High Power Pulsed Laser Diodes
905-Series

Features
▪ Single and stacked devices up to 130 Watts
▪ Proven AlGaAs high reliability structure
▪ 1 W/A efficiency with 25° beam divergence
▪ Excellent temperature stability
▪ Hermetic and custom designed package

Applications
▪ Range finding
▪ Surveying equipment
▪ Weapons simulation
▪ Laser radar
▪ Security barrier
▪ Optical trigger

Optical Characteristics at $t_{RT}= 21°C$

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wavelength of peak radiant intensity $\lambda$ nm</td>
<td>895</td>
<td>905</td>
<td>915</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral bandwidth $\Delta \lambda$ at 50% intensity points</td>
<td>5</td>
<td></td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Wavelength temperature coefficient</td>
<td>0.27</td>
<td></td>
<td></td>
<td>nm/°C</td>
</tr>
<tr>
<td>Beam spread (50% peak intensity) Parallel to junction plane</td>
<td>12</td>
<td></td>
<td></td>
<td>Degrees</td>
</tr>
<tr>
<td>Perpendicular to junction plane</td>
<td>25</td>
<td></td>
<td>30</td>
<td>Degrees</td>
</tr>
<tr>
<td>Single element Stacks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**SINGLE CHIPS**

Single Chip Characteristics at $t_{RT}=21^\circ C$, $t_w=150$ ns, $P_{rr}=6.66$ kHz

<table>
<thead>
<tr>
<th>Parameter</th>
<th>905D1S1.5X</th>
<th>905D1S03X</th>
<th>905D1S06X</th>
<th>905D1S09X</th>
<th>905D1S12X</th>
<th>905D1S16X</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_\text{O at } i_{FM}$ (min)</td>
<td>3.0 W</td>
<td>6.0 W</td>
<td>13.0 W</td>
<td>19.0 W</td>
<td>26.0 W</td>
<td>34.0 W</td>
</tr>
<tr>
<td>Emitting area</td>
<td>$37.5 \times 1 \mu m$</td>
<td>$75 \times 1 \mu m$</td>
<td>$150 \times 1 \mu m$</td>
<td>$230 \times 1 \mu m$</td>
<td>$300 \times 1 \mu m$</td>
<td>$400 \times 1 \mu m$</td>
</tr>
<tr>
<td>Max peak forward current $i_{FM}$</td>
<td>3.5 A</td>
<td>7 A</td>
<td>15 A</td>
<td>22 A</td>
<td>30 A</td>
<td>40 A</td>
</tr>
<tr>
<td>$I_{th \text{ typ}}$</td>
<td>100 mA</td>
<td>200 mA</td>
<td>400 mA</td>
<td>600 mA</td>
<td>800 mA</td>
<td>1200 mA</td>
</tr>
</tbody>
</table>

**STACKED ARRAYS**

Stacked Chip Characteristics at $t_{RT}=21^\circ C$, $t_w=150$ ns, $P_{rr}=6.66$ kHz

<table>
<thead>
<tr>
<th>Parameter</th>
<th>905D2S06X</th>
<th>905D3S09X</th>
<th>905D3S12X</th>
<th>905D4S12X</th>
<th>905D4S16X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of elements</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>$P_\text{O at } i_{FM}$ (min)</td>
<td>25 W</td>
<td>55 W</td>
<td>70 W</td>
<td>90 W</td>
<td>130 W</td>
</tr>
<tr>
<td>Emitting area</td>
<td>$150 \times 125 \mu m$</td>
<td>$230 \times 225 \mu m$</td>
<td>$300 \times 225 \mu m$</td>
<td>$300 \times 340 \mu m$</td>
<td>$400 \times 340 \mu m$</td>
</tr>
<tr>
<td>Max peak forward current $i_{FM}$</td>
<td>15 A</td>
<td>22 A</td>
<td>30 A</td>
<td>30 A</td>
<td>40 A</td>
</tr>
<tr>
<td>$I_{th \text{ typ}}$</td>
<td>400 mA</td>
<td>600 mA</td>
<td>800 mA</td>
<td>800 mA</td>
<td>1200 mA</td>
</tr>
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</table>

**Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Maximum ratings</th>
<th>Limiting values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak reverse voltage</td>
<td>6 V</td>
</tr>
<tr>
<td>Pulse duration</td>
<td>1 (\mu)s</td>
</tr>
<tr>
<td>Single element</td>
<td>200 ns</td>
</tr>
<tr>
<td>Stacks</td>
<td></td>
</tr>
<tr>
<td>Duty factor</td>
<td>0.1%</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>- Storage</td>
<td>-55 °C to + 100 °C</td>
</tr>
<tr>
<td>- Operating</td>
<td>-45 °C to + 85 °C</td>
</tr>
<tr>
<td>Lead soldering</td>
<td></td>
</tr>
<tr>
<td>- 5 seconds max at</td>
<td>200 °C</td>
</tr>
</tbody>
</table>
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Figure 1: Optical output power vs. forward current

Figure 2: Optical output power vs. temperature

Figure 3: Optical output power vs. half angle

Figure 4: Wavelength vs. temperature

Figure 5: Spectral plot distribution

Figure 6: Far field emission pattern parallel and perpendicular to junction plane
Figure 7: 905D1S series, static Vf

Product Number Designations

<table>
<thead>
<tr>
<th>9</th>
<th>0</th>
<th>5</th>
<th>D</th>
</tr>
</thead>
</table>

Diode Configuration
1S = single stack
2S = double stack
3S = triple stack
4S = quad stack

Contact Stripe Width
1.5 = 1.5 mil
06 = 6 mil
09 = 9 mil
12 = 12 mil
16 = 16 mil

Package Style
C = 8 - 32 coax
R = 9 mm CD
S = TO-18
U = 5.6 mm CD
Y = ceramic carrier
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Package Drawings

Package C
8 - 32 coax

Package C: Pin Out: Case (-), Pin (+), Inductance 12 nH

Package R
9 mm CD

Package R: Pin Out: 1. LD Anode (+), 2. NC, 3. LD Cathode (-) Case, Inductance 6.8 nH
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Package S | TO-18

![Image of Package S TO-18](image1)

**Package S Pin Out:**
1. LD Anode (+)
2. LD Cathode (-) Case, Inductance 5.2 nH

Package U | 5.6 mm CD

![Image of Package U 5.6 mm CD](image2)

**Package U Pin Out:**
1. LD Anode (+)
2. NC
3. LD Cathode (-) Case, Inductance 5.0 nH
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Package Y: ceramic carrier

Product Changes

LASER COMPONENTS reserves the right to make changes to the product(s) or information contained herein without notice. No liability is assumed as a result of their use or application.

Ordering Information

Products can be ordered directly from LASER COMPONENTS or its representatives. For a complete listing of representatives, visit our website at www.lasercomponents.com

Custom designed products are available on request.

Personal Hazard:

Depending on the mode of operation, these devices emit highly concentrated non visible infrared light which can be hazardous to the human eye. Products which incorporate these devices have to follow the safety precautions given in IEC 60825-1 "Safety of laser products".

Handling Precautions:

Products are subject to the risks normally associated with sensitive electronic devices including static discharge, transients, and overload.