

ОПТИЧЕСКАЯ ПРОДУКЦИЯ

- лазерные модули
- лазерные диоды
- импульсные лазеры
- оптические модули

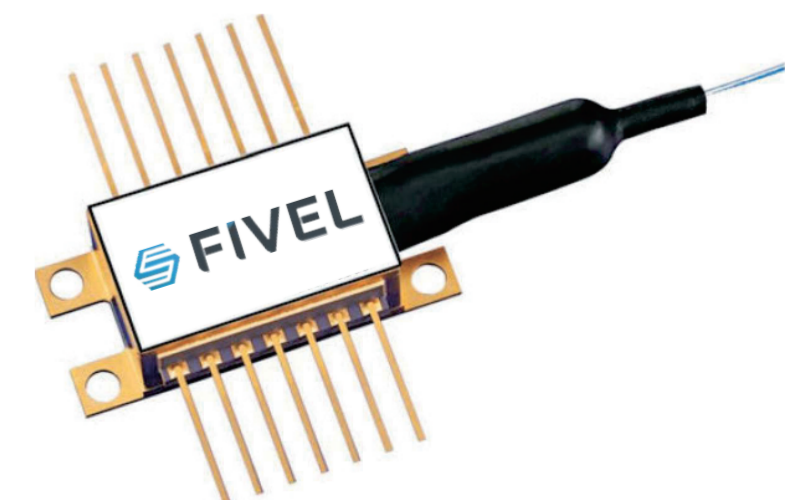
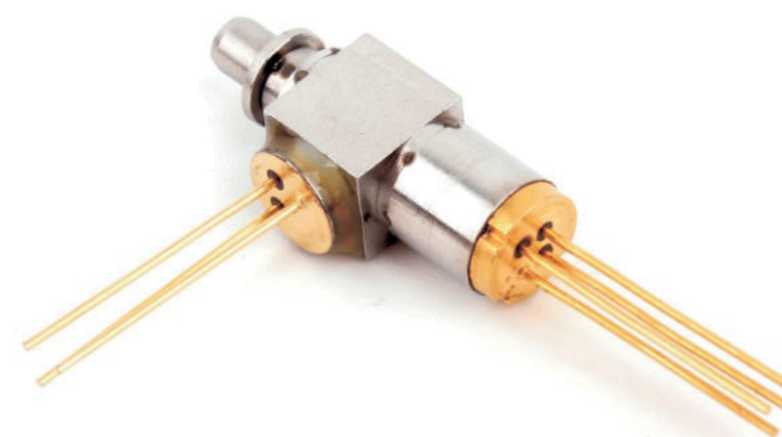
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Application:CATV/GSM/RF

1310nm/1550nm DFB Pigtailed Components

Features

- Built - in optical isolator
- Low capacitance and low dark current
- High stability of DFB lasers die
- Low threshold current , low operating current
- Integrated high isolation , low insertion loss

Applications

- CATV Reverse Transmission/GSM Transmission
- Other Analog or Digital Optical Transmission



Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Rated Power	Po	2	-	5	mW	CW,Ith+20mA
		4	-	10		CW,Ith+40mA
Slope Efficiency	SE	-	-	0.25	mW/mA	CW
Threshold Current	Ith	-	5	15	mA	-
Operating Current	Iop	-	45	55	mA	-
Forward Voltage Drop	Vop	-	1.0	1.2	V	CW, Ith+20mA
Cent Wavelength	λc	1300	1310	1320	nm	CW,Po=2mw
		1540	1550	1560		
Spectrum Width(-20dB)	Δλ	-	0.2	0.5	nm	CW, Ith+20mA
Side-mode Suppression Ratio	SMSR	35	-	-	dB	-
Bandwidth	Bw	-	2.5	5	GHz	-
Monitor Current	Im	100	-	1200	uA	CW, Ith+40mA
Dark Current of Monitor	Id	-	-	100	nA	5V
Optical Isolation(Single stage)	ISO	35	40	-	dB	-
Optical Isolation(Double stage)	ISO	45	50	-	dB	-
Return Loss	RL	-	-	-45	dB	-
Analog Characteristic index						
Relative Intensity Noise	RIN	-	-155	-150	dB/Hz	-
RF Bandpass Flatness	BF	-	±1.5	-	dB	-
Third-order Distortion	IMD3	-	-55	-	dBc	-
Carrier Noise Ratio	CNR	51	-	-	dB	Note 1
Composite Second Order	CSO	-	-	-57	dBc	
Composite Triple Beat	CTB	-	-	-65	dBc	

Note 1: ① If=Iop, Optical Modulation, Index=3.2%/channel (minimum),60 PAL-D unmodulated carries (47 to 550MHz), 10km singlemode fiber, -1dBm received power, Receiver responsivity=0.85A/W.
 ② If=Iop, Optical Modulation Index=3.2%/channel (minimum), CNR, CSO, CTB tested value at worst case over all test frequencies. NTSC 120ch., 10km singlemode fiber, -1dBm received power, Receiver responsivity=0.85A/W

1310nm/1550nm FP Pigtailed Components

Features

- Built - in optical isolator
- Low capacitance and low dark current
- High stability of FP lasers diode
- Low threshold current , low operating current
- Integrated high isolation , low insertion loss

Applications

- CATV Reverse Transmission
- Other Analog or Digital Optical Transmission



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Test Condition
Storage Temperature	Tstg	-40	100	°C	-
Operating Temperature	Top	-40	85	°C	-
Forward Current(LD)	If(LD)	-	120	mA	-
Reverse Voltage(LD)	Vr(PD)	-	2	V	CW
Forward Current(PD)	If(LD)	-	2	mA	-
Reverse Voltage(PD)	Vr(PD)	-	15	V	CW
Soldering Temp	-	-	260	°C	-
Soldering Time	-	-	10	S	S

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Rated Power	Po	0.2	-	4	mW	Ith+20mA
Threshold Current	Ith	5	-	12	mA	CW
Forward Voltage Drop	Vop	-	1.0	1.5	V	CW, Ith+20mA
Cent Wavelength	λc	1300	1310	1320	nm	CW, Ith+20mA
		1540	1550	1560		
Spectrum Width(-3dB)	Δλ	-	-	4	nm	Ith+20mA
Bandwidth	Bw	-	-	2.5	GHz	-
Monitor Current	Im	100	-	1000	uA	CW, Ith+20mA
Dark Current of Monitor	Id	-	-	100	nA	5V
Relative Intensity Noise	RIN	-	-150	-	dB/Hz	CW, 25°C
RF Bandpass Flatness	BF	-	±1.5	-	dB	If=Iop,45MHz-2500MHz
Third-order Distortion	IMD3	-	53	-	dBc	2 tone test,
Optical Isolation	ISO	30	40	-	dB	25°C

1270~1610nm CWDM Pigtailed Components

Features

- Built - in optical isolator
- Low capacitance and low dark current
- High stability of CWDM lasers diode
- Low threshold current , low operating current
- Integrated high isolation , low insertion loss

Applications

- CATV Reverse Transmission
- Other Analog or Digital Optical Transmission



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Test Condition
Storage Temperature	Tstg	-40	100	°C	
Operating Temperature	Top	-40	85	°C	I=Iop
Laser Forward Current	If	-	150	mA	
LD Reverse Voltage	Lvr	-	2	V	
PD Reverse Voltage	Pvr	-	15	V	
Soldering Temp		-	260	°C	
Soldering Time		-	10	S	

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Rated Power	Po	1	-	4	mW	Ith+20mA
Threshold Current	Ith	5	-	15	mA	CW
Forward Voltage Drop	Vop	-	1.0	1.2	V	
Cent Wavelength	λ_c	-	Note 2	-	nm	Note 1
Spectrum Width	$\Delta\lambda$	-	0.2	1	nm	CW,-20dB
Side-mode Suppression Ratio	SMSR	35	-	-	dB	
Monitor Current	Im	100	-	1000	uA	CW, Ith+20mA
Dark Current of Monitor	Id	-	-	100	nA	
Optical Isolation	ISO	30	40	-	dB	25°C
Frequency Range	F	2.5	-	5	GHz	RI=50Ω
Cut-off Frequency	Fc	6	-	-	GHz	If=Iop
Relative Intensity Noise	RIN	-	-155	-150	dB/Hz	CW, If=Iop, f=4500MHz
RF Bandpass Flatness	BF	-	±1.5	-	dB	If=Iop,45MHz-4500MHz,T=25 °C

Note 1. 2.5Gb/s NRZ, pseudo-random, Pb=0.2mW, Ppeak=1.0mW
 Note 2. The selected wavelength is available

