LED SPECIFICATION

560MR2D

ATTENTION
OBSERVE PRECAUTIONS
FOR HANDLING
ELECTROSTATIC
DISCHARGE
SENSITIVE
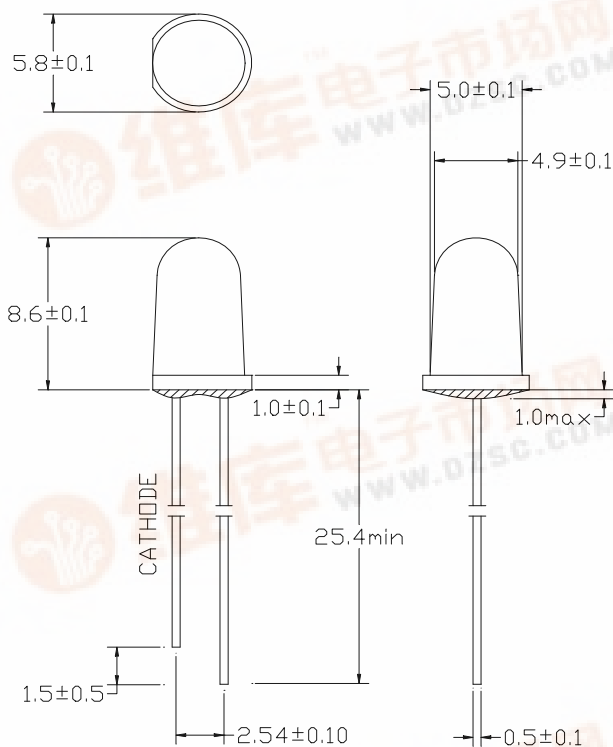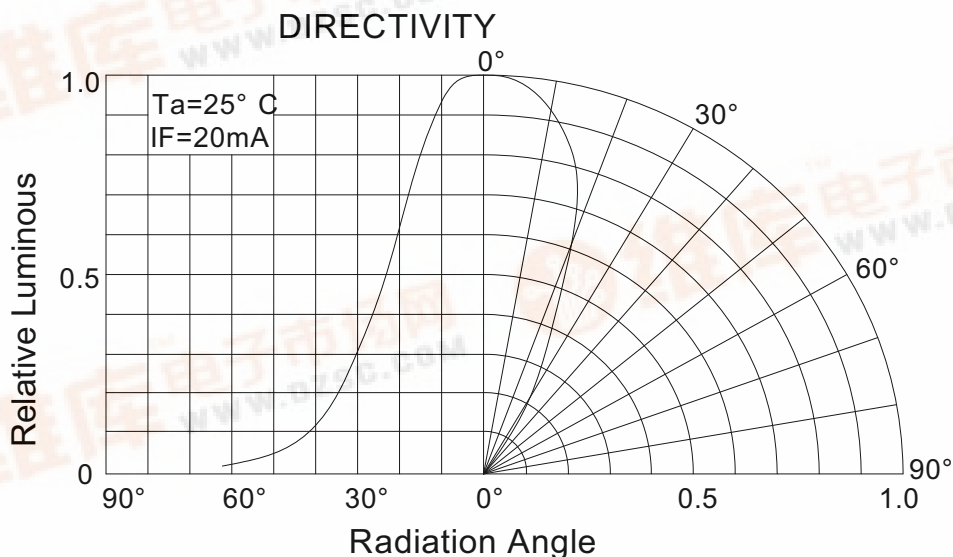DEVICES

➢ Features

- Single color
- High bright output
- Low power consumption
- High reliability and long life

➢ Descriptions：

- Dice material：AlGaInP Hewlett Packard
- Emitting Color：

   Super Bright RED (Diffused)

