High Power Laser Diode
Achieves 8× Speed CD-R Recording

SLD235VL

Sony is now releasing a 780-nm band high power laser diode in the 100 mW class, the industry's highest output level class.
This device allows 8× speed recording in CD-R and CD-RW systems.
Provided in an easy to use ø5.6 package, the SLD235VL also achieves low power consumption.

- **The industry's highest power output CD-R device class: 100 mW**
- **Low power consumption, a low aspect ratio, high reliability, low astigmatism**
- **Sony is the industry's leader in mass producing high power lasers for optical disc applications.**
- **Easy to use ø5.6 package**

Optical Disc Multimedia System

There have been remarkable advances recently in multimedia systems centered on optical disc technology. Since the audio CD first appeared 15 years ago, many related formats, including CD-ROM, MO, MD, and DVD, have appeared and have played active roles in their corresponding applications. Of those formats, one that has received much attention recently is CD-R/RW, which is the recordable system in the CD family. As is the case with the CD-ROM, CD-R/RW is in the midst of aggressive competition for faster speeds. However, since CD-R/RW uses thermal recording (the optical energy from a laser diode is used to change the physical properties of the disc, and those changed physical properties allow data to be read out) the achievement of even higher power laser diodes is an absolute requirement for achieving increased recording speeds. (See figure 1.)

The Industry's Highest Power Output CD-R Device Class: 100 mW

Last year, Sony released the SLD234VL (80 mW class) as a device that achieves 4× speed recording. High power laser technology is an area which has progressed along with advances in MiniDisc (MD) technology, and Sony's key technology in this area is high-precision MOCVD technology, optimized multi-quantum well structure, and the actual refractive index waveguide structure with low loss. Sony has now developed the SLD235VL, which can provide an optical radiative output of over 100 mW to achieve 8× speed recording.

Technology Issues for Increasing Power

The following issues were important in achieving an increased power:

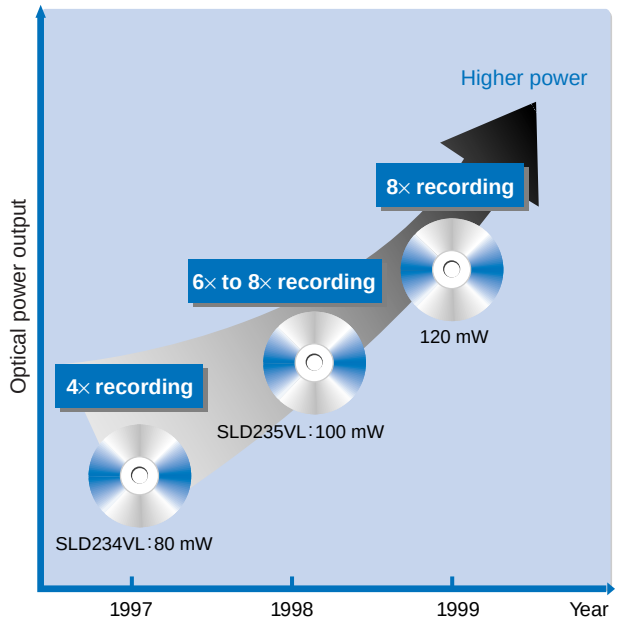
- Improved emission angle characteristics to increase the practical efficiency of the device when used in the optical pickup system (See figure 4.)
- Increasing the strength of the optical output surface to increase the laser lifetime (reducing the optical density)
- Increasing the length of the resonator to extract more energy from the device

In addition, Sony strove for improved generality by using the same 5.6 ø package used in conventional products. These enabled Sony to achieve reduced power consumption and kink-free L-I characteristics up to 130 mW. (See figure 2.) In addition, customizations, such as wavelength design specifically for CD-R applications and measures reduce problems associated with 3-spot return light, were also performed.
Future plans in this area call for not only further increases in power, but also the development of new technologies for laser diodes to respond to even higher level demands. Keep your eye on Sony for your laser diode needs.

