Monaco 517

Industrial Femtosecond Laser

Monaco 517 is an industrial femtosecond laser with a MOPA architecture. Designed for high-uptime, 24/7 applications, the laser family provides >40 μJ/pulse at 517 nm. This energy is available at 750 kHz to allow high ablation threshold materials to be processed at high throughput levels. The green wavelength provides better interaction coupling in specific materials such as copper and polymers, with the added benefit of superior depth of focus. The second harmonic stage is fully integrated into the laser enclosure, ensuring robust, highly reliable green output for industrial environments.

FEATURES & BENEFITS

• 40 μJ/pulse for processing of high ablation threshold materials
• 30 W average power for high throughput
• <350 fs standard pulsewidth for low HAZ machining
• Green wavelength is ideal for polymer, copper, and ceramics processing
• Green output to provide better depth of focus and smaller spot size
• Compact single box design for ease of integration
• HALT-designed and HASS-verified to ensure quality and reliability

APPLICATIONS

• Polymer Cutting
• Flex PCB Cutting
• IC Package Cutting
• Si Wafer Singulation
• Medical Device Manufacturing
• Thin Metal Foil Cutting and Texturing
### Optical Specifications

<table>
<thead>
<tr>
<th></th>
<th>Monaco 517-20-20</th>
<th>Monaco 517-40-30</th>
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</thead>
<tbody>
<tr>
<td><strong>Fundamental Center Wavelength (nm)</strong></td>
<td>517 ±5</td>
<td>517 ±5</td>
</tr>
<tr>
<td><strong>Output Power (W)</strong></td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td><strong>Energy (µJ)</strong></td>
<td>20 (at 1 MHz)</td>
<td>40 (at 750 kHz)</td>
</tr>
<tr>
<td><strong>Repetition Rate</strong></td>
<td>Single-shot to maximum repetition at maximum energy (defined above)</td>
<td></td>
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<tr>
<td><strong>Pulsewidth (fs)</strong></td>
<td>&lt;350</td>
<td></td>
</tr>
<tr>
<td><strong>Tuning Range</strong></td>
<td>Custom pulse width range may optimized at factory</td>
<td></td>
</tr>
<tr>
<td><strong>Spatial Mode</strong></td>
<td>TEM(_{00}), M(_2) &lt;1.2</td>
<td></td>
</tr>
<tr>
<td><strong>Beam Divergence (mrad, (\theta))</strong></td>
<td>&lt;1</td>
<td></td>
</tr>
<tr>
<td><strong>Beam Diameter at Output(^2) (mm, 1/e(^2))</strong></td>
<td>2.0 ±0.2</td>
<td></td>
</tr>
<tr>
<td><strong>Beam Circularity (%)</strong></td>
<td>&gt;85</td>
<td></td>
</tr>
<tr>
<td><strong>Polarization Ratio</strong></td>
<td>&gt;100:1</td>
<td></td>
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<tr>
<td><strong>Polarization Direction</strong></td>
<td>Vertical ±3(^\circ)</td>
<td></td>
</tr>
<tr>
<td><strong>Beam Pointing Stability (µrad/({}^\circ)C)</strong></td>
<td>&lt;25</td>
<td></td>
</tr>
<tr>
<td><strong>Pulse Energy Stability (%) (RMS)</strong></td>
<td>&lt;1.5</td>
<td></td>
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<tr>
<td><strong>Power Stability (%) (RMS, 2(\sigma))</strong></td>
<td>&lt;1.5</td>
<td></td>
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<tr>
<td><strong>Warm-up Time (minutes)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cold Start</td>
<td>&lt;45</td>
<td></td>
</tr>
<tr>
<td>Warm Start</td>
<td>&lt;15</td>
<td></td>
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<tr>
<td><strong>Long-term Pointing Stability (µrad)</strong></td>
<td>±25 over 8 hours</td>
<td></td>
</tr>
<tr>
<td><strong>Head Weight</strong></td>
<td>50 kg (110 lbs.)</td>
<td></td>
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<tr>
<td><strong>External Comms</strong></td>
<td>RS-232, Ethernet, USB</td>
<td>48VDC, &lt;500W</td>
</tr>
</tbody>
</table>

### Operating Specifications

- **Temperature (non-condensing)**
  - Laser Head: +10 to 30°C (50 to 86°F)
  - Power Supply: -20 to +60°C (-4 to 140°F)
  - Non-Operation (storage): 5 to 65°C (41 to 149°F)

- **Relative Humidity (%)**: <90, non-condensing

### Shipping Specifications

- **Temperature**: -20 to +60°C (-4 to 140°F)
TYPICAL PERFORMANCE DATA

Monaco 517 Sample Spatial Mode at 1 MHz

Monaco 517 Sub-350 fs Temporal Profile (Autocorrelator)

MECHANICAL SPECIFICATIONS

Monaco 517 Power Supply

Front View

Top View

- 349.6 mm (13.77 in.)
- 277.8 mm (14.88 in.)
- 192.1 mm (7.56 in.)
- 82.6 mm (3.25 in.)
- 76.2 mm (3.0 in.)
Coherent follows a policy of continuous product improvement. Specifications are subject to change without notice. Coherent’s scientific and industrial lasers are certified to comply with the Federal Regulations (21 CFR Subchapter J) as administered by the Center for Devices and Radiological Health on all systems ordered for shipment after August 2, 1976.

Coherent offers a limited warranty for all Monaco 517 Lasers. For full details of this warranty coverage, please refer to the Service section at www.coherent.com or contact your local Sales or Service Representative.

Monaco 517 Datasheet

MECHANICAL SPECIFICATIONS

Monaco 517

Front View

Rear View

Side View

Top View

Coolant Return

Coolant Supply