- Device Outline：

   φ5mm Round Type/ 5mm

- Lens Type：

   Water Clear

1.   All dimensions are millimeters
2.   Tolerance is +/-0.25mm unless otherwise noted

➢ Directivity：

DIRECTIVITY

Ta=25° C
IF=20mA

Absolute maximum ratings（Ta = 25℃）

Parameter	Symbol	Test Condition	Value Min.	Value Max.	Unit
Reverse Voltage	VR	IR = 30μA	5	--	V
Forward Current	IF	----	----	30	mA
Power Dissipation	Pd	----	----	75	mW
Pulse Current	Ipeak	Duty=0.1mS，1kHz	----	100	mA
Operating Temperature	Topr	----	-40	+85	℃
Storage Temperature	Tstr	----	-40	+100	℃

Electrical and optical characteristics （Ta = 25℃）

Parameter	Symbol	Test Condition	Value Min.	Value Typ.	Value Max.	Unit
Forward Voltage	VF	IF = 20mA		V2~V4		
Reverse Current	IR	VR = 5V	----	----	30	μA
Dominate Wavelength	λd	IF = 20mA		R1~R3		
Spectral Line half-width	Δλ	IF = 20mA	----	20	----	nm
Luminous Intensity	Iv	IF = 20mA		P~R		
Viewing Angle	2θ1/2	IF = 20mA	55		70	Deg.

BIN ranking for LEDs

"5CMR3D"

BRIGHTNESS BIN

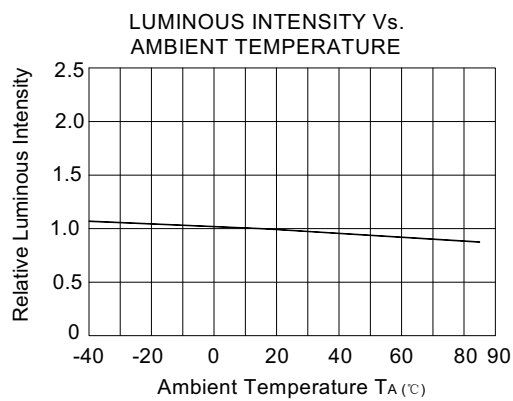| Bin Code	IV(mcd)	Bin Code	IV(mcd)	Bin Code	IV(mcd)	Bin Code	IV(mcd)
A	0-5.0	H	37.2-52.0	Q	390-550	X	4180--5860
B	5.0-7.0	J	52.0-72.8	R	550-770	Y	5860-8200
C	7.0-9.8	K	72.8-102	S	770-1100	Z1	8-10cd
D	9.8-13.7	L	102-145	T	1100-1520	Z2	10-12cd
E	13.7-19.0	M	145-200	U	1520-2130	Z3	12-14cd
F	19.0-26.6	N	200-280	V	2130-3000	Z4	14-16cd
G	26.6-37.2	P	280-390	W	3000-4180	Z5	16-18cd

WAVELENGTH BIN

Ligth Col.	Bin Code	Wavel. (nm)	Ligth Col.	Bin Code	Wavel. (nm)
BLUE	B1	450-455	YELLOW GREEN	YG1	555-558
BLUE	B2	455-460	YELLOW GREEN	YG2	558-561
BLUE	B3	460-465	YELLOW GREEN	YG3	561-564
BLUE	B4	465-470	YELLOW GREEN	YG4	564-567
BLUE	B5	470-475	YELLOW GREEN	YG5	567-570
BLUE	B6	475-480	YELLOW GREEN	YG6	570-573
BLUE GREEN	G1	491-494	YELLOW GREEN	YG7	573-576
BLUE GREEN	G2	494-497	YELLOW	Y1	582-585
BLUE GREEN	G3	497-500	YELLOW	Y2	585-588
BLUE GREEN	G4	500-503	YELLOW	Y3	588-591
BLUE GREEN	G5	503-506	YELLOW	Y4	591-594
BLUE GREEN	G6	506-509	YELLOW	Y5	594-597
BLUE GREEN	G7	509-512	YELLOW ORANGE	YO1	597-600
BLUE GREEN	G8	512-515	YELLOW ORANGE	YO2	600-603
PURE GREEN	G9	515-518	YELLOW ORANGE	YO3	603-606
PURE GREEN	G10	518-521	YELLOW ORANGE	YO4	606-609
PURE GREEN	G11	521-524	PURE ORANGE	O1	609-612
PURE GREEN	G12	524-527	PURE ORANGE	O2	612-615
PURE GREEN	G13	527-530	PURE ORANGE	O3	615-618
PURE GREEN	G14	530-533	RED	R1	618-621
PURE GREEN	G15	533-536	RED	R2	621-624
PURE GREEN	G16	536-539	RED	R3	624-627
PURE GREEN	G17	539-542	RED	R4	627-630
PURE GREEN	G18	542-545	RED	R5	630-633
PURE GREEN	G19	545-548	RED	R6	633-636

