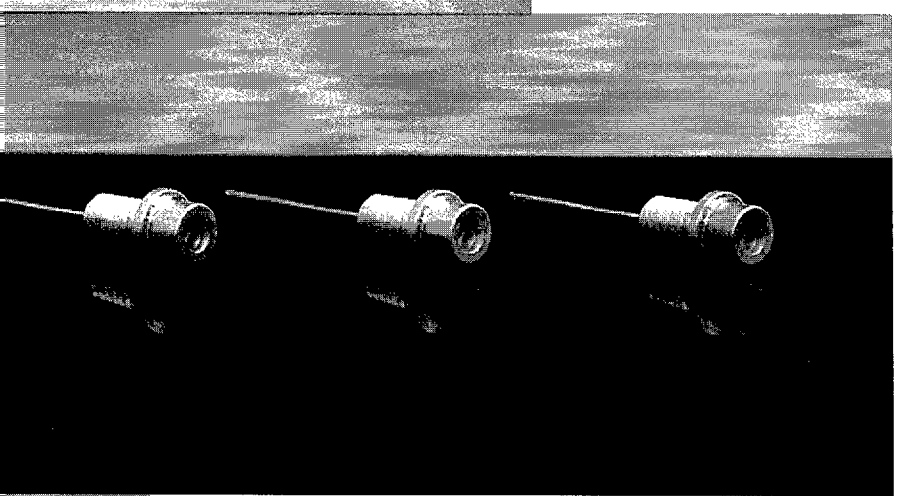
SDL 2100 SERIES



1 WATT PULSED GaAlAs LASER DIODES

Key Features

1 W Peak Pulsed Power

High Efficiency, Low Threshold

1% Duty Factor, 10 mW Average Power

High Temperature Operating Capability

The high duty factor, high optical power offered by the SDL-2100 Series is achieved by a quantum well active layer structure that provides low threshold and highly efficient operation. An electrical-to-optical power conversion efficiency of 20% is typical. These quantum well devices feature a broad area emitter with 100 µm aperture mounted "p" up.

These devices are produced using state-of-the-art metalorganic chemical vapor deposition (MOCVD) techniques, providing reliable, long life operation over a wide range of temperatures. Greater than 10,000 hour life has been demonstrated at 1 W power, 100 ns pulse width, at 125°C case temperature.

The SDL-2100-E1 is a hermetically sealed TO-18 window package laser. The multimode beam is useful for applications including time of flight ranging, proximity detection, illumination, robotic vision and point-to-point communications. The high duty factor and high repetition rate provide 10 mW average power for integrating detectors.

The convenient TO-18 package is compatible with standard electronic fixturing and allows easy mounting in system applications.

SDL®

Specifications

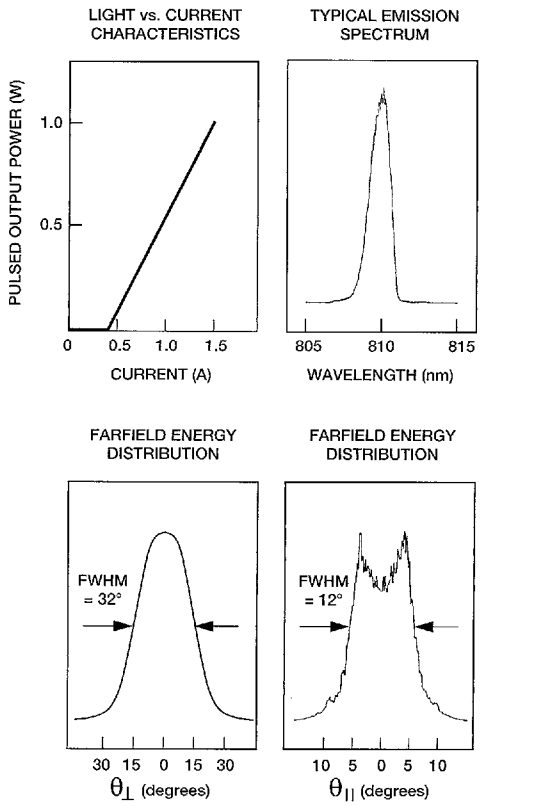
(Typical values at 25 °C and 0.6 NA collection optics)