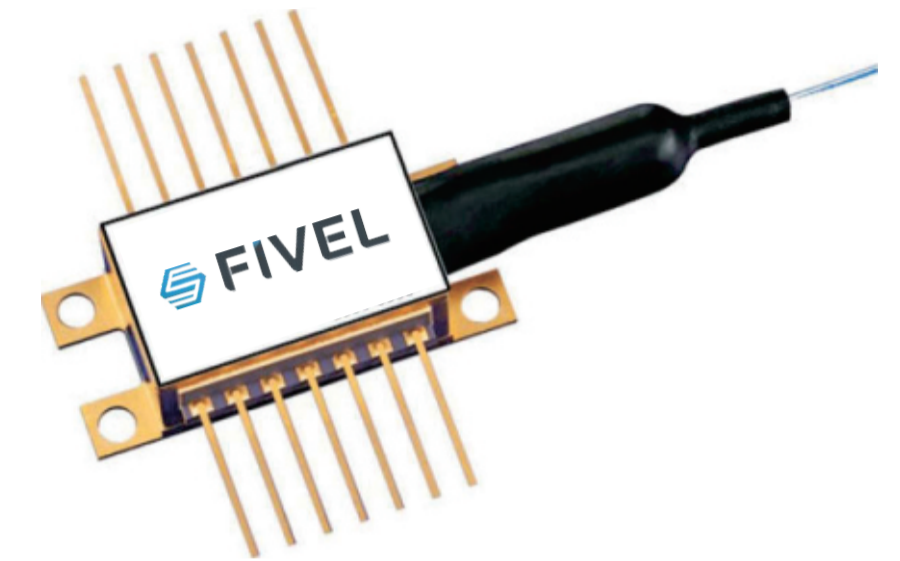
1270nm~1610nm CWDM Butterfly Laser Diode

Features

- High linearity high power MQW CWDM DFB LD chip
- Built-in isolator, TEC,thermistor and Monitor PD
- Optimized for 2.5 Gb/s Modulation Rates
- 14-pin butterfly cooled package
- Single mode FC/APC connector or customized
- Output power 2~16mW

Applications

- 2.5 Gb/s long haul CWDM Transmission



Optical & Electrical Characteristics

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Center Wavelength	λ_c	Note1	-	Note2	-	nm
Spectral Width (-20 dB)	$\Delta\lambda$	CW	-	0.2	1	nm
Optical Output Power	Po	CW, TL=25 °C	-	-	16	mW
Optical Isolation	IS	T=25 °C	30	35	-	dB
Side-mode Suppression Ratio	SMSR	CW	35	40	-	dB
Threshold Current	Ith	TL=25 °C	-	10	15	mA
Operating Current	Iop	CW	-	-	100	mA
Forward Voltage	VF	CW	-	1.2	2.0	V
Monitor Current	Imon	Vrpd=5 V	100	-	1500	μA
Monitor Dark Current	ID	Vrpd=5 V	-	-	100	nA
Operating Case Temperature	T		-20	-	60	°C
Tracking Error	γ	TE=10log(Po(Tc)/Po(25°C))	-1	-	1	dB
Thermistor Resistance	Rt	T=25 °C	9.5	-	10.5	KΩ
Thermistor B Constant	B	T=25 °C	-	3900	-	K
TEC Current	IC	$\Delta T=40^\circ C$	-	-	1.0	A
TEC Voltage	VC	$\Delta T=40^\circ C$	-	-	2.0	V
Frequency Range	F		45	-	2500	MHz
Cut-off Frequency	Fc(-3dB)	If=Iop	4	-	-	GHz
RIN	Nr	CW, If=Iop, f=2.5GHz	-	-155	-150	dB/Hz

Note 1. 2.5Gb/s NRZ, pseudo-random, Pb=0.2mW, Ppeak=2.0mW
 Note 2. The selected wavelength is available

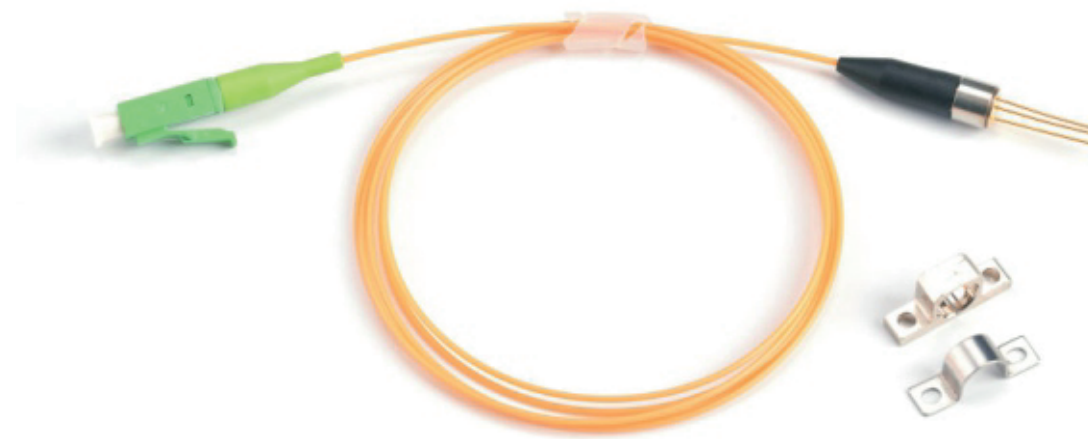
1100-1650nm InGaAs Coaxial Pigtailed PD

Features

- High response, flat structure of InGaAs PIN detector
- Low capacitance and low dark current
- Operating wavelength of 1100~1650nm
- Single-mode fiber coaxial package

Applications

- CATV transmission optical receiver
- RF transmission optical receiver
- Other Analog receiver/ Power detector



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Storage Temperature	Tstg	-40~+100	°C
Operating Temperature	Top	-40~+85	°C
Max Input Power	Pmax	+6	dBm
Operating Voltage	Vop	5	V
PD Reverse Voltage	VR(PD)	15	V
Soldering Temp	-	260	°C
Soldering Time	-	10	S

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Wavelength Range	λ	1100	-	1650	nm	-
Power Range	P	-70	-	+6	dBm	5V
Active Diameter	Ad	30	-	80	um	-
Dark Current	Id	-	0.2	0.5	nA	5V
Responsivity	R	-	0.85	0.90	A/W	$\lambda=1310$ nm
			0.90	0.95		$\lambda=1550$ nm
Frequency Bandwidth	Bw	2000	-	6000	MHz	-
Frequency Response	Fr	-	± 0.5	-	dB	-
Capacitance	Ct	-	0.2	0.65	Pf	-
Response Time	Tr	0.1	-	-	ns	-
Optical Return Loss	ORL	40	-	-	dB	SMF
CSO	-	-	-70	-	dBc	-
CTB	-	-	-80	-	dBc	-

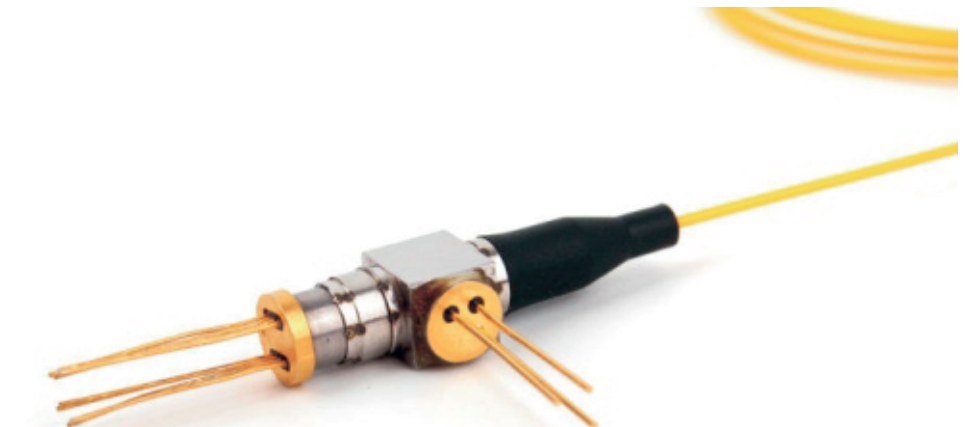
TEC TCWDM/R1550nm BOSA

Features

- High-stability CWDM MQW-DFB laser
- Built-in isolator, TEC, thermistor and Monitor PD
- 8PIN coaxial cooled package
- High reliability InGaAs PIN

Applications

- Optical communication system



Optical & Electrical Characteristics Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Rated Power	Po	1.6	-	3.0	mW	Iop=Ith+20 mA, Tc=25°C
Central Wavelength	λ	1271	-	1611	nm	Out 1530/1550/1570
Spectrum Width	$\Delta\lambda$	-	0.2	1	nm	CW
Threshold Current	Ith	-	5	10	mA	CW
Slope Efficiency	Es	0.08	-	-	W/A	CW, Tc=25°C
Side-mode Suppression Ratio	SMSR	35	40	-	dB	CW
Tracking Error	TE	-0.5	-	0.5	dB	Iop=Ith+25mA, Tc=-20~70°C
Optical Isolation	Iso	30	-	-	dB	-
Rise and Fall Times	Tr/Tf	-	-	0.5	ns	CW
Monitor PD Current	Im	100	-	1000	uA	CW, Ith+20 mA
Monitor PD Dark Current	Id	-	-	100	nA	5V
Thermistor Resistance	Rt	9.5	-	10.5	K Ω	T=25 °C
Thermistor B Constant	B	-	72	-	K	T=25 °C
TEC Current	IC	-	-	0.5	A	$\Delta T=40^\circ C$
TEC Voltage	VC	-	-	1.8	V	$\Delta T=40^\circ C$

Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Wavelength Range	λ	1540	1550	1560	nm	CW
Overload	P	6	-	-	dBm	-
Bandwidth	BW	2500	-	-	MHz	-
Responsivity	R	0.85	0.9	-	A/W	$\lambda=1550$ nm
Active Diameter	Ad	-	70	-	um	-
Dark Current	Id	-	-	0.5	nA	-
Optical Isolation	Iso	35	-	-	dB	$\lambda=1510, 1590$ nm
Capacitance	Ct	-	0.6	-	Pf	-
Response Time	Tr	-	-	0.3	ns	-

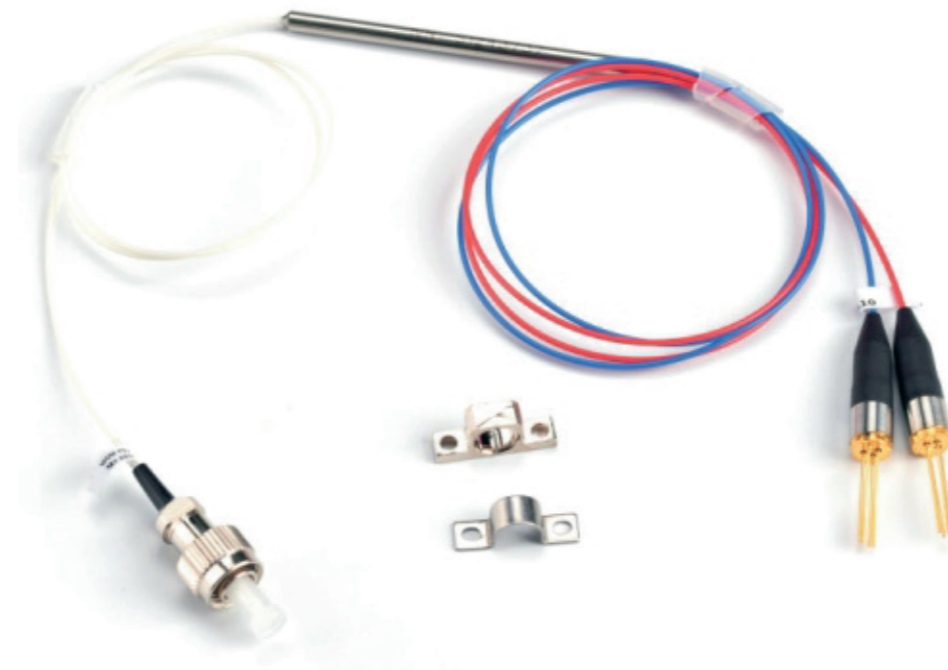
BI-DIRECTIONAL OPTICAL MODULE

Features

- High-reliability MQW DFB laser chips
- Low noise, low distortion Low threshold current
- Integrated Optical Isolator
- Coaxial Pigtail Package

Applications

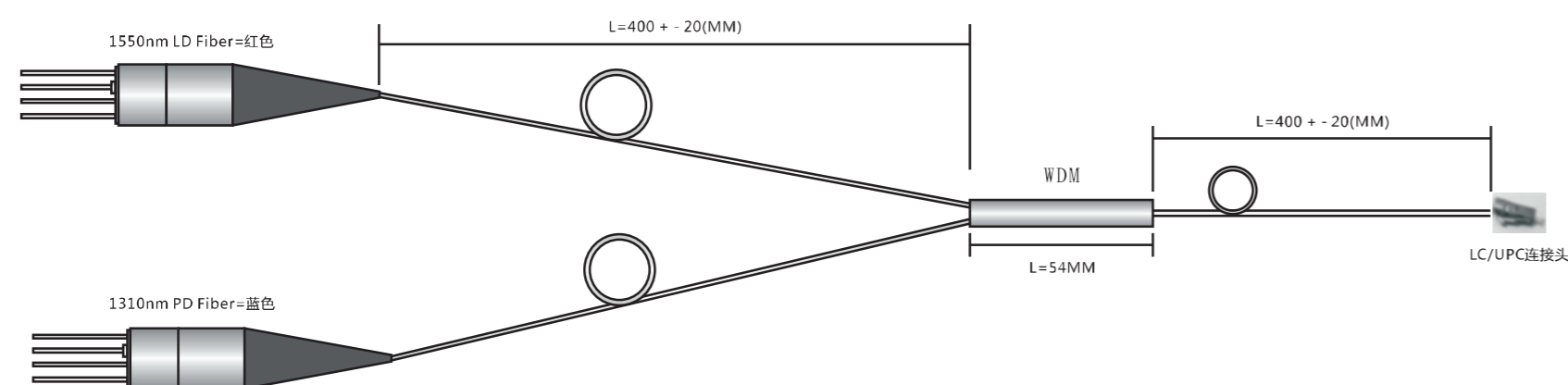
- CDMA/GSM transmission system
- Other analog transmission system



Absolute Maximum Ratings

Parameter	Symbol	Min.	Type.	Max.	Unit
Reverse Voltage(LD)	V _{rl}	-	-	2	V
Forward Current (LD)	I _{fL}	-	-	150	mA
Reverse Voltage (monitor)	V _{rl}	-	-	15	V
Reverse Current (monitor)	I _{rp}	-	-	2	mA
Input Optical Power(PIN)	P _{in}	-	-	6	dBm
Soldering Temperature(<10sec.)	Stemp	-	-	260	°C
Storage Temperature	T _{stg}	-40	-	100	°C
Operating Temperature	T _{op}	-40	-	85	°C

Dimensions



Electrical and Optical Characteristics

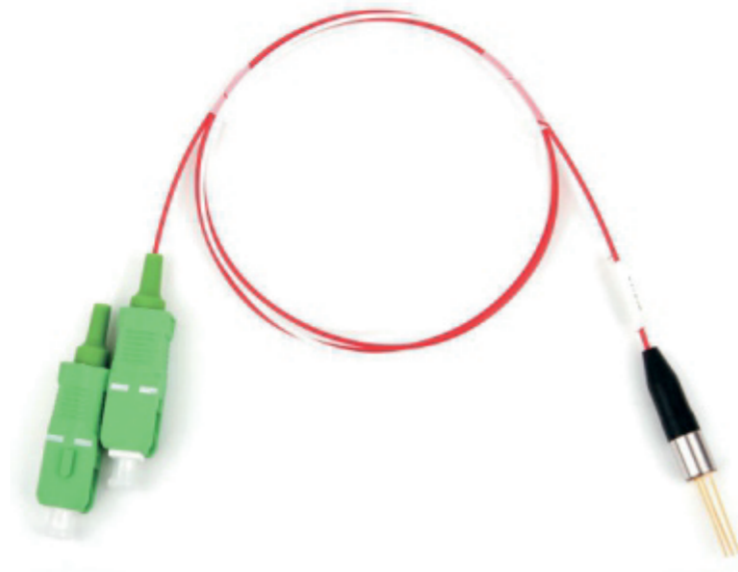
Parameter	Symbol	Min	Typical	Max	Unit	Notes
1550nm DFB Laser						
Output Power	P _o	2	-	2.8	mW	CW, I _f =I _{th} +20mA
Slope Efficiency	SE	0.1	-	0.14	mW/mA	-
Threshold Current	I _{th}	-	5	15	mA	CW
Operating Current	I _f	-	25	35	mA	CW
Operating Voltage	V _f	-	1.0	1.2	V	CW
Monitor Current	I _m	100	-	1000	uA	V _{rd} =5V, I _f =I _{th} +20mA
Monitor Dark Current	I _d	-	0.5	1	nA	V _{rd} =5V
Cent Wavelength	λ _c	1540	1550	1560	nm	CW, I _f =I _{th} +20mA
Spectral Width(RMS)	Δλ	-	0.2	1	nm	-20dB
Spectral Shift	Δλ/ΔT	-	-	0.1	nm/°C	CW, I _f =I _{th} +20mA
Side-Mode Suppression Ratio	SMSR	35	-	-	dB	P ₀ =2mW,
Tracking Error	TE	-1.2	-	1.2	dB	I _m =const, TE=10log(P/2.0)
Return Loss	ER	40	45	-	dB	CW
Modulation Bandwidth	-	3	4	-	GHz	-3dB
Isolation	ISO	30	35	-	dB	Single Stage
Relative Intensity Noise	RIN	-	-155	-150	dB/Hz	CW
RF Bandpass Flatness	BF	-1.5	-	1.5	dB	I _f =I _{op} ;CW;200MHz-2400MHz
3rd Order Inter-modulation Distortion	IDM3	-	-62	-60	dBc	CW
1310nm PIN						
Operating Wavelength Range	λ	1100	-	1650	nm	-
Bandwidth	BW	3	4	-	GHz	-3dB, V _r =12V
Capacitance	C	-	0.5	0.6	pF	V _r =5V, f=1MHz
Dark Current	I _d	-	0.2	0.5	nA	-
Responsivity	R	0.85	0.90	-	A/W	V _r =5V, 1310nm
Optical Return Loss	RL	40	45	-	dB	-
Supply Voltage	V _r	-	-12	0	V	-
CSO	CSO	-	-72	-70	dBc	-
CTB	CTB	-	-82	-80	dBc	-