FORWARD VOLTAGE (VF) BIN

Bin Code	VF (V)	Bin Code	VF (V)	Bin Code	VF (V)	Bin Code	VF (V)
V1	1.6-1.8	V5	2.4-2.6	V9	3.2-3.4	V13	4.0-4.2
V2	1.8-2.0	V6	2.6-2.8	V10	3.4-3.6	V14	4.2-4.4
V3	2.0-2.2	V7	2.8-3.0	V11	3.6-3.8	V15	4.4-4.6
V4	2.2-2.4	V8	3.0-3.2	V12	3.8-4.0	V16	4.6-4.8

LED SPECIFICATION

Typical electrical/optical characteristic curves：

FORWARD CURRENT Vs.
FORWARD VOLTAGE

LUMINOUS INTENSITY Vs.
FORWARD CURRENT

FORWARD CURRENT Vs.
AMBIENT TEMPERATURE

LUMINOUS INTENSITY Vs.
AMBIENT TEMPERATURE
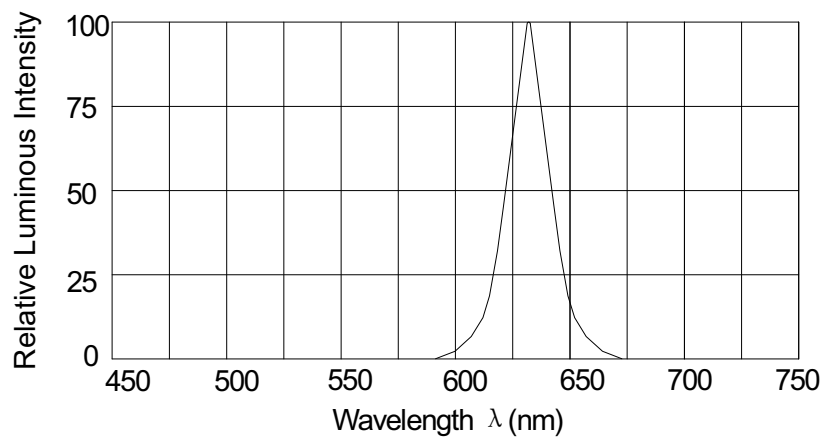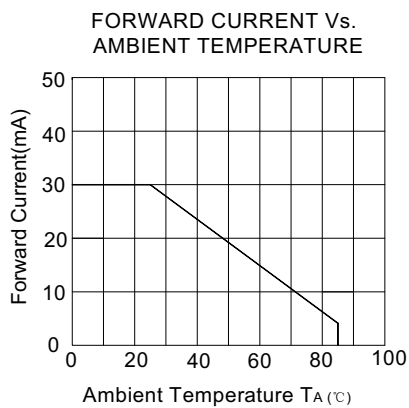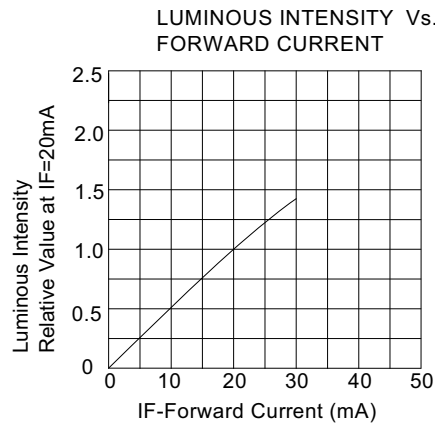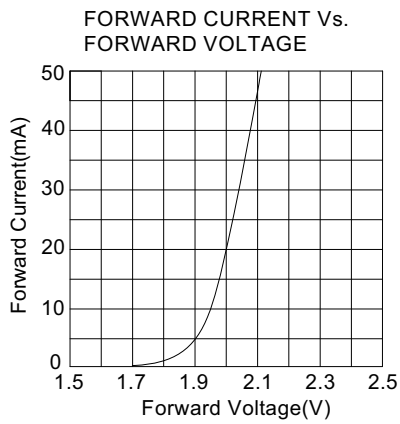
•SOLDERING

