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AFR Catalog 2017

Advanced Fiber Resources

Advanced Fiber Resources

Catalog 3 - 2

2017

COMPONETNTS FOR BIOMEDICAL & RESEARCH

INDEX

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NOTES
* Fiber options of products listed here: singlemode fiber, PM fiber, LMA fiber, etc.
* Optical power handling options of the products listed here: 300 mW, 2 W, 30 W, 200 W, etc.
* Wavelength options of the products listed here: 450 - 2000nm. Please check with us.
* Package dimension options of the products listed here: customized. Please check with us.
* Connectorization options of the products listed here: FC, SC, LC, SMA, etc.

	488 nm	532 nm	638 nm	790 nm	850 nm	980 nm	1030 nm	1064 nm	1310 nm	1480 nm	1550 nm	2000 nm
Cladding Power Stripper					●	●	●	●	●	●	●	●
Circulator	●	●	●	●	●	●	●	●	●	●	●	●
Collimator	●	●	●	●	●	●	●	●	●	●	●	●
Coupler												
Fused Coupler	●	●	●	●	●	●	●	●	●	●	●	●
Thin-Film Filter Coupler				●	●	●	●	●	●	●	●	●
PM Crystal Coupler	●	●	●	●	●	●	●	●	●	●	●	●
Delay Line								●	●		●	
Faraday Mirror		●	●	●	●	●	●	●	●	●	●	●
Faraday Rotator					●	●		●	●	●	●	●
Hybrid Components												
Circulator + BP								●				
Circulator + PD								●				
Circulator + Tap Monitors								●	●	●	●	
Collimator + Polarizer							●	●			●	
Fiber Mirror + BP								●				
FWDM + BP							●	●	●	●	●	●
Isolator + BP						●	●	●	●	●	●	●
Isolator + Fiber Mirror											●	
Isolator + GFF											●	
Isolator + PBC/S							●	●	●	●	●	●
Isolator + PD								●				
Isolator + Tap + WDM						●	●	●	●	●	●	●
Isolator + WDM						●	●	●	●	●	●	●
Tap Coupler + BP							●	●	●	●	●	●
Tap Isolator							●	●	●	●	●	●
In-Line Polarizer				●	●	●	●	●	●	●	●	●
Isolator												
Free Space Isolator			●	●	●	●	●	●	●	●	●	●
Isolator	●	●	●	●	●	●	●	●	●	●	●	●
High Power Isolator				●	●	●	●	●	●	●	●	●
High Power Fiber to Free Space Isolator								●			●	●
Isolator Array											●	
Metalized fiber								●	●		●	
Mode Field Adaptor								●	●		●	●
Module												
Coupler Module	●	●	●	●	●	●	●	●	●	●	●	●
CWDM Module											●	
DWDM Module											●	
EDFA Gain Block Module											●	
OCT Optical Module	●	●	●		●			●	●		●	
RGB Combiner Module	●	●	●									
Others												
Acousto-Optic Modulator								●				
In-Line Waveplate									●		●	
Optic-Electric Transformer									●			
Optical Fiber Saturable Absorber Mirror								●			●	
Phase Delay PM Faraday Mirror								●				
PM Partial Reflector											●	
PM Piezoelectric Optical Fiber Mirror											●	
Quartz Lyot Depolarizer											●	
PM SESAM for Pulse Application								●	●		●	
Optical Mechanical Switch									●		●	
Patchcord (FC, SC, LC, SMA)	●	●	●	●	●	●	●	●	●	●	●	●
Photodiode		●	●	●	●	●	●	●	●	●	●	●
Polarization Beam Combiner/Splitter	●	●	●	●	●	●	●	●	●	●	●	●
Pump Combiner (up to 2000 W)							●	●			●	●
Pump & Signal Combiner (up to 2000 W)						●	●	●			●	
Tunable Filter											●	
WDM												
Fused WDM	●	●	●	●	●	●	●	●	●	●	●	●
Thin-Film Filter WDM	●	●	●	●	●	●	●	●	●	●	●	●
Variable Optical Attenuator	●	●	●	●	●	●	●	●	●	●	●	●
	488 nm	**532 nm**	**638 nm**	**790 nm**	**850 nm**	**980 nm**	**1030 nm**	**1064 nm**	**1310 nm**	**1480 nm**	**1550 nm**	**2000 nm**

Jan 2017

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Company Profile

Incorporated in 2000, AFR is a leading provider of passive optical components, designed mainly for telecommunication, fiber laser, and fiber sensor applications. AFR designs and manufactures advanced and cost-effective passive components through our ISO 9001-certified facility in Zhuhai, China.

AFR specializes in high power handling fiber optic components and polarization maintaining components. Our 1064 nm high power components are capable of handling up to 200 W average, and 100 kW peak optical power for fiber laser applications.

Our PM components offer excellent optical performance, i.e., high extinction ratio and low insertion loss, and high reliability which become the key enabler of broadband optical networks, high-speed optical test equipments, laser gyroscope, and other PM optical systems.

We design and manufacture both standard and customized components, and provide contract manufacturing solutions to our customers. AFR's customer base includes fiber laser, optical network and fiber sensing manufacturers, as well as research institutes and universities around the world.

AFR has a strong management team. Many of them possess more than a decade of successful management experience in fiber optic industry in Silicon Valley. Our goal is to become the customers' first choice for high power handling & PM fiber optic components, and to promote our world-class optical technology in the global market.

Contents

Contents

Special Wavelength Fused Coupler (445 - 2100 nm) (SMC Series)

HOT

Key Features

- Wavelength 445 - 2100 nm available
- Coupling ratio from 1/99 to 50/50 available
- Low excess loss
- Special Wavelength WDM also available
- High power handling
- High stability and reliability

Applications

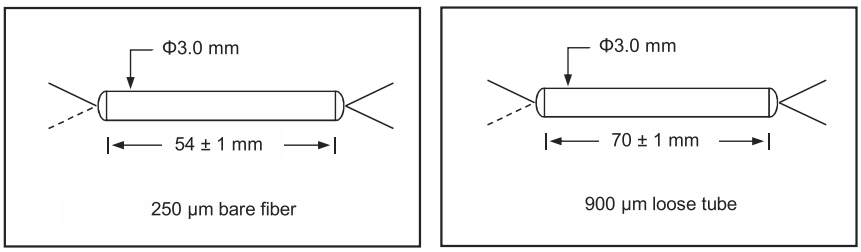
- Power monitoring
- Splitter
- Fixed attenuation
- Testing instruments

Specifications

Parameter	Unit	Value							
Center Wavelength (λc)	nm	488, 532, 635		780, 830		980, 1064		1700, 2000	
Operating Wavelength	nm	λc ± 5		λc ± 10		λc ± 10		λc ± 20	
Max. PDL	dB	0.2		0.2		0.1		0.2	
Max. Excess Loss	dB	0.3		0.3		0.15		0.3	
Max. Excess Loss for each connector	dB	1.5		0.7		0.5		0.3	
Max. Optical Power (Continuous Wave)	W	4							
Thermal Stability	dB/℃	≤ 0.005							
Min. Return Loss	dB	50							
Min. Directivity	dB	50							
Fiber Type		Singlemode fiber							
Operating Temperature	℃	- 40 to + 75							
Storage Temperature	℃	- 40 to + 85							
Coupling Ratio & Insertion Loss									
Coupling Ratio	%	1/99	2/98	5/95	10/90	20/80	30/70	40/60	50/50
Max. Insertion Loss, λc	dB	22/0.3	18.5/0.35	14.5/0.5	11.5/0.75	8.0/1.5	6.0/2.0	4.8/2.8	3.6/3.6

*RL is 5 dB lower for each connector added.
*The optical power is 1 W only for connector added. For visible wavelength, the limit is 50 mW.
*Data tested at central wavelength only.

Package Dimensions



*The Package Dimensions is Φ3.0 × 47 mm for 2000 nm bare fiber coupler.

Ordering Information

SMC-①-②②②②-③③-④-⑤-⑥-⑦

①: Configuration
1 - 1 × 2
2 - 2 × 2

②②②②: Wavelength
488 - 488 nm
532 - 532 nm
635 - 635 nm
780 - 780 nm
830 - 830 nm
980 - 980 nm
1064 - 1064 nm
1700 - 1700 nm
2000 - 2000 nm
SSSS - Specify

③③: Coupling Ratio
01 - 01/99
02 - 02/98
05 - 05/95
10 - 10/90
20 - 20/80
30 - 30/70
40 - 40/60
50 - 50/50
SS - Specify

④: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

⑤: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube

⑥: Fiber Length
Q - 0.75 m
1 -1.0 m
S - Specify

⑦: Fiber Type
1 - Nufern 460-HP
2 - Nufern 630-HP
3 - Corning HI 780C
4 - Corning HI 1060
5 - Corning HI 1060 Flex
6 - Corning SMF-28
7 - Nufern SM 1950
S - Specify

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PM Fused Coupler (445 - 2100 nm) (PMC Series)

HOT

Key Features

- Wavelength 445 - 2100 nm available
- Coupling ratio from 1/99 to 50/50 available
- Operating on both fast and slow axes
- Low excess loss
- High power handling
- High stability and reliability

Applications

- Power monitoring
- Coherent communication
- Fiber gyroscope
- Fiber laser
- Fiber amplifier
- Test equipment

Specifications

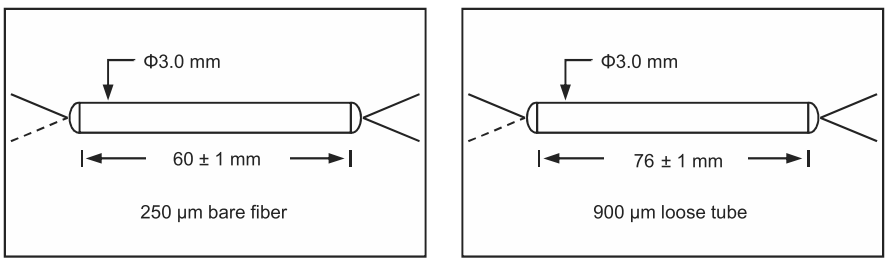
Parameter	Unit	Value							
Center Wavelength (λc)	nm	488, 532, 635	780, 830	980, 1064	1310, 1480, 1550			1700, 2000	
Operating Wavelength	nm	λc ± 5	λc ± 10	λc ± 10	λc ± 20			λc ± 20	
Typ. Excess Loss	dB	0.8	0.5	0.4	0.2			0.5	
Max. Excess Loss	dB	1.2	0.8	0.6	0.4			0.8	
Min. Extinction Ratio[1]	dB	18	18	20[1]	20			20	
Max. Excess Loss for each connector	dB	1.5	0.7	0.5	0.3			0.3	
Max. Optical Power (Continuous Wave)	W	2							
Thermal Stability	dB/℃	≤ 0.005							
Min. Return Loss	dB	50							
Min. Directivity	dB	50							
Fiber Type for Signal Port		PM fiber							
Fiber Type for Tap Port		PM fiber or Singlemode fiber							
Operating Temperature	℃	- 5 to + 70							
Storage Temperature	℃	- 40 to + 85							
Coupling Ratio & Its Tolerance									
Coupling Ratio	%	1/99	2/98	5/95	10/90	20/80	30/70	40/60	50/50
Max. Coupling Ratio Tolerance, λc	%	± 0.3	± 0.5	± 0.7	± 1.0	± 2.0	± 2.0	± 2.5	± 3.0

[1] Extinction ratio data listed in the table are for the ports with coupling ratio greater than 10%. It will be 2 dB lower for a tap port with coupling ratio between 1-10%. For 1% tap port, extinction ratio is not considered.

*ER will be 2 dB lower for Nufern FUD-3460 fiber. *RL is 5 dB lower, ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

*The Optical Power is 1 W only for connector added. For visible wavelength, the limit is 50 mW. *Data tested at central wavelength only.

Package Dimensions



Ordering Information

PMC-①-②②②②-③③-④-⑤-⑥-⑦-⑧

①: Configuration
1 - 1 × 2
2 - 2 × 2

②②②②: Wavelength

488 - 488 nm	1064 - 1064 nm
532 - 532 nm	1310 - 1310 nm
635 - 635 nm	1480 - 1480 nm
780 - 780 nm	1550 - 1550 nm
830 - 830 nm	1700 - 1700 nm
980 - 980 nm	2000 - 2000 nm
	SSSS - Specify

③③: Coupling Ratio

01 - 01/99	30 - 30/70
02 - 02/98	40 - 40/60
05 - 05/95	50 - 50/50
10 - 10/90	SS - Specify
20 - 20/80	

④: Fiber Type for Tap Port
P - PM fiber
S - Singlemode fiber

⑤: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

⑥: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube

⑦: Fiber Length
H - 0.5 m
Q - 0.75 m
S - Specify

⑧: Fiber Type
1 - Nufern PM 460-HP
2 - Nufern PM 630-HP
3 - Corning Panda PM 850
4 - Corning Panda PM 980
5 - Corning Panda PM 1310
6 - Corning Panda PM 1550
7 - Nufern PM 1950
8 - Nufern FUD-3460
S - Specify

790 nm PM Crystal Tap Coupler (PMTC Series)

The PMTC Series is manufactured by using advanced technology to allow the input signal to be splitted at various ratios with high extinction ratio.

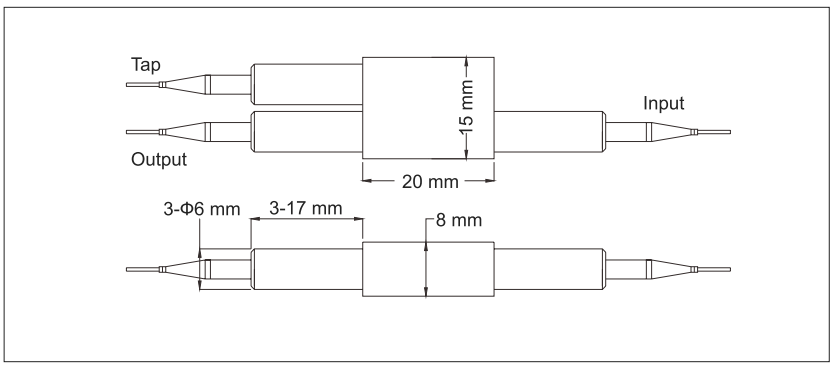
Specifications

Parameter	Unit	Value
Center Wavelength	nm	790
Operating Wavelength Range	nm	λc± 50
Configuration		1 × 2
Max. Excess Loss	dB	1.5
Max. Uniformity (only for 50%)	dB	1.0
Tap Ratio	%	1 ± 0.2, 2 ± 0.4, 5 ± 1.0, 10 ± 2.0 and 50
Min. Return Loss	dB	50
Min. Extinction Ratio	dB	20
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85
Fiber Type		PM 780-HP fiber for all ports

*IL is 0.5 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

*Cutoff wavelength of PM 780-HP fiber is 710 ± 60 nm.

