HL1551A/AC

InGaAsP Laser Diodes

Description

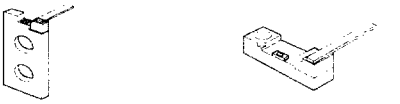
The HL1551A/AC are 1.55 μm InGaAsP λ/4 phase-shifted distributed-feedback laser diodes (DFB-LD) with a multi-quantum well (MQW) structure. They are suitable as light sources for high-bit-rate, long-haul fiberoptic communication systems and other applied optical equipment. The compact package is suitable for module assembly.

Features

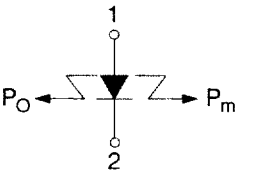
- Long wavelength output: 1530 to 1570 nm
- High-power output: 12 mW
- High quantum efficiency: $\eta_s \geq 0.125$ mW/mA
- Fast pulse response: t_r, t_f: ≤ 0.2 ns
- Dynamic single longitudinal mode: $S_r = 40$ dB Typ.
- Narrow spectral width (2.5 Gbps): $\Delta\lambda = 0.5$ nm Typ.

Package Type

- HL1551A: A1
- HL1551AC: AC



Internal Circuit



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

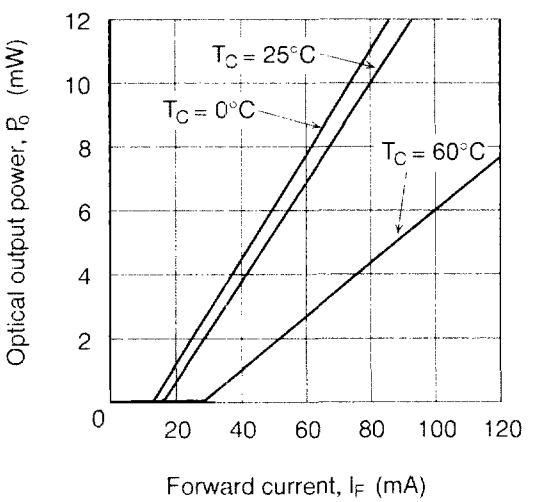
Item	Symbol	Value	Unit
Optical output power	P_O	12	mW
Reverse voltage	V_R	2	V
Operating temperature	T_{opr}	0 to +60	°C
Storage temperature	T_{stg}	0 to +80	°C

Optical and Electrical Characteristics (T_C = 25°C)

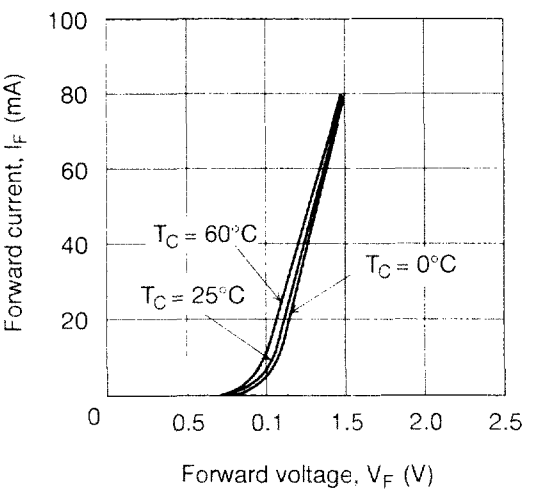
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Threshold current	I_{th}	—	15	50	mA	
Optical output power	P_O	12	—	—	mW	Kink free
Monitor optical output power	P_m	2	—	—	mW	P_O = 8 mW
Slope efficiency	η_s	0.125	0.15	—	mW/mA	
Spectral width	$\Delta\lambda$	—	0.5	—	nm	–27 dB, 2.5 Gbps (NRZ)
Lasing wavelength	λ_p	1530	1550	1570	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

