

ML1XX3 SERIES

FOR OPTICAL INFORMATION SYSTEMS

**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 685-nm and standard CW light output of 50mW.

ML1XX3 has a window-mirror-facet which improves the maximum output power. That leads to highly reliable and high-power operation.

FEATURES

- High Power: 50mW (CW), 60mW (pulse)
- Visible Light: 685nm (typ)

APPLICATION

Optical disc drive (High Density / High Speed)

ABSOLUTE MAXIMUM RATINGS (Note 1)

| Symbol | Parameter | Conditions | Ratings | Unit |
|--------|-------------------------------|---------------|------------------|------|
| Po | Light output power | CW | 60 | mW |
| | | Pulse(Note 2) | 60 | |
| VRL | Reverse voltage (laser diode) | - | 2 | V |
| VRD | Reverse voltage (Photodiode) | - | 30 | V |
| IFD | Forward current (Photodiode) | - | 10 | mA |
| Tc | Case temperature | - | -10~ +60 | °C |
| Tstg | Storage temperature | - | -40~ +100 | °C |

Note1: 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. As for the reliability, please refer to the reliability report from Mitsubishi Semiconductor Quality Assurance Department.

Note2: TARGET SPEC /Condition Duty less than 50%, pulse width less than 1μs

ELECTRICAL/OPTICAL CHARACTERISTICS (Tc=25°C)


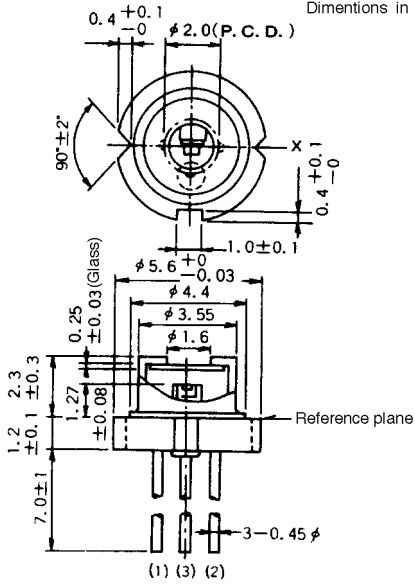
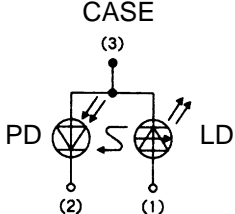
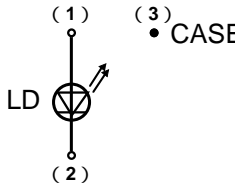
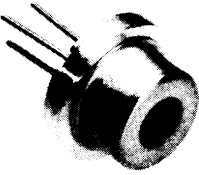
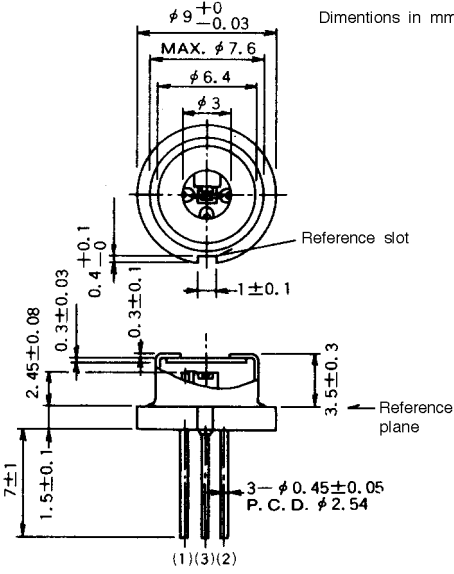
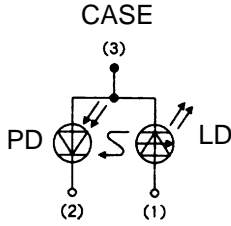
| Symbol | Parameter | Test conditions | Min. | Typ. | Max | Unit |
|-----------------|--|--------------------------------------|-------------|------------|------------|-------|
| I _{th} | Threshold current | CW | - | 35 | 60 | mA |
| I _{op} | Operation current | CW, Po=50mW | - | 80 | 120 | mA |
| V _{op} | Operating voltage | CW, Po=50mW | 2.0 | 2.4 | 3.0 | V |
| η | Slope efficiency | CW, Po=50mW | - | 0.8 | - | mW/mA |
| λ _p | Peak wavelength | CW, Po=50mW | 670 | 685 | 700 | nm |
| θ _{//} | Beam divergence angle (parallel) | CW, Po=50mW | 7 | 10 | 12 | ° |
| θ _⊥ | Beam divergence angle (perpendicular) | CW, Po=50mW | 16 | 20 | 25 | ° |
| I _m | Monitoring output current (Photodiode) | CW, Po=50mW VRD=1V RL=10Ω(Note 3) | 0.05 | 0.3 | 1.5 | mA |
| I _D | Dark current (Photodiode) | VRD=10V | 0 | - | 0.5 | μA |
| C _t | Capacitance (Photodiode) | VRD=5V | - | 7 | - | pF |

