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# HL1327CF/CN/SN/PF

InGaAsP Laser Diodes

# HITACHI

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## Description

The HL1327CF/CN/SN/PF are 1.3  $\mu\text{m}$  InGaAsP Fabry-Perot laser diodes with a multi-quantum well (MQW) structure. They are suitable as light sources in short and medium range fiberoptic communication systems. Laser output is delivered from the coaxial package through an attached single mode fiber. A built-in photodiode provides monitor current output.

## Features

- Wide operating temperature range:  
 $T_{opr} = -40$  to  $+85^{\circ}\text{C}$
- High output power: 0.6 mW (Pulse)  
0.4 mW (CW)
- Low operating current:  
 $I_{op} (P_f = 0.4 \text{ mW}) = 18 \text{ mA}$  (Typ. @  $T_c = 25^{\circ}\text{C}$ )  
 $I_{op} (P_f = 0.4 \text{ mW}) = 38 \text{ mA}$  (Typ. @  $T_c = 85^{\circ}\text{C}$ )

## Fiber Specifications

Mode field diameter:  $9.5 \pm 1.0 \mu\text{m}$

Cutoff wavelength: 1.10 to 1.27  $\mu\text{m}$

Outer diameter: 125  $\mu\text{m}$

Jacket diameter: 900  $\mu\text{m}$

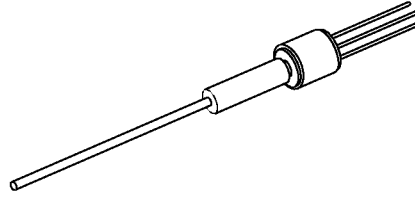
Fiber minimum Bend Radius: 25mm

Fiber length: More than 1000 mm

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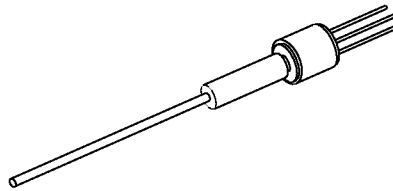
Package Type

- HL1327CF: CF2



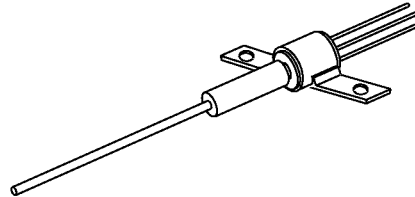
Package Type

- HL1327CN: CN2



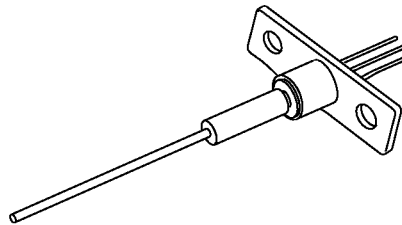
Package Type

- HL1327PF: PF2

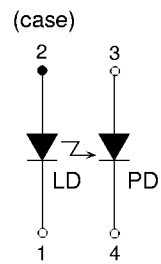


Package Type

- HL1327SN: SN2



Internal Circuit



**Absolute Maximum Ratings (TC = 25°C)**

Item	Symbol	Rated Value	Unit
Fiber optical output power	P <sub>f</sub> (Pulse)	0.6 *1	mW
	P <sub>f</sub> (CW)	0.4	mW
LD reverse voltage	V <sub>R</sub> (LD)	2	V
PD reverse voltage	V <sub>R</sub> (PD)	15	V
PD forward current	I <sub>F</sub> (PD)	1	mA
Operating temperature	T <sub>opr</sub>	-40 to +85	°C
Storage temperature	T <sub>stg</sub>	-40 to +85	°C

Note: 1. Maximum 50 % duty cycle, maximum 1μs pulse width.

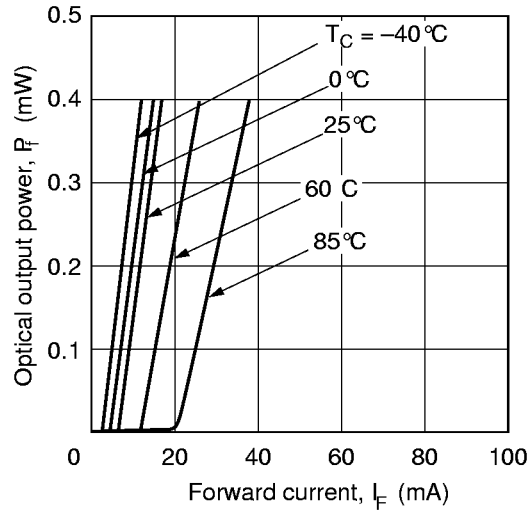
**Optical and Electrical Characteristics (TC = 25°C)**

