

SONY

SLD303V

## 500mW High Power Laser Diode

### Description

SLD303V are gain-guided, high-power laser diodes fabricated by MOCVD.

MOCVD: Metal Organic Chemical Vapor Deposition

### Features

- High power  
Recommended power output  $P_o=450\text{mW}$
- Small operating current

### Applications

- Solid state laser excitation
- Medical use

### Structure

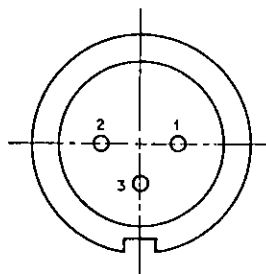
GaAlAs double-hetero laser diode

### Absolute Maximum Ratings ( $T_c=25^\circ\text{C}$ )

- |                         |           |            |                  |
|-------------------------|-----------|------------|------------------|
| • Radiant power output  | $P_o$     | 500        | mW               |
| • Reverse voltage       | $V_R$     | LD 2       | V                |
|                         |           | PD 15      | V                |
| • Operating temperature | $T_{opr}$ | -10 to +30 | $^\circ\text{C}$ |
| • Storage temperature   | $T_{stg}$ | -40 to +85 | $^\circ\text{C}$ |

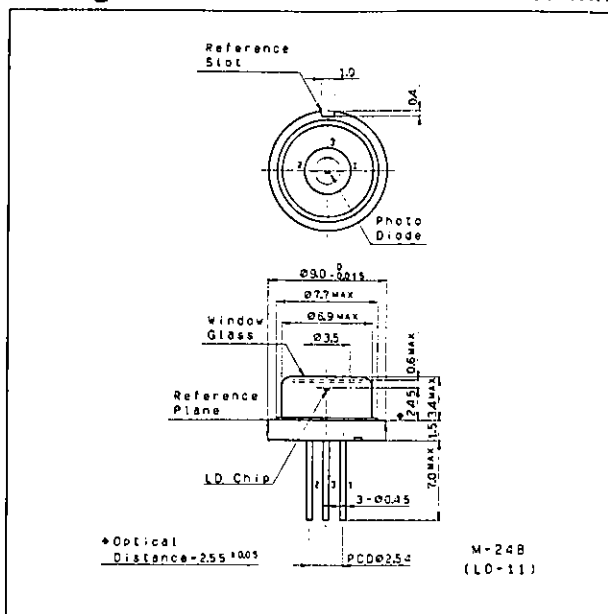
### Pin Configuration (Bottom View)

| No. | Function            |
|-----|---------------------|
| 1   | Laser diode cathode |
| 2   | Photodiode anode    |
| 3   | Common              |



### Package Outline

Unit: mm



## Optical and Electrical Characteristics

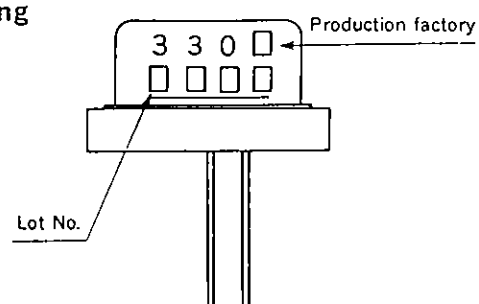
 $T_c = 25^\circ\text{C}$ 

| Item                            |               | Symbol               | Condition                                  | Min. | Typ. | Max.     | Unit          |
|---------------------------------|---------------|----------------------|--------------------------------------------|------|------|----------|---------------|
| Threshold current               |               | $I_{th}$             |                                            |      | 450  | 600      | mA            |
| Operating current               |               | $I_{OP}$             | $P_o = 450\text{mW}$                       |      | 950  | 1500     | mA            |
| Operating voltage               |               | $V_{OP}$             | $P_o = 450\text{mW}$                       |      | 1.9  | 3.0      | V             |
| Wavelength*                     |               | $\lambda_p$          | $P_o = 450\text{mW}$                       | 770  |      | 840      | nm            |
| Monitor current                 |               | $I_{mon}$            | $P_o = 450\text{mW}$<br>$V_R = 10\text{V}$ |      | 0.8  |          | mA            |
| Radiation angle<br>(F. W. H. M) | Perpendicular | $\theta_{\perp}$     | $P_o = 450\text{mW}$                       |      | 28   | 40       | degree        |
|                                 | Parallel      | $\theta_{\parallel}$ |                                            |      | 12   | 17       | degree        |
| Positional accuracy             | Position      | $\Delta X, \Delta Y$ | $P_o = 450\text{mW}$                       |      |      | $\pm 50$ | $\mu\text{m}$ |
|                                 | Angle         | $\Delta\phi_{\perp}$ |                                            |      |      | $\pm 3$  | degree        |
| Slope efficiency                |               | $\eta_D$             | $P_o = 450\text{mW}$                       | 0.65 | 0.9  |          | mW/mA         |

