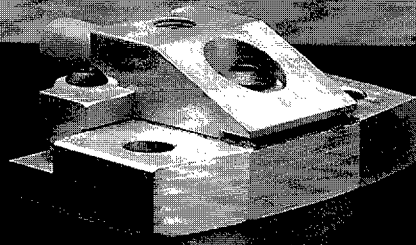


SDL 3400 SERIES



Key Features

- Up to 20 W cw Optical Power
- Monolithic Linear Array
- High Efficiency Quantum Well Structure
- < 3 nm Spectral Width
- 797-810 nm Wavelength

20 / 15 / 10 W CW GaAlAs LINEAR ARRAY LASER DIODES

The high cw optical power and linear array format provided by the SDL-3400 Series serves applications such as optical pumping of solid state lasers, beacons, and high power illuminators. With a total emitting aperture of 1 cm x 1 μ m, the array can be easily coupled to side pumped Nd:YAG, or Nd:YLF rods or slabs. This highly efficient source is ideal for systems with limited energy or heat transfer budgets.

The SDL-3400 Series consists of multiple emitters spaced on a monolithic, 1 cm laser diode "bar." The bar is bonded to a submount with the "p" surface (active junction) toward the submount for minimum thermal resistance. All emitters are driven in electrical parallel.

Reliability is enhanced by the relatively low energy emitted per emitter and the heat spreading spaces between groups of emitter apertures. High optical power and high efficiency is achieved by a quantum well active layer structure that provides low threshold and excellent electrical-to-optical conversion efficiency. Electrical contact to the laser cathode is made by a plug, the copper base is the anode contact.

The linear array output facet is directly available, facilitating placement of optical elements or intimate coupling to laser media. The copper "S" package heatsink is designed to be readily mounted to an external liquid heat removal system. Options include wavelength selection for Nd:YAG and Nd:YLF. The diode array must be temperature tuned to the rare earth absorption band.



Specifications

(Typical values at 25 °C)

Model Number	CW Output Power (W)	Differential Quantum Efficiency (W/A)	Total Conversion Efficiency (%)	Emitting Dimensions W X H	Beam Divergence $\theta_{\perp}, \theta_{\parallel}$ (deg FWHM)	Threshold Current (A)	Operating Current (A)
SDL-3470-S	20	1.0 (65%)	33	1 cm x 1 μ m	30, 10	12	32
SDL-3450-S	15	1.0 (65%)	33	1 cm x 1 μ m	30, 10	8	23
SDL-3490-S	10	1.0 (65%)	33	1 cm x 1 μ m	30, 10	8	18

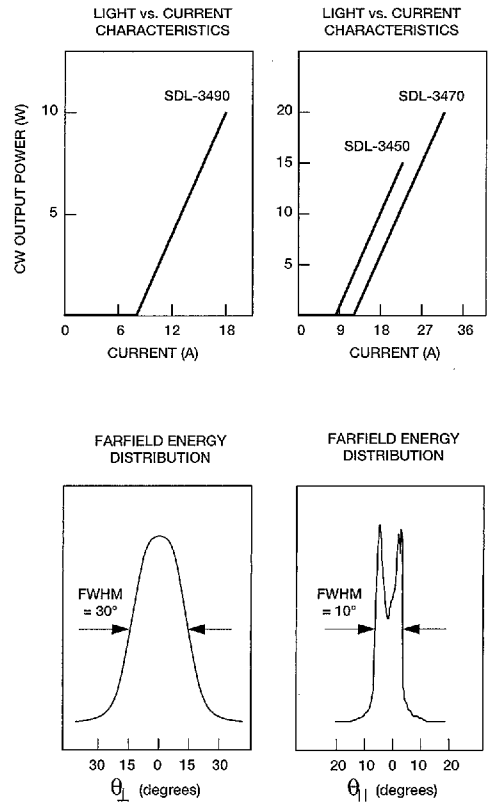
Notes

- The SDL-3400 Series laser diode is a 1 cm aperture line source. Individual emitter width, emitter format and emitter spacing on the monolithic laser diode "bar" vary depending on output power, wavelength and ongoing device development.

If emitter aperture or center-to-center spacing is important in the intended application, contact SDL prior to order placement for details.
- Features common to all SDL-3400 diodes include:
 - Spectral Width of less than 3 nm FWHM.
 - Temperature coefficient of wavelength is ~ 0.27 to 0.3 nm/°C.
 - Temperature coefficient of threshold current can be modeled as:

$$I_{TH2} = I_{TH1} \exp [(T_2 - T_1)/T_0]$$
 where T_0 is a device constant of about 150°K.
 - Temperature coefficient of operating current is approximately 0.5% to 0.7% per °C.
- Forward Voltage is typically: $V_f = 1.5 \text{ V} + I_{op} \times R_s$
- Wavelength range is 797 to 810 nm for SDL-3490 and 3450. Wavelength range is 805 to 810 nm for SDL-3470. Wavelength selection and tolerance is available as an option. See Price List for more information.
- The S package is designed for mechanical attachment to a water cooled heatsink such as the SDL-830-S.

