

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.

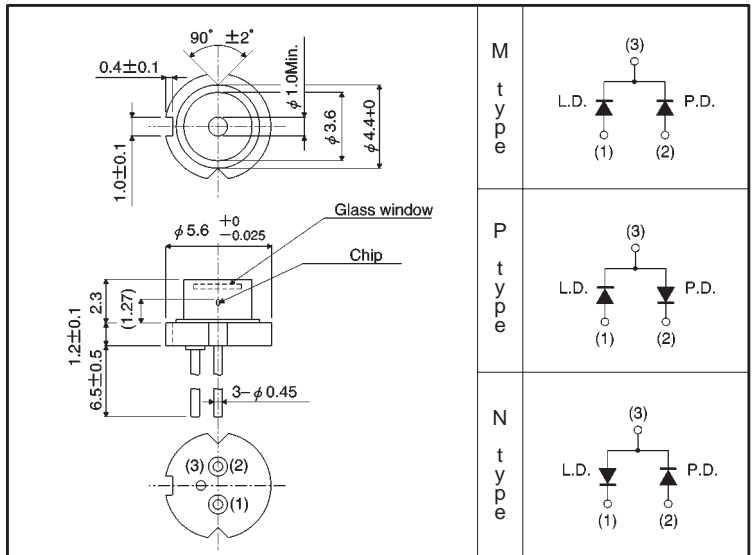
●Applications

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 _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	50	mA	—
Operating current	I_{op}	—	45	65	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}^*	28	37	45	deg	
Parallel deviation angle	$\Delta\phi_{//}$	—	—	±2	deg	
Perpendicular deviation angle	$\Delta\phi_{\perp}$	—	—	±3	deg	
Emission point accuracy	ΔX ΔY ΔZ	—	—	±80	μm	—
Peak emission wavelength	λ	770	785	810	nm	Po=3mW
Relaxation oscillation frequency	f_r	1.8	—	—	GHz	P _{ave} =1.5mV, 50% duty

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

●Electrical and optical characteristic curves

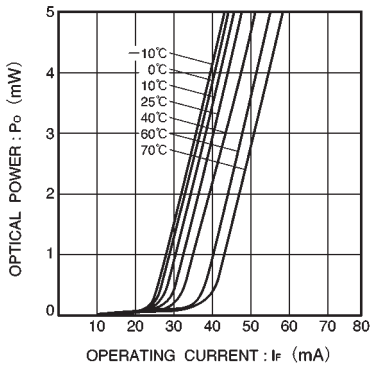


Fig. 1 Optical output vs. operating current

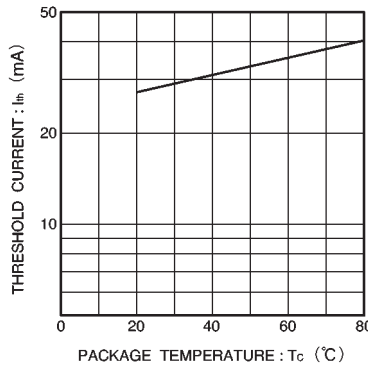


Fig. 2 Dependence of threshold current on temperature

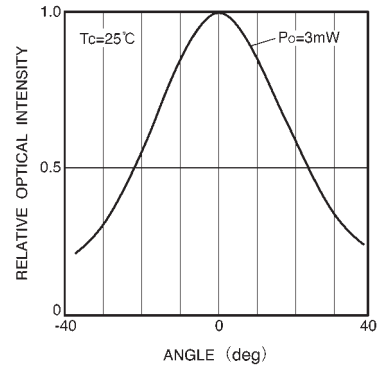


Fig. 3 Perpendicular far field pattern

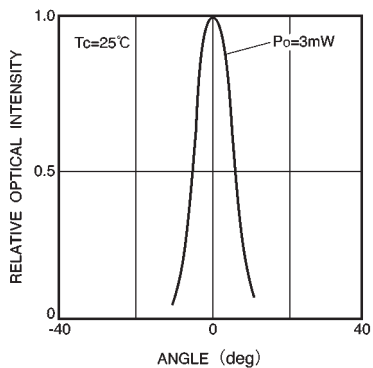


Fig. 4 Parallel far field pattern

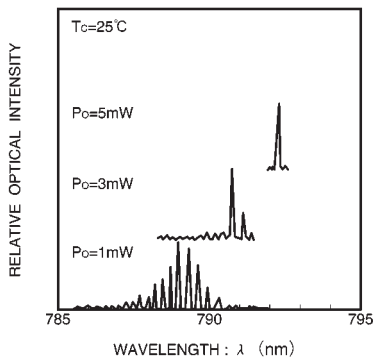


Fig. 5 Dependence of emission spectrum on optical output

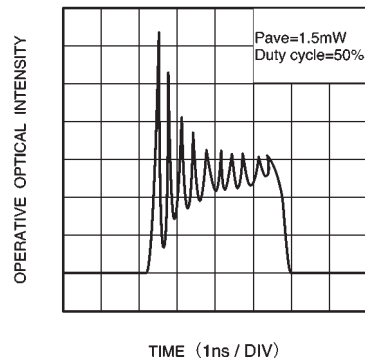


Fig. 6 Pulse response characteristic

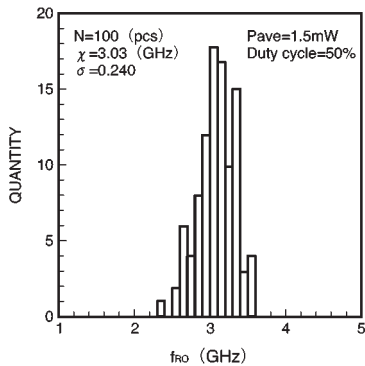


Fig. 7 Distribution of relaxation oscillation frequency