APF3236SEEZGKQBKC
3.2 mm x 3.6 mm Full-Color Surface Mount LED Lamp

DESCRIPTIONS
- The Hyper Red source color devices are made with AlGaInP on GaAs substrate Light Emitting Diode
- The Green source color devices are made with InGaN on Sapphire Light Emitting Diode
- The Blue source color devices are made with InGaN Light Emitting Diode
- Electrostatic discharge and power surge could damage the LEDs
- It is recommended to use a wrist band or anti-electrostatic glove when handling the LEDs
- All devices, equipments and machineries must be electrically grounded

FEATURES
- 3.2 mm x 3.6 mm SMD LED, 1.1 mm thickness
- Low power consumption
- One red, one green and one blue chips in one package
- Package: 1000 pcs / reel
- Moisture sensitivity level: 3
- Halogen-free
- RoHS compliant

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

ATTENTION
Observe precautions for handling electrostatic discharge sensitive devices

SELECTION GUIDE

<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 [1]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hyper Red (AlGaInP)</td>
<td>Water Clear</td>
<td>Min. 80 Typ. 140</td>
<td>281/2</td>
</tr>
<tr>
<td></td>
<td>Green (InGaN)</td>
<td></td>
<td>Min. 200 Typ. 330</td>
<td>150°</td>
</tr>
<tr>
<td></td>
<td>Blue (InGaN)</td>
<td></td>
<td>Min. 40 Typ. 70</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.
**ELECTRICAL / OPTICAL CHARACTERISTICS at T_A=25°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 = 20,\text{mA})</td>
<td>(\lambda_{\text{peak}})</td>
<td>Hyper Red Green Blue</td>
<td>630</td>
<td>515</td>
</tr>
<tr>
<td>Dominant Wavelength (I_F = 20,\text{mA})</td>
<td>(\lambda_{\text{dom}})</td>
<td>Hyper Red Green Blue</td>
<td>621</td>
<td>525</td>
</tr>
<tr>
<td>Spectral Bandwidth at 50% (\Phi) REL MAX (I_F = 20,\text{mA})</td>
<td>(\Delta\lambda)</td>
<td>Hyper Red Green Blue</td>
<td>20</td>
<td>35</td>
</tr>
<tr>
<td>Capacitance</td>
<td>C</td>
<td>Hyper Red Green Blue</td>
<td>25</td>
<td>45</td>
</tr>
<tr>
<td>Forward Voltage (I_F = 20,\text{mA})</td>
<td>(V_F)</td>
<td>Hyper Red Green Blue</td>
<td>2.0</td>
<td>2.5</td>
</tr>
<tr>
<td>Reverse Current ((V_R = 5,\text{V}))</td>
<td>(I_R)</td>
<td>Hyper Red Green Blue</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Temperature Coefficient of (\lambda_{\text{peak}}) (I_F = 20,\text{mA}, -10^\circ\text{C} \leq T \leq 85^\circ\text{C})</td>
<td>(\text{TC}<em>{\lambda</em>{\text{peak}}})</td>
<td>Hyper Red Green Blue</td>
<td>0.13</td>
<td>0.05</td>
</tr>
<tr>
<td>Temperature Coefficient of (\lambda_{\text{dom}}) (I_F = 20,\text{mA}, -10^\circ\text{C} \leq T \leq 85^\circ\text{C})</td>
<td>(\text{TC}<em>{\lambda</em>{\text{dom}}})</td>
<td>Hyper Red Green Blue</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Temperature Coefficient of (V_F) (I_F = 20,\text{mA}, -10^\circ\text{C} \leq T \leq 85^\circ\text{C})</td>
<td>(\text{TC}_V)</td>
<td>Hyper Red Green Blue</td>
<td>-1.9</td>
<td>-3</td>
</tr>
</tbody>
</table>

**Notes:**
1. The dominant wavelength (\(\lambda_d\)) above is the setup value of the sorting machine. (Tolerance \(\lambda_d\): ±1nm.)
2. Forward voltage: ±0.1V.
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°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>102.5</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>115</td>
<td>115</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>(T_{\text{op}})</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>(T_{\text{slp}})</td>
<td>-40 to +85</td>
<td>°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_{F\text{M}})</td>
<td>195</td>
<td>150</td>
</tr>
<tr>
<td>Electrostatic Discharge Threshold (HBM)</td>
<td>-</td>
<td>3000</td>
<td>450</td>
</tr>
<tr>
<td>Thermal Resistance (Junction / Ambient)</td>
<td>(R_{\text{th JA}})</td>
<td>650</td>
<td>630</td>
</tr>
<tr>
<td>Thermal Resistance (Junction / Solder point)</td>
<td>(R_{\text{th JS}})</td>
<td>500</td>
<td>540</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 ≥ 16 mm² 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 Blue, Green, and Red](image1)

SPATIAL DISTRIBUTION

![Spatial distribution graph with T_a = 25 °C](image2)

HYPER RED

- **Forward Current vs. Forward Voltage**
  - ![Graph showing forward current vs. forward voltage for T_a = 25 °C](image3)

- **Luminous Intensity vs. Forward Current**
  - ![Graph showing luminous intensity vs. forward current for T_a = 25 °C](image4)

- **Forward Current Derating Curve**
  - ![Graph showing forward current derating curve for T_a = 25 °C](image5)

- **Luminous Intensity vs. Ambient Temperature**
  - ![Graph showing luminous intensity vs. ambient temperature for T_a = 25 °C](image6)

GREEN

- **Forward Current vs. Forward Voltage**
  - ![Graph showing forward current vs. forward voltage for T_a = 25 °C](image7)

- **Luminous Intensity vs. Forward Current**
  - ![Graph showing luminous intensity vs. forward current for T_a = 25 °C](image8)

- **Forward Current Derating Curve**
  - ![Graph showing forward current derating curve for T_a = 25 °C](image9)

- **Luminous Intensity vs. Ambient Temperature**
  - ![Graph showing luminous intensity vs. ambient temperature for T_a = 25 °C](image10)

BLUE

- **Forward Current vs. Forward Voltage**
  - ![Graph showing forward current vs. forward voltage for T_a = 25 °C](image11)

- **Luminous Intensity vs. Forward Current**
  - ![Graph showing luminous intensity vs. forward current for T_a = 25 °C](image12)

- **Forward Current Derating Curve**
  - ![Graph showing forward current derating curve for T_a = 25 °C](image13)

- **Luminous Intensity vs. Ambient Temperature**
  - ![Graph showing luminous intensity vs. ambient temperature for T_a = 25 °C](image14)
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

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.
3. When using the products referenced in this document, please make sure the product is being operated within the environmental and electrical limits specified in the datasheet. If customer usage exceeds the specified limits, Kingbright will not be responsible for any subsequent issues.
4. The information in this document applies to typical usage in consumer electronics applications. If customer's application has special reliability requirements or have life-threatening liabilities, such as automotive or medical usage, please consult with Kingbright representative for further assistance.
5. The contents and information of this document may not be reproduced or re-transmitted without permission by Kingbright.
6. All design applications should refer to Kingbright application notes available at https://www.KingbrightUSA.com/ApplicationNotes