# AlGaAs laser diodes RLD-78MAT1

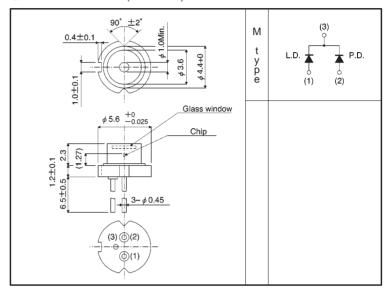
The RLD-78MAT1 is the world's first mass-produced laser diodes that is manufactured by molecular beam epitaxy. The signal-to-noise ratio is stable in comparison to previous manufacturing techniques. This device is ideal for compact disc players in cars.

## Applications Compact disc players in cars Navigation system

#### Features

- Signal-to-noise ratio guaranteed over entire operating temperature range.
- 2) Reduced facet reflection.
- One-third dispersion compared with conventional laser diodes.
- 4) High-precision, compact package.
- 5) General purpose polarity type is available. (M type)

#### External dimensions (Units: mm)



#### ● Absolute maximum ratings (Tc = 25°C)

| Parameter             |                | Symbol   | Limits  | Unit |
|-----------------------|----------------|----------|---------|------|
| Output                |                | Po       | 5       | mW   |
| Reverse<br>voltage    | Laser          | VR       | 2       | V    |
|                       | PIN photodiode | VR (PIN) | 30      | V    |
| Operating temperature |                | Topr     | -10~+80 | °C   |
| Storage temperature   |                | Tstg     | -40~+90 | °C   |

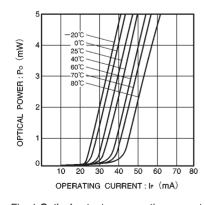
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### ●Electrical and optical characteristics (Tc = 25°C)

| Parameter                         | Symbol         | Min. | Тур. | Max. | Unit  | Conditions           |  |
|-----------------------------------|----------------|------|------|------|-------|----------------------|--|
| Threshold current                 | Ith            | _    | 35   | 60   | mA    | _                    |  |
| Operating current                 | lop            | _    | 45   | 70   | mA    | Po=3mW               |  |
| Operating voltage                 | Vop            | _    | 1.9  | 2.3  | ٧     | Po=3mW               |  |
| Differential efficiency           | η              | 0.1  | 0.25 | 0.6  | mW/mA | 2mW<br>I(3mW)—I(1mW) |  |
| Monitor current                   | lm             | 0.1  | 0.2  | 0.6  | mA    | Po=3mW,VR(PIN)=15V   |  |
| Parallel divergence angle         | θ // *         | 8    | 11   | 15   | deg   |                      |  |
| Perpendicular<br>divergence angle | <i>θ</i> ⊥*    | 20   | 37   | 45   | deg   | Po=3mW               |  |
| Parallel deviation angle          | Δθ"            | _    | _    | ±2   | deg   |                      |  |
| Perpendicular deviation angle     | Δθ⊥            | _    | _    | ±з   | deg   |                      |  |
| Emission point accuracy           | ΔX<br>ΔΥ<br>ΔΖ | _    | _    | ±80  | μm    | _                    |  |
| Peak emission wavelength          | λ              | 770  | 785  | 810  | nm    | Po=3mW               |  |
| Signal-to-noise ratio             | S/N            | 60   | _    | _    | dB    | f=720kHz, Δf=10kHz   |  |

<sup>\*</sup>  $\theta$  // and  $\theta$   $\perp$  are defined as the angle within which the intensity is 50% of the peak value.

#### Electrical and optical characteristic curves



PACKAGE TEMPERATURE: Tc (°C)

ANGLE (deg)

Fig. 1 Optical output vs. operating current

Fig. 2 Dependence of threshold current on temperature

Fig. 3 Far field pattern



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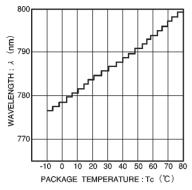


Fig. 4 Dependence of wavelength on temperature

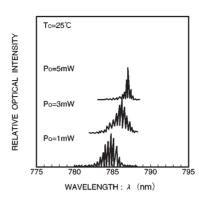


Fig. 5 Dependence of emission spectrum on optical output

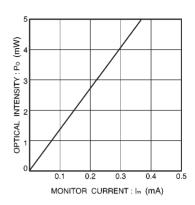


Fig. 6 Monitor current vs. optical output

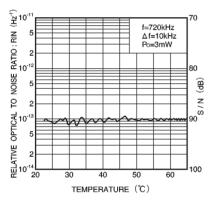


Fig. 7 Temperature dependence of noise

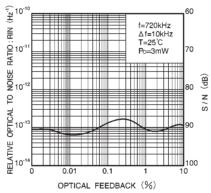


Fig. 8 Dependence of noise on optical feedback