Finisar

Product Specification

1310nm FABRY-PEROT (FP) LASER DIODE, LC TOSA

FP-1310-4I-LCB, FP-1310-4I-LCC

PRODUCT FEATURES

- Wide operating temperature (-40℃ to 85℃)
- Stable threshold current for easy transmitter control (T_0 ~ 80K)
- 1310 nm typical emission wavelength FP-LDs
- High-speed modulation capability (Up to 4Gb/s)
- Excellent reliability
  - Ultra-low gradual wear-out rates
  - <1% failures in 20 yrs at 55℃

The FP-1310-4I-LCx is an MOCVD grown InAlGaAs ridge laser diode with emission wave-length of 1310 nm and standard continuous light output of 5mW per facet. These lasers provide stable, single transverse mode oscillation.

These are hermetically sealed devices in a coaxial package (TO-56) with an integrated photodiode to monitor the optical output. Suitable as a light source in data-com and telecom applications with data rates up to 4 Gb/s.

PRODUCT SELECTION

Part Number	Description
FP-1310-4I-LCB	1310 nm Fabry-Perot (FP) Laser Diode, LC TOSA package
FP-1310-4I-LCC	1310 nm Fabry-Perot (FP) Laser Diode, LC TOSA package, low power.

I. Absolute Maximum Ratings

Parameter		Rating
Output Power, CW	FP-1310-4I-LCA	10mW
	FP-1310-4I-LCB	5mW
	FP1310-4I-LCC FP-1310-4I-SCC	2mW
Reverse Voltage (laser diode)		2V
Reverse voltage (monitor photodiode)		10V
Forward current (photodiode)		1mA
Operating temperature		-40℃ to +85℃
Storage temperature		-40℃ to +100℃
ESD Exposure (Human Body Model)		200V

Notice

Stresses greater than those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operations section for extended periods of time may affect reliability.

Notice

The inherent design of this component causes it to be sensitive to electrostatic discharge (ESD). To prevent ESD-induced damage and/or degradation to equipment, take normal ESD precautions when handling this product

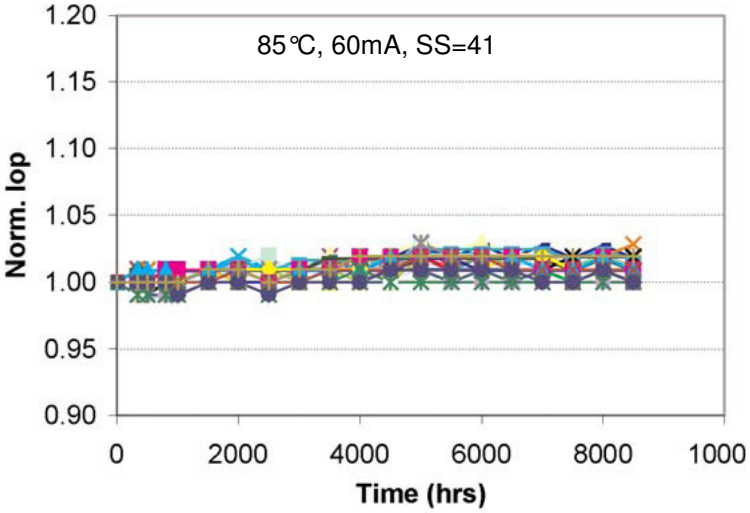
II. Electro-Optical Characteristics (T_{CASE} =25°C unless otherwise stated)