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Threshold current	I <sub>th</sub>	—	8	20	mA	
Fiber optical output power	P <sub>f</sub>	0.4	—	—	mW	Kink free
Slope efficiency	η <sub>s</sub>	0.008	0.040	—	mW/mA	T <sub>C</sub> = 25°C
		0.004	0.020	—		T <sub>C</sub> = 85°C
Lasing wavelength	λ <sub>c</sub>	1280	1310	1340	nm	P <sub>f</sub> = 0.3 mW, RMS
Spectral width	σ	—	2	—	nm	P <sub>f</sub> = 0.3 mW, RMS
Rise time	t <sub>r</sub>	—	—	0.5	ns	10 to 90%
Fall time	t <sub>f</sub>	—	—	0.5	ns	90 to 10%
Monitor current	I <sub>s</sub>	100	—	—	μA	P <sub>f</sub> = 0.3 mW, V <sub>R(PD)</sub> = 5 V
PD dark current	I <sub>(DARK)</sub>	—	—	350	nA	V <sub>R(PD)</sub> = 5 V
PD capacitance	C <sub>t</sub>	—	15	20	pF	V <sub>R(PD)</sub> = 5 V, f = 1 MHz
Photosensitivity saturation voltage	V <sub>R(S)</sub>	—	—	2	V	

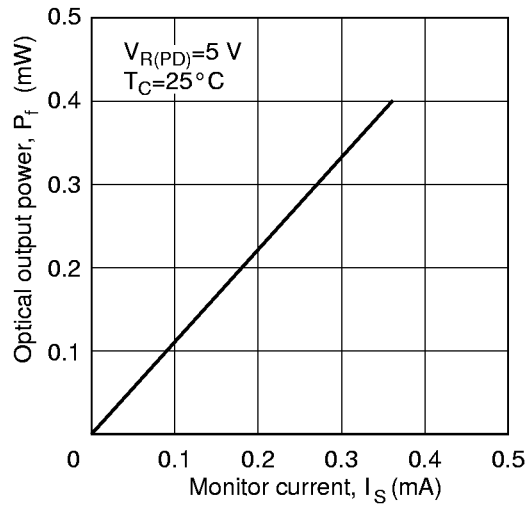
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## Typical Characteristic Curves

Optical Output Power vs. Forward Current

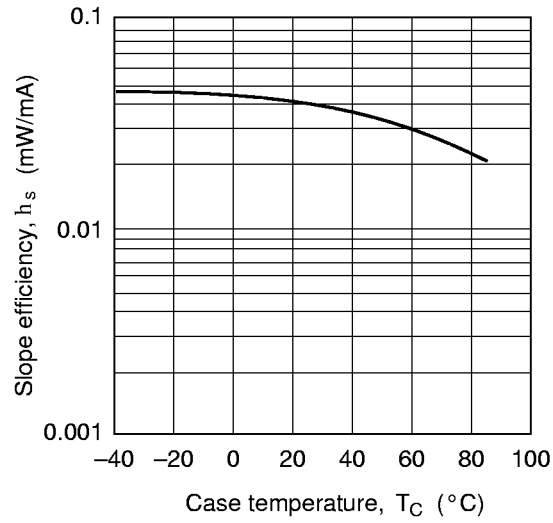


Optical Output Power vs. Monitor Current

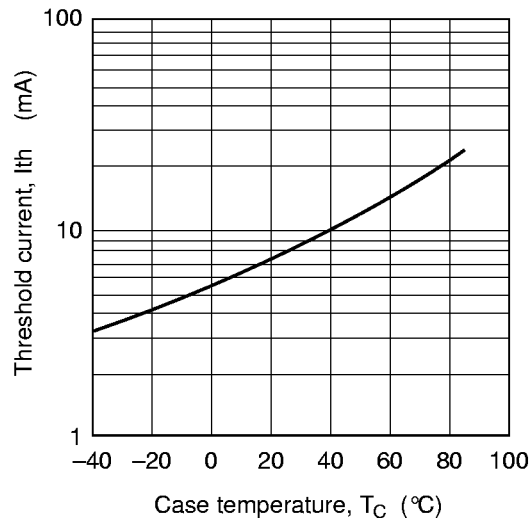


Typical Characteristic Curves (cont)

