

CWDM Analog Bi-Directional Optical Subassembly

Description

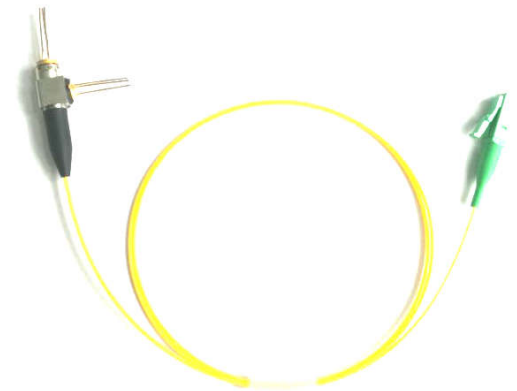
LBxx12 series has a CWDM(TX)/1550nm(RX) Bi-direction Optical Subassembly (BOSA) for analog transmission application .

This module contains a O&E band(1260~1460nm) MQW CWDM laser diode as transmitter, the wavelength of CWDM will be selected, an InGaAs/ InP PIN as receiver, an edge filter (CWDM transmit / 1550nm reflect) to separate original band and 1550nm laser.

The TX with an InGaAs monitor PD, it can be used with appropriate feedback control circuitry to set optimal power level for each CWDM DFB 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 PIN chip has a photosensitivity area diameter of 80um with a InGaAs planar structure.

The products has single mode type fiber(G.657A) with a FC/APC or SC/APC optical connector can be selected.



Features

- Transmitter with uncooled CWDM-DFB-LD (1260~1460nm)
- Transmitter with isolator
- Low noise, low distortion, Low threshold current
- 1550nm PIN diode receiver
- Low optical crosstalk
- operating temperature range: 0°C to 70°C
- Fiber is meet the G.657A standard

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	-10	+85	°C	Case temperature
Storage Temperature	T_{STG}	-40	+85	°C	Ambient temperature
Relative Humidity	RH	---	80	%	
Lead Soldering Temperature/Time	T_S	---	260/10	°C/S	
Fiber bend radius		10	---	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°C±3°C, @1310±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, If=lth+20mA
Slope Efficiency	η	0.05	0.07	---	W/A	CW
Center Wavelength	λ	Code List			nm	CW, If=lth+20mA
Spectral Width(-20dB)	$\Delta\lambda$	---	0.2	1	nm	CW, If=lth+20mA
Side-Mode Suppression Ratio	SMSR	30	---	---	dB	CW, If=lth+20mA
Tracking Error	$TE^{[1]}$	-1.5	---	1.5	dB	I_M hold@ $P_0=1.5mW, 25^\circ C$ CW, $T_c= 0 \sim +70^\circ C$
Threshold Current	I_{th}	---	8	15	mA	CW
		---	30	45	mA	CW, $T_c= +70^\circ C$
Operating Voltage	V_F	---	1.2	1.7	V	CW, If=lth+20mA
Monitor Current	I_M	100	---	1300	μA	CW, If=lth+20mA, $V_{RMP}=1V$
Monitor Dark Current	I_D	---	---	200	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	---	-145	---	dB/Hz	CW, If=lth+20mA

Receiver Operating Characteristic-Optical, Electrical						
Parameter	Symbol	Min	Typical	Max	Units	Notes
Operating Wavelength	λ	1545	1550	1565	nm	
Saturation Power	Psat	3	---	---	dBm	VRP=5V, λ =1550nm
Responsivity	R	0.8	0.9	---	A/W	
Supply Voltage	V _S	---	-12	-5	V	
Active Area	Φ	---	75	---	μ m	
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	λ =1550nm
Composite Third Order beat	CTB ^[2]	---	---	-80	dBc	λ =1550nm
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	40	---	---	dB	λ =1310nm, with isolator
		40	---	---	dB	λ =1550nm
Optical Isolation	Iso	30	---	---	dB	λ =1260nm~1510nm
		15	---	---		λ =1510nm~1537nm
		15	---	---		λ =1583nm~1595nm
		30	---	---		λ =1597nm~1650nm
Exterior fiber diameter		0.8	0.9	1.0	mm	70°C max temperature
Pigtail Length	L	900	1000	1100	mm	Outline Dimensions[L]
Optical Connector Return loss	ORL	45	---	---	dB	APC connector

