

1550nmTx/1310nmRx FP Bi-Directional Optical Subassembly

Description

LB5F11 series is a 1550(TX)/1310nm(RX) Bi-direction Optical Subassembly (BOSA) for RFOG transmission application.

This module contains a 1550nm MQW FP laser diode as transmitter, an InGaAs/InP PIN as receiver, an edge filter (1550nm transmit / 1310nm reflect) to separate 1310nm and 1550nm wavelength.

The FP laser integrated an InGaAs monitor PD, it can be used with appropriate feedback control circuitry to set optical power level of the FP laser, As the current changed above the threshold, the optical power will change accordingly.

The PIN transduces incident light into optical current with high efficiency. The photosensitivity area of the PIN chip is 80um with a InGaAs planar structure.

This product has a single mode type fiber with a FC/APC or SC/APC optical connector.



Features

- 1550 nm transmitter with uncooled FP-LD
- Low noise, low distortion, Low threshold current
- 1310nm PIN diode receiver
- Low optical crosstalk
- operating temperature range: -40°C to 85°C

Application

- RFOG system application
- Suitable for CATV/CDMA application

Absolute Maximum Ratings^[1]

Parameter	Symbol	Min	Max	Units	Notes
Reverse Voltage(LD)	V_{RL}	---	2	V	
Forward Current(LD)	IFL	---	120	mA	
Reverse Voltage(MPD)	VRMP	---	15	V	
Forward Current(MPD)	IFMP	---	2	mA	
Reverse Voltage(PIN)	VRP	---	20	V	
Forward Current(PIN)	IR	---	5	mA	
Fiber Input Power	Pin	---	10	dBm	
Operating Temperature ^[1]	T_c	-40	+85	°C	Case temperature
Storage Temperature	T_{STG}	-40	+85	□	Ambient temperature
Relative Humidity	RH	---	80	%	
Lead Soldering Temperature/Time	TS	---	260/10	□/S	
Fiber bend radius		30	---	mm	
Fiber yield strength		---	1	kgf	

Note 1: Beyond the scope of absolute maximum ratings can cause permanent damage to the device. If it has been a long time to use the device in the absolute maximum ratings may affect device reliability.

Electric and Optical Characteristics

(All measurements are at Case temperature of $25 \pm 3 \square$, @1550±10nm unless stated otherwise.)

Transmitter Operating Characteristic-Optical, Electrical						
Parameter	Symbol	Min	Typical	Max	Units	Notes
Fiber Output Power	P_o	1.0	1.4	---	mW	CW, $I_f=I_{th}+20mA$
Slope Efficiency	η	0.05	0.07	---	W/A	CW
Center Wavelength	λ	1520	1550	1580	nm	CW, $I_f=I_{th}+20mA$
Spectral Width(-20dB)	$\Delta\lambda$	---	2	5	nm	CW, $I_f=I_{th}+20mA$
Modulation Bandwidth	BW	3	---	---	GHz	-3dB
Tracking Error	$TE^{[1]}$	-1.5	---	1.5	dB	I_M hold@ $P_o=1.5mW, 25^\circ C$ CW, $T_c= -40 \sim +85^\circ C$
Threshold Current	I_{th}	---	8	15	mA	CW
		---	30	45	mA	CW, $T_c= +85^\circ C$
Operating Voltage	V_f	---	1.2	1.7	V	CW
Monitor Current	I_M	100	---	1300	μA	CW, $I_f=I_{th}+20mA, V_{RMP}=1V$
Monitor Dark Current	I_D	---	---	100	nA	CW, $V_{RMP}=5V$
Photodiode Capacitance	C	---	---	10	pF	$V_{RMP}=5V, f=1MHz$
Rise time	T_r	---	---	150	Ps	Unfilter 20%~80%
Fall time	T_f	---	---	150	Ps	Unfilter 20%~80%
Relative Intensity Noise	RIN	---	---	-125	dB/Hz	CW, $I_f=I_{th}+20mA$

Receiver Operating Characteristic-Optical, Electrical						
Parameter	Symbol	Min	Typical	Max	Units	Notes
Operating Wavelength	λ	1270	1310	1350	nm	
Saturation Power	Psat	3	---	---	dBm	
Responsivity	R	0.75	0.8	---	A/W	Pin=-30dBm,VRP = 5V, λ =1310nm
Small Signal Bandwidth	BW	3.0	---	---	GHz	-3dB, VRP=12V
Dark Current	I_D	---	---	1	nA	VRP = 5 V
Composite Second Order beat	CSO ^[2]	---	---	-70	dBc	
Composite Third Order beat	CTB ^[2]	---	---	-80	dBc	
Capacitance	C	---	---	0.8	PF	VRP=5V,f=1MHz
Other Characteristic-Optical, Electrical						
Parameter	Symbol	Min	Typical	Max	Unit	Notes
Optical Crosstalk	CRT	---	---	-40	dB	
Return Loss	RL	12	---	---	dB	λ =1550nm
		35	---	---	dB	λ =1310nm
Optical Isolation	Iso	30			dB	λ =1480nm~1600nm
Exterior fiber diameter		0.8	0.9	1.0	mm	70 \square max temperature
Fiber length	L	900	1000	1100	mm	Outline Dimensions[L]
Optical Connector Return loss	ORL	45	---	---	dB	

Notes1:TE=10*log(Pf(Tc)/Pf(25 \square)) @ APC with monitor current is constant.