Package Dimensions



Ordering Information

PMTC-①①-②-③③-④-⑤-⑥-⑦-⑧

①①: Wavelength
79 - 790 nm

②: Configuration
1 - 1 × 2

③③: Coupling Ratio
01 - 1/99
02 - 2/98
05 - 5/95
10 - 10/90
50 - 50/50
SS - Specify

④: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

⑤: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
S - Specify

⑥: Fiber Type for Tap Port
P - Panda fiber

⑦: Fiber Length
Q - 0.75 m
S - Specify

⑧: Working Axis
F - Fast axis blocked

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Visible Fused Multimode Coupler (500 - 650 nm) (MMC Series)

HOT

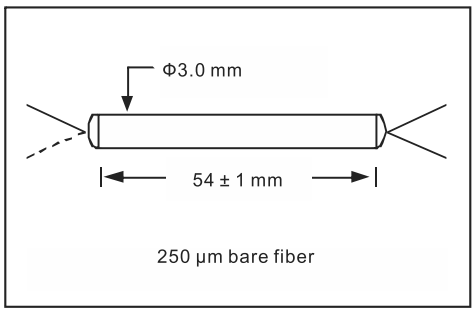
The MMC series offers very low excess loss, broad operating wavelength and high stability and reliability. These components are extensively used in LAN, multimode fiber communication systems, fiber sensors and testing instruments.

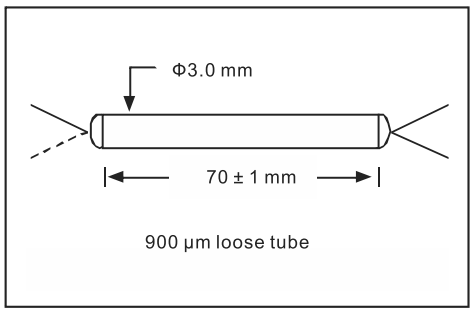
Specifications

Parameter	Unit	Value
Operating Wavelength	nm	500 - 650
Coupling Ratio	%	50/50
Max. Insertion Loss	dB	3.8
Typ. Excess Loss	dB	0.4
Max. Uniformity for 50/50 ratio	dB	0.5
Min. Directivity	dB	50
Fiber Type		Multimode fiber
Max. Optical Power (Continuous Wave)	mW	300
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.3 dB higher for each connector added.
*Above specifications are measured at low order modes.

Package Dimensions





Ordering Information

MMC-①-②②②-③③-④-⑤-⑥-⑦

①: Configuration
1 - 1 × 2
2 - 2 × 2

②②②: Wavelength
575 - 500 - 650 nm

③③: Coupling Ratio
50 - 50/50

④: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

⑤: Fiber Core
1 - 50 um
2 - 62.5 um
3 - 105 um

⑥: Fiber Length
1 - 1.0 m
S - Specify

RG, RB, GB Combiner (WDM Series)

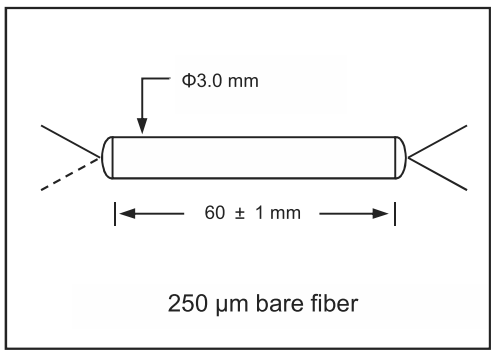
The RG, RB, GB Combiner enable any two primary colors in the visible wavelength region to be combined . They offer very low insertion loss and excellent environmental stability.

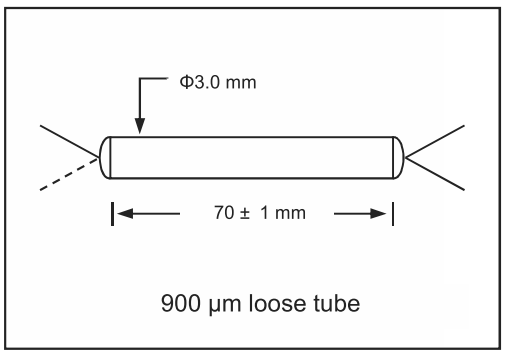
Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	532(G)/635(R), 488(B)/635(R), 488(B)/532(G)
Typ. Insertion Loss, λc	dB	0.3
Max. Insertion Loss, λc	dB	0.5
Thermal Stability	dB/℃	≤ 0.002
Min. Return Loss	dB	55
Min. Directivity	dB	55
Max. Optical Power (Continuous Wave)	mW	100
Fiber Type		Nufern 460-HP fiber
Operating Temperature	℃	- 40 to + 75
Storage Temperature	℃	- 40 to + 85

*IL is 1.5 dB higher, RL is 5 dB lower for each connector added.
*The optical power is 50 mW only for connector added.

Package Dimensions





Ordering Information

WDM-①-②②②②②②-③-④-⑤

①: Configuration	②②②②②②: Wavelength	③: Connetor Type		④: Fiber Jacket	⑤: Fiber Length
1 - 1 × 2	532635 - 532 & 635 nm	1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber	Q - 0.75 m
2 - 2 × 2	488635 - 488 & 635 nm	2 - FC/APC	N - None	L - 900 μm loose tube	1 - 1.0 m
	488532 - 488 & 532 nm	3 - SC/UPC	S - Specify		S - Specify

Red, Green, Blue Combiner (WDM Series)

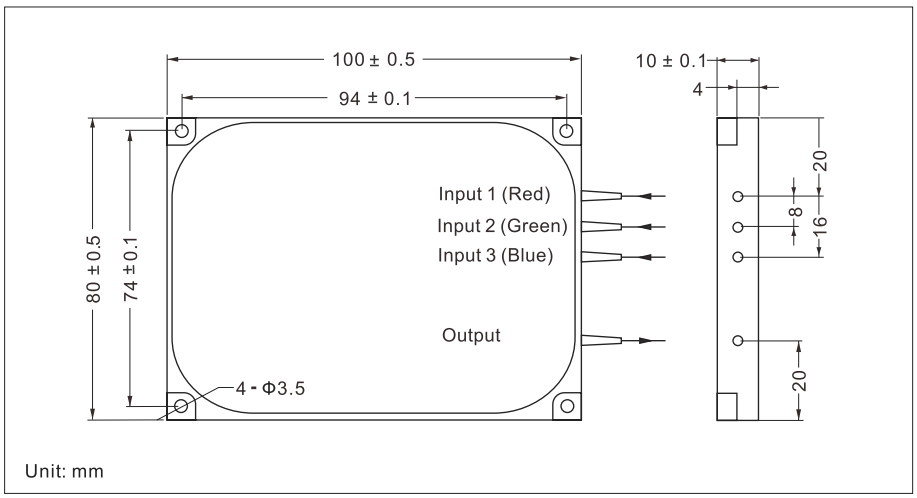
The Red, Green, Blue Combiner enable three primary colors in the visible wavelength region to be combined. They offer very low insertion loss and excellent environmental stability.

Specifications

Parameter	Unit	Value
Center Wavelengths (λc)	nm	635(R)/532(G)/488(B) or Specify
Typ. Insertion Loss, Red, Green, Blue Input to Output, λc	dB	0.8
Max. Insertion Loss, Red, Green, Blue Input to Output, λc	dB	1.2
Thermal Stability	dB/℃	≤ 0.005
Min. Return Loss	dB	50
Min. Directivity	dB	50
Max. Optical Power (Continuous Wave)	mW	100
Fiber Type		Nufern 460-HP fiber
Operating Temperature	℃	- 40 to + 75
Storage Temperature	℃	- 40 to + 85

*IL is 1.5 dB higher, RL is 5 dB lower for each connector added.
*The optical power is 50 mW only for connector added.

Package Dimensions



Ordering Information

WDM-①-②-③-④

① Wavelengths	② Connector Type		③ Fiber Jacket	④ Fiber Length
1 - 635, 532, 488 nm	1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber	H - 0.5 m
S - Specify	2 - FC/APC	N - None	L - 900 μm loose tube	1 - 1.0 m
	3 - SC/UPC	S - Specify	3 - 3 mm cable	S - Specify
			S - Specify	

RG PM Fused Combiner (PMWDM Series)

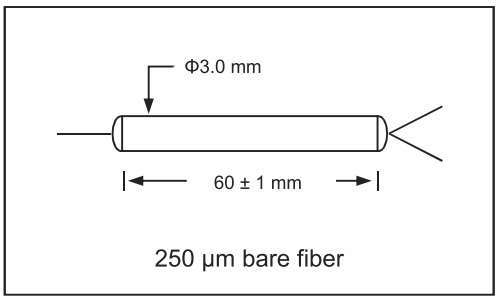
The Polarization Maintaining Fused RG Combiner is manufactured by using advanced technology and polarization maintaining fiber to enable the red and green light to be combined. They offer low excess loss, small size, high extinction ratio, high return loss, and excellent environmental stability.

Specifications

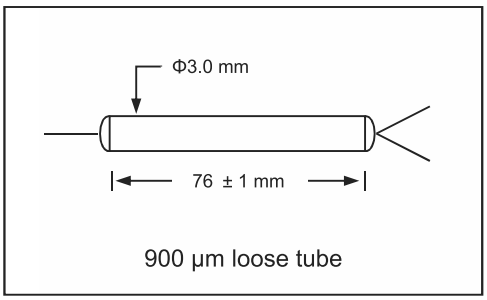
Parameter	Unit	Value
Center Wavelength (λc)	nm	532(G)/635(R)
Typ. Insertion Loss, λc	dB	1.0
Max. Insertion Loss, λc	dB	1.5
Min. Extinction Ratio	dB	18
Thermal Stability	dB/℃	≤ 0.005
Min. Return Loss	dB	55
Min. Directivity	dB	55
Max. Optical Power (Continuous Wave)	mW	300
Fiber Type		Nufern PM 460-HP fiber
Operating Temperature	℃	- 5 to + 70
Storage Temperature	℃	- 40 to + 85

*IL is 1.5 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.
*The optical power is 50 mW only for connector added.

Package Dimensions



250 μm bare fiber



900 μm loose tube

Ordering Information

PMWDM-①-②②②②②②-③-④-⑤

①: Configuration	②②②②②②: Wavelength	③: Connector Type		④: Fiber Jacket	⑤: Fiber Length
1 - 1 × 2	532635 - 532 & 635 nm	1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber	H - 0.5 m
		2 - FC/APC	N - None	L - 900 μm loose tube	Q - 0.75 m
		3 - SC/UPC	S - Specify		S - Specify

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Filter Wavelength Division Multiplexer (FWDM Series)

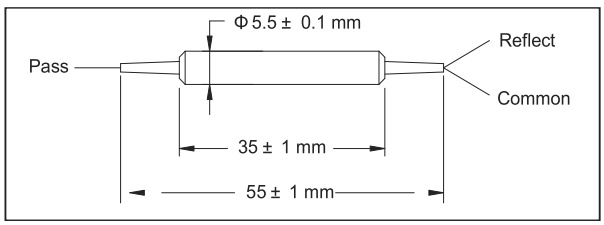
The Filter Wavelength Division Multiplexer is based on environmentally stable thin film filter technology. The devices combine or separate light at different wavelength in a wide wavelength range. They offer very low insertion loss, low polarization dependence, high isolation and excellent environmental stability. High power handling capability can be achieved through unique pigtail processing and high quality AR coating. These components have been extensively used in EDFAs, Raman amplifiers, WDM networks and fiber optical instruments.

Specifications

Parameter		Unit	Value		
Pass Band	Wavelength Range	nm	1270 - 1350 (1530 - 1600)	1450 - 1490 (1530 - 1580)	1500 - 1520 (1530 - 1570)
	Typ. Insertion Loss	dB	0.4	0.4	0.5
	Max. Insertion Loss	dB	0.6	0.6	0.7
	Typ. Isolation	dB	35	30	35
	Min. Isolation	dB	30	25	30
Reflection Band	Wavelength Range	nm	1530 - 1600 (1270 - 1350)	1530 - 1580 (1450 - 1490)	1530 - 1570 (1500 - 1520)
	Typ. Insertion Loss	dB	0.3		
	Max. Insertion Loss	dB	0.5		
	Typ. Isolation	dB	15		
	Min. Isolation	dB	12		
Min. Return Loss		dB	50		
Typ. Polarization Dependent Loss		dB	0.05		
Max. Polarization Dependent Loss		dB	0.1		
Thermal Stability		dB/℃	0.005		
Max. Optical Power (Continuous Wave)		mW	300		
Max. Tensile Load		N	5		
Fiber Type			SMF-28 fiber		
Operating Temperature		℃	- 5 to + 70		
Storage Temperature		℃	- 40 to + 85		

*IL is 0.3 dB higher, RL is 5 dB lower for each connector added.

Package Dimensions



Ordering Information

FWDM-①①①①-②-③-④

①①①①: Wavelength

3155 - 1310 Pass/1550 Reflect
5531 - 1310 Reflect/1550 Pass
4855 - 1480 Pass/1550 Reflect
5548 - 1480 Reflect/1550 Pass
5155 - 1510 Pass/1550 Reflect
5551 - 1510 Reflect/1550 Pass
SSSS - Specify

②: Connector Type

1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

③: Fiber Jacket

B - 250 μm bare fiber
L - 900 μm loose tube
S - Specify

④: Fiber Length

1 - 1.0 m
S - Specify

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PM Filter Wavelength Division Multiplexer (PMFWDM Series)

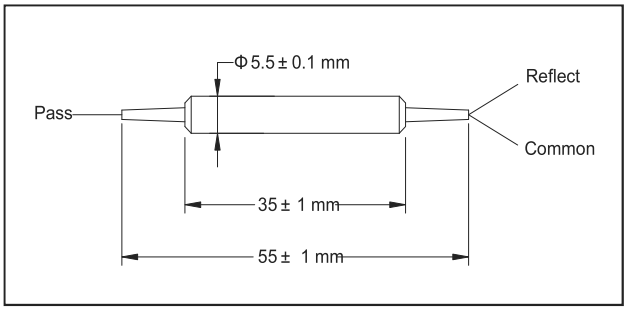
The PM FWDM series provides wavelength division multiplexing while maintaining signal polarization. The components are based on environmentally stable thin-film filter technology and are characterized with high extinction ratio, low insertion loss, and high return loss. They are ideal for high speed WDM network systems.

