SONY

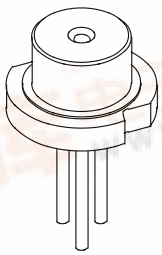
# SLD1133VL-53

## 650nm Index-Guided Red Laser Diode

### Description

The SLD1133VL-53 is an index-guided red laser diode designed for DVD systems. For bar code scanners, its wavelength (650nm Typ.) is 20nm shorter than that of the current device.

M-274



### Features

- Small astigmatism (7µm typ.)
- Low operating current (60mA typ.)
- Small package (ϕ5.6mm)
- Single longitudinal mode

### Applications

- DVD
- Bar code scanner

### Structure

- AlGaInP quantum well structure laser diode
- PIN photo diode for optical power output monitor

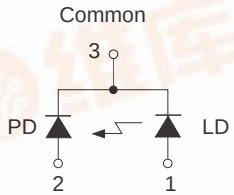
### Recommended Optical Power Output

5mW

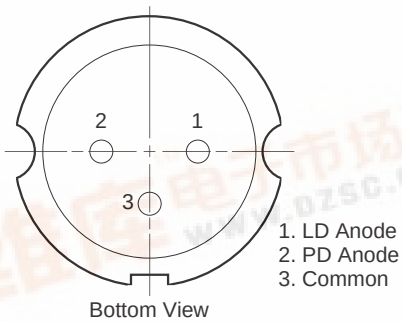
### Absolute Maximum Ratings (Tc = 25°C)

| | | | | |
|---|---|---|---|---|
| • Optical power output | Po | | 7 | mW |
| • Reverse voltage | $V_R$ | LD | 2 | V |
| | | PD | 15 | V |
| • Operating temperature | Topr | | –10 to +70 | °C |
| • Storage temperature | Tstg | | –40 to +85 | °C |

### Connection Diagram




### Pin Configuration








E98213C92-PS

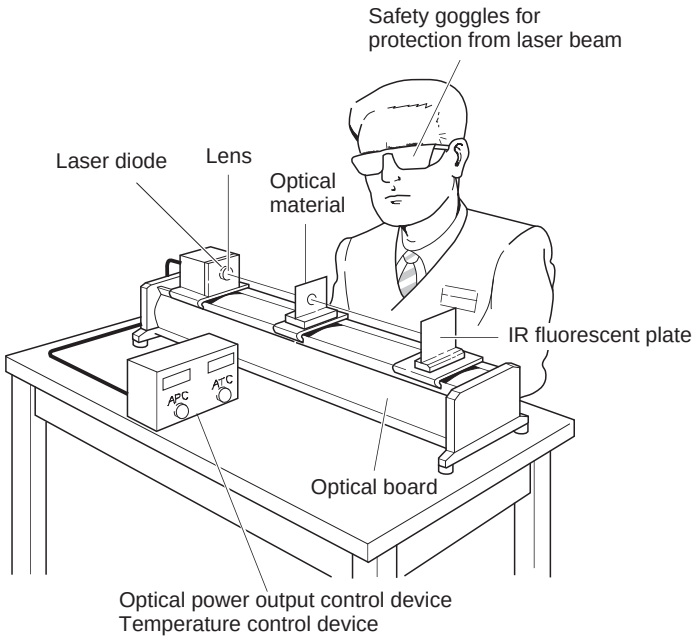
**Electrical and Optical Characteristics** (Tc: Case temperature, Tc = 25°C)

| Item | | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Threshold current | | Ith | | | 50 | 65 | mA |
| Operating current | | Iop | Po = 5mW | | 60 | 70 | mA |
| Operating voltage | | Vop | Po = 5mW | | 2.3 | 2.8 | V |
| Wavelength | | λ | Po = 5mW | 640 | 650 | 660 | nm |
| Radiation angle | Perpendicular | θ⊥ | Po = 5mW | 24 | 30 | 40 | degree |
| | Parallel | θ// | | 7 | 8 | 10 | degree |
| Positional accuracy | Position | ΔX, ΔY, ΔZ | Po = 5mW | | | ±80 | μm |
| | Angle | Δϕ// | | | | ±2 | degree |
| | | Δϕ⊥ | | | | ±3 | degree |
| Differential efficiency | | ηD | Po = 5mW | 0.15 | 0.4 | 0.7 | mW/mA |
| Astigmatism | | As | Po = 5mW | | 7 | 15 | μm |
| Monitor current | | Imon | Po = 5mW, $V_R$ = 5V | 0.08 | 0.1 | 0.25 | mA |