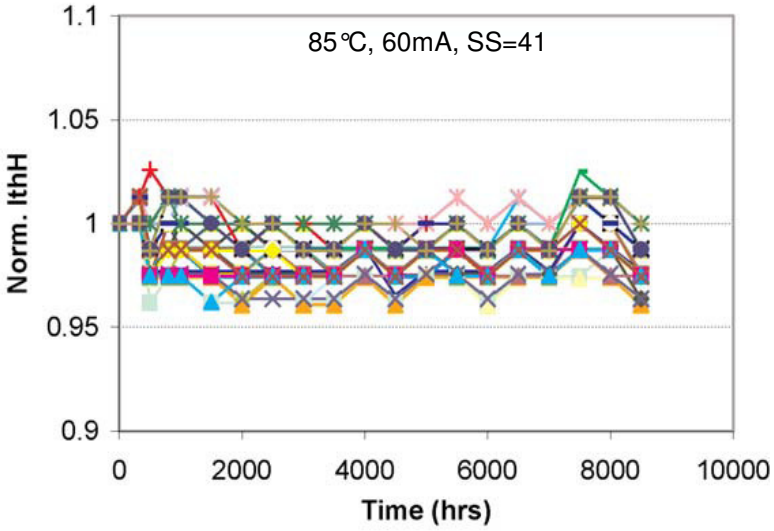
Parameter		Test Condition	Symbol	Min.	Typ.	Max.	Units	Notes
Optical Output Power	FP-1310-4I-LCB	$I_F = I_{OP}$	P_0	-4.0	-1.0	-0.5	dBm	1
	FP-1310-4I-LCC	$I_F = I_{OP}$		-6.5	-4.3	-3		
Slope Efficiency	FP-1310-4I-LCB	T_c = 25°C	SE	0.02	0.03	0.04	W/A	2
	FP-1310-4I-LCC	T_c = 25°C		0.009	0.016	0.024		
Operating Current		T_c = 25°C	I_{OP}		32		mA	
Threshold Current		CW, T_c = 25°C	I_{TH}	3	9	13	mA	
		CW, T_c = 85°C	$I_{TH,85}$		21	30	mA	
Temperature dependence of threshold current			T_0		80		K	
Operating Voltage		CW voltage at $I_F = I_{OP}$	V_{OP}		1.15	1.4	V	
Differential series resistance (laser diode)		CW dV/dI at T=25℃	R_{OP}	4	7	12	Ω	3
Slope efficiency ratio			SER	0.6	0.8	-		4
Lasing wavelength			λc	1290	1310	1330	nm	
Spectral width under modulation		PRBS 2^7-1, ER =10 dB; Ib = 1.8*I_{th}; RMS (sigma)	Δλ		1.5	2.75	nm	5
Temperature dependence of lasing wavelength			Δλc/ΔT	0.40	0.45	0.55	nm/C	
Rise time		20% - 80% ; Tc = 85℃; ER = 10 dB; Ib = 1.8*I_{th}	t_r			140	ps	
Fall time		20% - 80% ; Tc = 85℃; ER = 10 dB; Ib = 1.8*I_{th}	t_f			140	ps	
Relaxation oscillation frequency		Tc = 85℃; I = I_{th}+36mA	f_R		5.5		GHz	
Monitor photodiode capacitance			C_d		5		pF	
Tracking error			Δ_{TRACK}	-1.5		+1.5	dB	6
Monitor photodiode dark current		V_R = 3V	I_{m0}	0		0.1	μA	
Monitor photodiode current	FP-1310-4I-LCB	$I_F = I_{op}$	I_m	30	130	800	μA	
	FP-1310-4I-LCC	$I_F = I_{OP}$		30	200	800		

Notes:

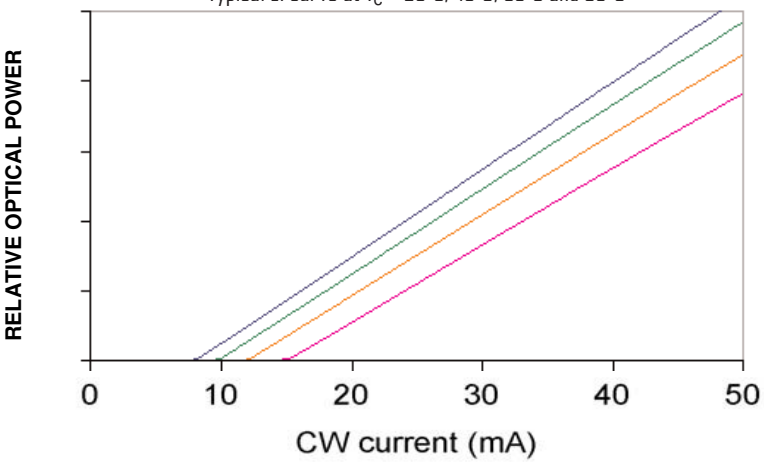
1. Output power is measured into a 9/125um single mode fiber
2. Slope Efficiency is measured between I_{TH}+10mA and I_{TH}+20mA
3. Series resistance is measured between 15mA and 25mA
4. .Slope Efficiency Ratio is defined as the ratio of SE_{85C}/SE_{25C}
5. Spectral width is measured according to FOTP-127
6. Tracking error is defined as the change in fiber coupled optical power when the monitor current is held constant over the operating temperature range

