Data sheet microchip laser MCL-1064-150

Microchip pulse laser module with emission wavelength 1064 nm
(Data sheet rev. 2.0, 2020-05-14)

Table of contents:

1 Microchip laser description ..................................................................................................................1
2 MCL-1064 applications ..........................................................................................................................1
3 Microchip laser parameters ....................................................................................................................2
4 Dimension and Weight ............................................................................................................................5
5 Included Accessories ..............................................................................................................................5

1 Microchip laser description
The Microchip Laser module delivers short single mode pulses on demand at a wavelength of 1064 nm. The pulse repetition rate is software controlled and can be set between single shot and 500 kHz. The pulse duration is in the range of 150 ps.

The MCL-1064 contains a Q-switched microchip with pump diode and a software controlled electronic module. The microchip consist of a Nd:YVO₄ laser crystal with a saturable output coupler.

The MCL-1064 can be used
- In combination with a LabVIEW based driver for custom access via USB port
- In stand alone mode at fixed pulse rate without additional software control
- With an external clock.

2 MCL-1064 applications
Possible applications of the MCL-1064-150 can be
- Micromachining
- Light detection and ranging (LIDAR)
- Precision measurements
- Frequency conversion.
### 3 Microchip laser parameters

<table>
<thead>
<tr>
<th>Parameter (@200 kHz)</th>
<th>minimum</th>
<th>typical</th>
<th>maximum</th>
<th>unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser emission wavelength</td>
<td>1063.8</td>
<td>1064.0</td>
<td>1064.2</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral width</td>
<td></td>
<td>13</td>
<td></td>
<td>pm</td>
</tr>
<tr>
<td>Spectral shift</td>
<td>13</td>
<td></td>
<td></td>
<td>pm/100 kHz</td>
</tr>
<tr>
<td>Beam divergence</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>mrad</td>
</tr>
<tr>
<td>Beam waist diameter</td>
<td>28</td>
<td>32</td>
<td></td>
<td>µm</td>
</tr>
<tr>
<td>Beam Waist at Aperture</td>
<td>1.0</td>
<td>1.2</td>
<td>1.4</td>
<td>mm</td>
</tr>
<tr>
<td>$M^2$</td>
<td></td>
<td></td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>Pulse energy</td>
<td>12.5</td>
<td>15</td>
<td></td>
<td>nJ</td>
</tr>
<tr>
<td>output power</td>
<td>2.5</td>
<td>3.0</td>
<td></td>
<td>mW</td>
</tr>
<tr>
<td>Pulse duration</td>
<td>120</td>
<td>150</td>
<td>180</td>
<td>ps</td>
</tr>
<tr>
<td>Repetition rate</td>
<td>Single shot</td>
<td>500</td>
<td></td>
<td>kHz</td>
</tr>
<tr>
<td>Polarization</td>
<td></td>
<td></td>
<td>linear</td>
<td></td>
</tr>
<tr>
<td>Timing jitter</td>
<td>1.8</td>
<td>3.0</td>
<td></td>
<td>ns</td>
</tr>
</tbody>
</table>

**Other Features**
- Synchronization to external clock or pulse on demand
- Stand alone mode at fixed pulse rate without software control
- A Laptop or PC with Win 7 or higher, one USB port and LabVIEW drivers is required for full operation mode

![Output Power](image)
**Beam Divergence**

Distance [mm] vs. Beam Radius [mm]

**Timing Jitter Histogram**

- $\mu = 5000.01\,\text{ns}$
- $\sigma = 1.56\,\text{ns}$
- pulses: 19200

Number of measured pulse to pulse distances vs. pulse to pulse distance [ns]
4 Dimension and Weight

Dimension:

Weight: 870 g (without external Power supply)

5 Included Accessories

- external power supply, 110 – 230 V, output 60W
- USB-cable
- Key
- User manual
- Control software