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# HL1566AF

1.55  $\mu\text{m}$  Laser Diode with EA Modulator

# HITACHI

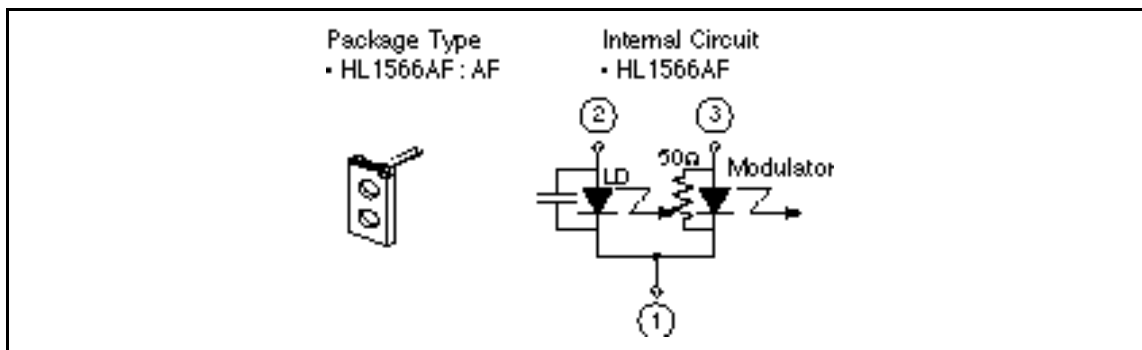
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## Description

The HL1566AF is a 1.55  $\mu\text{m}$  InGaAsP distributed-feedback laser diode (DFB-LD) with a multi-quantum well (MQW) structure. An electroabsorption (EA) modulator is integrated with the laser diode. It is suitable as a light source for high-bit-rate, long haul fiberoptic communication systems, such as 2.5 Gbps external modulation systems for up to 600 km.

## Features

- Σ Long wavelength output:  $\lambda_p = 1550 \text{ nm}$  Typ.
- Σ High extinction ratio: 13 dB Min. at  $V_{R(EA)} = -2 \text{ V}$
- Σ Fast pulse response:  $\text{tr}/\text{tf} \leq 80 \text{ ps}$
- Σ Dynamic single longitudinal mode:  $S_r = 40 \text{ dB}$  Typ.
- Σ Package: open air package (chip on carrier) with micro strip-line



