AM23ESGC
SOT-23 Surface Mount LED Lamp

DESCRIPTIONS
- The High Efficiency Red source color devices are made with Gallium Arsenide Phosphide on Gallium Phosphide Orange Light Emitting Diode
- The Super Bright Green source color devices are made with Gallium Phosphide Green Light Emitting Diode

FEATURES
- SOT-23 package surface mount LED lamp
- Low power consumption
- Long life - solid state reliability
- Package: 2000 pcs / reel
- Moisture sensitivity level: 3
- Halogen-free
- RoHS compliant

APPLICATIONS
- Backlight
- Status indicator
- Home and smart appliances
- Wearable and portable devices
- Healthcare applications

PACKAGE DIMENSIONS

RECOMMENDED SOLDERING PATTERN
(units : mm; tolerance : ± 0.1)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Emitting Color (Material)</th>
<th>Lens Type</th>
<th>Iv (mcd) @ 20mA [2]</th>
<th>Viewing Angle [3]</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM23ESGC</td>
<td>High Efficiency Red (GaAsP/GaP)</td>
<td>Water Clear</td>
<td>5 12</td>
<td>160°</td>
</tr>
<tr>
<td></td>
<td>Super Bright Green (GaP)</td>
<td></td>
<td>5 10</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
2. Luminous intensity / luminous flux: +/−15%.
3. Luminous intensity value is traceable to CIE127-2007 standards.

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**ELECTRICAL / OPTICAL CHARACTERISTICS at \( T_A = 25^\circ C \)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Emitting Color</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength at Peak Emission ( I_F = 20mA )</td>
<td>( \lambda_{\text{peak}} )</td>
<td>High Efficiency Red Super Bright Green</td>
<td>627</td>
<td>nm</td>
</tr>
<tr>
<td>Dominant Wavelength ( I_F = 20mA )</td>
<td>( \lambda_{\text{dom}} )</td>
<td>High Efficiency Red Super Bright Green</td>
<td>617</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral Bandwidth at 50% REL MAX ( I_F = 20mA )</td>
<td>( \Delta \lambda )</td>
<td>High Efficiency Red Super Bright Green</td>
<td>45</td>
<td>nm</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>High Efficiency Red Super Bright Green</td>
<td>15</td>
<td>pF</td>
</tr>
<tr>
<td>Forward Voltage ( I_F = 20mA )</td>
<td>( V_F )</td>
<td>High Efficiency Red Super Bright Green</td>
<td>2.0</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Current ( V_R = 5V )</td>
<td>( I_R )</td>
<td>High Efficiency Red Super Bright Green</td>
<td>-</td>
<td>( \mu A )</td>
</tr>
<tr>
<td>Temperature Coefficient of ( \lambda_{\text{peak}} )</td>
<td>( I_F = 20mA ), (-10^\circ C \leq T \leq 85^\circ C )</td>
<td>TC( \lambda_{\text{peak}} )</td>
<td>0.13</td>
<td>( \text{nm/}^\circ \text{C} )</td>
</tr>
<tr>
<td>Temperature Coefficient of ( \lambda_{\text{dom}} )</td>
<td>( I_F = 20mA ), (-10^\circ C \leq T \leq 85^\circ C )</td>
<td>TC( \lambda_{\text{dom}} )</td>
<td>0.06</td>
<td>( \text{nm/}^\circ \text{C} )</td>
</tr>
<tr>
<td>Temperature Coefficient of ( V_F )</td>
<td>( I_F = 20mA ), (-10^\circ C \leq T \leq 85^\circ C )</td>
<td>TC( V )</td>
<td>-1.9</td>
<td>( \text{mV/}^\circ \text{C} )</td>
</tr>
</tbody>
</table>

**Notes:**
1. The dominant wavelength (\( \lambda_d \)) above is the setup value of the sorting machine. (Tolerance \( \lambda_d \) : \( \pm 1 \text{nm} \).)
2. Forward voltage : \( \pm 0.1 \text{V} \).
3. Wavelength value is traceable to CIE127:2007 standards.
4. Excess driving current and / or operating temperature higher than recommended conditions may result in severe light degradation or premature failure.

