SINGLE HETEROJUNCTION
GaAs LASER DIODES

FEATURES
- High Efficiency at Low Drive Currents
- Up to 20 Watts Peak Power Output
- Operation to 75°C for Selected Devices
- Optically Centered Hermetic Coaxial Package
- Reverse Polarity Devices Available
- Pigtailed Devices Available

DESCRIPTION
The LD-60 Series devices are single heterostructure Gallium Arsenide injection laser diodes designed for high peak power pulsed operation at a wavelength of 904 nm. These single chip devices offer peak output powers of between 1 and 20 Watts. Selected units may be operated up to 75°C. The standard housing for the laser is a hermetically sealed optically centered TO-18 coaxial package. Other packages such as TO-5 coaxial header or 14 pin dual in lines with peltier cooler with fiber pigtailed are also available. On request devices may be supplied in coaxial styles with reverse polarity.

ELECTRO-OPTICAL CHARACTERISTICS OF THE DIODE AT 25°C

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Symbol</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Wavelength of Emission</td>
<td>λ</td>
<td></td>
<td>904</td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Spectral Width</td>
<td>Δλ</td>
<td>3.5</td>
<td>7</td>
<td></td>
<td>nm</td>
</tr>
<tr>
<td>Rise Time of Radiant Flux — 10%-90% Pts.</td>
<td>Tr</td>
<td></td>
<td>&lt;0.5</td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Max. Pulse Width — 50% Pts.</td>
<td>Tpm</td>
<td></td>
<td>200</td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Duty Factor @1pm</td>
<td></td>
<td></td>
<td>0.1</td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tₛ</td>
<td>-196</td>
<td></td>
<td>+100</td>
<td>°C</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>Tₒ</td>
<td>-50</td>
<td></td>
<td>+60(+75*)</td>
<td>°C</td>
</tr>
</tbody>
</table>

*For Selected Units
## TYPICAL CHARACTERISTICS

### CHARACTERISTICS OF A PACKAGED DIODE @ 25°C

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
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</tr>
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<tbody>
<tr>
<td>at max. rated $I_{th}$</td>
<td>2</td>
<td>2.3</td>
<td>1</td>
<td>1.5</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Maximum Peak Forward Current $I_{th}$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{th}$</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>25</td>
<td>40</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Typical Threshold Current $I_{th}$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$I_{th}$</td>
<td>3</td>
<td>3.5</td>
<td>3</td>
<td>6</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>16</td>
<td>18</td>
</tr>
<tr>
<td>Typical Peak $@I_{th}$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Voltage $@50mA$</td>
<td>5.0</td>
<td>5.0</td>
<td>5.8</td>
<td>6.5</td>
<td>6.7</td>
<td>7.0</td>
<td>7.0</td>
<td>8.0</td>
<td>18</td>
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<tr>
<td>Emitting Area</td>
<td>3.0 x 0.8</td>
<td>3.0 x 0.8</td>
<td>6.0 x 0.8</td>
<td>6.0 x 0.8</td>
<td>9.0 x 0.8</td>
<td>9.0 x 0.8</td>
<td>16.0 x 0.8</td>
<td>16.0 x 0.8</td>
<td>16.0 x 0.8</td>
</tr>
</tbody>
</table>

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**Fig. 1** — Typical peak power output vs. pulse repetition rate

**Fig. 2** — Total peak radiant flux vs. peak forward current for selected units

**Fig. 3** — Typical peak power output and threshold current vs. case temperature

**Fig. 4** — Relative Intensity vs. Wavelength

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DRIVING THE LASER

High power, pulsed laser diodes are typically driven by a
silicon controlled rectifier (SCR) capacitor discharge
circuit. A typical circuit is shown in Figure 8.

LASER DIODE, Inc. manufactures pulser and power
supplies for this family of lasers. For laboratory experimen-
tation the LP-23C pulse generator, and the LC-200 (for
115V operation) or the LC-23 (for 28V operation) power
supply may be used. Custom drivers are available for
specific applications.

DETECTING THE LASER

LASER DIODE, Inc. manufactures a calibrated power
meter for use with its family of laser diodes. The LPD-2 is a
solid state, NBS traceable power meter capable of
measuring peak powers ranging from 1 to 100 watts. The
LPD-2 is configured so that it may be mounted on an
optical bench or rail.

For further information on lasers, drivers, or detectors
please contact the Sales Department at LASER DIODE,
Inc., 1130 Somerset Street, New Brunswick, NJ 08901,
(phone) 201-249-7000, (fax), 201-249-9165, (twx)
710-998-0597.

LASER SAFETY

Gallium arsenide lasers emit infrared radiation
which is invisible to the human eye. When in
use, safety precautions should be taken to
avoid the possibility of eye damage.

Do not stare directly at the device or view an
operating laser at close range. If viewing is re-
quired, the beam should only be observed by
reflection from a matte surface utilizing an
image converter or by use of a suitable fluo-
rescent screen.

CAUTION: Use of controls or adjustments or performance of procedures other than
those specified herein may result in hazardous radiation exposure.

LASER DIODE, Inc., reserves the right to make changes at any time as deemed practical and/or necessary to improve the design
and to supply the best possible product.

Information provided is believed at this time to be accurate and reliable. No responsibility is assumed for its use, nor for any
infringements on the rights of others.

*For further information on this product or others of LASER DIODE, Inc., please call:

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