

HL1569AF

1.55 μm Laser Diode with EA Modulator

HITACHI

ADE-208-834A (Z)
2nd Edition
Dec. 2000

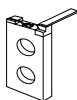
Description

The HL1569AF is a 1.55 μm 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.

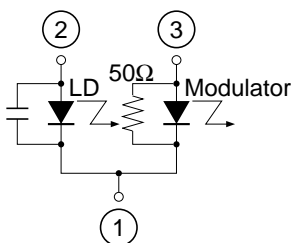
Features

- Long wavelength output: $\lambda_p = 1550 \text{ nm}$ Typ
- High extinction ratio: 15 dB Min at $V_{R(EA)} = -2 \text{ V}$
- Fast pulse response: $t_r/t_f \leq 80 \text{ ps}$
- Dynamic single longitudinal mode: $S_r = 40 \text{ dB}$ Typ
- Package: open air package (chip on carrier) with micro strip-line

Package Type
• HL1569AF: AF



Internal Circuit



Absolute Maximum Ratings (T_C = 25°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	°C
Storage temperature *	T _{stg}	−40 to +85	°C

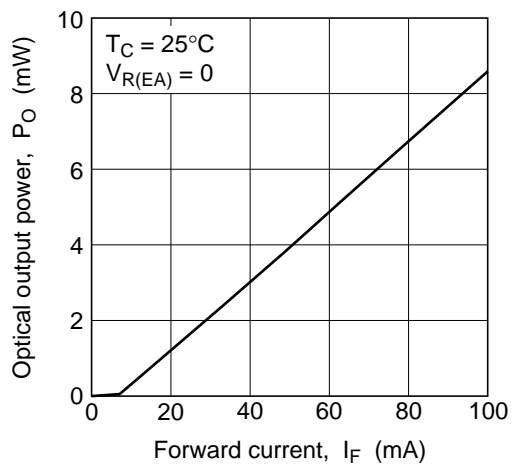
Note: without condensation

Optical and Electrical Characteristics (T_C = 25°C)

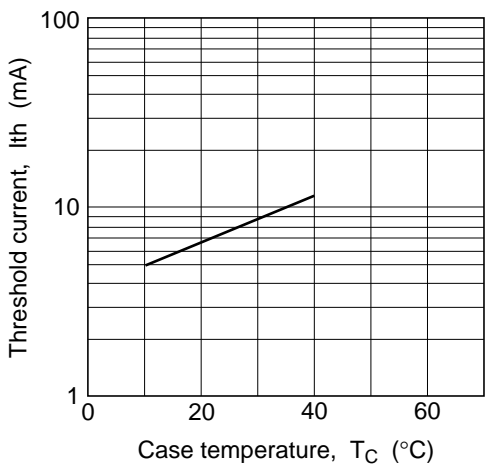
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Threshold current	I _{th}	—	10	20	mA	
Optical output power	P _O	4	—	—	mW	I _{F(LD)} = 60 mA, V _{R(EA)} = 0 V
Extinction ratio	ER	15	—	—	dB	I _{F(LD)} = 60 mA, V _{R(EA)} = 0/−2 V
Lasing wavelength	λ _p	1530	1550	1570	nm	2.5 Gbps (NRZ)
Side-mode suppression ratio	Sr	30	40	—	dB	2.5 Gbps (NRZ)
Beam divergence parallel to the junction	θ//	—	30	—	deg.	P _O = 4 mW, FWHM
Beam divergence parpendicular to the junction	θ⊥	—	40	—	deg.	P _O = 4 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)} = 60 mA, V _{R(EA)} = −1 V
RF return loss	S ₁₁	10	—	—	dB	I _{F(LD)} = 60 mA, V _{R(EA)} = −1 V, f ≤ 3 GHz

Typical Characteristic Curves

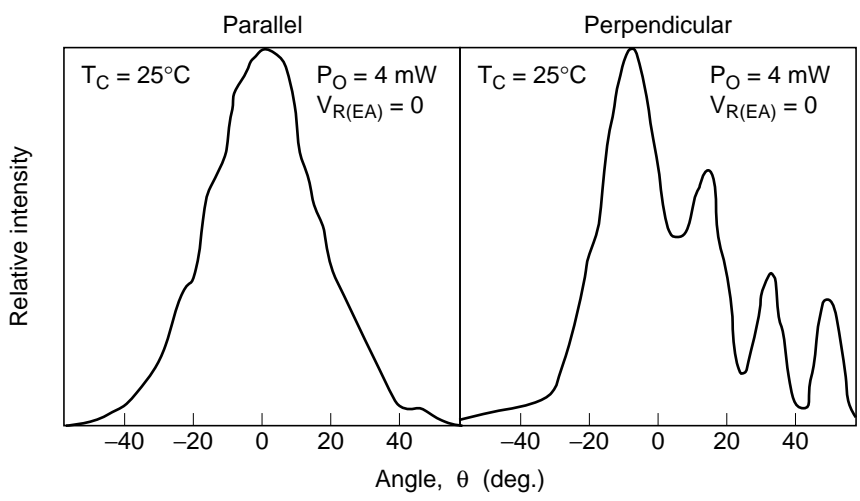
Optical Output Power vs. Forward Current



