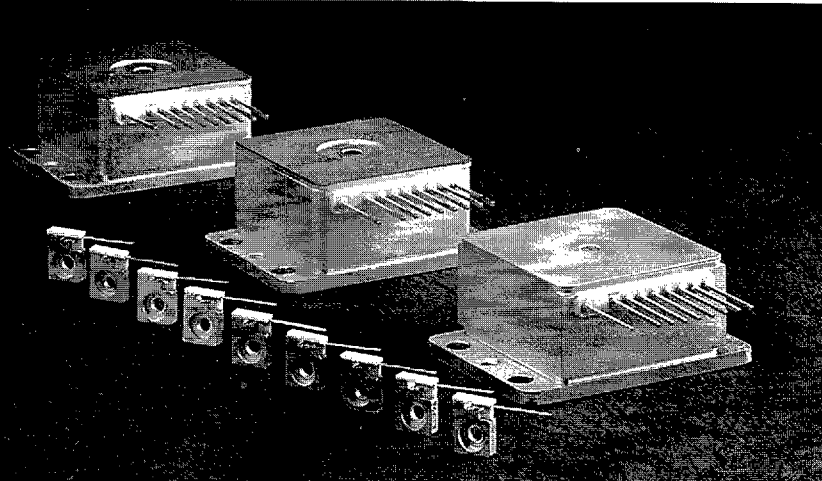


SDL

6400

SERIES

PRELIMINARY PRODUCT



Key Features

- 1.8-1.96 μm Wavelength
- Up to 500 mW cw Output Power
- Low NA Fiber-Coupled Option
- TEC Package Available

2 micron WAVELENGTH, 500 mW CW InGaAsP/InP LASER DIODES

Laser diodes operating in the 2 μm wavelength range are useful in applications including medical microsurgery, eye-safe ranging and illumination, infrared absorption measurement and a variety of industrial and biomedical systems. High power from efficient laser diodes is now available from developmental versions of these unique products.

Research and development programs at SDL have produced a variety of semiconductor laser diode devices operating from 1.8 to 1.96 μm . Power in excess of 1 W cw has been demonstrated from 200 μm aperture laser diodes. An ongoing effort to optimize the materials and device structure has yielded useful devices for laboratory experimentation.

Although the technology is not fully developed, experimental devices for initial system development are available with useful lifetime and performance. Device characteristics vary as a function of fabrication value choices, typical values are shown in this data sheet. Contact SDL for an up-to-date description of parameter variations.



CW High Power/Brightness Laser Diodes/Linear Arrays
SDL-6400

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

OCW Linear Arrays and Stacked Arrays

Pulsed and QCW Laser Diodes

Laser Diode Drivers, Systems and Heatinks

SDL-6400
 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 Heatinks

Specifications

Model Number	CW Output Power (mW)	Differential Quantum Efficiency (W/A)	Total Conversion Efficiency (%)	Emitting Dimensions W X H (μm)	Beam Divergence $\theta_{\perp}, \theta_{\parallel}$ or θ (deg FWHM)	Fiber Core Dia. \varnothing (μm)	Fiber Numerical Aperture	Threshold Current (mA)
Typical Values at 10°C								
SDL-6430-C ⁽⁵⁾	500	0.25 (40%)	15	200 x 1.0	45, 10	—	—	350
SDL-6432-P1	500	0.25 (40%)	15	200 x 1.0	45, 10	—	—	350
SDL-6432-P2	300	0.15 (25%)	8	—	—	200	0.16	350
Typical Values at 25°C								
SDL-6430-C	500	0.16 (27%)	12	200 x 1.0	45, 10	—	—	500
SDL-6432-P1	500	0.16 (27%)	12	200 x 1.0	45, 10	—	—	500
SDL-6432-P2	300	0.10 (17%)	7	—	—	200	0.16	500

Notes

- Other features of the SDL-6400 Series:
 - Spectral Width of 10-12 nm FWHM for C, P1.
Spectral Width of 20-25 nm FWHM for P2.
 - Temperature coefficient of wavelength is approximately 1 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 40-60°K.

