# HL6501MG

Visible High Power Laser Diode for DVD-RAM

HITACHI

ADE-208-515F (Z)
Preliminary
7th Edition
February 1998

## Description

The HL6501MG is a 0.65 μm band AlGalnP laser diode(LD) with a multi-quantum well (MQW) structure. It is suitable as a light source for large capacity optical disc memories, such as DVD-RAM, and various other types of optical equipment.

Hermetic sealing of the small package (ϕ5.6 mm) assures high reliability.

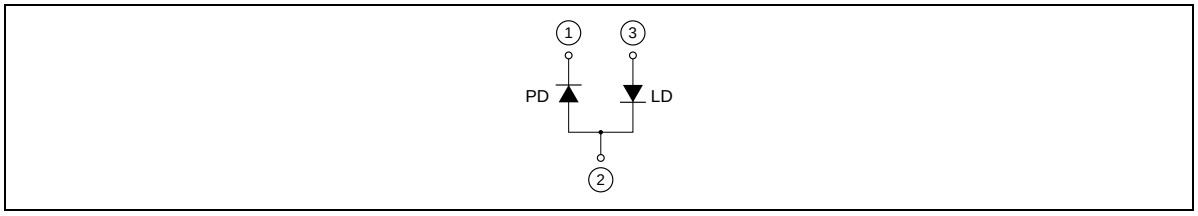
## Application

- Optical disc memories
- Optical equipment

## Features

- High output power : 35 mW (CW)
- Visible light output : λp = 658 nm Typ
- Small package : ϕ 5.6 mm
- Low astigmatism : 6 μm Typ ($P_o$ = 5 mW)

## Internal Circuit



## Absolute Maximum Ratings ($T_C$ = 25°C)

| Item | Symbol | Value | Unit |
|---|---|---|---|
| Optical output power | $P_O$ | 35 | mW |
| Pulse optical output power | $P_O$ (pulse) | 50 * | mW |
| Laser diode reverse voltage | $V_{R(LD)}$ | 2 | V |
| Photo diode reverse voltage | $V_{R(PD)}$ | 30 | V |
| Operating temperature | Topr | –10 to +60 | °C |
| Storage temperature | Tstg | –40 to +85 | °C |

Note: Pulse condition : Pulse width = 100 ns, duty = 50%

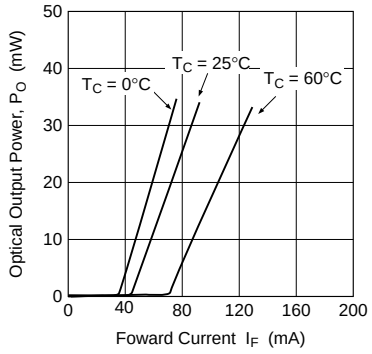
## Optical and Electrical Characteristics ($T_C$ = 25°C)

| Items | Symbols | Min | Typ | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| Optical output power | $P_O$ | 35 | — | — | mW | Kink free * |
| Pulse optical output power | $P_{O(pulse)}$ | 50 | — | — | mW | Kink free * |
| Threshold current | Ith | 30 | 45 | 70 | mA | — |
| Operating voltage | $V_{OP}$ | 2.1 | 2.6 | 3.0 | V | $P_O$ = 30 mW |
| Slope efficiency | ηs | 0.5 | 0.75 | 1.0 | mW/mA | 18(mW)/($I_{(24mW)}$ – $I_{(6mW)}$) |
| Lasing wavelength | λp | 645 | 658 | 665 | nm | $P_O$ = 30 mW |
| Beam divergence parallel to the junction | θ// | 7 | 8.5 | 10.5 | deg. | $P_O$ = 30 mW |
| Beam divergence parpendicular to the junction | θ⊥ | 18 | 22 | 26 | deg. | $P_O$ = 30 mW |
| Monitor current | $I_S$ | 0.05 | 0.3 | 1.5 | mA | $P_O$ = 30 mW, $V_{R(PD)}$ = 5 V |
| Asitgmatism | $A_S$ | — | 6 | — | µm | $P_O$ = 5 mW, NA = 0.55 |

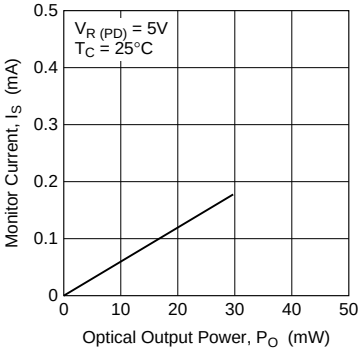
Note: Kink free is confirmed at the temperature of 25°C.

