

# Hybrid High-Power Two-Wavelength Laser Diode for DVD ×4-Speed Recording and CD Playback

## SLD6361VL

The DVD recording market continues to evolve even further.

Sony developed the two-wavelength laser diode to support both the CD and DVD formats.

Now, Sony is releasing a new product, the SLD6361VL, which adopts high-precision hybrid mounting for a DVD recording laser diode and a CD playback laser diode to achieve all the advantages of the two-wavelength laser diode.

This is a new two-wavelength laser diode that inherits the performance of conventional single-wavelength laser diodes.

- Two-wavelength (650 and 780 nm) high-power laser diode (high-precision hybrid mounting)
- DVD: 110 mW maximum (pulse drive)  
CD: 8 mW maximum (self-pulsation mode)
- High-temperature operation (70°C) guaranteed

Sony has responded to the needs of the DVD player market with two-wavelength laser diodes. Now that the market is rapidly shifting from players to recorders, the two-wavelength laser diode is evolving the ability to record.

### ■ Two-Wavelength (650 and 780 nm) Hybrid Laser Diode

The SLD6361VL mounts a 650 nm band record/playback laser diode and a 780 nm band playback laser diode at the beam spacing of 110 μm allowed for optical aberrations and combines them in a single package. By using a newly-developed

hybrid mounting technology, Sony was able to control the emitting point spacing at the ±10 μm level. This makes it possible, when creating new end products, to select laser diode products with the most optimized structure and design from Sony's extensive product line both for DVD and CD applications. Hybrid two-wavelength laser diodes have the following advantages.

- Reductions in both the number of parts in the optical pickup and the number of assembly steps.
- Shorter development periods while allowing optimized design of each of the DVD and CD laser diodes.

### ■ 110 mW DVD, 8 mW CD

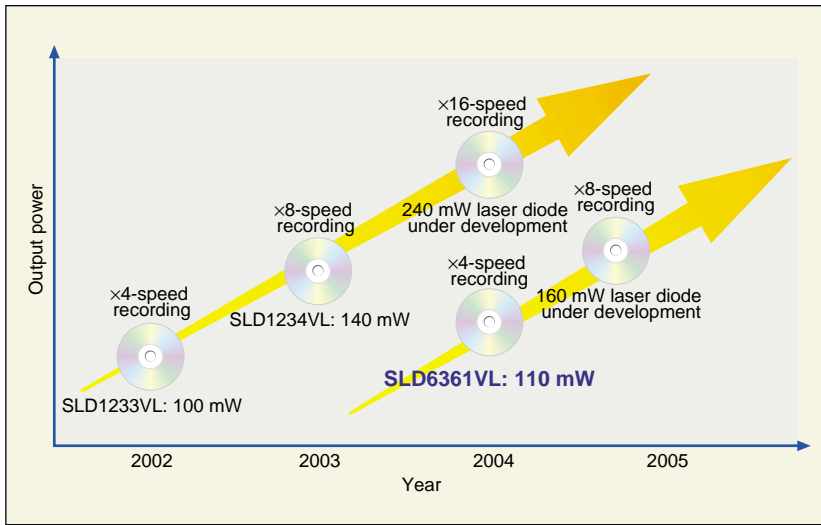
This new product uses the proven ×8 recording SLD1234 (140 mW in pulse drive) as its DVD recording laser diode. In addition to having the ability to support future improvements in the SLD6361VL, another advantage of this hybrid technology is the ability to quickly design and move to mass products using future laser diode products that support ×12 and ×16 speeds. As its CD playback laser diode, the SLD6361VL includes a low-power self-pulsation laser diode that has an index-waveguide and a multiple quantum well structure and can achieve low noise without high frequency superposing circuit.

### ■ High-Temperature Operation (70°C) Guaranteed

The SLD6361VL achieves operation at 70°C by mounting together two laser diodes, a proven self-pulsation type device to which a low threshold/low operation current structure has been incorporated in the CD side (780 nm band), and a device that inherits the basic structure of the SLD1234VL in the DVD side (650 nm band). The merits of the hybrid two-wavelength laser diode derive from this combination, and this technology can achieve reduced number of parts, more stable performance, and lower cost in DVD recorder optical pickups while responding to increasingly diverse needs without compromise and striving for improved characteristics.

