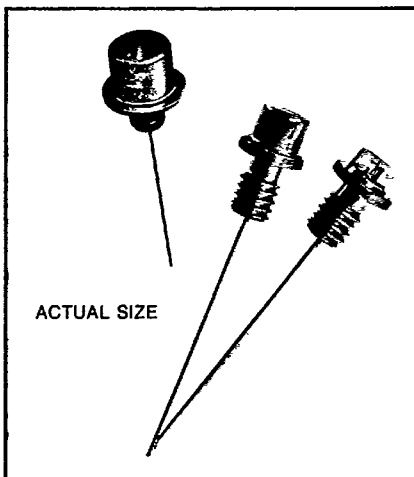
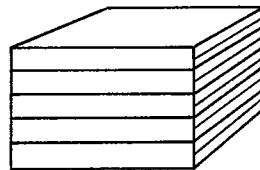


# SINGLE HETEROJUNCTION STACKED DIODE LASERS



## FEATURES

- ▶ High Efficiency at Low Drive Currents
- ▶ Up to 120 Watts Peak Power Output
- ▶ Operation to 70° C for Selected Devices
- ▶ Hermetic Coaxial Package
- ▶ Custom Stacked Arrays Available
- ▶ Pigtailed Devices Available
- ▶ Reverse Polarity Devices Available



## DESCRIPTION

The LD-160 Series devices are single heterostructure Gallium Arsenide injection laser diodes designed for high peak power pulsed operation at a wavelength of 904nm. These multichip stacked devices offer peak output powers up to 120 Watts. Selected units may be operated up to 70° C. The standard housing for these

lasers is a hermetically sealed, TO-5 coaxial package. Other packages such as an optically centered TO-18 coaxial header or 14 pin dual in lines with peltier cooler with fiber pigtails are also available. On request devices may be supplied in coaxial styles with reverse polarities.

## ELECTRO-OPTICAL CHARACTERISTICS OF THE DIODE AT 25°C

Parameters	Symbol	Min.	Typ.	Max.	Units
Peak Wavelength of Emission	$\lambda$		904		nm
Spectral Width	$\Delta\lambda$		4	10	nm
Rise Time of Radiant Flux — 10%-90% Pts.	$T_r$		<0.5		ns
Max. Pulse Width — 50% Pts.	$T_{pm}$			200	ns
Storage Temperature	$T_s$	-196		+100	°C
Operating Temperature	$T_o$	-50		+60(+70*)	°C

\*For Selected Units

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

	LD-160	LD-161	LD-162	LD-163	LD-164	LD-166	LD-167	LD-168	Units
Total Peak Radiant Flux at Max. Rated $I_{fm}$	5	10	15	25	30	50	75	100	Watts
-Typ.	6	12	18	30	37	65	90	120	
Number of Diodes	2	2	3	3	2	4	5	6	
Emitting Area	4x4	6x4	6x8	9x8	16x4	12x12	16x16	20x20	Mils
Maximum Peak Forward Current - $I_{fm}$	15	25	25	40	75	60	75	100	Amps
Typical Threshold Current - $I_{th}$	4	7	7	10	18	14	18	25	Amps
Typical Peak Forward Voltage - $I_{fm}$ @ 50 ma	7 2.4	9 2.4	12 3.6	15 3.6	13 2.4	22 4.8	27 6.0	37 7.2	Volts
Duty Factor - @ $I_{fm}$	.08	.06	.04	.04	.04	.02	.02	.01	%

Fig. 1 — Typical Peak Power Output vs. pulse Repetition Rate  
 Maximum Duty Factor — 0.04%

