

AlGaAs laser diodes

RLD-78MV

The RLD-78MV is the world's first mass-produced laser diodes to be mass produced by molecular beam epitaxy. Low-noise is achieved through self-pulsation. This laser diode is ideal for use in video disc players.

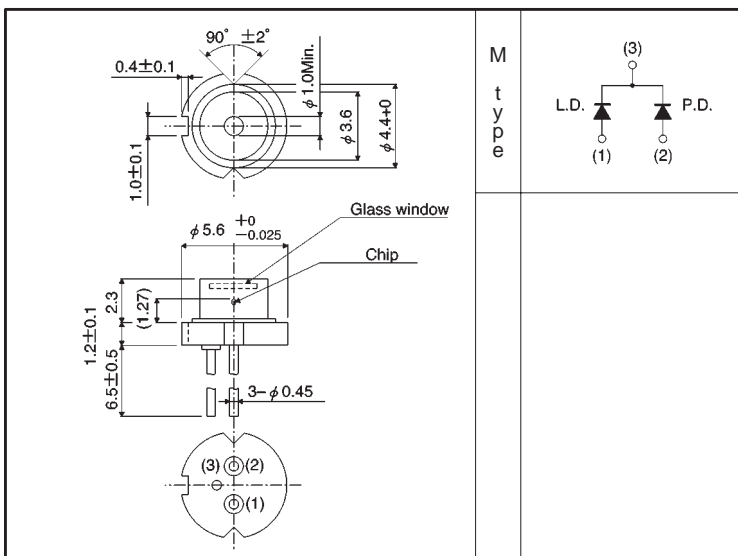
●Applications

Video disc players (VD) (LD)

●Features

- 1) Low noise.
- 2) Low astigmatism.
- 3) Noise is independent of optical feedback.
- 4) Signal-to-noise ratio guaranteed over entire operating temperature range.
- 5) High-precision, compact package.

●External dimensions (Units: mm)



●Absolute maximum ratings ($T_c = 25^\circ\text{C}$)

| Parameter | | Symbol | Limits | Unit |
|-----------------------|----------------|-------------|----------------|------------------|
| Output | | P_o | 5 | mW |
| Reverse voltage | Laser | V_R | 2 | V |
| | PIN photodiode | V_R (PIN) | 30 | V |
| Operating temperature | | T_{opr} | $-10 \sim +60$ | $^\circ\text{C}$ |
| Storage temperature | | T_{stg} | $-40 \sim +85$ | $^\circ\text{C}$ |

●Electrical and optical characteristics (Tc = 25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Conditions |
|--------------------------------|--|------|------|------|---------|--|
| Threshold current | I _{th} | — | 45 | 60 | mA | — |
| Operating current | I _{op} | — | 55 | 70 | mA | Po=3mW |
| Operating voltage | V _{op} | — | 1.9 | 2.3 | V | Po=3mW |
| Differential efficiency | η | 0.1 | 0.25 | 0.6 | mW / mA | $\frac{2\text{mW}}{I(3\text{mW}) - I(1\text{mW})}$ |
| Monitor current | I _m | 0.1 | 0.2 | 0.6 | mA | Po=3mW, V _{R(PIN)} =15V |
| Parallel divergence angle | θ _∥ * | 8 | 11 | 15 | deg | Po=3mW |
| Perpendicular divergence angle | θ _⊥ * | 20 | 37 | 45 | deg | |
| Parallel deviation angle | Δθ _∥ | — | — | ±2 | deg | |
| Perpendicular deviation angle | Δθ _⊥ | — | — | ±3 | deg | |
| Emission point accuracy | $\begin{matrix} \Delta X \\ \Delta Y \\ \Delta Z \end{matrix}$ | — | — | ±80 | μm | — |
| Peak emission wavelength | λ | 770 | 785 | 810 | nm | Po=3mW |
| Signal-to-noise ratio | S / N | 60 | — | — | dB | f=10kHz, Δf=10kHz |

* θ_∥ and θ_⊥ are defined as the angle within which the intensity is 50% of the peak value.

