

HL1321 FG

Laser Diode

Description

HL1321FG is a 1.3 μm InGaAsP laser diode with double heterojunction structure.

It is suitable as a light source in high-bit-rate, long-distance fiberoptic communications equipment.

The laser beam is output through the glass window in the package cap. Monitoring current is output from a built-in photodiode.

Features

- Long wavelength light output:
 $\lambda_p = 1290 - 1330 \text{ nm}$
- 5 mW CW operation at room temperature
- Built-in photodiode for monitoring laser output
- Fast pulse response: $\tau_r, \tau_f \leq 0.5 \text{ ns}$

Absolute Maximum Ratings (T_C = 25°C)

Items	Symbols	Values	Units
Optical output power	P_O	5	mW
Laser diode reverse voltage	$V_{R(LD)}$	2	V
Photodiode reverse voltage	$V_{R(PD)}$	15	V
Photodiode forward current	$I_{F(PD)}$	1	mA
Operating temperature	T_{opr}	0 to +60	°C
Storage temperature	T_{sto}	-40 to +80	°C

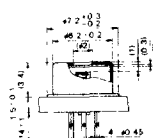
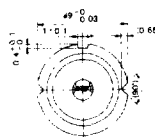
The absolute maximum ratings are limiting values, to be applied individually, beyond which the device may be permanently damaged. Functional operation under any of these conditions is not guaranteed. Exposing a circuit to its absolute maximum rating for extended periods of time may affect the device's reliability.

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

Items	Symbols	min.	typ.	max.	Units	Test conditions
Threshold current	I_{th}		30	50	mA	
Optical output power	P_O	5			mW	Kink free
		1.5	3.0		mW	$I_F = I_{th} + 20 \text{ mA}$
Lasing wavelength	λ_p	1290	1310	1330	nm	$P_O = 3 \text{ mW}$
Spectral width	$\Delta\lambda$		2		nm	$P_O = 3 \text{ mW}$
Beam divergence parallel to the junction	$\theta_{//}$		30		deg.	$P_O = 3 \text{ mW}$, FWHM
Beam divergence perpendicular to the junction	$\theta_{\perp}$		40		deg.	$P_O = 3 \text{ mW}$, FWHM
Photodiode dark current	I_{DARK}			350	nA	$V_{R(PD)} = 5 \text{ V}$
Monitor current	I_S	100			μA	$V_{R(PD)} = 5 \text{ V}$, $P_O = 3 \text{ mW}$
Photodiode capacitance	C_t		10	20	pF	$V_{R(PD)} = 5 \text{ V}$, $f = 1 \text{ MHz}$
Photosensitivity saturation voltage	$V_{R(S)}$			2	V	
Rise time	t_r			0.5	ns	$P_O = 3 \text{ mW}$, $I_{bias} = I_{th}$, 10 to 90%
Fall time	t_f			0.5	ns	$P_O = 3 \text{ mW}$, $I_{bias} = I_{th}$, 90 to 10%



Package Dimensions



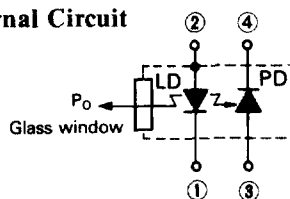
Notes: Optical path 2.55 mm
Refraction index of window 1.515

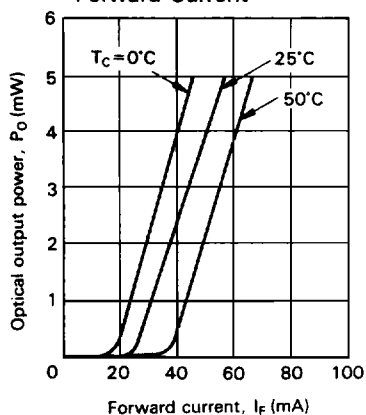
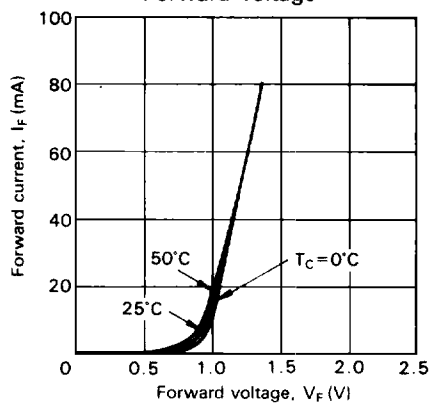
- 1 Laser diode cathode
- 2 Laser diode anode (Case)
- 3 Photodiode anode
- 4 Photodiode cathode

(Unit: mm)

