DFB laser diodes from 1100 nm to 1300 nm

nanoplus single mode laser diodes

nanoplus is the only manufacturer worldwide routinely providing single and multimode lasers at any wavelength from 760 to 6000 nm. At wavelengths up to 14 μm, QCLs complete nanoplus’ laser portfolio. Our patented distributed feedback laser diodes deliver single mode emission with well defined optical properties enabling a wide range of applications.

nanoplus lasers operate reliably in tens of thousands of installations worldwide, including chemical and metallurgical industries, gas pipelines, power plants, medical systems, airborne and satellite applications.

key features

✓ very high spectral purity
✓ narrow linewidth typically < 3 MHz
✓ excellent reliability
✓ wide variety of packaging options
✓ customer-specific designs available

nanoplus lasers with excellent performance are specifically designed and characterized to fit your needs. This data sheet summarizes typical properties of nanoplus DFB lasers in the range from 1100 nm to 1300 nm. Overleaf data for lasers fabricated for injection seeding of fiber lasers used to provide a guiding star for large telescopes with adaptive optics.

application areas

✓ high performance gas sensing for process and environmental control
✓ precision metrology
✓ atomic clocks
✓ spectroscopy
✓ space technology

general ratings (T = 25 °C)

<table>
<thead>
<tr>
<th>symbol</th>
<th>unit</th>
<th>typical</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_{\text{out}}$</td>
<td>mW</td>
<td>20</td>
</tr>
<tr>
<td>$V_{\text{op}}$</td>
<td>V</td>
<td>2</td>
</tr>
<tr>
<td>$I_f$</td>
<td>mA</td>
<td>70</td>
</tr>
<tr>
<td>SMSR</td>
<td>dB</td>
<td>&gt; 35</td>
</tr>
</tbody>
</table>

For dimensions and accessories, please see www.nanoplus.com

Further packaging options available on request.

On request, lasers with specifically optimized properties, e.g. higher output power, are available.
nanoplus DFB laser diodes at 1178 nm

A wide variety of gas molecules exhibit characteristic absorption lines in the near infrared. DFB lasers emitting at 1178 nm are highly suited for injection seeding of high power fiber lasers as required, e.g. for guiding the adaptive optics of large telescopes. For this application, highly stable laterally and longitudinally single mode lasers are required.

This data sheet reports performance data of nanoplus DFB lasers at this wavelength. Similar performance data are obtained in the entire wavelength range from 1100 nm to 1300 nm. For examples of performance data of nanoplus lasers in other wavelength ranges, please see www.nanoplus.com or contact sales@nanoplus.com.

In many applications, temperature and/or current variations are used to adjust the laser emission precisely to the target wavelength.

![Room temperature cw spectrum of a nanoplus DFB laser diode operating at 1178 nm](image)

**Fig. 1**

**Mode hop free tuning of 1178 nm based DFBs by current variation at different temperatures**

![Mode hop free tuning of 1178 nm based DFBs by current variation at different temperatures](image)

**Fig. 2**

### Electrooptical Characteristics (T = 25 °C)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Symbol</th>
<th>Unit</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak wavelength</td>
<td>( \lambda )</td>
<td>nm</td>
<td>1177</td>
<td>1178</td>
<td>1179</td>
</tr>
<tr>
<td>Threshold current</td>
<td>( I_{th} )</td>
<td>mA</td>
<td>12</td>
<td>15</td>
<td>25</td>
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<tr>
<td>Temperature tuning coefficient</td>
<td>( C_T )</td>
<td>nm / K</td>
<td>0.07</td>
<td>0.09</td>
<td>0.1</td>
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<tr>
<td>Current tuning coefficient</td>
<td>( C_I )</td>
<td>nm / mA</td>
<td>0.007</td>
<td>0.01</td>
<td>0.02</td>
</tr>
<tr>
<td>Slow axis (FWHM)</td>
<td></td>
<td>degrees</td>
<td>12</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Fast axis (FWHM)</td>
<td></td>
<td>degrees</td>
<td>45</td>
<td>50</td>
<td>55</td>
</tr>
<tr>
<td>Emitting area</td>
<td></td>
<td>( \mu m \times \mu m )</td>
<td>1.8 x 1.8</td>
<td>2 x 2</td>
<td>2.5 x 2.3</td>
</tr>
<tr>
<td>Storage temperatures</td>
<td>( T_S )</td>
<td>°C</td>
<td>-40</td>
<td>+20</td>
<td>+80</td>
</tr>
<tr>
<td>Operational temperature at case</td>
<td>( T_c )</td>
<td>°C</td>
<td>-20</td>
<td>+25</td>
<td>+50</td>
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We will be happy to answer further questions. Please contact us at sales@nanoplus.com.