

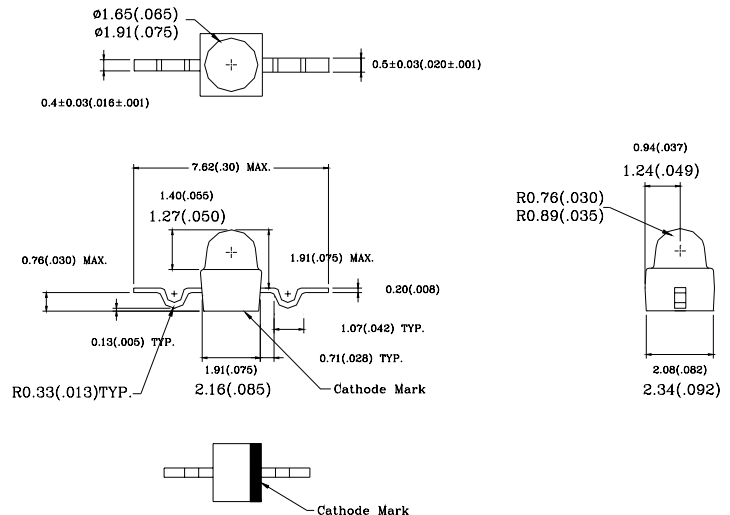
### ● Features:

1. Emitted Color: Super Red.
2. Lens Appearance: Water Clear.
3. Low cost plastic package.
4. This product doesn't contain restriction Substance, comply ROHS standard.

### ● Applications:

1. Automotive: Dashboards, stop lamps, turn signals.
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  $\pm 0.10\text{mm}$  (0.004") unless otherwise specified.
3. Specifications are subject to change without notice.

### ● Absolute Maximum Ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Power Dissipation	Pd	60	mW
Forward Current	I <sub>F</sub>	30	mA
Peak Forward Current * 1	I <sub>FP</sub>	100	mA
Reverse Voltage	V <sub>R</sub>	5	V
Operating Temperature	T <sub>opr</sub>	-25°C~80°C	-
Storage Temperature	T <sub>stg</sub>	-30°C~100°C	-
Soldering Temperature	T <sub>sol</sub>	See Page 5	-

\* 1 Condition for I<sub>FP</sub> is pulse of 1/10 duty and 0.1msec width.

## ● Electrical and optical characteristics(Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V <sub>f</sub>	I <sub>F</sub> =20mA	-	1.7	2.6	V
Luminous Intensity	I <sub>v</sub>	I <sub>F</sub> =20mA	28	60	-	mcd
Reverse Current	I <sub>R</sub>	V <sub>R</sub> =5V	-	-	100	μA
Peak Wave Length	λ <sub>p</sub>	I <sub>F</sub> =20mA	-	660	-	nm
Dominant Wave Length	λ <sub>d</sub>	I <sub>F</sub> =20mA	638		648	nm
Spectral Line Half-width	Δλ	I <sub>F</sub> =20mA	-	20	-	nm
Viewing Angle	2θ <sub>1/2</sub>	I <sub>F</sub> =20mA	-	35	-	deg

