The Pulseo® family of high power Q-switched lasers is designed for micromachining applications in a 24/7 manufacturing environment. Pulseo lasers lead the industry in product reliability and system uptime, and have the lowest cost of ownership.

The Pulseo is smaller than comparable products, ensuring simple integration into any machine tool. With its intuitive GUI, comprehensive data log, automated command set, and superior design, the Pulseo Q-switched DPSS laser is nearly maintenance free, requiring little human intervention to keep constant power, beam quality, and throughput.

**Outstanding Performance**

Pulseo lasers also lead the industry in performance. With their shorter pulse widths, Pulseo lasers have higher peak powers resulting in cleaner scribing, and less thermal damage to your parts. And, exceptional near and far field beam pointing stability, coupled with superior pulse-to-pulse stability translate to better processing accuracy, more consistent results, and higher yields.

The integrated E-Pulse™ feature allows users to tailor the overall pulse energy to the specific job on hand. To ensure consistent machining quality and dependability over the lifetime of the laser, we’ve also integrated an automatic crystal shifter which keeps the output power constant.

**High Reliability**

Pulseo lasers have a number of unique design features that significantly increase the both laser life and uptime. Our diodes typically last twice the industry average. The Pulseo laser is designed for field service, should it be necessary, resulting in improved tool uptime. Known wear components (such as diodes, fibers, output window, and shutter) are easy to change in the field without costly tool realignment. This lowers service inventory holding costs while shortening Mean Time to Repair (MTTR).

Our proprietary optical alignment system (EternAlign™) and rugged I-beam laser housing virtually eliminate alignment failures that can occur with vibration and shock during shipping. The sealed laser resonator and unique filtration system (ALPS) significantly extends the life of the laser by keeping the air inside the laser clean, dry, and free of volatile organic compounds.

And finally, the Pulseo lasers’ automatic data logging software monitors all key laser performance parameters over the life of the laser, providing a powerful service feature and product reliability tool.
Applications

Pulseo 355
- Via hole drilling
- c-Si solar cell manufacturing
- Flex circuit cutting and drilling
- Flat panel manufacturing
- ITO patterning for touch screen displays
- LED substrate scribing
- Silicon wafer dicing/scrubing (including low K)

Pulseo 532
- Electronic package singulation (micro-SD, QFN, FBGA, and Direct Chip Attach (DCA) type packages)
- PCB material ablation / PCB structuring
- PCB singulation
- Ceramic scribing
- Silicon wafer marking
- Solar cell edge isolation and thin film patterning

Pulseo Laser Head Dimensions

Power Supply Dimensions
1. Typically measured performance; not a guaranteed or warranted specification.
## Pulseo Specifications

<table>
<thead>
<tr>
<th></th>
<th>Pulseo 532-44</th>
<th>Pulseo 532-34</th>
<th>Pulseo 355-10</th>
<th>Pulseo 355-20</th>
<th>Pulseo 355-Turbo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength</td>
<td>532 nm</td>
<td>532 nm</td>
<td>355 nm</td>
<td>355 nm</td>
<td>355 nm</td>
</tr>
<tr>
<td>Peak Power</td>
<td>~14.5 kW</td>
<td>~13.5 kW</td>
<td>~5 kW</td>
<td>~10 kW</td>
<td>~2.3 kW</td>
</tr>
<tr>
<td>Average Power</td>
<td>&gt;44 W at 100 kHz</td>
<td>&gt;34 W at 120 kHz</td>
<td>&gt;10 W at 90 kHz</td>
<td>&gt;20 W at 100 kHz</td>
<td>&gt;8 W at 300 kHz</td>
</tr>
<tr>
<td>Repetition Rate Range</td>
<td>1 Hz – 250 kHz</td>
<td>0–300 kHz</td>
<td>0–300 kHz</td>
<td>0–300 kHz</td>
<td>0–500 kHz</td>
</tr>
<tr>
<td>Pulse Width</td>
<td>&lt;30 ns at 100 kHz</td>
<td>&lt;30 ns at 120 kHz</td>
<td>&lt;23 ns at 90 kHz</td>
<td>&lt;23 ns at 100 kHz</td>
<td>&lt;35 ns at 300 kHz</td>
</tr>
</tbody>
</table>

### Beam Characteristics

- **Spatial Mode**: TEM\(_{00}\)
- **M\(^2\)**: <1.3
- **Polarization**: 100:1, horizontal 100:1, horizontal 100:1, vertical 100:1, vertical 100:1, vertical
- **Beam Diameter, at waist**: 3.6 mm ±10% 3.6 mm ±10% 1.75 mm ±10% 3.6 mm ±10% 3.6 mm ±10%
- **Waist Location, nominal**: At output ±25% of Rayleigh range
- **Beam Ellipticity**: <15% <15% <10% <10% <10%
- **Bore sight Tolerance**: n/a n/a ±1 mm position at output ±3.5 mrad angle ±1 mm position at output (angular) ±3.5 mrad (angular)
- **Pulse-to-Pulse Stability**: <3% rms 1s at 100 kHz <3% rms 1s at 120 kHz <4% rms 1 s at 90 kHz <4% rms 1 s at 100 kHz <8% rms 1 s at 300 kHz
- **Power Stability (over 8 hours at constant temperature)**: ±2% peak-to-peak

### Operating Conditions

- **Warm-up Time**: <40 min
- **Temperature Range**: 18–35 °C
- **Altitude**: 0–3,000 m
- **Humidity**: 8–95%, non-condensing (for temperatures up to 35°C)

### Non-operating Conditions

- **Temperature Range**: 0–40 °C 0–40 °C 0–50 °C 0–50 °C 0–50 °C
- **Altitude**: 0–12,000 m
- **Humidity**: 8–95%, non-condensing

### Physical Characteristics

- **Laser Head Dimensions**: 9.4 x 6.46 x 25.35 in (240 x 164 x 644 mm)
- **Laser Head Weight**: 60 lbs (27 kg)
- **Power Supply Dimensions**: 19 x 12.15 x 21.11 in (483 x 309 x 536 mm)
- **Power Supply Weight**: 69 lbs (31 kg)
- **Fiber Length**: 5 m or 10 m

### Electrical and Chiller Requirements

- **Power Input**: 100–240 VAC, 50/60 Hz, auto ranging
- **Power Consumption**: 750 W 750 W 400 W 750 W 750 W
- **Water Temperature (laser inlet)**: 20°C
- **Water Pressure (laser inlet)**: 30 psi
- **Water Flow Rate**: 3.8 l/min
- **Heat Load**: 300 W (typical), 500 W (max) 300 W (typical), 500 W (max) 170 W (typical), 250 W (max) 300 W (typical), 500 W (max) 300 W (typical), 500 W (max)
- **Water Temperature Stability**: ±0.5°C

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