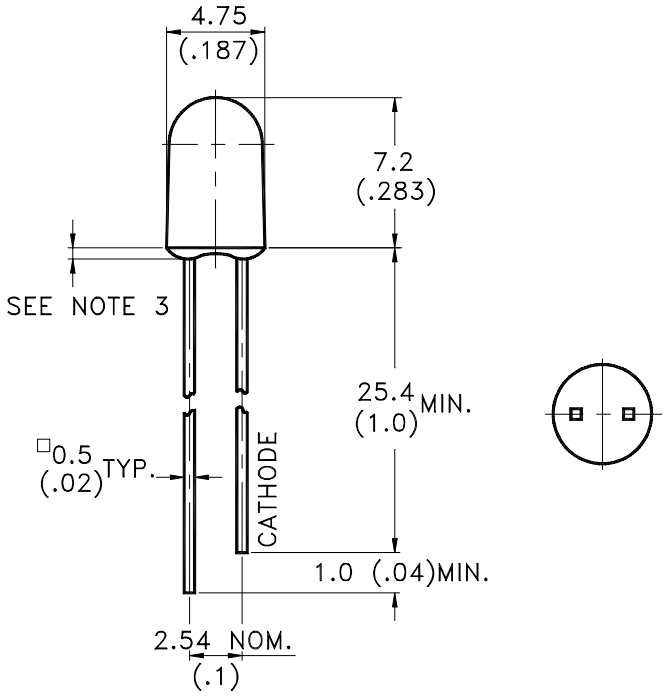
Features

* Low power consumption.
* High efficiency.
* Versatile mounting on p.c. board or CBI.
* I.C. compatible/low current requirement.
* Narrow viewing angle for more brightness.

Package Dimensions



Part No.	Lens	Source Color
LTL102SFK	Water Clear	AlInGaP Yellow Orange

Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm(.010") unless otherwise noted.
3. Protruded resin under flange is 1.0mm(.04") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specifications are subject to change without notice.

Absolute Maximum Ratings at T_A=25℃

Parameter	Maximum Rating	Unit
Power Dissipation	120	mW
Peak Forward Current (1/10 Duty Cycle, 0.1ms Pulse Width)	90	mA
Continuous Forward Current	50	mA
Derating Linear From 50℃	0.6	mA/℃
Reverse Voltage	5	V
Operating Temperature Range	-40℃ to + 100℃	
Storage Temperature Range	-55℃ to + 100℃	
Lead Soldering Temperature [1.6mm(.063") From Body]	260℃ for 5 Seconds	

Electrical / Optical Characteristics at T_A=25℃

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Luminous Intensity	I_V	4500	7200		mcd	I_F = 20mA Note 1
Viewing Angle	$2\theta_{1/2}$		15		deg	Note 2 (Fig.5)
Peak Emission Wavelength	λ_P		610		nm	Measurement @Peak (Fig.1)
Dominant Wavelength	λ_d		605		nm	Note 4
Spectral Line Half-Width	$\Delta\lambda$		17		nm	
Forward Voltage	V_F		2.0	2.4	V	I_F = 20mA
Reverse Current	I_R			100	μA	V_R = 5V
Capacitance	C		40		pF	V_F = 0 , f = 1MHz

NOTE: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE eye-response curve.

2. $\theta_{1/2}$ is the off-axis angle at which the luminous intensity is half the axial luminous intensity.

3. Iv classification code is marked on each packing bag.

4. The dominant wavelength, λd is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

Typical Electrical / Optical Characteristics Curves

(25℃ Ambient Temperature Unless Otherwise Noted)

