



**BRIGHTTEK**  
**BRIGHTTEK (EUROPE) LIMITED**

## APPROVAL SHEET

CUSTOMER: \_\_\_\_\_

TYPE NO.: NOR28L32

PACKAGE SIZE: 3.0mm Round Type LED Lamp

DICE MATERIAL: AlInGaP PEAK WAVE LENGTH(nm) 635

EMITTED COLOR: Super Orange Red VIEWING ANGLE (deg): 25

LENS COLOR: Red Transparent IV(mcd): 2500

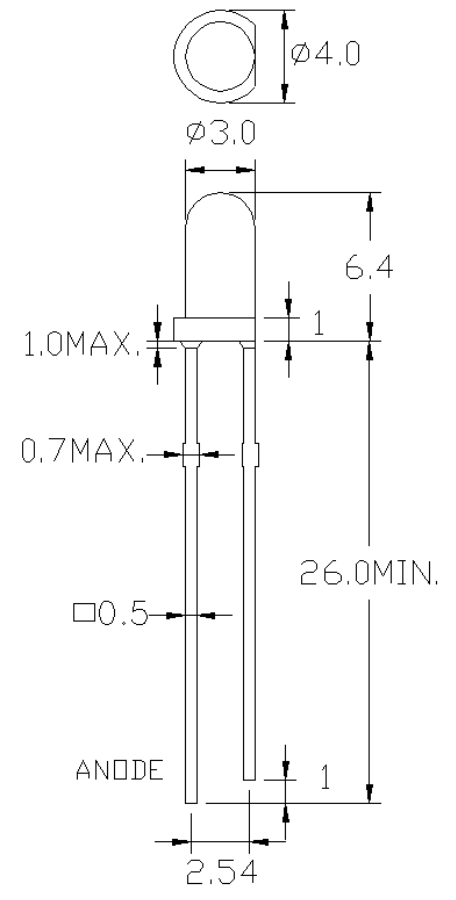
**TYPE NO.: NOR28L32****ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta = 25°C**

| PARAMETER                                   | SYMBOL          | MIN  | TYP  | MAX  | UNIT | TEST      |
|---|-----------------|------|------|------|------|-----------|
| Luminous Intensity                          | IV              | 1600 | 2500 | 3000 | mcd  | IF = 20mA |
| Viewing Angle                               | 2 $\theta$ 1/2  |      | 25   |      | deg  |           |
| Peak Emission Wavelength                    | $\lambda_p$     |      | 635  |      | nm   |           |
| Dominant Wavelength                         | $\lambda_D$     | 620  | 625  | 630  | nm   |           |
| Spectral Line Half-Width                    | $\Delta\lambda$ |      | 19   |      | nm   |           |
| Forward Voltage                             | VF              | 1.9  | 2.0  | 2.6  | V    |           |
| Power Dissipation                           | Pd              |      |      | 85   | mW   |           |
| Peak Forward Current<br>( Duty1/10 @ 1KHZ ) | IF (Peak)       |      |      | 100  | mA   |           |
| Recommended Operating Current               | IF (Rec)        |      | 20   |      | mA   |           |

● **ABSOLUTE MAXIMUM RATINGS** : ( Ta = 25°C )

|  |                        |
|--|------------------------|
| Reverse Voltage  | : 5 Volt               |
| Reverse Current  | : 10 $\mu$ A ( VR=5V ) |
| Operating Temperature Range  | : -40°C TO 85°C        |
| Storage Temperature Range  | : -40°C TO 100°C       |
| Lead Soldering Temperature Range<br>【 1.6 mm (1/16 inch) from body 】 | : 260°C For 5 Seconds  |