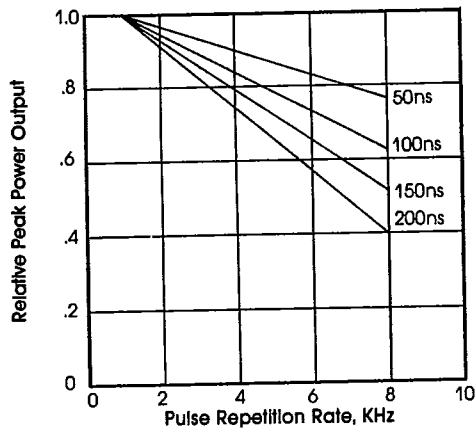


Fig. 2 — Total peak radiant flux vs. peak forward current for selected units

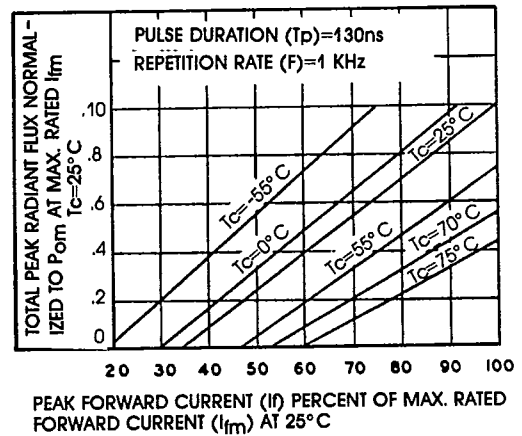


Fig. 3 — Typical peak power output and threshold current vs. case temperature

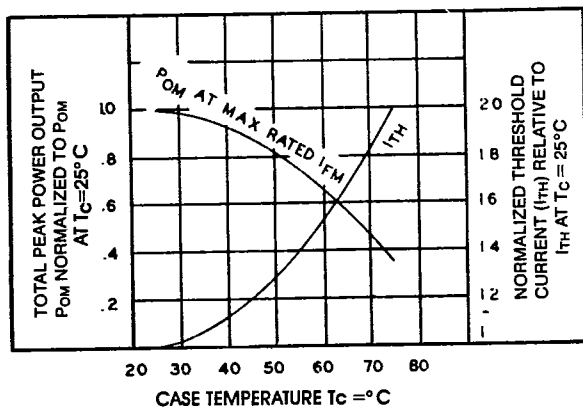


Fig. 4 — Relative Intensity vs. Wavelength

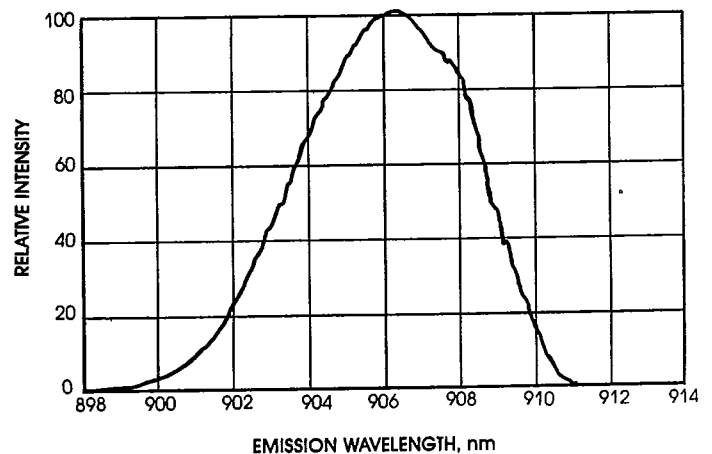


Fig. 5 — Relative Intensity vs. Beam Spread for LD-163 In Plane Normal to Junction

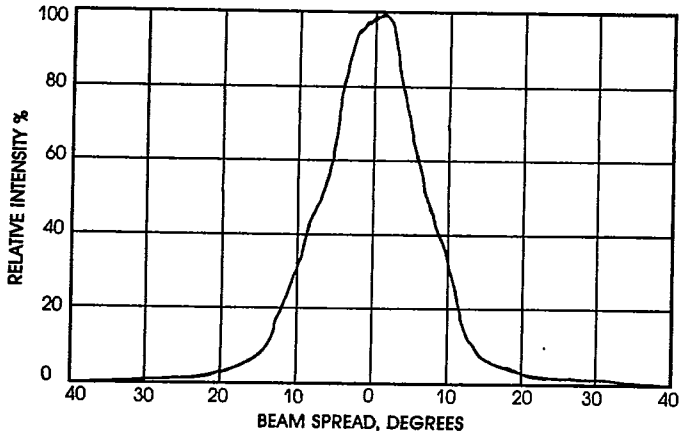


Fig. 6 — Relative Intensity vs. Beam Spread for LD-163 in Plane Perpendicular to Junction

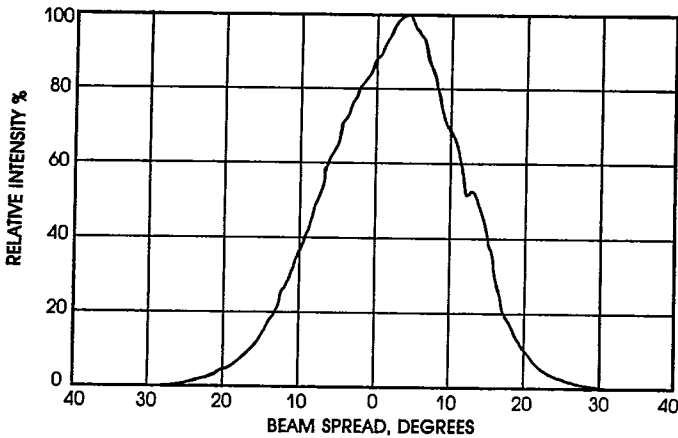
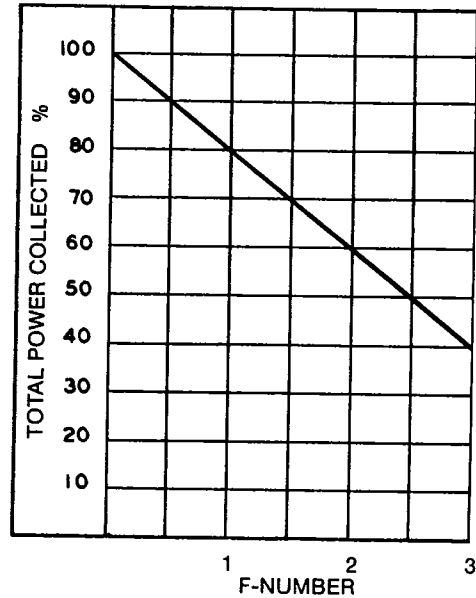
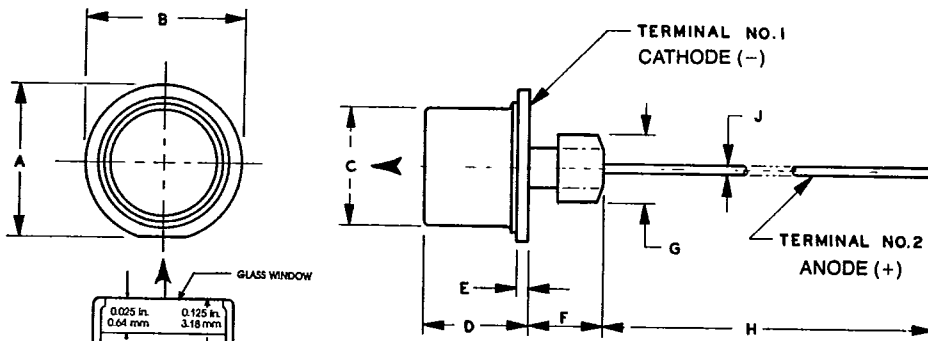


