PARA LIGHT ELECTRONICS CO., LTD.
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E-mail: para@para.com.tw www.paralighttaiwan.com

DATA SHEET

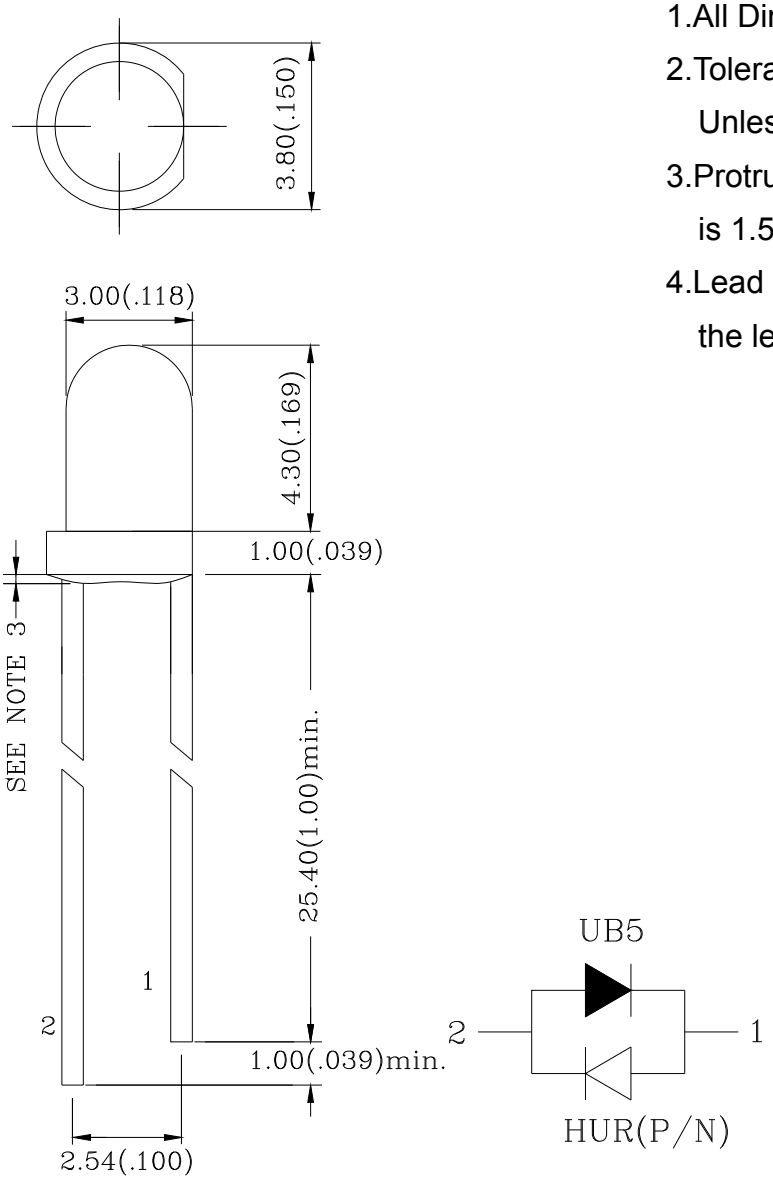
PART NO. : LHR3UB5HURW251

REV : A / 1

CUSTOMER'S APPROVAL : _____ DCC : _____

PACKAGE DIMENSIONS

ITEM	MATERIALS
RESIN	Epoxy Resin



Note:

1.All Dimensions are in millimeters.

2.Tolerance is ±0.25mm(0.010 ")
Unless otherwise specified.

3.Protruded resin under flange
is 1.5mm(0.059 ") max.

4.Lead spacing is measured where
the leads emerge from the package.

FEATURES

* 3.0 mm DIA LED LAMP
* LOW POWER CONSUMPTION.
* I.C. COMPATIBLE.
* TWO CHIPS ARE MATCHED FOR UNIFORM LIGHT OUTPUT.
* LONG LIFE SOLID STATE RELIABILITY.
* Pb FREE PRODUCTS

CHIP MATERIALS

* Dice Material : GaInN/GaN & AlGaInp
* Light Color : MULTICOLOR(ULTRA BLUE & ULTRA RED)
* Lens Color : WHITE DIFFUSED

ABSOLUTE MAXIMUM RATING : (Ta = 25°C)

