



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

## APPROVAL SHEET

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

CUSTOMER PART NO. \_\_\_\_\_

TYPE NO.: NOR50D96GS / NOR50D97GS

PACKAGE SIZE: 0.56 inch Four Digit Common Anode LED Display

DICE MATERIAL: AllnGaP PEAK WAVE LENGTH(nm) 650

EMITTED COLOR: Super Red VIEWING ANGLE (deg): \_\_\_\_\_

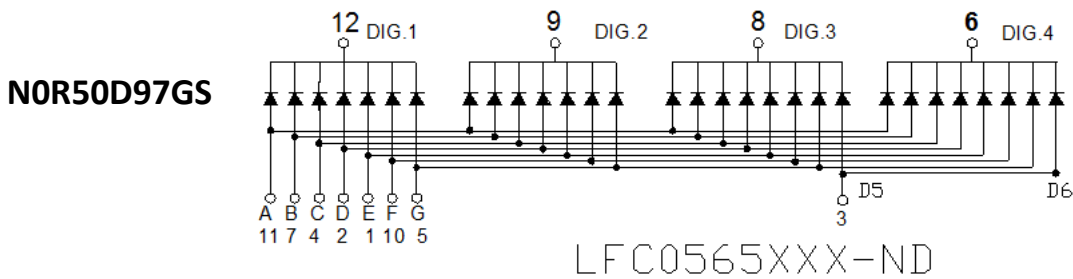
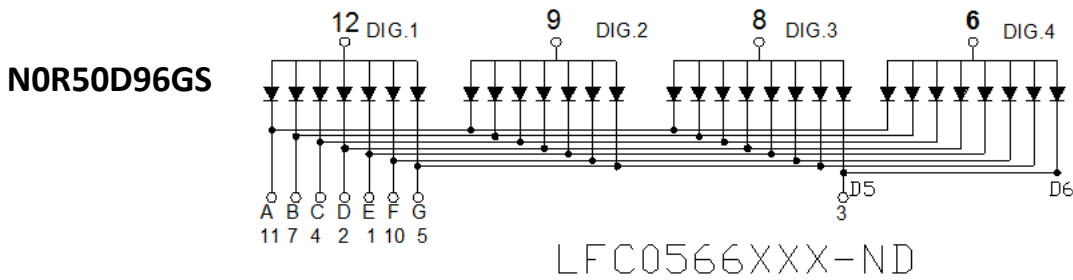
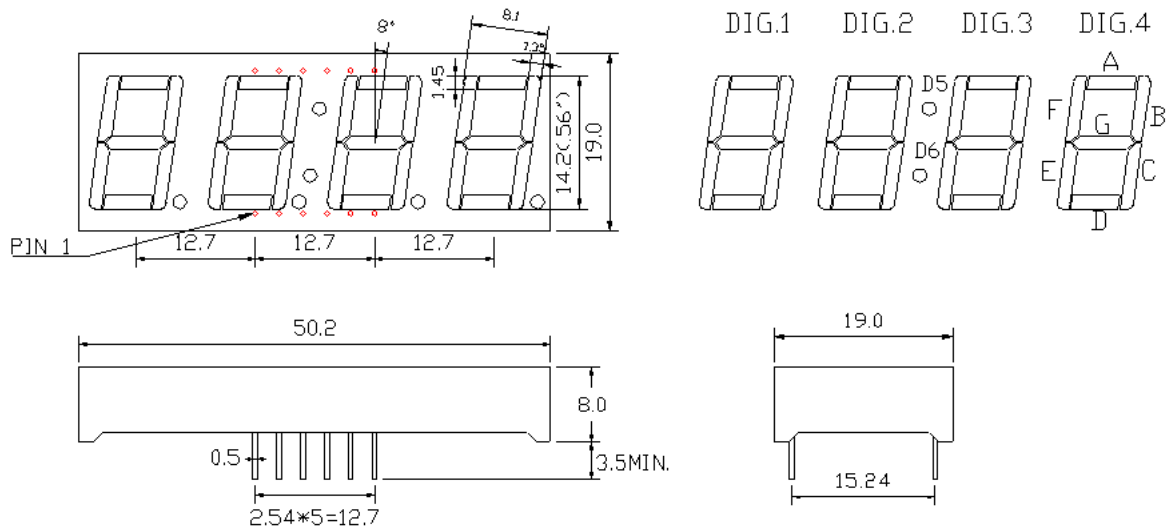
EPOXY COLOR: White Diffused IV(mcd): 4.5