III. Typical Characteristics

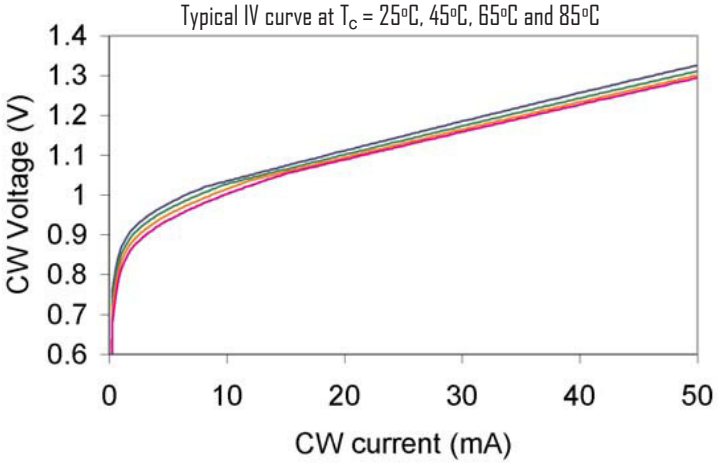




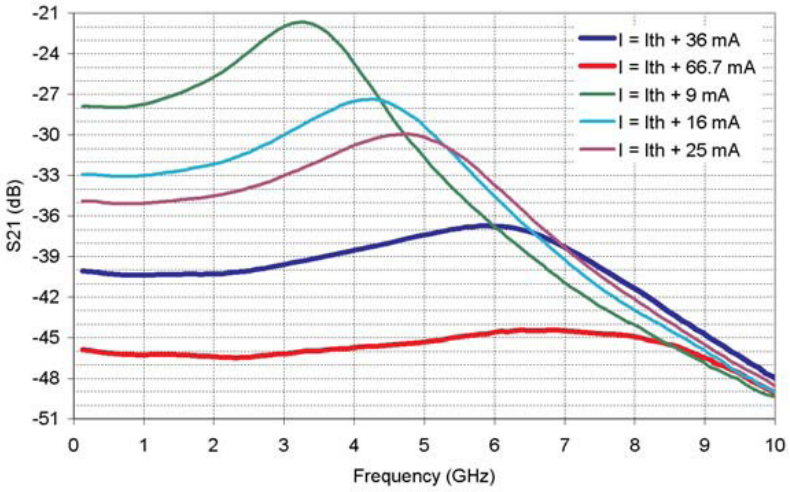
Typical LI curve at T_c = 25°C, 45°C, 65°C and 85°C



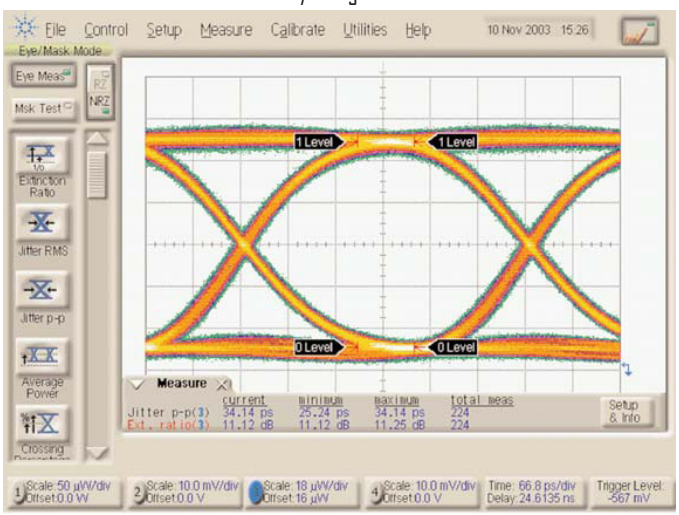
Typical IV curve at T_c = 25°C, 45°C, 65°C and 85°C



