DESCRIPTION

- F3 Made with Gallium Arsenide Infrared Emitting diodes

FEATURES

- 2.0 mm x 1.25 mm SMD LED, 1.1 mm thickness
- Mechanically and spectrally matched to the phototransistor
- Package: 3000 pcs / reel
- Moisture sensitivity level: 3
- RoHS compliant

APPLICATIONS

- Infrared Illumination for cameras
- Machine vision systems
- Surveillance systems
- Industrial electronics
- IR data transmission
- Remote control

PACKAGING DIMENSIONS

RECOMMENDED SOLDERING PATTERN

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Emitting Color (Material)</th>
<th>Lens Type</th>
<th>Po (mW/sr) @ 20mA</th>
<th>Viewing Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>APTD2012F3C</td>
<td>Infrared (GaAs)</td>
<td>Water Clear</td>
<td>2</td>
<td>40°</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. All dimensions are in millimeters (inches).
2. Tolerance is ±0.15 (0.006") unless otherwise noted.
3. The specifications, characteristics and technical data described in the datasheet are subject to change without prior notice.
4. The device has a single mounting surface. The device must be mounted according to the specifications.

Notes:
1. θ1/2 is the angle from optical centerline where the luminous intensity is 1/2 of the optical peak value.
2. Radiant intensity / luminous flux: +/-15%.
3. Radiant 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 $I_F = 20mA$</td>
<td>$\lambda_{\text{peak}}$</td>
<td>Infrared</td>
<td>940</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral Bandwidth at 50% $\Phi_{\text{REL MAX}}$ $I_F = 20mA$</td>
<td>$\Delta\lambda$</td>
<td>Infrared</td>
<td>50</td>
<td>nm</td>
</tr>
<tr>
<td>Capacitance</td>
<td>$C$</td>
<td>Infrared</td>
<td>90</td>
<td>pF</td>
</tr>
<tr>
<td>Forward Voltage $I_F = 20mA$</td>
<td>$V_F$</td>
<td>Infrared</td>
<td>1.2</td>
<td>V</td>
</tr>
<tr>
<td>Reverse Current ($V_R = 5V$)</td>
<td>$I_R$</td>
<td>Infrared</td>
<td>-</td>
<td>10</td>
</tr>
</tbody>
</table>

**Notes:**
1. Forward voltage: ±0.1V.
2. Wavelength value is traceable to CIE127-2007 standards.
3. 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>90</td>
<td>mW</td>
</tr>
<tr>
<td>Reverse Voltage</td>
<td>$V_R$</td>
<td>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>$T_{\text{op}}$</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>$T_{\text{stg}}$</td>
<td>-40 to +85</td>
<td>°C</td>
</tr>
<tr>
<td>DC Forward Current</td>
<td>$I_F$</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Peak Forward Current</td>
<td>$I_{FM}$</td>
<td>1200</td>
<td>mA</td>
</tr>
<tr>
<td>Electrostatic Discharge Threshold (HBM)</td>
<td>$-$</td>
<td>8000</td>
<td>V</td>
</tr>
</tbody>
</table>

**Notes:**
1. 1/100 Duty Cycle, 10\mu s Pulse Width.
2. 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 with peak at 650 nm at Ta = 25 °C]

**SPATIAL DISTRIBUTION**

![Graph showing spatial distribution with radiation intensity at different angles at Ta = 25 °C]

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**INFRARED**

**Forward Current vs. Forward Voltage**

![Graph showing forward current vs. forward voltage with peak at Ta = 25 °C]

**Radiant Intensity vs. Forward Current**

![Graph showing radiant intensity vs. forward current with peak at Ta = 25 °C]

**Forward Current Derating Curve**

![Graph showing forward current derating curve at Ta = 25 °C]

**Radiant Intensity vs. Ambient Temperature**

![Graph showing radiant intensity vs. ambient temperature at Ta = 25 °C]

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**REFLOW SOLDERING PROFILE for LEAD-FREE SMD PROCESS**

![Graph showing reflow soldering profile with temperature vs. time]

**TAPE SPECIFICATIONS (units : mm)**

![Diagram showing tape specifications with dimensions]

**REEL DIMENSION (units : mm)**

![Diagram showing reel dimension with dimensions]

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**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.

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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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