## \*Wavelength Selection Classification

| Type       | Wavelength (nm) |
|------------|-----------------|
| SLD303V-1  | $785 \pm 15$    |
| SLD303V-2  | $810 \pm 10$    |
| SLD303V-3  | $830 \pm 10$    |
| SLD303V-21 | $798 \pm 3$     |
| -24        | $807 \pm 3$     |
| -25        | $810 \pm 3$     |

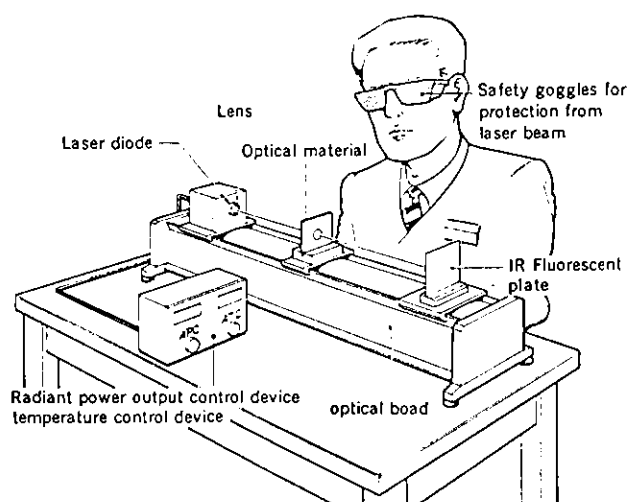
## Marking



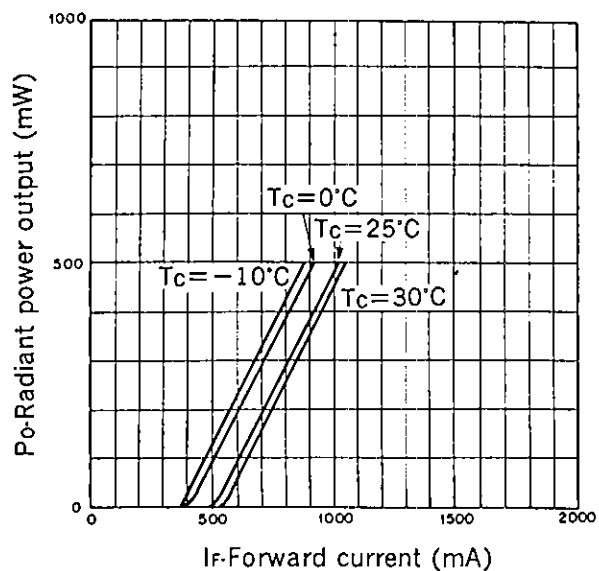
## Precautions

## Eye protection against laser beams

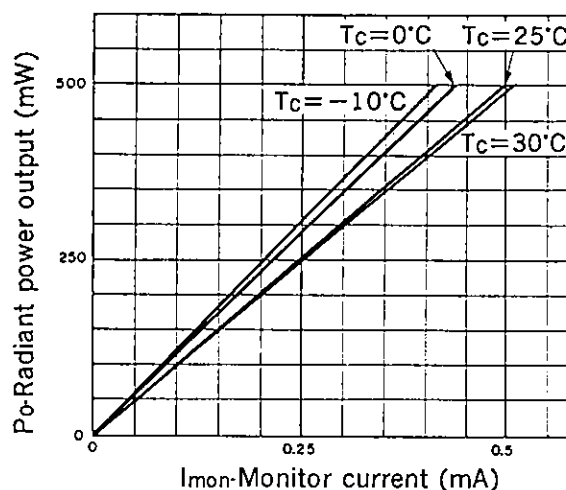
The optical output of laser diodes ranges from several milliwatts to one watt. However the optical density of the laser beam at the diode chip reaches 