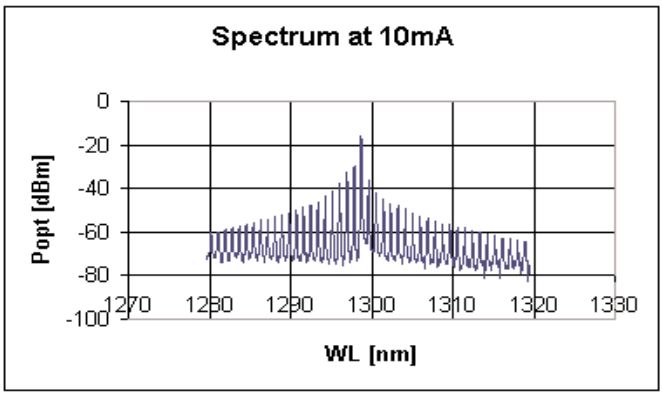
LD chip level bandwidth at 85°C

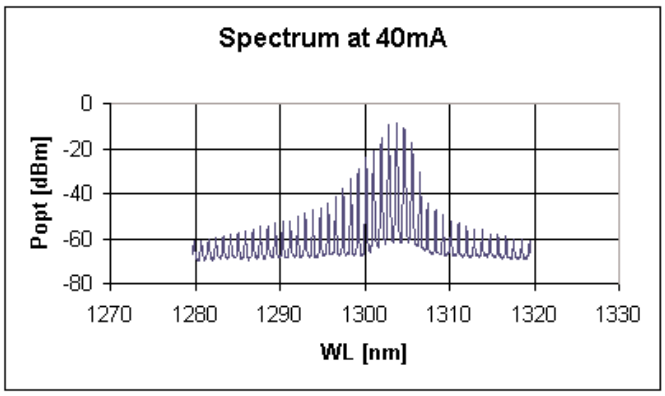


2.5Gb/s eye diagram at RT



Typical Characteristics





IV. Environmental Specifications

Parameter	Symbol	Min	Typ	Max	Units	Ref.
Case Operating Temperature	T_{op}	-40		85	°C	
Storage Temperature	T_{sto}	-40		100	°C	

V. Regulatory Compliance

Feature	Agency	Standard	Certificate Number
Laser Eye Safety	FDA/CDRH	CDRH 21 CFR 1040 and Laser Notice 50	0820400

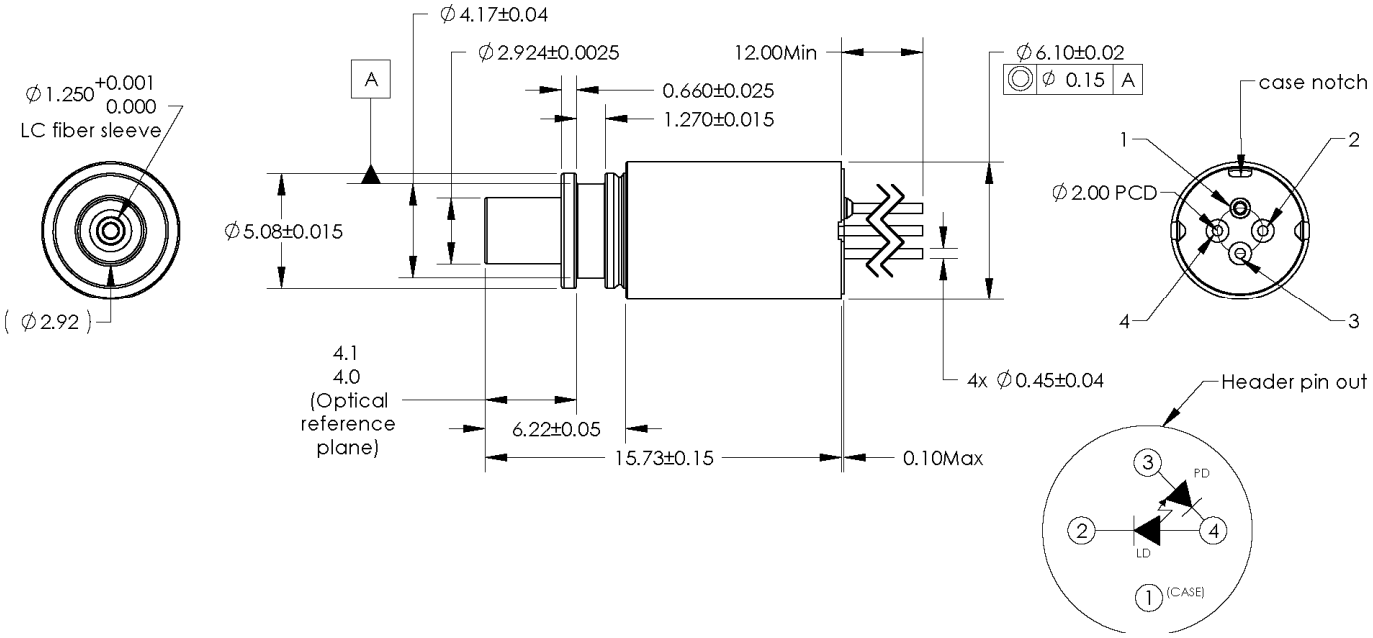
Copies of the referenced certificates are available at Finisar Corporation upon request.

