Data Sheet

HL40053MG

404nm / 500mW Violet Laser Diode

**Features**

- Optical output power: 400mW (CW)
- Violet Lasing: 398~410nm
- Low operating current: 370mA Typ.
- Low operating voltage: 4.9V Max.
- Package: φ5.6mm
- Multiple transverse mode
- TE mode oscillation

**Application**

- Bio & Medical
- Measurement

**Outline**

(Unit: mm)

**Internal Circuit**

- HL40053MG
  - 1
  - 2 (flange)
  - 3

**Internal Circuit Diagram**

- LD
### 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>500</td>
<td>mW</td>
</tr>
<tr>
<td>LD Reverse Voltage</td>
<td>VR(LD)</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Topr</td>
<td>0 ~ +30</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tstg</td>
<td>-35 ~ +85</td>
<td>°C</td>
</tr>
</tbody>
</table>

### 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>Ith</td>
<td>-</td>
<td>110</td>
<td>130</td>
<td>mA</td>
<td>-</td>
</tr>
<tr>
<td>Operating current</td>
<td>Iop</td>
<td>-</td>
<td>370</td>
<td>410</td>
<td>mA</td>
<td>Po=400mW</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>Vop</td>
<td>-</td>
<td>-</td>
<td>4.9</td>
<td>V</td>
<td>Po=400mW</td>
</tr>
<tr>
<td>Beam divergence Parallel to the junction</td>
<td>θ//</td>
<td>5</td>
<td>13</td>
<td>25</td>
<td>°</td>
<td>Po=400mW, Full angle 1/e²</td>
</tr>
<tr>
<td>Beam divergence Perpendicular to the junction</td>
<td>θ⊥</td>
<td>30</td>
<td>42</td>
<td>50</td>
<td>°</td>
<td>Po=400mW, Full angle 1/e²</td>
</tr>
<tr>
<td>Lasing Wavelength</td>
<td>λp</td>
<td>398</td>
<td>404</td>
<td>410</td>
<td>nm</td>
<td>Po=400mW</td>
</tr>
</tbody>
</table>
Typical Characteristic Curves

Optical output power vs. Forward current
- $T_c = 0^\circ C$
- $25^\circ C$
- $30^\circ C$

Forward voltage vs. Forward current
- $T_c = 0^\circ C$
- $25^\circ C$
- $30^\circ C$

Threshold current vs. Case temperature

Slope efficiency vs. Case temperature

Lasing wavelength vs. Case temperature
- $P_o = 400 \text{ mW}$
- $T_c = 25^\circ C$

Far field pattern
- $P_o = 400 \text{ mW}$
- $T_c = 25^\circ C$
- Perpendicular
- Parallel

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