Features

- Low Insertion Loss
- Low PDL
- High Isolation
- Excellent Environmental Reliability

Applications

- WDM Transmission
- CATV Transmission
- PON Transmission



Optical & Electrical Characteristics

Active Parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Power Range	P	-	-	+6	dBm	V _r =5V
Active Diameter	Ad	-	75	-	um	-
Dark Current	I _d	-	-	0.5	nA	-
Responsivity	R	0.9	0.95	-	A/W	λ=1550nm, P _o =0DB
Frequency Bandwidth	Bw	2	2.5	-	GHz	-
Capacitance	C _t	-	0.6	0.7	Pf	-
Response Time	T _r	-	-	0.3	ns	-
CSO	-	-	-70	-	dBc	-
CTB	-	-	-80	-	dBc	-

Passive Parameters

Parameter	Symbol	Min.	Typ.	Max.	Unit
Pass Channel Wavelength Range(1550)	λ	1535	-	1560	nm
Reflect Channel Wavelength (1310/1490/1577/1610)	λ	1260	-	1520	nm
		1572	-	1660	
Isolation	Pass Channel	-	30	35	dB
	Reflect Channel	-	15	18	
Polarization Dependent loss	Pass Channel	-	-	-	dB
	Reflect Channel	-	-	-	
Directivity(dB)	-	50	55	-	dB
Return Loss(dB)	-	45	-	-	dB
Insert Loss(dB)	Pass Channel	-	-	0.4	dB
	Reflect Channel	-	-	0.6	

Features

- Small Dark Current: 1~10 nA
- Small Terminal Capacitance:CT = 0,35 pF at 0,9 VBR
- High Speed Response :f_c = 2 GHz at M = 10
- Detecting Area Size:50um
- Various connectors and different flange options

Applications

- OTDR System
- Optical fiber communications
- Distance measurement



Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Forward Current	I _F	-	-	10	mA
Reverse Current	I _R	-	-	0.5	mA
Operating Case Temp.	TC	-40	-	85	°C
Storage Temperature	TSTG	-10	-	60	°C
Lead Soldering Temp.	TSOL	-	-	260(10s)	°C
Relative Humidity	RH	0	-	85	%

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Reverse Breakdown Voltage	VBR	40	-	50	V	ID = 100 μA
Temperature Coefficient of Reverse Breakdown Voltage ¹	δ	-	0.1	-	V/°C	-
Multiplied Dark Current	IDM	-	5	10	nA	M = 10 to 40
Terminal Capacitance	C _t	-	0.35	-	pF	VR = VBR x 0.9, f = 1 MHz
Cut-off Frequency	f _c	2	-	-	GHz	M = 10
Responsivity	S	0.85	0.90	-	A/W	λ = 1310 nm, M = 1
		0.90	0.95	-		λ = 1550 nm, M = 1
Optical Return Loss	ORL	30	40	-	dB	SMF

850nm Pulsed Laser For OTDR

Features

- High output power $P_f = 120\text{mW}$ @ $\text{IFP} = 300\text{mA}$
- Long wavelength $\lambda_c = 850\text{ nm}$
- Pulsed Conditions: Pulsed width (PW) = $10\ \mu\text{s}$, Duty = 1%
- Multi mode fiber 50um or 62.5um

Applications

- OTDR System



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Pulsed Forward Current*1	IFP	-	450	mA
Reverse Voltage	VR	-	2	V
Reverse Voltage (monitor PD)	VRM	-	30	V
Reverse Current (monitor PD)	IFPM	-	2	mA
Operating Case Temperature	TC	0	40	°C
Storage Temperature	Tstg	-40	80	°C
Lead Soldering Temperature	Tsld	-	260(10s)	°C
Relative Humidity (noncondensing)	RH	-	85	%

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward Voltage	VFP	-	-	3.5	V	IFP = 300 mA, PW = 10 μs , Duty = 1%
Threshold Current	I _{th}	-	18	25	mA	-
Optical Output Power	P _f	-	120	-	mW	IFP = 300 mA, PW = 10 μs , Duty = 1% Fiber Type :MM50 or MM62.5
Center Wavelength	λ_c	840	850	865	nm	PW = 10 μs , Duty = 1%
Rise Time	t _r	-	0.5	2.0	ns	10-90%
Fall Time	t _f	-	0.5	2.0	ns	90-10%

1310nm Pulsed Laser For OTDR

Features

- High output power $P_f = 120\text{mW}$ @ $\text{IFP} = 750\text{mA}$
- Long wavelength $\lambda_c = 1310\text{ nm}$
- Built-in/out monitor PD
- Pulse Conditions: Pulse width (PW) = $10\ \mu\text{s}$, Duty = 1%

Applications

- OTDR System



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Pulsed Forward Current*1	IFP	-	1000	mA
Reverse Voltage	VR	-	2	V
Reverse Voltage (monitor PD)	VRM	-	10	V
Reverse Current (monitor PD)	IFPM	-	2	mA
Operating Case Temperature	TC	0	60	°C
Storage Temperature	Tstg	-40	85	°C
Lead Soldering Temperature	Tsld	-	260(10s)	°C
Relative Humidity (noncondensing)	RH	-	85	%

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Forward Voltage	VFP	-	-	3.5	V	IFP = 750 mA, PW = 10 μs , Duty = 1%
Threshold Current	I _{th}	-	-	25	mA	-
Optical Output Power From SM Fiber	P _f	-	120	-	mW	IFP = 750 mA, PW = 10 μs , Duty = 1%
Center Wavelength	λ_c	1290	1310	1330	nm	PW = 10 μs , Duty = 1%
Spectral Width	σ	-	-	6	nm	RMS (-3 dB)
Rise Time	t _r	-	0.5	1.0	ns	20-80%
Fall Time	t _f	-	0.5	1.0	ns	80-20%
Monitor Current	I _m	0.05	-	2	mA	VRM = 2 V

1550nm Pulsed Laser For OTDR

Features

- High output power $P_f = 80\text{mW}$ @ $\text{IFP} = 750\text{mA}$
- Long wavelength $\lambda_c = 1550\text{ nm}$
- Built-in/out monitor PD
- Pulse Conditions: Pulse width (PW) = $10\ \mu\text{s}$, Duty = 1%

Applications

- OTDR System



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Pulsed Forward Current*1	IFP	-	1000	mA
Reverse Voltage	VR	-	2	V
Reverse Voltage (monitor PD)	VRM	-	10	V
Reverse Current (monitor PD)	IFPM	-	2	mA
Operating Case Temperature	TC	0	60	°C
Storage Temperature	Tstg	-40	85	°C
Lead Soldering Temperature	Tsld	-	260(10s)	°C
Relative Humidity (noncondensing)	RH	-	85	%

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward Voltage	VFP	-	-	3.5	V	IFP = 750 mA, PW = 10 μs , Duty = 1%
Threshold Current	I _{th}	-	-	25	mA	-
Optical Output Power From SM Fiber	P _f	-	80	-	mW	IFP = 750 mA, PW = 10 μs , Duty = 1%
Center Wavelength	λ_c	1530	1550	1570	nm	PW = 10 μs , Duty = 1%
Spectral Width	σ	-	-	6	nm	RMS (-3 dB)
Rise Time	t _r	-	0.5	1.0	ns	20-80%
Fall Time	t _f	-	0.5	1.0	ns	80-20%
Monitor Current	I _m	0.05	-	2	mA	VRM = 2 V

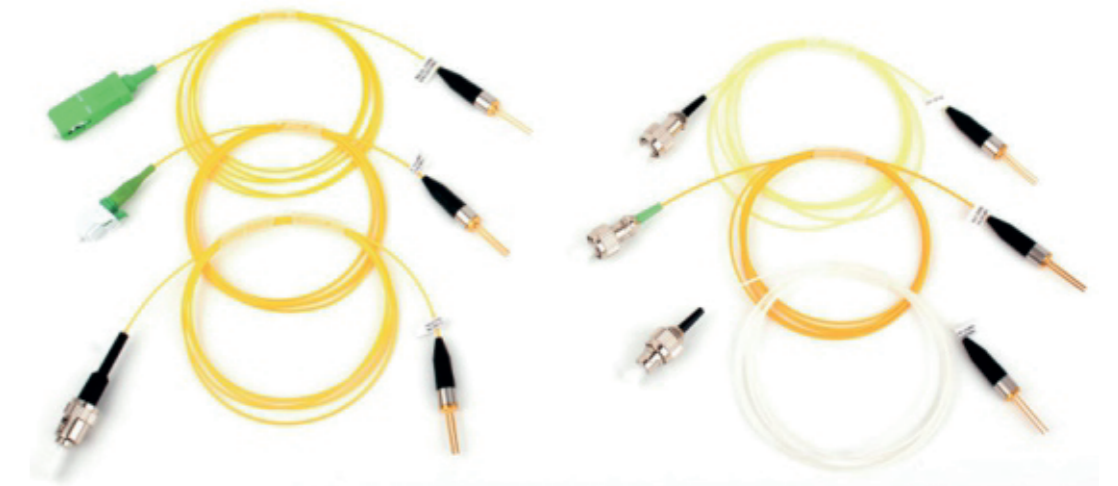
1625nm Pulsed Laser For OTDR

Features

- High output power $P_f = 30\text{mW}$ @ $\text{IFP} = 300\text{mA}$
- Long wavelength $\lambda_c = 1625\text{ nm}$
- Built-in/out monitor PD
- Pulse Conditions: Pulse width (PW) = $10\ \mu\text{s}$, Duty = 1%

