

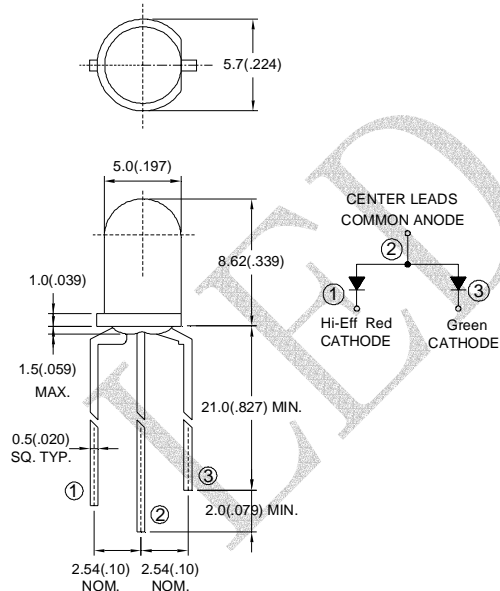
## ● Features:

1. Chip material: GaAsP/GaP(Hi-Eff Red) and GaP/GaP (Green)
2. Emitted color : Hi-Eff Red and Green
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:



### Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25\text{mm}$  (0.01") unless otherwise specified.
3. Lead spacing is measured where the leads emerge from the package.
4. Specifications are subject to change without notice.

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

Parameter	Symbol	Hi-Eff Red	Green	Unit
Power Dissipation	$P_d$	80	80	mW
Forward Current	$I_F$	30	30	mA
Peak Forward Current	$I_{FP}$	150	150	mA
Reverse Voltage	$V_R$	5		V
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	$V_F$	$I_F=20\text{mA}$	Hi-Eff Red Green	-	2.0 2.2	2.6 2.6	V
Luminous Intensity	$I_v$	$I_F=20\text{mA}$	Hi-Eff Red Green	-	12 13	-	mcd
Reverse Current	$I_R$	$V_R=5\text{V}$	Hi-Eff Red Green	-	-	100	$\mu\text{A}$
Peak Wave Length	$\lambda_p$	$I_F=20\text{mA}$	Hi-Eff Red Green	-	640 568	-	nm
Dominant Wave Length	$\lambda_d$	$I_F=20\text{mA}$	Hi-Eff Red Green	617 560	-	638 574	nm
Spectral Line Half-width	$\Delta\lambda$	$I_F=20\text{mA}$	Hi-Eff Red Green	-	35 30	-	nm
Viewing Angle	$2\theta_{1/2}$	$I_F=20\text{mA}$	Hi-Eff Red Green	-	80	-	deg

## Typical electro-optical characteristics curves

Fig.1 Relative intensity vs. Wavelength

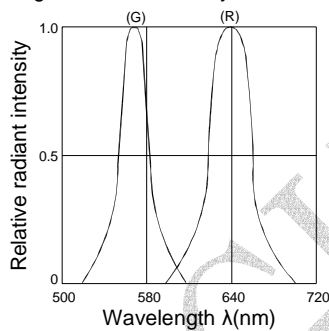


Fig.2 Forward current derating curve vs. Ambient temperature

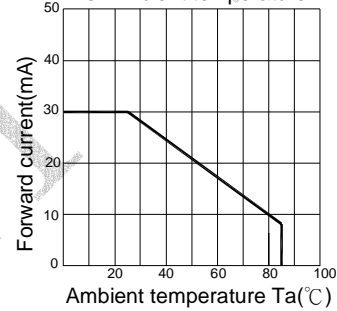


Fig.3 Forward current vs. Forward voltage

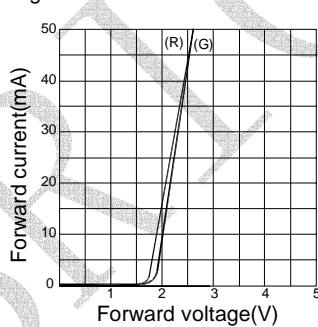


Fig.4 Relative luminous intensity vs. Ambient temperature

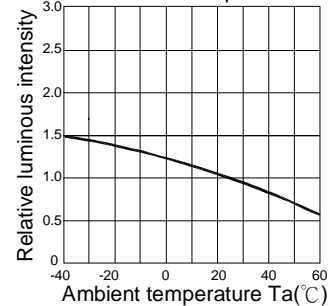


Fig.5 Relative luminous intensity vs. Forward current

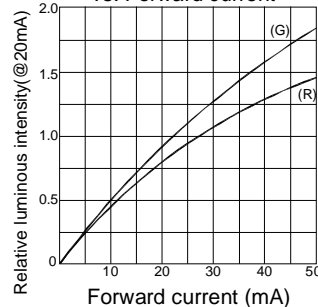
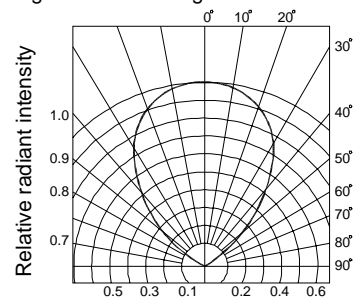


Fig.6 Radiation diagram



## ● 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°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 $\pm$ 1secs	0/32

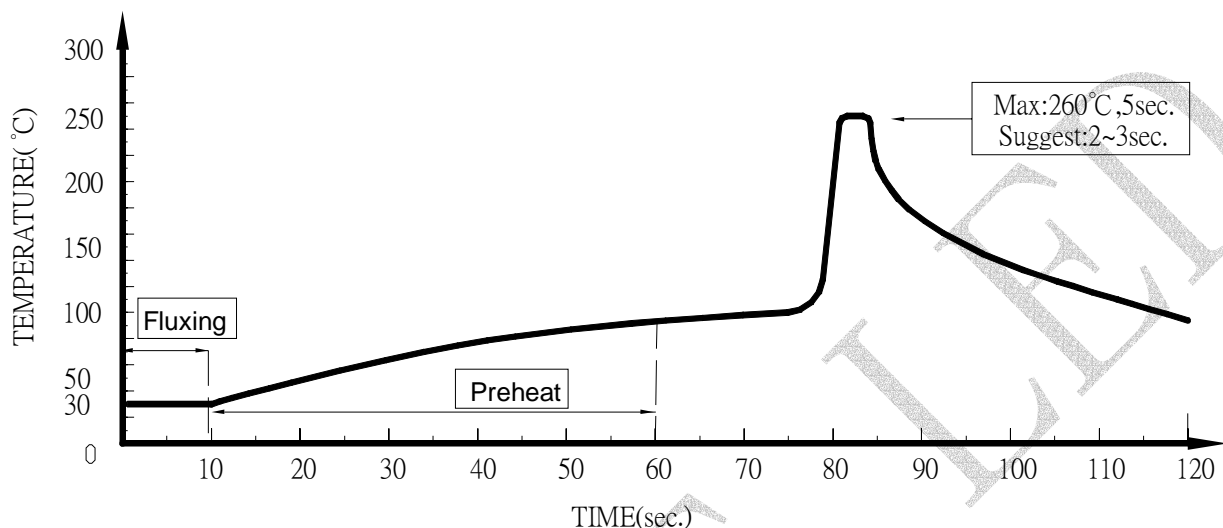
## ● Judgment criteria of failure for the reliability

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	$I_v (mcd)$	$I_F=20\text{mA}$	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

**300°C Within 3 sec., One time only.**