Specifications

Parameter		Unit	Value		
Pass Band	Wavelength Range	nm	1270 - 1350 (1530 - 1600)	1450 - 1490 (1530 - 1600)	1500 - 1520 (1530 - 1570)
	Typ. Insertion Loss	dB	0.4	0.4	0.5
	Max. Insertion Loss	dB	0.6	0.6	0.7
	Typ. Isolation	dB	30	30	30
	Min. Isolation	dB	25	25	25
Reflection Band	Wavelength Range	nm	1530 - 1600 (1270 - 1350)	1530 - 1600 (1450 - 1490)	1530 - 1570 (1500 - 1520)
	Typ. Insertion Loss	dB	0.3		
	Max. Insertion Loss	dB	0.5		
	Typ. Isolation	dB	15		
	Min. Isolation	dB	12		
Min. Extinction Ratio		dB	20		
Min. Return Loss		dB	50		
Thermal Stability		dB/℃	0.005		
Fiber Type			PM Panda fiber		
Max. Optical Power (Continuous Wave)		mW	300		
Max. Tensile Load		N	5		
Operating Temperature		℃	-5 to +70		
Storage Temperature		℃	-40 to +85		

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

PMFWDM-①①①①-②-③-④

①①①①: Wavelength	②: Connector Type	③: Fiber Jacket	④: Fiber Length
3155 - 1310 Pass/1550 Reflect	1 - FC/UPC	B - 250 μm bare fiber	Q - 0.75 m
5531 - 1310 Reflect/1550 Pass	2 - FC/APC	L - 900 μm loose tube	S - Specify
4855 - 1480 Pass/1550 Reflect	3 - SC/UPC	S - Specify	
5548 - 1480 Reflect/1550 Pass	4 - SC/APC		
5155 - 1510 Pass/1550 Reflect	N - None		
5551 - 1510 Reflect/1550 Pass	S - Specify		

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Visible Wavelength PM Isolator (PMI Series)

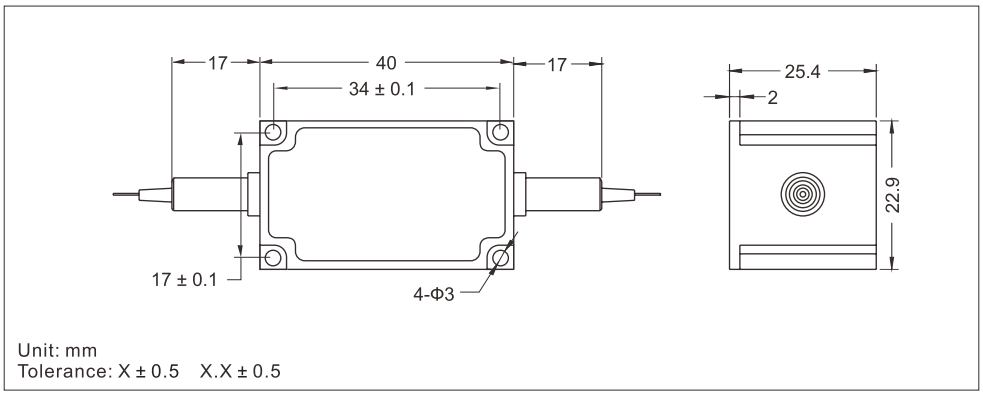
The Polarization Maintaining Isolator is characterized with low insertion loss, high isolation, high return loss, high extinction ratio, and excellent environmental stability and reliability. It is ideal for polarization maintaining fiber amplifiers, fiber lasers, high speed communication systems and instrumentation applications.

Specifications

Parameter	Unit	Value	
Center Wavelength (λc)	nm	488	532/635
Typ. Insertion Loss, λc, 23 °C	dB	1.6	1.3
Max. Insertion Loss, λc, 23 °C	dB	2	1.7
Min. Isolation, λc, 23 °C, all polarization states	dB	23	
Min. Return Loss	dB	50	
Min. Extinction Ratio	dB	18	
Max. Optical Power (Continuous Wave)	mW	50	100
Fiber Type		PM Panda fiber	
Operating Temperature	°C	0 to 50	

*IL is 1.5 dB higher, RL is 5 dB lower, ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.
*The Optical Power is 50 mW only for connector added.

Package Dimensions



Unit: mm
Tolerance: X ± 0.5 X.X ± 0.5

Ordering Information

PMI-①①①-②-③-④

①①①: Wavelength
488 - 488 nm
532 - 532 nm
635 - 635 nm
SSS - Specify

②: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

③: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
S - Specify

④: Fiber Length
Q - 0.75 m
S - Specify

488 nm Isolator (PSSI Series)

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	488
Operating Wavelength Range	nm	λc ± 5
Typ. Insertion Loss, 23 ℃	dB	1.5
Max. Insertion Loss, 23 ℃	dB	2.0
Min. Isolation at 23 ℃, λc	dB	30
Max. Optical Power (Continuous Wave)	mW	50
Fiber Type		Nufern 460-HP Fiber
Operating Temperature	℃	+ 25 to + 45

*IL is 1.5 dB higher, RL is 5 dB lower for each connector added.

532 nm Isolator (PSSI Series)

Specifications

Parameter	Unit	Value
Operating Wavelength (λc)	nm	532
Typ. Peak Isolation	dB	30
Min. Isolation, λc, 23 ℃, all polarization states	dB	25
Typ. Insertion Loss, λc, 23 ℃, all polarization states	dB	1.8
Max. Insertion Loss, λc, 23 ℃, all polarization states	dB	2.0
Max. Polarization Dependent Loss, 23 ℃	dB	0.2
Max.Optical Power (Continuous Wave)	mW	100
Max. Tensile Load	N	5
Fiber Type		Nufern 460-HP fiber
Operating Temperature	℃	+ 10 to + 50

*IL is 1.5 dB higher, RL is 5 dB lower for each connector added.

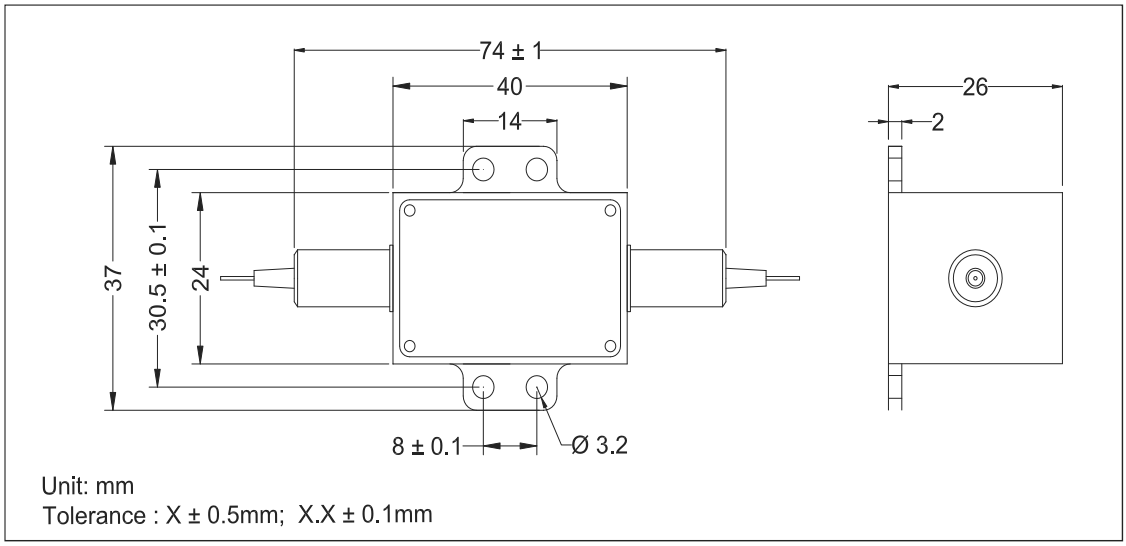
638 nm Isolator (PSSI Series)

Specifications

Parameter	Unit	Value
Operating Wavelength(λc)	nm	638
Typ. Insertion Loss, 23 ℃	dB	1.5
Max. Insertion Loss, 23 ℃	dB	1.7
Typ. Peak Isolation, 23 ℃	dB	30
Min. Isolation, λc, 23 ℃, all polarization states	dB	25
Fiber Type		Nufern 630 HP
Operating Temperature	℃	+ 25 to + 45

*IL is 0.5 dB higher for each connector added.

Package Dimensions



Unit: mm
Tolerance : X ± 0.5mm; X.X ± 0.1mm

Ordering Information

PSSI-①①①-②-③-④

①①①: Wavelength	②: Connector Type	③: Fiber Jacket	④: Fiber Length
488 - 488 nm	1 - FC/UPC	B - 250 μm bare fiber	1 - 1.0 m
532 - 532 nm	2 - FC/APC	L - 900 μm loose tube	S - Specify
638 - 638 nm	3 - SC/APC	S - Specify	
SSS - Specify	4 - SC/UPC		
	N - None		

790 nm 300 mW Isolator (HI Series)

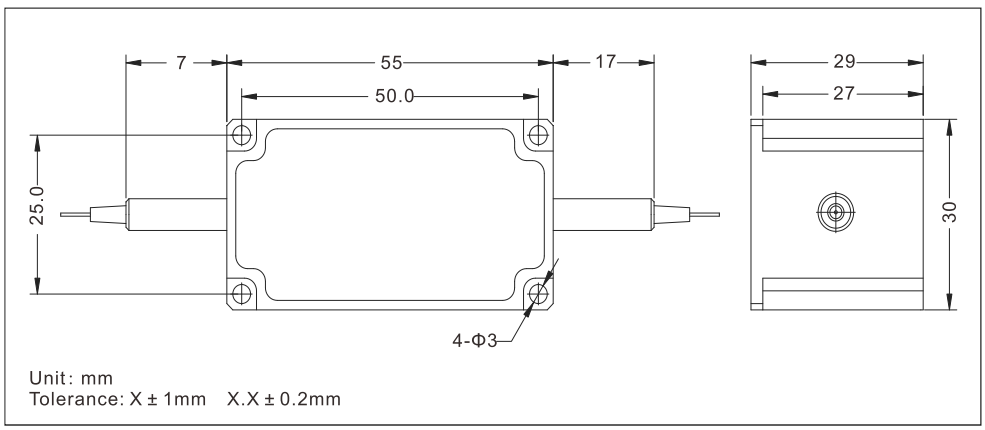
The 790 nm High Power Polarization Insensitive Isolator is characterized with low insertion loss, high isolation, high power handling, high return loss, excellent environmental stability and reliability. It is ideal for fiber laser and instrumentation applications.

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	790
Max. Polarization Dependent Loss	dB	0.2
Min. Isolation, λc, 23 ℃, all polarization states	dB	20
Typ. Insertion Loss, 23 ℃	dB	1.3
Max. Insertion Loss, 23 ℃	dB	1.8
Min. Return Loss (Input/Output)	dB	45/45
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Fiber Type		HI 780 SM fiber
Operating Temperature	℃	10 to + 50
Storage Temperature	℃	-10 to + 65

*IL is 0.5 dB higher, RL is 5 dB lower for each connector added.

Package Dimensions



Ordering Information

HI-①①-②-③-④

①①: Wavelength	②: Connector Type	③: Fiber Jacket	④: Fiber Length
79 - 790 nm	1 - FC/UPC	B - 250 μm bare fiber	1 - 1.0 m
SS - Specify	2 - FC/APC	L - 900 μm loose tube	S - Specify
	3 - SC/UPC	S - Specify	
	4 - SC/APC		
	N - None		
	S - Specify		

850 nm 300 mW Isolator (HI Series)

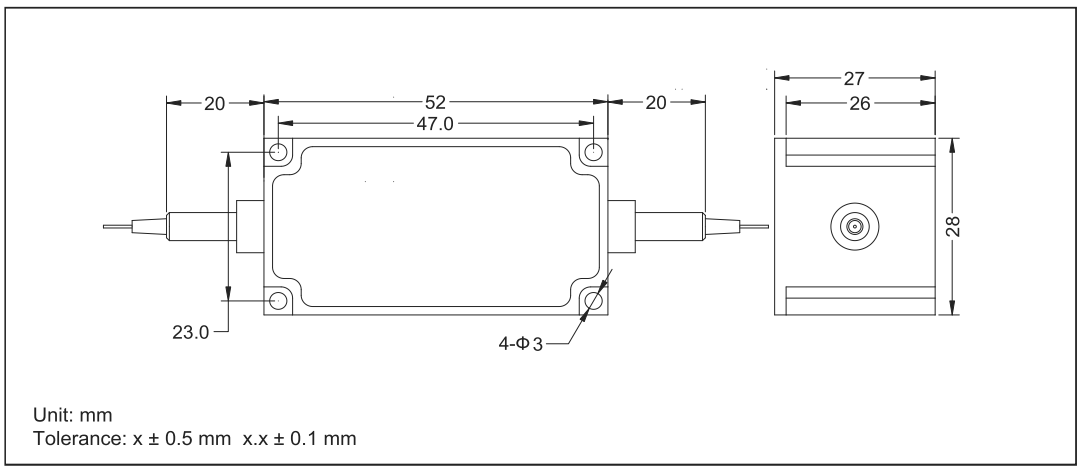
The 850 nm High Power Polarization Insensitive Isolator is characterized with low insertion loss, high isolation, high power handling, high return loss, excellent environmental stability and reliability. It is ideal for fiber laser and instrumentation applications.

Specifications

Parameter	Unit	Grade P	Grade A
Center Wavelength (λc)	nm	850	
Operating Wavelength	nm	± 10	
Max. Polarization Dependent Loss	dB	0.15	0.20
Min. Isolation, λc, 23 ℃, all polarization states	dB	25	22
Typ. Insertion Loss, 23 ℃	dB	1.3	1.5
Max. Insertion Loss, 23 ℃	dB	1.5	1.8
Min. Return Loss (Input/Output)	dB	50/50	45/45
Max. Optical Power (Continuous Wave)	mW	300	
Max. Tensile Load	N	5	
Fiber Type		HI 780 SM fiber	
Package Dimension	mm	52 × 28 × 27	

*IL is 0.5 dB higher, RL is 5 dB lower for each content add.

Package Dimensions



Unit: mm
Tolerance: x ± 0.5 mm x.x ± 0.1 mm

Ordering Information

HI-①①-②-③-④-⑤

①①: Wavelength	②: Grade	③: Connector Type	④: Fiber Jacket	⑤: Fiber Length
85 - 850 nm	P - Premium	1 - FC/UPC	B - 250 μm bare fiber	1 - 1.0 m
SS - Specify	A - A grade	2 - FC/APC	L - 900 μm loose tube	S - Specify
		3 - SC/UPC	S - Specify	
		4 - SC/APC		
		N - None		
		S - Specify		

1310/1480/1550 nm 300 mW PM Isolator (PMI Series)

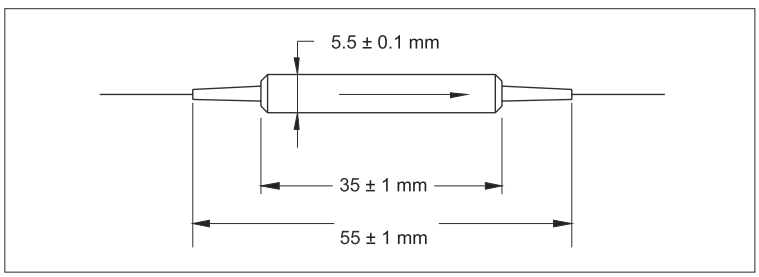
The Polarization Maintaining Isolator is characterized with low insertion loss, high isolation, high return loss, high extinction ratio and excellent environmental stability and reliability. It is ideal for polarization maintaining fiber amplifers, fiber lasers, high speed communication systems and instrumentation applications.