1 megawatt per square centimeter. Unlike gas lasers, since laser diode beams are divergent, uncollimated laser diode beams are fairly safe at a laser diode. For observing laser beams, ALWAYS use safety goggles that block infrared rays. Usage of IR scopes, IR cameras and fluorescent plates is also recommended for monitoring laser beams safely.



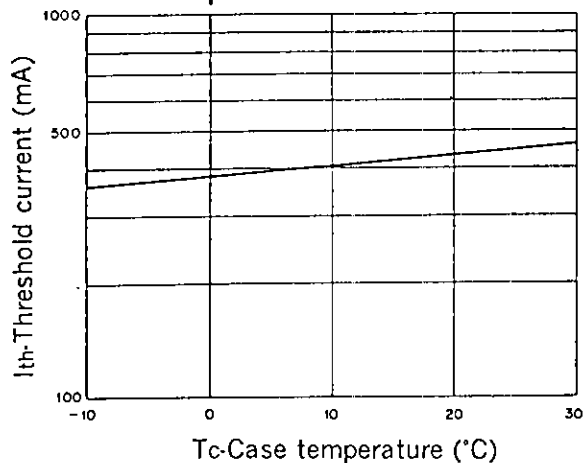
Radiant power output vs.  
Forward current characteristics



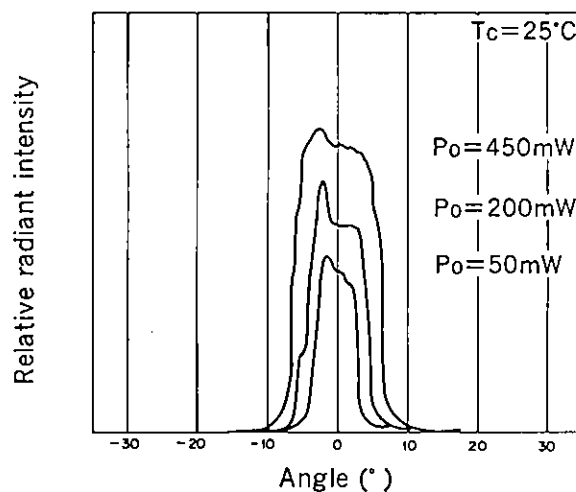
Radiant power output vs.  
Monitor current characteristics



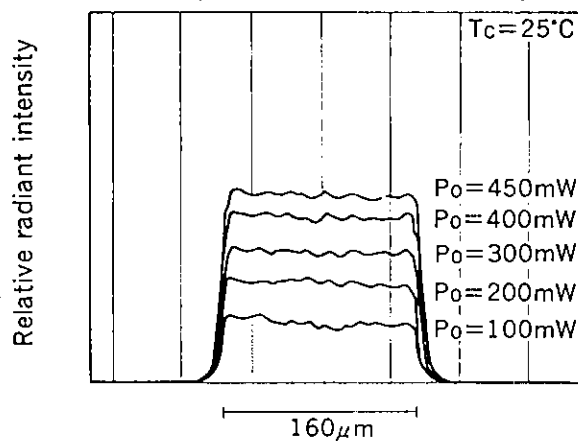
Threshold current vs.  
Temperature characteristics



