Ultrahigh Power Infrared Array Laser Diode
Achieves 40 W Optical Power Output

SLD432S

Did you know that ultrahigh power infrared laser diodes are used in welding equipment and the equipment used to trim photomasks? These ultrahigh power infrared laser diodes now have the high reliability to respond to the needs of this evolving industrial equipment. Sony continues to push the limits of increased power and improved reliability in the laser diodes that support these developments. Sony has now developed the SLD432S 40 W optical power output array laser diode that features both high power and the ability to be used in a wide range of applications.

- **Emission wavelength: 808 ±3 nm**
- **Rated optical power output: 40 W, CW operation**
- **High reliability**
- **Low operating current**

Ultrahigh Power Laser Diode Array

The development of ultrahigh power laser diodes began with the single stripe type device. The one-dimensional linear array laser was developed to respond to needs for even higher power levels from ultrahigh power infrared laser diodes. This array laser diode concept is a technology that can be applied when the reliability and other characteristics of the single-stripe ultrahigh power laser diode technology have achieved a high level. The technology that allowed the SLD344YT and other single-stripe type laser diode products to achieve the 6 W output level became the technological foundation for the array laser diode.

V O I C E

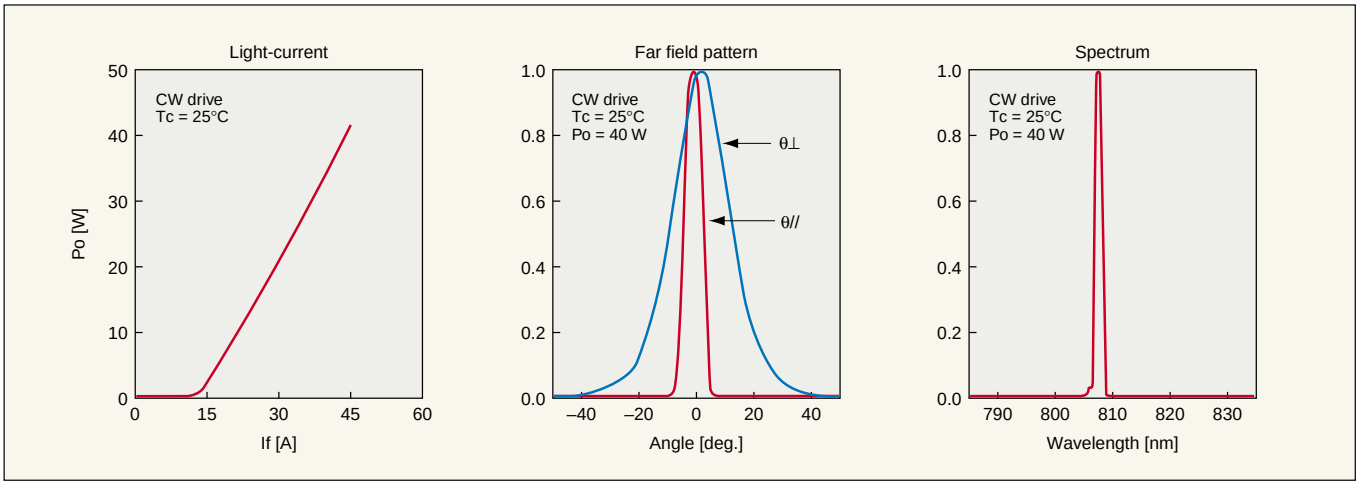
The development of infrared array laser diodes, using the AlGaAs material familiar from the laser diodes used in CD players and similar products has finally reached the extremely high level of 40 W. We plan to continue to increase the power levels and the functionality of laser diodes using this material, which is well suited to volume production. Sony is the company to watch for leading edge laser diodes.