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

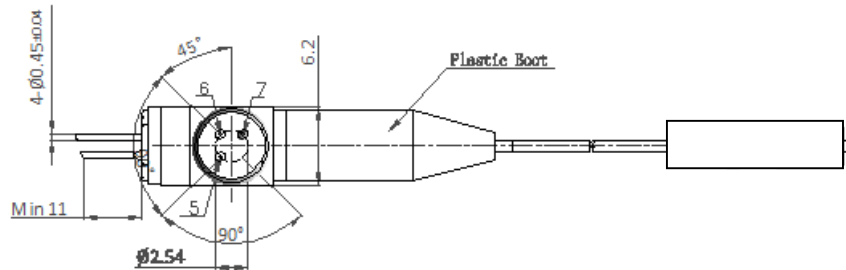
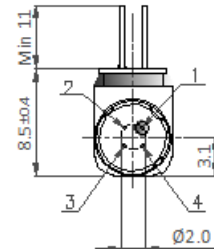
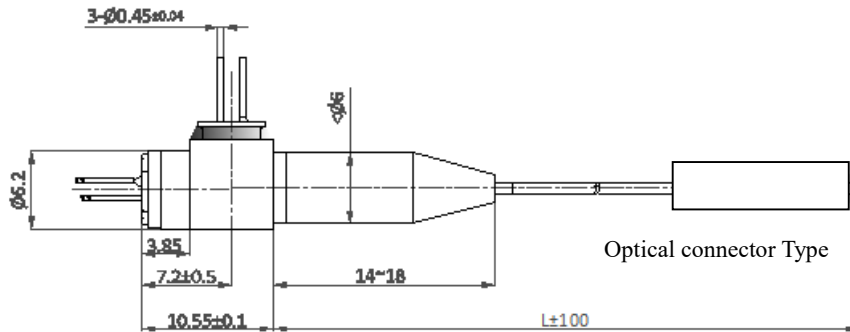
Notes2:Two-tone test condition : f1=50MHz, f2=505MHz, f1+f2, VRP=-12V,Pavg=0dBm,MI=0.4,Rload=75Ω.

Pigtail parameters

Parameter	Symbol
Optical connector	LC/APC (IEC874/7)
Mode field diameter	9.5±1μm
Cladding diameter	125±2μm
Outermost Jacket	900±100μm
Jacket color	Yellow or White
Pigtail Length	0.63±0.03m

Outline Dimensions

All dimensions are ±0.1mm unless otherwise specified (Unit: mm). For detail information please contact LinkPhotonic.



1	Case
2	Ld Anode/Mpd Cathode
3	Mpd Anode
4	Ld Cathode
5	PD Anode
6	PD Cathode
7	Case

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.

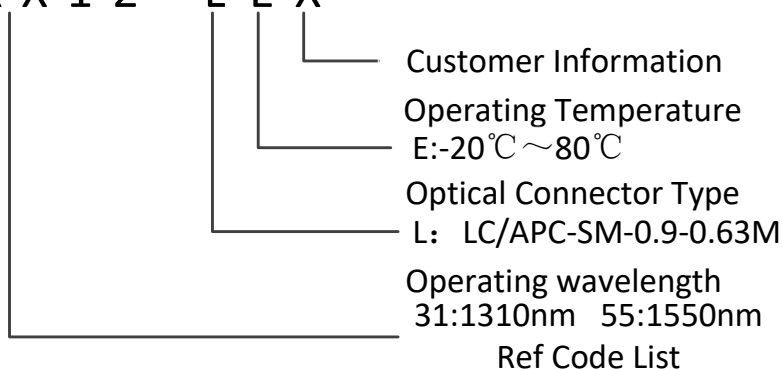
b. Humidity in working environment should be controlled equal or above 40 percent RH.

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

L B X X 1 2 - L E X


Wavelength

The wavelength of CWDM DFB LD as Code List at 25±3°C.

xx	Center of wavelenth	$\Delta\lambda$	xx	Center of wavelenth	$\Delta\lambda$
27	1270nm	±3nm	45	1450nm	±3nm
29	1290nm	±3nm	47	1470nm	±3nm
31	1310nm	±3nm	49	1490nm	±3nm
33	1330nm	±3nm	51	1510nm	±3nm
35	1350nm	±3nm	53	1530nm	±3nm
37	1370nm	±3nm	55	1550nm	±3nm
39	1390nm	±3nm	57	1570nm	±3nm
41	1410nm	±3nm	59	1590nm	±3nm
43	1430nm	±3nm	61	1610nm	±3nm

Statement

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