

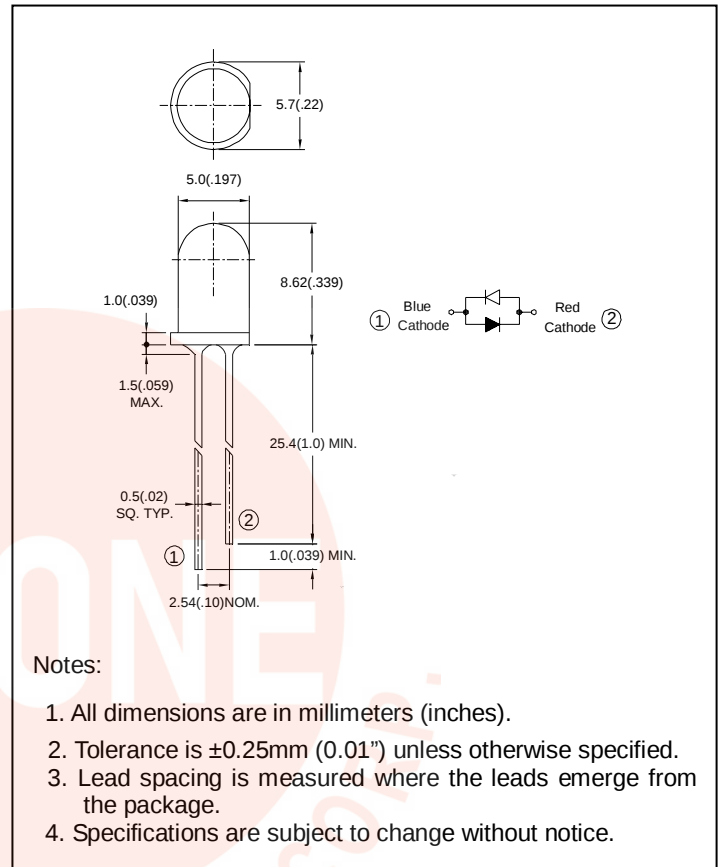
● Features:

1. Chip material: AlGaInP/GaAs (Red)
and InGaN (Blue)
2. Emitted color : Red and Blue
3. Lens Appearance : White Diffused
4. Low power consumption.
5. High efficiency.
6. Versatile mounting on P.C. Board or panel.
7. Low current requirement.
8. 5mm diameter package.
9. This product don't contained restriction substance, compliance RoHS standard.

● Applications:

1. TV set
2. Monitor
3. Telephone
4. Computer
5. Circuit board

● Package dimensions:



● Absolute maximum ratings($T_a=25^\circ\text{C}$)

Parameter	Symbol	Red	Blue	Unit
Power Dissipation	P_d	80	110	mW
Forward Current	I_F	30	30	mA
Peak Forward Current ^{*1}	I_{FP}	150	150	mA
Operating Temperature	T_{opr}	$-40^\circ\text{C} \sim 85^\circ\text{C}$		
Storage Temperature	T_{stg}	$-40^\circ\text{C} \sim 85^\circ\text{C}$		

^{*1}Condition for I_{FP} is pulse of 1/10 duty and 0.1msec width.

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

Parameter	Symbol	Condition	Color	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F=20\text{mA}$	Red Blue	-	2.0 3.2	2.6 3.6	V
Luminous Intensity	I_v	$I_F=20\text{mA}$	Red Blue	-	160 80	-	mcd
Peak Wave Length	λ_p	$I_F=20\text{mA}$	Red Blue	-	645 470	-	nm
Dominant Wave Length	λ_d	$I_F=20\text{mA}$	Red Blue	624 460	-	634 475	nm
Spectral Line Half-width	$\Delta\lambda$	$I_F=20\text{mA}$	Red Blue	-	20 30	-	nm
Viewing Angle	$2\theta_{1/2}$	$I_F=20\text{mA}$	Red Blue	-	50	-	deg

