

**MITSUBISHI LASER DIODES**  
**ML1XX3 SERIES**  
**AlGaInP LASER DIODES**

**TYPE  
NAME**

**ML1013R, ML1413R, ML120G3**

**DESCRIPTION**

ML1XX3 is a high power AlGaInP semiconductor laser which provides a stable, single transverse mode oscillation with emission wavelength of 685nm (typical) and standard continuous light output of 50mW.

**FEATURES**

- High power 50mW(CW)
- Short wavelength (685nm typ.)
- High reliability

**APPLICATION**

Optical disc drive (Higt Density)

**ABSOLUTE MAXIMUM RATINGS** (Note 1)

Symbol	Parameter	Conditions	Ratings	Unit
P <sub>O</sub>	Light output power	CW	60	mW
		Pulse (Note 2)	60	
V <sub>RL</sub>	Reverse voltage (laser diode)	—	2	V
V <sub>RD</sub>	Reverse voltage (Photodiode)	—	30	V
I <sub>FD</sub>	Forward current (Photodiode)	—	10	mA
T <sub>C</sub>	Case temperature	—	-10~+60	°C
T <sub>stg</sub>	Storage temperature	—	-10~+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 gurantee of its lifetime.

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

**ELECTRICAL/OPTICAL CHARACTERISTICS**

Symbol	Parameter	Test condition	Limits			Unit
			Min.	Typ.	Max.	
I <sub>th</sub>	Threshold current	CW	—	35	60	mA
I <sub>OP</sub>	Operation current	CW, P <sub>O</sub> = 50mW	—	100	140	mA
V <sub>OP</sub>	Operating voltage	CW, P <sub>O</sub> = 50mW	2.0	2.7	3.0	V
η	Slope efficiency	CW, P <sub>O</sub> = 50mW	—	0.75	—	mW/mA
λ <sub>P</sub>	Peak wavelength	CW, P <sub>O</sub> = 50mW	670	685	700	nm
θ <sub>∥</sub>	Beam divergence angle (parallel)	CW, P <sub>O</sub> = 50mW	7	9.5	12	deg.
θ <sub>⊥</sub>	Beam divergence angle (perpendicular)	CW, P <sub>O</sub> = 50mW	16	20	25	deg.
I <sub>m</sub>	Monitoring output current (Photodiode)	CW, P <sub>O</sub> = 50mW, V <sub>RD</sub> = 1V, R <sub>L</sub> = 10 Ω *3	0.05	0.3	2.5	mA
I <sub>D</sub>	Dark current (Photodiode)	V <sub>RD</sub> = 10V	—	—	0.5	μA
C <sub>t</sub>	Capacitance (Photodiode)	f = 1MHz, V <sub>RD</sub> = 5V	—	7	—	pF

Note3: R<sub>L</sub>=the load resistance of photodiode (ML1013R, ML1413R)

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OUTLINE DRAWINGS