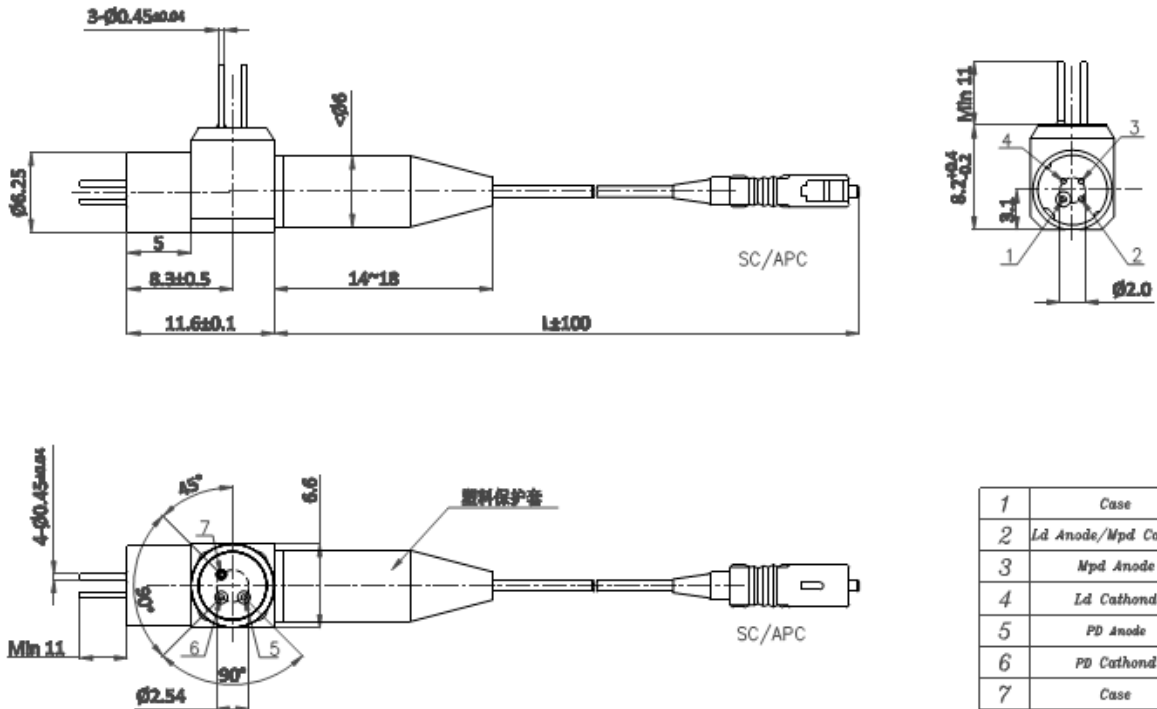
Notes2:Two-tone test condition : f1=50MHz, f2=505MHz, f1 \neq f2, VRP=-12V,Pavg=0dBm,MI=0.4,Rload=75 Ω .

Pigtail parameters

Parameter	Symbol
Optical connector	SC/APC (IEC874/7)
Mode field diameter	9.5 \pm 1 μ m
Cladding diameter	125 \pm 2 μ m
Outermost Jacket	900 \pm 100 μ m
Jacket color	Yellow or White
Pigtail Length	1.0 \pm 0.1m

Outline Dimensions

All dimensions are $\pm 0.1\text{mm}$ unless otherwise specified (Unit: mm). For detail information please contact LinkPhotonic.



Precautions

Semiconductor chips are sensitive to electro-static damage. The module shall be packed with antistatic material for transportation. The working station and operators shall be grounded. Switching transients can cause electrical overstress (EOS) damage to the chips. EOS be may resulted from improper ESD handling, improper power sequencing, a faulty power supply or an intermittent connection.

a. Operators should always use antistatic bands and clothing, electric conductive shoes, and other safety appliances while at work are highly recommended.

b. Humidity in working environment should be controlled equal or above 40 percent RH.

c. It is recommended that grounding mats be placed on the surfaces of assembly line workbench and the surrounding floor in working area, etc.

d. When mounting this product in other parts or materials which can be electrically charged (printed wiring boards, plastic products, etc.), pay close attention to the static electricity in those parts.ESD may damage the product.

Ordering Information

LB5F11 - xxx

- Customer Information
- Operating Temperature:
C:0~70℃ E:-20~80℃ I:-40~85℃
- Optical Connector Type:
A: FC/UPC-SM-0.9-1.0M
B: FC/APC-SM-0.9-1.0M
C: SC/UPC-SM-0.9-1.0M
D: SC/APC-SM-0.9-1.0M

Statement

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