● Typical electro-optical characteristics curves

Fig.1 Relative intensity vs. Wavelength

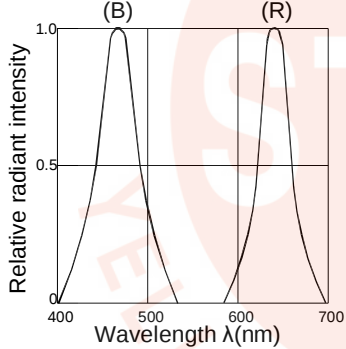


Fig.2 Forward current derating curve vs. Ambient temperature

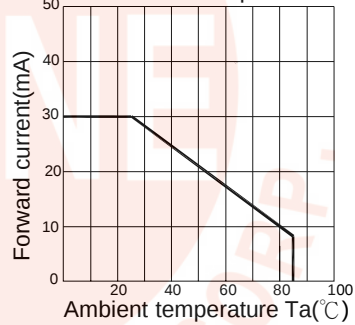


Fig.3 Forward current vs. Forward voltage

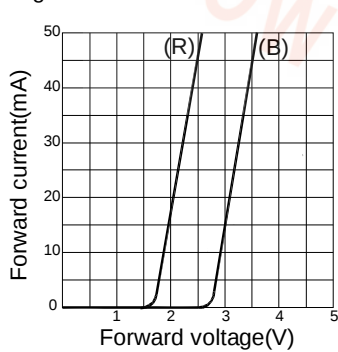


Fig.4 Relative luminous intensity vs. Ambient temperature

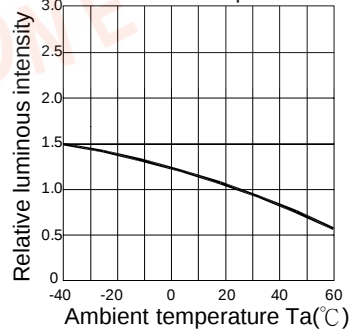


Fig.5 Relative luminous intensity vs. Forward current

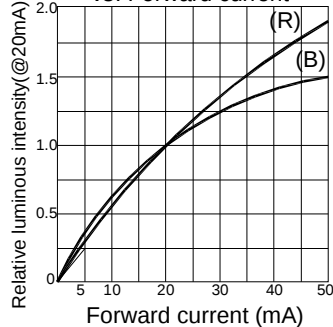
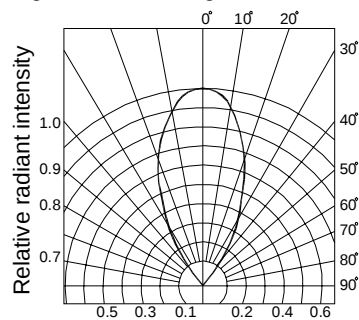


Fig.6 Radiation diagram





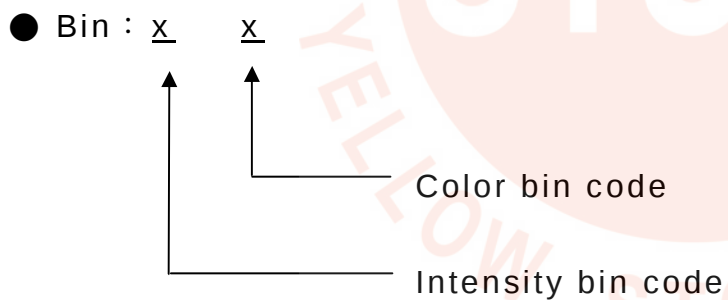
● Bin Limits(Blue)

1. Intensity Bin Limits (At $I_F = 20\text{mA}$)

Bin Code	Min. (mcd)	Max. (mcd)
M	28	42
N	42	63
P	63	94
Q	94	140
R	140	210

2. Color Bin Limits (At $I_F = 20\text{mA}$) : Dominant Wave Length $\lambda_d(\text{nm})$

Bin Code	Min. (nm)	Max. (nm)
3	460	465
4	465	470
5	470	475



NOTES: 1. Tolerance of measurement of luminous intensity.

