

# 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 audio in cars.

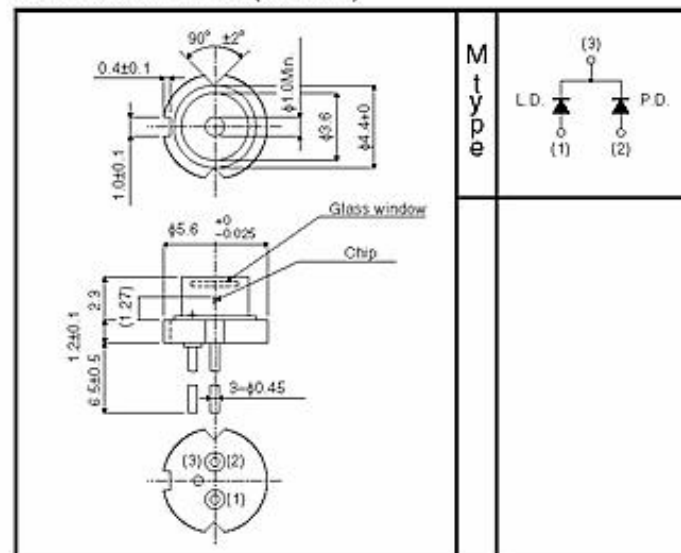
### ●Applications

Audio in cars  
Navigation system.

### ●Features

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

### ●External dimensions (Unit : mm)



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

Parameter	Symbol	Limits	Unit
Output	P <sub>O</sub>	5	mW
Reverse voltage	V <sub>R</sub>	2	V
Laser	V <sub>R(PIN)</sub>	30	V
PIN photodiode	T <sub>opr</sub>	-10 to +80	°C
Operating temperature	T <sub>stg</sub>	-40 to +90	°C
Storage temperature			

## Laser diodes

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold current	$I_{th}$	—	35	60	mA	—
Operating current	$I_{op}$	—	45	70	mA	$P_O=0.3mW$
Operating voltage	$V_{op}$	—	1.9	2.3	V	$P_O=0.3mW$
Differential efficiency	$\eta$	0.1	0.25	0.6	mW/mA	$\frac{2mW}{I(3mW)-I(1mW)}$
Monitor current	$I_m$	0.1	0.2	0.6	mA	$P_O=0.3mW, V_{R(PN)}=15V$
Parallel divergence angle	$\theta_{  }^*$	8	11	15	deg	$P_O=0.3mW$
Perpendicular divergence angle	$\theta_{\perp}^*$	20	37	45	deg	
Parallel deviation angle	$\Delta\phi_{  }$	—	—	$\pm 2$	deg	
Perpendicular deviation angle	$\Delta\phi_{\perp}$	—	—	$\pm 3$	deg	
Emission point accuracy	$\Delta X$ $\Delta Y$ $\Delta Z$	—	—	$\pm 80$	$\mu m$	—
Peak emission wavelength	$\lambda$	770	785	810	nm	$P_O=0.3mW$
Signal-to-noise ratio	S/N	60	—	—	dB	$f=720kHz, \Delta f=10kHz$

\*  $\theta_{||}$  and  $\theta_{\perp}$  are defined as the angle within which the intensity is 50% of the peak value.

## ●Electrical and optical characteristics curves

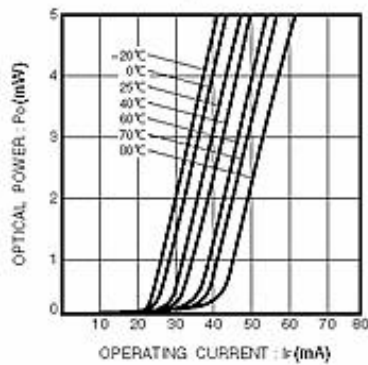


Fig. 1 Optical output vs. operating current

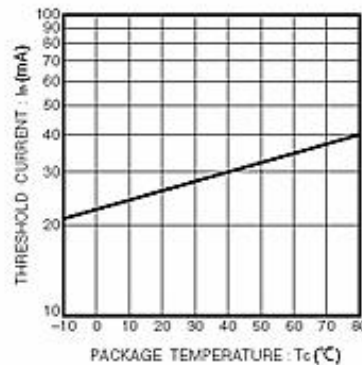


Fig. 2 Dependence of threshold current on temperature

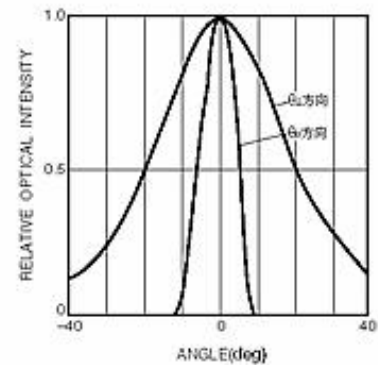


Fig. 3 Far field pattern

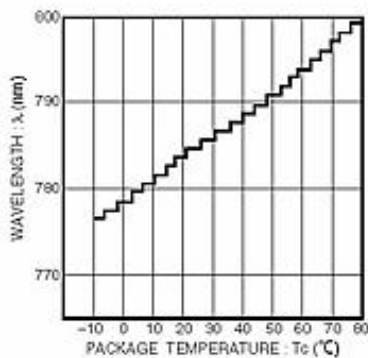


Fig. 4 Dependence of wavelength on temperature

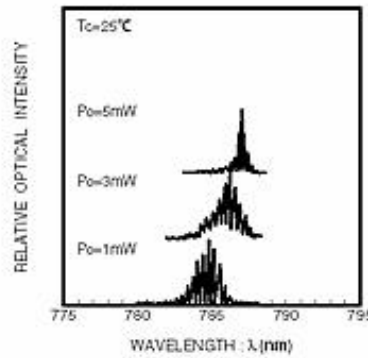


Fig. 5 Dependence of emission spectrum on optical output

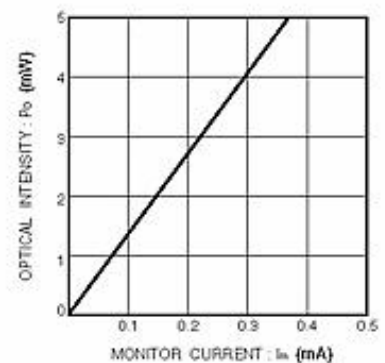


Fig. 6 Monitor current vs. optical output

## Laser diodes

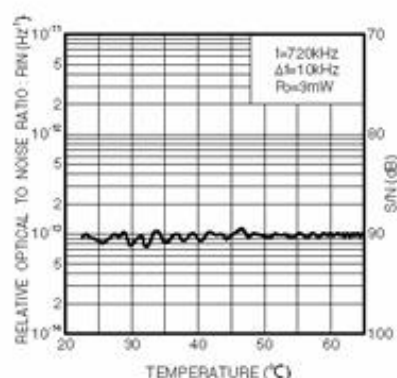


Fig. 7 Temperature dependence of noise

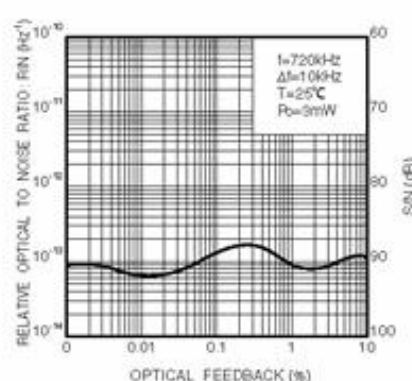


Fig. 8 Dependence of noise on optical feedback

## Appendix

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