**Handling Precautions**

(1) Eye protection against laser beams

The optical output of laser diodes ranges from several mW to 4W. However the optical power density of the laser beam at the diode chip reaches 1MW/cm$^2$. 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.

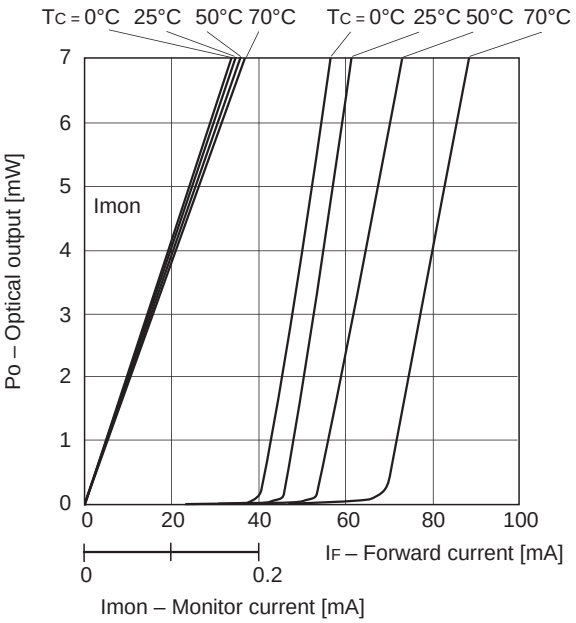



(2) Prevention of surge current and electrostatic discharge

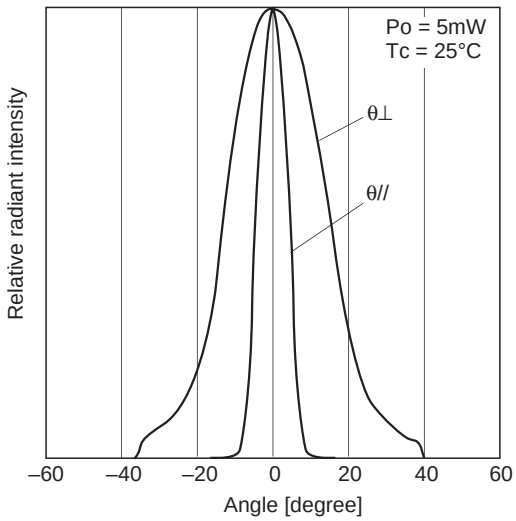
Laser diode is most sensitive to electrostatic discharge among semiconductors. When a large current is passed through the laser diode even for an extremely short time (in the order of nanosecond), the strong light emitted from the laser diode promotes deterioration and then laser diodes are destroyed. Therefore, note that the surge current should not flow the laser diode driving circuit from switches and others. Also, if the laser diode is handled carelessly, it may be destructed instantly because electrostatic discharge is easily applied by a human body. Be great careful about excess current and electrostatic discharge.