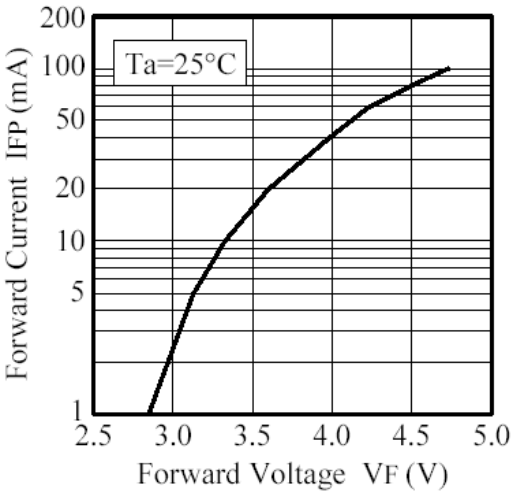
SYMBOL	DESCRIPTION	ULTRA BLUE	ULTRA RED	UNIT
P_D	Power Dissipation Per Chip	80	56	mW
V_R	Reverse Voltage Per Chip	5	5	V
I_F	Average Forward Current Per Chip	20	20	mA
I_{PF}	Peak Forward Current Per Chip (Duty=0.1,1KHZ)	80	80	mA
Topr	Operating Temperature Range	-40°C to 85°C		
Tstg	Storage Temperature Range	-40°C to 85°C		

ELECTRO-OPTICAL CHARACTERISTICS : (Ta = 25°C)

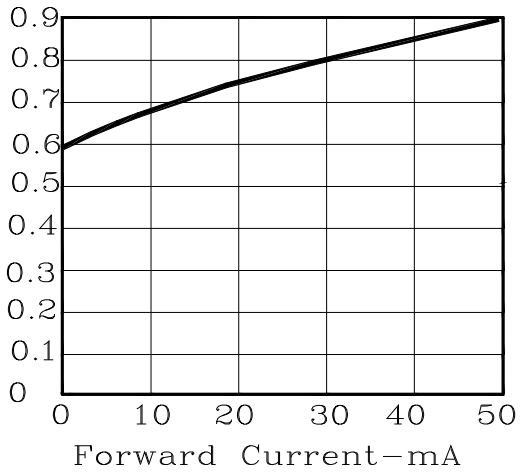
SYMBOL	PARAMETER	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
V_F	Forward Voltage	I_F=20mA	Ultra Blue		3.5	4.0	V
			Ultra Red		2.0	2.8	V
λ_D	Dominant Wavelength	I_F=20mA	Ultra Blue		470		nm
			Ultra Red		633		nm
$\Delta\lambda$	Spectral Line Half-Width	I_F=20mA	Ultra Blue		30		nm
			Ultra Red		20		nm
$2\theta 1/2$	Half Intensity Angle	I_F=20mA	Ultra Blue		60		deg
			Ultra Red		60		deg
I_V	Luminous Intensity	I_F=20mA	Ultra Blue		750		mcd
			Ultra Red		200		mcd

