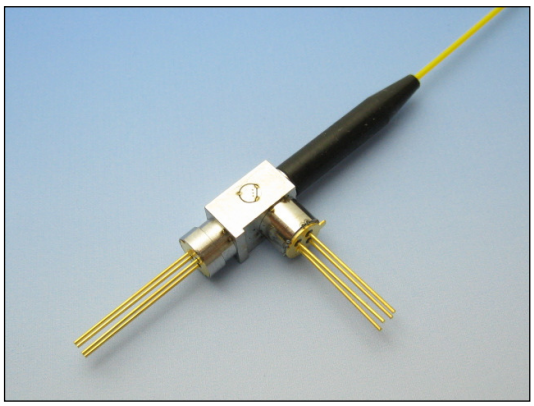
Optoelectronics Components Data Sheet

■ BD22D

1.25 Gbps Bi-Directional Optical Module for GE-PON OUN applications

Description



BD22D is a bi-direction optical module integrated with a 1310nm laser diode (LD) to transmit optical upstream data, a photodetector to receive 1490nm optical downstream data and a single mode fiber, which can operate up to 1.25Gbps.The module consists of the multi quantum well FP-LD (MQW Fabry-Perot LD) with a monitor photodiode, a PIN-PD with a trans-impedance amplifier (TIA), a wavelength division multiplexing (WDM) filter, a cut filter and the fiber. This module is suitable for building optical network unit (ONU) of 1.25bps passive optical network (PON) system.

Features

- Integrated WDM filter for Tx/Rx operation at 1310/1490 nm
- High fiber output power (Tx) : 2.5mW
- High sensitivity (Rx) : -29dBm
- Integrated 1310nm &1550nm to 1650nm cut filter
- 1310nm MQW FP-LD suitable for burst transmitter data rate up to 1.25Gbps
- 1490nm PIN PD receiver with integrated 1.25Gbps TIA.
- Hermetically sealed LD and PD devices
- YAG laser spot welding for high reliability
- RoHS Compliant
- -20 ^{o}C to +75 ^{o}C operating temperature range

Applications

- ONU module for PON System:
  - GE-PON (Gigabit Ethernet PON) system
  - E-PON (Ethernet PON) system

Absolute Maximum Ratings

(Tc=25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Unit	Conditions
Module				
Storage temperature	Tstg	-40 ~ +85	°C	
Operating temperature	Tc	-20 ~ +75	°C	
Soldering temperature	Ts	260	°C	10sec, >2mm
LD				
Light output power	Pf	5	mW	CW
Reverse voltage	VRmax	2	V	
Forward current	IFmax	150	mA	
Monitor PD				
Reverse voltage	VRmax	15	V	
Forward current	IFmax	2	mA	
PD				
Reverse voltage	VRmax	15	V	
Forward current	IFmax	2	mA	
TIA				
Maximum applied voltage	Vcc	4	V	

Electrical and Optical Characteristics

(Tc=-20 to 75°C, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
LD						
Output power	Pf	CW	2.5	---	---	mW
Threshold current	Ith	CW, Tc=75°C	---	---	35	mA
Threshold current	Ith	CW, Tc=-20°C	1	---	---	mA
Modulation current	Imod	CW, Tc=75°C, Pf=2.5mW	---	---	80	mA
Center wavelength	λ	CW, Pf=2.5mW,RMS, Tc=25°C	1290	1310	1330	nm
Spectrum width	Δλ	CW, Tc=25°C Pf=2.5mW (RMSσ, –20dB)	---	---	2	nm
Rise & Fall time	t_r, t_f	10-90%, Ib=Ith, Pf=2.5mW	---	0.3	0.7	ns
Forward voltage	Vf	CW, Pf=2.5mW	---	---	1.5	V
Tracking Error	TE	CW, Im=constant (@Tc=25°C)	-1	---	1	dB
Monitoring output current	Im	VR=1V,Pf=2.5mW, Tc=25°C	100	500	1500	uA
PD & TIA						
Supply Voltage	V_{CC}	---	3	3.3	3.6	V
Supply current	I_{CC}	Vcc=3.3V (no loads)	---	30	39	mA
Responsivity	R	Pin=-26dBm (Pulse, Ave.) Differential λ=1480~1580nm, RL=50Ω	9	20	26	kV/W

Sensitivity	Prmin	fop=1.25Gbps, NRZ, ExR=10dB BER=10^{-10}, PRBS 2^7-1	---	-29	-25	dBm
Overload	Prmax		+4	---	---	
Rise and fall time	tr tf	Pin=-26dBm (Pulse, Ave) fop=1.25Gbps, λ=1490nm 10-90%, RL=50Ω Vcc=3.3±0.1V	---	0.3	0.5	ns

