# HL1362A/AC

InGaAsP Laser Diodes

HITACHI

## Description

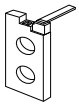
The HL1362A/AC are 1.3 μm InGaAsP λ/4 phase-shifted distributed-feedback laser diodes (DFB-LDs). They are suitable as light sources for high-bit-rate, long-haul fiberoptic communication systems and other applied optical equipment. The compact packages are suitable for module assembly.

## Features

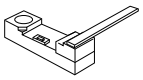
- Long wavelength output: 1290 to 1330 nm
- High-power output: 12 mW
- High quantum efficiency: $\eta_s \geq 0.2$ mW/mA
- Fast pulse response: $t_r$ and $t_f \leq 0.2$ ns
- Dynamic single longitudinal mode: $S_r = 40$ dB Typ.
- High frequency response: $f_r = 10$ GHz Typ.

Package Type

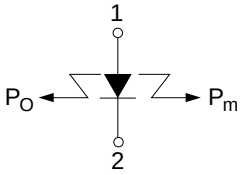
- HL1362A: A1



- HL1362AC: AC



Internal Circuit



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

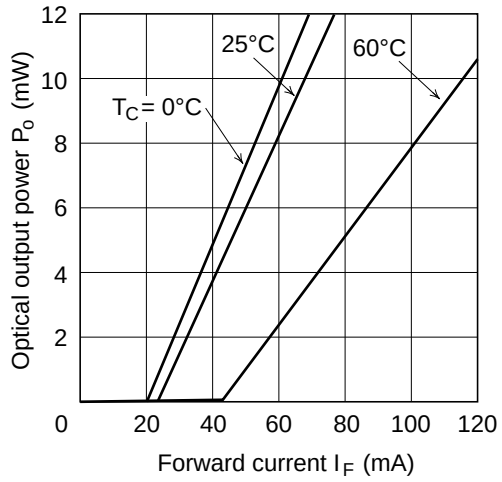
| Item | Symbol | Value | Unit |
|---|---|---|---|
| Optical output power | $P_O$ | 12 | mW |
| Reverse voltage | $V_R$ | 2 | V |
| Operating temperature | $T_{opr}$ | 0 to +60 | °C |
| Storage temperature | $T_{stg}$ | 0 to +80 | °C |

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

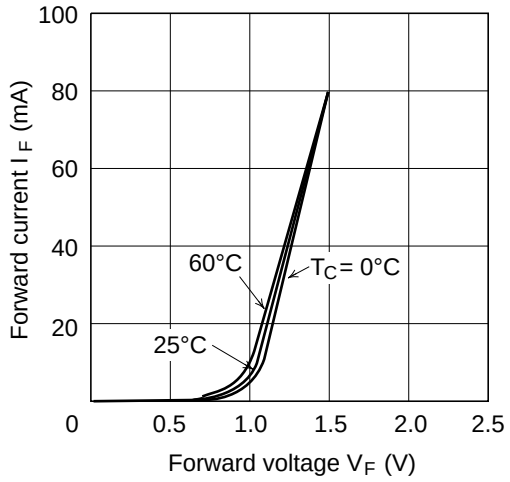
| Item | Symbol | Min | Typ | Max | Unit | Test Conditions |
|---|---|---|---|---|---|---|
| Threshold current | $I_{th}$ | — | 25 | 50 | mA | |
| Optical output power | $P_O$ | 12 | — | — | mW | Kink free |
| Monitor optical output power | $P_m$ | 2 | — | — | mW | $P_O$ = 8 mW |
| Slope efficiency | $\eta_s$ | 0.2 | — | — | mW/mA | |
| Lasing wavelength | $\lambda_p$ | 1290 | 1310 | 1330 | nm | $P_O$ = 8 mW |
| Side-mode suppression ratio | $S_r$ | 30 | 40 | — | dB | 2.5 Gbps (NRZ) |
| Beam divergence (parallel) | $\theta_{//}$ | — | 30 | — | deg. | $P_O$ = 8 mW, FWHM |
| Beam divergence (perpendicular) | $\theta_{\perp}$ | — | 40 | — | deg. | $P_O$ = 8 mW, FWHM |
| Rise time | $t_r$ | — | 0.1 | — | ns | $P_O$ = 3 mW, $I_b$ = $I_{th}$, 10 to 90% |
| Fall time | $t_f$ | — | 0.15 | — | ns | $P_O$ = 3 mW, $I_b$ = $I_{th}$, 90 to 10% |

