

**Features**

- Single fiber bi-directional operation
- Laser diode with multi-quantum-well structure
- Low threshold current
- InGaAs/InP PIN Photodiode with trans-impedance amplifier
- High sensitivity with AGC\*
- Differential ended output
- Single +3.3V Power Supply
- Integrated WDM coupler
- Un-cooled operation from -40°C to +85°C
- Hermetically sealed active component
- Single mode fiber pigtailed with optical FC/ST/SC/MU/LC connector
- Design for fiber optic networks
- RoHS Compliant available

**Absolute Maximum Rating (Tc=25°C)**

Parameter	Symbol	Value	Unit
Fiber Output Power L / M / H	$P_f$	1(L) / 1.5(M) / 2.5(H)	mW
LD Reverse Voltage	$V_{RLD}$	2	V
PIN-TIA Voltage	$V_{CC}$	4.5	V
Operating Temperature	$T_{opr}$	-40 to +85	°C
Storage Temperature	$T_{stg}$	-40 to +85	°C

(All optical data refer to a coupled 9/125µm SM fiber)

**Optical and Electrical Characteristics( Tc=25°C)**

Parameter	Symbol	Min	Typical	Max	Unit	Test Condition	
<b>Laser Diode</b>							
Optical Output Power	L M H	$P_f$	0.2 0.5 1	0.35 0.75 1.6	0.5 1 -	mW	CW, $I_{th}+20mA$ , kink free
Peak Wavelength		$\lambda$	1290	1310	1330	nm	CW, $P_f=P_f(\text{Min})$
Spectrum Width (RMS)		$\Delta\lambda$	-	-	3	nm	CW, $P_f=P_f(\text{Min})$
Threshold Current		$I_{th}$	-	10	15	mA	CW
Forward Voltage		$V_f$	-	1.2	1.5	V	CW, $P_f=P_f(\text{Min})$
Rise/Fall Time		$t_r / t_f$	-	-	0.3	ns	$I_{bias}=I_{th}$ , 10% to 90%
<b>Monitor Diode</b>							
Monitor Current		$I_m$	100	-	-	µA	CW, $P_f=P_f(\text{Min})$ , $V_{RPD}=2V$
Dark Current		$I_{DARK}$	-	-	0.1	µA	$V_{RPD}=5V$
Capacitance		$C_t$	-	6	15	pF	$V_{RPD}=5V$ , $f=1MHz$
<b>Module</b>							
Tracking Error		$\Delta P_f/P_f$	-1.5	-	1.5	dB	APC, -40 to +85°C
Optical Crosstalk		CRT		< -45		dB	

**Note:**

- 1.Pin assignment can be customized.
- 2.Specifications subject to change without notice.

### Detector $\lambda=1480-1500\text{nm}$

#### DC Electrical Characteristics( $T_c=25^\circ\text{C}$ )

Parameter	Symbol		Min	Typical	Max	Unit	Test Condition
Power Supply	$V_{CC}$		3.0	3.3	3.6	V	
Differential Output Voltage	$V_d$	F02	-	-	1000	mV	
		F04	-	260	450		
		F06	185	250	415		
Supply Current (no load)	$I_{CC}$	F02	-	-	35	mA	
		F04	-	21	30		
		F06	-	26	50		

#### AC/Optical and Electrical Characteristics( $T_c=25^\circ\text{C}$ )

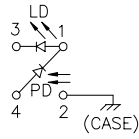
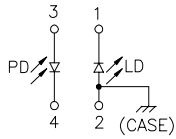
Parameter	Symbol		Min	Typical	Max	Unit	Test Condition
Detection Range			1480	-	1500	nm	-
Gain @ 10 Mbps Differential	G	F02	52	-	70	V/mW	Measure differentially, AC coupled, $R_L=50\Omega$
		F04	6	7	-		Measure differentially, AC coupled, $R_L=50\Omega$
		F06	1.92	2.5	3.4		Measure differentially with 30uAp-p signal
Bandwidth	BW	F02	120	140	-	MHz	
		F04	404	470	-		
		F06	700	920	1100		
Saturation Power	Psat	F02	-3	0	-	dBm	BER<10 <sup>-10</sup> @155Mbps PRBS 2 <sup>23</sup> -1, Er=10dB
		F04	-7	-6	-		BER<10 <sup>-10</sup> @622Mbps PRBS 2 <sup>23</sup> -1, Er=10dB
		F06	-3	-	-		BER<10 <sup>-12</sup> @1.25Gbps PRBS 2 <sup>7</sup> -1, Er=10dB
Sensitivity	Sens.	F02	-	-38	-35	dBm	BER<10 <sup>-10</sup> @155Mbps PRBS 2 <sup>23</sup> -1, Er=10dB
		F04	-	-33	-30		BER<10 <sup>-10</sup> @622Mbps PRBS 2 <sup>23</sup> -1, Er=10dB
		F06	-	-26	-23		BER<10 <sup>-12</sup> @1.25Gbps PRBS 2 <sup>7</sup> -1, Er=10dB
Output Resistance	Rout	F02	-	50	-	ohm	
		F04	48	50	52		
		F06	48	50	62		