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.
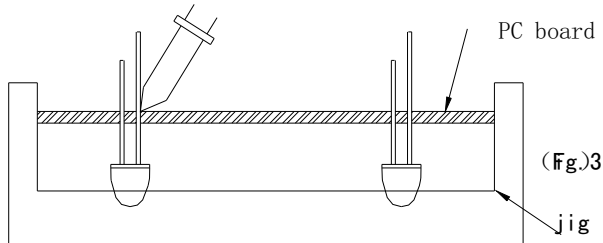

Lead wries

Panel   (Fig.1)
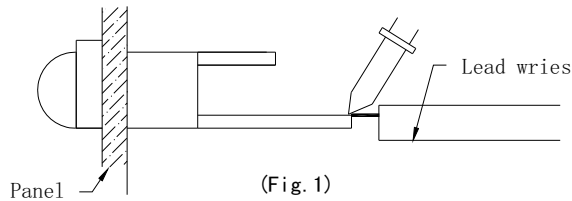
2) When soldering wire to the lead, work with a Fig (See Fig.2) to avoid stressing the package.

Lead wries

Leave a slight clearance

(Fig.2)
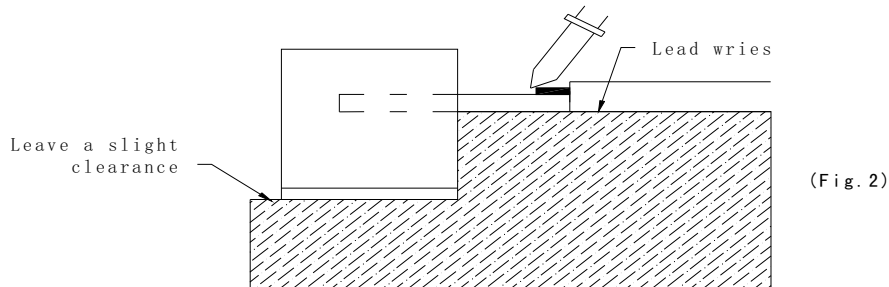
3) Similarly, when a jig is used to solder the LED to PC board, take care as much as possible to avoid steering the leads (See Fig.3).

PC board

(Fig.)3

jig

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)
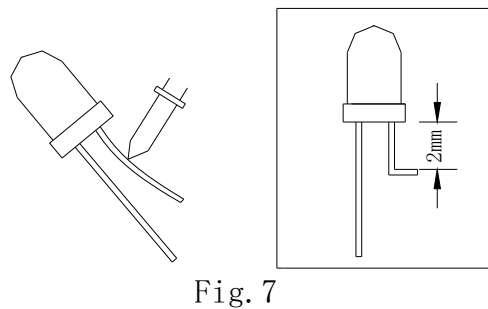