Model Number	Peak Pulsed Power (W)	Differential Quantum Efficiency (mW/mA)	Total Conversion Efficiency (%)	Emitting Dimensions W X H (µm)	Beam Divergence $\theta_\perp$, $\theta_{//}$ (deg FWHM)	Threshold Current (A)	Operating Current (A)
SDL-2100-E1	1.0	0.80 (50%)	20	100 x 1	32, 12	0.4	1.5

Notes

1. Features common to all SDL-2100 Series laser diodes include:
   a. Duty Factor of 1%.
   b. Spectral width of 2 nm FWHM.
   c. Maximum Pulse Width is 100 nsec.
   d. Temperature coefficient of wavelength is approximately 0.27 to 0.3 nm per °C.
   e. Temperature coefficient of threshold current can be modeled as:
   $$I_{TH2} = I_{TH1} \exp [(T_2 - T_1)/T_o]$$
   where T_o is a device constant of about 150°K.
   f. Temperature coefficient of operating current is approximately 0.5 to 0.7% per °C.
2. Forward Voltage is typically: $V_f = 1.5\ V + I_{op} \times R_s$
3. Wavelength range of pulsed laser diodes is 830 ± 30 nm. Wavelength selection is available as an option. Refer to Price List for wavelength selection range, variance and price.

Optical Characteristics



Series Resistance (Ω)	Forward Voltage at 100 mA (volts)	Recommended Case Temperature (°C)
0.30	1.6	0 to 30

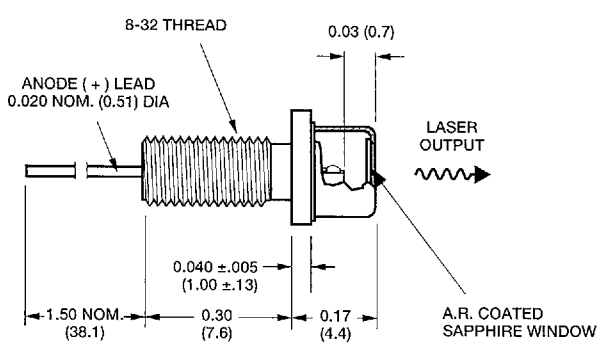
Absolute Maximum Ratings

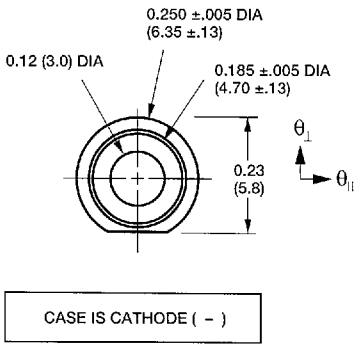
Peak Pulsed Power (W)	Reverse Voltage (volts)	Case Operating Temperature (°C)	Storage Temperature Range (°C)	Lead Soldering Temperature (°C for 5 sec)
1.1	3.0	-20 to 70	-55 to 80	250

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

E1 TO-18 WINDOW PACKAGE





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.

Thermal device degradation accelerates approximately as exp $(-0.7eV/kT_C)$, and therefore careful attention to minimize the case temperature is advised. For example, life expectancy will decrease by a factor of 5 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 5.0 °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

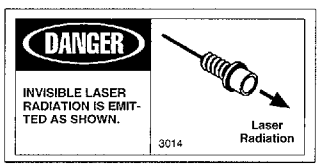
Because of the small size of these devices, each of the labels shown is attached to the individual shipping container. They are illustrated here to comply with 21 CFR 1040.10 as applicable under the radiations control for health and safety act of 1968.

SERIAL NUMBER IDENTIFICATION LABEL

SDL, INC.
SAN JOSE, CALIFORNIA 95134 U.S.A.
MODEL: **S/N:**
MANUFACTURED:
WAVELENGTH: **I op:**
This laser product complies with 21 CFR 1040 as applicable

OUTPUT POWER DANGER LABEL

PACKAGE APERTURE LABELS



"E1" PACKAGE DIODES