



## PW13L85 WDM Multimode1310 Transmit / 850nm Receive Bidirectional Modules

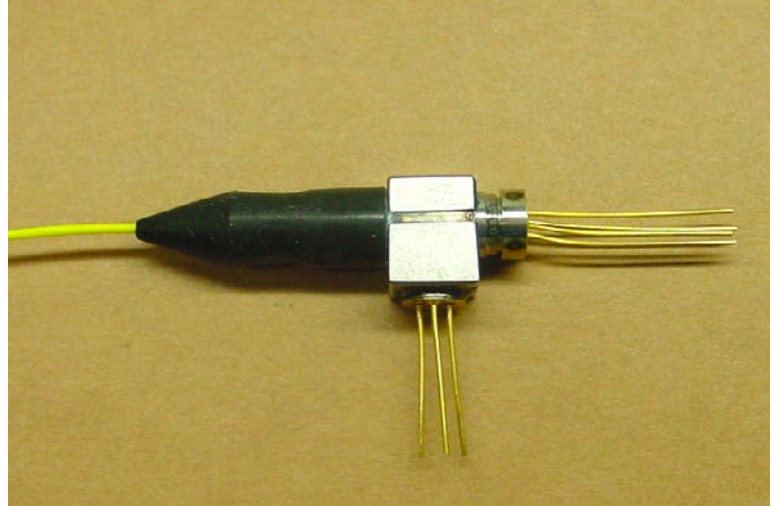
PD-LD Inc. is now offering its next generation of WDM style BiDirectional transmitter and receiver modules operating in the 1310 and 850nm optical windows. These devices are designed to simultaneously transmit and receive over a single optical fiber at frequencies from DC to 1.0 GHz. Dual wavelength bi-directional modules replace the need for a multi-mode fiber coupled laser diode, a fiber coupled PIN photodiode, a discrete fiber optic WDM and a second stage optical isolator. The BiDirectional Modules combine all of these optical functions and relieve the user of having to fusion splice several discrete units together and then squeeze them onto their PCB.

These small, compact modules require minimal board real estate and when used in pairs deliver two way operation over a single 62.5/125um optical fiber.

The PD-LD product incorporates low threshold current, high differential quantum efficiency 1310nm FP laser transmitters that have 10mA typical threshold currents and usually operate with less than 20mA of total drive current. The receiver sections offer discrete Silicon PIN photodiodes of planar semiconductor design that have dielectric passivation for very low noise performance at 850nm. See the data sheet for the PW85 series for the matching bidirectional module. PD-LD's BiDirectional WDM modules are built to meet the demanding requirements of industrial operating temperature ranges of -40 to 85°C.

The PD-LD BiDirectional modules are assembled using laser welding processes. This technique guarantees a semiconductor to optical fiber interface that remains stable over mechanical and environmental extremes. The optical semiconductor die are mounted within hermetically sealed TO can subassemblies making them impervious to contaminants and moisture. This construction ensures that optical output power will vary by no more than +/-1.5dB over the entire operating temperature range from its initial 25°C performance.

WDM BiDirectional modules are built with 1+/-0.2 meter long 62.5/125/900 um MMF fiber optic pigtails. These fibers may be terminated with most standard fiber optic connectors including FC, SC and ST styles.



### Features

- Output Power up to 0.5 mW CW
- -40 to +85° Operating Temperature
- 1310 nm FP Laser Diodes
- Low Noise Silicon PIN Photodiodes
- Compact, rugged construction
- Low Threshold Current Lasers
- Low Power Consumption
- Available with optical connectors
- Replaces Discrete Lasers and Optical Couplers
- Class 1 Eye Safe Device
- UL Listed
- Pairs with PW8513 Series