## Curve Characteristics

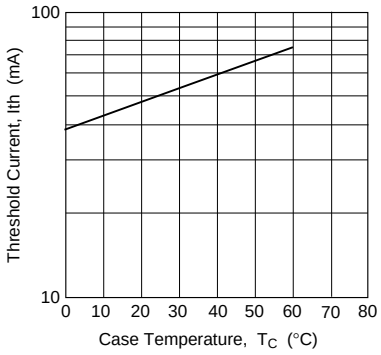
Optical Output Power vs.Forward Current



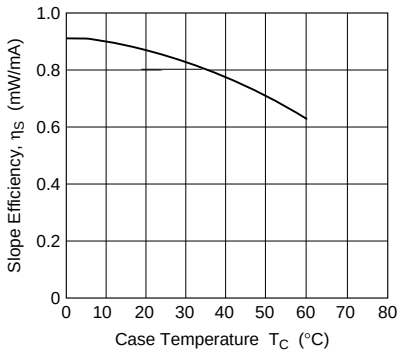

Monitor Current vs. Optical Output Power



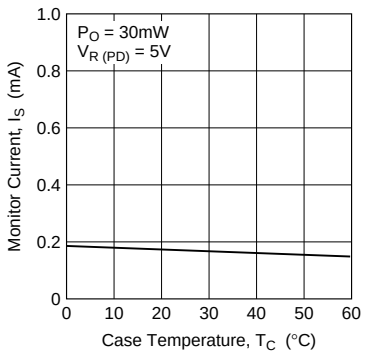

Threshold Current vs. Case Temperature



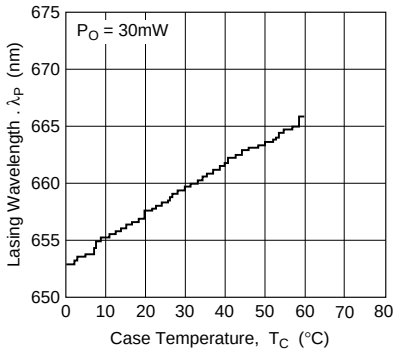

Slope Efficiency vs. Case Temperature



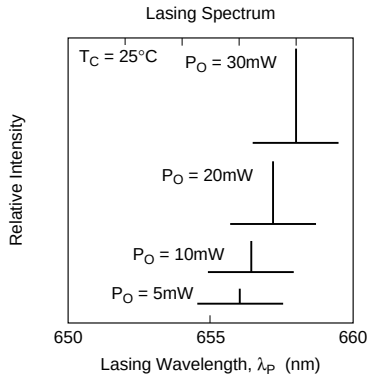
Monitor Current vs. Case Temperature



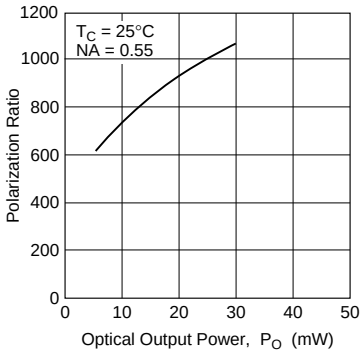

Lasing Wavelength vs. Case Temperature



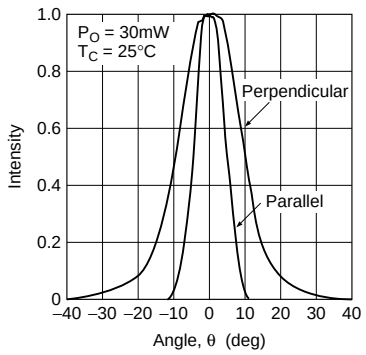

