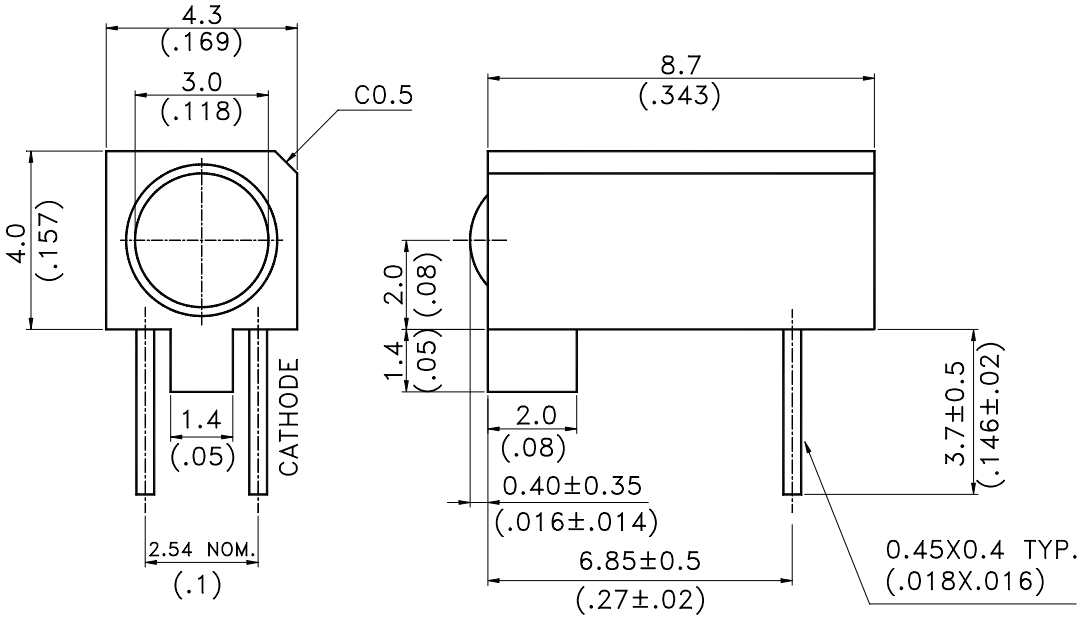
## Features

* Designed for ease in circuit board assembly.
* Black case enhance contrast ratio.
* Solid state light source.
* Reliable and rugged.

## Package Dimensions




| Lamp Part No. | Lens | Source Color |
|---|---|---|
| LTL-4232N | Green Transparent | Green |

Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.25mm(.010") unless otherwise noted.
3. The holder color is black.
4. The LED lamp is LTL-4232N.

## Absolute Maximum Ratings at $T_A$=25°C

| Parameter | Maximum Rating | Unit |
|---|---|---|
| Power Dissipation | 100 | mW |
| Peak Forward Current<br>(1/10 Duty Cycle, 0.1ms Pulse Width) | 120 | mA |
| DC Forward Current | 30 | mA |
| Derating Linear From 50°C | 0.4 | mA/°C |
| Reverse Voltage | 5 | V |
| Operating Temperature Range | -55°C to + 100°C | |
| Storage Temperature Range | -55°C to + 100°C | |
| Lead Soldering Temperature<br>[1.6mm(.063") From Body] | 260°C for 5 Seconds | |

## Electrical / Optical Characteristics at $T_A$=25℃

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Luminous Intensity | $I_V$ | 12.6 | 40 | 100 | mcd | $I_F$ = 10mA Note 1,4 |
| Viewing Angle | $2\theta_{1/2}$ | - | 45 | - | deg | Note 2 (Fig.6) |
| Peak Emission Wavelength | $\lambda_P$ | 560 | 565 | 572 | nm | Measurement @Peak (Fig.1) |
| Dominant Wavelength | $\lambda_d$ | 564 | 569 | 575 | nm | Note 3 |
| Spectral Line Half-Width | $\Delta\lambda$ | - | 30 | - | nm | |
| Forward Voltage | $V_F$ | - | 2.1 | 2.6 | V | $I_F$ = 20mA |
| Reverse Current | $I_R$ | - | - | 100 | μA | $V_R$ = 5V |
| Capacitance | C | - | 35 | - | pF | $V_F$ = 0 , f = 1MHz |

Note: 1. Luminous intensity is measured with a light sensor and filter combination that approximates the CIE (Commission International De L'Eclairage) eye-response curve.

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

3. The dominant wavelength, $\lambda_d$ is derived from the CIE chromaticity diagram and represents the single wavelength which defines the color of the device.