: $\pm 15\%$

2. Tolerance of measurement of dominant wavelength

: $\pm 1.0\text{nm}$

● 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	$I_F=20\text{mA}$ $T_a=+25^{\circ}\text{C}\pm 5^{\circ}\text{C}$ Test time=1,000hrs	0/32
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	$T_a=+85^{\circ}\text{C}\pm 5^{\circ}\text{C}$ RH=90%-95% Test time=240hrs	0/32
	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	0/32
	Low Temperature Storage	JIS-C-7021 :B-12	Low $T_a=-45^{\circ}\text{C}\pm 5^{\circ}\text{C}$ Test time=1,000hrs	0/32
Environmental Test	Temperature Cycling	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1010 JIS-C-7021 :A-4	$T_a: +85^{\circ}\text{C} (30\text{min}) \sim +25^{\circ}\text{C} (5\text{min}) \sim -45^{\circ}\text{C} (30\text{min}) \sim +25^{\circ}\text{C} (5\text{min})$ Test Time : 70min/ctcle 10cycle	0/32
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	$-45^{\circ}\text{C}\pm 5^{\circ}\text{C} \sim +85^{\circ}\text{C}\pm 5^{\circ}\text{C}$ 20min 20min Test Time=10cycle	0/32
	Solder Resistance	MIL-STD-202:201A MIL-STD-750:2031 JIS-C-7021 :A-1	Preheating : 120°C , within 120-180 sec. Operation heating : $255^{\circ}\text{C}\pm 5^{\circ}\text{C}$ within 5 sec. 260°C (Max)	0/32
	Solderability	MIL-STD-202F:208D MIL-STD-750D:2026 MIL-STD-883D:2003 JIS C 7021:A-2	$T_{\text{sol}}=230\pm 5^{\circ}\text{C}$ Dwell Time= $5\pm 1\text{secs}$	0/32

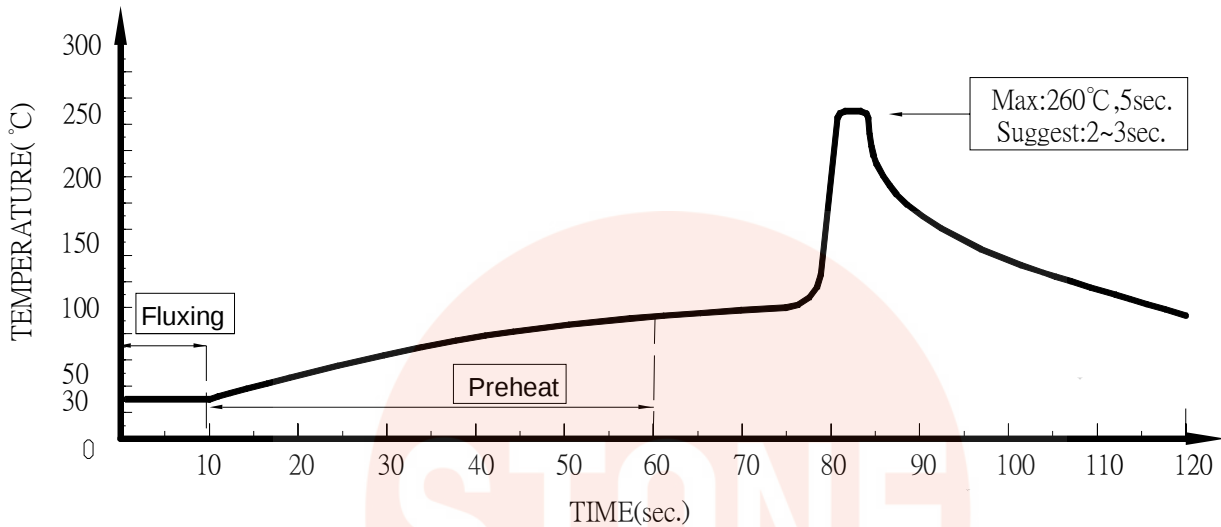
● Judgment criteria of failure for the reliability

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	$V_F (V)$	$I_F=20\text{mA}$	Over $U^1 \times 1.2$
Reverse current	$I_R (\mu A)$	$V_R=5V$	Over $U^1 \times 2$
Luminous intensity	$I_v (\text{mcd})$	$I_F=20\text{mA}$	Below $S^1 \times 0.5$

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.

●Dip Soldering



1. Please avoid any external stress applied to the lead-frames and epoxy while the LEDs are at high temperature, especially during soldering
2. DIP soldering and hand soldering should not be done more than one time.
3. After soldering, avoid the epoxy lens from mechanical shock or vibration until the LEDs are back to room temperature.
4. Avoid rapid cooling during temperature ramp-down process
5. Although the soldering condition is recommended above,
soldering at the lowest possible temperature is feasible for the LEDs

●IRON Soldering

A : Max : 350°C Within 3 sec. One time only.

B : For 3mm LED without flange, if the LED epoxy lays flat on the PCB, the welding condition is 350°C within 2 seconds, one time only.