Specifications

Parameter	Unit	Single Stage		Dual Stage	
		Grade P	Grade A	Grade P	Grade A
Center Wavelength (λc)	nm	1310, 1480 or 1550			
Min. Extinction Ratio for -F Version	dB	25	23	25	23
Min. Extinction Ratio for -B Version	dB	20	18	20	18
Typ. Peak Isolation	dB	42	40	58	55
Min. Isolation, λc ± 10 nm, 23 ℃	dB	30	28	46	45
Typ. Insertion Loss, λc ± 20 nm, 23 ℃, all polarization states	dB	0.4	0.5	0.5	0.7
Max. Insertion Loss, λc ± 20 nm, all temperature, all polarization states	dB	0.6	0.7	0.7	0.9
Min. Return Loss (Input/Output)	dB	55/50	55/50	55/50	55/50
Max. Optical Power (Continuous Wave)	mW	300			
Max. Tensile Load	N	5			
Fiber Type		PM Panda fiber			
Operating Temperature	℃	-5 to +70			

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



1310/1480/1550 nm 300 mW Isolator (PSSI & PDSI Series)

FULL Specification Available on the WEB

Parameter	Unit	Single Stage		Dual Stage	
		Grade P	Grade A	Grade P	Grade A
Center Wavelength (λc)	nm	1310, 1480 or 1550			
Typ. Peak Isolation	dB	42	40	58	55
Min. Isolation, λc ± 10 nm, 23 ℃, all polarization states	dB	30	29	46	45
Typ. Insertion Loss, λc, 23 ℃; all polarization states	dB	0.35	0.5	0.4	0.6
Max. Insertion Loss, λc ± 20 nm, all temperature, all polarization states	dB	0.5	0.7	0.6	0.9
Min. Return Loss (Input/Output)	dB	60/55	60/55	60/55	60/55
Max. Polarization Dependent Loss, 23 ℃	dB	0.05	0.10	0.05	0.15
Max. Polarization Mode Dispersion	ps	0.20	0.25	0.05	0.07
Max. Optical Power (Continuous Wave)	mW	300			
Fiber Type		SMF-28 fiber			

2000 nm 2 W PM Isolator (PMI Series)

The 2000 nm PM Isolator is designed and manufactured according to Telcordia standard. The unique manufacturing process and optical path epoxy-free design enhance the device high power handling capability. The device is characterized with high performance, high reliability. It was designed specially for 2000 nm laser system.

Specifications

Parameter	Unit	Single Stage	Dual Stage
Center Wavelength (λc)	nm	2000	
Min. Extinction Ratio	dB	18	18
Min. Isolation, λc ± 50 nm, 23 ℃, all polarization states	dB	16	35
Max. Insertion Loss, λc ± 20 nm, 23 ℃, all polarization states	dB	1.3	1.5
Min. Return Loss (Input/Output)	dB	50	50
Max. Average Optical Power	W	1 or 2	
Max. Peak Power for ns Pulse	kW	10	
Max. Tensile Load	N	5	
Fiber Type		PM 1550 Panda fiber	
Operating Temperature	℃	-5 to +70	
Storage Temperature	℃	-40 to +85	

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.
*The optical power is 1 W only for connector added.

Ordering Information

PMI-①①①①-②-③-④-⑤-⑥-⑦-⑧

①①①① : Wavelength	② : Handling Power	③ : Stage	④ : Connector Type	
2000 - 2000 nm	1 - 1 W	1 - Single Stage	1 - FC/UPC	4 - SC/APC
SSSS - Specify	2 - 2 W	2 - Dual Stage	2 - FC/APC	N - None
	S - Specify		3 - SC/UPC	S - Specify
⑤ : Fiber Jacket	⑥ : Fiber Length	⑦ : Working Axis	⑧ : Power Type	
B - 250 μm bare fiber	Q - 0.75 m	F - Fast axis blocked	P - Pulsed	
L - 900 μm loose tube	S - Specify	B - Both axes working	C - Continuous Wave	
S - Specify				

2000 nm 2 W Isolator (PSSI & PDSI Series)

FULL Specification Available on the WEB

Parameter	Unit	Single Stage	Dual Stage
Center Wavelength (λc)	nm	2000	
Max. Polarization Dependent Loss	dB	0.2	0.2
Min. Isolation, λc ± 50 nm, 23 ℃, all polarization states	dB	16	35
Max. Insertion Loss, λc ± 20 nm, 23 ℃, all polarization states	dB	1.3	1.5
Min. Return Loss (Input/Output)	dB	50	50
Max. Average Optical Power	W	1 or 2	
Max. Peak Power for ns Pulse	kW	10	
Max. Tensile Load	N	5	
Fiber Type		SMF-28 fiber or Nufern SM-1950 fiber	

*IL is 0.3 dB higher and RL is 5 dB lower for each connector added.
*The optical power is 1 W only for connector added.

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1310/1550 nm 3-port Circulator (FCIR Series)

Parameter	Unit	Value
Center Wavelength (λc)	nm	1310 or 1550
Operating Wavelength Range	nm	λc ± 20
Typ. Insertion Loss	dB	0.7
Max. Insertion Loss	dB	0.8
Min. Isolation, 23 ℃	dB	45
Min. Crosstalk	dB	50
Min. Return loss	dB	55
Max. Polarization Dependent Loss, 23 ℃	dB	0.1
Max. Polarization Mode Dispersion	ps	0.1
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Fiber Type		SMF-28 fiber
Operating Temperature	℃	- 5 to + 70
Storage Temperature	℃	- 40 to + 85
Package Dimensions	mm	Φ 5.5 × 50

*IL is 0.3 dB higher and RL is 5 dB lower for each connector added.

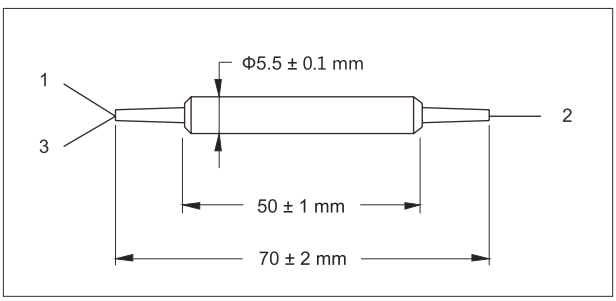
1310/1550 nm 4-port Circulator (FCIR Series)

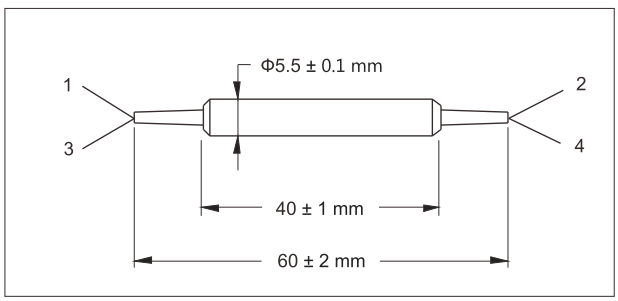
FULL Specification Available on the WEB

Parameter	Unit	Value
Center Wavelength (λc)	nm	1310 or 1550
Operating Wavelength Range	nm	λc ± 20
Transmitting Direction		1→2, 2→3, 3→4
Typ. Insertion Loss	dB	0.7
Max. Insertion Loss	dB	0.9
Min. Isolation, 23 ℃	dB	38
Min. Crosstalk	dB	50
Min. Return loss	dB	50
Max. Polarization Dependent Loss, 23 ℃	dB	0.2
Max. Polarization Mode Dispersion	ps	0.1
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Fiber Type		SMF-28 fiber
Operating Temperature	℃	0 to +70

*IL is 0.3 dB higher and RL is 5 dB lower for each connector added.

Package Dimensions





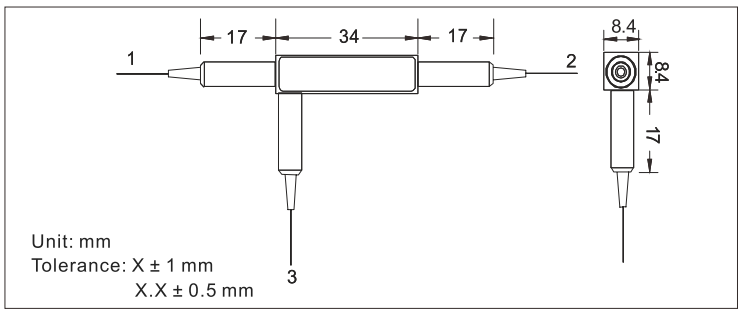
1550nm PM Circulator (Both Axes Working) (PMCIR Series)

HOT

Parameter	Unit	Value
Center Wavelength (λc)	nm	1550
Operating Wavelength Range	nm	λc ± 10
Min. Extinction Ratio	dB	20
Max. Insertion Loss	dB	1
Min. Isolation	dB	20
Min. Crosstalk	dB	45
Min. Return Loss	dB	50
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Operating Temperature	℃	0 to + 40
Storage Temperature	℃	- 40 to + 85
Fiber Type		PM 1550 Panda fiber

*IL is 0.3 dB higher, RL is 5 dB lower and ER is 2 dB lower for each connector added. Connector key aligned to slow axis.

Package Dimensions



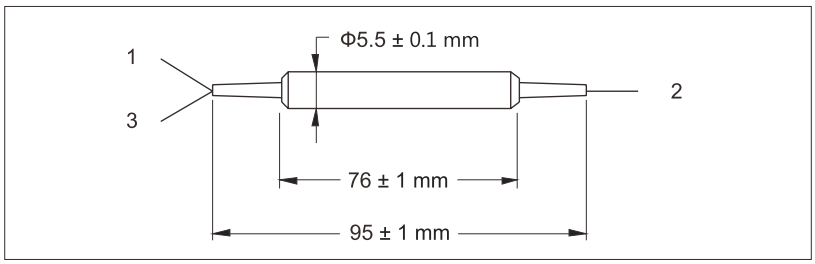
1310/1550 nm Multimode Circulator (MMCIR Series)

FULL Specification Available on the WEB

Parameter	Unit	Value
Center Wavelength (λc)	nm	1310 or 1550
Typ. Insertion Loss	dB	1.0
Max. Insertion Loss	dB	1.2
Min. Isolation, 23 ℃	dB	25
Min. Crosstalk	dB	30
Min. Return loss	dB	30
Max. Polarization Dependent Loss	dB	0.2
Max. Optical Power (Continuous Wave)	mW	300
Fiber Type		62.5/125 or 50/125 μm MM fiber

*IL is 0.3 dB higher and RL is 10 dB lower for connector added.

Package Dimensions



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2000 nm Circulator and PM Circulator (FCIR & PMCIR Series)

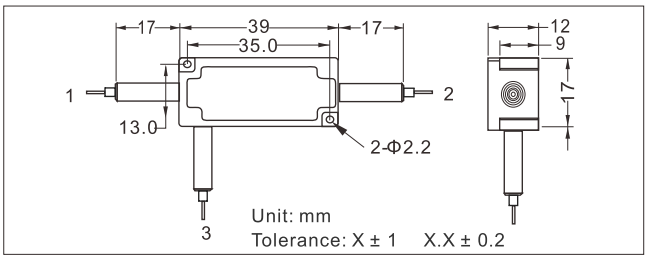
The 2000 nm Fiber Optic Circulator is a high performance lightwave component that routes incoming signals from Port 1 to Port 2, and incoming Port 2 signals to Port 3.

Specifications

Parameter	Unit	Value
Operating Wavelength	nm	1950 or 2000
Max. Insertion Loss, 23 ℃, λc ± 30 nm	dB	1.5
Min. Isolation, 23 ℃, λc ± 30 nm	dB	16
Min. Crosstalk	dB	40
Min. Return Loss	dB	50
Max. Polarization Dependent Loss (for FCIR Only)	dB	0.2
Min. Extinction Ratio (for PMCIR Only)	dB	18
Max. Average Optical Power	W	0.3, 0.5, 1, 2 or 5
Max. Peak Power for ns Pulse	kW	10
Max. Tensile Load	N	5

*IL is 0.3 dB higher and RL is 5 dB lower for each connector added. The optical power is 1 W only for connector added.
*For PMCIR, ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

FCIR-①①①①-②-③-④-⑤-⑥-⑦

①①①①: Wavelength	②: Handling Power		③: Connector Type		④: Fiber Jacket
1950 - 1950 nm	03 - 0.3 W	05 - 0.5 W	1 - FC/UPC	3 - SC/UPC	B - 250 μm bare fiber
2000 - 2000 nm	1 - 1 W	5 - 5 W	2 - FC/APC	4 - SC/APC	L - 900 μm loose tube
SSSS - Specify	2 - 2 W	S - Specify	N - None	S - Specify	S - Specify

⑤: Fiber Length	⑥: Fiber Type	⑦: Power Type
1 - 1.0 m	1 - SMF-28 fiber	P - Pulsed
S - Specify	2 - Nufern SM1950 fiber	C - Continuous wave
	3 - Thorlabs SM2000 fiber	

PMCIR-①①①①-②-③-④-⑤-⑥-⑦-⑧

①①①①: Wavelength	②: Handling Power		③: Connector Type		④: Fiber Jacket
2000 - 2000 nm	03 - 0.3 W	05 - 0.5 W	1 - FC/UPC	3 - SC/UPC	B - 250 μm bare fiber
SSSS - Specify	1 - 1 W	5 - 5 W	2 - FC/APC	4 - SC/APC	L - 900 μm loose tube
	2 - 2 W	S - Specify	N - None	S - Specify	S - Specify

⑤: Fiber Length	⑥: Working Axis	⑦: Fiber Type	⑧: Power Type
Q - 0.75 m	F - Fast axis blocked	1 - PM 1550 Panda fiber	P - Pulsed
S - Specify	B - Both axes working	2 - Nufern PM 1950 fiber	C - Continuous wave
		3 - Thorlabs PM 2000 fiber	

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488/532/640 nm Visible Beam Delivery Collimator (VBD Series)

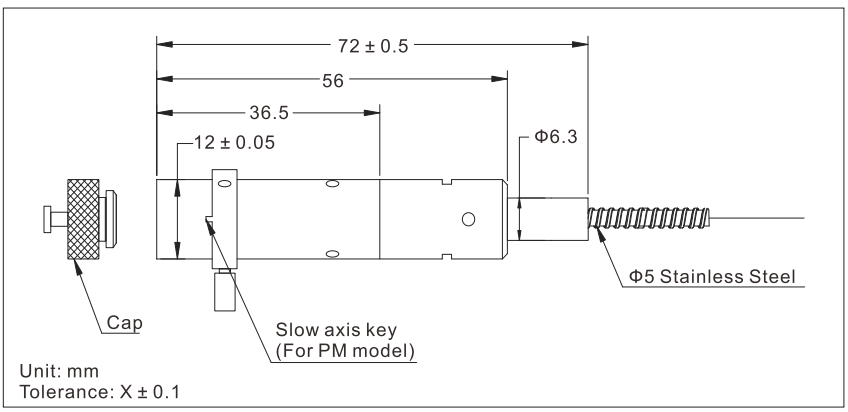
NEW

The Visible Beam Delivery Collimator is the basic element for optics systems from 488 nm to 640 nm. The beam diameter can be customized. It has high extinction ratio, low insertion loss and high return loss. The most advantage of the collimator is the high output pointing accuracy with high stability and reliability. The unique processing and high quality AR coating also enable this collimator to handle high power.