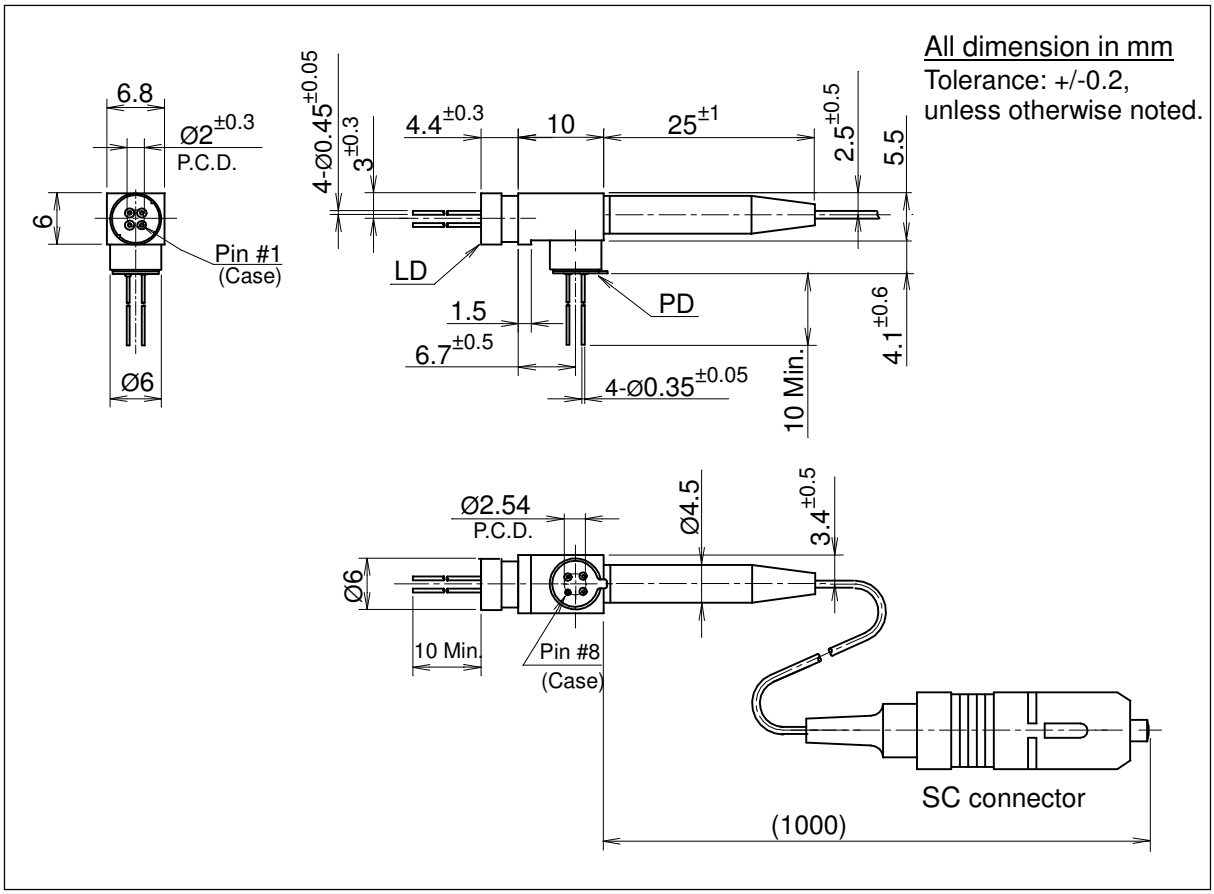
Module						
Operating bit rate	fop	---	---	---	1.25	Gbps
Optical crosstalk	CRT	Note 1	---	---	-47	dB
Optical return loss	ORL	λ=1480~1580nm	20	---	---	dB
		λ=1310nm	6	---	---	dB

Note1: Optical crosstalk(CRT) is defined as CRT=10*log($I_{Det,0}$/$I_{Det,1}$) [dB] with:
$I_{Det,0}$: the photocurrent with Pf=1mW, without optical input, CW laser operation, VR = 2V and
$I_{Det,1}$: the photocurrent without Pf=0mW, but Pin=1mW optical input power , λ=1490nm.

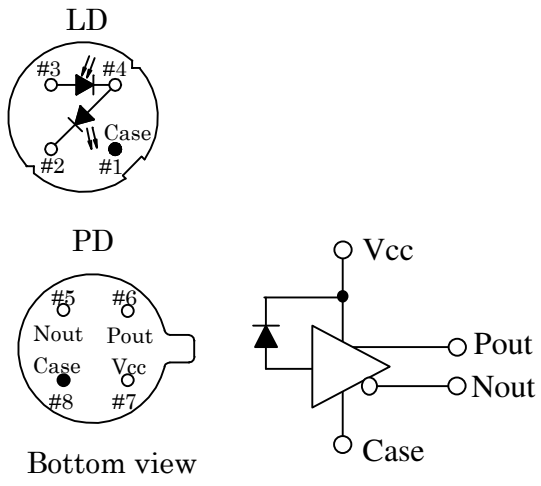
Optical Fiber Characteristics

Parameter	Min	Typ	Max	Unit
Fiber type	Single mode			---
Mode field diameter	8	9	10	μm
Clad diameter	123	125	127	μm
Concentricity error	---	---	1	μm
Cladding non-circularity	---	---	2	%
Mode field non-circularity	---	---	6	%
Cut off wavelength	1270	---	---	nm
Jacket diameter	0.8	0.9	1	mm
Bending Radius	20	---	---	mm
Tensile strength fiber case	5	---	---	N
Length	---	(1000)	---	mm
Connector	SC type / SPC			

Outline Drawings



Pin configuration



Pin No.	Function
LD	
1	Case
2	LD cathode
3	Monitor PD anode
4	LD anode, Monitor PD cathode
PD	
5	Nout : Inverting TIA Output
6	Pout : Non-inverting TIA Output
7	Vcc : TIA supply voltage
8	Case : TIA ground

OPTOHUB Co., Ltd.

305 Live Tower Musashi Urawa
7-6-8 Bessho, Minami-ku, Saitama-shi
Saitama, 336-0021 JAPAN

URL : http://www.optohub.com
E-mail : info@optohub.com
TEL : +81-48-844-8899
FAX : +81-48-844-8902