Applications

- OTDR System



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Pulsed Forward Current*1	IFP	-	500	mA
Reverse Voltage	VR	-	2	V
Reverse Voltage (monitor PD)	VRM	-	10	V
Reverse Current (monitor PD)	IFPM	-	2	mA
Operating Case Temperature	TC	0	60	°C
Storage Temperature	Tstg	-40	85	°C
Lead Soldering Temperature	Tsld	-	260(10s)	°C
Relative Humidity (noncondensing)	RH	-	85	%

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward Voltage	VFP	-	-	2.5	V	IFP = 300 mA, PW = 10 μs , Duty = 1%
Threshold Current	I _{th}	-	-	25	mA	-
Optical Output Power From SM Fiber	P _f	-	30	-	mW	IFP = 300 mA, PW = 10 μs , Duty = 1%
Center Wavelength	λ_c	1620	1630	1640	nm	PW = 10 μs , Duty = 1%
Spectral Width	σ	-	-	6	nm	RMS (-3 dB)
Rise Time	t _r	-	0.5	1.0	ns	20-80%
Fall Time	t _f	-	0.5	1.0	ns	80-20%
Monitor Current	I _m	0.05	-	2	mA	VRM = 2 V

1650nm Pulsed Laser For OTDR

Features

- High output power $P_f = 30\text{mW}$ @ $IFP = 300\text{mA}$
- Long wavelength $\lambda_c = 1650\text{ nm}$
- Built-in/out monitor PD
- Pulse Conditions: Pulse width (PW) = $10\ \mu\text{s}$, Duty = 1%



Applications

- OTDR System

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Pulsed Forward Current*1	IFP	-	500	mA
Reverse Voltage	VR	-	2	V
Reverse Voltage (monitor PD)	VRM	-	10	V
Reverse Current (monitor PD)	IFPM	-	2	mA
Operating Case Temperature	TC	0	60	°C
Storage Temperature	Tstg	-40	85	°C
Lead Soldering Temperature	Tsld	-	260(10s)	°C
Relative Humidity (noncondensing)	RH	-	85	%

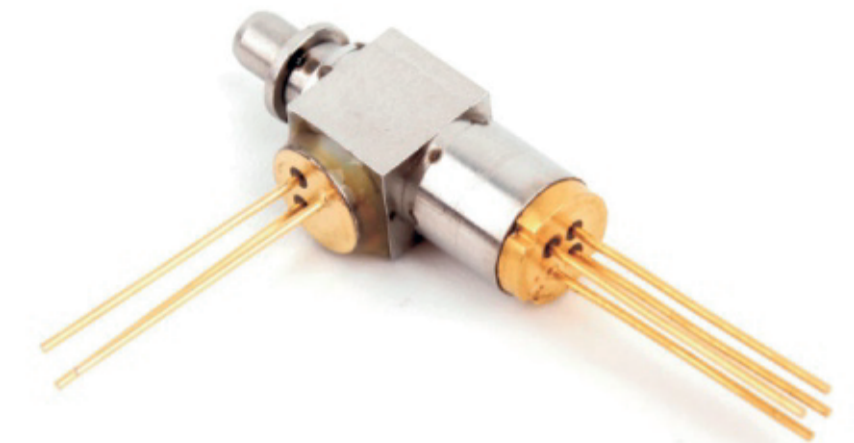
Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Forward Voltage	VFP	-	-	2.5	V	$IFP = 300\text{ mA}$, $PW = 10\ \mu\text{s}$, Duty = 1%
Threshold Current	I _{th}	-	-	25	mA	-
Optical Output Power From SM Fiber	P _f	-	30	-	mW	$IFP = 300\text{ mA}$, $PW = 10\ \mu\text{s}$, Duty = 1%
Center Wavelength	λ_c	1635	1650	1660	nm	$PW = 10\ \mu\text{s}$, Duty = 1%
Spectral Width	σ	-	-	6	nm	RMS (-3 dB)
Rise Time	t _r	-	0.5	1.0	ns	20-80%
Fall Time	t _f	-	0.5	1.0	ns	80-20%
Monitor Current	I _m	0.05	-	2	mA	VRM = 2 V

TX λ_c =RX λ_c BOSA For OTDR

Features

- High-reliability MQW DFB laser chips
- Low noise, low distortion, low threshold current
- Coaxial pigtail package



Applications

- OTDR transmission system

Absolute Maximum Ratings

Parameter	Symbol	Min.	Type.	Max.	Unit
Reverse Voltage(LD)	V _{rl}	-	-	2	V
Forward Current (LD)	I _{fL}	-	-	700	mA
Reverse Voltage (monitor)	V _{rl}	-	-	15	V
Reverse Current (monitor)	I _{rp}	-	-	2	mA
Input Optical Power(APD)	P _{in}	-	-	-10	dBm
Soldering Temperature(<10sec.)	Stemp	-	-	260	°C
Storage Temperature	T _{stg}	-40	-	85	°C
Operating Temperature	T _{op}	-10	-	60	°C

Electrical and Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
1625nm Pulse Laser						
Output Power	P _o	20	-	-	mW	$PW = 10\ \mu\text{s}$, Duty = 1%
Threshold Current	I _{th}	-	10	15	mA	-
Operating Current	IFP	300	400	-	mA	$PW = 10\ \mu\text{s}$, Duty = 1%
Operating Voltage	V _f	-	2.5	3.0	V	$PW = 10\ \mu\text{s}$, Duty = 1%
Cent Wavelength	λ_c	1625	-	1640	nm	$PW = 10\ \mu\text{s}$, Duty = 1%
Rise Time	t _r	-	0.2	0.5	ns	10-90%
Fall Time	t _f	-	0.2	0.5	ns	90-10%
Spectral Width(RMS)	$\Delta\lambda$	-	0.5	1	nm	-20dB
1625nm APD						
Operating Wavelength Range	λ	1100	-	1700	nm	-
Reverse Breakdown Voltage	V _{BR}	40	-	50	V	I _D = 100 μA
Dark Current	I _D	-	5	10	nA	VR = V _{BR} x 0.95
Bandwidth	BW	2	-	-	GHz	M=10
Capacitance	C	-	0.3	0.5	pF	-
Responsivity	R	0.40	0.45	-	A/W	1625nm, M=1
Multiplication Factor	M	20	-	-	M	1625nm, I _{po} =1.0uW, V _r =(I _D <5nA)
TX&RX ISO	I _{so}	15	-	-	dB	-
Optical Return Loss	RL	30	40	-	dB	-

Application: INSTRUMENTS AND METERS



635/650nm Laser Diode Component

Features

- MQW 635/650nm FP LD
- High output power
- Low threshold current
- Built-in InGaAsP monitor PD
- Wide temperature range operation (Tc= -10 to +65°C)

Applications

- Light Source



Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
LD Forward Current	IF(LD)	200	mA
LD Reverse Voltage	VR(LD)	2	V
PD Forward Current	IF(PD)	2	mA
PD Reverse Voltage	VR(PD)	25	V
Operating Temperature	TOP(LD)	-10 ~ +60	°C
Storage Temperature	TST	-40 ~ +80	°C
Soldering Temperature/Time	-	240/10	°C/S

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Output Power	Po	1	-	20	mW
Threshold Current	Ith	10	-	40	mA
Operating Current	Iop	30	-	140	mA
Operating Voltage	Vop	1.8	-	3.0	V
Center Wavelength	λ_c	630	635	645	635
		640	650	660	650
Spectral Width	$\Delta\lambda$	-	-	6	nm
Monitor Current	Im	100	-	1000	uA

CWDM Pulsed Laser For Sensing

Features

- High output power Pf = 40mW @ IFP = 400mA
- Long wavelength λ_c = 1270-1650 nm
- Built-in/out monitor PD
- Pulse Conditions: Pulse width (PW) = 10 μ s, Duty = 1%

Applications

- Sensing System



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Pulsed Forward Current*1	IFP	-	600	mA
Reverse Voltage	VR	-	2	V
Reverse Voltage (monitor PD)	VRM	-	10	V
Reverse Current (monitor PD)	IFPM	-	2	mA
Operating Case Temperature	TC	-10	60	°C
Storage Temperature	Tstg	-40	85	°C
Lead Soldering Temperature	Tsld	-	260(10s)	°C
Relative Humidity (noncondensing)	RH	-	85	%

