

High Power Semiconductor Laser Diodes Feature Uniform Near Field Pattern

SLD333V

SLD334YT

To take advantage of its semiconductor laser diode technology that features with extremely high electric to optical power conversion efficiencies, Sony provides a full product line of high power IR semiconductor laser diodes in the 100 mW to several 10 W range.

Now, to respond to demand for laser diodes that provide both high power and uniform near field pattern (NFP), Sony has developed the 1 W output SLD333V and the 2 W output SLD334YT.

- Uniform NFP characteristics
- Low operating current
- SLD333V: Maximum optical power output of 1 W
- SLD334YT: Maximum optical power output of 2 W

■ Uniform NFP Characteristics

One desired application of watt class superhigh power semiconductor laser diodes is for high-efficiency excitation in place of the excitation lamps used with solid-state lasers. Thus the main requirement on earlier superhigh power laser diodes was for higher power regardless of other characteristics. However, along with their more widespread availability, there are now desires to directly use the high power beams from these laser diodes to machine or modify the characteristics of various materials. As a result, we now hear requests for not only high power levels, but additionally for uniform NFP characteristics. To respond to these desires, Sony has now succeeded in using the index guide structure, which had previously not been introduced in watt class laser diodes, to radically improve the NFP characteris-

tics. We are hopeful that these new products will be used in printers and other fields.

■ Low Operating Current

Due to the introduction of the index guide structure mentioned above, accurate control of current injection to the emitting region, and precise control of the emitting region became possible. Compared to conventional laser diodes with the same output, loss currents have been reduced, achieving a lower operating current value.

■ Two Laser Diodes Products Respond to Application Needs

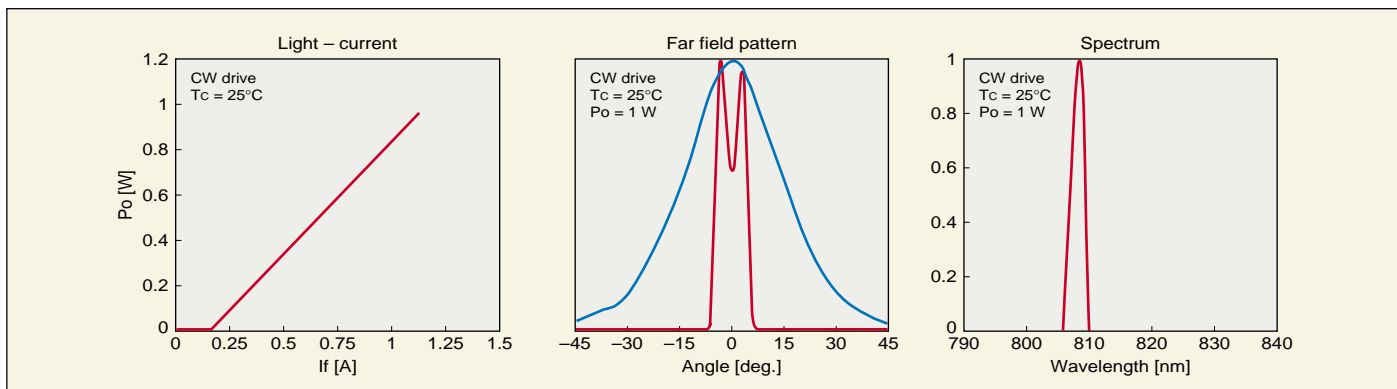
To respond to an even wider range of application needs, Sony developed two laser diode products that differ in both their power output and the package.

The SLD333V operates with an optical power output of up to 1 W from 100 μm laser beam width. It is provided in the extremely easy-to-use $\phi 9$ mm CAN package that is used in conventional superhigh power IR laser diodes.