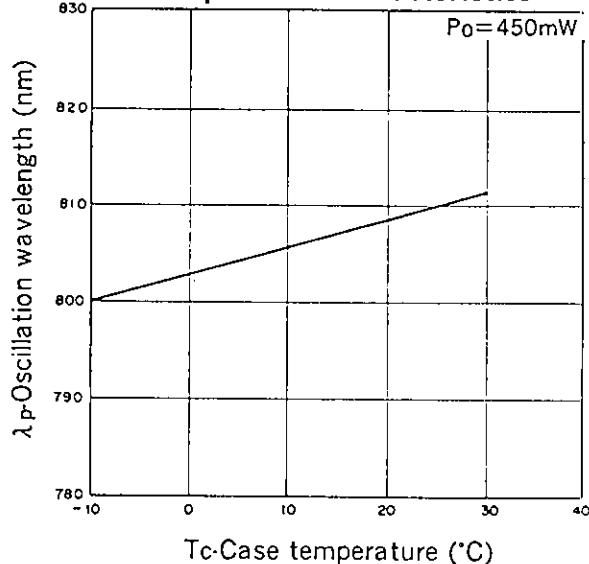
Power dependence of far field pattern  
(parallel to junction)



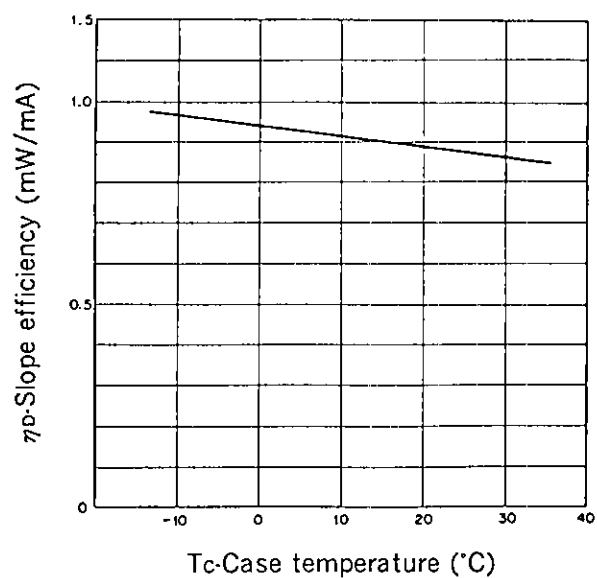
Power dependence of near field pattern



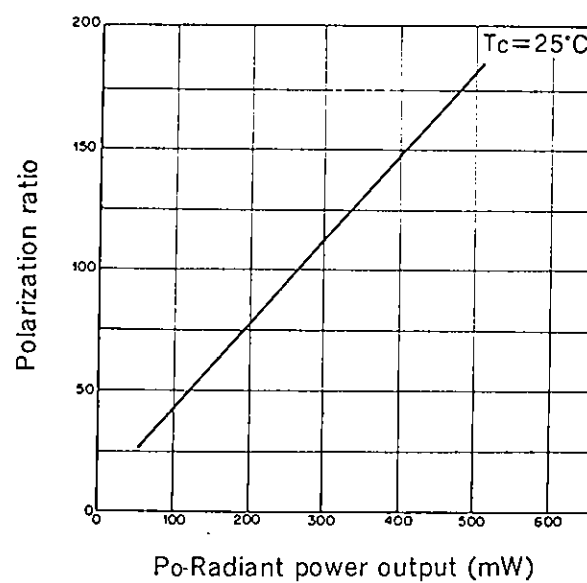
Oscillation wavelength vs.  
Temperature characteristics