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Forward Voltage	VFP	-	-	2.5	V	IFP = 400 mA, PW = 10 μ s, Duty = 1%
Threshold Current	Ith	-	-	15	mA	-
Optical Output Power From SM Fiber	Pf	40	60	-	mW	IFP = 400 mA, PW = 10 μ s, Duty = 1%
Center Wavelength	λ_c	Note 1			nm	PW = 10 μ s, Duty = 1%
Spectral Width	σ	-	-	1	nm	RMS (~20 dB)
Rise Time	tr	-	0.5	1.0	ns	20-80%
Fall Time	tf	-	0.5	1.0	ns	80-20%
Monitor Current	Im	0.05	-	2	mA	VRM = 2 V

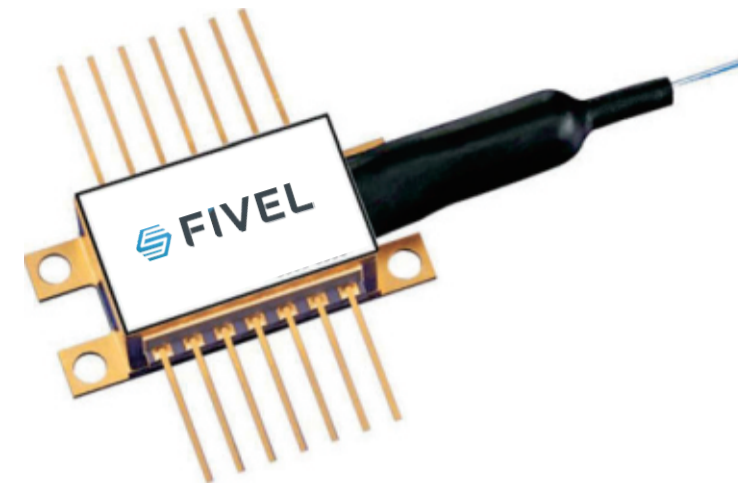
980nm EDFA Laser Module

Features

- Kink-free operating power up to 400mW
- epoxy-free, and flux-free 14-PIN butterfly package with SM Hi1060
- Fiber Bragg grating stabilization ,
- Wavelength selection available
- Integrated thermoelectric cooler, thermistor, and monitor diode
- Excellent low power stability

Applications

- Next generation dense wavelength division multiplexing(DWDM) erbium doped fiber amplifiers(EDFA)
- Reduced pump-count EDFA architectures
- Very long distance cable television(CATV) trunks and very high node count distribution



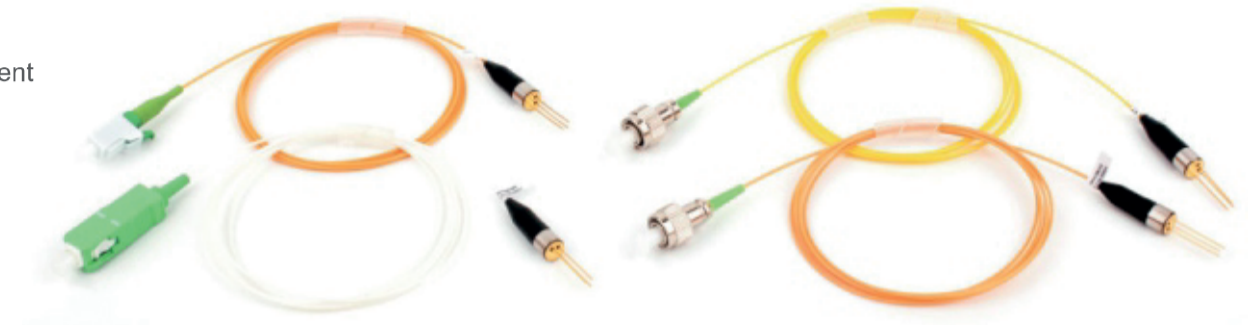
850/1300nm LED TOSA Components

Features

- High efficiency of LED laser die
- Hermetically sealed active component
- Low threshold current , low operating current

Applications

- Optical data communication transmitter
- E-O converters/LANS/FDDI networks/FITL



Optical & Electrical Characteristics($T_C=25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Min	Typ	Max	Unit	Test Condition
LD Threshold Current	I _{th}	-	45	55	mA	CW
Output Power	P _f	-	-	400	mW	I _f (BOL)<470mA
LD Forward Current	I _f	-	-	900	mA	P _f =Rated Power
Kink Free Power	P _{kink}	400	-	-	mW	>=1.2*Rated Power
Kink Free Current	I _{kink}	>=1.2*I _f (BOL)		-	mA	[1]
LD Forward Voltage	V _f	-	2.5	3.0	V	P _f =Rated Power
Center Wavelength	λ_c	973	974	975	nm	Peak,P _f =Rated Power
		975	976	977		
Peak Wavelength Turning	$\Delta \lambda_p / \Delta T_{amb}$	-	-	0.02	nm/°C	T: FBG Temp.
Spectrum Width	$\Delta \lambda$	-	-	2	nm	RMS@-13dB
Spectrum Stability	-	-0.5	-	0.5	nm	P _f =Rated Power,t=60s
Monitor Responsivity	I _m /P _f	-	1	20	uA/mW	VPD=5V,P _f =Rated Power
Monitor Responsivity Stability	-	-	10%	-	-	@All Operating Temperature
Monitor Dark Current	I _d	-	-	50	nA	VPD=5V
TEC Current	I _{tec}	-	-	1.5	A	T _{case} =75°C
TEC Voltage	V _{tec}	-	-	3	V	T _{case} =75°C
TEC Modul Power Consumption	P	-	-	5	W	T _{case} =75°C
Power Stability	-	-	-	0.5	dB	Peak-to-peak,t=60s, DC to 50kHz sampling,TC=25°C
Tracking Error	TE	-0.5	-	0.5	dB	TC=-20~75°C,Referred to [2]
Thermistor Resistance	R _{th}	9.5	10	10.5	Kohm	T _{stg} =25°C
Thermistor B constant	B _{th}	-	3900	-	k	T _{stg} =25°C

Notes:[1] Kink Current is defined as the current which deviation of light versus current slop(dL/dI)from a linear fit is beyond +/-50%,P_{kink}>=1.2*Rated Power,I_{kink}>=I_f(BOL)*1.2

[2] Tracking error is defined at a given case temperature,it is the change in fibre power,at a constant monitor current, relative to the value measured at case 25°C

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Test Condition
Storage Temperature	T _{stg}	-40	+95	°C	-
Operating Temperature	T _{op}	-40	+85	°C	-
Reverse Voltage	V _r	-	2	V	CW
Soldering Temp	-	-	260	°C	-
Soldering Time	-	-	10	S	S

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Rated Power	P _o	-	20	-	uW	I _{op} =60mA; Fiber MM 50/125um
		-	30	-		I _{op} =60mA; Fiber MM 62.5/125um
Forward Voltage Drop	V _{op}	-	1.2	1.7	V	-
Cent Wavelength	λ_c	1280	1310	1350	nm	I _{op} =60mA;1300LED
		830	850	870		I _{op} =60mA;850LED
Spectrum Width	$\Delta \lambda$	-	40	80	nm	-
Bandwidth	B _w	50	-	-	MHz	-
Rise/Fall Time	T _r /T _f	-	3.5	10	ns	10%-90%
Output Power Over Temperature	$\Delta P_o / \Delta T$	-	-	±3	dB	-40~+85°C

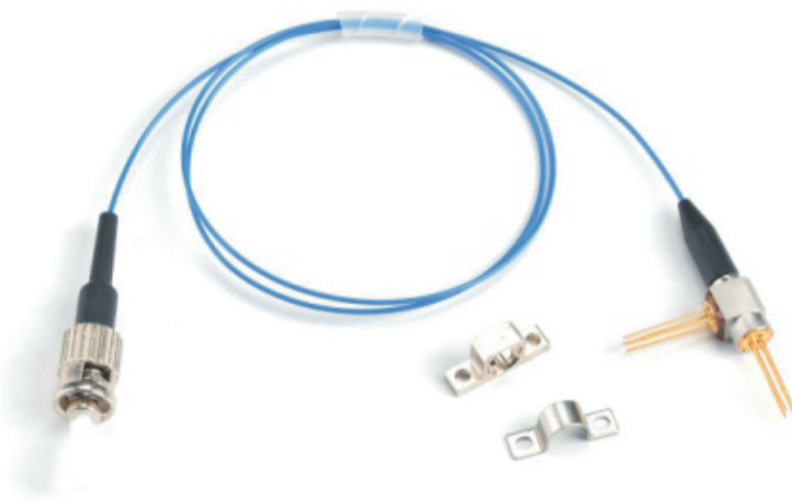
WDM Combo Double Laser Module 1310nm/1490nm or 1310nm/1550nm

Features

- High-reliability MQW DFB laser chips
- Built-in InGaAsP monitor PD
- Low noise, low distortion Low threshold current
- Integrated Optical Isolator
- Coaxial Pigtail Package