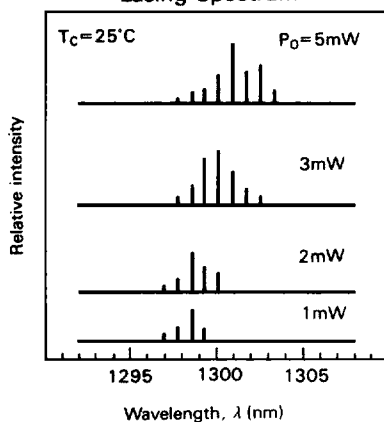
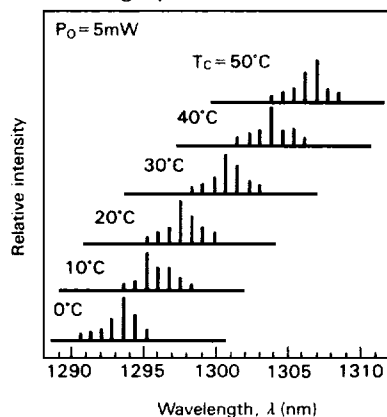
FG-type

Internal Circuit

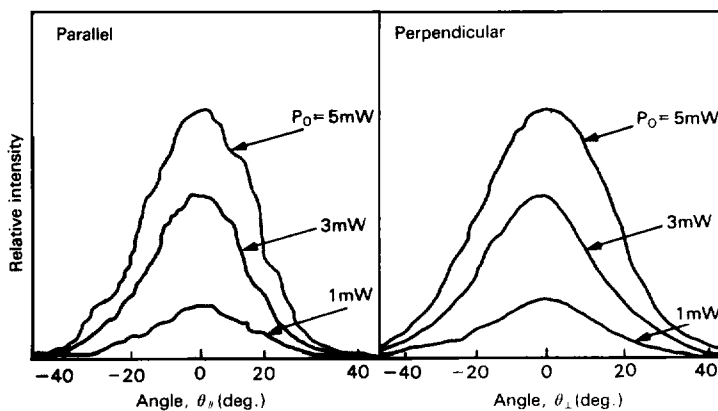


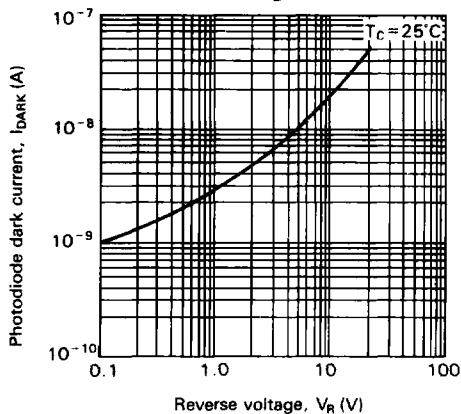
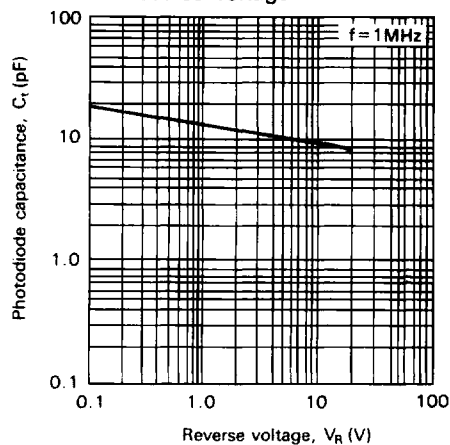
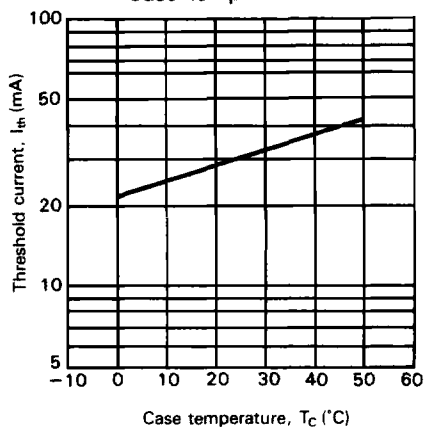
Optical Output Power vs.
Forward CurrentForward Current vs.
Forward Voltage

Lasing Spectrum

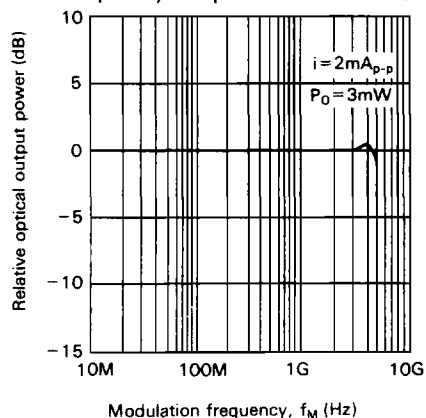
Temperature Dependence of
Lasing Spectrum

Far Field Pattern

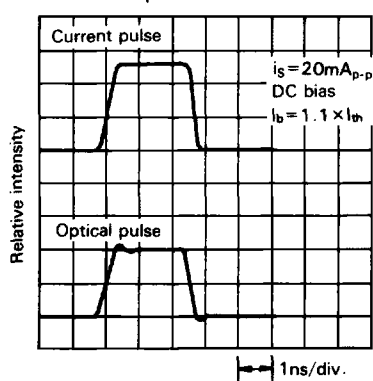


Photodiode Dark Current vs.
Reverse VoltagePhotodiode Capacitance vs.
Reverse VoltageThreshold Current vs.
Case Temperature

Frequency Response of Laser Diode



Pulse Response of Laser Diode

Optical Output Power vs.
Monitor Current