

# AlGaAs laser diodes

## RLD-78MIT / RLD-78PIT / RLD-78NIT

The RLD-78MIT, RLD-78PIT and RLD-78NIT are the world's first mass-produced laser diodes those are manufactured by molecular beam epitaxy. Modal noise is controlled by relaxation oscillation, and they are ideal for short-distance, high-speed optical communications.

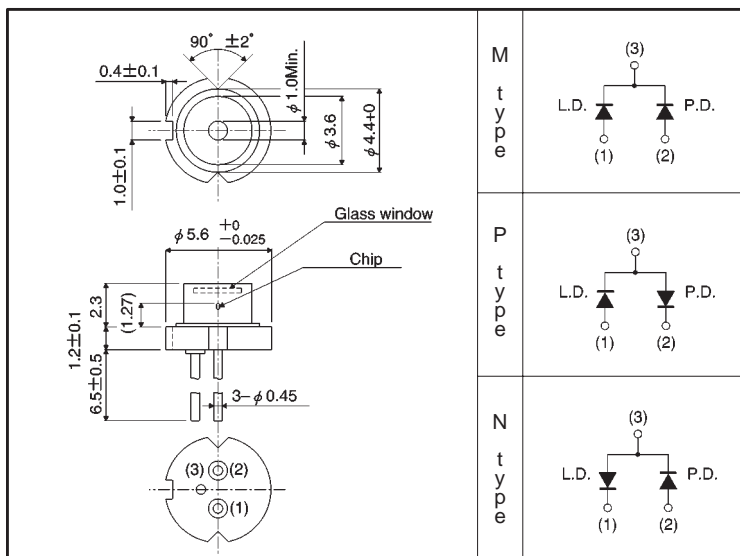
### ●Applications

Short-distance optical communications

### ●Features

- 1) High oscillation relaxation frequency.
- 2) Little transmission loss within optical fiber.
- 3) High-precision, compact package.
- 4) Little dispersion of characteristics.
- 5) Long life.
- 6) Can be driven by single power supply (P and N types).

### ●External dimensions (Units: mm)



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

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

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Threshold current	$I_{th}$	—	35	50	mA	—
Operating current	$I_{op}$	—	45	65	mA	Po=3mW
Operating voltage	$V_{op}$	—	1.9	2.3	V	Po=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	Po=3mW, V <sub>R(PIN)</sub> =15V
Parallel divergence angle	$\theta_{//}^*$	8	11	15	deg	Po=3mW
Perpendicular divergence angle	$\theta_{\perp}^*$	28	37	45	deg	
Parallel deviation angle	$\Delta\phi_{//}$	—	—	±2	deg	
Perpendicular deviation angle	$\Delta\phi_{\perp}$	—	—	±3	deg	
Emission point accuracy	$\Delta X$ $\Delta Y$ $\Delta Z$	—	—	±80	μm	—
Peak emission wavelength	$\lambda$	770	785	810	nm	Po=3mW
Relaxation oscillation frequency	f <sub>r</sub>	1.8	—	—	GHz	P <sub>ave</sub> =1.5mW, 50%duty

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

## ●Electrical and optical characteristic curves

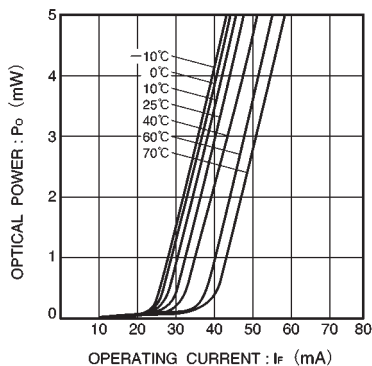


Fig. 1 Optical output vs. operating current

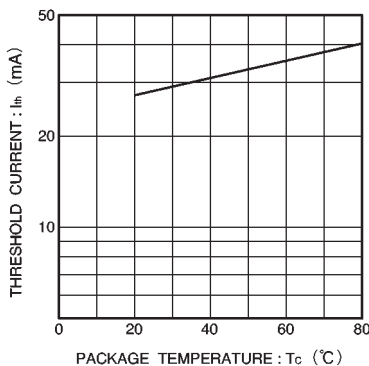


Fig. 2 Dependence of threshold current on temperature

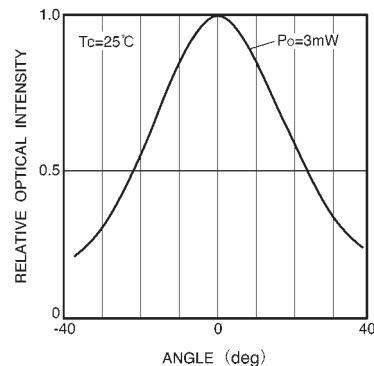


Fig. 3 Perpendicular far field pattern

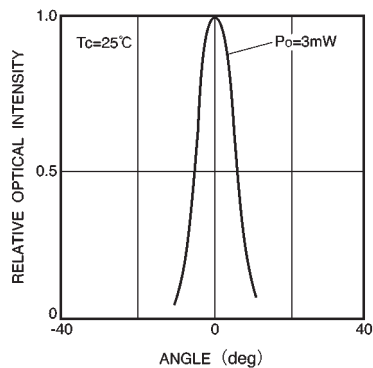


Fig. 4 Parallel far field pattern

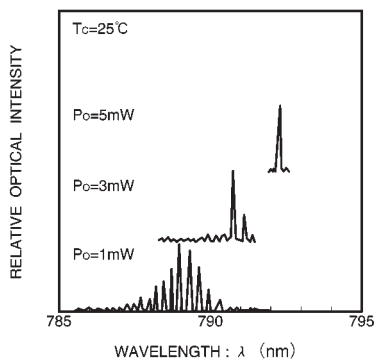


Fig. 5 Dependence of emission spectrum on optical output

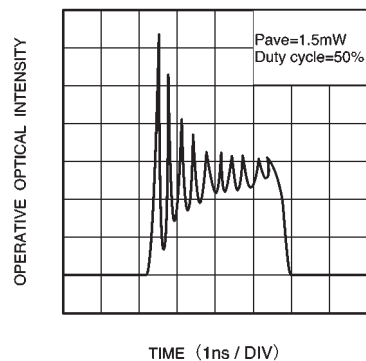


Fig. 6 Pulse response characteristic

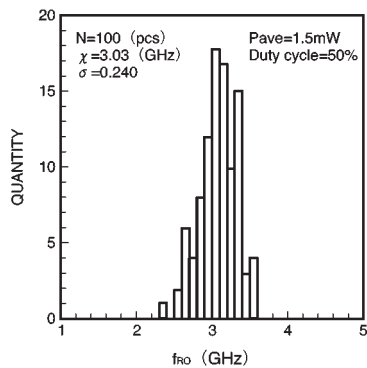


Fig. 7 Distribution of relaxation oscillation frequency