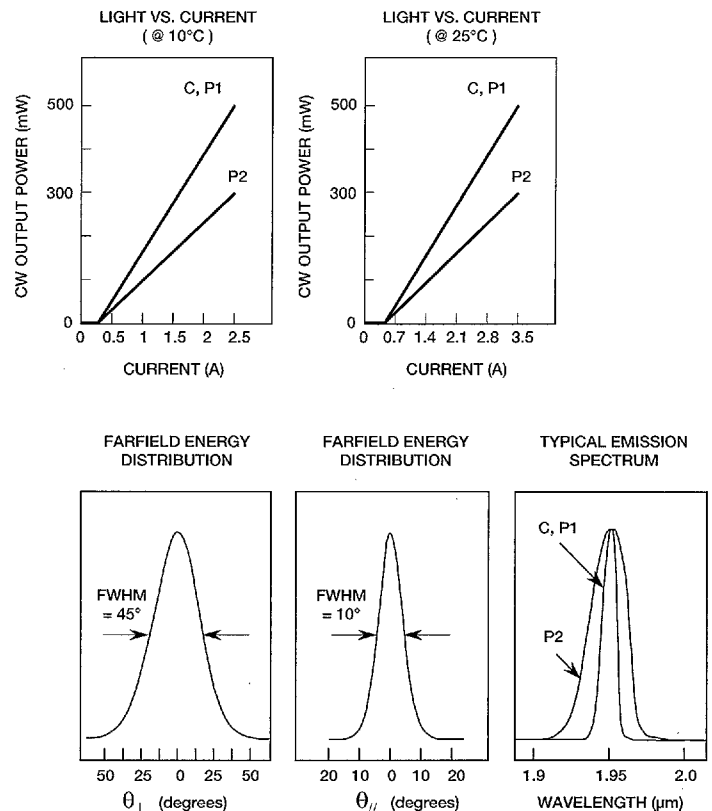
- Forward Voltage is typically: $V_f = 0.6 V + I_{op} \times R_s$
- Wavelength range is approximately 1.8 to 1.96 μm and is dependent on inventory.
- Thermoelectric Cooler** (available on "P" pkg. only)
 Maximum Drive Current: 3.5 A
 Maximum Drive Voltage: 8.0 V
 Thermistor R @ 25 °C: 10 kΩ
- Do not operate SDL-6430-C near or below the dew point. At the 10°C operating temperature, condensation may form on the diode facet, possibly causing damage. Contact SDL for specific guidelines for operation at temperatures below the dew point.

- Definition of Part Numbers:

SDL-643X - (C, P1, or P2 package)

- 0 - No Options
- 2 - TE Cooler

Optical Characteristics



SDL-6400 SERIES

CW High Power/Brightness
Laser Diodes/Linear Arrays
SDL-6400

Absolute Maximum Ratings

Operating Current (A)	Series Resistance (Ω)	Thermal Resistance ($^{\circ}\text{C}/\text{W}$)	Recommended Case Temperature ($^{\circ}\text{C}$)
2.5	0.4	2.5	-20 to 30
2.5	0.4	NA	-20 to 30
2.5	0.4	NA	-20 to 30
3.5	0.4	2.5	-20 to 30
3.5	0.4	NA	-20 to 30
3.5	0.4	NA	-20 to 30

CW Output Power (W)	Reverse Voltage (volts)	Case Operating Temperature ($^{\circ}\text{C}$)	Storage Temperature Range ($^{\circ}\text{C}$)	Lead Soldering Temp. ($^{\circ}\text{C}$ for 5 sec)
550	3	-20 to 30	-55 to 80	250
550	3	-20 to 30	-55 to 80	250
330	3	-20 to 30	-55 to 80	250
550	3	-20 to 30	-55 to 80	250
550	3	-20 to 30	-55 to 80	250
330	3	-20 to 30	-55 to 80	250

