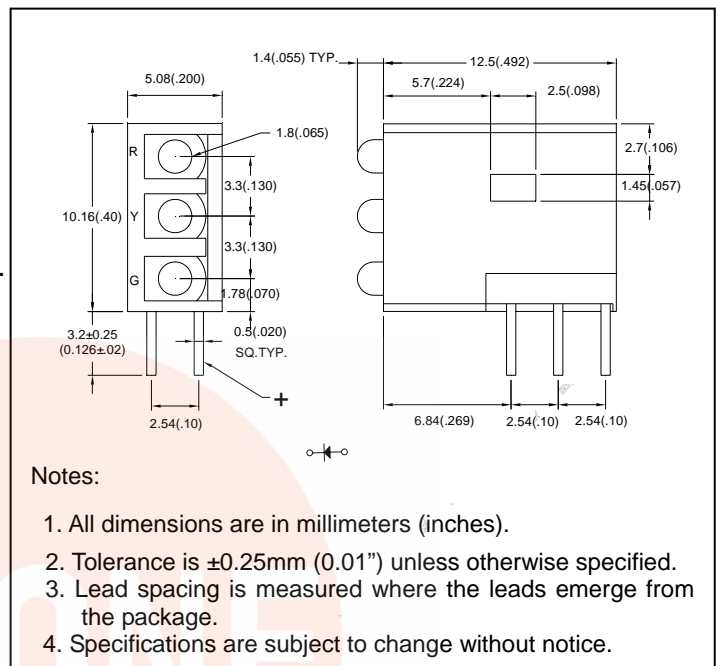


● **Features:**

1. Chip material: AlGaInP/GaAs (Red) and GaP/GaP(Green) and GaAsP/GaP(Yellow)
2. Emitted color : Red and Green and Yellow
3. Lens Appearance : Red Diffused and Green Diffused and Yellow Diffused
4. Designed for ease in circuit board assembly.
5. Black case enhance contrast ratio.
6. Solid state light source.
7. Reliable and rugged.
8. This product don't contained restriction substance, compliance ROHS standard.

● **Package dimensions:**



● **Applications:**

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

● **Absolute Maximum Ratings(Ta=25°C)**

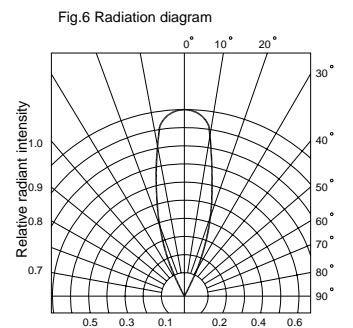
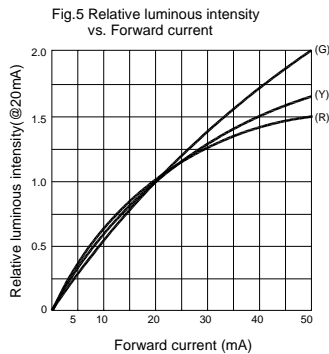
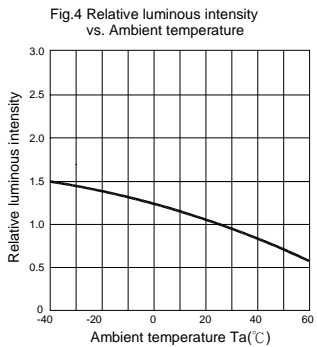
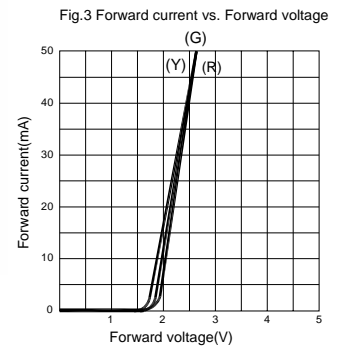
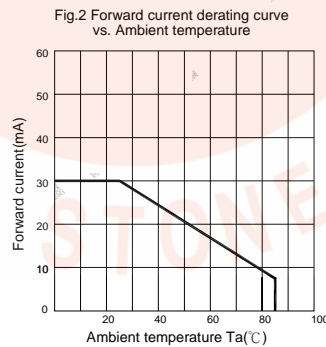
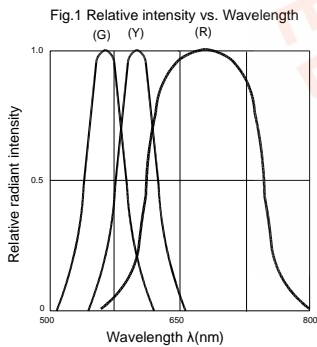
Parameter	Symbol	Red	Green	Yellow	Unit
Power Dissipation	Pd	80	80	80	mW
Forward Current	I _F	30	30	30	mA
Peak Forward Current* ¹	I _{FP}	150	150	150	mA
Reverse Voltage	V _R	5			V
Operating Temperature	Topr	-40°C~80°C			
Storage Temperature	Tstg	-40°C~100°C			