## V O I C E

The two requirements for forming the optical system are that the laser beam emitting point be narrow and that the precision be excellent. For assembly, the chip spacing needs to be wide. We on the development team worked as a group to overcome these conflicting design requirements, and succeeded in creating this new product. DVD speeds are increasing along with improvements in DVD recording technologies. I hope to continue to be able to develop, in the short-run, new high value added easy to use laser diodes that can respond to these market needs.

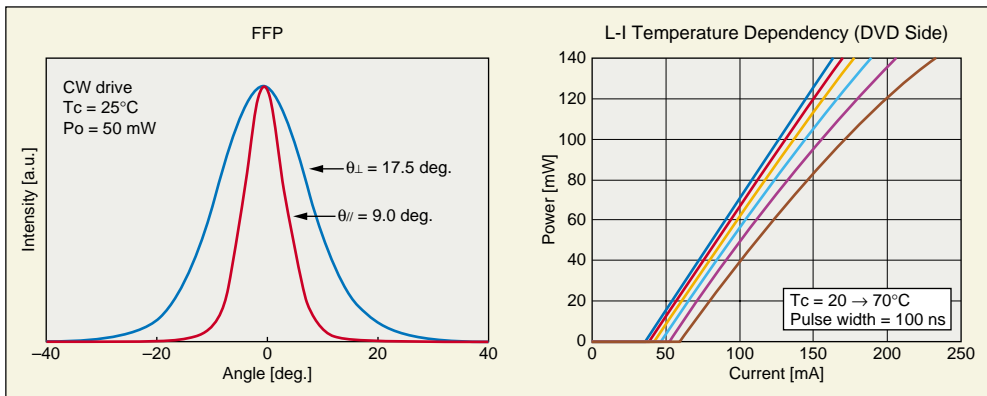


■ Figure 1 DVD Recording Laser Diode Development Trends

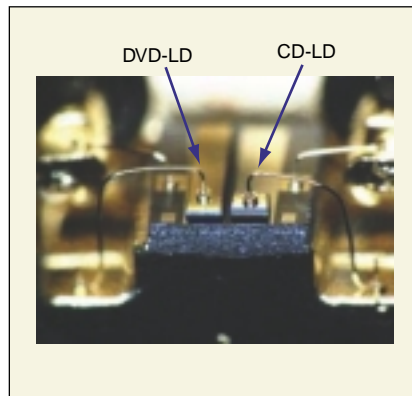
■ Table 1 SLD6361VL Main Specifications

Item	Symbol	DVD side	CD side	Unit	
Threshold current	$I_{th}$	40	26	mA	
Operating current	$I_{op}$	90	34		
Operating voltage	$V_{op}$	2.5	1.9	V	
Wavelength	$\lambda_p$	658	790	nm	
Radiation angle	Parallel	$\theta_{//}$	9.0	11.0	deg.
	Perpendicular	$\theta_{\perp}$	17.5	32.0	

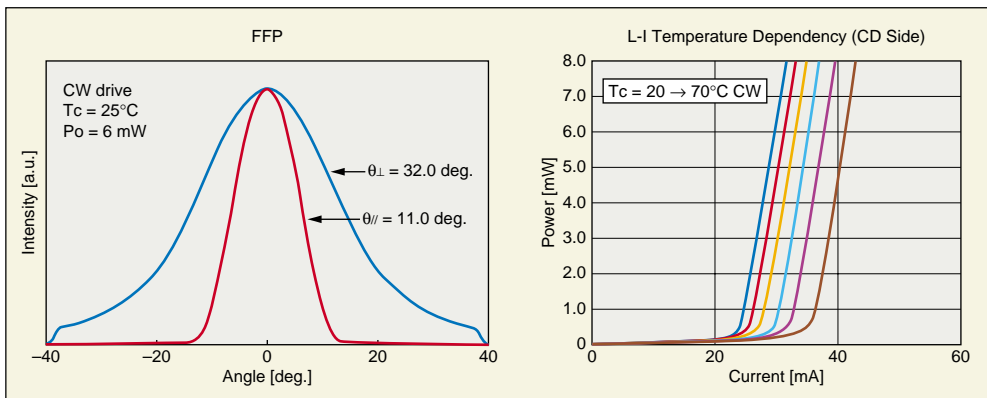
Condition:  $T_c = 25^{\circ}\text{C}$   
 DVD:  $P_o = 50\text{ mW}$  @CW  
 CD:  $P_o = 6\text{ mW}$  @CW



■ Figure 2 SLD6361VL Representative Characteristics (DVD Side)



■ Photograph 1 SLD6361VL



■ Figure 3 SLD6361VL Representative Characteristics (CD Side)