Specifications

Parameter	Unit	Value
Operating Wavelength	nm	488, 532 or 640
Maximum Input Laser Power	mW	500
Max. Extinction Ratio	dB	20
Throughput Efficiency (assuming 0.7 input beam diameter)	%	≥ 65
Collimated Output Beam		
Beam Diameter	mm	0.65 ± 0.1
Beam Waist Position	mm	30 ± 200
M^2		1.05
Pointing Stability	μrad/℃	1
Beam Divergence	mm	Diffraction Limited
Output Eccentricity	mm	± 0.15
Output Concentricity	mrad	± 0.5
Environmental Conditions		
Storage Temperature	℃	+ 10 to + 40
Operating Temperature	℃	+ 10 to + 40
Operating Pressure		Atmospheric
Operating Humidity		Non-condensing

Package Dimensions



Ordering Information

VBD-①①①-②-③-④-⑤

①①①: Wavelength	②: Beam Diameter	③: Fiber Jacket	④: Fiber Length	⑤: Fiber Type
488 - 488 nm	0.65 - 0.65 ± 0.1	S - Stainless Steel	1 - 1.0 m	P - PM fiber

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1310/1480/1550 nm Single Fiber Collimator (C Series)

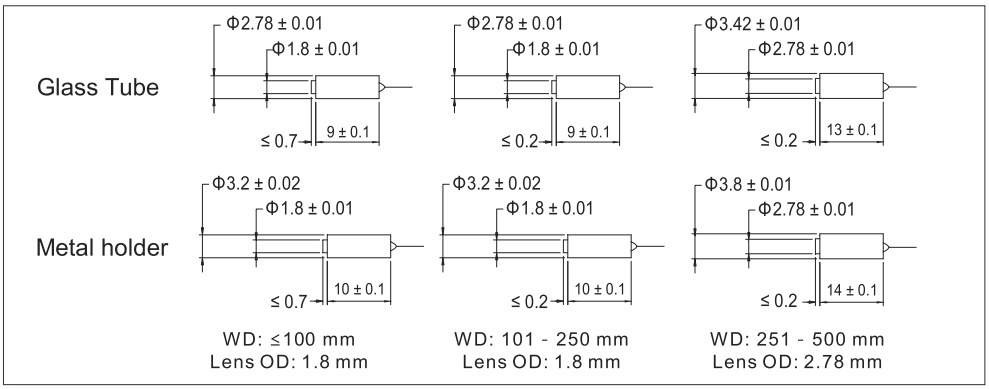
The fiber collimator is the basic element for in-line fiber optics components, such as isolator and DWDM. It has low insertion loss and high retrun loss. The unique processing and high quality AR coating also enable this collimator to handle high power.

Specifications

Parameter	Unit	Value			
Center Wavelength (λc)	nm	1310, 1480, 1550 or specify			
Operating Wavelength Range	nm	λc ± 30			
Working Distance	mm	5 - 50	51 - 100	101 - 250	251 - 500
Typ. Insertion Loss	dB	0.25	0.25	0.3	0.5
Max. Insertion Loss	dB	0.3	0.35	0.4	0.6
Beam Diameter ($1/e^2$)	mm	0.45 ± 0.05	0.45 ± 0.05	0.75 ± 0.05	0.95 ± 0.05
Min. Return Loss	dB	55			
Max. Optical Power (Continuous Wave)	W	0.3, 0.5, ..., 3			
Max. Tensile Load	N	5			
Fiber Type		SMF-28 fiber			
Operating Temperature	℃	-5 to +70			
Storage Temperature	℃	-40 to +85			

*IL is 0.3 dB higher and RL is 5 dB lower for each connector added. *Optical power is only 1 W only for connector added.

Package Dimensions



Ordering Information

C-①-②-③③-④-⑤-⑥-⑦-⑧-⑨-⑩

①: Lens Diameter
1 - 1.8 mm
3 - 2.78 mm

②: Pigtail Type
1 - Single fiber pigtail

③③: Wavelength
31 - 1310 nm
48 - 1480 nm
55 - 1550 nm

④: Holder Type
1 - Metal holder
2 - Glass tube

⑤: Working Distance
5 - 5.0 mm
S - Specify

⑥: Connector Type
1 - FC/UPC 4 - SC/APC
2 - FC/APC N - None
3 - SC/UPC S - Specify

⑦: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube

⑧: Fiber Length
1 - 1.0 m
S - Specify

⑨: Lens Type
C - C lens

1310/1550 nm Single Fiber Mini Collimator (C Series)

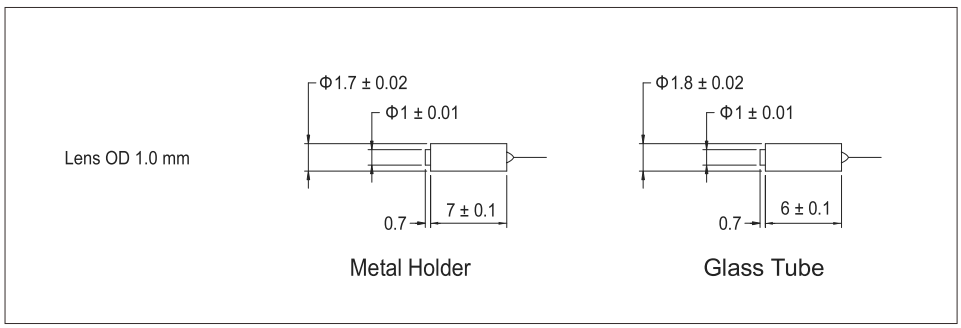
The fiber collimator is the basic element for in-line fiber optics components, such as isolator and DWDM. It has low insertion loss and high return loss. The unique processing and high quality AR coating also enable this collimator to handle high power.

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	1310, 1550 or specify
Operating Wavelength Range	nm	λc ± 30
Working Distance	mm	5
Typ. Insertion Loss	dB	0.20
Max. Insertion Loss	dB	0.25
Min. Return Loss	dB	60
Beam Diameter (1/e^2, for C-lens only)	mm	0.3 ± 0.05
Beam Diameter (1/e^2, for G-lens only)	mm	0.2 ± 0.02
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Fiber Type		SMF-28 fiber
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.3 dB higher for each connector added. RL is 10 dB lower for each UPC connector added, and RL is 5 dB lower for each APC connector added.
*Optical power is only 1W only for connector added.

Package Dimensions



Ordering Information

C-①-②-③③-④-⑤-⑥-⑦-⑧-⑨

①: Lens Diameter	②: Pigtail Type	③③: Wavelength	④: Holder Type	⑤: Working Distance
2 - 1.0 mm	1 - Single fiber pigtail	31 - 1310 nm	1 - Metal holder	5 - 5.0 mm
		55 - 1550 nm	2 - Glass tube	S - Specify
		SS - Specify		

⑥: Connector Type		⑦: Fiber Jacket	⑧: Fiber Length	⑨: Lens Type
1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber	1 - 1.0 m	G - Grin lens
2 - FC/APC	N - None	L - 900 μm loose tube	S - Specify	C - C lens
3 - SC/UPC				

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1060/1550 nm Variable Optical Delay Line (VDL Series)

Variable Optical Delay Line provides precision optical path variation of more than 15 cm (500 ps). The compact, rugged design makes the device ideal for integration in network equipment, test instruments, and optical for integration in network equipment, test instruments, and optical coherence tomography (OCT) systems for precision optical path length or timing alignment.

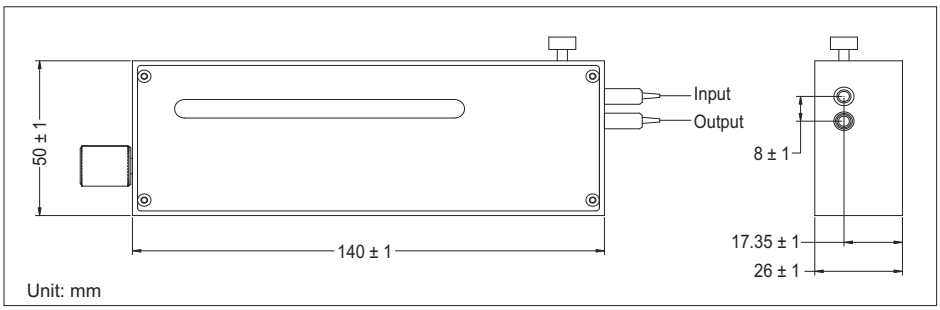
Specifications

Parameter	Unit	Values
Center Wavelength (λc)	nm	1060 or 1550
Operation Wavelength	nm	λc ± 50
Optical Delay Range	ps	0 - 500 ps continuous
Zero Point Delay Offset[1]	ps	- 440
Readout Scale Resolution	mm	1.0
Max. Insertion Loss	dB	1.2
Max. Insertion Loss Variation	dB	0.5
Max. PDL (for Singlemode model)	dB	0.1
Min. Extinction Ratio (for PM model)	dB	20
Min. Return Loss	dB	50
Max. Optical Power Handling (Continuous Wave)	mW	300
Operating Temperature	°C	0 to + 40
Storage Temperature	°C	-40 to + 60
Fiber Type		Singlemode or PM Panda fiber

*IL is 0.5 dB higher, RL is 5 dB lower and ER is 2 dB lower for each connector added, measured at center wavelength

[1] Absolute delay at 0 ps setting measured to the edge of the enclosure (excluding caps, boots, and pigtails).

Package Dimensions



Ordering Information

VDL-①①①①-②②②-③-④-⑤-⑥-⑦

①①①①: Wavelength
1060 - 1060 nm
1550 - 1550 nm
SSSS - Specify

②②②: Delay Range
500 - 500 ps
SSS - Specify

③: Attenuator
A - Attenuator
N - None

④: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

⑤: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
3 - 3 mm cable
S - Specify

⑥: Fiber Length
1 - 1.0 m
S - Specify

⑦: Fiber Type
S - Singlemode fiber
P - PM fiber

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1060/1550 nm Motorized Variable Optical Delay Line (MDL Series)

Motorized Variable Optical Delay Line provides precision optical path length adjustment of up to 500 ps. Driven by a stepping motor. The MDL has a delay resolution about 10 um (34 fs). In addition, its advanced motion design guarantees longevity for long-term continuous operation. Low insertion loss and high reliability make this device ideal for integration in optical coherence tomography (OCT) systems, network equipment and test instruments for precision optical path length control or timing alignment.

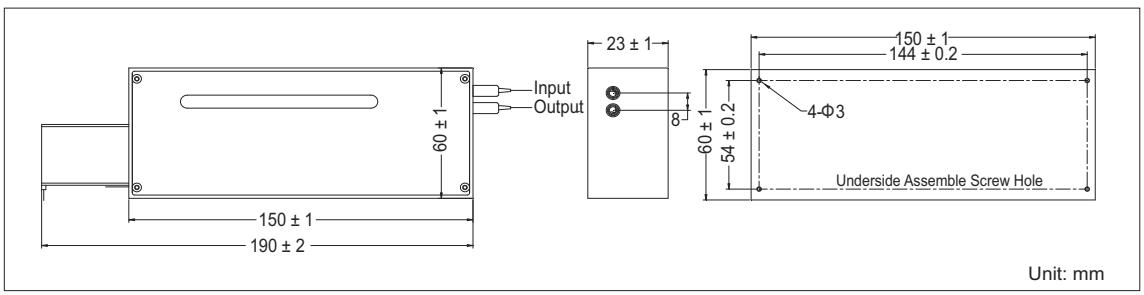
Specifications

Parameter	Unit	Values
Center Wavelength (λc)	nm	1060 or 1550
Operation Wavelength	nm	λc ± 40
Optical Delay Range	ps	0 - 500 ps continuous
Zero Point Delay Offset[1]	ps	- 440
Optical Delay Resolution		10 μm or 34 fs per encoder count
Max. Insertion Loss	dB	1.2
Max. Insertion Loss Variation	dB	0.5
Max. PDL (for singlemode model)	dB	0.1
Min. Extinction Ratio (for PM model)	dB	18
Min. Return Loss	dB	50
Max. Optical Power (Continuous Wave)	mW	300
Electrical Interface		2 - phase stepper motor drive signal
		2 sensor connections
Operating Temperature	°C	0 to +40
Storage Temperature	°C	-20 to +60

*IL is 0.5 dB higher, RL is 5 dB lower and ER is 2 dB lower for each connector added, measured at center wavelength

[1] Absolute delay at 0 ps setting measured to the edge of the enclosure (excluding caps, boots, and pigtails).