V O I C E

This article presents our latest creation: the SLD235VL. With the addition of this device, Sony now boasts an extensive lineup of high power lasers for MD and other applications. We hope that this device will be widely used.

New Products

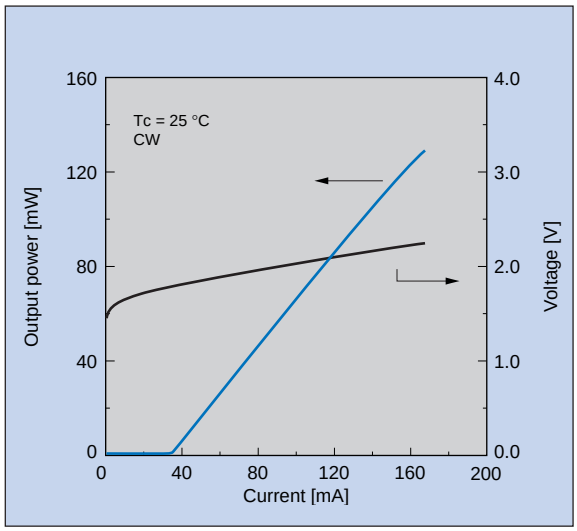


■ **Figure 1 Development Trends**

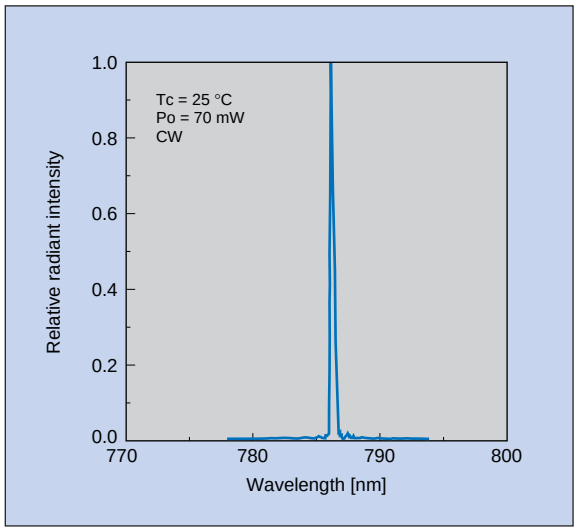
■ **Table 1 Main Characteristics**

Item		Symbol	Typical value	Unit
Threshold current		Ith	30	mA
Operating current		Iop	100	
Operating voltage		Vop	2.0	V
Oscillation wavelength		λp	784	nm
Radiation angle	Perpendicular	θ⊥	20	degree
	Parallel	θ//	8	
Differential efficiency		ηD	1.0	mW/mA

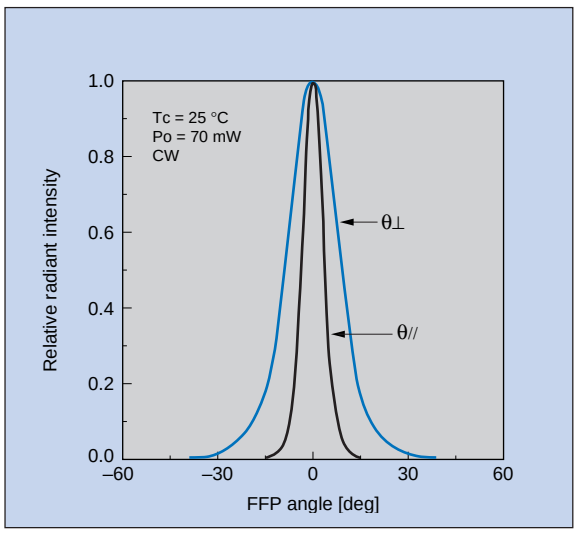
Condition : Tc=25 °C
Po=70 mW CW



■ **Figure 2 SLD235VL L-I and V-I Characteristics**



■ **Figure 3 SLD235VL Spectrum**



■ **Figure 4 SLD235VL Far Field Pattern**