## ● Typical Electro-Optical Characteristics Curves

Fig.1 RELATIVE INTENSITY VS. WAVELENGTH

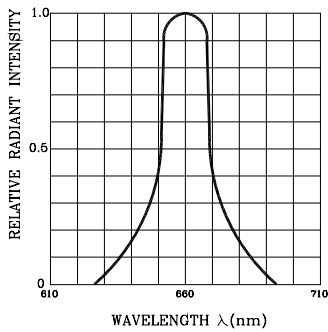


Fig.2 FORWARD CURRENT DERATING CURV

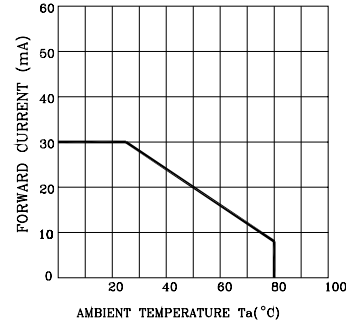


Fig.3 FORWARD CURRENT VS. FORWARD VOLTAGE

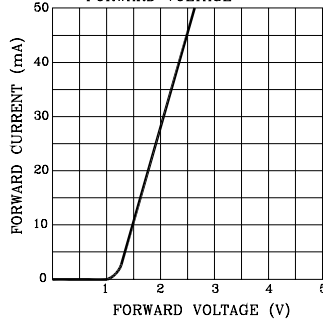


Fig.4 RELATIVE LUMINOUS INTENSITY VS. AMBIENT TEMPERATURE

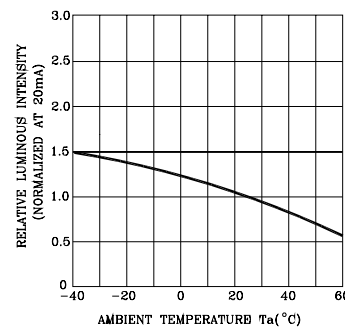
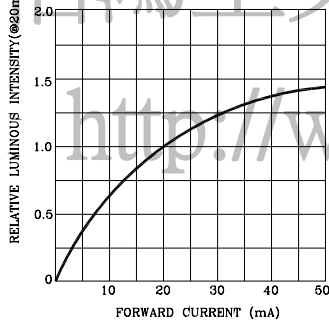
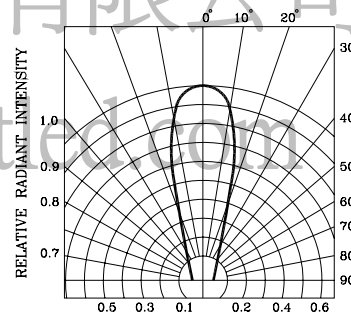


Fig.5 RELATIVE LUMINOUS INTENSITY VS. FORWARD CURRENT

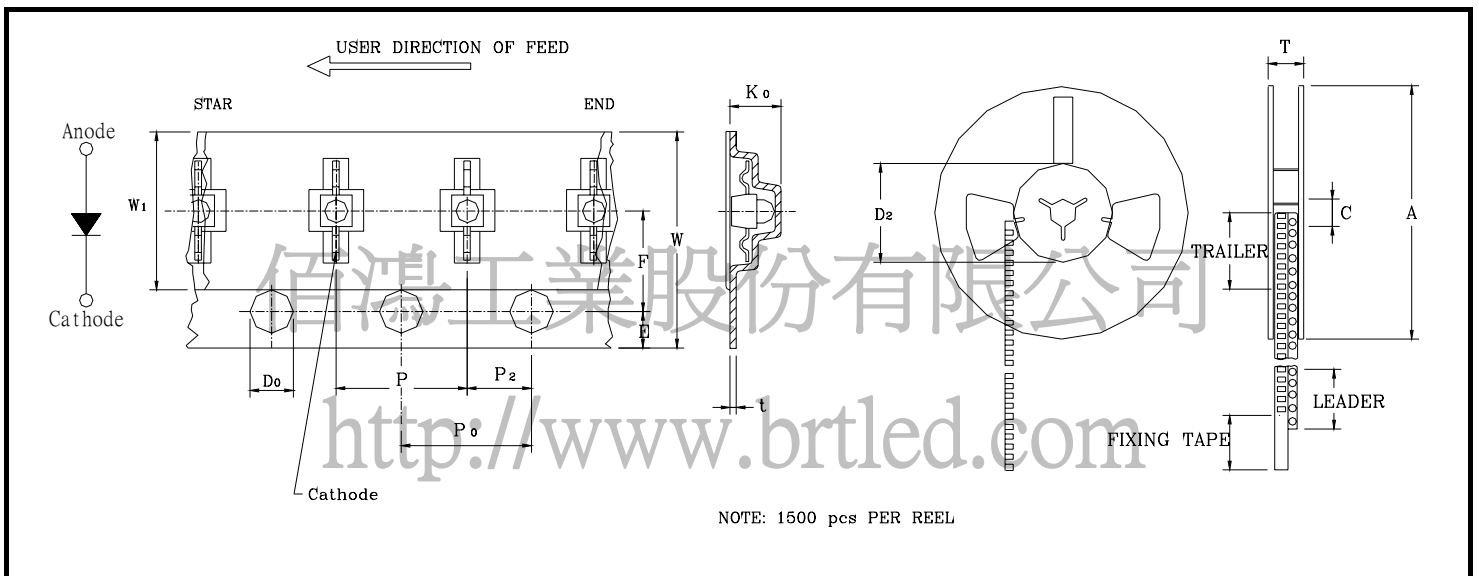


RADIATION DIAGRAM



● Tapping and packaging specifications(Units: mm)

