

PW15M11 Series SM 1550 TX / 1310 RX Bidirectional 1.25 GB/s PINTIA RX

PD-LD Inc. is now offering its next generation of WDM style Bidirectional transmitter and receiver modules operating in the 1310 and 1550nm optical windows. These devices are designed to simultaneously transmit and receive over a single optical fiber at frequencies from 10 to 1.25GBs. Dual wavelength bi-directional modules replace the need for a single mode fiber coupled laser diode, a fiber coupled InGaAs PIN-TIA, 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.

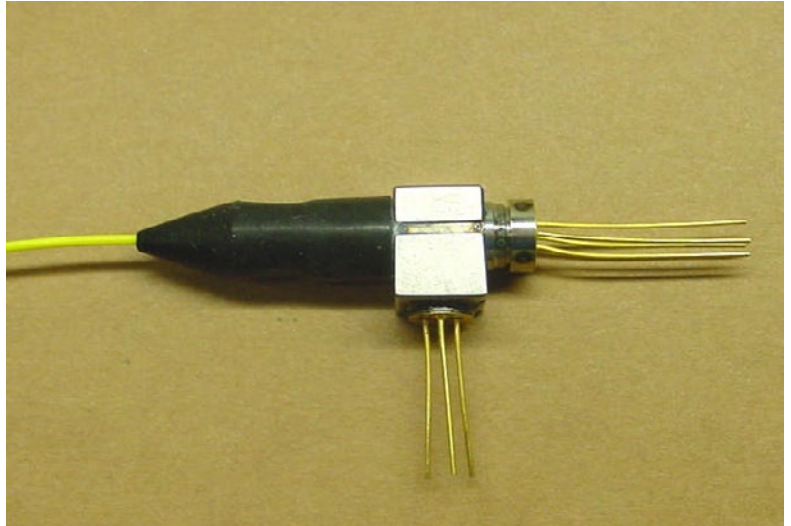
These small, compact modules require minimal board real estate and when used in pairs deliver full duplex operation of a single 9/125um optical fiber with crosstalk of <-45dB.

The PD-LD product incorporates low threshold current, high differential quantum efficiency MQW (Multiple Quantum Well) FP semiconductor lasers whose typical total operating currents are less than 30mA. Customers may also request DFB lasers. The receiver section offers a 1200 MHz bandwidth PIN TIA component that is ideal for digital differential operation. These receivers deliver typically -26 dBm optical sensitivity at a BER of 10^{-10} at OC-24 operation. AGC allows for high optical input power. PD-LD's Bidirectional WDM modules are built to meet the demanding requirements for optical networking.

These modules comply with the Class 1 Eye Safety standards as outlined by CDRH1040.10&11, as well as IEC825-1 and -2.

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 and environmental extremes. The optical semiconductor die are mounted within hermetically sealed TO can subassemblies making them impervious to contaminants and moisture.

This particular WDM Bidirectional modules is built with 0.25 meter long 9/125/900 um SMF28 fiber optic pigtails. These fibers may be terminated with most standard fiber optic connectors including FC, SC, ST and LC.



Features

- Output Power up to 1 mW CW
- -40 to +85° Operating Temperature
- 1550nm FP MQW Laser Diodes
- Low Noise 1.25 GBs PIN TIA Receivers
- 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

Applications

- Passive Optical Networks
- Full Duplex Communications
- WDM Bi-Directional transmission over a single fiber
- CATV
- Digital or Analog Operation

Absolute Maximum Ratings Parameters

Module	Symbol	Rating	Units
Operating Temp	T _{OP}	-40 to 85	°C
Storage Temp	T _{STG}	-40 to 85	°C
Soldering Temp	T _{SLD}	250	°C
Laser Diode			
Forward Current	I _{F(LD)}	100	mA
Reverse Voltage	V _{R(LD)}	2	V
Monitor Diode			
Forward Current	I _{F(MD)}	2	mA
Reverse Voltage	V _{R(MD)}	20	V
PIN TIA			
Forward Current	I _{F(PD)}	2	mA
Reverse Voltage	V _{R(PD)}	4.5	V
Max Optical Input Power	P	1.0	mW

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Ordering Information

BiDirectional Module Characteristics and Parameters						
	Symbol	MIN.	TYP.	MAX	Units	Test Condition
Laser Diode						
Power Medium	P_O	0.5	-	-	mW	CW, 9/125um SMF
Threshold Current 1550nm	I_{TH}	-	10	15	mA	CW
Slope Efficiency	s	0.1			W/A	1.5dBm output
Operating Current	I_{OP}	-	20	35	mA	$I_F = I_{OP}$
Operating Voltage	V_{OP}	-	1.2	1.5	V	$I_F = I_{OP}$
Peak Wavelength 1550nm	λ	1530	1550	1570	nm	25°C
Spectral Width	$\Delta \lambda$	-	-	3	nm	RMS
Temp. Coefficient		-	-	<0.5	nm/°C	-40 to 85°C
Rise/Fall Time	t_r, t_f	-	-	0.3	nsec	10~90%
Monitor Diode						
Output	I_{MD}	0.1	0.5		mA	$I_F = I_{OP}, P_O$
Dark Current	$I_{D(MD)}$	-	0.01	0.1	μ A	$V_{R(MD)}=10V$
Capacitance	$C_{(MD)}$	-	10	15	pF	$V_{R(MD)}=10V,$ $f=1MHz$
Tracking Error		-1.5		+1.5	dB	-40 to 85°C
1.25GB/s PIN TIA						
Supply Voltage		3.0	3.3	3.6	V	DC
Spectral Sensitivity	S	-	-26	-23	dBm	BER=10exp-12
Optical Saturation	P_{max}	-3	0		dBm	Average
Output Resistance	R_{out}	48	50	62	Ohm	Differential
Differential Output Voltage	V_d	185	250	415	mV	DC
Gain	G	1.92	2.5	3.4	V/mW	Gain @10MB/s
Supply Current			26	50	mA	No Load
Module						
Bandwidth	f_c			1100	MHz	
Optical Crosstalk	X_{TALK}			-45	dB	

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