HL1569AF

1.55 μm Laser Diode with EA Modulator

HITACHI

ADE-208-834A (Z)

2nd Edition
Dec. 2000

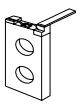
Description

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.

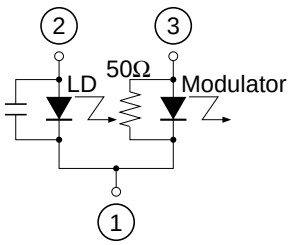
Features

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

Package Type
• HL1569AF: AF



Internal Circuit



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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	Topr	+10 to +40	°C
Storage temperature *	Tstg	–40 to +85	°C

Note: without condensation

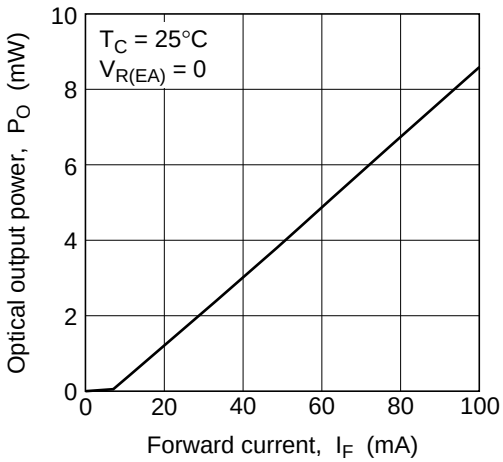
Optical and Electrical Characteristics

(T_C = 25°C)

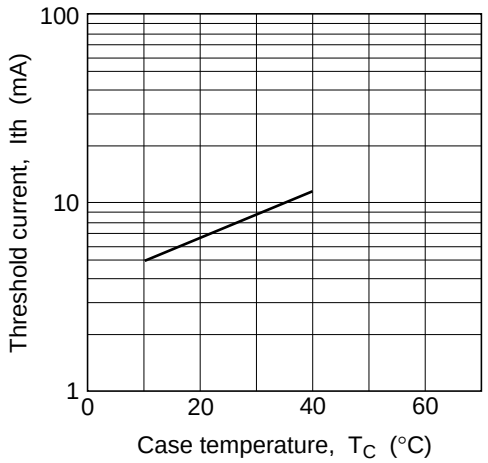
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Threshold current	Ith	—	10	20	mA	
Optical output power	P_O	4	—	—	mW	$I_{F(LD)}$ = 60 mA, $V_{R(EA)}$ = 0 V
Extinction ratio	ER	15	—	—	dB	$I_{F(LD)}$ = 60 mA, $V_{R(EA)}$ = 0/–2 V
Lasing wavelength	λp	1530	1550	1570	nm	2.5 Gbps (NRZ)
Side-mode suppression ratio	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

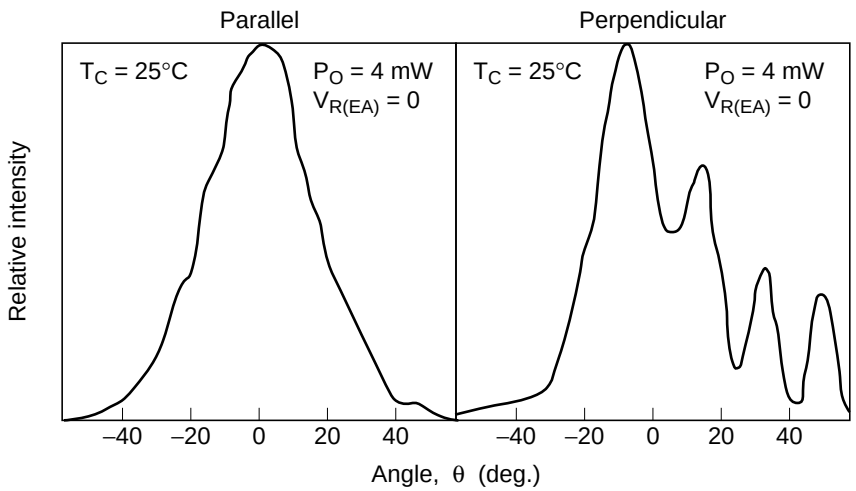
Optical Output Power vs. Forward Current



Threshold Current vs. Case Temperature

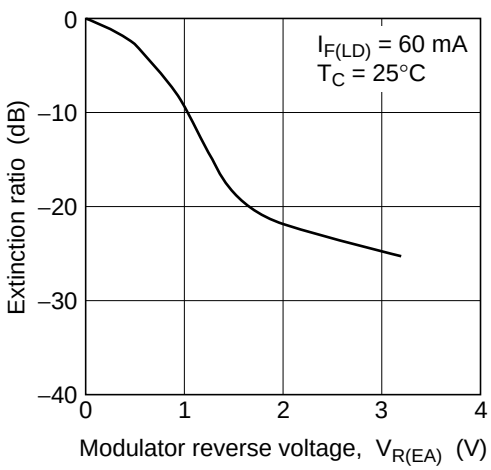


Far Field Pattern

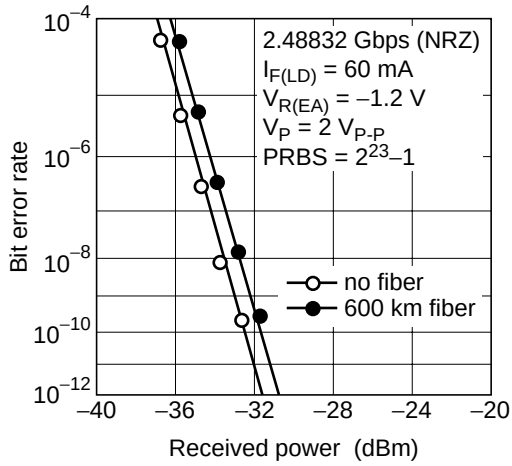


Typical Characteristic Curves (cont)

Extinction Ratio vs. Modulator Reverse Voltage



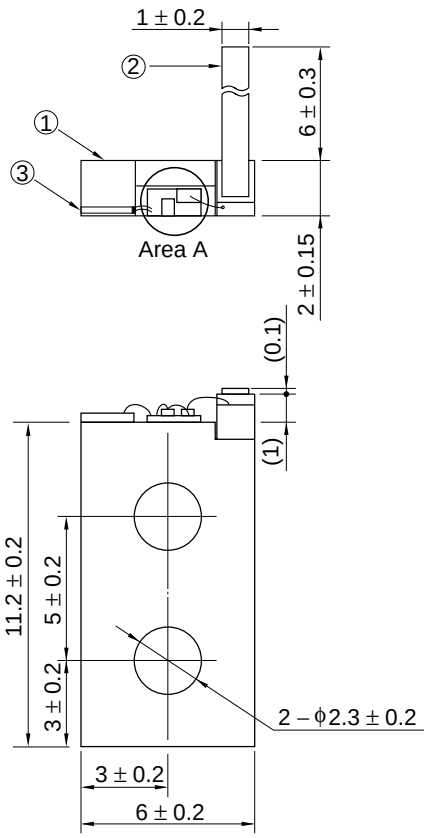
Bit Error Rate vs. Received Power

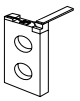


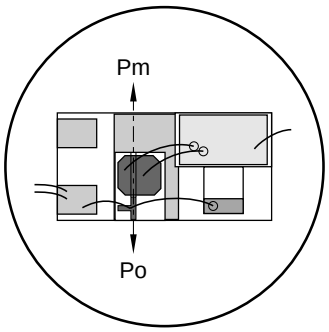
Package Dimensions

As of January, 2001

Unit: mm







Enlargement of Area A

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

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