SURFACE INK COLOR Gray

TYPE NO.: N0R50D96GS / N0R50D97GS

● ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta = 25°C						
Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Luminous Intensity	IV	2.8	4.5	6.0	mcd	IF = 20mA
Viewing Angle	2θ1/2				deg	
Peak Emission Wavelength	λp		650		nm	
Dominant Wavelength	λD	635	640	645	nm	
Spectral Line Half-Width	Δλ		20		nm	
Forward Voltage	VF	1.8	1.9	2.2	V	
Reverse Current	Ir	-	-	10	uA	VR=5V
▲ Luminous intensity (IV) ±10%, Forward Voltage (VF) ±0.1V, Wavelength (λd) ±0.5nm						
● ABSOLUTE MAXIMUM RATINGS : ( Ta = 25°C)						
Parameter	Symbol	Rating		Unit		
Power Dissipation	Pd	85		mW		
Peak Forward Current ( Duty 1/10 @ 1KHZ )	IF (Peak)	100		mA		
Recommended Operating Current	IF (Rec)	30		mA		
Electrostatic Discharge	ESD <sub>HBM</sub>	2000		V		
Operating Temperature Range	T <sub>OPR</sub>	-40 ~ +85		°C		
Storage Temperature Range	T <sub>STG</sub>	-40 ~ +100		°C		
Lead Soldering Temperature Range 【1.6 mm (1/16 inch) from body】	Reflow Soldering : 260 °C for 5 sec. Hand Soldering : 350 °C for 3 sec.					

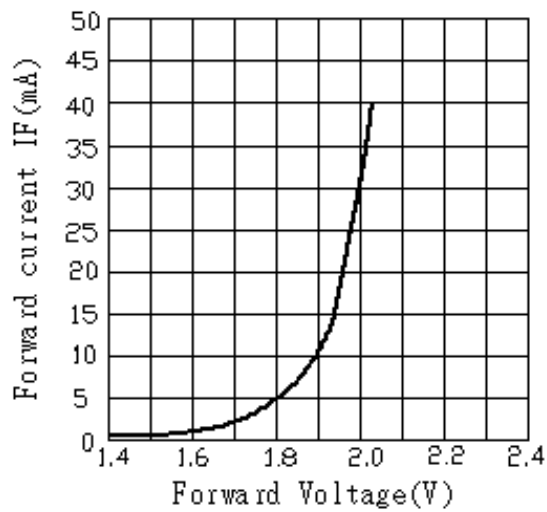
# LED DISPLAYS PACKAGE DIMENSIONS



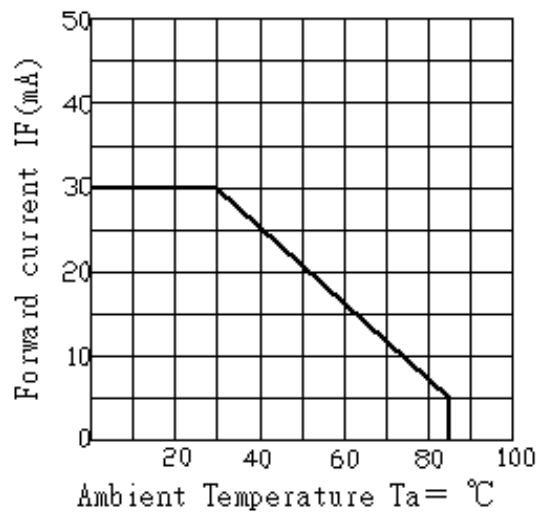
<b>DEVICE NO.:</b> <b>N0R50D96GS / N0R50D97GS</b>	<b>DRAWING NO.</b>	<b>ENGINEER</b>
<b>ALL TOLERANCE SHALL BE</b> <b>±0.01 inch/0.25mm</b> <b>UNLESS OTHERWISE NOTED</b>	<b>DRAWING DATE</b>	<b>APPROVER</b>

# Typical Electro-Optical Characteristics Curves

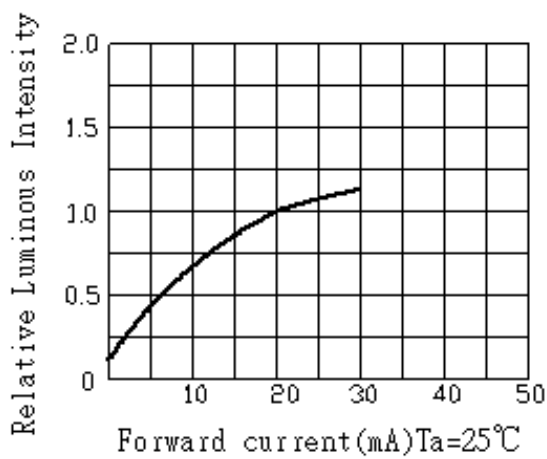
## Super Red (AlInGaP $\lambda_d=640\text{nm}$ )