Lasing Spectrum



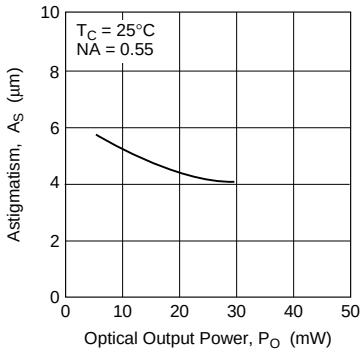

Polarization Ratio vs. Optical Output Power



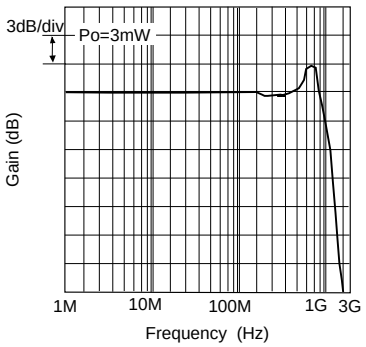
Far Feild Pattern



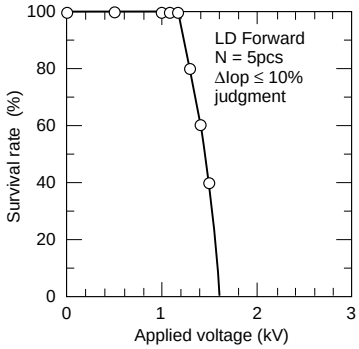

Astigmtism vs. Optical Output Power



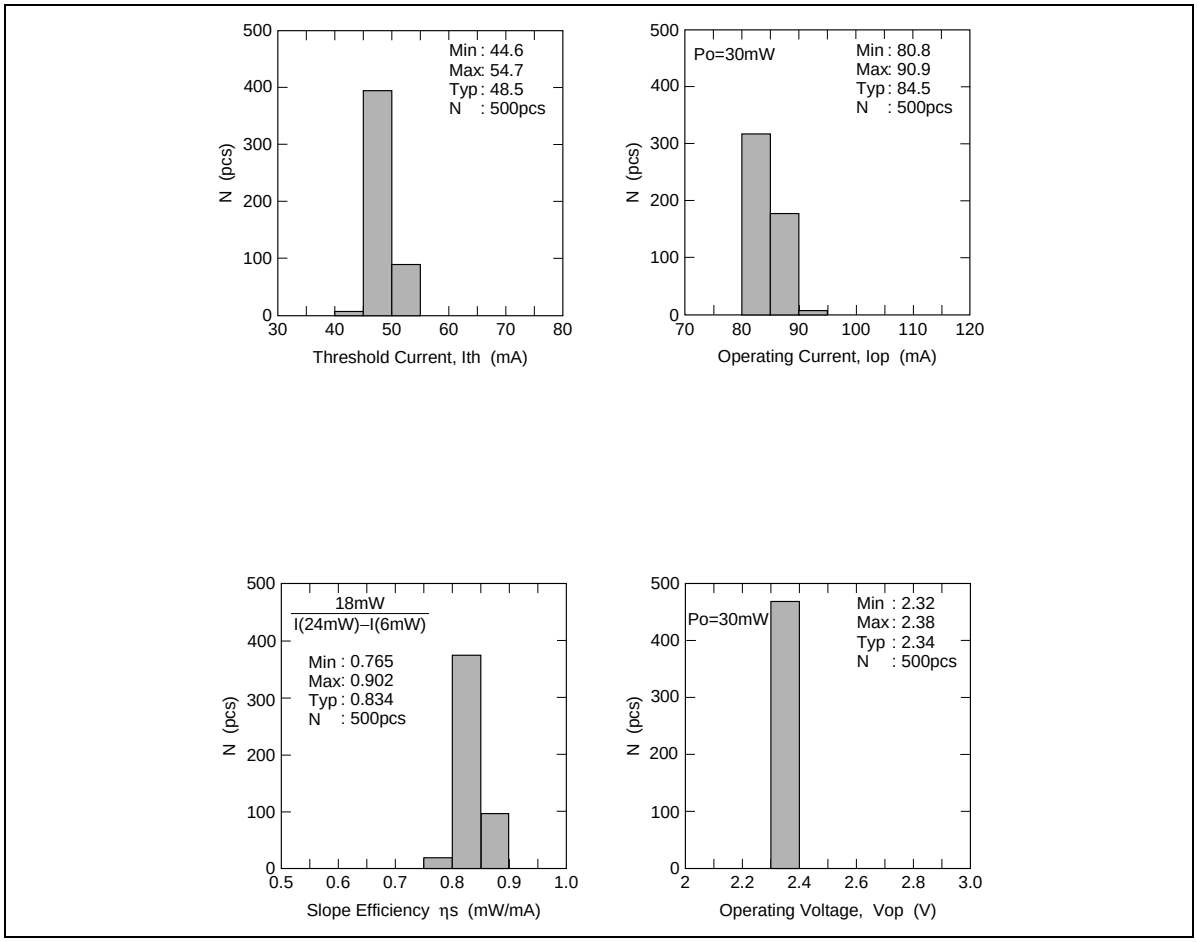

Frequency Response

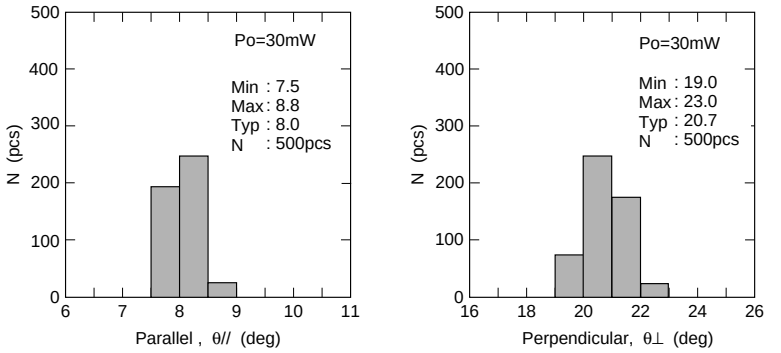



Electrostatic Destruction(MIL standard)

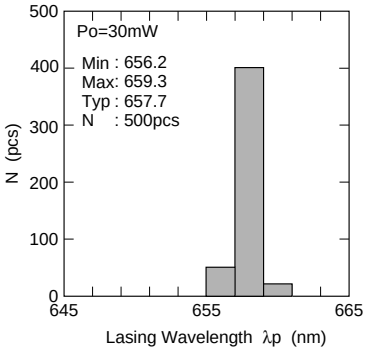


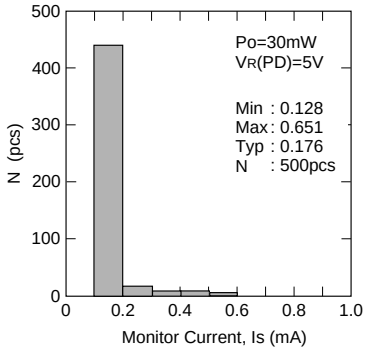
## Characteristics Distribution




Po=30mW
Min : 7.5
Max: 8.8