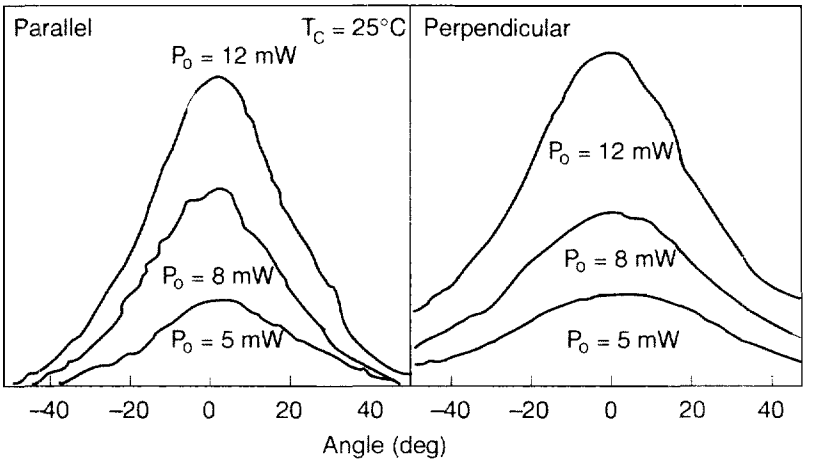


Forward Current vs. Forward Voltage

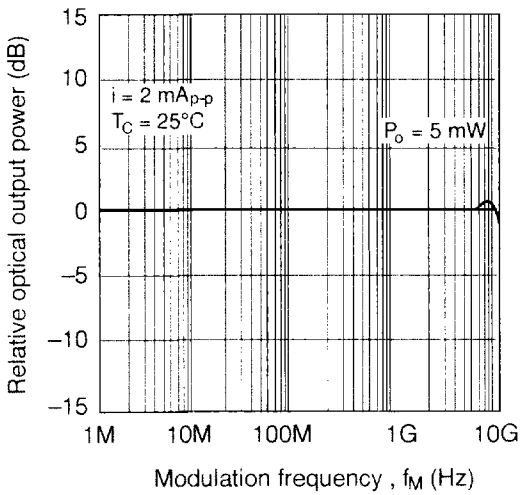


Typical Characteristic Curves (cont)

Far Field Pattern



Frequency Response of Laser Diode

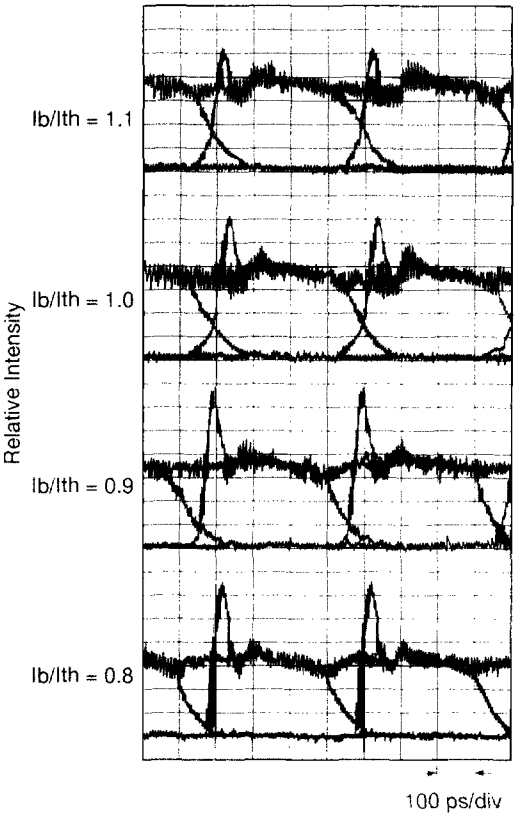


Typical Characteristic Curves (cont)