UB5

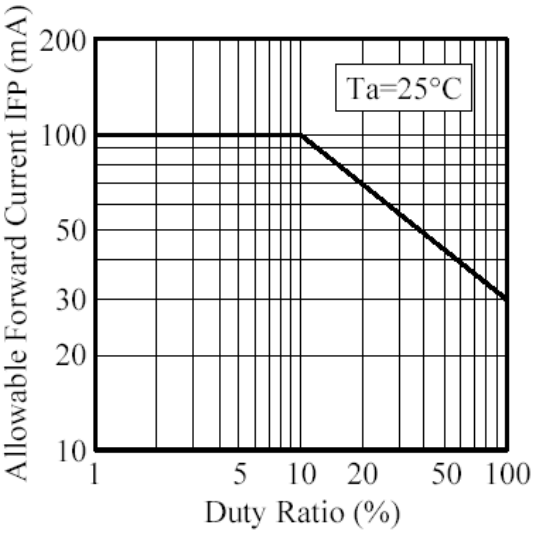
■ Forward Voltage vs. Forward Current



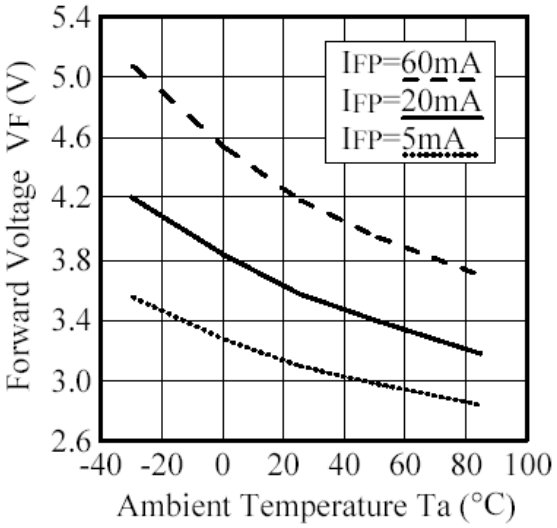
Forward Current vs. Relative luminosity



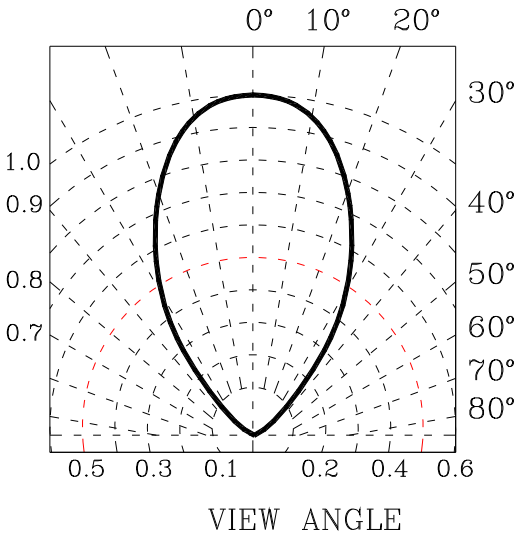
■ Duty Ratio vs. Allowable Forward Current

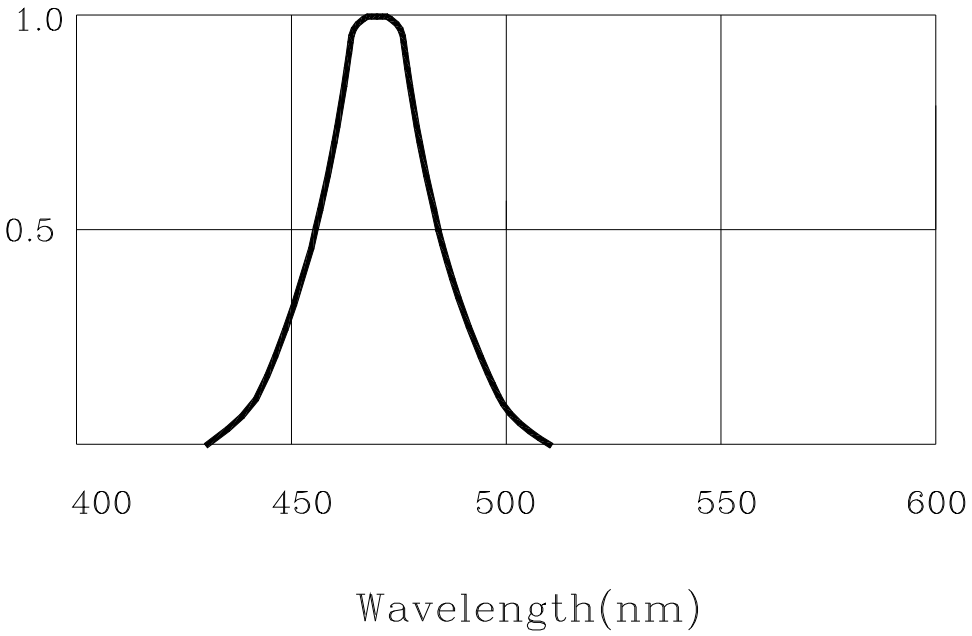


■ Ambient Temperature vs. Forward Voltage

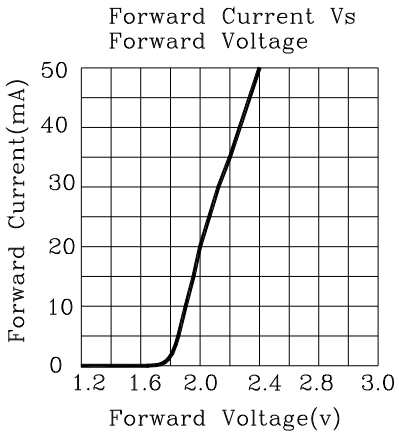


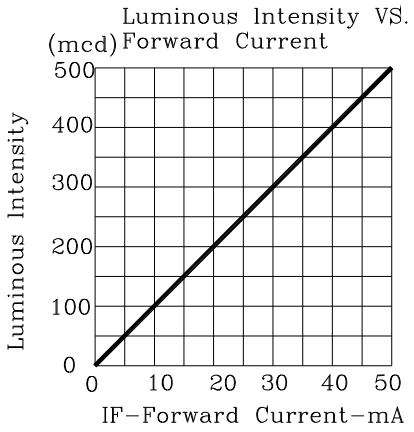
UB5

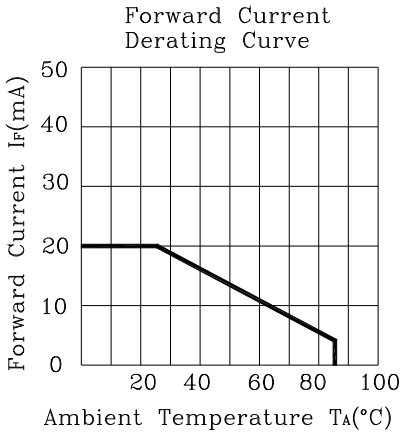

0° 10° 20°
30°
40°
50°
60°
70°
80°
1.0
0.9
0.8
0.7
0.5 0.3 0.1 0.2 0.4 0.6
VIEW ANGLE

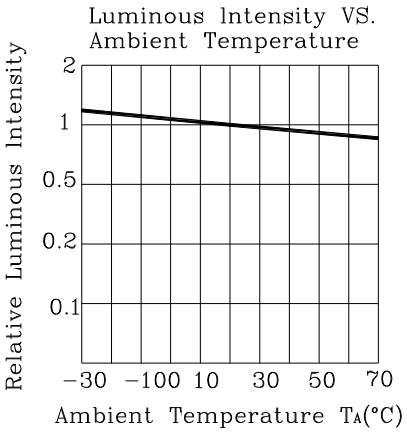

1.0
0.5
400 450 500 550 600
Wavelength(nm)

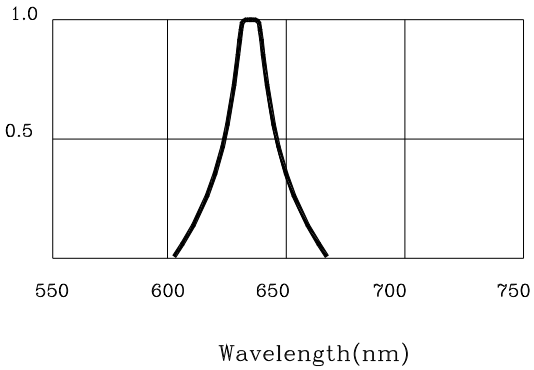
HUR

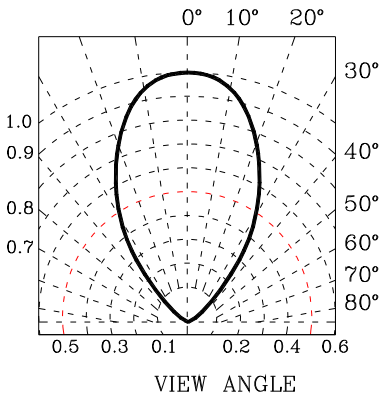

Forward Current Vs
Forward Voltage
Forward Current(mA)
50
40
30
20
10
0
1.2 1.6 2.0 2.4 2.8 3.0
Forward Voltage(v)


Luminous Intensity VS.
Forward Current
(mcd)
Luminous Intensity
500
400
300
200
100
0
0 10 20 30 40 50
IF-Forward Current-mA

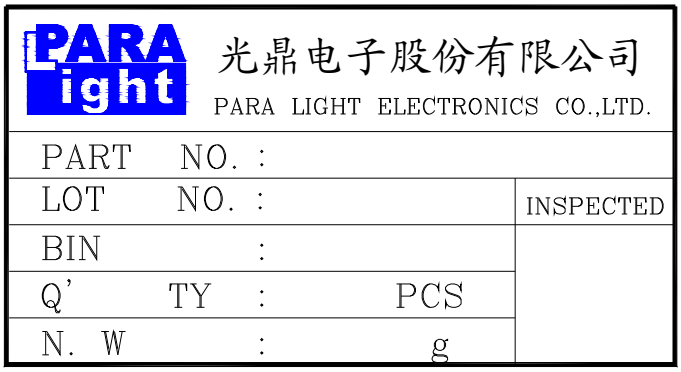

Forward Current
Derating Curve
Forward Current IF(mA)
50
40
30
20
10
0
20 40 60 80 100
Ambient Temperature TA(°C)


Luminous Intensity VS.
Ambient Temperature
Relative Luminous Intensity
2
1
0.5
0.2
0.1
-30 -100 10 30 50 70
Ambient Temperature TA(°C)


1.0
0.5
550 600 650 700 750
Wavelength(nm)


0° 10° 20°
30°
40°
50°
60°
70°
80°
1.0
0.9
0.8
0.7
0.5 0.3 0.1 0.2 0.4 0.6
VIEW ANGLE

Label Explanation



PART NO. : Refer to p16

LOT NO. : **EN L L 4 7 0009**

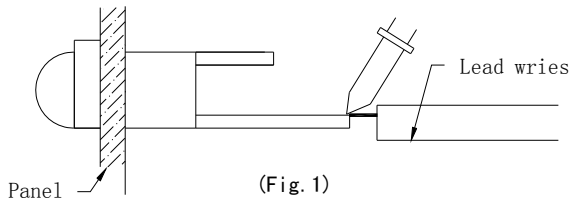
A B C D E F

A---E: For series number
B---L: Local F: Foreign
C---L: LAMP
D---Year
E---Month
F---SPEC.

•SOLDERING

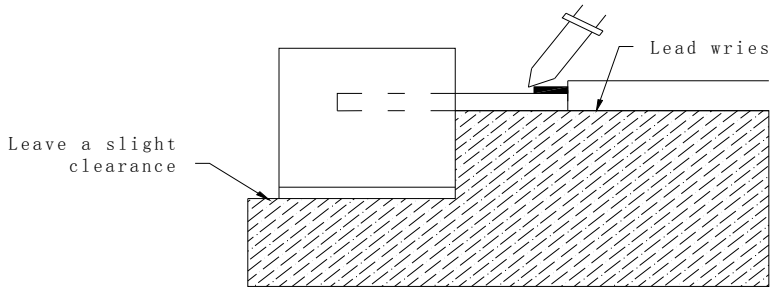
METHOD	SOLDERING CONDITIONS	REMARK
IR REFLOWER	Bath temperature: 260℃ Immersion time: with 3 sec ,1time	• Solder no closer than 3mm from the base of the package • Using soldering flux," RESIN FLUX" is recommended. •Attached data of temperatuare cure for your reference
DIP SOLDERING	Bath temperature: 260℃ Immersion time: with 3 sec ,1time	
SOLDERING IRON	Soldering iron: 30W or smaller Temperature at tip of iron: 300℃ or lower Soldering time: within 3 sec.	• During soldering, take care not to press the tip of iron against the lead. (To prevent heat from being transferred directly to the lead, hold the lead with a pair of tweezers while soldering

1) When soldering the lead of LED in a condition that the package is fixed with a panel (See Fig.1), be careful not to stress the leads with iron tip.



(Fig. 1)

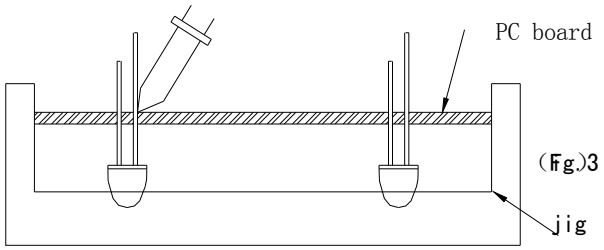
2) When soldering wire to the lead, work with a Fig (See Fig.2) to avoid stressing the package.



(Fig. 2)

Regarding solution in the tinning oven for product-tinning, compound sub-solution made of tin & copper and sliver is proposed with the temperature of Celsius 260. The proportion of the alloyed solution is tin 95.5: copper 3.5: silver 0.5 by percentage. The time of tinning is constantly 3 seconds.

3) Similarly, when a jig is used to solder the LED to PC board, take care as much as possible to avoid steering the leads (See Fig.3).



(Fig.)3

4) Repositioning after soldering should be avoided as much as possible. If inevitable, be sure to preserve the soldering conditions with irons stated above: select a best-suited method that assures the least stress to the LED.
5) Lead cutting after soldering should be performed only after the LED temperature has returned to normal temperature.

• STORAGE

1) The LEDs should be stored at 30℃ or less and 70% RH or less after being shipped from PARA and the storage life limits are 1 year .
2) PARA LED lead frames are comprised of a stannum plated iron alloy. The silver surface may be affected by environments which contain corrosive gases and so on. Please avoid conditions which may cause the LEDs to corrode, tarnish or discolor. This corrosion or discoloration may cause difficulty during soldering operations. It is recommended that the LEDs be used as soon as possible.

Please avoid rapid transitions in ambient temperature, especially, in high humidity environments where condensation can occur.

• STATIC ELECTRICITY

1) Static electricity or surge voltage damages the LEDs.
   It is recommended that a wrist band or an anti-electrostatic glove be used when handling the LEDs.
2) All devices, equipment and machinery must be properly grounded. It is recommended that measures be taken against surge voltage to the equipment that mounts the LEDs.
3) When inspecting the final products in which LEDs were assembled, it is recommended to check whether the assembled LEDs are damaged by static electricity or not. It is easy to find static-damaged LEDs by a light-on test or a VF test at a lower current (below 1mA is recommended).

4) Damaged LEDs will show some unusual characteristics such as the leak current remarkably increases, the forward voltage becomes lower, or the LEDs do not light at the low current .
   Criteria : (VF>2.0V at IF=0.5mA)

•LED MOUNTING METHOD

4) When mounting the LED by using a case, as shown Fig.4, ensure that the mounting holds on the PC board match the pitch of the leads correctly-tolerance of dimensions of the respective components including the LED should be taken into account especially when designing the case, PC board, etc. to prevent pitch misalignment between the leads and board holes, the diameter of the board holes should be slightly larger than the size of the lead. Alternatively, the shape of the holes should be made oval. (See Fig.4)

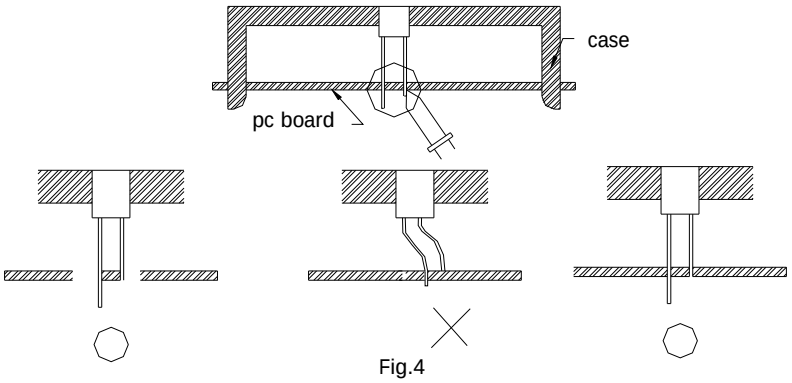


Fig.4

5) Use LEDs with stand-off (Fig.5) or the tube or spacer made of resin (Fig.6) to position the LEDs.

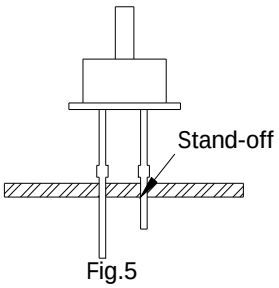


Fig.5

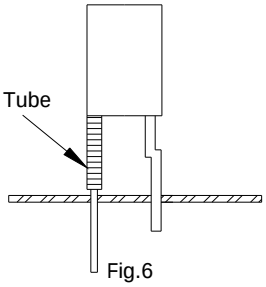


Fig.6

•FORMED LEAD

1) The lead should be bent at a point located at least 2mm away from the package. Bending should be performed with base fixed means of a jig or pliers (Fig.7)

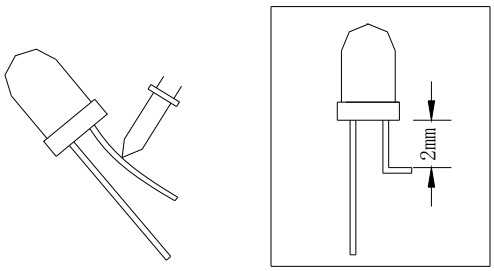


Fig. 7

2) Forming lead should be carried our prior to soldering and never during or after soldering.
3) Form the lead to ensure alignment between the leads and the hole on board, so that stress against the LED is prevented. (Fig.8)

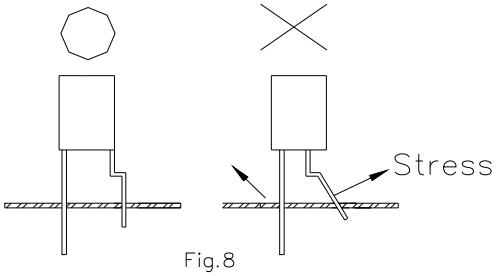


Fig.8

•LEAD STRENGTH

1) Bend strength
   Do not bend the lead more than twice. (Fig.9)

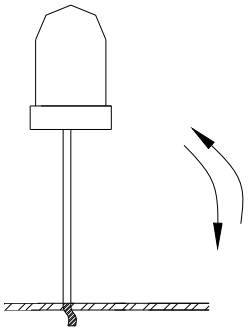


Fig.9

2) Tensile strength (@Room Temperature)
If the force is 1kg or less, there will be no problem. (Fig.10)

Fig.10

• HEAT GENERATION

1) Thermal design of the end product is of paramount importance. Please consider the heat generation of the LED when making the system design. The coefficient of temperature increase per input electric power is affected by the thermal resistance of the circuit board and density of LED placement on the board, as well as other components. It is necessary to avoid intense heat generation and operate within the maximum ratings given in this specification.

The operating current should be decided after considering the ambient maximum temperature of LEDs.

•CHEMICAL RESISTANCE

1) Avoid exposure to chemicals as it may attack the LED surface and cause discoloration.
2) When washing is required, refer to the following table for the proper chemical to be sued. (Immersion time: within 3 minutes at room temperature.)

SOLVENT	ADAPTABILITY
Freon TE	⊙
Chlorothene	╳
Isopropyl Alcohol	⊙
Thinner	╳
Acetone	╳
Trichloroethylene	╳

⊙--Usable ╳--Do not use.

NOTE: Influences of ultrasonic cleaning of the LED resin body differ depending on such factors as the oscillator output, size of the PC board and the way in which the LED is mounted. Therefore, ultrasonic cleaning should only be performed after confirming there is no problem by conducting a test under practical.

•OTHERS

1) Care must be taken to ensure that the reverse voltage will not exceed the absolute maximum rating when using the LEDs with matrix drive.
2) Flashing lights have been known to cause discomfort in people; you can prevent this by taking precautions during use. Also, people should be cautious when using equipment that has had LEDs incorporated into it.
3) The LEDs described in this brochure are intended to be used for ordinary electronic equipment (such as office equipment, communications equipment, measurement instruments and household appliances). Consult PARA's sales staff in advance for information on the applications in which exceptional quality and reliability are required , particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as for airplanes, aerospace, submersible repeaters, nuclear reactor control systems, automobiles, traffic control equipment, life support systems and safety devices).
4) User shall not reverse engineer by disassembling or analysis of the LEDs without having prior written consent from PARA. When defective LEDs are found, the User shall inform PARA directly before disassembling or analysis.
5) The formal specifications must be exchanged and signed by both parties before large volume purchase begins.
6) The appearance and specifications of the product may be modified for improvement without notice.

Bin Code List

Forward Voltage (VF), Unit:v@20mA		
Bin Code(UB5)	Min	Max
V0	2.8	3.0
V1	3.0	3.2
V2	3.2	3.4
V3	3.4	3.6
V4	3.6	3.8
V5	3.8	4.0

Tolerance of each bin are±0.1Volt

Dominant Wavelength(λD), Unit:nm@20mA		
Bin Code(UB5)	Min	Max
D4	463	466
D5	466	469
D6	469	472
D7	472	474
D8	474	476

Luminous Intensity(IV), Unit:mcd@20mA		
Bin Code(UB5)	Min	Max
D	280	390
E	390	550
F	550	770
G	770	1080
H	1080	1510

Tolerance of each bin are±15%

Bin Code List

Forward Voltage (VF), Unit:v@20mA		
Bin Code(HUR)	Min	Max
C	1.7	1.8
D	1.8	1.9
E	1.9	2.0
F	2.0	2.1
G	2.1	2.2
H	2.2	2.3
I	2.3	2.4
J	2.4	2.5
K	2.5	2.6
L	2.6	2.7
M	2.7	2.8

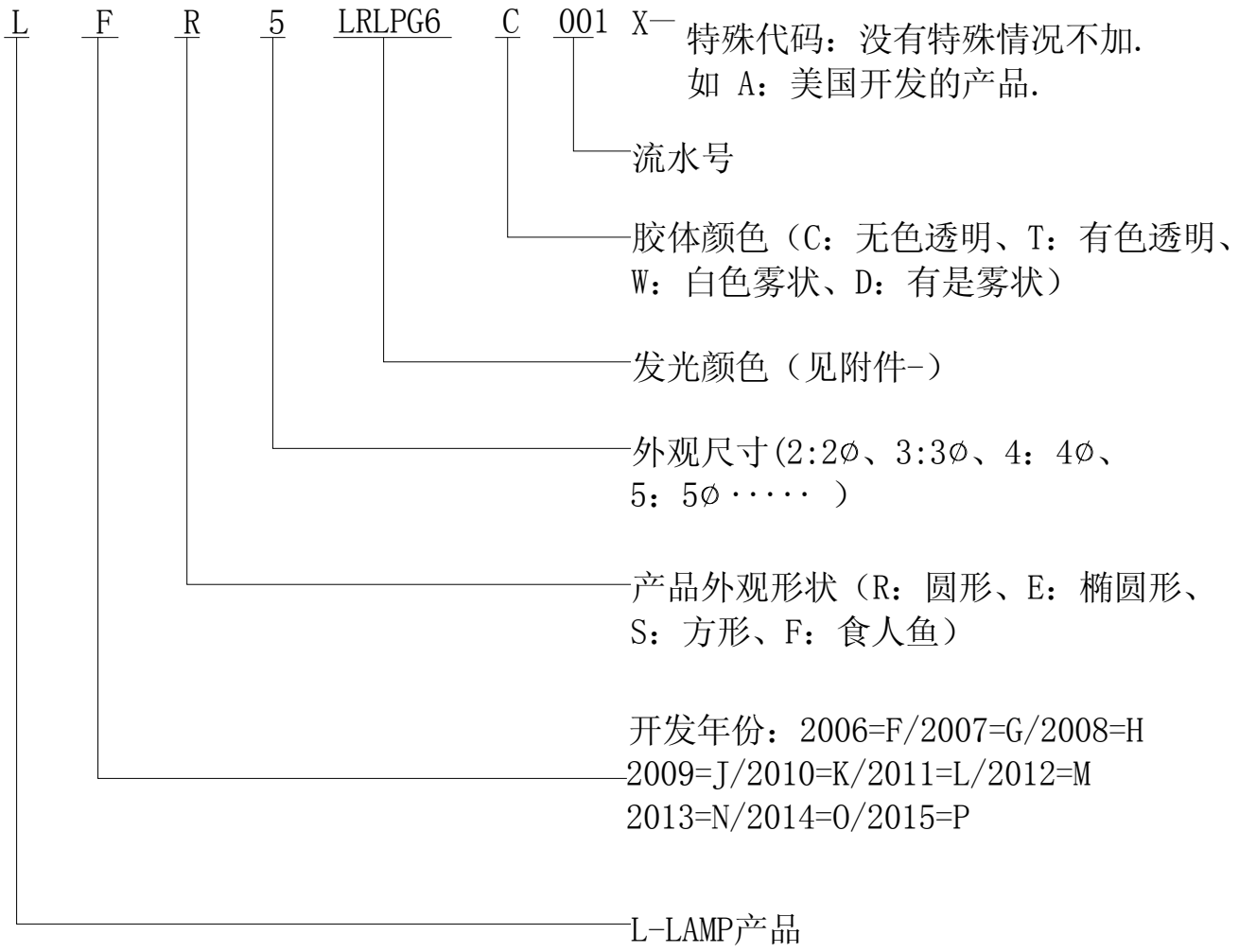
Tolerance of each bin are±0.1 Volt

Dominant Wavelength(λD), Unit:nm@20mA		
Bin Code(HUR)	Min	Max
O8	621	624
R1	624	629
R2	629	634
R3	634	639
R4	639	644

Luminous Intensity(IV), Unit:mcd@20mA		
Bin Code(HUR)	Min	Max
N	80.9	113.3
O	113.3	158.6
P	158.6	222
Q	222	310.8
R	310.8	435.1

Tolerance of each bin are±15%

LED Lamps:


L F R 5 LRLPG6 C 001 X—
特殊代码：没有特殊情况不加.
如 A：美国开发的产品.
流水号
胶体颜色（C：无色透明、T：有色透明、
W：白色雾状、D：有是雾状）
发光颜色（见附件-）
外观尺寸(2:2ø、3:3ø、4：4ø、
5：5ø····· ）
产品外观形状（R：圆形、E：椭圆形、
S：方形、F：食人鱼）
开发年份：2006=F/2007=G/2008=H
2009=J/2010=K/2011=L/2012=M
2013=N/2014=O/2015=P
L-LAMP产品