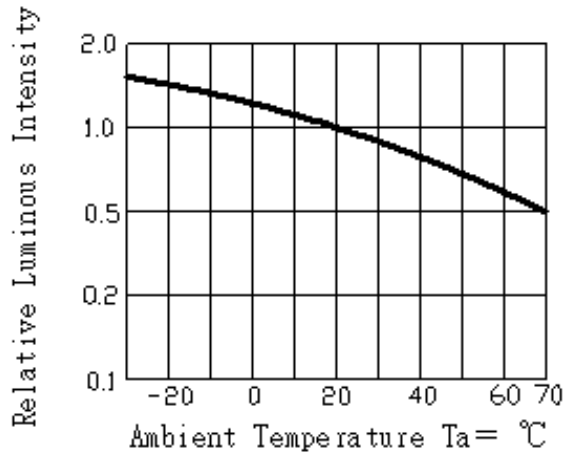
Forward current vs. Forward Voltage



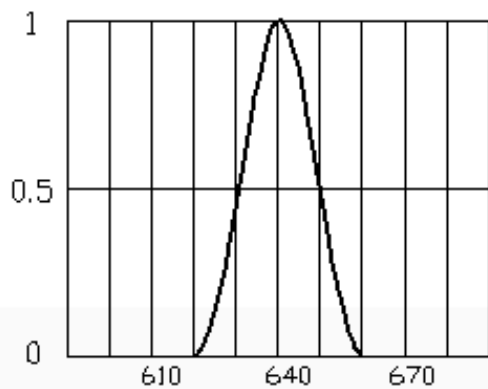
Forward current Derating curve



Luminous Intensity vs. Forward current



Luminous Intensity vs. Ambient Temperature



Relative Intensity VS. wavelength

## Reliability test For LED Lamps

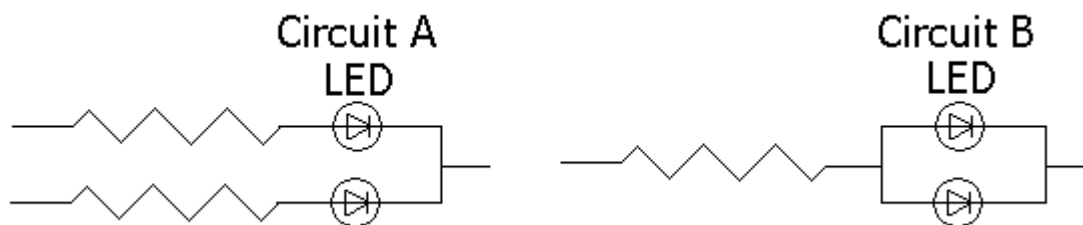
Type No. : NOR50D96GS / NOR50D97GS

NO.	Item	Test Conditions	Test Time/ Cycle	Sample Size	Ac/Re
1	DC Operating Life	Temperature:25°C IF:20mA	1000HRS	20PCS	0/1
2	High Temperature High Humidity	Temperature:85°C 85%RH	1000HRS	20PCS	0/1
3	High Temperature Storage	Temperature:100°C	1000HRS	20PCS	0/1
4	Low Temperature Storage	Temperature:— 40°C	1000HRS	20PCS	0/1
5	Temperature Cycling	85°C~ 25°C~— 35°C 15min~ 5min~ 15min	15Cycles	20PCS	0/1
6	Thermal Shock	85°C~ 25°C~— 10°C 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 an 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 within 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 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

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

## 5. Others

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

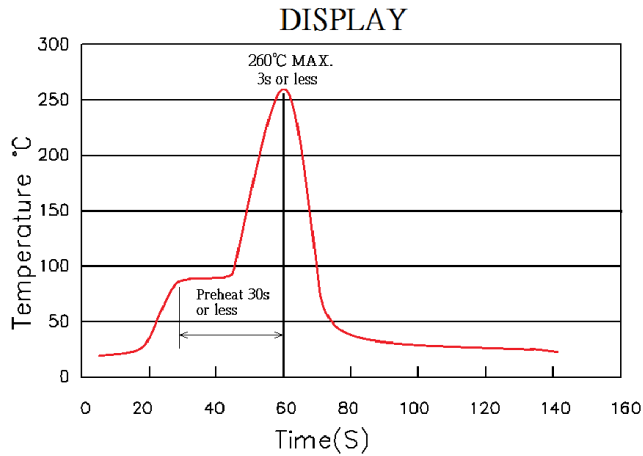
and avoid using intermix to cause the differences of luminance and color.

(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 : 350°C Max.

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

If temperature is higher, time should be shorter