LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, to store it in the environment as following:
(1) Temperature : 5℃-30℃(41℉)Humidity : RH 60% Max.
(2) After this bag is opened, devices that will be applied to infrared reflow, vapor-phase reflow, or equivalent soldering process must be:
a. Completed within 168 hours.
b. Stored at less than 30% RH.
(3) Devices require baking before mounting, if:
2a or 2b is not met.
(4) If baking is required, devices must be baked under below conditions:
48 hours at 60℃±3℃.

● **Package and Label of Products:**

(1) Package: Products are packed in one bag of 2000 pcs (one taping reel) and a label is attached to each bag.
(2) Label: