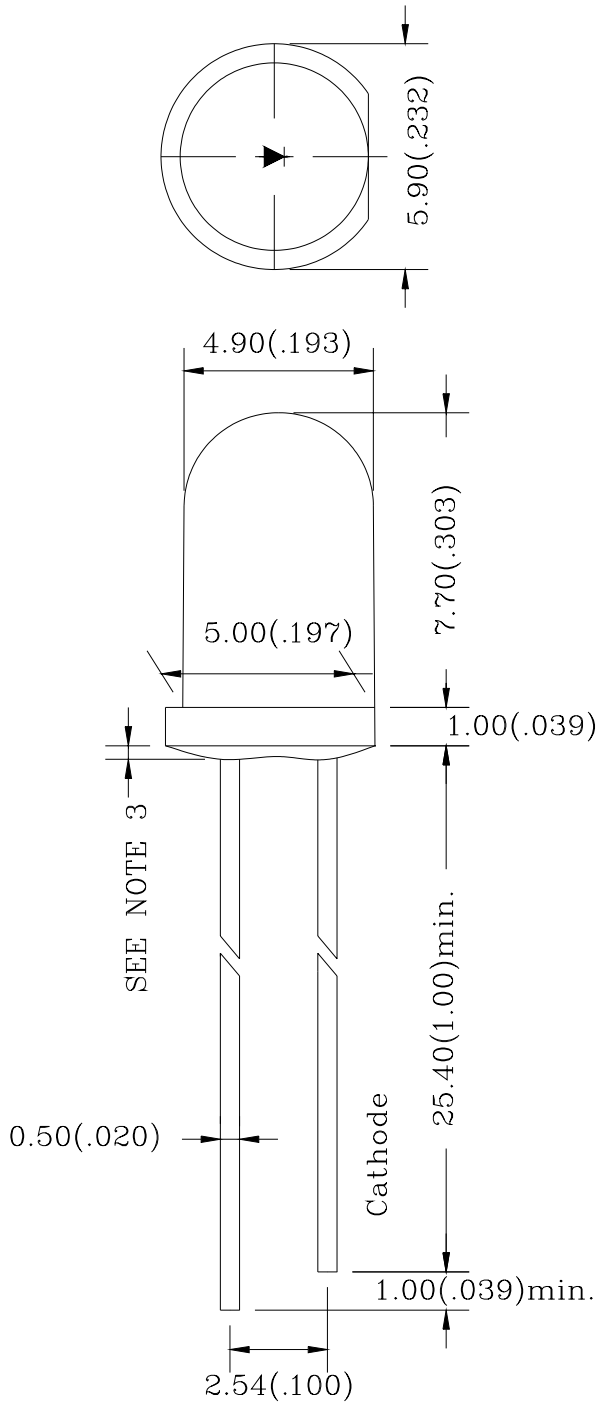
5.0 mm DIA LED LAMP

520HRF2

PACKAGE DIMENSIONS



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.
5.Specification are subject to change
without notice

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FEATURES

* 5.0 mm DIA LED LAMP
* HIGH LUMINOUS INTENSITY OUTPUT.
* LOW POWER CONSUMPTION.
* HIGH EFFICIENCY.
* VERSATILE MOUNTING ON P.C. BOARD OR PANEL.
* I.C. COMPATIBLE.
* Pb FREE PRODUCTS

CHIP MATERIALS

* Dice Material : GaAlInP/GaAs
* Light Color : ULTRA RED
* Lens Color : WATER CLEAR

ABSOLUTE MAXIMUM RATING : (Ta = 25°C)

SYMBOL	PARAMETER	ULTRA RED	UNIT
P_{AD}	Power Dissipation Per Chip	80	mW
V_R	Reverse Voltage Per Chip	5	V
I_{AF}	Continuous Forward Current Per Chip	30	mA
I_{PF}	Peak Forward Current Per Chip (Duty－0.1,1KHz)	60	mA
—	Derating Linear From 25°C Per Chip	0.40	mA/°C
Topr	Operating Temperature Range	-25°C to 85°C	
Tstg	Storage Temperature Range	-40°C to 85°C	
Lead Soldering Temperature｛1.6mm(0.063 inch) From Body｝260°C ± 5°C for 5 Seconds			

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

SYMBOL	PARAMETER	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
V_F	Forward Voltage	I_F = 20mA		2.0	2.6	V
I_R	Reverse Current	V_R = 5V			100	μA
λ_D	Dominant Wavelength	I_F = 20mA		633		nm
$\Delta\lambda$	Spectral Line Half-Width	I_F = 20mA		20		nm
2θ1/2	Half Intensity Angle	I_F = 20mA		20		deg
I_V	Luminous Intensity	I_F = 20mA		2500		mcd
FBLK	IC Flicker Frequency	Vdd=5Vdc	1.30	1.60	1.90	Hz
VDD	Operating Voltage		2	5	15	V

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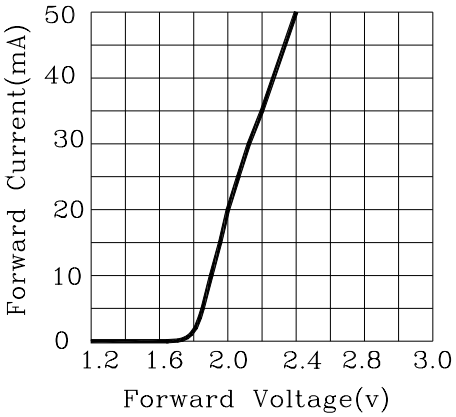
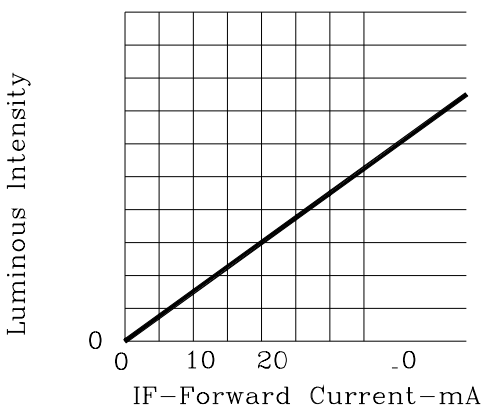
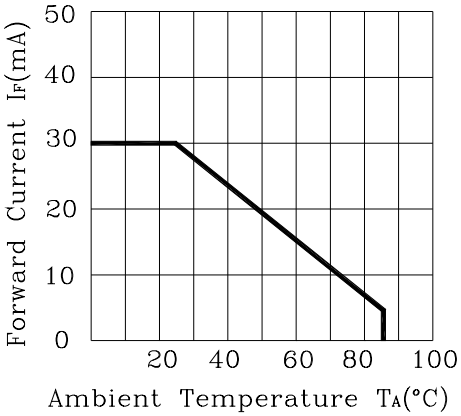
Forward Current Vs
Forward Voltage



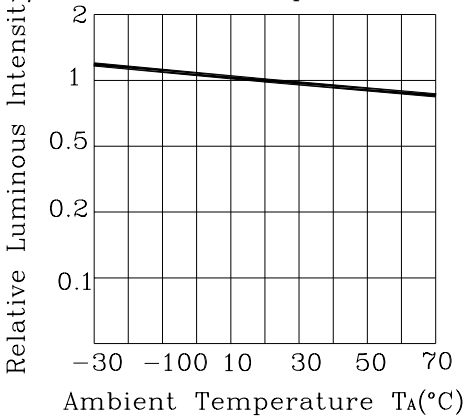
Luminous Intensity VS.
Forward Current

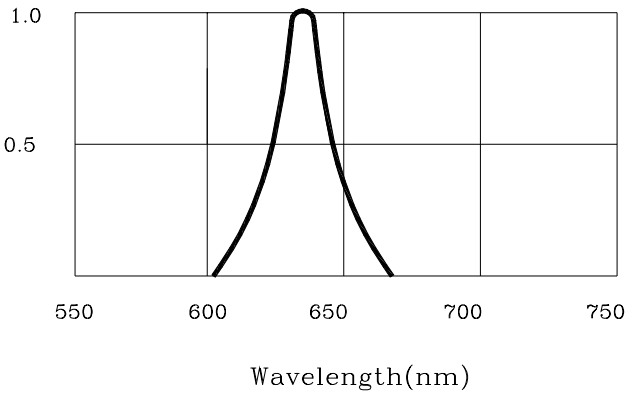


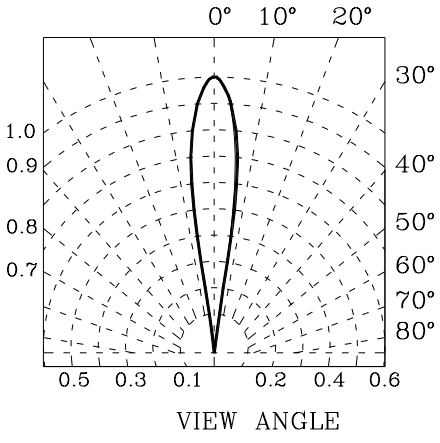
Forward Current
Derating Curve



Luminous Intensity VS.
Ambient Temperature



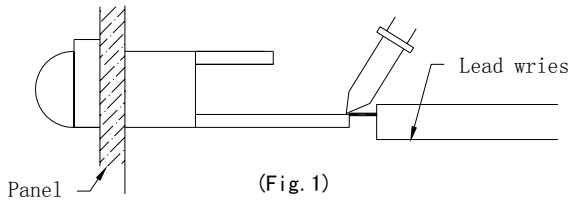




•SOLDERING

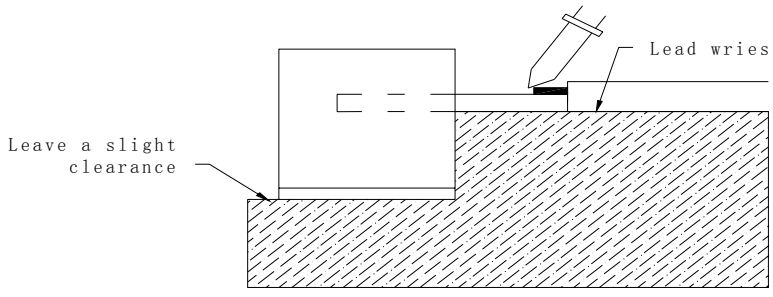
METHOD	SOLDERING CONDITIONS	REMARK
DIP SOLDERING	Bath temperature: 260±5℃ Immersion time: with 5 sec	• Solder no closer than 3mm from the base of the package • Using soldering flux," RESIN FLUX" is recommended.
SOLDERING IRON	Soldering iron: 30W or smaller Temperature at tip of iron: 260℃ or lower Soldering time: within 5 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)

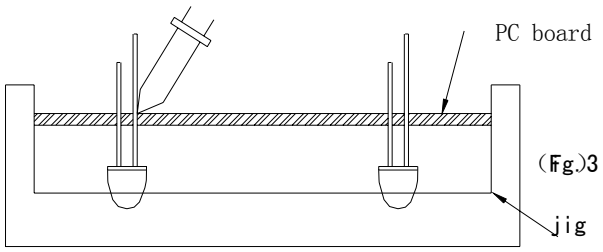
2) When soldering wire to the lead, work with a Fig (See Fig.2) to avoid stressing the package.



(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.

•LED MOUNTING METHOD

1) 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)

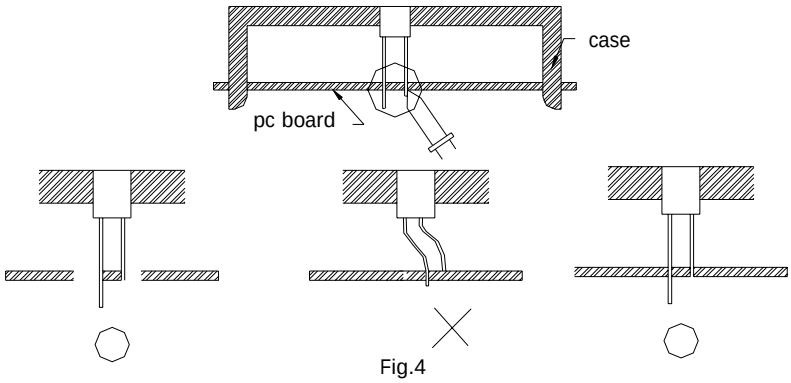


Fig.4

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

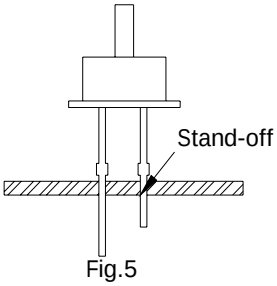


Fig.5

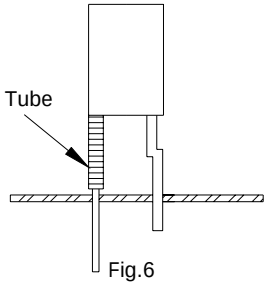


Fig.6

•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)

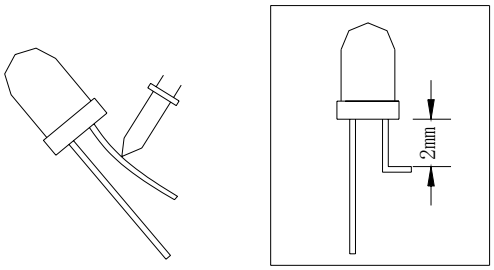


Fig. 7

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)

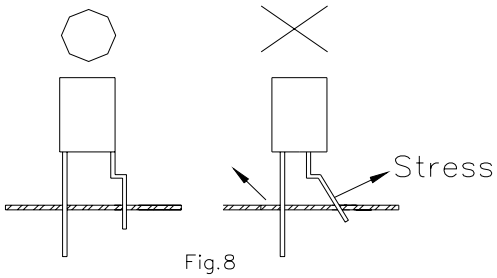


Fig.8

•LEAD STRENGTH

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

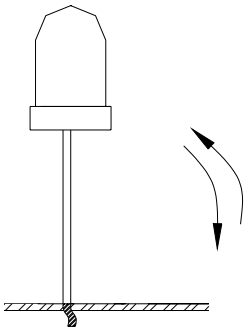


Fig.9

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

Fig.10

•HANDLING PRECAUTIONS

Although rigid against vibration, the LEDs may damaged or scratched if dropped. So take care when handling.

•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.

Experiment Item:

Item	Test Condition Lamp & IR	Reference Standard
OPERATION LIFE	Ta： 25±5℃ IF= 20mA RH：＜=60%RH ① DYNAMIC:100mA 1ms 1/10 duty ② STATIC STATE: IF＝20mA TEST TIME: 168HRS（-24HRS，+24HRS） 500HRS（-24HRS，+24HRS） 1000HRS（-24HRS，+72HRS）	MIL-STD-750：1026 MIL-STD-883：1005 JIS C 7021：B-1
HIGH TEMPERATURE HIGH HUMIDITY STORAGE	Ta： 65℃±5℃ RH： 90～95%RH TEST TIME：240HRS±2HRS	MIL-STD-202：103B JIS C 7021 ：B-1
TEMPERATURE CYCLING	105℃～25℃～-55℃～25℃ 30min 5min 30min 5min 10CYCLES	MIL-STD-202：107D MIL-STD-750：1051 MIL-STD-883：1010 JIS C 7021 ：A-4
THERMAL SHOCK	105℃±5℃～-55℃±5℃ 10min 10min 10CYCLES	MIL-STD-202：107D MIL-STD-750：1051 MIL-SYD-883：1011
SOLDER RESISTANCE	T，sol：260℃±5℃ DWELL TIME：10±lsec	MIL-STD-202：210A MIL-STD-750-2031 JIS C 7021：A-1
SOLDERABILITY	T，sol：230℃±5℃ DWELL TIME：5±lsec	MIL-STD-202：208D MIL-STD-750：2026 MIL-STD-883：2003 JIS C 7021 ：A-2