ITEM	SYMBOL	SPECIFICATION			
		Minimum		Maximum	
		mm	inch	mm	inch
Tape Feed Hole Diameter (DIA)	$D_0$	1.40	0.055	1.55	0.061
Feed Hole Location	E	1.65	0.065	1.85	0.072
Centers Line Dimensions Length Direction	F	5.45	0.215	5.55	0.218
Compartment Depth	$K_0$	3.00	0.118	3.20	0.126
Carrier Tape Overall Thickness	K	3.00	0.118	3.20	0.126
Compartment Pitch	P	3.90	0.153	4.10	0.161
Sprocket Hole Diameter	$P_0$	3.90	0.153	4.10	0.161
Centers Line Dimensions Length Direction	$P_2$	1.95	0.076	2.05	0.080
Carrier Tape Thickness	t	—	—	0.30	0.012
Carrier Tape Width	W	12.00	0.472	12.30	0.484
Flange Diameter	A	178.0	7.008	180.0	7.087
Hub Spindle Hole	C	12.50	0.492	13.50	0.531
Hub Diameter	$D_2$	20.00	0.788	21.50	0.846
Fixing Tape Width	$W_1$	9.00	0.354	9.30	0.366
Flange Space Between Flanges	T	16.00	0.629	17.00	0.669
Compartment Length	$A_0$	1.87	0.074	2.07	0.081
Compartment Width	$B_0$	6.30	0.248	6.50	0.256



## ● 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	Connect with a power $I_f=20\text{mA}$ $T_a$ =Under room temperature Test time=1,000hrs	0/20
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	$T_a=+65^\circ\text{C}\pm 5^\circ\text{C}$ RH=90%-95% Test time=240hrs	0/20
	High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High $T_a=+85^\circ\text{C}\pm 5^\circ\text{C}$ Test time=1,000hrs	0/20
	Low Temperature Storage	JIS-C-7021 :B-12	Low $T_a=-35^\circ\text{C}\pm 5^\circ\text{C}$ 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	$-35^\circ\text{C} \sim +25^\circ\text{C} \sim +85^\circ\text{C} \sim +25^\circ\text{C}$ 60min 20min 60min 20min Test Time=5cycle	0/20
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	$-35^\circ\text{C}\pm 5^\circ\text{C} \sim +85^\circ\text{C}\pm 5^\circ\text{C}$ 20min 20min Test Time=10cycle	0/20
	Solder Resistance	MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1	Preheating : $140^\circ\text{C}-160^\circ\text{C}$ , within 2 minutes. Operation heating : $235^\circ\text{C}$ (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)	$I_F=20\text{mA}$	Over $U_x1.2$
Reverse current	$I_R$ ( $\mu\text{A}$ )	$V_R=5\text{V}$	Over $U_x2$
Luminous intensity	$I_v$ (mcd)	$I_F=20\text{mA}$	Below $SX0.5$

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

2. Measurement shall be taken between 2 hours and after the test pieces have been returned to normal ambient conditions after completion of each test.

● **Soldering :**

1. Manual Of Soldering

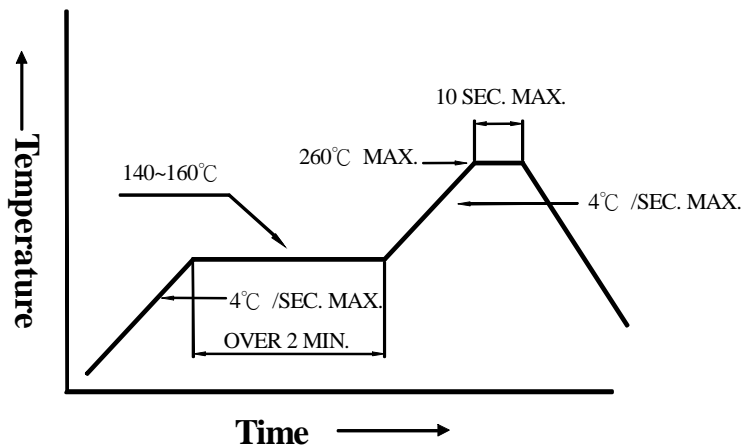
The temperature of the iron tip should not be higher than 300°C (572°F) and Soldering within 3 seconds per solder-land is to be observed.

2. Refold Soldering

Preheating : 140°C~160°C ±5°C ,within 2 minutes.

Operation heating : 260°C (Max.) within 10 seconds.(Max)

Gradual Cooling (Avoid quenching).

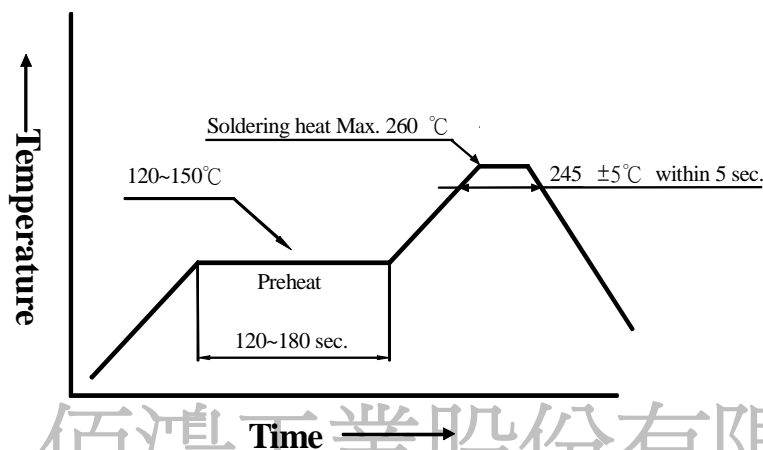


3. DIP soldering (Wave Soldering) :

Preheating : 120°C~150°C,within 120~180 sec.