Note3: RL=the load resistance of photodiode for ML1013R and ML1413R

ML1XX3 SERIES

FOR OPTICAL INFORMATION SYSTEMS

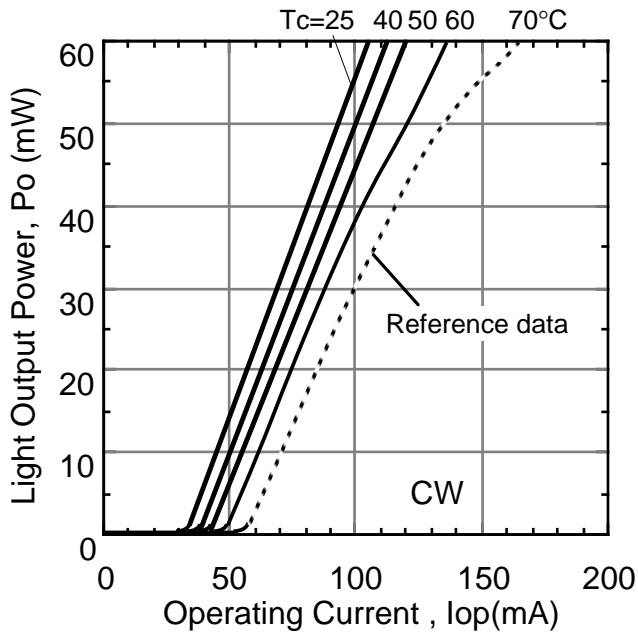
OUTLINE DRAWINGS

| | | |
|--|--|---|
| <p>ML1013R ML120G3</p>  | <p>Dimensions in mm</p>  | <p>CASE</p>  <p>ML1013R</p>  <p>ML120G3</p> |
| <p>ML1413R</p>  | <p>Dimensions in mm</p>  | <p>CASE</p>  <p>ML1413R</p> |