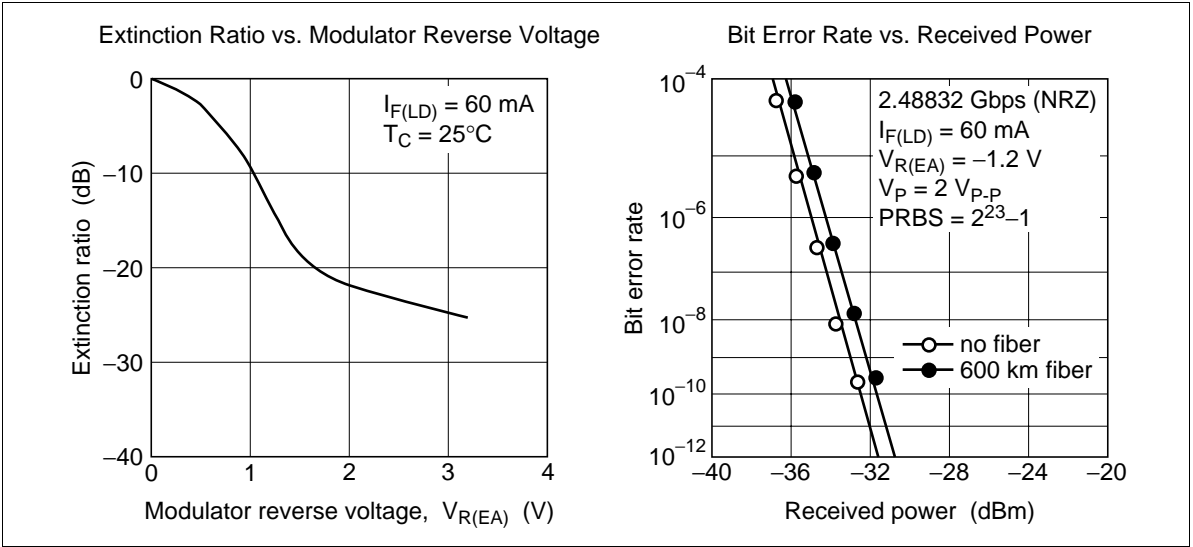
Threshold Current vs. Case Temperature



Far Field Pattern

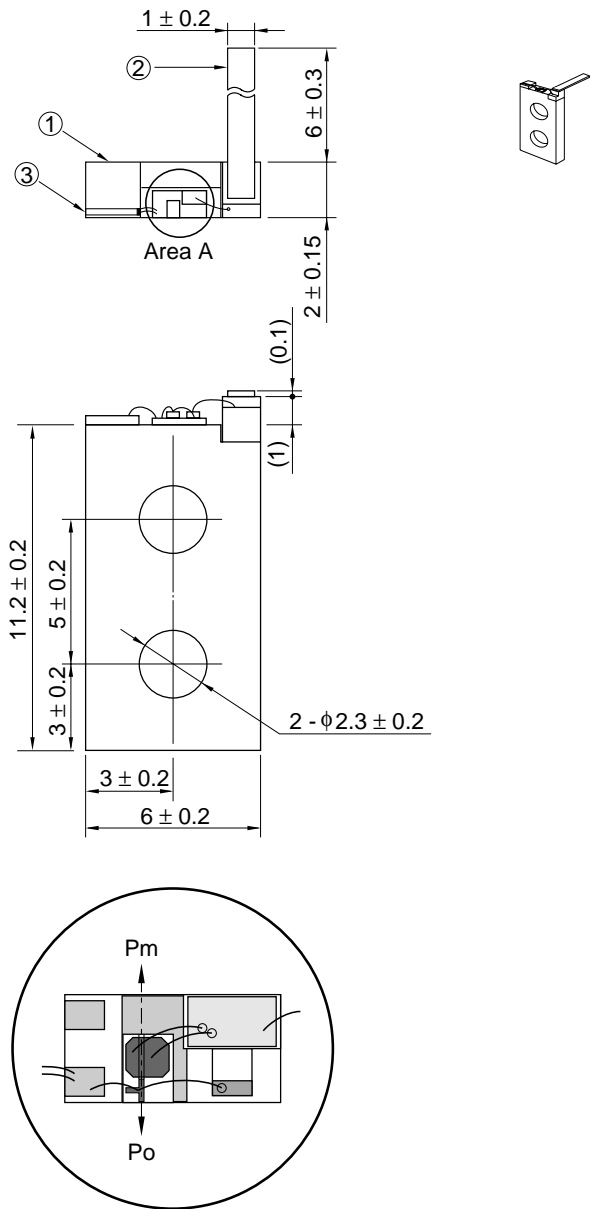


Typical Characteristic Curves (cont)



Package Dimensions

Unit: mm



Enlargement of Area A

Hitachi Code	LD/AF
JEDEC	—
EIAJ	—
Mass (reference value)	1.1 g

Cautions

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1. The laser light is harmful to human body especially to eye no matter what directly or indirectly. The laser beam shall be observed or adjusted through infrared camera or equivalent.

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