# APPROVAL SHEET

<table>
<thead>
<tr>
<th>CUSTOMER:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CUSTOMER PART NO.:</td>
<td></td>
</tr>
<tr>
<td>TYPE NO.:</td>
<td>LA058GBRC-A</td>
</tr>
<tr>
<td>PACKAGE SIZE:</td>
<td>5.0mm Full-Color LED Lamp</td>
</tr>
<tr>
<td>DICE MATERIAL:</td>
<td>AlInGaP/InGaN/InGaN</td>
</tr>
<tr>
<td>PEAK WAVE LENGTH(nm):</td>
<td>635/525/470</td>
</tr>
<tr>
<td>EMITTED COLOR:</td>
<td>RGB Full Color</td>
</tr>
<tr>
<td>VIEWING ANGLE (deg):</td>
<td>45</td>
</tr>
<tr>
<td>LENS COLOR:</td>
<td>Water Clear</td>
</tr>
<tr>
<td>IV(mcd):</td>
<td>1000/3800/900</td>
</tr>
</tbody>
</table>

CUSTOMER: LENOO ELECTRONICS CO., LTD.

ENGINEERING DEPARTMENT

(Authorized Signature)

APPROVED DATE

ISSUED DATE
**TYPE NO. : LA058GBRC-A**

**ELECTRICAL / OPTICAL CHARACTERISTICS AT Ta = 25°C**

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SYMBOL</th>
<th>MIN</th>
<th>TYP R/G/B</th>
<th>MAX</th>
<th>UNIT</th>
<th>TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luminous Intensity</td>
<td>IV</td>
<td>800/2500/600</td>
<td>1000/3800/900</td>
<td>-</td>
<td>mcd</td>
<td>IF = 20mA</td>
</tr>
<tr>
<td>Viewing Angle</td>
<td>2Ø1/2</td>
<td>45</td>
<td></td>
<td></td>
<td>deg</td>
<td></td>
</tr>
<tr>
<td>Peak Emission Wavelength</td>
<td>λ p</td>
<td>635/525/470</td>
<td></td>
<td></td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td>Dominant Wavelength</td>
<td>λ D</td>
<td>620/515/465</td>
<td>-</td>
<td>630/530/470</td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td>Spectral Line Half-Width</td>
<td>Δλ</td>
<td>20/40/25</td>
<td></td>
<td></td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td>Forward Voltage</td>
<td>VF</td>
<td>1.8/2.9/2.9</td>
<td>2.2/3.2/3.1</td>
<td>2.6/3.6/3.6</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td>Power Dissipation</td>
<td>Pd</td>
<td>85/95/95</td>
<td></td>
<td></td>
<td>mW</td>
<td></td>
</tr>
<tr>
<td>Peak Forward Current</td>
<td>IF (Peak)</td>
<td>100</td>
<td></td>
<td></td>
<td>mA</td>
<td></td>
</tr>
<tr>
<td>Recommended Operating Current</td>
<td>IF (Rec)</td>
<td>20~25</td>
<td></td>
<td></td>
<td>mA</td>
<td></td>
</tr>
</tbody>
</table>

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

- Reverse Voltage : 5 Volt
- Reverse Current : 10 uA ( VR=5V )
- Electrostatics Discharge (ESD) : 200 Volt
- Operating Temperature Range : -40°C TO 85°C
- Storage Temperature Range : -40°C TO 100°C
- Lead Soldering Temperature Range [1.6 mm (1/16 inch) from body] : 260°C For 5 Seconds
DEVICE NO.: LA058GBRC-A

ALL TOLERANCE SHALL BE ±0.01 inch/0.25mm UNLESS OTHERWISE NOTED

LENOO ELECTRONICS CO., LTD.
Typical Electro-Optical Characteristics Curves

Ultra Orange (AlInGaP λP=635nm)

Forward current vs. Forward Voltage

Forward Current (mA) Vs. Forward Voltage

Forward Current (mA) Vs. Ambient Temperature Ta= °C

Relative Luminous Intensity

Luminous Intensity vs. Forward current

Luminous Intensity vs. Ambient Temperature

Relative Intensity vs. Wavelength

Wavelength λ (nm)

Relative Intensity vs. Wavelength
LENNO ELECTRONICS CO., LTD.

Typical Electro-Optical Characteristics Curves

Ultra Green (InGaN $\lambda_P = 525\text{nm}$)

Forward Voltage (V) vs. Forward Current (mA)

Ambient Temperature $T_a(\text{°C})$ vs. Forward Current (mA)

Relative Luminous Intensity vs. Forward Current ($\text{mA}$) $T_a = 25\text{°C}$

Relative Luminous Intensity vs. Ambient Temperature $T_a = \text{°C}$

Relative Radiant Intensity vs. Wavelength $\lambda (\text{nm})$

RELATIVE INTENSITY VS. WAVELENGTH
LENOO ELECTRONICS CO., LTD.

Typical Electro-Optical Characteristics Curves

Super Blue (InGaN λP=470nm)

- Forward Current vs. Forward Voltage
- Forward Current Derating Curve
- Luminous Intensity vs. Forward current
- Luminous Intensity vs. Ambient Temperature

Relative Radiant Intensity vs. Wavelength

RELATIVE INTENSITY VS. WAVELENGTH
Reliability test For LED Lamps

Type No.: LA058GBRC-A

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

- Soldering Iron
  - Temperature at tip of iron: 350°C Max.
  - Soldering Time: 3 sec. ± 1 sec. (one time only)
  - If temperature is higher, time should be shorter

**Reflow Temp./Time(SMD)**

![Reflow Temp./Time diagram]