## Example of Representative Characteristics

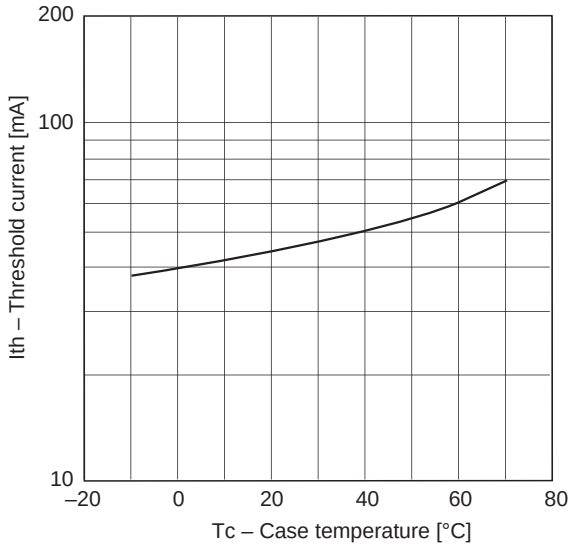
**Optical power output vs. Forward current characteristics**
**Optical power output vs. Monitor current characteristics**



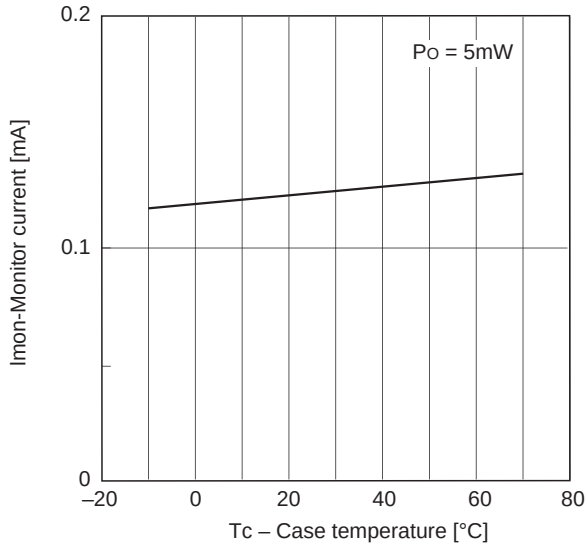

