

## High-Power Red Laser Diode Supports ×16-Speed DVD Recording

# SLD1236VL

The DVD recording market is developing rapidly.

Following the ×4, ×8, and ×12 speeds, high-speed recording has already evolved to the ×16-speed level.

To respond to this market trend, Sony has now developed the SLD1236VL 250 mW optical power output laser diode that supports ×16-speed DVD recording.

In addition to the optical power output being increased by 50 mW over earlier products, the SLD1236VL also achieves guaranteed operation under the severe environmental conditions of temperatures up to 75°C.

- Maximum optical power output : 250 mW (in pulse drive mode)
- High-temperature (75°C) operation guaranteed
- New user-friendly actual refracting waveguide window structure

### ■ Maximum Optical Power Output: 250 mW (in pulse drive mode)

Increasing the recording speed in DVD+R/RW and DVD-R/RW requires that the optical power output of the laser diode used as the light source be increased. This is because the material characteristics of the recording medium must be changed in a period of time that becomes shorter as the recording speed is increased. Sony has already released laser diodes with optical power output levels of 100, 140, and 200 mW to support recording speeds of ×4, ×8, and ×12. The SLD1236VL of this release achieves an even higher optical power output, and can be driven at an optical power output of 250 mW, which supports ×16-speed recording.

### ■ High-Temperature (75°C) Operation Guaranteed

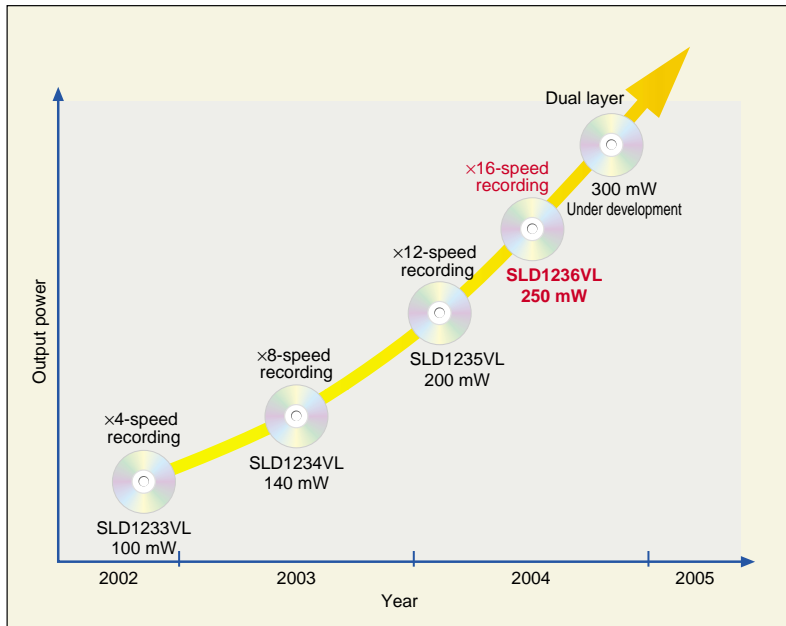
When recording at speeds as high as ×16, the heat released by the various system components increases due to the spindle motor that turns the disc running faster, the laser diode power being increased, and other changes. As a result, the ambient temperature inside the case increases. This there is demand for laser diodes whose operation is guaranteed at temperatures as high as 75°C. Sony introduced new structures in the areas surrounding the light emitting regions of the newly-developed SLD1236VL, and as a result, operation is guaranteed under severe operating conditions up to 75°C.

### ■ User-Friendly Actual Refracting Waveguide Window Structure

To respond to calls for the lower aspect ratios demanded for optical pickups, Sony has adopted, in the previously released SLD1234VL (pulse drive: up to 140 mW) and SLD1235VL (pulse drive: up to 200 mW), designs that reduce the radiation angle in the perpendicular direction ( $\theta_{\perp}$ ) at the end surface of the laser. The SLD1236VL inherits the structure that results in the same  $\theta_{\perp}$  angle of 17.5 degrees (typical) achieved in the SLD1234VL and SLD1235VL, thus creating a user friendly laser diode product. In addition, the SLD1236VL adopts a low-loss actual refracting waveguide window structure that improves the low threshold current and temperature characteristics. As a result, the SLD1236VL achieves a threshold current of 50 mA (typical) and current value of 130 mA (typical) in 80 mW CW drive mode. The reduction in the threshold current also reduces the noise levels.

## V O I C E

Despite this being a difficult device to design, we only had a short development period and the road to commercial release was perilous. However, thanks to much assistance from the staff and our cohesion as a group, we succeed in making it safely to commercial release. Our next step is to proceed with development aimed at even higher output to support two-layer discs.

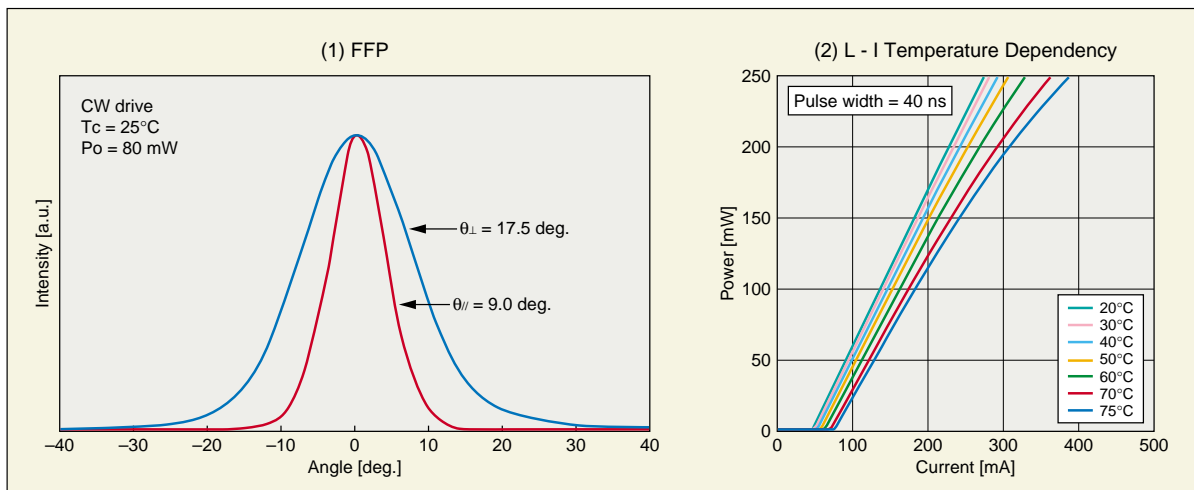


■ Figure 1 DVD Recording Laser Diode Development Trends

■ Table 1 SLD1236VL Main Specifications

Item	Symbol	Typ.	Unit	
Threshold current	$I_{th}$	50	mA	
Operating current	$I_{op}$	130		
Operating voltage	$V_{op}$	2.5	V	
Wavelength	$\lambda_p$	658	nm	
Radiation angle	Parallel	$\theta_{//}$	9.0	deg.
	Perpendicular	$\theta_{\perp}$	17.5	

Condition:  $T_c = 25^{\circ}\text{C}$   
 $P_o = 80 \text{ mW@CW}$



■ Figure 2 SLD1236VL Representative Characteristics