Operation heating : 245°C±5°C within 5 sec.260°C (Max)

Gradual Cooling (Avoid quenching).



● **Handling :**

Care must be taken not to cause to the epoxy resin portion of BRIGHT LEDs while it is exposed to high temperature.

Care must be taken not rub the epoxy resin portion of BRIGHT LEDs with hard or sharp article such as the sand blast and the metal hook.

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<http://www.brtled.com>

● **Notes for designing:**

Care must be taken to provide the current limiting resistor in the circuit so as to drive the BRIGHT LEDs within the rated figures. Also, caution should be taken not to overload BRIGHT 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 to be subjected to reverse voltage when turning off the BRIGHT LEDs.

● **Storage:**

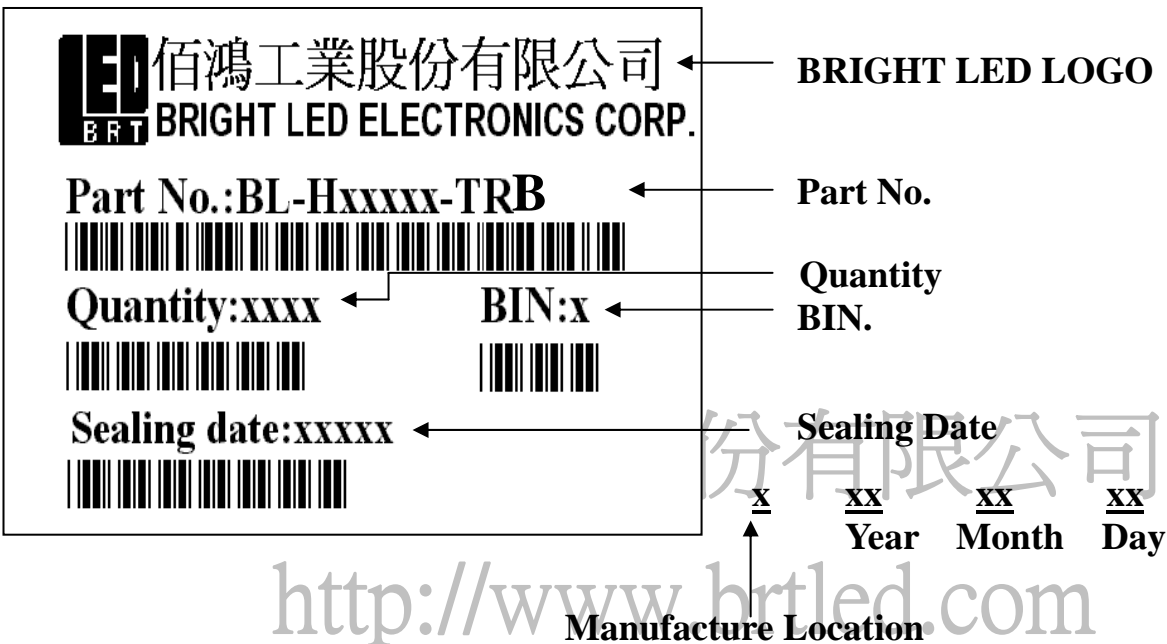
In order to avoid the absorption of moisture, it is recommended to solder BRIGHT LEDs as soon as possible after unpacking the sealed envelope.

If the envelope is still packed, to store it in the environment as following:

- (1) Temperature : 5°C-30°C (41°F) 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:
  - (2) a or (2) b is not met.
- (4) If baking is required, devices must be baked under below conditions:
  - 48 hours at 60°C±3°C.

● **Package and Label of Products:**

- (1) Package: Products are packed in one bag of 1500 pcs (one taping reel) and a label is attached on each bag.
- (2) Label:



The diagram shows a rectangular label with the following fields and callouts:

- BRIGHT LED LOGO:** Points to the logo at the top left, which includes the text "佰鴻工業股份有限公司" and "BRIGHT LED ELECTRONICS CORP." above a "BRT" logo.
- Part No.:** Points to the text "Part No.:BL-Hxxxxx-TRB".
- Quantity:** Points to the text "Quantity:xxxx".
- BIN:** Points to the text "BIN:x".
- Sealing Date:** Points to the text "Sealing date:xxxxx".
- Manufacture Location:** Points to a barcode at the bottom left.

Below the label, the date format is shown as:              
Year Month Day

A large watermark "http://www.brtled.com" is visible across the bottom of the label area.