

MITSUBISHI LASER DIODES  
ML4XX23 SERIES

AlGaAs LASER DIODES

TYPE  
NAME

ML40123N

DISCRIPTION

ML4XX23 is a AlGaAs laser diodes which provides a stable, single transverse mode oscillation with emission wavelength of 780nm and standard continuous light output of 3mW.

ML4XX23 is produced by the MOCVD crystal growth method which is excellent in mass production and characteristics uniformity. This is a high - performance, highly reliable, and long life semiconductor laser.

FEATURES

- Low droop\*
- Small astigmatic distance
- Low threshold current
- Stable single transverse mode oscillation
- Built - in monitor photodiode

APPLICATION

Laser beam printing, laser beam copy

\* Droop is a characteristics of dropping of light output caused by heat generated when a constant pulse current is applied to LD.

ABSOLUTE MAXIMUM RATINGS (Note 1)

Symbol	Parameter	Conditions	Ratings	Unit
Po	Light output power	CW	5	mW
		Pulse*2	6	
VRL	Reverse voltage (Laser diode)	—	2	V
VRD	Reverse voltage (photodiode)	—	30	V
IFD	Forward voltage (photodiode)	—	10	mA
Tc	Case temperature	—	-40~+60	°C
Tstg	Storage temperature	—	-40~+100	°C

Note 1: The maximum rating means the limitation over which the laser should not be operated even instant time, and this does not mean the guarantee of its lifetime.

Note 2: Duty cycle less than 50%, pulth width less than 1 μs.

ELECTRICAL/OPTICAL CHARACTERISTICS (Tc = 25°C)

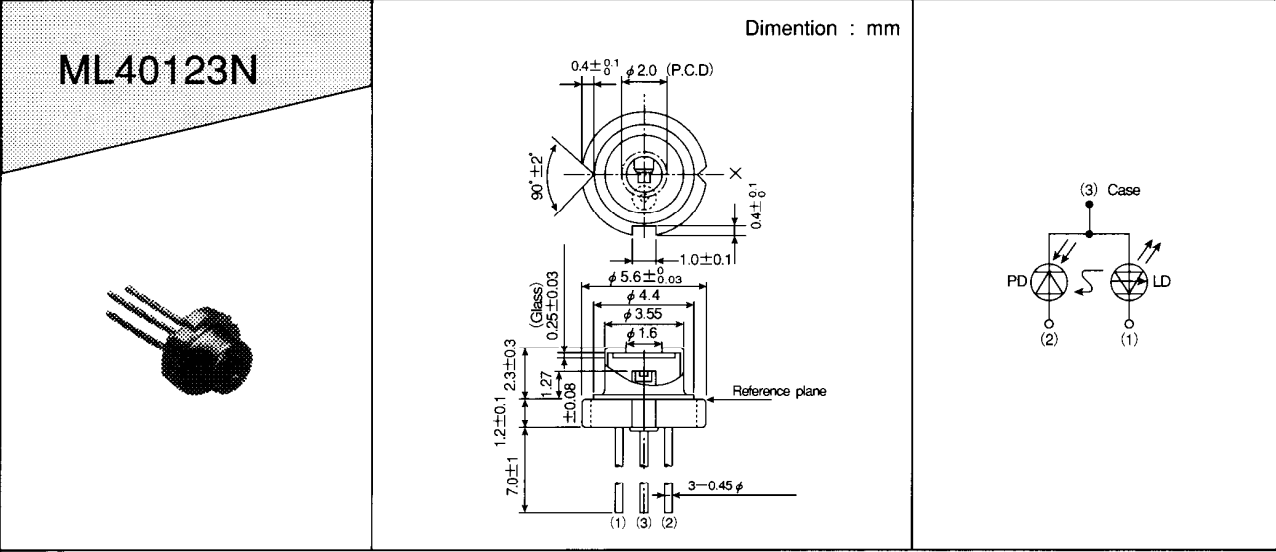
Symbol	Parameter	Test conditions	Limits			Unit
			Min.	Typ.	Max.	
Ith	Threshold current	CW	—	18	30	mA
IOP	Operating current	CW, Po = 3mW	—	40	70	mA
VOP	Operating voltage	CW, Po = 3mW	—	2.0	2.5	V
η	Slope efficiency	CW	0.08	0.15	0.25	mW/mA
λP	Center Wavelength	CW, Po = 3mW	770	785	800	nm
θ //	Beam divergence angle (parallel)	CW, Po = 3mW	9	11	15	deg.
θ ⊥	Beam divergence angle (perpendicular)	CW, Po = 3mW	22	29	36	deg.
Im	Monitoring output current (photodiode)	CW, Po = 3mW, VRD = 1V, RL* = 10Ω	—	0.6	—	mA
ID	Dark current (photodiode)	VRD = 10V	—	—	0.5	μA
Ct	capacitance (photodiode)	VRD = 5V, f = 1MHz	—	7	—	pF
D	Droop	Po = 3mW, Duty 10~90%, 600Hz	—	3	—	%