●Electrical and optical characteristic curves

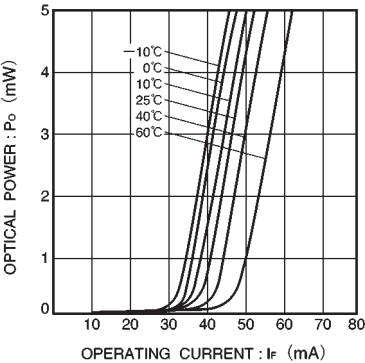


Fig. 1 Optical output vs. operating current

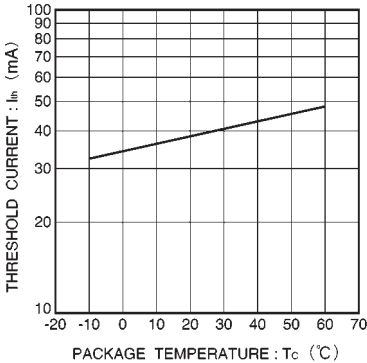


Fig. 2 Dependence of threshold current on temperature

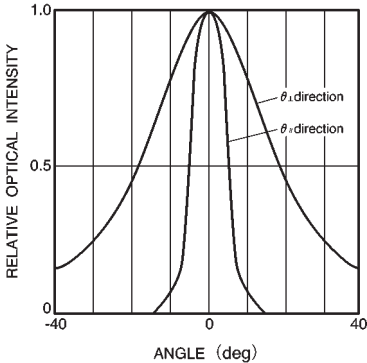


Fig. 3 Far field pattern

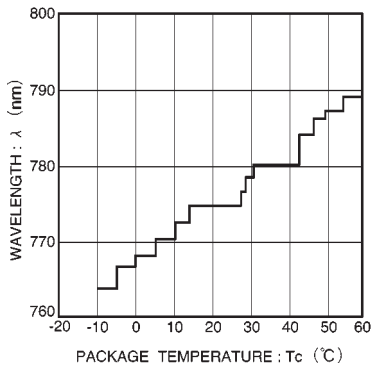


Fig. 4 Dependence of wavelength on temperature

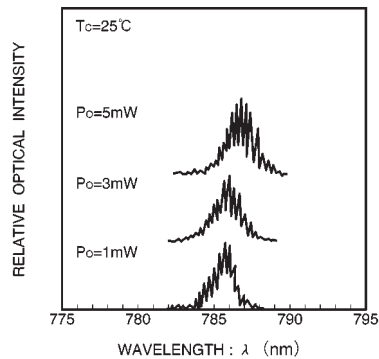


Fig. 5 Dependence of emission spectrum on optical output

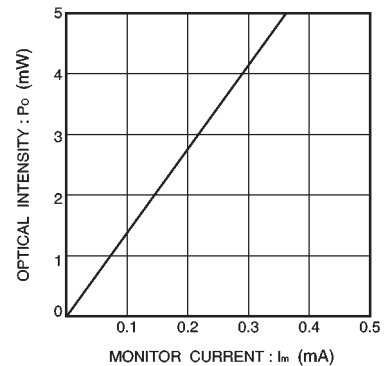


Fig. 6 Monitor current vs. optical output

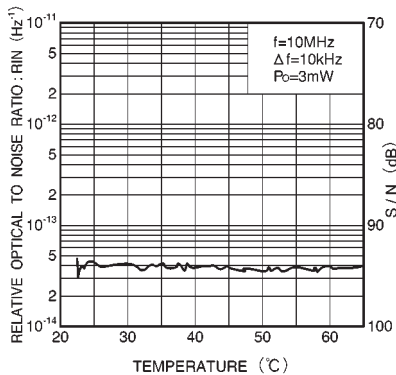


Fig. 7 Temperature dependence of noise

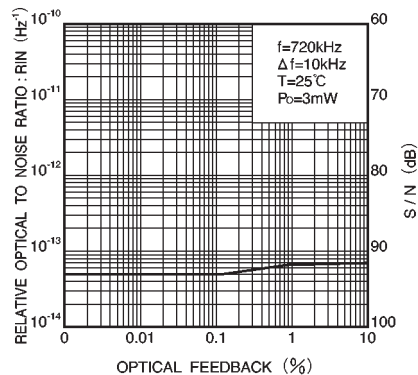


Fig. 8 Dependence of noise on optical feedback