## Typical Characteristic Curves

Optical Output Power vs. Forward Current

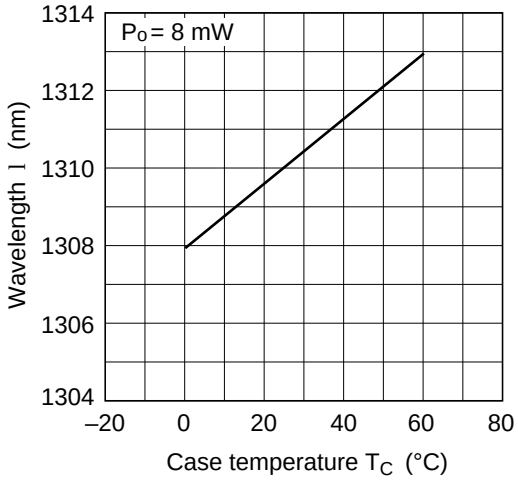



Forward Current vs. Forward Voltage

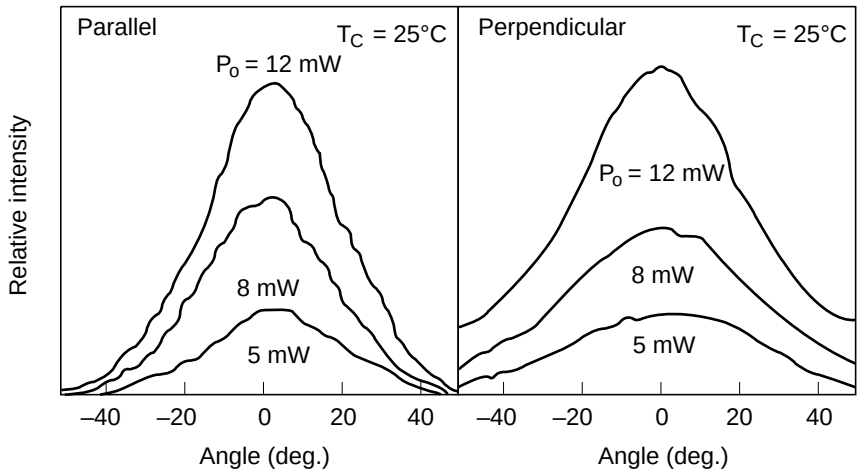


## Typical Characteristic Curves (cont)

Lasing Wavelength Temperature Dependence

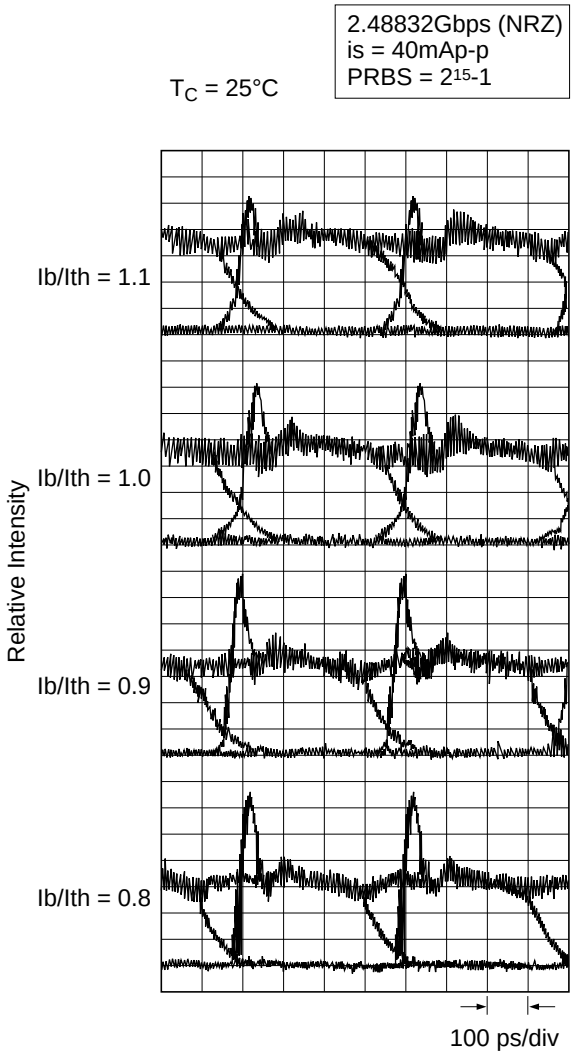



Far Field Pattern

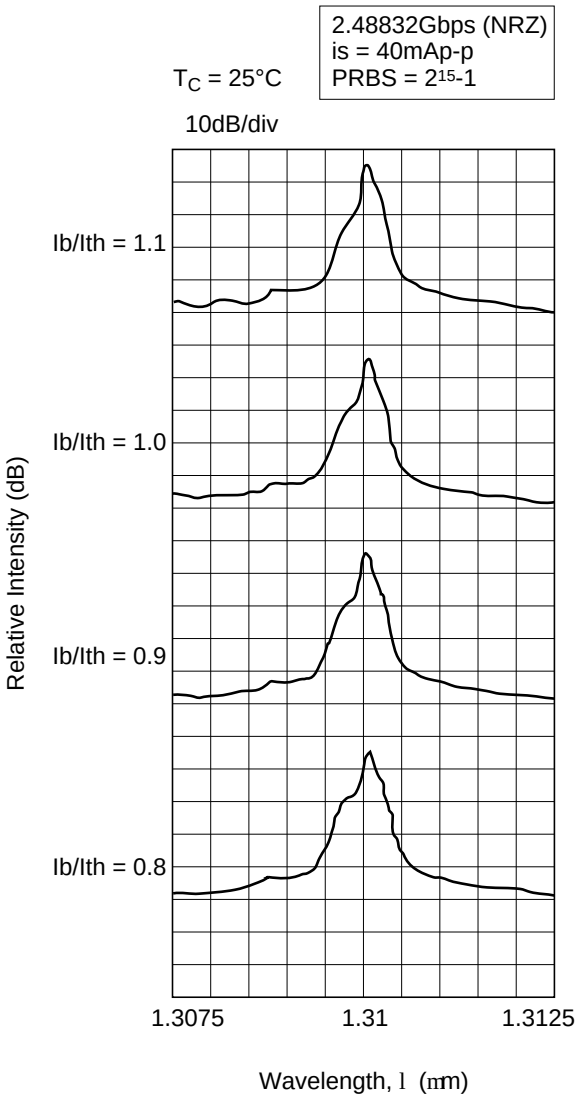