## LED LAMPS PACKAGE DIMENSIONS

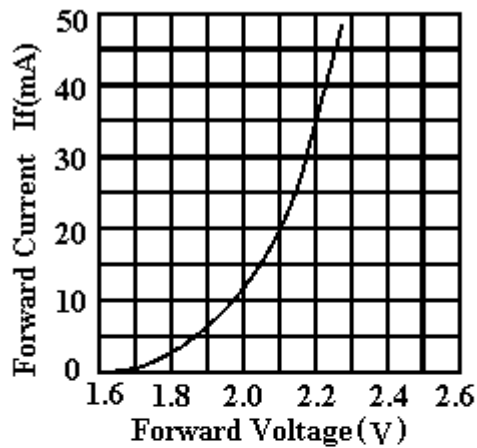


**Unit :mm**

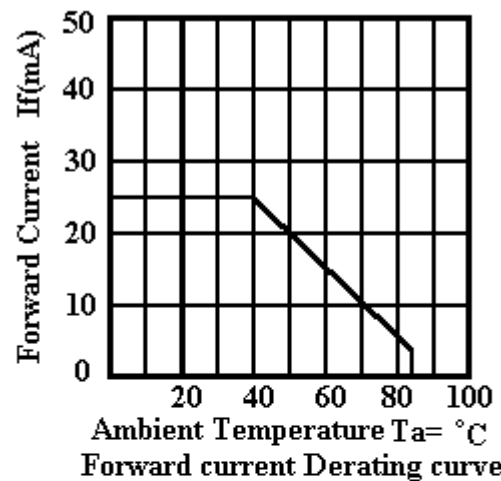
|   |              |          |
|---|--------------|----------|
| DEVICE NO.: N0R28L32  | DRAWING NO.  | ENGINEER |
| ALL TOLERANCE SHALL BE<br>±0.01 inch/0.25mm<br>UNLESS OTHERWISE NOTED | DRAWING DATE | APPROVER |

## Typical Electro-Optical Characteristics Curves

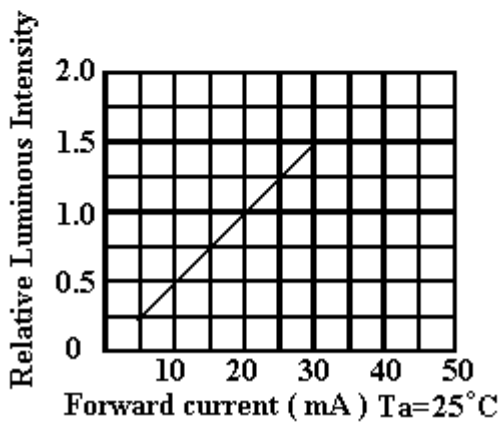
### Super Orange (AlInGaP $\lambda_P=635\text{nm}$ )