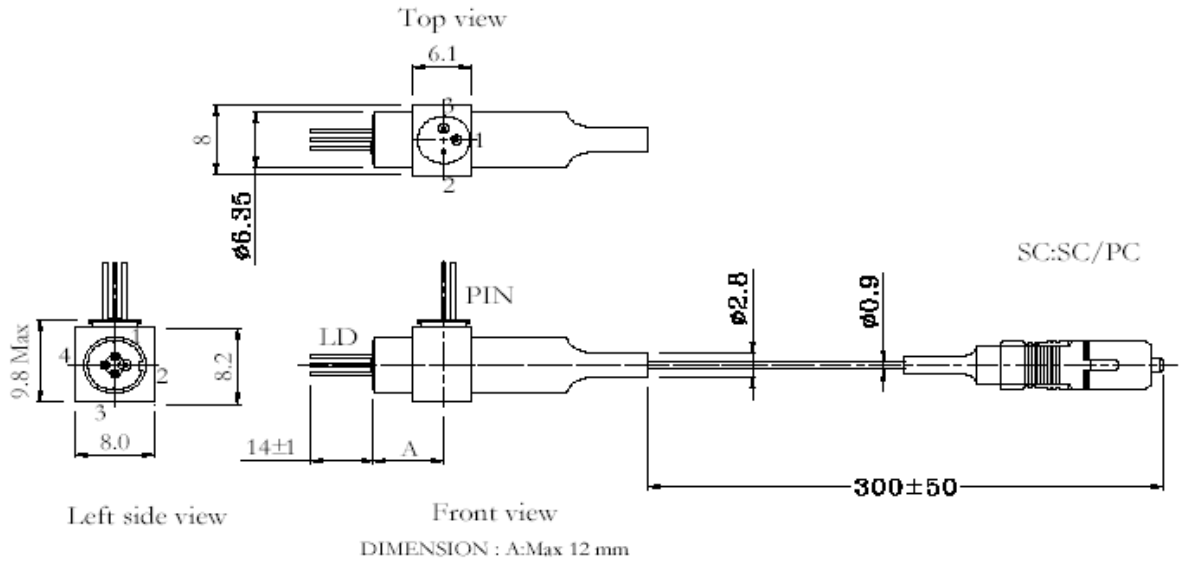
### Applications

- Passive Optical Networks
- Short distance over MMF
- Full Duplex Communications
- WDM Bi-Directional transmission over a single fiber
- CATV
- CCTV

### Absolute Maximum Ratings Parameters

Module	Symbol	Rating	Units
Operating Temp	T <sub>OP</sub>	-40 to 85	°C
Storage Temp	T <sub>STG</sub>	-40 to 85	°C
Soldering Temp	T <sub>SLD</sub>	250	°C
<b>Laser Diode</b>			
Forward Current	I <sub>F(LD)</sub>	100	mA
Reverse Voltage	V <sub>R(LD)</sub>	2	V
<b>Monitor Diode</b>			
Forward Current	I <sub>F(MD)</sub>	2	mA
Reverse Voltage	V <sub>R(MD)</sub>	15	V
<b>PIN Photodiode</b>			
Forward Current	I <sub>F(PD)</sub>	10	mA
Reverse Current	I <sub>R(PD)</sub>	5	mA
Reverse Voltage	V <sub>R(PD)</sub>	15	V
Max Optical Input Power	P	1.5	mW

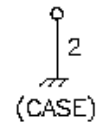
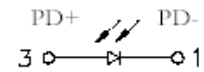
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LD Pin Assignment

PIN Pin Assignment

Pin 1 : Laser Cathode  
Pin 2 : Case  
Pin 3 : LD Anode and PD Cathode  
Pin 4 : PD Anode



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### Ordering Information

BiDirectional Module Characteristics and Parameters						
	Symbol	MIN.	TYP.	MAX	Units	Test Condition
<b>Laser Diode 1310nm</b>						
Power Low	$P_O$	0.5	0.8		mW	$I_f=40mA$
Slope Efficiency	SE		0.08		mW/mA	CW
Threshold Current	$I_{TH}$	-	12	15	mA	CW
Operating Voltage	$V_{OP}$	-	1.2	1.6	V	$I_f = I_{OP}$
Peak Wavelength	Lambda	1290	1310	1330	nm	25°C
Spectral Width	Delta Lambda	-	2	5	nm	RMS
Temp. Coefficient		-	-	<0.5	nm/°C	-40 to 85°C
Rise/Fall Time	$t_r, t_f$	-	-	0.3	nsec	10~90%
<b>Monitor Diode</b>						
Reverse Voltage	$V_{RPD}$			10	V	
Forward Current	$I_{FPD}$			2	mA	CW
Output	$I_{MD}$	100	-		μA	$I_f = I_{OP}, P_O$
Dark Current	$I_{D(MD)}$	-	-	0.1	μA	$V_{R(MD)}=5V$
Capacitance	$C_{(MD)}$	-	6	15	pF	$V_{R(MD)}=5V,$ $f=1MHz$
<b>PIN Photodiode</b>						
Spectral Sensitivity	S		0.3		A/W	$V_{R(PD)}$ $=5V@850nm$
Reverse Voltage	V		5	15	V	
Dark Current	$I_{D(PD)}$	-	-	1	nA	$V_{R(PD)}=5V@25°C$
Capacitance	$C_{(PD)}$			3.3	pF	$V_{R(PD)}=5V,$ $f=1MHz$
Rise/Fall Time	$t_r, t_f$	-	1	-	nsec	$V_{R(PD)}=5V,$ 10~90%
<b>Module</b>						
Tracking Error		-1.5		+1.5	dB	-40 to 85°C
Fiber Tensile Strength		5			N	
Connector Return Loss				45	dB	

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