Bias Dependence of
Optical Pulse Response

2.48832Gbps (NRZ)
is = 40mAp-p
PRBS = 2^{15}-1

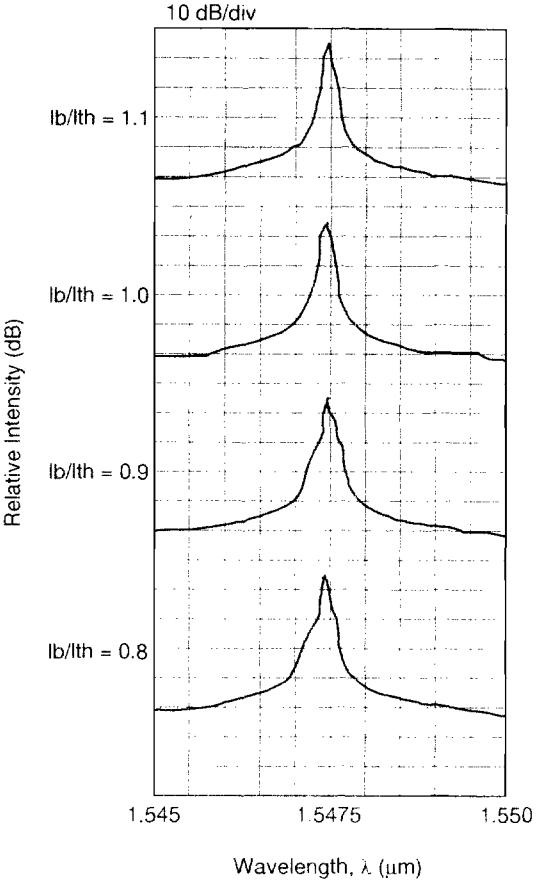
T_C = 25°C



Bias Dependence of
Lasing Spectrum

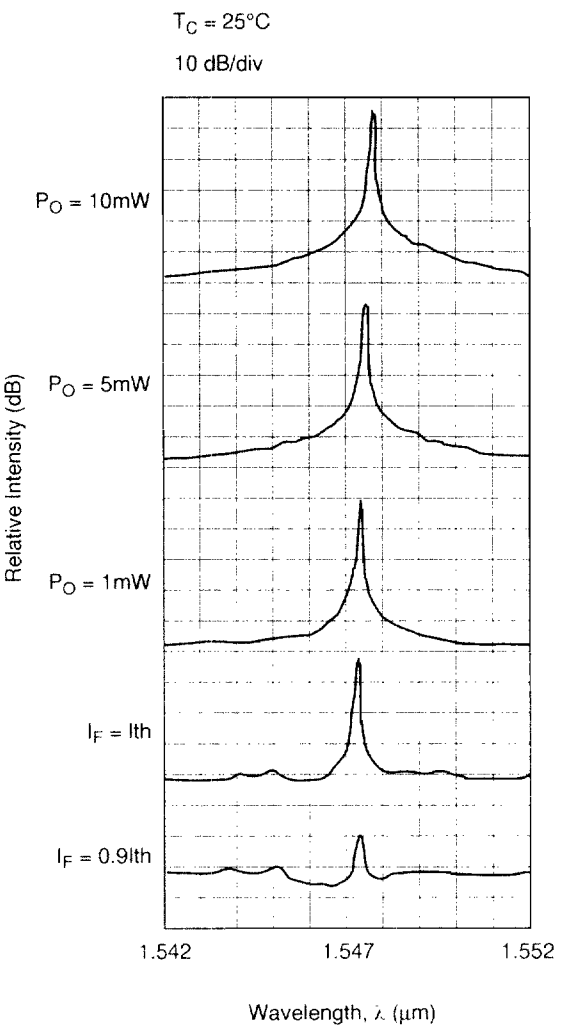
2.48832Gbps(NRZ)
is = 40mAp-p
PRBS = 2^{15}-1

T_C = 25°C

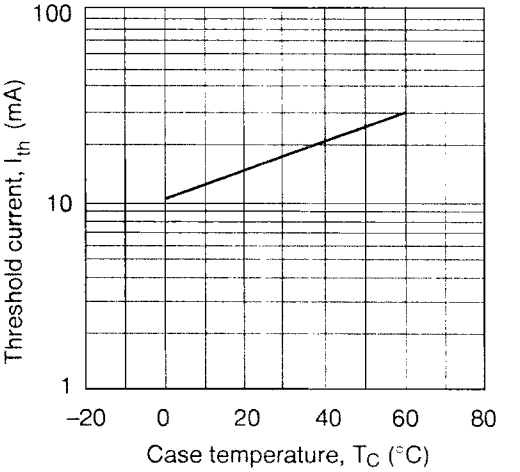


Typical Characteristic Curves (cont)

Optical Output Power Dependence of Lasing Spectrum



Threshold Current vs. Case Temperature



Temperature Dependence of Lasing Wavelength