Package Dimensions



Ordering Information

MDL -①①-②②②-③-④-⑤-⑥

①①: Wavelength
06 - 1060 nm
55 - 1550 nm
SS - Specify

②②②: Delay Range
500 - 500 ps
SSS - Specify

③: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

④: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
3 - 3 mm cable
S - Specify

⑤: Fiber Length
1 - 1.0 m
S - Specify

⑥: Fiber Type
M - Singlemode fiber
P - PM fiber

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Mini Manual Variable Attenuator (1310/1480/1550 nm, 1310 & 1550 nm) (MVOA Series)

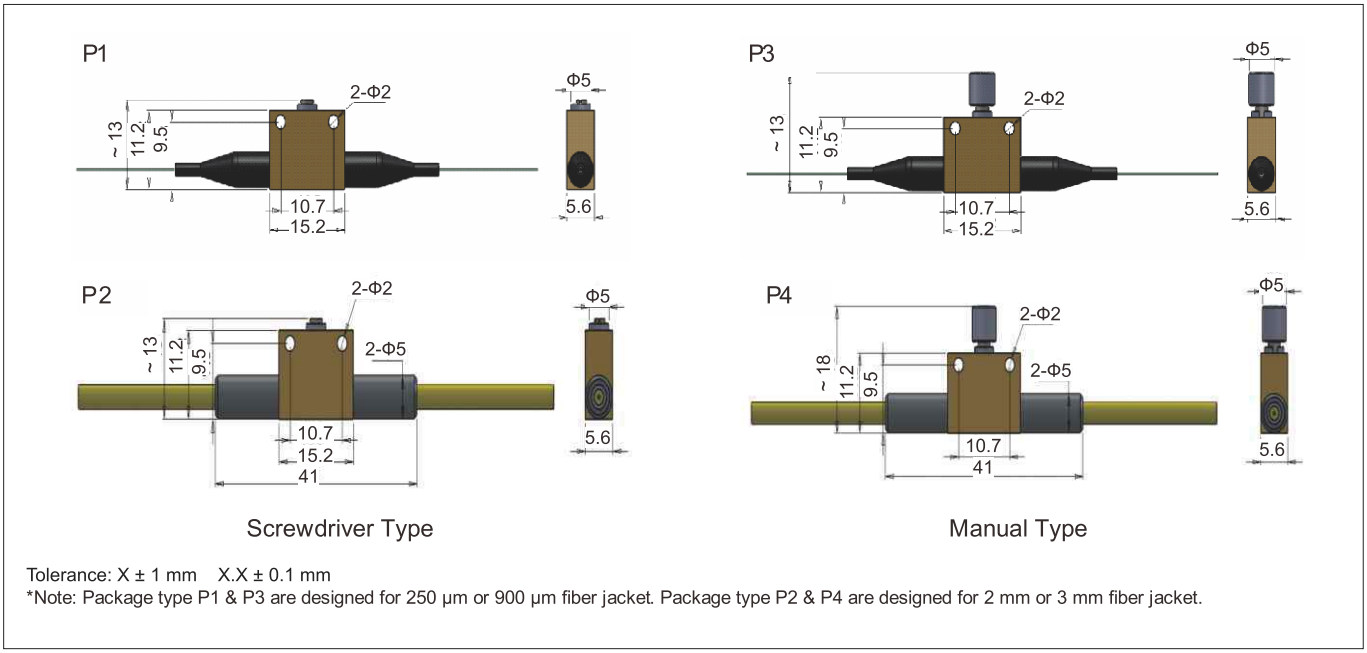
Mini Type Manual variable Attenuator (MVOA) operates by manually moving a shading element into optical beam. The shading element can be integrating adjusted to get any attenuation value in a range. MVOA features low insertion loss, good resolution, high stability and good reliability. It applies for pre-emphasis attenuation, transmitter power control, in-line power equalization, and amplifier power control, etc.

Specifications

Parameter	Unit	Value
Operating Center Wavelength (λc)	nm	1310,1480,1550 or 1310&1550
Max. Excess Loss	dB	0.6
Max. WDL, 23 ℃, minimum attenuation	dB	0.3
Min. Attenuation Range	dB	30
Resolution within 10 dB Attenuation Range	dB	0.1
Min. Extinction Ratio (for PM fiber type)	dB	20
Max. PDL (for SM fiber type), 23 ℃, λc, min attenuation	dB	0.05
Max. TDL at attenuation range, λc[1]	dB/℃	0.01
Min. Return Loss (for SM or PM fiber)	dB	55
Min. Return Loss (for MM fiber)	dB	25
Max. Optical Power (Continuous Wave)	mW	300
Operating Temperature	℃	0 to +70
Storage Temperature	℃	-40 to + 85

[1] TDL is exempted when attenuation value over 30 dB.
*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added.
*PM 1310 fiber for 1310 nm and 3155 nm, PM 1550 fiber for 1480 nm and 1550 nm.

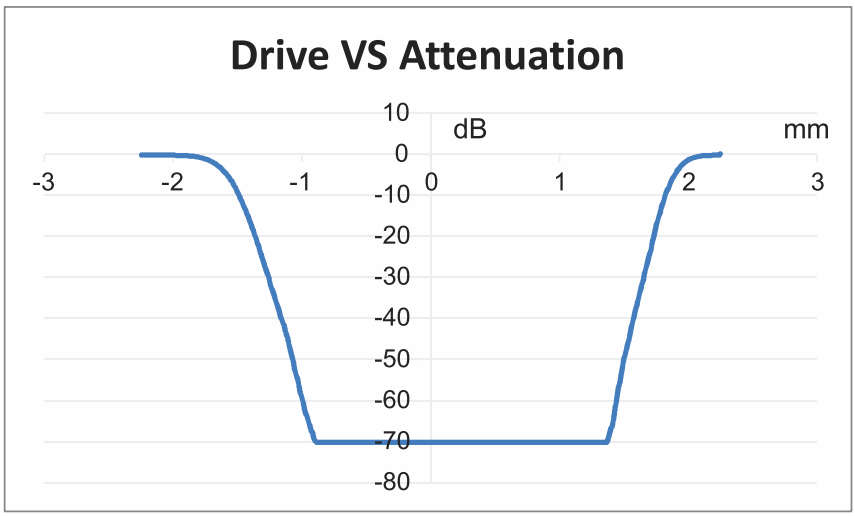
Package Dimensions



Screwdriver Type　　Manual Type

Tolerance: X ± 1 mm　X.X ± 0.1 mm
*Note: Package type P1 & P3 are designed for 250 μm or 900 μm fiber jacket. Package type P2 & P4 are designed for 2 mm or 3 mm fiber jacket.

Attenuation Curve



Ordering Information

MVOA-①①①①-②-③-④-⑤-⑥

①①①①: Wavelength
1310 - 1260 - 1360 nm
1480 - 1450 - 1510 nm
1550 - 1510 - 1610 nm
3155 - 1260 - 1360 & 1510 - 1610 nm
SSSS - Specify

②: Fiber Type
F - SMF-28 fiber
P3 - PM 1310 fiber
P5 - PM 1550 fiber
M1 - 105/125 N.A. 0.22
M5 - 50/125
M6 - 62.5/125
S - Specify

③: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None

④: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
2 - 2 mm cable
3 - 3 mm cable

⑤: Fiber Length
Q - 0.75 m
1 - 1.0 m
S - Specify

⑥: Package Type
P1 - turn with screwdriver
P2 - turn with screwdriver
P3 - turn with manual
P4 - turn with manual

Mini Manual Variable Attenuator (780/850nm, 980/1064 nm) (MVOA Series)

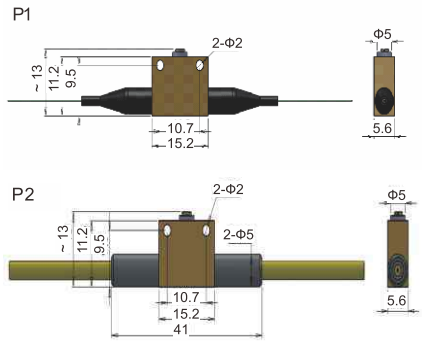
Mini Type Manual variable Attenuator (MVOA) operates by manually moving a shading element into optical beam. The shading element can be integrating adjusted to get any attenuation value in a range. MVOA features low insertion loss, good resolution, high stability and good reliability. It applies for pre-emphasis attenuation, transmitter power control, in-line power equalization, and amplifier power control, etc.

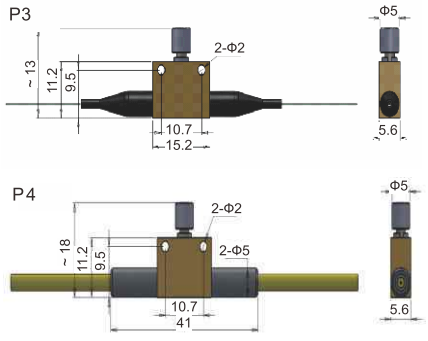
Specifications

Parameter	Unit	Value	
Center Wavelength (λc)	nm	780 or 850	980 or 1064
Operating Wavelength Range	nm	± 10	± 20
Max. Excess Loss	dB	1.0	0.6
Max. WDL, 23 ℃, minimum attenuation	dB	0.3	
Min. Attenuation Range	dB	30	
Resolution within 10dB Attenuation Range	dB	0.1	
Min. Extinction Ratio (for PM fiber type)	dB	20	
Max. PDL (for SM fiber type), 23 ℃, λc, minimum attenuation	dB	0.05	
Max. TDL at attenuation range, λc *	dB/℃	0.01	
Min. Return Loss (for SM or PM fiber)	dB	50	
Min. Return Loss (for MM fiber)	dB	25	
Max. Optical Power (Continuous Wave)	mW	300	
Operating Temperature	℃	0 to 70	
Storage Temperature	℃	-40 to + 85	

*IL is 0.5 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. *TDL is exempted when attenuation value over 30dB.

Package Dimensions





Screwdriver Type Manual Type

Tolerance: X ± 1mm X.X ± 0.1mm

*Note: Package type P1 & P3 is designed for 250 um or 900 um fiber jacket.Package type P2 & P4 is designed for 2 mm or 3 mm fiber jacket.

Ordering Information

MVOA-①①①①-②-③-④-⑤-⑥

①①①①: Wavelength	②: Fiber Type	③: Connector Type	④: Fiber Jacket	⑤: Fiber Length
780 - 780 ± 10 nm	H - HI fiber	1 - FC/UPC	B - 250 μm bare fiber	Q - 0.75 m
850 - 850 ± 10 nm	P - Panda fiber	2 - FC/APC	L - 900 μm loose tube	1 - 1.0 m
980 - 980 ± 20 nm	M1 - 105/125（NA 0.22)	3 - SC/UPC	C - 3 mm cable	S - Specify
1064 - 1064 ± 20 nm	M5 - 50/125	4 - SC/APC	2 - 2 mm cable	
S - Specify	M6 - 62.5/125	N - None		
	S - Specify			

⑥: Package type

P1 - turn with screwdriver P2 - turn with screwdriver P3 - turn with manual P4 - turn with manual

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1310/1480/1550 nm Faraday Mirror (FM Series)

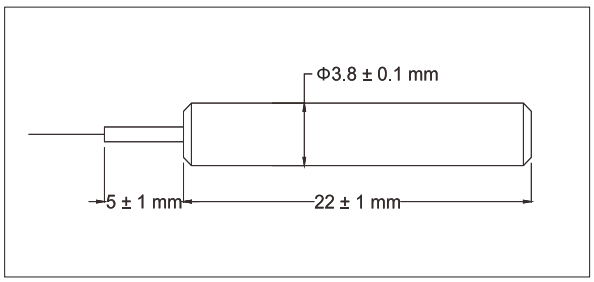
The Faraday Mirror is a passive device that provides 90 degree rotation regarding to the polarization state of the input light. The FM offers excellent performance including the lowest possible insertion loss and enviromental stability. It is used in EDFAs, fiber lasers and fiber instruments to mininize the polarization effect.

Specifications

Parameter	Unit	Value
Center Wavelength	nm	1310, 1480 or 1550
Operating Wavelength Range	nm	± 15
Typ. Insertion Loss	dB	0.4
Max. Insertion Loss	dB	0.6
Faraday Rotation Angle (Single Pass)	degree	45
Max. Rotation Angle Tolerance, λc, 23℃	degree	± 1
Max. PDL	dB	0.1
Fiber Type		SMF-28 fiber
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.5dB higher and RL is 5dB lower for each of connector added.

Package Dimensions



Ordering Information

FM-①①-②-③-④

①①: Wavelength	②: Connector Type		③: Fiber Jacket	④: Fiber Length
31 - 1310 nm	1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber	1 - 1.0 m
48 - 1480 nm	2 - FC/APC	N - None	L - 900 μm loose tube	S - Specify
55 - 1550 nm	3 - SC/UPC	S - Specify	S - Specify	
SS - Specify				

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1310/1480/1550 nm PM Faraday Mirror (PMFM Series)

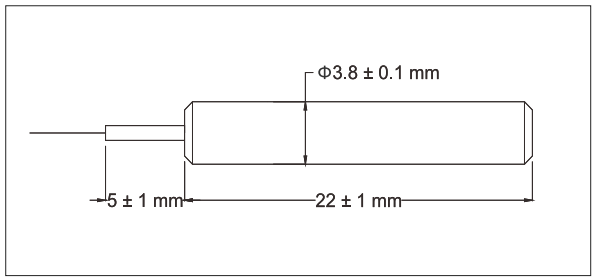
The Polarization Maintaining Faraday Mirror is a passive device that provides 90 degree rotation regarding to the polarization state of the input light. The PMFM offers excellent performance including the lowest possible insertion loss and enviromental stability. It is used in amplifiers, fiber lasers and fiber instruments to minimize the polarization effect.

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	1310, 1480 or 1550
Operating Wavelength Range	nm	λc ± 15
Typ. Insertion Loss	dB	0.4
Max. Insertion Loss	dB	0.6
Faraday Rotation Angle (single pass)	degree	45
Max. Rotation Angle Tolerance, λc, 23℃	degree	± 1
Min. Extinction Ratio	dB	20
Fiber Type		PM Panda fiber
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

PMFM-①①-②-③-④

①①: Wavelength	②: Connector Type	③: Fiber Jacket	④: Fiber Length
31 - 1310 nm	1 - FC/UPC	B - 250 μm bare fiber	Q - 0.75 m
48 - 1480 nm	2 - FC/APC	L - 900 μm loose tube	S - Specify
55 - 1550 nm	3 - SC/UPC	S - Specify	
SS - Specify	4 - SC/APC		
	N - None		

1310/1480/1550 nm In-Line Faraday Rotator (ILF Series)

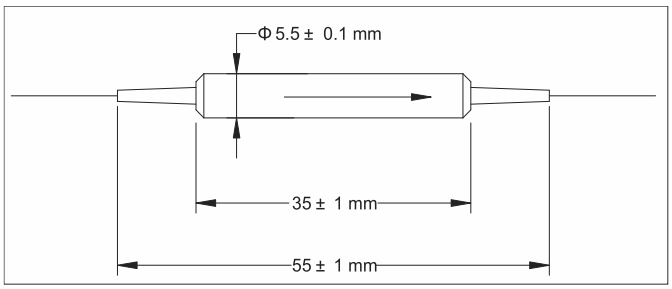
The In-Line Faraday Rotator is designed to rotate the polarization of the input light by 45 degrees. It performs low insertion loss, high extinction ratio, high return loss and excellent environmental stability. It is used in sensors, amplifiers and lasers, etc.

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	1310, 1480 or 1550
Operating Wavelength Range	nm	λc ± 15
Typ. Insertion Loss	dB	0.3
Max. Insertion Loss	dB	0.5
Rotation Angle, λc, 23 ℃	degree	45 ± 1
Min. Extinction Ratio (slow axis of input port is aligned to slow axis of output port, for PM/PM type, at 23 ℃)	dB	20
Min. Extinction Ratio (slow axis of output port is aligned to fast axis of input port, for PM/PM type, at 23 ℃)	dB	20
Min. Return Loss	dB	50
Max. Optical Power (Continuous Wave)	mW	500
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added.
*Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

ILF-①①-②-③-④-⑤

①①: Wavelength
31 - 1310 nm
48 - 1480 nm
55 - 1550 nm
SS - Specify

②: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None

③: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube

④: Fiber Type (Input/Output)
1 - PM/PM
2 - SMF/SMF
S - Specify

⑤: Fiber Length
Q - 0.75 m
S - Specify

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1310/1480/1550 nm 5 W Faraday Mirror (FM Series)

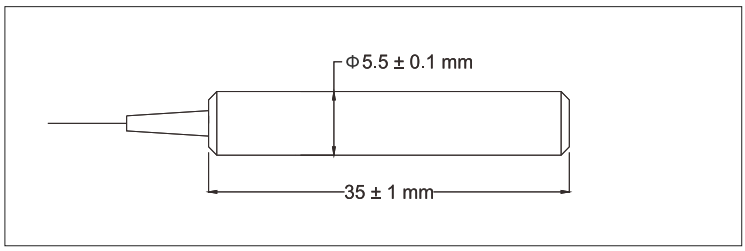
The Faraday Mirror is a passive device that provides 90 degree rotation regarding to the polarization state of the input light. The FM offers excellent performance including the lowest possible insertion loss and enviromental stability. It is used in EDFAs, fiber lasers and fiber instruments to mininize the polarization effect.