Applications

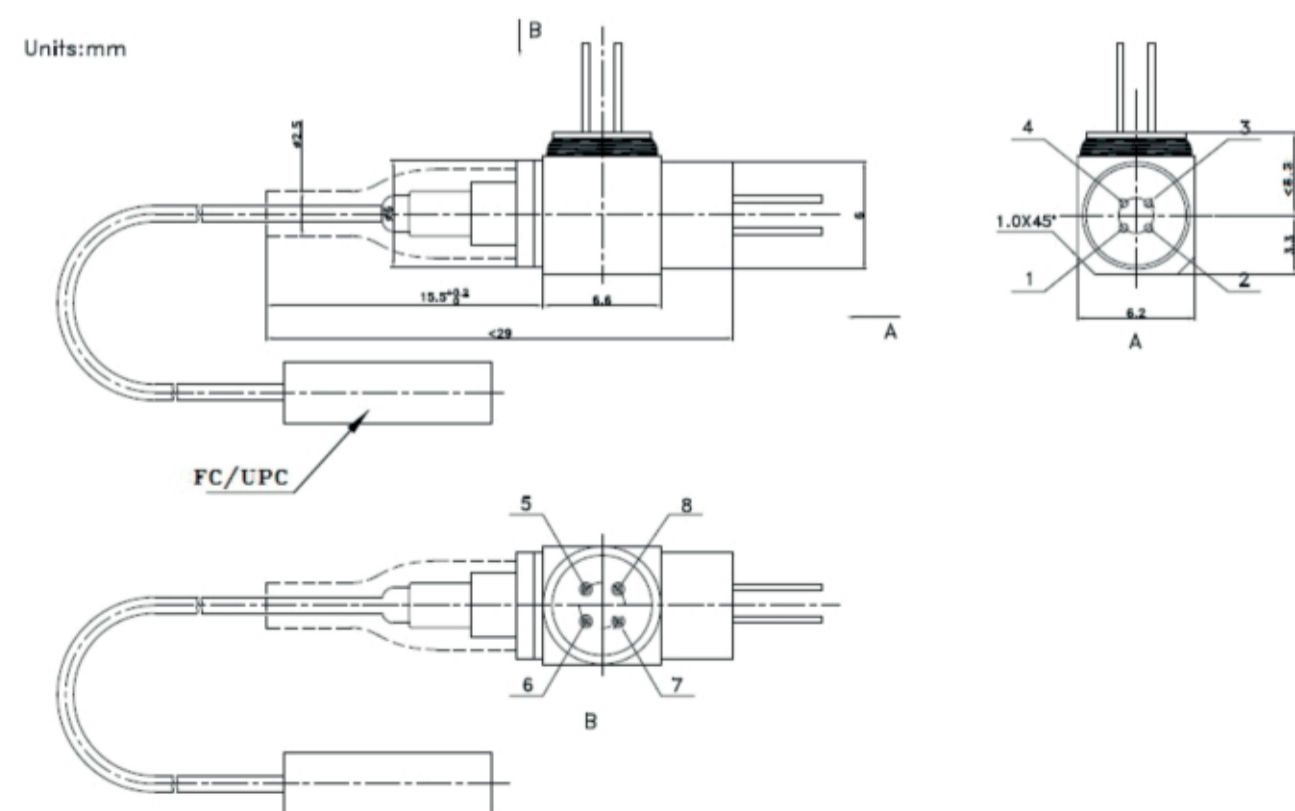
- Light source



Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Reverse Voltage(LD)	Vrl	-	-	2	V
Forward Current (LD)	LfL	-	-	150	mA
Reverse Voltage (monitor)	Vrl	-	-	15	V
Reverse Current (monitor)	Lrp	-	-	2	mA
Soldering Temperature(<10sec.)	Stemp	-	-	260	°C
Storage Temperature	Tstg	-40	-	85	°C
Operating Temperature	Top	-20	-	80	°C

Dimensions



Electrical and Optical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
1310nm FP Laser						
Output Power	Po	1	2	-	mW	CW, If=Ith+20mA
Threshold Current	Ith	-	10	-	mA	CW
Operating Current	If	-	30	15	mA	CW
Operating Voltage	Vf	-	1.0	40	V	CW
Monitor Current	Im	100	-	1.2	uA	Vrd=5V, If=Ith+20mA
Monitor Dark Current	Id	-	-	1000	nA	Vrd=5V
Cent Wavelength	λc	1300	1310	100	nm	CW, If=Ith+20mA
Spectral Width	Δλ	-	4	1320	nm	-3dB
Spectral Shift	Δλ/ΔT	-	-	-	nm/°C	CW, If=Ith+20mA
Tracking Error	TE	-1.5	-	0.1	dB	Im=const, TE=10log(P/2.0)
Return Loss	ER	40	45	1.5	dB	CW
Isolation	ISO	30	35	-	dB	Single Stage
1490nm DFB Laser						
Output Power	Po	1	2	-	mW	CW, If=Ith+20mA
Threshold Current	Ith	-	10	15	mA	CW
Operating Current	If	-	30	40	mA	CW
Operating Voltage	Vf	-	1.0	1.2	V	CW
Monitor Current	Im	100	-	1000	uA	Vrd=5V, If=Ith+20mA
Monitor Dark Current	Id	-	-	100	nA	Vrd=5V
Cent Wavelength	λc	1480	1490	1550	nm	CW, If=Ith+20mA
Spectral Width	Δλ	-	0.2	1	nm	-20dB
Side-Mode Suppression Ratio	SMSR	35	-	-	dB	Po=2mW
Spectral Shift	Δλ/ΔT	-	-	0.1	nm/°C	CW, If=Ith+20mA
Tracking Error	TE	-1.5	-	1.5	dB	Im=const, TE=10log(P/2.0)
Return Loss	ER	40	45	-	dB	CW
Isolation	ISO	30	35	-	dB	Single Stage
1550nm FP Laser						
Output Power	Po	1	2	-	mW	CW, If=Ith+20mA
Threshold Current	Ith	-	10	15	mA	CW
Operating Current	If	-	30	40	mA	CW
Operating Voltage	Vf	-	1.0	1.2	V	CW
Monitor Current	Im	100	-	900	uA	Vrd=5V, If=Ith+20mA
Monitor Dark Current	Id	-	0.5	1	nA	Vrd=5V
Cent Wavelength	λc	1540	1550	1560	nm	CW, If=Ith+20mA
Spectral Width	Δλ	-	-	4	nm	-3dB
Spectral Shift	Δλ/ΔT	-	-	0.1	nm/°C	CW, If=Ith+20mA
Tracking Error	TE	-1.5	-	1.5	dB	Im=const, TE=10log(P/2.0)
Return Loss	ER	40	45	-	dB	CW
Isolation	ISO	30	35	-	dB	Single Stage

CWDM TEC Pigtailed Laser Diode

Features

- High linearity high power MQW CWDM DFB LD chip
- Built-in isolator, TEC thermistor and monitor PD
- 8PIN coaxial cooled package
- Output power 2~10 mW

Applications

- Long haul CWDM transmission



Absolute Maximum Ratings

Parameter	Symbol	Condition	Min.	Max.	Unit
Operating Case Temperature	T _c	I=I _{op}	-10	70	°C
Storage Temperature	T _{stg}	-	-40	85	°C
Laser Forward Current	I _f	-	-	120	mA
Laser Reverse Bias	V _r	-	-	2	V
Photodiode Reverse Bias	V _{rpd}	-	-	30	V
TEC Current	I _{tec}	-20 °C < T _c < +80 °C, Top=25 °C I _f =50 mA	-	0.8	A
TEC Voltage	V _c	-	-	2	V
Lead Solder Temperature	-	-	-	260	°C
Lead Soldering Time	-	-	-	10	S

Optical & Electrical Characteristics

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Center Wavelength	λ _c	-	1271	-	1611	nm
Spectral Width (-20 dB)	Δλ	CW, I _{th} +20mA	-	0.5	1	nm
Optical Output Power	P _o	CW, T _L =25 °C	-	-	10	mW
Optical Isolation	IS	T=25 °C	30	35	-	dB
Side-mode Suppression Ratio	SMSR	CW, P _o =2mw	35	40	-	dB
Threshold Current	I _{th}	T _L =25 °C	-	10	15	mA
Forward Voltage	V _F	CW, I _{th} +20mA	-	1.0	1.2	V
Monitor Current	I _{mon}	V _{rpd} =5 V	100	-	1200	μA
Monitor Dark Current	I _D	V _{rpd} =5 V	-	-	10	nA
Tracking Error	γ	TE=10log(P _o (T _c)/P _o (25°C))	-1	-	1	dB
Cut-off Frequency	F _c (-3dB)	I _f =I _{op}	-	-	6	GHz
Thermistor Resistance	R _t	T=25 °C	9.5	-	10.5	KΩ
Thermistor B Constant	B	T=25 °C	-	72	-	K
TEC Current	I _C	ΔT=40°C	-	-	0.5	A
TEC Voltage	V _C	ΔT=40°C	-	-	1.8	V

Large Area Pin Component

Features

- Small dark current
- High reliability
- High Accuracy

Applications

- Power Meter



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Storage Temperature	T _{stg}	-40~+100	°C
Operating Temperature	T _{op}	-40~+85	°C
Operating Voltage	V _{op}	5	V
PD Reverse Voltage	V _R (PD)	25	V
Soldering Temp	-	260	°C
Soldering Time	-	10	S