**ABSOLUTE MAXIMUM RATINGS at \( T_A = 25^\circ C \)**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Dissipation</td>
<td>( P_D )</td>
<td>75</td>
<td>62.5</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>( V_R )</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>( T_J )</td>
<td>125</td>
<td>110</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Top</td>
<td>-40 To +85</td>
<td>( ^\circ \text{C} )</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{\text{stg}} )</td>
<td>-40 To +85</td>
<td>( ^\circ \text{C} )</td>
</tr>
<tr>
<td>DC Forward Current</td>
<td>( I_F )</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>Peak Forward Current</td>
<td>( I_{\text{FM}} )</td>
<td>160</td>
<td>140</td>
</tr>
<tr>
<td>Electrostatic Discharge Threshold (HBM)</td>
<td>-</td>
<td>8000</td>
<td>8000</td>
</tr>
<tr>
<td>Thermal Resistance (Junction / Ambient)</td>
<td>( R_{\text{th, JA}} )</td>
<td>460</td>
<td>510</td>
</tr>
<tr>
<td>Thermal Resistance (Junction / Solder point)</td>
<td>( R_{\text{th, JS}} )</td>
<td>340</td>
<td>430</td>
</tr>
</tbody>
</table>

**Notes:**
1. 1/10 Duty Cycle, 0.1ms Pulse Width.
2. \( R_{\text{th, JA}} \), \( R_{\text{th, JS}} \). Results from mounting on PC board FR4 (pad size \( \geq 16 \text{mm}^2 \) per pad).
3. Relative humidity levels maintained between 40% and 60% in production area are recommended to avoid the build-up of static electricity – Ref JEDEC/JESD625-A and JEDEC/J-STD-033.
TECHNICAL DATA

**RELATIVE INTENSITY vs. WAVELENGTH**

![Graph showing relative intensity vs. wavelength for Green and Red colors at Ta = 25 °C.](image)

**SPATIAL DISTRIBUTION**

![Graph showing spatial distribution for different angles at Ta = 25 °C.](image)

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**HIGH EFFICIENCY RED**

**Forward Current vs. Forward Voltage**

![Graph showing forward current vs. forward voltage for Ta = 25 °C.](image)

**Luminous Intensity vs. Forward Current**

![Graph showing luminous intensity vs. forward current for Ta = 25 °C.](image)

**Forward Current Derating Curve**

![Graph showing forward current derating curve for Ta = 25 °C.](image)

**Luminous Intensity vs. Ambient Temperature**

![Graph showing luminous intensity vs. ambient temperature for Ta = 25 °C.](image)

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**SUPER BRIGHT GREEN**

**Forward Current vs. Forward Voltage**

![Graph showing forward current vs. forward voltage for Ta = 25 °C.](image)

**Luminous Intensity vs. Forward Current**

![Graph showing luminous intensity vs. forward current for Ta = 25 °C.](image)

**Forward Current Derating Curve**

![Graph showing forward current derating curve for Ta = 25 °C.](image)

**Luminous Intensity vs. Ambient Temperature**

![Graph showing luminous intensity vs. ambient temperature for Ta = 25 °C.](image)
REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS

Notes:
1. Don’t cause stress to the LEDs while it is exposed to high temperature.
2. The maximum number of reflow soldering passes is 2 times.
3. Reflow soldering is recommended. Other soldering methods are not recommended as they might cause damage to the product.

PACKING & LABEL SPECIFICATIONS

USER DIRECTION OF FEED

2,000pcs / Reel

1 Reel / Bag

30K / Box

60K / Box

PRECAUTIONARY NOTES

1. The information included in this document reflects representative usage scenarios and is intended for technical reference only.
2. The part number, type, and specifications mentioned in this document are subject to future change and improvement without notice. Before production usage, customer should refer to the latest datasheet for the updated specifications.
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