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	1310, 1480 or 1550
Operating Wavelength Range	nm	λc ± 15
Typ. Insertion Loss	dB	0.5
Max. Insertion Loss	dB	0.7
Faraday Rotation Angle (single pass)	degree	45
Max. Rotation Angle Tolerance, λc, 23 ℃	degree	± 1
Max. Polarization Dependent Loss	dB	0.05
Fiber Type		SMF-28
Max. Optical Power (Continuous Wave)	W	5
Max. Tensile Load	N	5
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.5 dB higher and RL is 5 dB lower for each connector added. *The optical power is 1 W only for connector add.

Package Dimensions



Ordering Information

HFM -①①-②-③-④

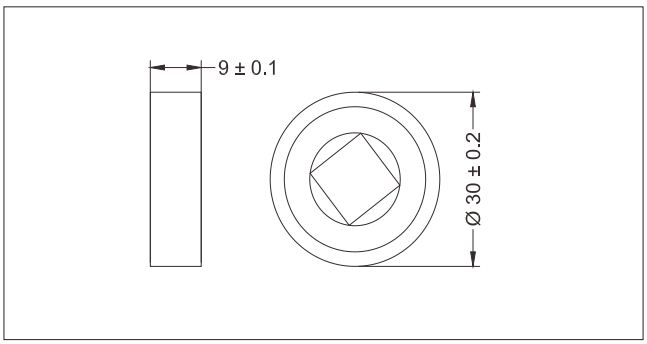
①①: Wavelength	②: Connector Type		③: Fiber Type	④: Fiber Length
31 - 1310 nm	1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber	1 - 1.0 m
48 - 1480 nm	2 - FC/APC	N - None	L - 900 μm loose tube	S - Specify
55 - 1550 nm	3 - SC/UPC	S - Specify	S - Specify	
SS - Specify				

1550 nm 30 W Faraday Rotator (HPFR Series)

Specifications

Parameter	Unit	Value
Operating Wavelength Range	nm	1550
Nominal Faraday Rotation angle	deg	45
Maximum Rotation angle tolerance, CWL, at 23°C	deg	± 1
Max. Insertion Loss, 1550nm, 23 ℃	dB	0.05
Clear Aperture	mm	9.0
Max. Average Optical Power	W	30
Max. Power Density for ns Pulse	MW/cm^2	200
Operating Temperature	℃	0 to +60
Storage Temperature	℃	-40 to +85

Package Dimensions



Ordering Information

HPFR-①①①①-②②

①①①①: Wavelength

1550 - 1550 nm

SSSS - Specify

②②: Clear Aperture

09 - dia 9.0 mm

SS - Specify

Patchcord (P Series)

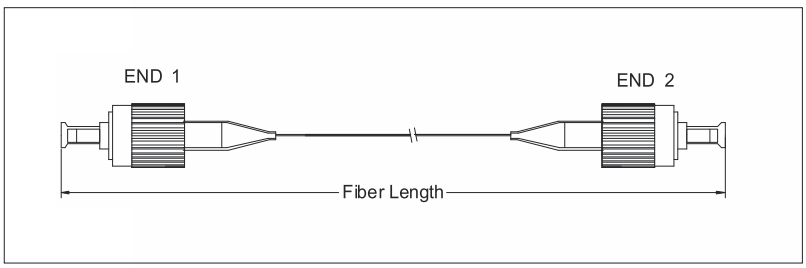
The singlemode patchcord series has excellent enviromental stability, high return loss, low Insertion loss and low polarization dependence. It is ideal for fiber lasers and test instrumentation applications.

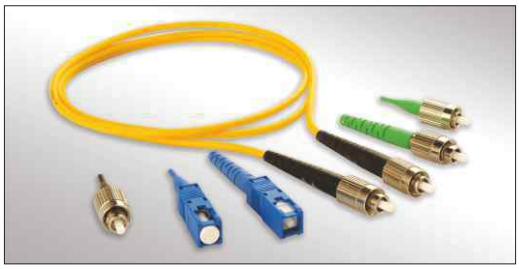
Specifications

Parameter	Unit	Value				
Wavelength	nm	488, 532, 635	780, 850	980, 1060	1310, 1480, 1550	1950, 2000
Typ. Insertion Loss	dB	1.0	0.5	0.4	0.3	0.3
Max. Insertion Loss	dB	1.5	0.7	0.6	0.5	0.5
Min. Return Loss	dB	50 (UPC) / 60 (APC)				
Max. Optical Power (Continuous Wave)	mW	300				
Fiber Length Tolerance	%	± 10 or specify				
Operating Temperature	℃	-5 to +70				
Storage Temperature	℃	-40 to +85				

* Key width for FC type is 2.02 mm.

Package Dimensions





Ordering Information

P-①①①①-②②-③③-④-⑤

①①①①: Wavelength

488 - 488 nm (Nufern 460-HP)
532 - 532 nm (Nufern 460-HP)
635 - 635 nm (Nufern 630-HP)
780 - 780 nm (Corning HI 780C)
850 - 850 nm (Corning HI 780C)
980 - 980 nm (Corning HI 1060)
1060 - 1060 nm (Corning HI 1060)
1310 - 1310 nm (Corning SMF-28)
1480 - 1480 nm (Corning SMF-28)
1550 - 1550 nm (Corning SMF-28)
2000 - 2000 nm (Nufern SM 1950)
SSSS - Specify

②② : Connector Type (End 1/End 2)

1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
5 - LC/UPC
6 - LC/APC
N - None
S - Specify

③: Fiber Jacket

B - 250 µm bare fiber
L - 900 µm loose tube
T - 900 µm tight buffer
2 - 2 mm cable
3 - 3 mm cable
S - Specify

④: Fiber Length

1 - 1.0 m
2 - 2.0 m
S - Specify

PM Patchcord (PMP Series)

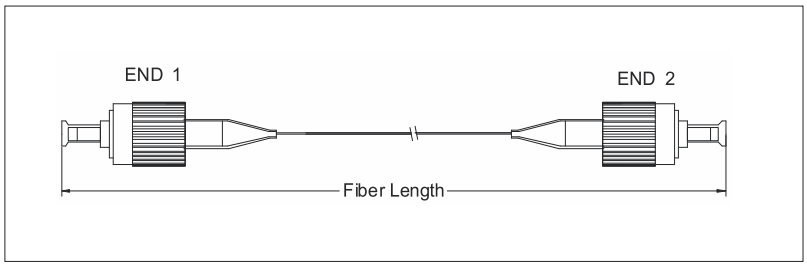
The PM Patchcord series has excellent enviromental stability, high return loss, low insertion loss. It is ideal for PM amplifiers, fiber lasers and test instrumentation applications.

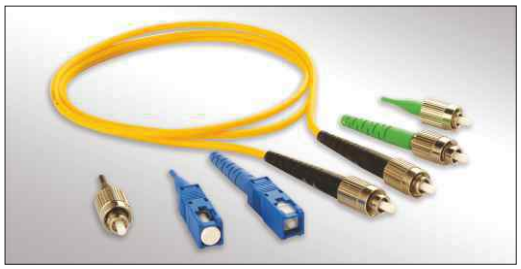
Specifications

Parameter	Unit	Value				
Wavelength	nm	488, 532, 635	780, 850	980, 1060	1310, 1480, 1550	1950, 2000
Typ. Insertion Loss	dB	1.0	0.5	0.4	0.3	0.3
Max. Insertion Loss	dB	1.5	0.7	0.6	0.5	0.5
Min. Extinction Ratio	dB	20		23		
Min. Return Loss	dB			50 (UPC) / 60 (APC)		
Max. Optical Power (Continuous Wave)	mW			300		
Fiber Length Tolerance	%			± 10 or specify		
Operating Temperature	℃			-5 to +70		
Storage Temperature	℃			-40 to +85		

* Key width for FC type is 2.02 mm. Slow axis is aligned to connector key.

Package Dimensions





Ordering Information

PMP-①①①①-②②-③-④

①①①①: Wavelength

488 - 488 nm (Nufern PM-S460-HP)
532 - 532 nm (Nufern PM-S460-HP)
635 - 635 nm (Nufern PM-S630-HP)
780 - 780 nm (Nufern PM780-HP)
850 - 850 nm (Corning PM 850)
980 - 980 nm (Corning PM 980)
1060 - 1060 nm (Corning PM 980)
1310 - 1310 nm (Corning PM 1310)
1480 - 1480 nm (Corning PM 1300)
1550 - 1550 nm (Corning PM 1550)
2000 - 2000 nm (Nufern PM 1950)
SSSS - Specify

②②: Connector Type (End 1/End 2)

1 - FC/UPC	5 - LC/UPC
2 - FC/APC	6 - LC/APC
3 - SC/UPC	N - None
4 - SC/APC	S - Specify

③: Fiber Jacket

B - 250 μm bare fiber
L - 900 μm loose tube
T - 900 μm tight buffer
2 - 2 mm cable
3 - 3 mm cable
S - Specify

④: Fiber Length

1 - 1.0 m
2 - 2.0 m
S - Specify

1310/1480/1550 nm In-Line Polarizer (ILP Series)

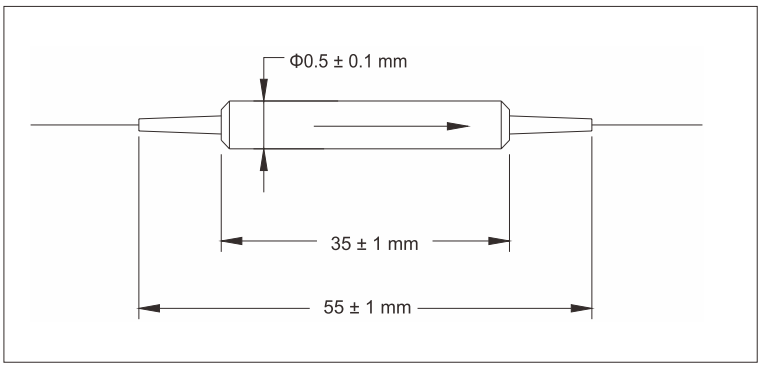
The In-Line Polarizer is designed to pass light with one specific polarization while blocking the other polarization. It can be used to convert unpolarized light into polarized light with high extinction ratio. It can also be used to enhances the extinction ratio of signals with its excellent polarization properties. It is ideal for high speed communication systems and test instrumentations where high polarization extinction ratio is required.

Specifications

Parameters	Unit	Values
Center Wavelength (λc)	nm	1310, 1480 or 1550
Operating Wavelength Range	nm	λc ± 50
Typ. Insertion Loss, 23 ℃	dB	0.3
Max. Insertion Loss	dB	0.5
Typ. Extinction Ratio, 23 ℃	dB	30
Min. Extinction Ratio, 23 ℃	dB	28
Max. Optical Power (Continuous Wave)	mW	300
Min. Return Loss	dB	50
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

ILP-①①-②-③-④-⑤

①①: Wavelength	②: Connector Type	③: Fiber Jacket	④: Fiber Type (Input/Output)	⑤: Fiber Length
31 - 1310 nm	1 - FC/UPC	B - 250 μm bare fiber	1 - PM/PM	Q - 0.75 m
48 - 1480 nm	2 - FC/APC	L - 900 μm loose tube	2 - SMF/PM	S - Specify
55 - 1550 nm	3 - SC/UPC	S - Specify	3 - SMF/SMF	
SS - Specify	4 - SC/APC			
	N - None			

1310/1480/1550 nm Polarization Beam Combiner/Splitter (PBC/PBS Series)

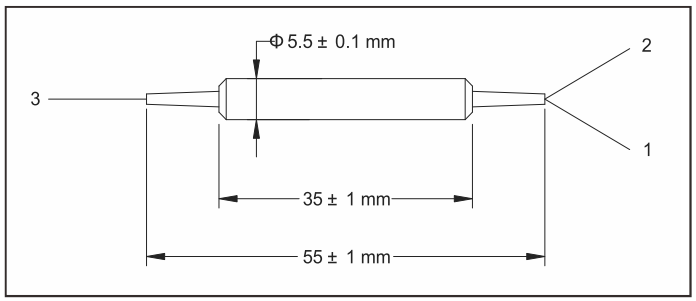
The Polarization Beam Combiner/Splitter is a compact high performance lightwave component that combines two orthogonal polarization signals into one output fiber. The most common application is to combine the light of two pump lasers into one single fiber to double the pump power in EDFA or Raman Amplifier. The device can also be used as a beam splitter.

Specifications

Parameter	Unit	Grade P	Grade A
Center Wavelength (λc)	nm	1310, 1480 or 1550	
Operating Wavelength Range	nm	λc ± 40	
Typ. Insertion Loss	dB	0.4	0.5
Max. Insertion Loss	dB	0.6	0.7
Min. Extinction Ratio (for Splitter Only)	dB	22	20
Min. Return Loss	dB	50	
Min. Directivity	dB	50	
Max. Optical Power (Continuous Wave)	mW	500	
Fiber Type		PM Panda fiber for Ports 1 & 2, SMF-28 or PM Panda fiber for Port 3	
Max. Tensile Load	N	5	
Operating Temperature	℃	-5 to +70	
Storage Temperature	℃	-40 to +85	

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

PBC -①①-②-③-④-⑤-⑥ **PBS-** ①①-②-③-④-⑤-⑥

①①: Wavelength
31 - 1310 nm
48 - 1480 nm
55 - 1550 nm
SS - Specify

②: Grade
P - Premium
A - A grade

③: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

④: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
S - Specify

⑤: Fiber Type for Port 3
1 - SMF-28 fiber
2 - Slow axis aligned 45° to Port 1
3 - Slow axis aligned to Port 1
S - Specify

⑥: Fiber Length
Q - 0.75 m
S - Specify

1310/1480/1550 nm 2 × 2 Polarization Beam Combiner/Splitter (DPBC/DPBS Series)

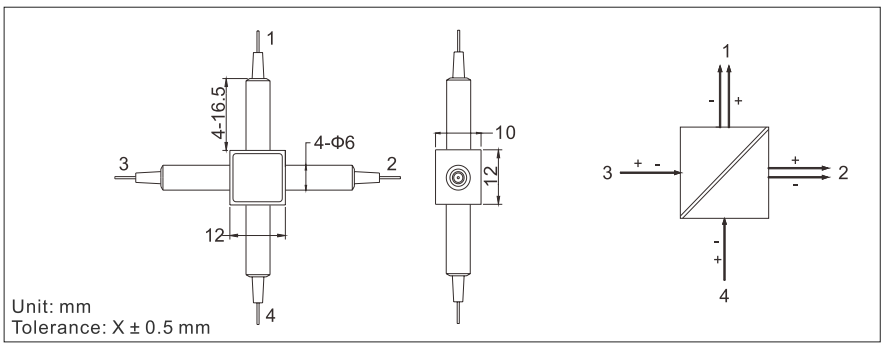
The Dual Polarization Beam Combiner/Splitter, 2 × 2 PBC/PBS, is a compact high performance lightwave component that combines or divides two orthogonal polarization signals into one or two output fibers. The most common applications are in polarization mode dispersion compensator, EDFA, Raman Amplifier, coherent telecommunication systems and fiber sensor. It is characterized with high extinction ratio and low insertion loss.