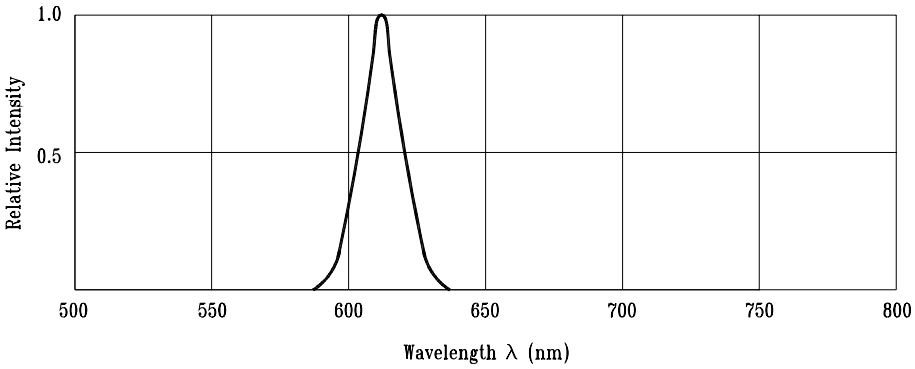


Fig.1 Relative Intensity vs. Wavelength

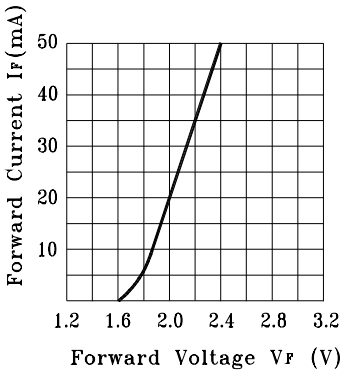


Fig.2 Forward Current vs. Forward Voltage

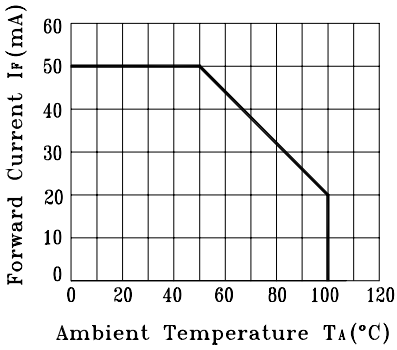


Fig.3 Forward Current Derating Curve

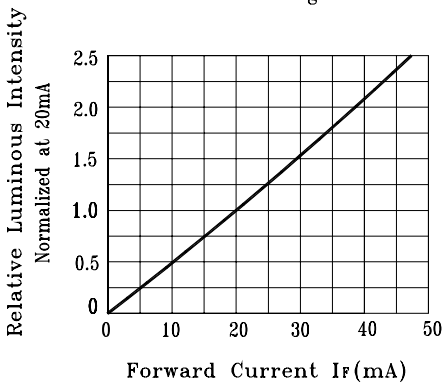


Fig.4 Relative Luminous Intensity vs. Forward Current

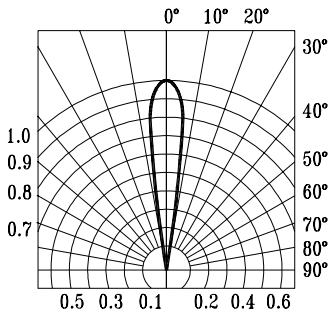


Fig.5 Spatial Distribution

Bin Code List For Reference

Luminous Intensity Unit : mcd @20mA		
Bin Code	Min.	Max.
V	4500	5500
W	5500	7200
X	7200	9300
Y	9300	12000

Dominant Wavelength Unit : nm @20mA		
Bin Code	Min.	Max.
H23	600.0	603.0
H24	603.0	606.5
H25	606.5	610.0

CAUTIONS

1. Application

The LEDs described here are intended to be used for ordinary electronic equipment (such as office equipment, communication equipment and household applications).Consult Lite-on's Sales in advance for information on applications in which exceptional reliability is required, particularly when the failure or malfunction of the LEDs may directly jeopardize life or health (such as in aviation, transportation, traffic control equipment, medical and life support systems and safety devices).

2. Storage

The storage ambient for the LEDs should not exceed 30°C temperature or 70% relative humidity . It is recommended that LEDs out of their original packaging are used within three months.

For extended storage out of their original packaging, it is recommended that the LEDs be stored in a sealed container with appropriate desiccant or in a dessicator with nitrogen ambient.

3. Cleaning

Use alcohol-based cleaning solvents such as isopropyl alcohol to clean the LEDs if necessary.

4. Lead Forming & Assembly

During lead forming, the leads should be bent at a point at least 3mm from the base of LED lens. Do not use the base of the leadframe as a fulcrum during forming.

Lead forming must be done before soldering, at normal temperature.

During assembly on PCB, use minimum clinch force possible to avoid excessive mechanical stress.

5. Soldering

When soldering, leave a minimum of 2mm clearance from the base of the lens to the soldering point. Dipping the lens into the solder must be avoided.

Do not apply any external stress to the lead frame during soldering while the LED is at high temperature.

Recommended soldering condition :

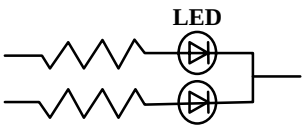
Soldering iron		Wave soldering	
Temperature	300°C Max.	Pre-heat	100°C Max.
Soldering time	3 sec. Max. (one time only)	Pre-heat time	60 sec. Max.
		Solder wave	260°C Max.
		Soldering time	10 sec. Max.