*¹Condition 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 Green Yellow	-	2.3 2.2 2.1	2.6 2.6 2.6	V
Luminous Intensity	I_v	$I_F=20\text{mA}$	Red Green Yellow	-	2.0 35 45	-	mcd
Reverse Current	I_R	$V_R=5\text{V}$	Red Green Yellow	-	-	100	μA
Peak Wave Length	λ_p	$I_F=20\text{mA}$	Red Green Yellow	-	700 568 585	-	nm
Dominant Wave Length	λ_d	$I_F=20\text{mA}$	Red Green Yellow	564 580	640	574 595	nm
Spectral Line Half-width	$\Delta \lambda$	$I_F=20\text{mA}$	Red Green Yellow	-	100 30 35	-	nm
Viewing Angle	$2\theta_{1/2}$	$I_F=20\text{mA}$	Red Green Yellow	-	70	-	deg

● **Typical Electro-Optical Characteristics Curves**



● 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 =20mA Ta=+25°C ±5°C Test time=1,000hrs	0/32
	High Temperature High Humidity Storage	MIL-STD-202:103B JIS-C-7021 :B-11	Ta=+85°C ±5°C RH=90%-95% Test time=240hrs	0/32
	High Temperature Storage	MIL-STD-883:1008 JIS-C-7021 :B-10	High Ta=+85°C ±5°C Test time=1,000hrs	0/32
	Low Temperature Storage	JIS-C-7021 :B-12	Low Ta=-45°C ±5°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	Ta: +85°C (30min) ~ +25°C (5min) ~ -45°C (30min) ~ +25°C (5min) Test Time : 70min/ctcle 10cycle	0/32
	Thermal Shock	MIL-STD-202:107D MIL-STD-750:1051 MIL-STD-883:1011	-45°C ±5°C ~ +85°C ±5°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 ±5°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.sol=230±5°C Dwell Time=5±1secs	0/32

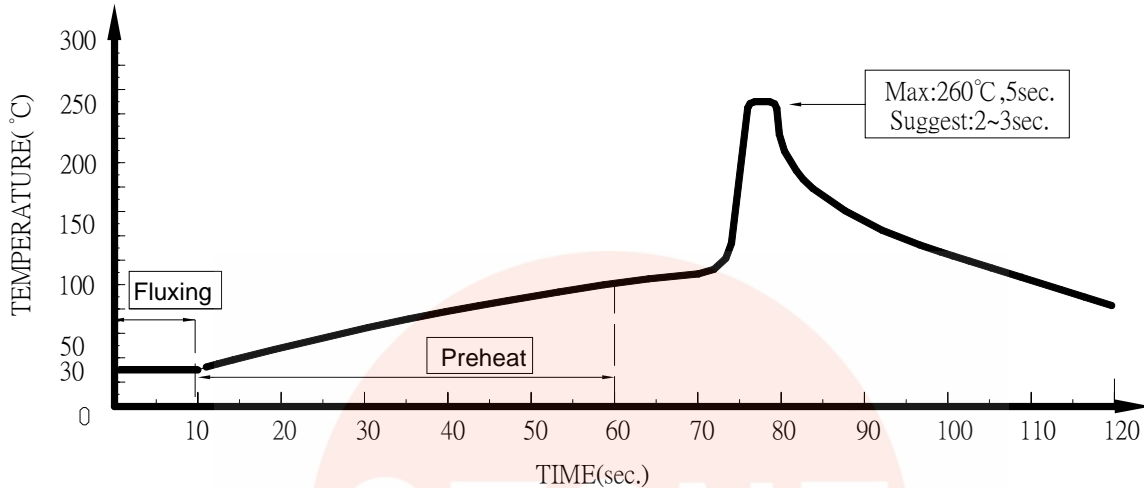
● Judgment criteria of failure for the reliability

Measuring items	Symbol	Measuring conditions	Judgment criteria for failure
Forward voltage	V _F (V)	I _F =20mA	Over U ¹ x1.2
Reverse current	I _R (uA)	V _R =5V	Over U ¹ x2
Luminous intensity	I _v (mcd)	I _F =20mA	Below S ¹ X0.5

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.

