



## PW15M11 Series SM 1550 TX / 1310 RX Bidirectional 125 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 discreet 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 discreet units together and then squeeze them onto their PCB.

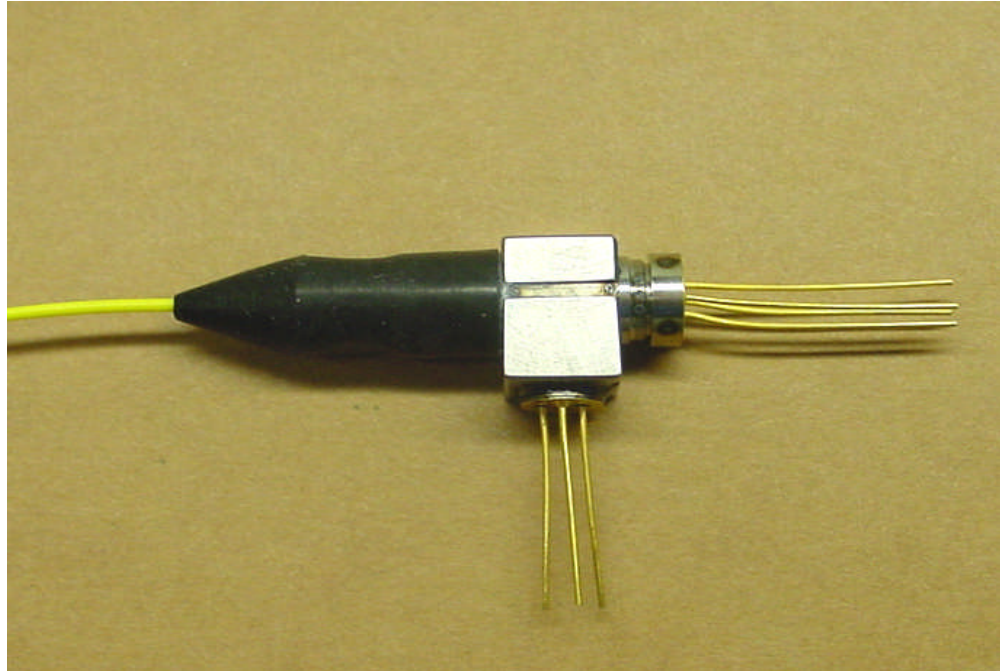
These small, compact modules require minimal board real estate and when used in pairs deliver full duplex operation of a single 9/125um optical fiber with crosstalk of <-45dB.

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 an 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 Discreet Lasers and Optical Couplers
- Class 1 Eye Safe Device
- UL Listed