Note.: Excessive soldering temperature and / or time might result in deformation of the LED lens or catastrophic failure of the LED.

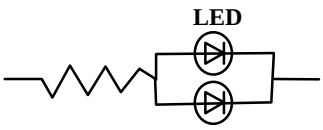
6. Drive Method

An LED is a current operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in an application, it is recommended that a current limiting resistor be incorporated in the drive circuit. in series with each LED as shown in Circuit A below.

Circuit model A



Circuit model B



(A) Recommended circuit.

(B) The brightness of each LED might appear different due to the differences in the I-V characteristics of those LEDs

7. ESD (Electrostatic Discharge)

Static Electricity or power surge will damage the LED.

Suggestions to prevent ESD damage:

- Use a conductive wrist band or anti- electrostatic glove when handling these LEDs.
- All devices, equipment and machinery must be properly grounded.
- Work tables , storage racks , etc. should be properly grounded.
- Use ion blower to neutralize the static charge which might have built up on surface of the LED's plastic lens as a result of friction between LEDs during storage and handling.

ESD-damaged LEDs will exhibit abnormal characteristics such as high reverse leakage current, low forward voltage, or “no lightup” at low currents. To verify for ESD damage, check for “lightup” and Vf of the suspect LEDs at low currents.

The Vf of “good” LEDs should be >2.0V@0.1mA for InGaN product and >1.4V@0.1mA for AlInGaP product.

Chip ESD level	Machine Mode	Human Body Mode
InGaN/Sapphire	100 V	300 V
AlInGaP	200 V	500 V
InGaN / SiC	600 V	1000 V

8. Reliability Test

Classification	Test Item	Test Condition	Reference Standard
ENDURANCE TEST	OPERATION LIFE	Ta= UNDER ROOM TEMPERATURE AS PER DATA SHEET MAXIMUM RATING *TEST TIME= 1000HRS (-24HRS, +72HRS)	MIL-STD-750D : 1026 (1995) MIL-STD-883D : 1005 (1991) JIS C 7021 : B-1 (1982)

Classification	Test Item	Test Condition	Reference Standard
ENDURANCE TEST	HIGH TEMPERATURE HIGH HUMIDITY STORAGE	Ta= 65±5℃ RH= 90 ～ 95% TEST TIME= 240HRS±2HRS	MIL-STD-202F: 103B(1980) JIS C 7021 : B-11(1982)
	HIGH TEMPERATURE HIGH HUMIDITY REVERSE BIAS	Ta= 65±5℃ RH= 90 ～ 95% VR=5V TEST TIME= 500HRS (-24HRS, +48HRS)	JIS C 7021 : B-11(1982)
	HIGH TEMPERATURE STORAGE	Ta= 105±5℃ TEST TIME= 1000HRS (-24HRS, +72HRS)	MIL-STD-883D : 1008 (1991) JIS C 7021 : B-10 (1982)
	LOW TEMPERATURE STORAGE	Ta= -55±5℃ TEST TIME= 1000HRS (-24HRS, +72HRS)	JIS C 7021 : B-12 (1982)
ENVIRONMENTAL TEST	TEMPERATURE CYCLING	105℃ ～ 25℃ ～ -55℃ ～ 25℃ 30mins 5mins 30mins 5mins 10CYCLES	MIL-STD-202F : 107D (1980) MIL-STD-750D : 1051(1995) MIL-STD-883D : 1010 (1991) JIS C 7021 : A-4(1982)
	THERMAL SHOCK	105 ± 5℃ ～ -55℃ ± 5℃ 10mins 10mins 10CYCLES	MIL-STD-202F : 107D(1980) MIL-STD-750D : 1051(1995) MIL-STD-883D : 1011 (1991)
	SOLDER RESISTANCE	T.sol= 260 ± 5℃ DWELL TIME= 10 ± 1secs	MIL-STD-202F : 210A(1980) MIL-STD-750D : 2031(1995) JIS C 7021 : A-1(1982)
	SOLDERABILITY	T.sol= 230 ± 5℃ DWELL TIME= 5 ± 1secs	MIL-STD-202F : 208D(1980) MIL-STD-750D : 2026(1995) MIL-STD-883D : 2003(1991) JIS C 7021 : A-2(1982)

9. Others

The appearance and specifications of the product may be modified for improvement, without prior notice.