Violet Laser Diode

**Features**
- Peak Wavelength: 405 nm
- Optical Output Power: 120 mW
- Package: 5.6 mm, with Photo Diode

**Electrical Connection**

<table>
<thead>
<tr>
<th>Pin Configuration</th>
<th>Bottom View</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>m-type</strong></td>
<td></td>
</tr>
<tr>
<td>PIN</td>
<td>Function</td>
</tr>
<tr>
<td>1</td>
<td>LD Anode</td>
</tr>
<tr>
<td>2</td>
<td>LD Cathode, PD Cathode</td>
</tr>
<tr>
<td>3</td>
<td>PD Anode</td>
</tr>
</tbody>
</table>

**Absolute Maximum Ratings (T<sub>C</sub>=25°C)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>CW Output Power</td>
<td>P&lt;sub&gt;O&lt;/sub&gt;</td>
<td>140</td>
<td>mW</td>
</tr>
<tr>
<td>LD Reverse Voltage</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; (LD)</td>
<td>5</td>
<td>V</td>
</tr>
<tr>
<td>PD Reverse Voltage</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; (PD)</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>Operating Case Temperature</td>
<td>T&lt;sub&gt;C&lt;/sub&gt;</td>
<td>-10 … +70</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>T&lt;sub&gt;stg&lt;/sub&gt;</td>
<td>-40 … +85</td>
<td>°C</td>
</tr>
</tbody>
</table>

**Specifications (T<sub>C</sub>=25°C)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical Specifications</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>CW Output Power</td>
<td>P&lt;sub&gt;O&lt;/sub&gt;</td>
<td>-</td>
<td>-</td>
<td>120</td>
<td>mW</td>
</tr>
<tr>
<td>Peak Wavelength *</td>
<td>λ&lt;sub&gt;p&lt;/sub&gt;</td>
<td>400</td>
<td>405</td>
<td>410</td>
<td>nm</td>
</tr>
<tr>
<td>FWHM Beam Divergence</td>
<td>θ&lt;sub&gt;Δ&lt;/sub&gt;</td>
<td>7.0</td>
<td>9.0</td>
<td>12.0</td>
<td>deg</td>
</tr>
<tr>
<td></td>
<td>θ&lt;sub&gt;Δ&lt;/sub&gt;</td>
<td>15.0</td>
<td>19.5</td>
<td>23.0</td>
<td>deg</td>
</tr>
<tr>
<td>Emission Point Accuracy</td>
<td>Angle</td>
<td>Δθ&lt;sub&gt;Δ&lt;/sub&gt;</td>
<td>-2.0</td>
<td>-</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Δθ&lt;sub&gt;Δ&lt;/sub&gt;</td>
<td>-2.5</td>
<td>-</td>
<td>2.5</td>
</tr>
<tr>
<td>Electrical Specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threshold Current</td>
<td>I&lt;sub&gt;th&lt;/sub&gt;</td>
<td>-</td>
<td>35</td>
<td>50</td>
<td>mA</td>
</tr>
<tr>
<td>Operating Current</td>
<td>I&lt;sub&gt;op&lt;/sub&gt;</td>
<td>-</td>
<td>120</td>
<td>150</td>
<td>mA</td>
</tr>
<tr>
<td>Slope Efficiency</td>
<td>η</td>
<td>1.2</td>
<td>1.4</td>
<td>1.9</td>
<td>W/A</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>U&lt;sub&gt;op&lt;/sub&gt;</td>
<td>-</td>
<td>4.8</td>
<td>5.5</td>
<td>V</td>
</tr>
<tr>
<td>Monitor Current **</td>
<td>I&lt;sub&gt;m&lt;/sub&gt;</td>
<td>-</td>
<td>0.2</td>
<td>0.4</td>
<td>0.7</td>
</tr>
</tbody>
</table>

* Measuring specifications.
** Monitor Current is short time power reference purpose only.

Length of pins: 3mm

The above specifications are for reference purpose only and subjected to change without prior notice.
Package Dimensions

5.6 mm Package (Unit:mm)

Length of pins: 3mm
**Typical Characteristics**

- **Optical Output Power vs. Forward Current**
- **Forward Voltage vs. Forward Current**
- **Threshold Current vs. Case Temperature**
- **Peak Wavelength vs. Case Temperature**
- **Far Field Pattern**
- **Typical Spectrum**
Safety of Laser light

- Laser Light can damage the human eyes and skin. Do not expose the eye or skin directly to any laser light and/or through optical lens. When handling the LDs, wear appropriate safety glasses to prevent laser light, even any reflections from entering to the eye. Focused laser beam through optical instruments will increase the chance of eye hazard.
- These LDs are classified in Class 4 of IEC60825-1 and 21 CFR Part 1040.10 Safety Standards. It is absolutely necessary to take overall safety measures against User’s modules, equipment and systems into which this LDs are incorporated and/or integrated.

Cautions

1. Operating method
   - This LD shall change its forward voltage requirement and optical output power according to temperature change. Also, the LD will require more operation current to maintain same output power as it degrades. In order to maintain output power, use of APC (Automatic Power Control) is recommended. Which use monitor feedback to adjust the operation current.
   - Confirm that electrical spike current generated by switching on and off does not exceed the maximum operating current level specified herein above as absolute maximum rating. Also, employ appropriate countermeasures to reduce chattering and/or overshooting in the circuit.

2. Static Electricity
   - Static electricity or electrical surges will reduce and degrade the reliability of the LDs. It is recommended to use a wrist trap or anti-electrostatic glove when handling the Product.

3. Absolute Maximum Rating
   - Active layer of LDs shall have high current density and generate high electric field during its operation. In order to prevent excessive damage, the LD must be operated strictly below absolute maximum rating.