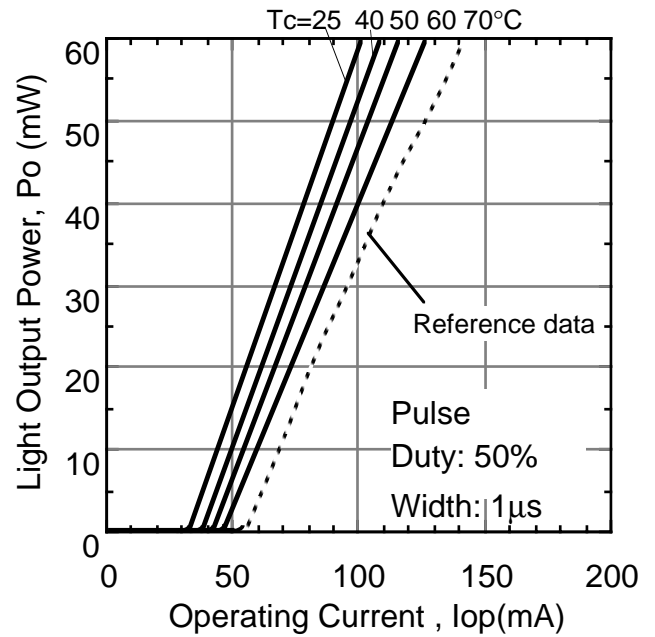
ML1XX3 SERIES

FOR OPTICAL INFORMATION SYSTEMS

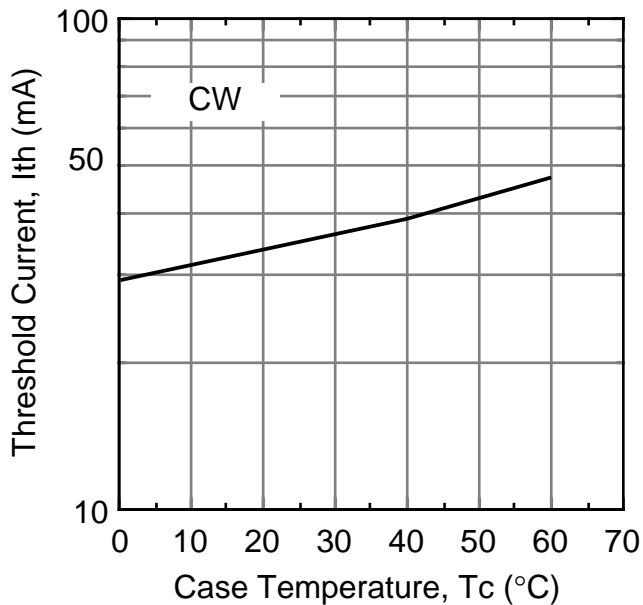
Typical Characteristics



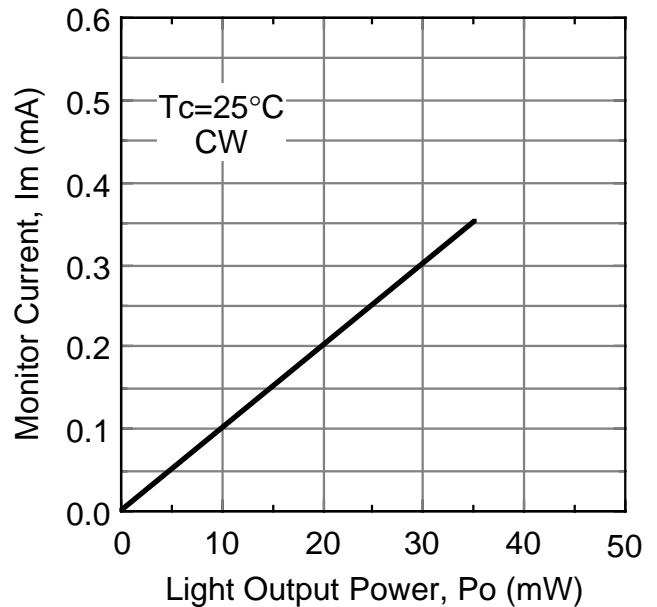
Light Output Power vs. Current (CW)



Light Output Power vs. Current (Pulse)