**Absolute Maximum Ratings ( $T_C = 25^\circ\text{C}$ )**

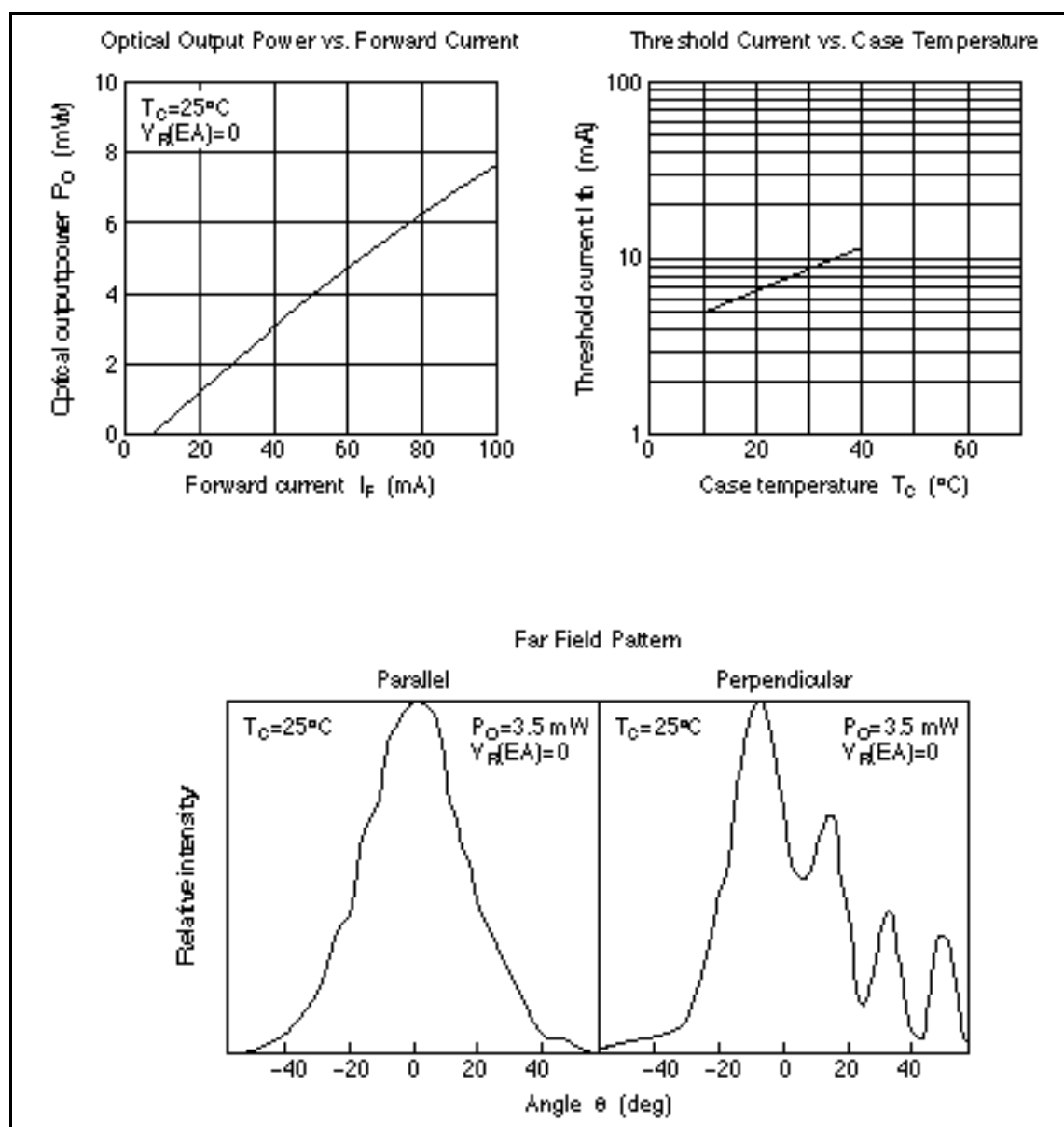
| Item                              | Symbol      | Value     | Unit             |
|-----------------------------------|-------------|-----------|------------------|
| LD forward current                | $I_F$       | 100       | mA               |
| Laser diode reverse voltage       | $V_{R(LD)}$ | 2         | V                |
| Modulator reverse voltage         | $V_{R(EA)}$ | -5        | V                |
| Operating Temperature             | $T_{opr}$   | 10 to 40  | $^\circ\text{C}$ |
| Storage temperature <sup>*1</sup> | $T_{stg}$   | -40 to 85 | $^\circ\text{C}$ |

Note: 1. without condensation

**Optical and Electrical Characteristics ( $T_C = 25^\circ\text{C}$ )**

| Item                            | Symbol      | Min  | Typ  | Max  | Unit | Test Conditions                                                                   |
|---------------------------------|-------------|------|------|------|------|-----------------------------------------------------------------------------------|
| Threshold current               | $I_{th}$    | —    | 10   | 20   | mA   |                                                                                   |
| Optical output power            | $P_O$       | 3.5  | —    | —    | mW   | $I_{F(LD)} = 50\text{ mA}$ , $V_{R(EA)} = 0\text{ V}$                             |
| Extinction ratio                | ER          | 13   | —    | —    | dB   | $I_{F(LD)} = 50\text{ mA}$ , $V_{R(EA)} = 0/-2\text{ V}$                          |
| Lasing wavelength               | $\lambda_p$ | 1530 | 1550 | 1570 | nm   | 2.5 Gbps (NRZ)                                                                    |
| Side-mode suppression ratio     | Sr          | 30   | 40   | —    | dB   | 2.5 Gbps (NRZ)                                                                    |
| Beam divergence (parallel)      | $q_{//}$    | —    | 30   | —    | deg. | $P_O = 3.5\text{ mW}$ , FWHM                                                      |
| Beam divergence (perpendicular) | $q^\perp$   | —    | 40   | —    | deg. | $P_O = 3.5\text{ mW}$ , FWHM                                                      |
| Rise time                       | $t_r$       | —    | —    | 80   | ps   | 2.5 Gbps (NRZ)                                                                    |
| Fall time                       | $t_f$       | —    | —    | 80   | ps   | 2.5 Gbps (NRZ)                                                                    |
| Cutoff frequency                | $S_{21}$    | 4    | —    | —    | GHz  | $I_{F(LD)} = 50\text{ mA}$ , $V_{R(EA)} = -1\text{ V}$                            |
| RF return loss                  | $S_{11}$    | 10   | —    | —    | dB   | $I_{F(LD)} = 50\text{ mA}$ , $V_{R(EA)} = -1\text{ V}$ ,<br>$f \leq 3\text{ GHz}$ |

# Typical Characteristics Curves



Typical Characteristics Curves (cont)

