HL63133DG
638nm / 170mW AlGaInP Laser Diode

Features
- Visible light output: 638nm Typ.
- Optical output power: 170mW (CW)
- Single transverse mode
- Low operating current: 250mA Typ.
- Low operating voltage: 2.8V Typ.
- Small package: \( \phi 5.6 \text{mm} \)
- TE mode oscillation

Application
- Pico projector
- Show laser
- Light source of optical equipments
### Absolute Maximum Ratings (Tc=25°C)

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Ratings</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical output power</td>
<td>Po</td>
<td>170</td>
<td>mW</td>
</tr>
<tr>
<td>LD Reverse Voltage</td>
<td>V_{R(LD)}</td>
<td>2</td>
<td>V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Topr</td>
<td>-10 ~ +40</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T_{stg}</td>
<td>-40 ~ +85</td>
<td>°C</td>
</tr>
</tbody>
</table>

Note: Operating temperature is defined by Case temperature "Tc". High increase in temperature of LD chip itself is expected during operation due to high current density. Thus, without proper heat dissipation, it is observed that no specific output power is achieved or it results to LD degradation. It is advised that sufficient measure of heat dissipation should be taken so that LD’s maximum operating temperature is not exceeded during actual operation.

### Optical and Electrical Characteristics (Tc=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Unit</th>
<th>Test Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Threshold current</td>
<td>I_{th}</td>
<td>-</td>
<td>60</td>
<td>90</td>
<td>mA</td>
<td>-</td>
</tr>
<tr>
<td>Operating current</td>
<td>I_{op}</td>
<td>-</td>
<td>250</td>
<td>320</td>
<td>mA</td>
<td>Po=170mW</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>V_{op}</td>
<td>-</td>
<td>2.8</td>
<td>3.2</td>
<td>V</td>
<td>Po=170mW</td>
</tr>
<tr>
<td>Beam divergence Parallel to the junction</td>
<td>θ//</td>
<td>5</td>
<td>9</td>
<td>13</td>
<td>°</td>
<td>Po=170mW, FWHM</td>
</tr>
<tr>
<td>Beam divergence Perpendicular to the junction</td>
<td>θ⊥</td>
<td>13</td>
<td>17</td>
<td>23</td>
<td>°</td>
<td>Po=170mW, FWHM</td>
</tr>
<tr>
<td>Lasing Wavelength</td>
<td>λ_p</td>
<td>632</td>
<td>638</td>
<td>643</td>
<td>nm</td>
<td>Po=170mW</td>
</tr>
</tbody>
</table>
Typical Characteristic Curves

Optical Output Power vs. Forward Current

Threshold Current vs. Case Temperature

Slope Efficiency vs. Case Temperature

Wavelength vs. Case Temperature

Far Field Pattern

- $P_O = 170\text{mW}$
- $T_C = 25\text{°C}$

- Perpendicular
- Parallel

Relative intensity vs. Angle, $\theta$ (°)
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