\*RL = the load resistance of photodiode

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OUTLINE DRAWING



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AIGaAs LASER DIODES

**TYPICAL CHARACTERISTICS**

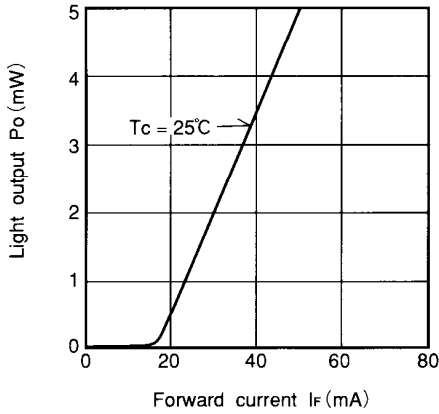


Fig. 1 Light output vs. forward current

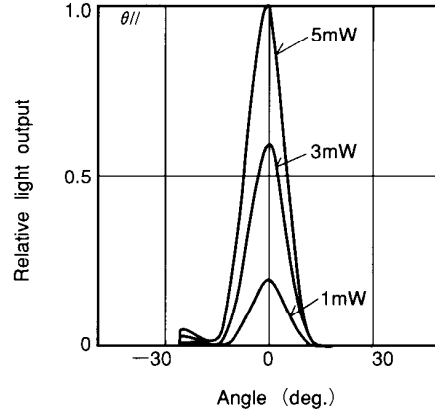


Fig. 2 Far - field pattern  $\theta //$

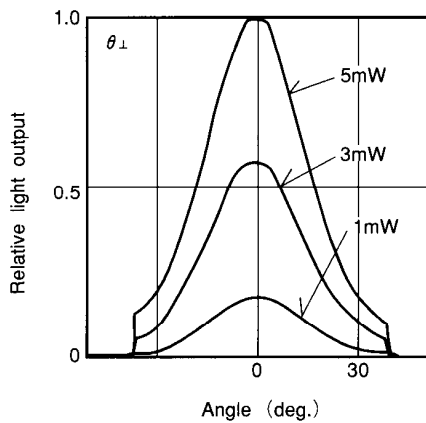


Fig.3 Far - field pattern  $\theta \perp$

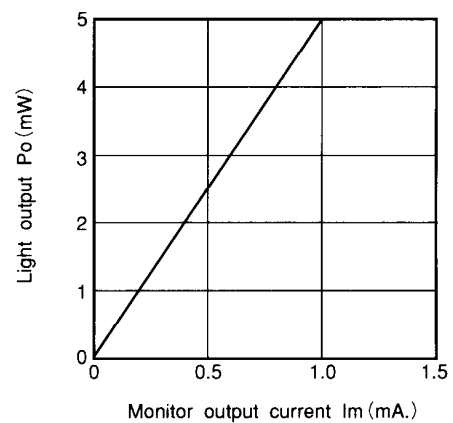


Fig. 4 Light output vs. monitor output current characteristic

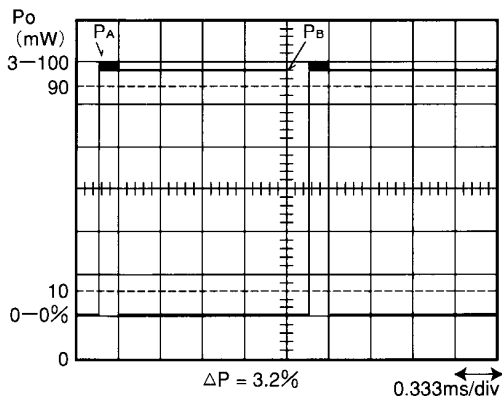


Fig. 5 Droop

Droop characteristics indicate the amount which optical light output is down by heating up when constant pulse current is loaded on LD.

Definition is follows.

$$\Delta P = \frac{P_A - P_B}{P_B} \times 100 (\%)$$

PA : Initial value of monitoring current at 10% duty pulse. (600Hz)

PB : Final value of monitoring current at 90% duty pulse. (600Hz)

Typical droop characteristic of ML4XX23 is shown in Fig.5. Typical droop value is 3% at PA = 3mW.