4. The Iv guarantee should be added ±15% .

## Typical Electrical / Optical Characteristics Curves

(25°C Ambient Temperature Unless Otherwise Noted)

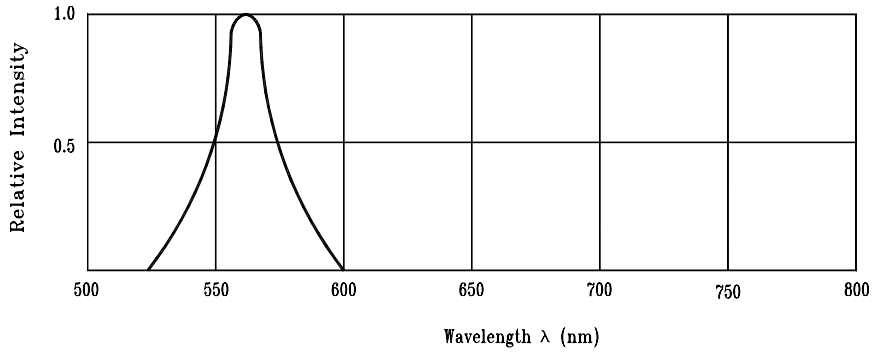



Fig.1 Relative Intensity vs. Wavelength

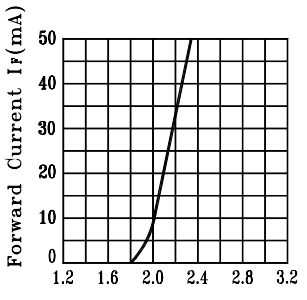



Fig.2 Forward Current vs. Forward Voltage

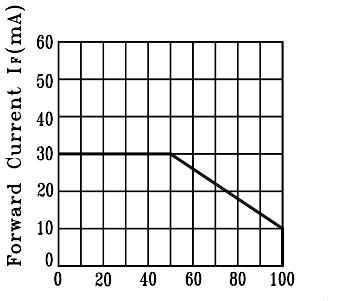



Fig.3 Forward Current Derating Curve

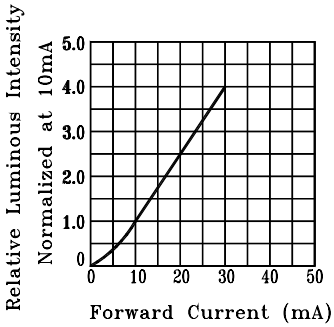



Fig.4 Relative Luminous Intensity vs. Forward Current

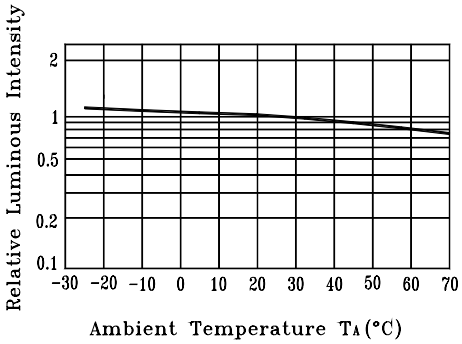



Fig.5 Luminous Intensity vs. Ambient Temperature

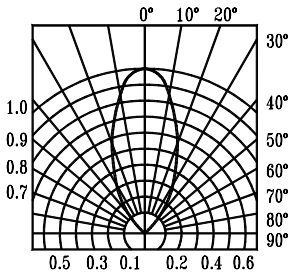



Fig.6 Spatial Distribution

## Bin Code List For Reference

| Luminous Intensity Unit : mcd @10mA | | |
|---|---|---|
| Bin Code | Min. | Max. |
| O1 | 60 | 100 |
| O2 | 40 | 60 |
| O3 | 29 | 40 |
| O4 | 21 | 29 |
| O5 | 12.6 | 21 |

Note: Tolerance of each bin limit is ±15%

| Dominant Wavelength Unit : nm @10mA | | |
|---|---|---|
| Bin Code | Min. | Max. |
| YG | 571 | 573 |
| PG | 570 | 571 |
| GG | 569 | 570 |
| GG1 | 567 | 569 |
| GG2 | 565 | 567 |
| - | 564 | 575 |

Note: Tolerance of each bin limit is ±1nm

# 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 Liteon'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 (for Lamp):

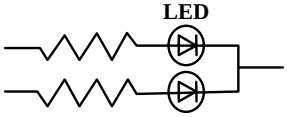
| Soldering iron | | Wave soldering | |
|---|---|---|---|
| Temperature<br>Soldering time | 300°C Max.<br>3 sec. Max.<br>(one time only) | Pre-heat<br>Pre-heat time<br>Solder wave<br>Soldering time | 100°C Max.<br>60 sec. Max.<br>260°C Max.<br>10 sec. Max. |

Note: Excessive soldering temperature and/or time might result in deformation of the LED lens or catastrophic failure of the LED. IR re-flow is not suitable process for through hole type LED lamp production.

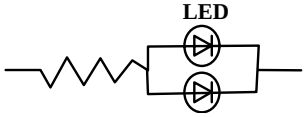
## 6. Drive Method

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.Others**

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