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition		
Wavelength Range	λ	800	-	1700	nm	-		
Power Range	P	-	-	6	dBm	V _{op} =5V	Attenuation	0dB
		-	-	16			10dB	
		-	-	26			20dB	
Dark Current	I _d	-	-	1	nA	λ=1310nm	300μm	-
		-	-	3			1000μm	-
		-	-	10			2000μm	-
Responsivity	R	-	0.9	-	A/W	λ=1310nm	Attenuation	0dB
		-	0.09	-			10dB	
		-	0.009	-			20dB	
Accuracy	-	-	-	±0.1	dB	-		
Capacitance	C _t	-	-	25	Pf	-		
Response Time	T _r	-	-	10	ns	-		

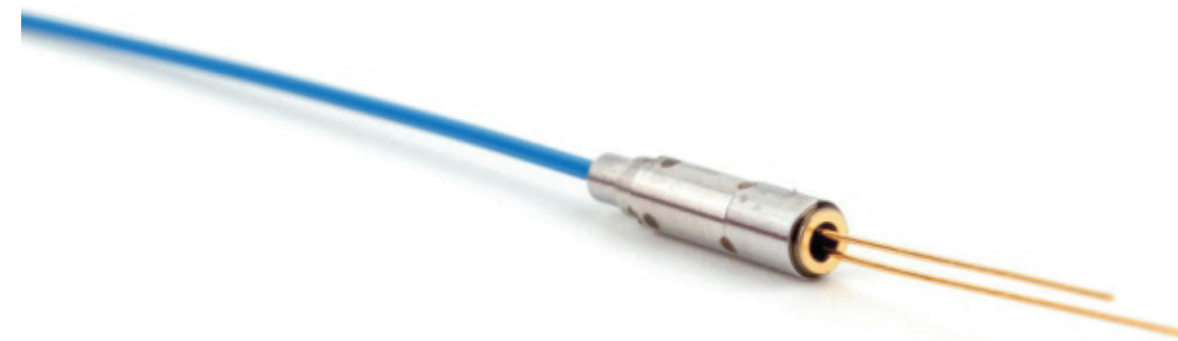
2G Pigtailed MINI Photodiode

Features

- Low Voltage Operation
- Low Capacitance and High Speed
- Low Dark Current
- Excellent Stability

Applications

- CATV transmission optical receiver
- RF transmission optical receiver
- Other Analog receiver/ Power detector



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Storage Temperature	Tstg	-40~+85	°C
Operating Temperature	Top	-40~+85	°C
Max Input Power	Pmax	+10	dBm
Forward Current	Iop	10	mA
PD Reverse Voltage	VR(PD)	20	V
Soldering Temp	-	260	°C
Soldering Time	-	10	S

Optical & Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Wavelength Range	λ	1100	-	1700	nm	-
Active Diameter	Ad	-	80	-	um	-
Dark Current	Id	-	0.2	0.5	nA	-5V
Responsivity	R	0.80	0.85	-	A/W	$\lambda=1310$ nm
		0.85	0.90	-		$\lambda=1550$ nm
Bandwidth	Bw	-	2	-	GHz	-
Frequency Response	Fr	-	± 0.5	-	dB	-
Capacitance	Ct	-	0.65	0.80	Pf	f =1MHz
Response Time	Tr	-	-	1	ns	-
Optical Return Loss	ORL	40	-	-	dB	SMF

CWDM TAP PD

Features

- Compact Design
- High Responsivity
- Low Insertion Loss and PDL
- Low Dark Current
- RoHS Compliant

Applications

- Power Control Monitoring For Amplifier
- Optical Add/Drop Multiplexing
- DWDM & CWDM Systems
- Optical Monitoring For Switching Systems



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Storage Temperature	Tstg	-40~+100	°C
Operating Temperature	Top	-40~+85	°C
Max Input Power	Pmax	+6	dBm
Operating Voltage	Vop	5	V
PD Reverse Voltage	VR(PD)	15	V
Soldering Temp	-	260	°C
Soldering Time	-	10	S

Optical and Electrical Performance

Parameter	Symbol	Unit	Data		
			Min	Typ	Max
Operating Wavelength	λ	nm	1260	-	1620
TAP Ratio	-	%	2	5	10
Responsivity	R	uA/mW	17	40	80
Reflection Loss	RIL	dB	0.3	0.6	1.0
TDL	T	dB/°C	-	-	0.02
PDL	-	dB	-	-	0.2
Dark Current	Id	nA	-	-	1
Return Loss	RL	dB	40	-	-

XG-PON Combo PD Module 1270/1310/1490/1550/1577nm

Features

- High response, flat structure of InGaAs PIN detector
- Low capacitance and low dark current
- Operating wavelength of 1100~1650nm
- Single-mode fiber coaxial package

Applications

- Power detector



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Storage Temperature	Tstg	-40~+100	°C
Operating Temperature	Top	-40~+85	°C
Max Input Power	Pmax	+6	dBm
Operating Voltage	Vop	5	V
PD Reverse Voltage	VR(PD)	15	V
Soldering Temp	-	260	°C
Soldering Time	-	10	S

Optical & Electrical Characteristics

Parameter	Symbol	Min	Typical	Max	Unit	Notes
1310nm Receiver						
Detected WL Range	-	1300	1310	1320	nm	-
Power Range	P	-50	-	+13	dBm	Vr=5V,R1=50Ω
Dark Current	Id	-	0.1	1	nA	Vr=5V
Responsivity	R	0.09	-	0.14	A/W	Vr=5V
Accuracy	-	-	-	+/-0.25	dB	25°C
Capacitance	Ct	-	-	5	pF	Vr=5V,f=1MHz
Response Time	Tr	-	-	1	ns	Vr=5V,R1=50Ω
InGaAs Area	S	-	300	-	um	-
Isolation	Iso	40	-	-	dB	-
1270nm Receiver						
Detected WL Range	-	1260	1270	1280	nm	-
Power Range	P	-50	-	+13	dBm	Vr=5V,R1=50Ω
Dark Current	Id	-	0.1	1	nA	Vr=5V
Responsivity	R	0.09	-	0.14	A/W	Vr=5V
Accuracy	-	-	-	+/-0.25	dB	25°C
Capacitance	Ct	-	-	5	pF	Vr=5V,f=1MHz
Response Time	Tr	-	-	1	ns	Vr=5V,R1=50Ω
InGaAs Area	S	-	300	-	um	-
Isolation	Iso	40	-	-	dB	-

Parameter	Symbol	Min	Typical	Max	Unit	Notes
1490nm Receiver						
Detected WL Range	-	1480	1490	1500	nm	-
Power Range	P	-50	-	+13	dBm	Vr=5V,R1=50Ω
Dark Current	Id	-	0.1	1	nA	Vr=5V
Responsivity	R	0.09	-	0.14	A/W	Vr=5V
Accuracy	-	-	-	+/-0.25	dB	25°C
Capacitance	Ct	-	-	5	pF	Vr=5V,f=1MHz
Response Time	Tr	-	-	1	ns	Vr=5V,10~90%
InGaAs Area	S	-	300	-	um	-
Isolation	Iso	40	-	-	dB	-
1577nm Receiver						
Detected WL Range	-	1572	1577	1582	nm	-
Power Range	P	-50	-	+13	dBm	Vr=5V,R1=50Ω
Dark Current	Id	-	0.1	1	nA	Vr=5V
Responsivity	R	0.09	-	0.14	A/W	Vr=5V
Accuracy	-	-	-	+/-0.25	dB	25°C
Capacitance	Ct	-	-	5	pF	Vr=5V,f=1MHz
Response Time	Tr	-	-	1	ns	Vr=5V,10~90%
InGaAs Area	S	-	300	-	um	-
Isolation	Iso	40	-	-	dB	-
1550nm Receiver						
Detected WL Range	-	1540	1550	1560	nm	-
Power Range	P	-40	-	+20	dBm	Vr=5V,R1=50Ω
Dark Current	Id	-	0.1	1	nA	Vr=5V
Responsivity	R	0.025	-	0.035	A/W	Vr=5V
Accuracy	-	-	-	+/-0.25	dB	25°C
Capacitance	Ct	-	-	5	pF	Vr=5V,f=1MHz
Response Time	Tr	-	-	1	ns	Vr=5V,10~90%
InGaAs Area	S	-	300	-	um	-
Isolation	Iso	40	-	-	dB	-
1550 FWDM						
Pass Band Wavelength Range	Pw	1540	-	1560	nm	-
Ref Band Wavelength Range	Rw	1260	-	1620	nm	-
Pass Channel Insertion Loss	PIL	-	0.4	-	dB	-
Ref Channel Insertion Loss	RIL	-	0.6	-	dB	-
Pass Channel Isoation	PISO	15	18	-	dB	-
Ref Channel Isoation	RISO	30	40	-	dB	-
Optical Return Loss	RL	55	-	-	dB	-

Note: The total insertion loss (OLT to ONU/ONU to OLT) will less than 1.0dB.