VI. Mechanical Specifications

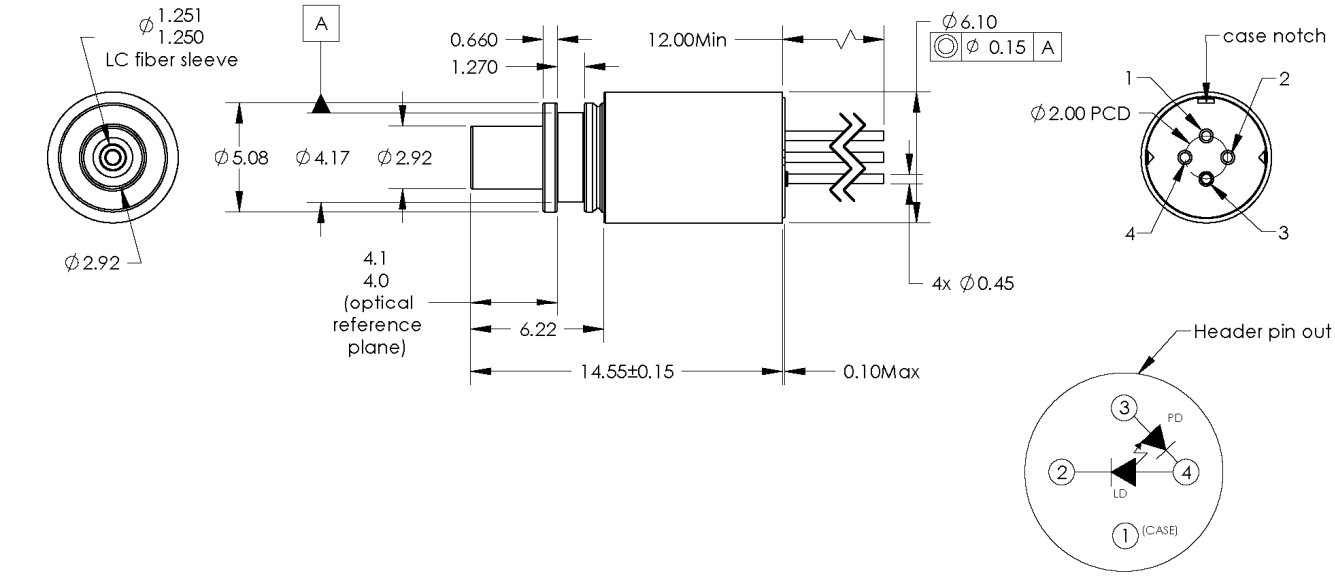
PIN	Description
1	Case (isolated)
2	LD Cathode
3	PD Anode
4	LD Cathode / PD Anode

(dimensions are in mm)

FP-1310-4I-LCB



FP-1310-4I- LCC



VII. Revision History

Revision	Date	Description
B00	10/8/2014	• Converted to Finisar Standard format

VIII. For More Information

Finisar Corporation
1389 Moffett Park Drive
Sunnyvale, CA 94089-1133
Tel. 1-408-548-1000
Fax 1-408-541-6138
sales@finisar.com
www.finisar.com

