APTF1616LSEEZGKQBKC
1.6 x 1.6 mm Full-Color Surface Mount LED

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
- 1.6 mm x 1.6 mm SMD LED, 0.7 mm thickness
- Low power consumption
- Can produce any color in visible spectrum, including white light
- 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

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) @ 2mA</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>APTF1616LSEEZGKQBKC</td>
<td>Hyper Red (AlGaInP)</td>
<td>Water Clear</td>
<td>6</td>
<td>130°</td>
</tr>
<tr>
<td></td>
<td>Green (InGaN)</td>
<td></td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Blue (InGaN)</td>
<td></td>
<td>6</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 \( T_A = 25^\circ C \)

<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 = 2mA )</td>
<td>( \lambda_{\text{peak}} )</td>
<td>Hyper Red, Green, Blue</td>
<td>630, 515, 460</td>
<td>nm</td>
</tr>
<tr>
<td>Dominant Wavelength ( I_F = 2mA )</td>
<td>( \lambda_{\text{dom}} )</td>
<td>Hyper Red, Green, Blue</td>
<td>621, 525, 465</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral Bandwidth at 50% ( \Phi ) REL MAX ( I_F = 2mA )</td>
<td>( \Delta \lambda )</td>
<td>Hyper Red, Green, Blue</td>
<td>20, 35, 25</td>
<td>nm</td>
</tr>
<tr>
<td>Capacitance</td>
<td>( C )</td>
<td>Hyper Red, Green, Blue</td>
<td>25, 45, 100</td>
<td>pF</td>
</tr>
<tr>
<td>Forward Voltage ( I_F = 2mA )</td>
<td>( V_F )</td>
<td>Hyper Red, Green, Blue</td>
<td>1.8, 2.65, 2.65</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Current (( V_R = 5V ))</td>
<td>( I_R )</td>
<td>Hyper Red, Green, Blue</td>
<td>-</td>
<td>( \mu A )</td>
</tr>
<tr>
<td>Temperature Coefficient of ( \lambda_{\text{peak}} ) ( I_F = 2mA, -10^\circ C \leq T \leq 85^\circ C )</td>
<td>( TC_{\lambda_{\text{peak}}} )</td>
<td>Hyper Red, Green, Blue</td>
<td>0.13, 0.05, 0.04</td>
<td>nm/°C</td>
</tr>
<tr>
<td>Temperature Coefficient of ( \lambda_{\text{dom}} ) ( I_F = 2mA, -10^\circ C \leq T \leq 85^\circ C )</td>
<td>( TC_{\lambda_{\text{dom}}} )</td>
<td>Hyper Red, Green, Blue</td>
<td>0.06, 0.03, 0.03</td>
<td>nm/°C</td>
</tr>
<tr>
<td>Temperature Coefficient of ( V_F ) ( I_F = 2mA, -10^\circ C \leq T \leq 85^\circ C )</td>
<td>( TC_{V_{F}} )</td>
<td>Hyper Red, Green, Blue</td>
<td>-2, -3, -3</td>
<td>mV/°C</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 \( T_A = 25^\circ C \)

<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, 102.5, 120</td>
<td>mW</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>( V_R )</td>
<td>5, 5, 5</td>
<td>V</td>
</tr>
<tr>
<td>Junction Temperature</td>
<td>( T_J )</td>
<td>115</td>
<td>°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>( T_{op} )</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{stg} )</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>DC Forward Current</td>
<td>( I_F )</td>
<td>30, 25, 30</td>
<td>mA</td>
</tr>
<tr>
<td>Peak Forward Current</td>
<td>( I_{FM} )</td>
<td>195, 150, 150</td>
<td>mA</td>
</tr>
<tr>
<td>Electrostatic Discharge Threshold (HBM)</td>
<td>-</td>
<td>3000, 450, 250</td>
<td>V</td>
</tr>
<tr>
<td>Thermal Resistance (Junction / Ambient)</td>
<td>( R_{th_JA} )</td>
<td>780, 790, 790</td>
<td>°C/W</td>
</tr>
<tr>
<td>Thermal Resistance (Junction / Solder point)</td>
<td>( R_{th_JS} )</td>
<td>640, 650, 650</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

Notes:
1. 1/10 Duty Cycle, 0.1ms Pulse Width.
2. \( R_{th_JA}, R_{th_JS} \): 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

SPATIAL DISTRIBUTION

HYPER RED

Forward Current vs. Forward Voltage

Luminous Intensity vs. Forward Current

Forward Current Derating Curve

Luminous Intensity vs. Ambient Temperature

GREEN

Forward Current vs. Forward Voltage

Luminous Intensity vs. Forward Current

Forward Current Derating Curve

Luminous Intensity vs. Ambient Temperature

BLUE

Forward Current vs. Forward Voltage

Luminous Intensity vs. Forward Current

Forward Current Derating Curve

Luminous Intensity vs. Ambient Temperature
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.
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