## Typical Characteristic Curves (cont)

Bias Dependence of Optical Pulse Response

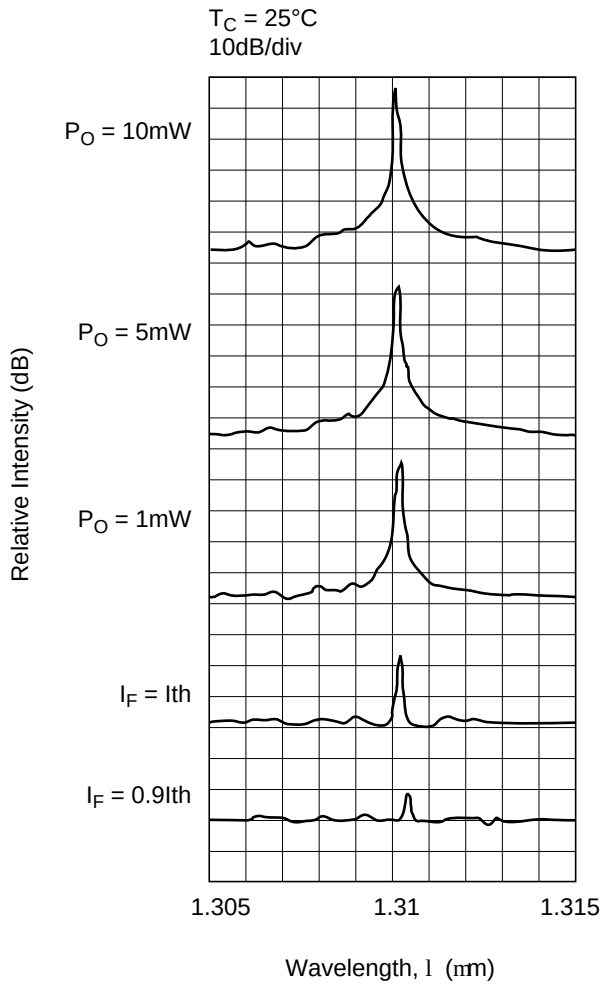


Bias Dependence of Lasing Spectrum

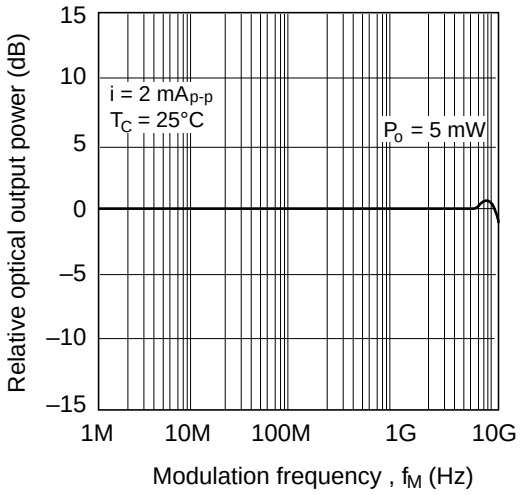


## Typical Characteristic Curves (cont)

Optical Output Power Dependence of Lasing Spectrum



Frequency Response of Laser Diode




Threshold Current vs. Case Temperature