Pin Assignment

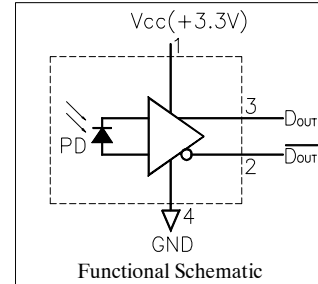
## Pin Assignment

### LD Pin Assignment

- |                                  |   |
|----------------------------------|---|
| <b>A Type</b>                    | <b>D Type</b>                                 |
| Pin 1 : Laser Cathode            | Pin 1 : Laser Anode and Monitor Diode Cathode |
| Pin 2 : Laser Anode and Case Gnd | Pin 2 : Case Gnd                              |
| Pin 3 : Monitor Diode Anode      | Pin 3 : Laser Cathode                         |
| Pin 4 : Monitor Diode Cathode    | Pin 4 : Monitor Diode Anode                   |



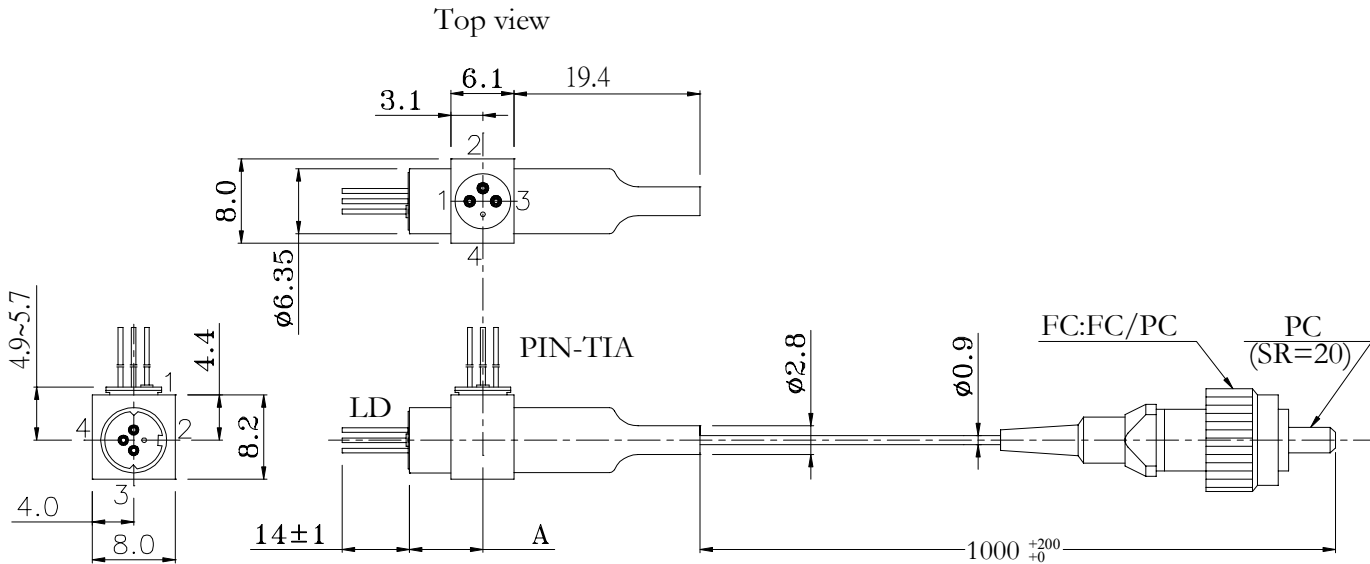
### PIN-TIA Pin Assignment



Outline Dimensions

Units in mm.

Part Number: C-13/14-FXX-PX-SXXX/XXX-XX



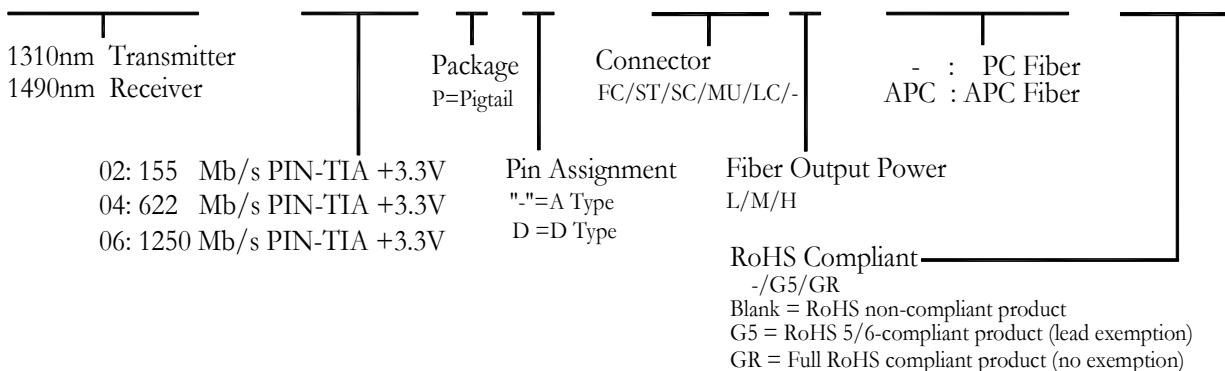
Left side view

Front view

DIMENSION: A:7.0~7.6 mm (Low & Middle power)  
A:9.3~9.9 mm (High power)

Ordering Information

# C-13/14-FXX-PX-SXXX/XXX-XX



Warnings

Handling Precautions: This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.  
Laser Safety: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

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