Plastic Infrared Light Emitting Diode

QEE122, QEE123

Description
The QEE12X is a 880 nm AlGaAs LED encapsulated in a medium wide angle, plastic sidelooker package.

Features
- λ = 880 nm
- Package Type = Sidelooker
- Chip Material = AlGaAs
- Matched Photosensor: QSE113
- Medium Wide Emission Angle, 50°
- Package Material: Clear Epoxy
- High Output Power
- Orange Dot Marking on the Top Side
- This is a Pb−Free Device

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOPR</td>
<td>Operating Temperature</td>
<td>–40 to +100</td>
<td>°C</td>
</tr>
<tr>
<td>TSTG</td>
<td>Storage Temperature</td>
<td>–40 to +100</td>
<td>°C</td>
</tr>
<tr>
<td>TSOL−I</td>
<td>Soldering Temperature (Iron)</td>
<td>240 for 5 s</td>
<td>°C</td>
</tr>
<tr>
<td></td>
<td>(Note 2), (Note 3), (Note 4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSOL−F</td>
<td>Soldering Temperature (Flow)</td>
<td>260 for 10 s</td>
<td>°C</td>
</tr>
<tr>
<td></td>
<td>(Note 2), (Note 3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IF</td>
<td>Continuous Forward Current</td>
<td>100</td>
<td>mA</td>
</tr>
<tr>
<td>VR</td>
<td>Reverse Voltage</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>PD</td>
<td>Power Dissipation (Note 1)</td>
<td>100</td>
<td>mW</td>
</tr>
</tbody>
</table>

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Derate power dissipation linearly 2.67 mW/°C above 25°C.
2. RMA flux is recommended.
3. Methanol or Isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron 1/16” (1.6 mm) minimum from housing.
## ELECTRICAL / OPTICAL CHARACTERISTICS

(T_A = 25°C unless otherwise noted)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Conditions</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \lambda_{PE} )</td>
<td>Peak Emission Wavelength</td>
<td>( I_F = 20 ) mA</td>
<td>–</td>
<td>890</td>
<td>–</td>
<td>nm</td>
</tr>
<tr>
<td>( TC_{\lambda} )</td>
<td>Temperature Coefficient</td>
<td>–</td>
<td>0.2</td>
<td>–</td>
<td>nm/°C</td>
<td></td>
</tr>
<tr>
<td>( 2\Theta^{1/2} )</td>
<td>Emission Angle</td>
<td>( I_F = 100 ) mA</td>
<td>–</td>
<td>50</td>
<td>–</td>
<td>°</td>
</tr>
<tr>
<td>( V_F )</td>
<td>Forward Voltage</td>
<td>( I_F = 100 ) mA, ( tp = 20 ) ms</td>
<td>–</td>
<td>–</td>
<td>1.7</td>
<td>V</td>
</tr>
<tr>
<td>( TC_{VF} )</td>
<td>Temperature Coefficient</td>
<td>–</td>
<td>–6</td>
<td>–</td>
<td>mV/°C</td>
<td></td>
</tr>
<tr>
<td>( I_R )</td>
<td>Reverse Current</td>
<td>( V_R = 5 ) V</td>
<td>–</td>
<td>–</td>
<td>10</td>
<td>μA</td>
</tr>
<tr>
<td>( I_E )</td>
<td>Radiant Intensity QEE122</td>
<td>( I_F = 100 ) mA, ( tp = 20 ) ms</td>
<td>4</td>
<td>9</td>
<td>16</td>
<td>mW/sr</td>
</tr>
<tr>
<td>( TC_{IE} )</td>
<td>Temperature Coefficient</td>
<td>Radiant Intensity QEE123</td>
<td>8</td>
<td>9</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>( t_r )</td>
<td>Rise Time</td>
<td>( I_F = 100 ) mA</td>
<td>–</td>
<td>900</td>
<td>–</td>
<td>ns</td>
</tr>
<tr>
<td>( t_f )</td>
<td>Fall Time</td>
<td>–</td>
<td>800</td>
<td>–</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>( C_J )</td>
<td>Junction Capacitance</td>
<td>( V_R = 0 ) V</td>
<td>–</td>
<td>11</td>
<td>–</td>
<td>pF</td>
</tr>
</tbody>
</table>

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
TYPICAL PERFORMANCE CHARACTERISTICS

Figure 1. Normalized Intensity vs. Wavelength

Figure 2. Peak Wavelength vs. Ambient Temperature

Figure 3. Normalized Radiant Intensity vs. Forward Current

Figure 4. Normalized Radiant Intensity vs. Ambient Temperature

Figure 5. Forward Voltage vs. Forward Current

Figure 6. Forward Voltage vs. Ambient Temperature

Normalized to:
- IF = 100 mA Pulsed
- tPW = 20 ms
- Duty Cycle = 4%
- TA = 25°C

Normalized to:
- IF = 20 mA Pulsed
- tPW = 20 ms
- Duty Cycle = 4%
- TA = 25°C
TYPICAL PERFORMANCE CHARACTERISTICS (continued)

Figure 7. Radiation Diagram

Figure 8. Coupling Characteristics of QEE122 and QSE113

IC(ON) - NORMALIZED COLLECTOR CURRENT

LENS TIP SEPARATION (inches)

Normalized to:
- $d = 0$ inch
- $I_F$ Pulsed
- $t_{PW} = 100 \, \mu s$
- Duty Cycle = 0.1%
- $V_{CC} = 5 \, V$
- $R_L = 100 \, \Omega$
- $T_A = 25^\circ C$

$I_F = 100 \, mA$

$I_F = 20 \, mA$
SIDELOOKER EMITTER
CASE 100CJ
ISSUE O

DATE 30 NOV 2016

Notes:
1. Dimensions for all drawings are in inches (mm).
2. Tolerance of ±0.010 (0.25) on all non-nominal dimensions unless otherwise specified.