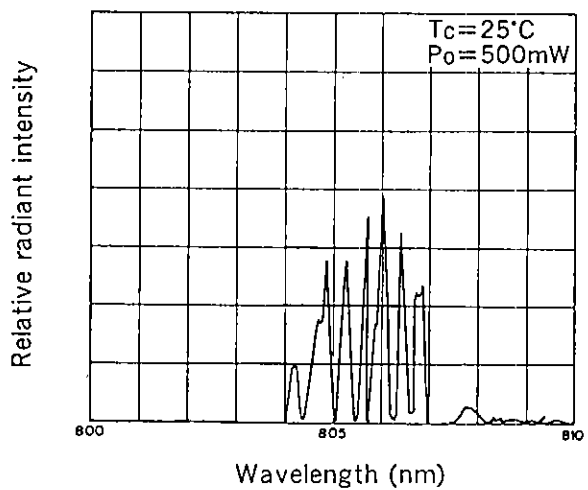
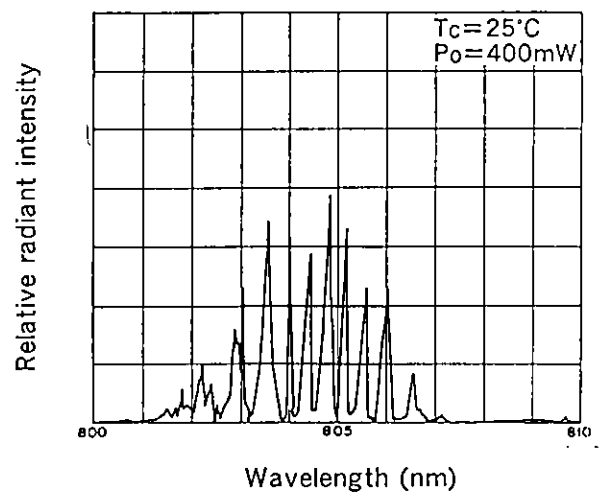
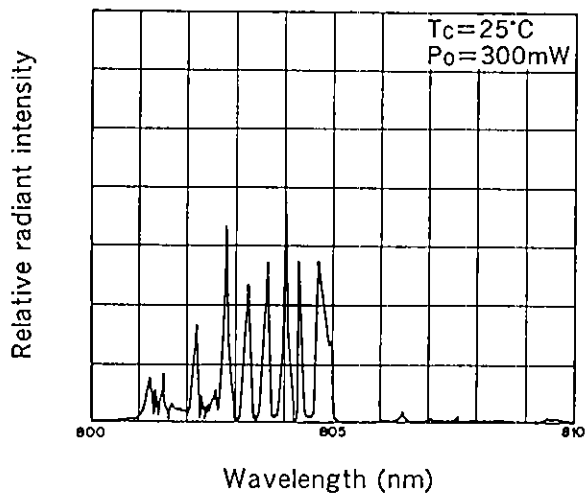
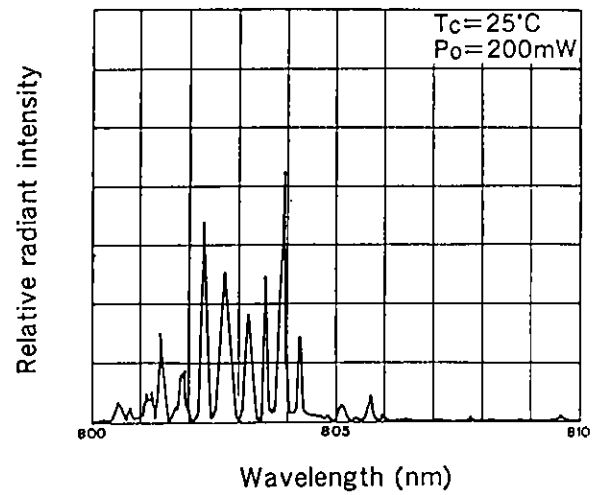
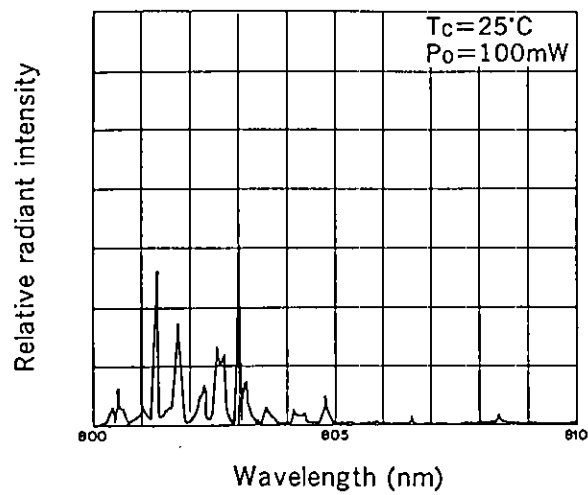
Slope efficiency vs.  
Temperature characteristics



Power dependence of polarization ratio



## Power dependence of wavelength



Temperature dependence of wavelength ( $P_o=450\text{mW}$ )