High-Reliability Ultrahigh Power Laser Diode

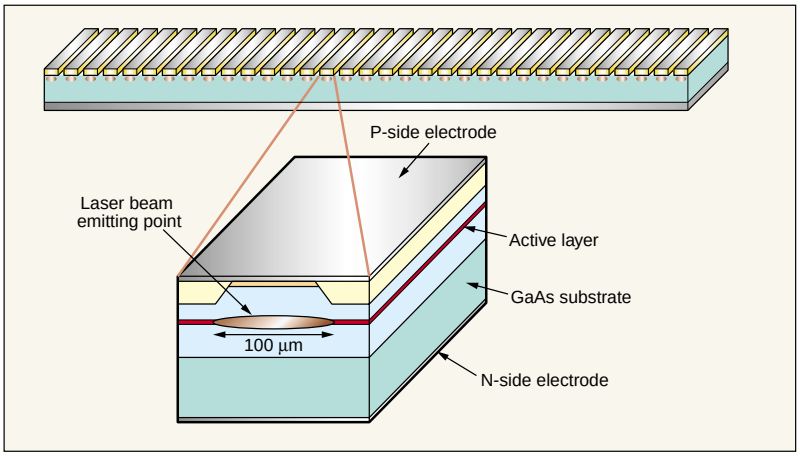
The SLD432S of this release has a structure in which 33 emitters with 100 µm width are arranged in a one-dimensional linear array as shown in figure 2 to allow the device to achieve an optical power output of 40 W. (See figure 1 and table 1.) This device uses the same package as the 20 W SLD431S array laser diode, allowing user designs in which the laser device can be easily replaced. (See figure 3.) The buried current confinement structure was used in the device structure when developing this device, and thus the device supports use at low operating current levels. Sony succeeded in achieving a laser beam radiation angle (in the vertical direction) narrower than those of ultrahigh array laser diodes that have other structures by optimizing the laser structure. In welders and other applications using this product, this radiation angle means that loss is less likely to occur when the laser beam is focused at the YAG crystal, and makes it possible to provide adequate margin in the optical design. Full consideration was given to achieving the stability and uniformity of quality and reliability so strongly desired in industrial applications.

Support for Wavelength Selection

While this device features the 808 ±3 nm wavelength required for YAG excitation as a general application, Sony can provide other infrared wavelengths if desired.



■ **Figure 1 SLD432S Representative Characteristics**

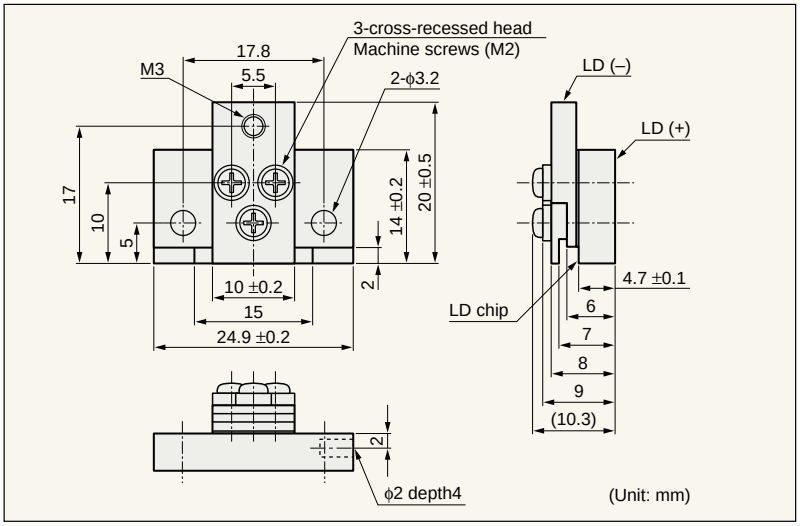


■ **Figure 2 SLD432S Chip Structure**

■ **Table 1 SLD432S Main Characteristics**

Item		Symbol	Typical value	Unit
Threshold current		Ith	13	A
Operating current		Iop	50	
Operating voltage		Vop	1.9	V
Oscillation wavelength		λp	808	nm
Radiation angle	Parallel to junction	θ//	8	deg.
	Perpendicular to junction	θ⊥	24	
Differential efficiency		ηD	1.2	W/A

Conditions: TC = 25°C
Po =40 W@CW



■ **Figure 3 SLD432S Package Dimensions**