Typ : 8.0
N : 500pcs
N (pcs)
Parallel , θ// (deg)

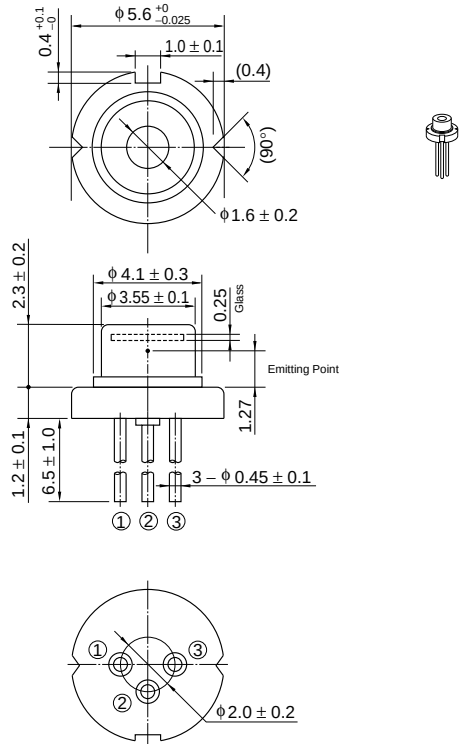

Po=30mW
Min : 19.0
Max: 23.0
Typ : 20.7
N : 500pcs
N (pcs)
Perpendicular, θ⊥ (deg)


Po=30mW
Min : 656.2
Max: 659.3
Typ : 657.7
N : 500pcs
N (pcs)
Lasing Wavelength λp (nm)


Po=30mW
VR(PD)=5V
Min : 0.128
Max: 0.651
Typ : 0.176
N : 500pcs
N (pcs)
Monitor Current, Is (mA)

## Package Dimensions

Unit: mm




| | |
|---|---|
| Hitachi Code | LD/MG |
| JEDEC | — |
| EIAJ | — |
| Weight (reference value) | 0.3 g |

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