

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.

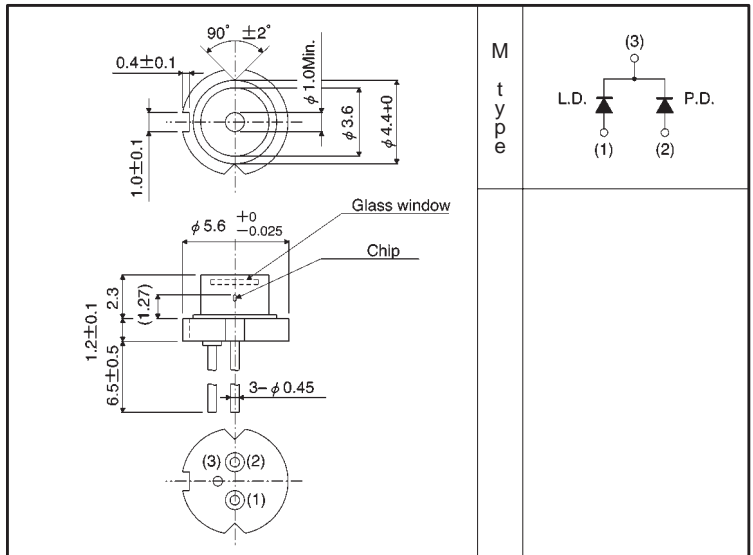
●Applications

Compact disc players in cars
Navigation system

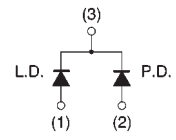
●Features

- 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 (Units: mm)



M
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e



●Absolute maximum ratings (Tc = 25°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~+80	°C	
Storage temperature	T _{stg}	-40~+90	°C	

●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	Po=3mW
Operating voltage	V_{op}	—	1.9	2.3	V	Po=3mW
Differential efficiency	η	0.1	0.25	0.6	mW/mA	$\frac{2mW}{I(3mW)-I(1mW)}$
Monitor current	I_m	0.1	0.2	0.6	mA	Po=3mW, V _{R(PIN)} =15V
Parallel divergence angle	$\theta_{//}$ *	8	11	15	deg	Po=3mW
Perpendicular divergence angle	θ_{\perp} *	20	37	45	deg	
Parallel deviation angle	$\Delta\theta_{//}$	—	—	±2	deg	
Perpendicular deviation angle	$\Delta\theta_{\perp}$	—	—	±3	deg	
Emission point accuracy	ΔX ΔY ΔZ	—	—	±80	μm	—
Peak emission wavelength	λ	770	785	810	nm	Po=3mW
Signal-to-noise ratio	S / N	60	—	—	dB	f=720kHz, Δf=10kHz

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

●Electrical and optical characteristic curves

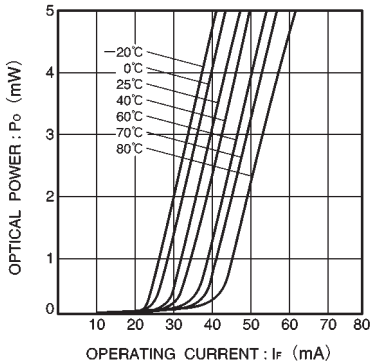


Fig. 1 Optical output vs. operating current

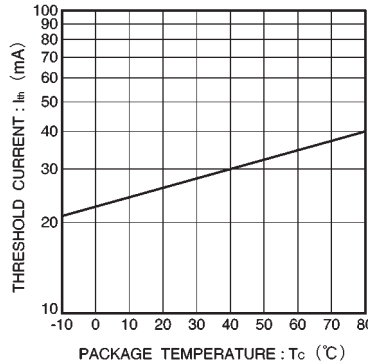


Fig. 2 Dependence of threshold current on temperature

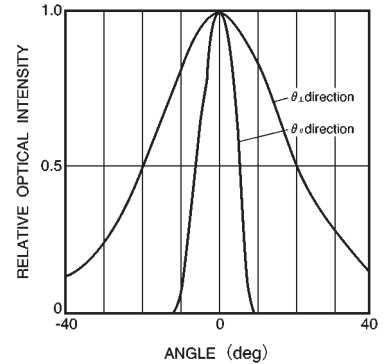


Fig. 3 Far field pattern

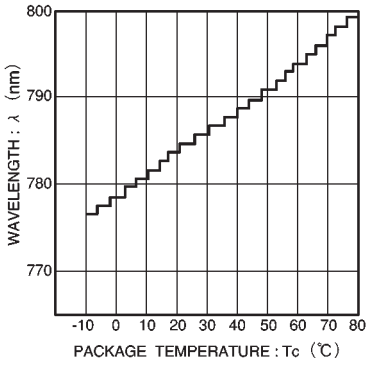


Fig. 4 Dependence of wavelength on temperature

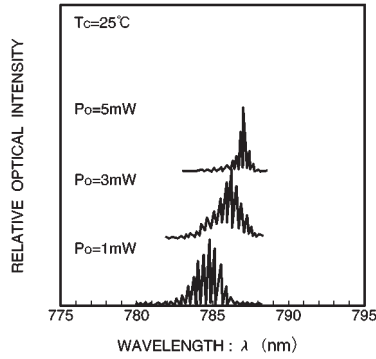


Fig. 5 Dependence of emission spectrum on optical output

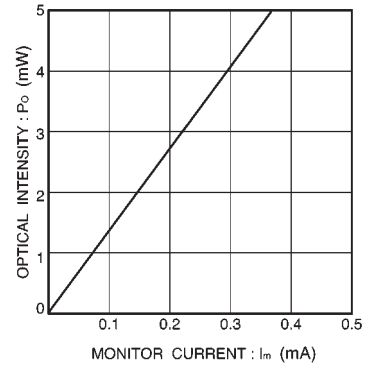


Fig. 6 Monitor current vs. optical output

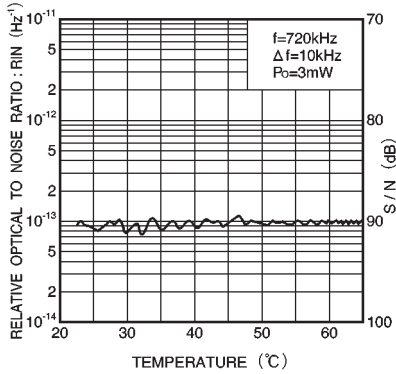


Fig. 7 Temperature dependence of noise

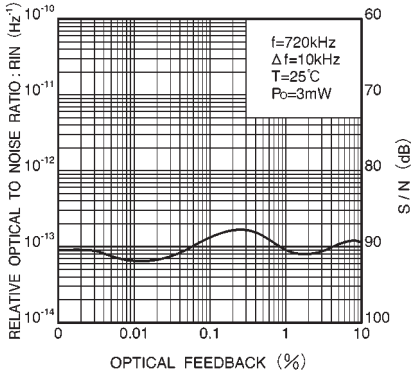


Fig. 8 Dependence of noise on optical feedback