Optical Characteristics



SDL-3400 SERIES

Absolute Maximum Ratings

Series Resistance (Ω)	Thermal Resistance ($^{\circ}\text{C/W}$)	Recommended Case Temperature ($^{\circ}\text{C}$)
0.012	0.6	0 to 25
0.015	0.7	0 to 25
0.015	0.7	0 to 25

CW Output Power (W)	Reverse Voltage (volts)	Case Operating Temperature ($^{\circ}\text{C}$)	Storage Temperature Range ($^{\circ}\text{C}$)
22	3	-20 to 30	-55 to 80
18	3	-20 to 35	-55 to 80
13	3	-20 to 35	-55 to 80

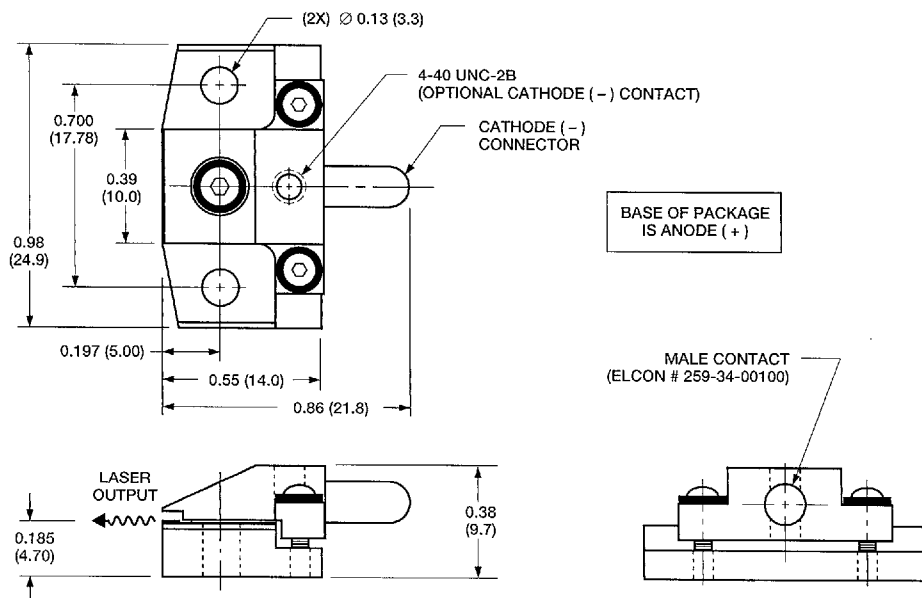
Package Specifications [Dimensions in inches (mm) except where indicated]

SDL Standard Tolerances:
(unless otherwise specified)

inches: x.xx = ± 0.02
x.xxx = ± 0.010

mm: x.x = ± 0.5
x.xx = ± 0.25

S CW BAR PLATE PACKAGE



CW High Power/Brightness Laser Diodes/Linear Arrays
 CW Single Spatial/Longitudinal Mode Laser Diodes
 CW Single Spatial Mode Laser Diodes
 Individually Addressable Array Laser Diodes
 High Power Fiber-Coupled Linear Arrays
 CW Tunable Laser Diodes
 QCW Linear Arrays and Stacked Arrays
 Pulsed and QCW Laser Diodes
 Laser Diode Drivers, Systems and Heatsinks

SDL-3400 SERIES

Safety And Operating Considerations

The laser light emitted from this laser diode is invisible and may be harmful to the human eye. Avoid looking directly into the laser diode, into the collimated beam along its optical axis when the device is in operation.

CAUTION: THE USE OF OPTICAL INSTRUMENTS WITH THIS PRODUCT WILL INCREASE EYE HAZARD.

Operating the laser diode outside of its maximum ratings may cause device failure or a safety hazard. Power supplies used with the component must be employed such that the maximum peak optical power cannot be exceeded. CW laser diodes may be damaged by excessive drive current or switching transients. When using power supplies, the laser diode should be connected with the main power on and the output voltage at zero. The current should be increased slowly while monitoring the laser diode output power and the drive current.

Device degradation accelerates with increased temperature and therefore careful attention to minimize the case temperature is advised. For example, life expectancy will decrease by a factor of four if the case is operated at 50 °C rather than 30 °C.

A proper heat sink for the laser diode on a thermal radiator will greatly enhance laser life. Firmly mount the laser on a radiator having a thermal impedance of less than 0.5 °C/W for increased reliability.

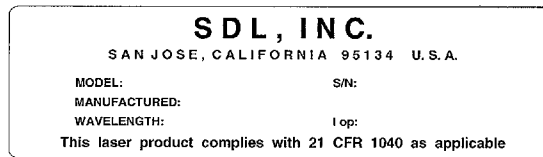
ESD PROTECTION — Electro-static discharge is the primary cause of unexpected laser diode failure. Take extreme precaution to prevent ESD. Use wrist straps, grounded work surfaces, and rigorous anti-static techniques when handling laser diodes.

This product is export controlled under CO-COM. The ECCN is 6A05A; Harmonized Commodity is 8541.40.6050.

21 CFR 1040.10 Compliance

Because of the small size of these devices, each of the labels shown is attached to the individual shipping container. They are illustrated here to comply with 21 CFR 1040.10 as applicable under the radiations control for health and safety act of 1968.

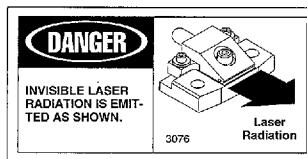
SERIAL NUMBER IDENTIFICATION LABEL



OUTPUT POWER DANGER LABELS



PACKAGE APERTURE LABEL



"S" PACKAGE DIODES