**Data Sheet**

**HL40033G**

405nm / 1,000mW  Violet Laser Diode

**Features**

- Optical output power: 1,000mW (CW)
- Violet Lasing: 405nm Typ.
- Low operating current: 1,000mA Typ.
- Low operating voltage: 5.0V Max.
- Package: φ9.0mm
- Multiple transverse mode
- TE mode oscillation

**Application**

- Direct imaging for PCB
- Industry
- Display
- Bio & Medical

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**Outline**

![Outline Diagram](image)

**Internal Circuit**

![Internal Circuit Diagram](image)
### 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>1,100</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>0 ~ +30</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tstg</td>
<td>-40 ~ +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>I_{th}</td>
<td>250</td>
<td>320</td>
<td>400</td>
<td>mA</td>
<td>-</td>
</tr>
<tr>
<td>Operating current</td>
<td>I_{op}</td>
<td>-</td>
<td>1,000</td>
<td>1,300</td>
<td>mA</td>
<td>Po=1,000mW</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>V_{op}</td>
<td>-</td>
<td>-</td>
<td>5.0</td>
<td>V</td>
<td>Po=1,000mW</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=1,000mW, 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=1,000mW, Full angle 1/e²</td>
</tr>
<tr>
<td>Lasing Wavelength</td>
<td>λ_p</td>
<td>400</td>
<td>405</td>
<td>410</td>
<td>nm</td>
<td>Po=1,000mW</td>
</tr>
</tbody>
</table>
Typical Characteristic Curves

- **Optical output power vs. Forward current**
- **Forward voltage vs. Forward current**
- **Threshold current vs. Case temperature**
- **Slope efficiency vs. Case temperature**
- **Lasing wavelength vs. Case temperature**
- **Far field pattern**

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**Data Sheet HL40033G Rev3. Dec. 08. 2015**

**USHIO OPTO SEMICONDUCTORS, INC.**

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<table>
<thead>
<tr>
<th>Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The laser light is harmful to human body especially to eye no matter what directly or indirectly. The laser beam shall be observed or adjusted through infrared camera or equivalent.</td>
</tr>
<tr>
<td>2. This product (without violet laser diode) contains gallium arsenide (GaAs), which may seriously endanger your health even at very low doses. Please avoid treatment which may create GaAs powder or gas, such as disassembly or performing chemical experiments, when you handle the product. When disposing of the product, please follow the laws of your country and separate it from other waste such as industrial waste and household garbage.</td>
</tr>
</tbody>
</table>

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