Fig. 7 — Total power collected vs. f-number



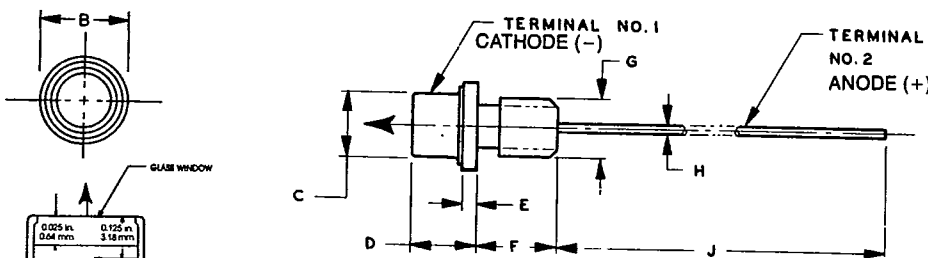
PACKAGE DRAWING



SYMBOL	INCHES	MILLIMETERS
	TYP.	TYP.
A	.418	10.61
B	.437	11.10
C	.325	8.25
D	.285	7.23
E	.030	0.76
F	.250	6.35
G	#10-32 THD.	
H	1.100	27.94
J	.020	0.51

PACKAGE 600-0114  
STANDARD PACKAGE (TO-5)

Invisible Laser  
Radiation emitted  
from glass window



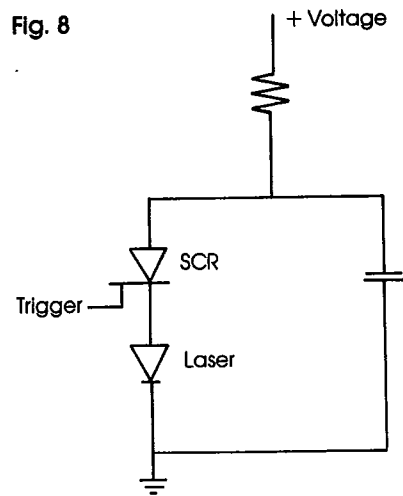
PACKAGE 600-0119  
OPTIONAL PACKAGE (TO-18)

SYMBOL	INCHES	MILLIMETERS
	TYP.	TYP.
B	.250	6.35
C	.183	4.64
D	.176	4.47
E	.040	1.01
F	.300	7.50
G	#8-32 THD.	
H	.020	0.51
J	0.750	19.05

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 pulsers and power supplies for this family of lasers. For laboratory experimentation the LPA-210C, pulse generator, and the LC-200 (for 115V operation) or the LC-210 (for 28V operation) power supply may be used. Custom drivers are available for specific applications.

Fig. 8



**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 required, the beam should only be observed by reflection from a matte surface utilizing an image converter or by use of a suitable fluorescent screen.

**DANGER**

"INVISIBLE LASER RADIATION AVOID DIRECT EXPOSURE TO BEAM."

MAX. PEAK POWER 240 WATTS  
WAVELENGTH 904 nm.  
"CLASS IIIb LASER PRODUCT."

**LASER DIODE, INC.**

**LASER DIODE**

Invisible Laser Radiation emitted from glass window

Type LD-168 Case NEG Pkg TO-5

$I_{th}$  25A  $I_m$  100A  $P_o$  120W @ 25 °C

$I_{th}$  \_\_\_\_\_  $I_m$  \_\_\_\_\_  $P_o$  \_\_\_\_\_ @ \_\_\_\_\_ °C

$\lambda$  904nm Date of Mfr. \_\_\_\_\_

**LASER DIODE, INC.**  
Made in New Brunswick, N.J. U.S.A.  
This product conforms to DHEW regulation 21 CFR Subchapter J

**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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