**Far field pattern (FFP)**



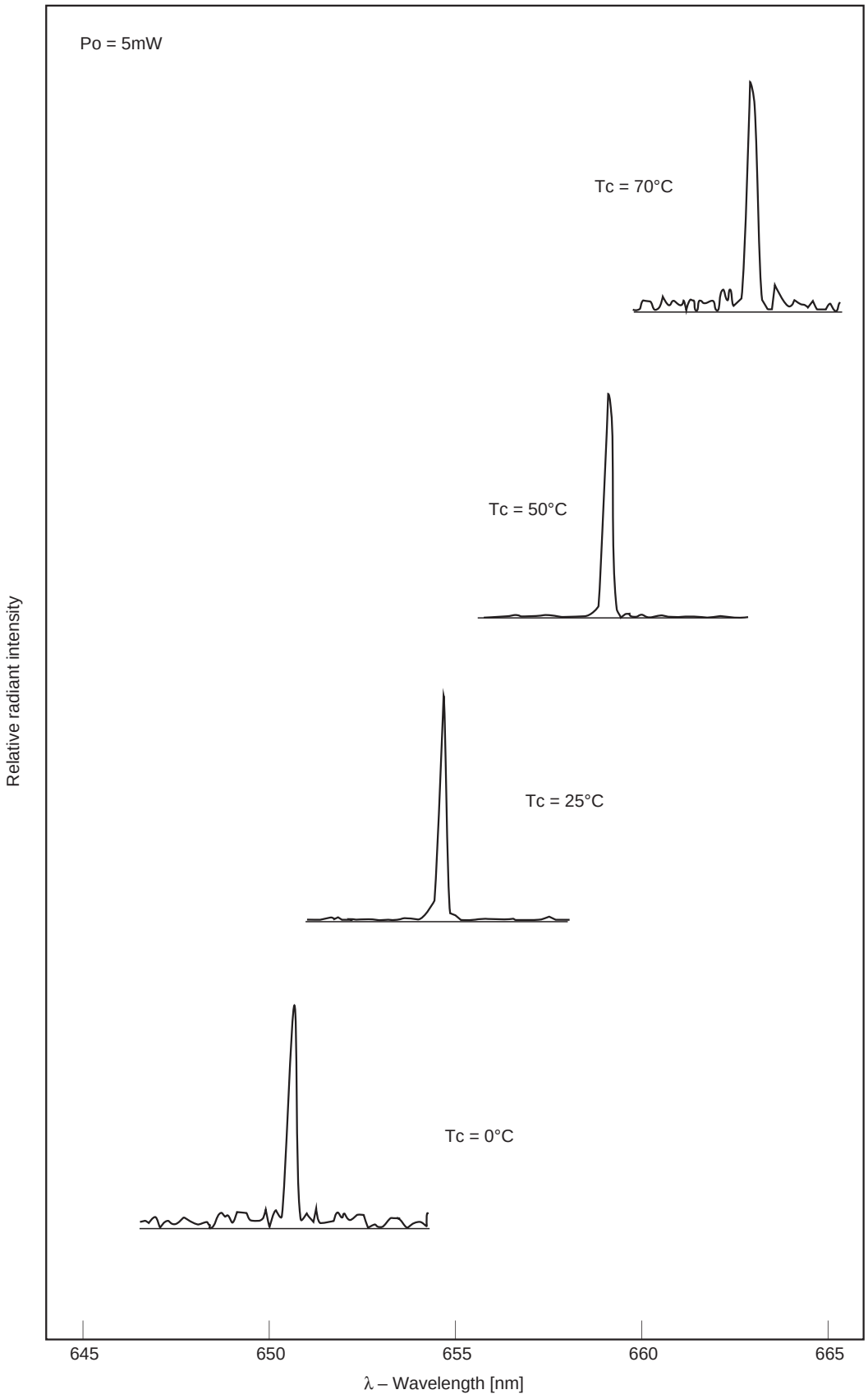

**Threshold current vs. Temperature characteristics**



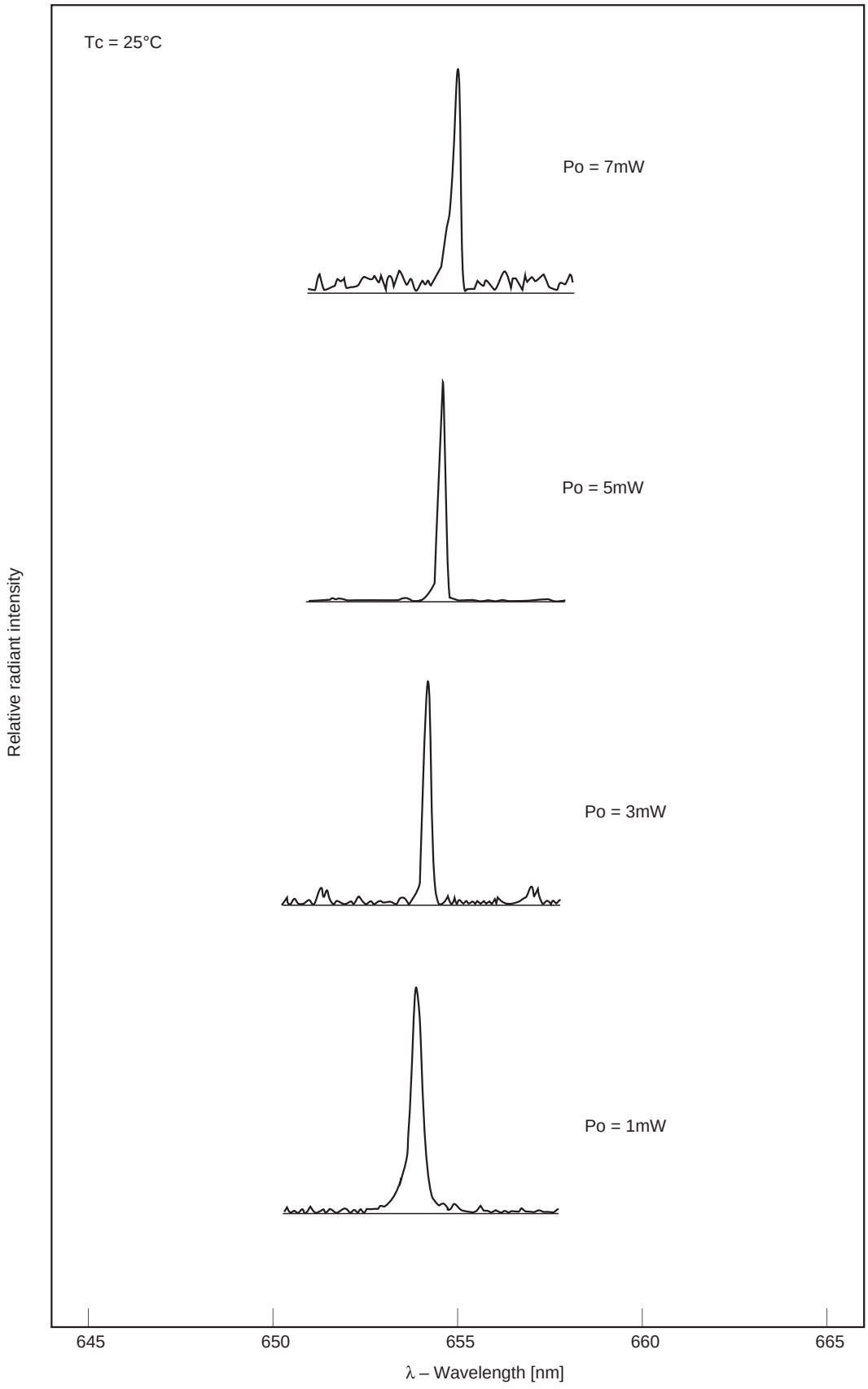

**Monitor current vs. Temperature characteristics**



**Temperature dependence of spectrum**



**Power output dependence of spectrum**



**Package