Threshold Current vs. Temperature

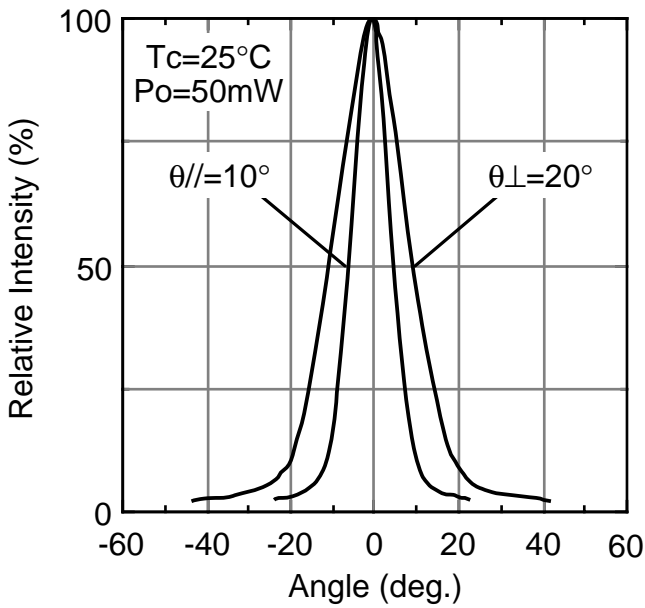


Monitor Photodiode Current

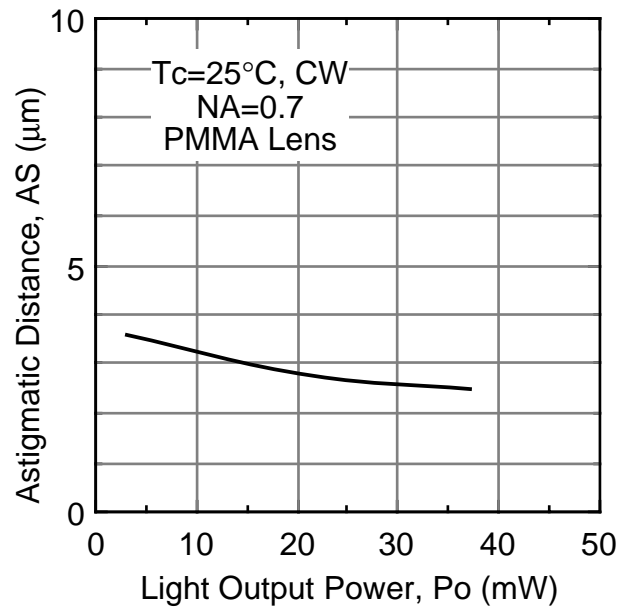
ML1XX3 SERIES

FOR OPTICAL INFORMATION SYSTEMS

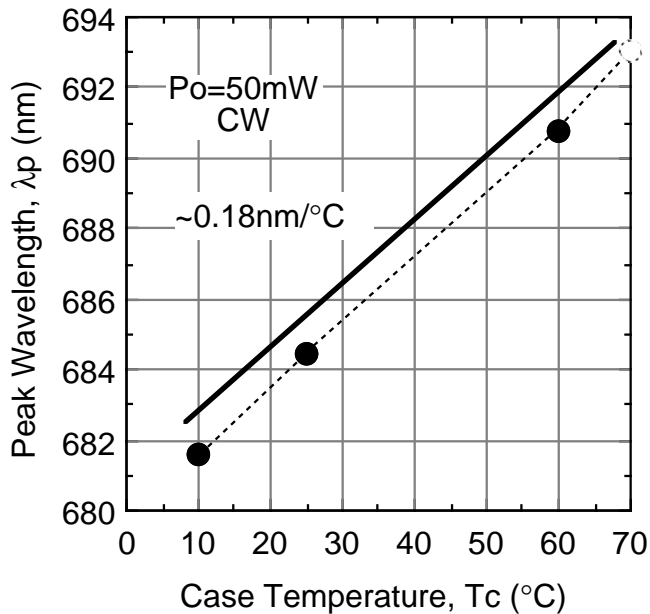
Typical Characteristics



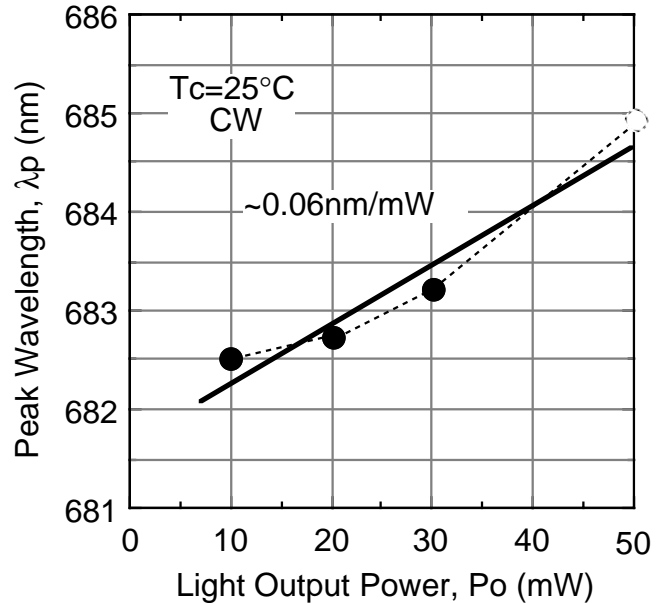
Far-Field-Patterns



Astigmatic Distance



Peak Wavelength vs. Temperature

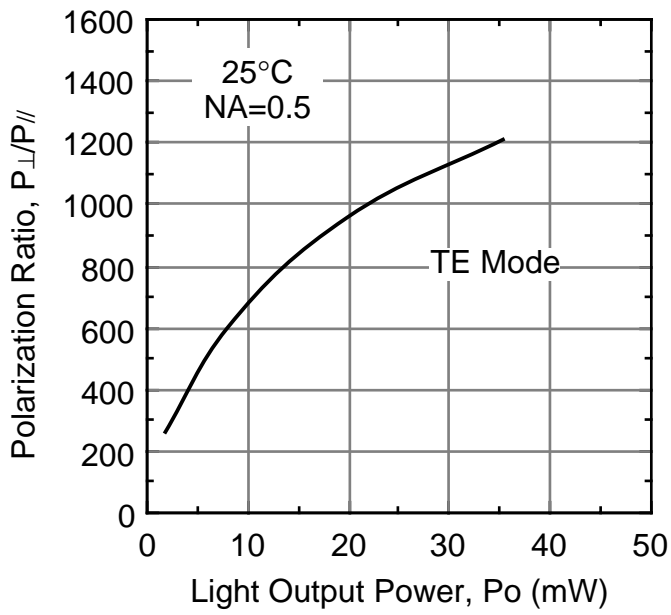


Peak Wavelength vs. Light Output Power

ML1XX3 SERIES

FOR OPTICAL INFORMATION SYSTEMS

Typical Characteristics



Polarization Ratio