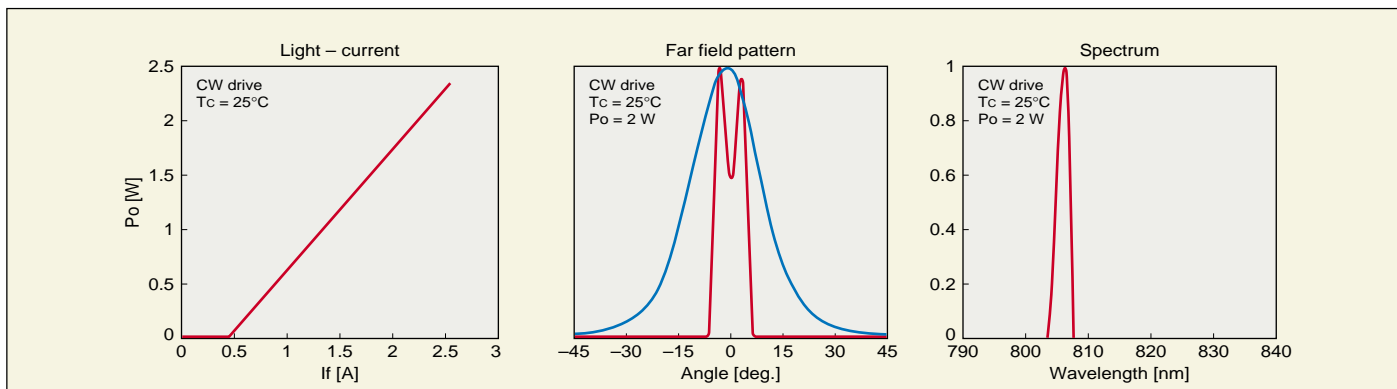
The SLD334YT operates with an optical power output of up to 2 W from 200 μm laser beam width. It is provided in a YT package that includes a built-in peltier controller to allow even more precise temperature control.

V O I C E

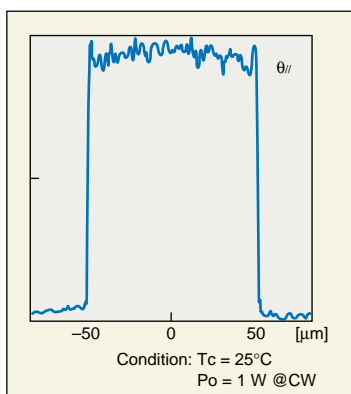
It took an incredible number of NFP measurements to develop this laser. Sometimes, when I closed my eyes, I'd see NFP characteristics on the backs of my eyelids, and, of course, they appeared in my dreams. Still, I made it through that period and created an extremely high output product. I hope to be able to create even better products in the future.



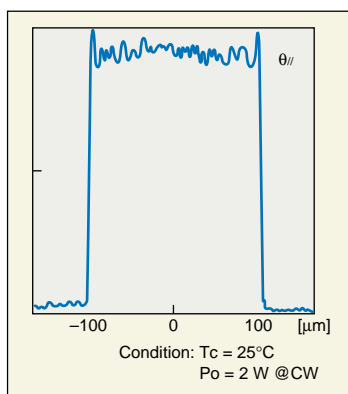
■ Figure 1 SLD333V Representative Characteristics



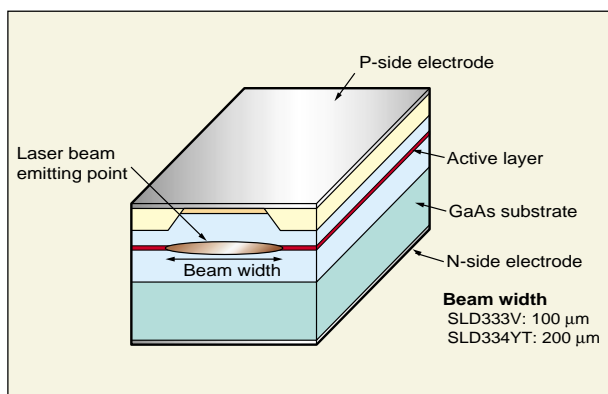
■ Figure 2 SLD334YT Representative Characteristics



■ Figure 3 SLD333V NFP Characteristics



■ Figure 4 SLD334YT NFP Characteristics



■ Figure 5 Chip Structure

■ Table 1 SLD333V Main Specifications

Item	Symbol	Typical value	Unit
Threshold current	I_{th}	0.2	mA
Operating current	I_{op}	1.2	
Operating voltage	V_{op}	2.0	V
Wavelength	λ_p	808	nm
Radiation angle	Parallel	$\theta_{//}$	deg.
	Perpendicular	θ_{\perp}	
Differential efficiency	η_D	0.9	W/A

Condition: $T_c = 25^\circ\text{C}$
 $P_o = 1$ W @ CW

■ Table 2 SLD334YT Main Specifications

Item	Symbol	Typical value	Unit
Threshold current	I_{th}	0.6	mA
Operating current	I_{op}	2.2	
Operating voltage	V_{op}	2.0	V
Wavelength	λ_p	808	nm
Radiation angle	Parallel	$\theta_{//}$	deg.
	Perpendicular	θ_{\perp}	
Differential efficiency	η_D	0.9	W/A

Condition: $T_c = 25^\circ\text{C}$
 $P_o = 2$ W @ CW