### Applications

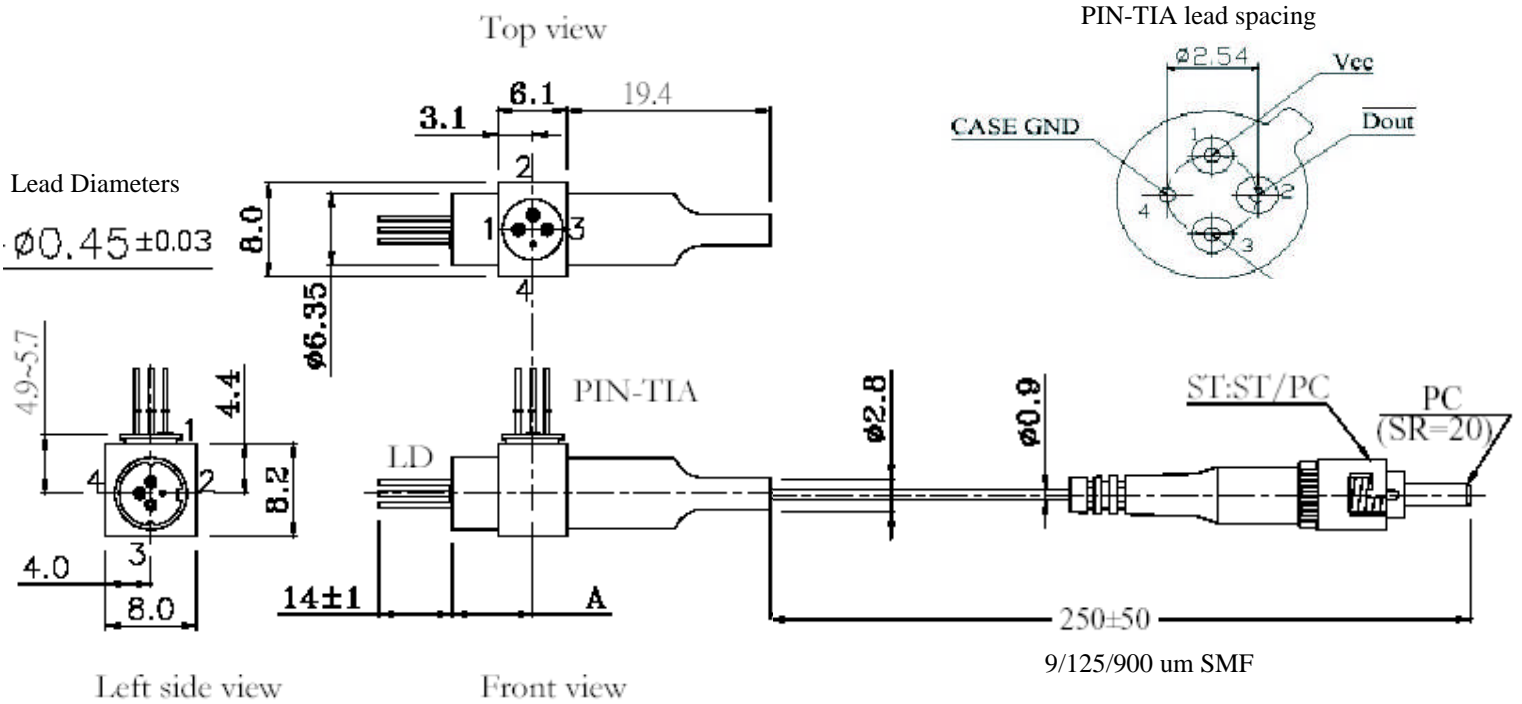
- Passive Optical Networks
- Full Duplex Communications
- WDM Bi-Directional transmission over a single fiber
- CATV
- Digital or Analog Operation

### 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
<b>Laser Diode</b>			
Forward Current	$I_{F(LD)}$	100	mA
Reverse Voltage	$V_{R(LD)}$	2	V
<b>Monitor Diode</b>			
Forward Current	$I_{F(MD)}$	2	mA
Reverse Voltage	$V_{R(MD)}$	20	V
<b>PIN TIA</b>			
Forward Current	$I_{F(PD)}$	2	mA
Reverse Voltage	$V_{R(PD)}$	4.5	V
Max Optical Input Power	P	1.0	mW

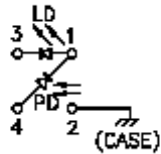


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Pin 1 : Laser Anode and Monitor Diode Cathode  
 Pin 2 : Case Gnd  
 Pin 3 : Laser Cathode  
 Pin 4 : Monitor Diode Anode

A: 7.0 to 7.6mm range



Laser lead spacing





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## Ordering Information

BiDirectional Module Characteristics and Parameters						
	Symbol	MIN.	TYP.	MAX	Units	Test Condition
<b>Laser Diode</b>						
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	Lambda	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%
<b>Monitor Diode</b>						
Output	$I_{MD}$	0.1	0.5		mA	$I_F = I_{OP}, P_O$
Dark Current	$I_{D(MD)}$	-	0.01	0.1	μA	$V_{R(MD)} = 10V$
Capacitance	$C_{(MD)}$	-	10	15	pF	$V_{R(MD)} = 10V,$ $f = 1MHz$
Tracking Error		-1.5		+1.5	dB	-40 to 85°C
<b>1.25GB/s PIN TIA</b>						
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
<b>Module</b>						
Bandwidth	$f_C$			1100	MHz	
Optical Crosstalk	$X_{TALK}$			-45	dB	



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