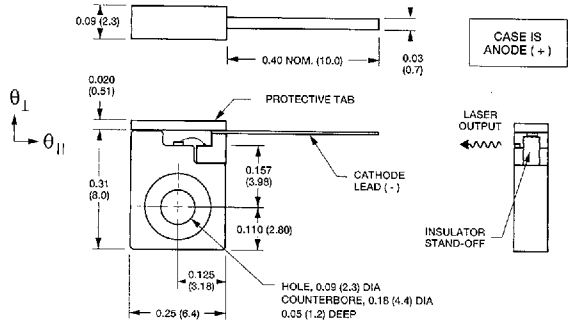
Package Specifications [Dimensions in inches (mm) except where indicated]

SDL Standard Tolerances:
(unless otherwise specified)

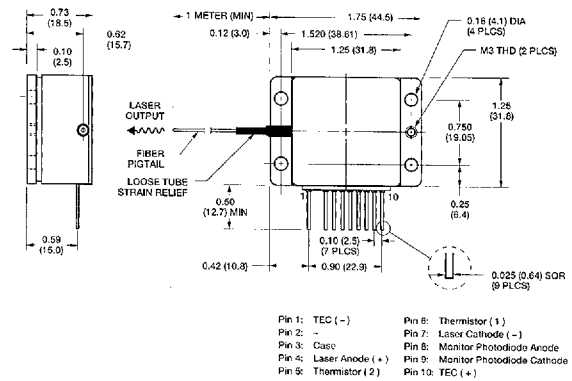
inches: x.xx = ± 0.02
x.xxx = ± 0.010

mm: x.x = ± 0.5
x.xx = ± 0.25

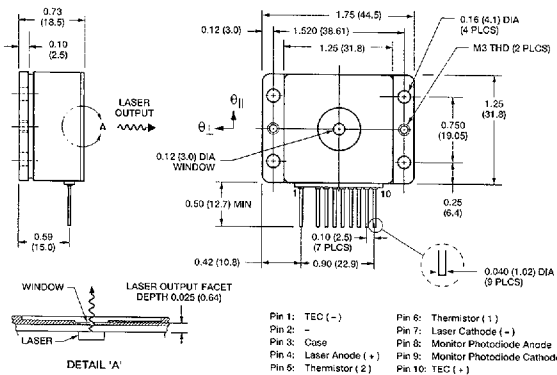
C OPEN HEATSINK PACKAGE



P2 HIGH HEAT LOAD FIBER PACKAGE



P1 HIGH HEAT LOAD (>1 W) WINDOW PACKAGE



CW Single Spatial/Longitudinal
Mode Laser Diodes

CW Single Spatial Mode
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Individually Addressable
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Linear Arrays

CW Tunable
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QCW Linear Arrays
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Pulsed and QCW
Laser Diodes

Laser Diode Drivers,
Systems and Heatsinks

SDL-6400 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.

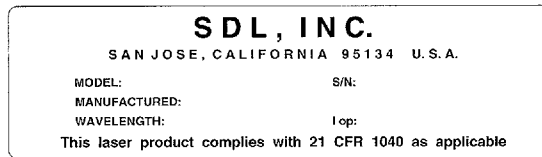
A proper heat sink for the laser diode on a thermal radiator will greatly enhance laser life. Firmly mount the laser on a radiator having a thermal impedance of less than 0.5 °C/W for increased reliability.

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.

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.

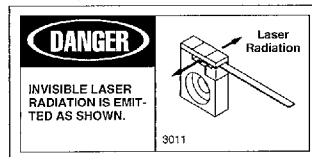
SERIAL NUMBER IDENTIFICATION LABEL



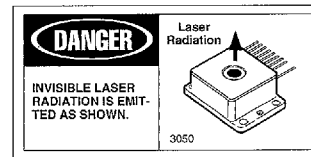
OUTPUT POWER DANGER LABEL



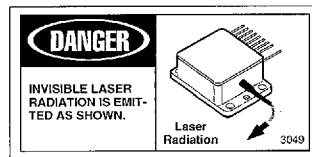
PACKAGE APERTURE LABEL



"C" PACKAGE DIODES



"P1" PACKAGE DIODES



"P2" PACKAGE DIODES

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