case

pc board

Fig.4
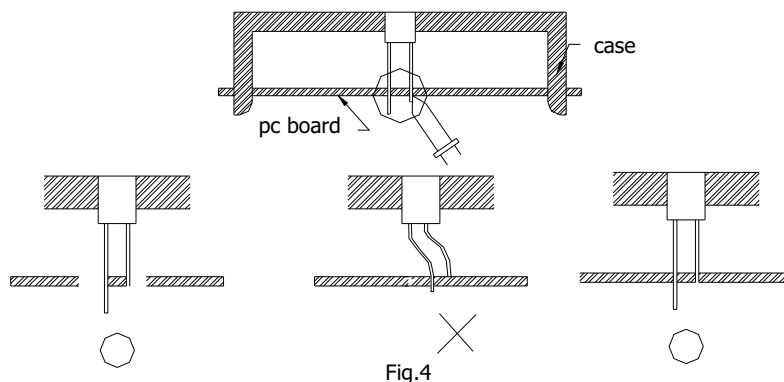
2) Use LEDs with stand-off (Fig.5) or the tube or spacer made of resin (Fig.6) to position the LEDs.

Stand-off

Fig.5

Tube

Fig.6
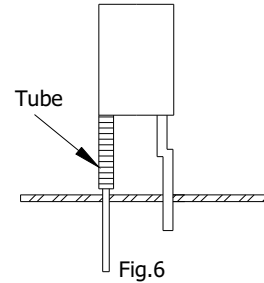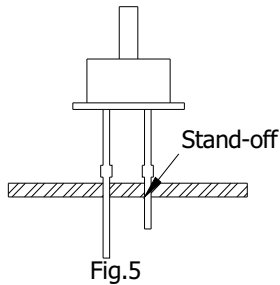
•FORMED LEAD

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)

2mm

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)

Stress

Fig.8
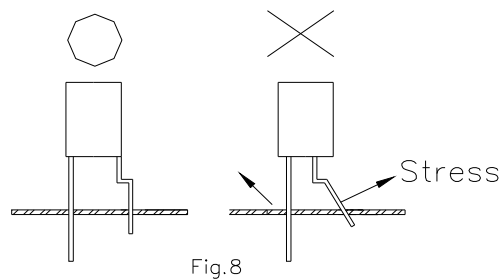
•LEAD STRENGTH

1) Bend strength

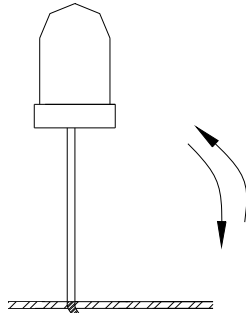Do not bend the lead more than twice. (Fig.9)

Fig.9

2) Tensile strength (@Room Temperature)

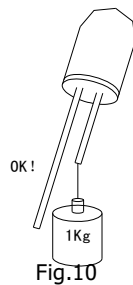If the force is 1kg or less, there will be no problem. (Fig.10)

OK !

1Kg

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.

LED LAMP PASSED TESTS

Experiment Item:

Item	Test Condition		Reference Standard
	Lamp & IR		
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

Drive Method

Circuit model A

Circuit model B
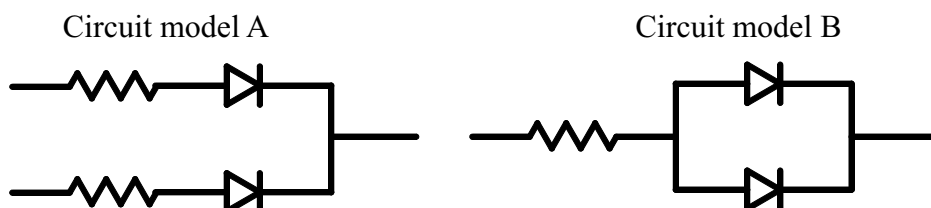
(A)Recommended circuit.

(B)The difference of brightness between LED`s could be found due to the Vf-If characteristics of LED.