Slope efficiency vs. Case Temperature

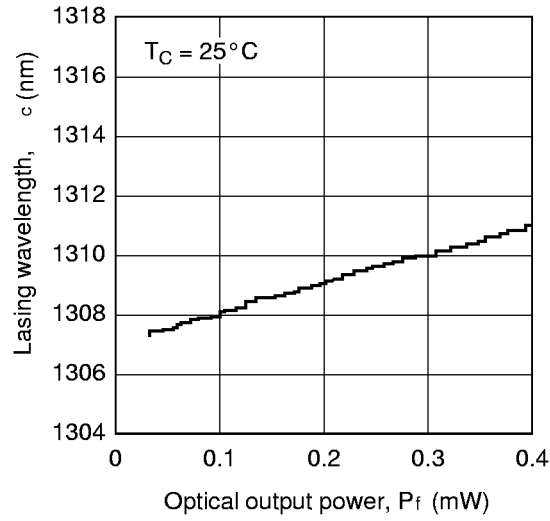


Threshold current vs. Case Temperature

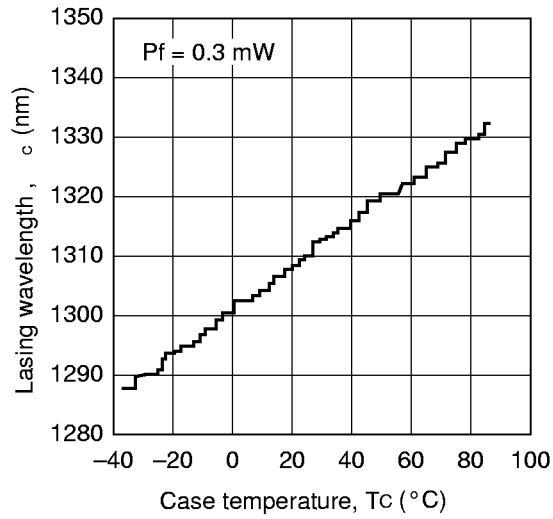


**Typical Characteristic Curves (cont)**

Lasing Spectrum vs. Optical Output Power

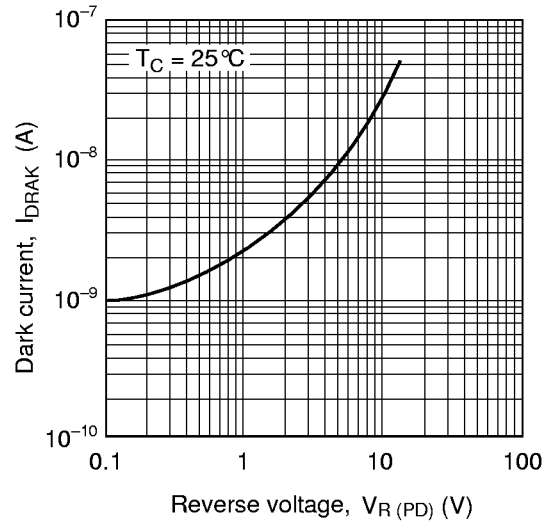


Lasing Spectrum vs. Case Temperature

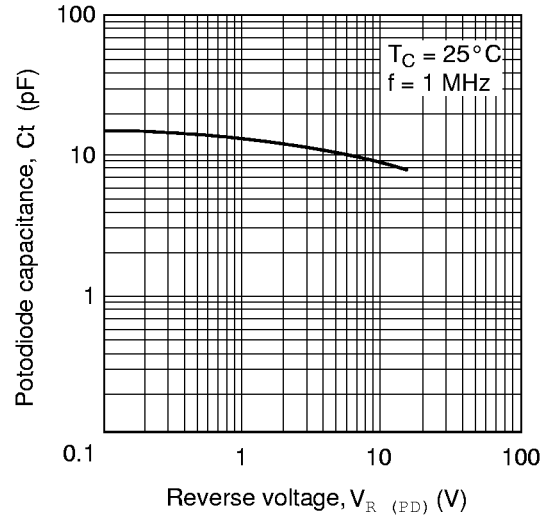


Typical Characteristic Curves (cont)

PD Dark Current vs. Reverse Voltage

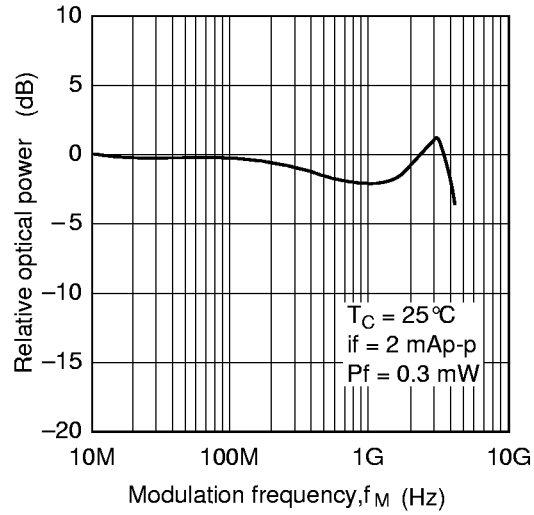


PD Capacitance vs. Reverse Voltage



**Typical Characteristic Curves (cont)**

Frequency Response of laser Diode



Pulse Response of Laser Diode