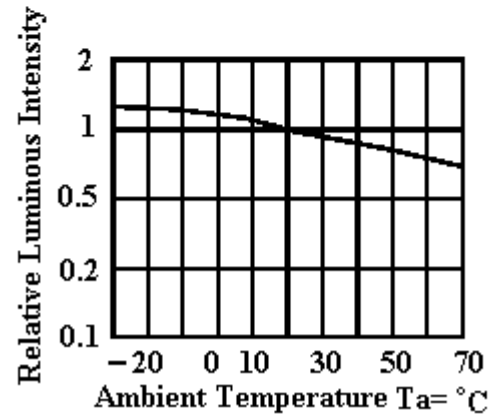
Forward current vs. Forward Voltage



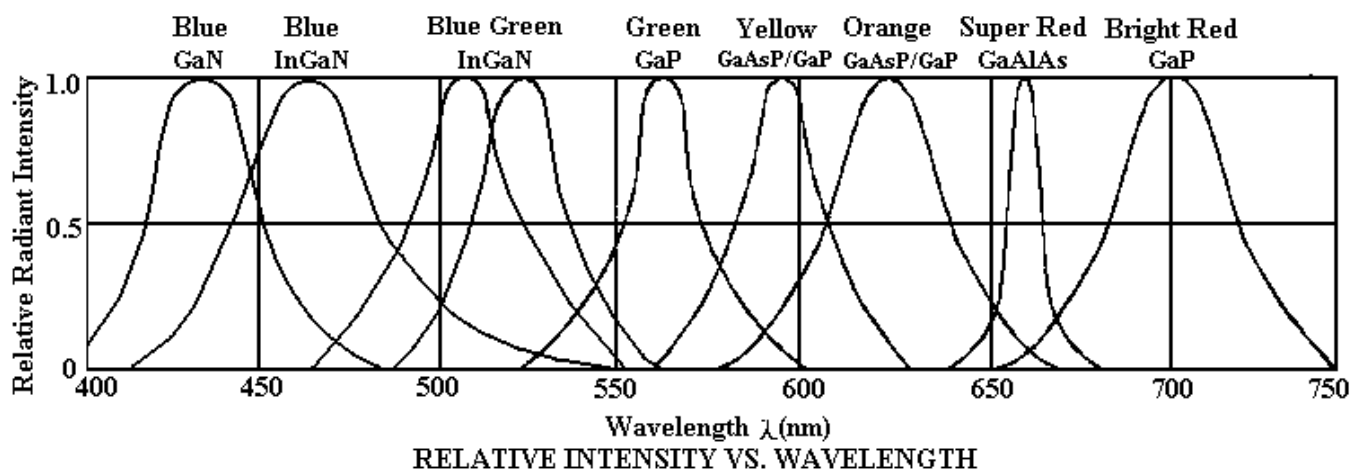
Forward current Derating curve



Luminous Intensity vs. Forward current



Luminous Intensity vs. Ambient Temperature



RELATIVE INTENSITY VS. WAVELENGTH

## Reliability test For LED Lamps

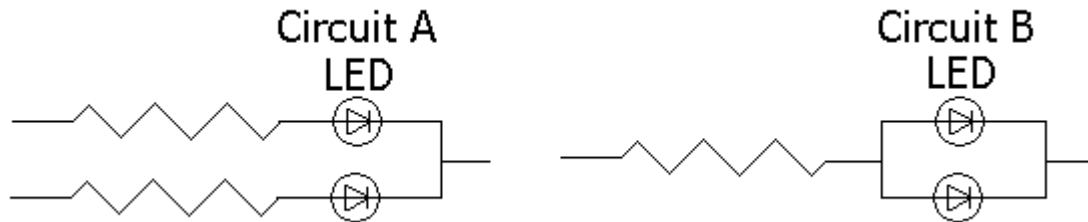
Type No. :N0R28L32

| NO. | Item                              | Test Conditions                         | Test Time/<br>Cycle | Sample Size | Ac/Re |
|-----|-----------------------------------|---|---------------------|-------------|-------|
| 1   | DC Operating Life                 | Temperature:25°C<br>IF:20mA             | 1000HRS             | 20PCS       | 0/1   |
| 2   | High Temperature<br>High Humidity | Temperature:85°C<br>85%RH               | 1000HRS             | 20PCS       | 0/1   |
| 3   | High Temperature<br>Storage       | Temperature:100°C                       | 1000HRS             | 20PCS       | 0/1   |
| 4   | Low Temperature<br>Storage        | Temperature:— 40°C                      | 1000HRS             | 20PCS       | 0/1   |
| 5   | Temperature Cycling               | 85°C~ 25°C~— 35°C<br>15min~ 5min~ 15min | 15Cycles            | 20PCS       | 0/1   |
| 6   | Thermal Shock                     | 85°C~ 25°C~— 10°C<br>5min~ 10sec ~ 5min | 15Cycles            | 20PCS       | 0/1   |
| 7   | Solder Heat                       | Temperature:260°C±5°C                   | 10SEC.              | 20PCS       | 0/1   |

## Precautions For Use LED

### 1. Drive Method

LED is current-operated device. In order to ensure intensity uniformity on multiple LEDs connected in parallel in a application, it is recommended that a current limiting resistor be incorporated in the drive circuit.



(a) Circuit A it is recommended circuit.

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

### 2. Over-current-proof

Customer must apply resistors for protection , otherwise slight voltage shift will cause big current change(Burn out will happen).

### 3. Storage

The Storage Temperature and RH are: 5°C ~ 30°C, RH 60% or less.

Once the package is opened, the products should be used with in a week. Otherwise, they should be kept in moisture proof package with moisture absorbent material (silica gel). we suggest our customers to use our products within a year.

If the moisture absorbent material (silica gel) has faded away or the LEDs exceeded the storage time , baking treatment should be performed using the following conditions.

Baking treatment: more than 24 hours at 60°C ±5°C.

### 4. Electrostatic Discharge (ESD)

Static electricity or surge voltage will damage the LEDs

Suggestions to prevent ESD damage:

Use of a conductive wrist band or ante-electrostatic glove when handing these LEDs

All devices, equipment, and machinery must be properly grounded.

Work tables storage racks, etc. should be properly grounded

In the events of manual working in process, make sure the devices are well protected from ESD at any time.

### 5. Others

(a) If want to have the uniform luminance and color, please use the same binning number,

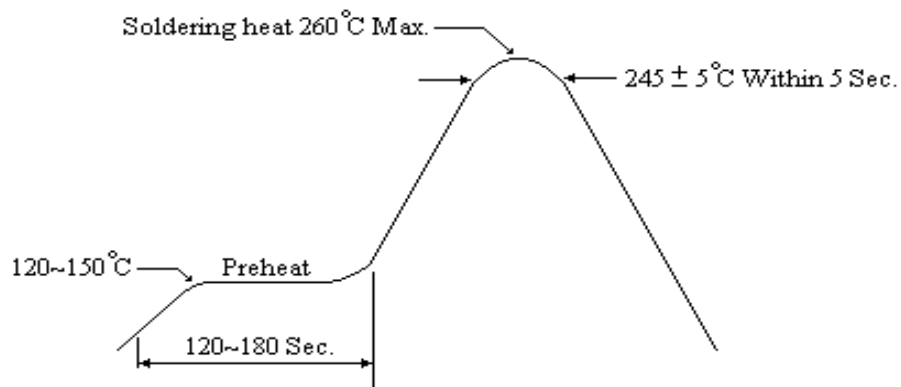
and avoid using intermix to cause the differences of luminance and color.

- (b) The appearance and specifications of the product may be modified for improvement without prior notice.

## 6. Soldering

Recommended soldering condition as shown below:

Soldering heat (DIP)



### Soldering Iron

Temperature at tip of iron :  $300^{\circ}\text{C}$  Max.

Soldering Time :  $3 \text{ sec.} \pm 1 \text{ sec.}$  ( one time only )

If temperature is higher, time should be shorter