Outline** Unit: mm

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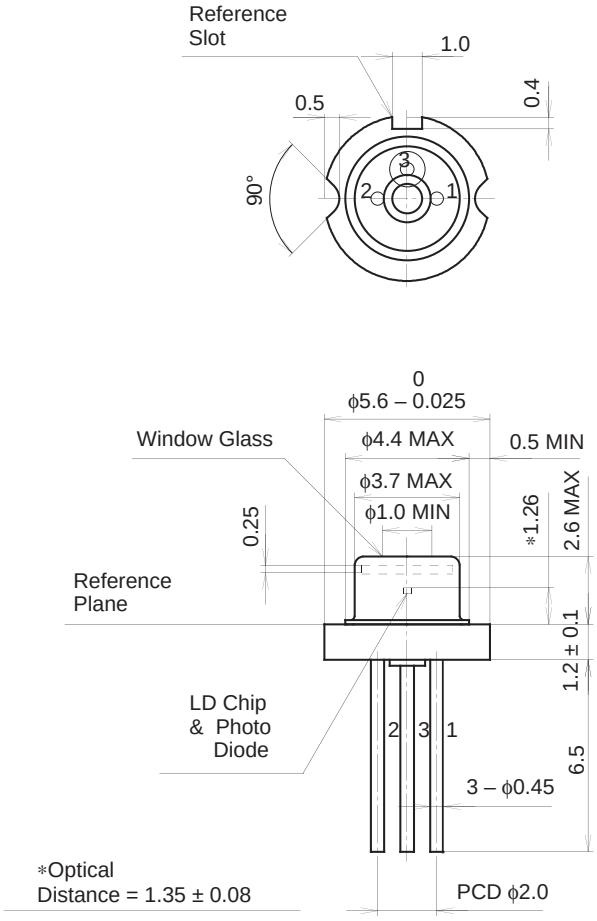


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|---|---|
| SONY CODE | M-274 |
| EIAJ CODE | ———— |
| JEDEC CODE | ———— |

| | |
|---|---|
| PACKAGE WEIGHT | 0.3g |