Specifications

Parameter	Unit	Grade P	Grade A
Center Wavelength (λc)	nm	1310, 1480 or 1550	
Operating Wavelength Range	nm	λc ± 40	
Typ. Insertion loss (Port 3 to Port 1 & 2, at slow axis, Port 4 to Port 1 & 2, at fast axis)	dB	0.8	1.0
Max. Insertion Loss (Port 3 to Port 1 & 2, at slow axis, Port 4 to Port 1 & 2, at fast axis)	dB	1.0	1.2
Min. Extinction Ratio (for splitter only)	dB	20	18
Min. Return Loss	dB	50	
Max. Optical Power (Continuous Wave)	mW	500	
Fiber Type		PM Panda fiber for Port 1 & 2, SMF-28 or PM Panda fiber for Port 3 & 4	
Max. Tensile Load	N	5	
Operating Temperature	℃	-5 to +70	
Storage Temperature	℃	-40 to +85	

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

DPBC-①①-②-③-④-⑤-⑥ **DPBS-①①-②-③-④-⑤-⑥**

①①: Wavelength
31 - 1310 nm
48 - 1480 nm
55 - 1550 nm
SS - Specify

②: Grade
P - Premium
A - A grade

③: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None

④: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
S - Specify

⑤: Fiber Type for Port 3 & 4
1 - SMF-28 (Standard)
2 - Slow axis aligned 45° to Port 1
3 - Slow axis aligned to Port 1
S - Specify

⑥: Fiber Length
Q - 0.75 m
S - Specify

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1310/1480/1550 nm Isolator Polarization Beam Combiner/Splitter (IPBC/IPBS Series)

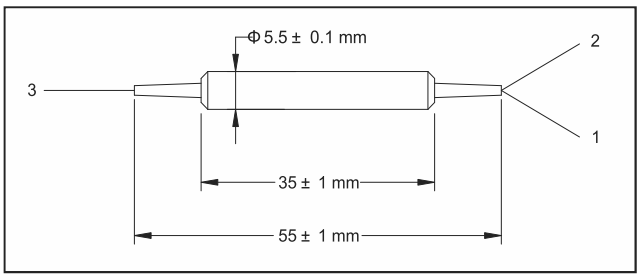
The Isolator Polarization Beam Combiner/Splitter is a compact device which provides both polarization beam combining and optical isolation in one integrated component. The most common application is to combine the light of two pump lasers into one single fiber to double the pump power in EDFA or Raman Amplifier. IPBC/IPBS has extremely low insertion loss, and it can improve the amplifier performance.

Specifications

Parameter	Unit	Single Stage	Dual Stage
Center Wavelength (λc)	nm	1310, 1480 or 1550	
Operating Wavelength Range	nm	λc ± 20	
Typ. Insertion loss	dB	0.45	0.55
Max. Insertion loss	dB	0.7	0.8
Min. Isolation	dB	20	42
Min. Extinction Ratio (for splitter only)	dB	20	20
Min. Return Loss	dB	50	
Min. Directivity	dB	50	
Max. Optical Power (Continuous Wave)	mW	500	
Fiber Type		PM Panda fiber for Ports 1 & 2, SMF-28 or PM Panda fiber for Port 3	
Max. Tensile Load	N	5	
Operating Temperature	℃	-5 to +70	
Storage Temperature	℃	-40 to +85	

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

IPBC-①-②②-③-④-⑤-⑥ **IPBS**-①-②②-③-④-⑤-⑥

①: Stage	②②: Wavelength	③: Connector Type		④: Fiber Jacket
1 - Single stage	31 - 1310 nm	1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber
2 - Dual stage	48 - 1480 nm	2 - FC/APC	N - None	L - 900 μm loose tube
	55 - 1550 nm	3 - SC/UPC	S - Specify	S - Specify
	SS - Specify			

⑤: Fiber Type for Port 3
1 - SMF-28 fiber
2 - Slow axis aligned 45° to Port 1
3 - Slow axis aligned to port 1
S - Specify

⑥: Fiber Length
Q - 0.75 m
S - Specify

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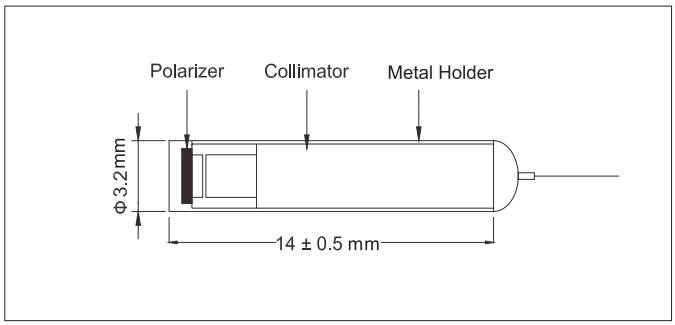
1550 nm PM Collimator Polarizer (PMCP Series)

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	1550
Operating Wavelength Range	nm	λc ± 30
Nominal Beam Diameter	mm	0.5
Max. Insertion Loss	dB	0.4
Min. Extinction Ratio	dB	25
Min. Return Loss	dB	55
Max. Optical Power (Continuous Wave)	mW	300
Fiber Type		PM 1550nm Panda Fiber
Panda Fiber Orientation		Slow Axis
Max. Tensile Load	N	5
Operating Temperature	℃	5 to +70
Storage Temperature	℃	-40 to +85

*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

PMCP-①①-②-③-④

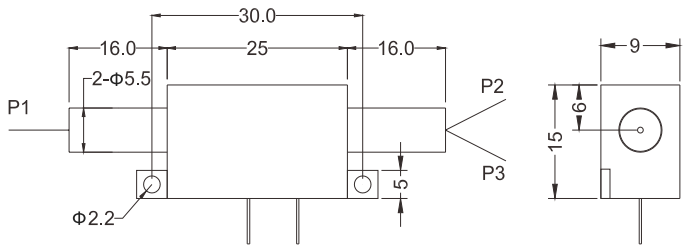
①①: Wavelength	②: Connector Type		③: Fiber Jacket	④: Fiber Length
55 - 1550 nm	1 - FC/UPC	4 - SC/APC	B - 250 μm bare fiber	1 - 0.75 m
	2 - FC/APC	N - None	L - 900 μm loose tube	S - Specify
	3 - SC/UPC			

1550 nm Variable Polarization Beam Splitter (VPBS Series)

Specifications

Optical Parameter	Unit	Value
Operating Wavelength Range	nm	1525 - 1565
Max. Excess Loss	dB	1.0
Initial Splitter Ratio	%	10% : 90%
Max. Splitter Ratio	%	90% : 10%
Min. Extinction Ratio for PM fiber output	dB	20
Max. Applied Voltage	V	-100
Min. Return Loss	dB	50
Max. Optical Power (Continuous Wave)	mW	500
Fiber Type Operating Temperature		PM Panda fiber
Operating Temperature	℃	PM Panda fiber -5 to +70
Storage Temperature	℃	-40 to +85

Dimensions



Unit: mm
Tolerance: X ± 0.5 mm X.X ± 0.1 mm
*Loose tube length: input side 75 cm and output side 25 cm.

Ordering Information

VPBS-①①-②-③-④-⑤⑤

①①: Wavelength	②: Connector	③: Fiber Jacket	④: Fiber Length	⑤⑤: Initial Splitting Ratio
55 -1550 nm	1 - FC/UPC	B - 250 μm bare fiber	Q - 0.75 m	10 - 10:90
SS - Specify	2 - FC/APC	L - 900 μm loose tube	S - Specify	20 - 20:80
	3 - SC/UPC	S - Specify		30 - 30:70
	4 - SC/APC			40 - 40:60
	N - None			50 - 50:50

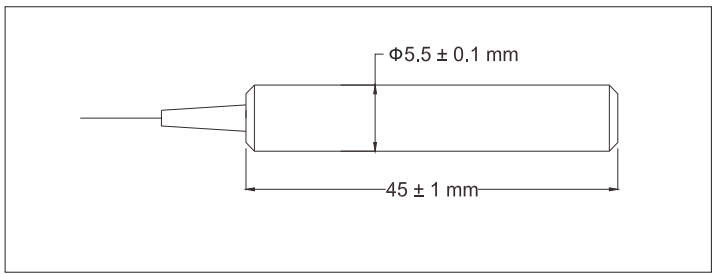
1550 nm PM SESAM for Pulse Application (PMFSESAM Series)

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	1550
Operating Wavelength Range	nm	λc ± 20
Typ. Excess Insertion Loss, λc, 23 ℃ (Input to Output)	dB	0.8
Max. Excess Insertion Loss (Input to Output)	dB	1.2
Min. Extinction Ratio (Input to Output)	dB	18
Beam Spot Size on SESAM Shiny Surface[1]	μm	18
Fiber Type		PM 1550 Panda fiber
Max. Average Optical Power	mW	20
Max. Peak Power for ns pulse	kW	3
Max. Tensile Load	N	5
Operating Temperature	℃	-5 to + 70
Storage Temperature	℃	-40 to + 85

[1] Beam spot on SAM surface can be vary per customer requirement. SESAM size: 1.3 × 1.3 mm provided by customer.
*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

PMFSESAM-①①-②-③-④-⑤⑤-⑥-P

①①: Wavelength
55 - 1550 nm
SS - Specify

②: Connector Type
1 - FC/UPC
2 - FC/APC
3 - SC/UPC
4 - SC/APC
N - None
S - Specify

③: Fiber Jacket
B - 250 μm bare fiber
L - 900 μm loose tube
S - Specify

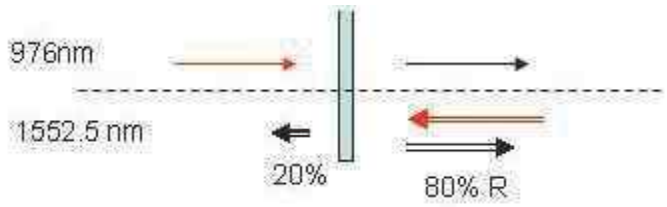
④: Fiber Length
Q - 0.75 m
S - Specify

⑤⑤: SESAM Type
12 - SAM-1550-12-2ps-1.3b-0
21 - SAM-1550-21-2ps-1.3b-0
22 - SAM-1550-22-5ps-1.3b-0
25 - SAM-1550-25-2ps-1.3b-0
33 - SAM-1550-33-2pc-1.3b-0
40 - SAM-1550-40-10ps-1.3b-0
SS - Specify

⑥: Working Axis
F - Fast axis blocked
B - Both axes working

1552.2 nm PM Partial Reflector (PMPR Series)

Function Description

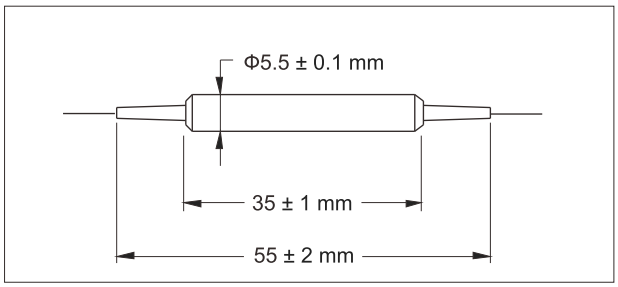


Specifications

Parameter	Unit	Value
Center Wavelength	nm	1552.5
1552.5 nm Reflection Insertion Loss	dB	1.6
1552.5 nm Transmission Insertion Loss	dB	8.0
976 nm Transmission Insertion Loss	dB	1.2
Min. Extinction Ratio for 1552.5 nm Signal	dB	20
Max. Optical Power (Continuous Wave)	mW	300
Max. Tensile Load	N	5
Fiber Type		PM 1550 Panda fiber
Operating Temperature	℃	10 to +50
Storage Temperature	℃	-40 to +85

*IL is fully depend on partail reflector performance, which is provided by customer.
*IL is 0.3 dB higher, RL is 5 dB lower, and ER is 2 dB lower for each connector added. Connector key is aligned to slow axis.

Package Dimensions



Ordering Information

PMPR-①①①①-②②-③-④-⑤

①①①①: Wavelength	②②: Reflectivity	③: Connector Type	④: Fiber Jacket	⑤: Fiber Length
1552 - 1552.5 nm	80 - 80%	1 - FC/UPC	B - 250 μm bare fiber	Q - 0.75 m
SSSS - Specify		2 - FC/APC	L - 900 μm loose tube	S - Specify
		3 - SC/UPC	S - Specify	
		4 - SC/APC		
		N - None		
		S - Specify		

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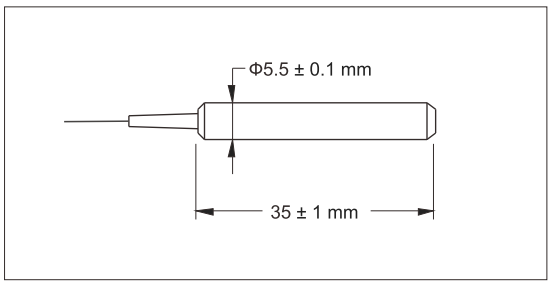
Learn More

1550 nm PM Optical Fiber Saturable Absorber Mirror (PMOFSAM Series)

Specifications

Parameter	Unit	Value
Center Wavelength (λc)	nm	1550
Operating Wavelength Range	nm	λc ± 50
Typ.Excess Insertion Loss	dB	0.4
Max. Excess Insertion Loss	dB	0.7
Min. Extinction Ratio	dB	20
Fiber Type		PM 1550 fiber
Max. Optical Power (Average Power)	mW	300
Max. Peak Power for ns pulse	kW	1
Max. Tensile Load	N	5
Operating Temperature	℃	-5 to +70
Storage Temperature	℃	-40 to +85
The SAM is provided by customer.		

Package Dimensions



Ordering Information

PMOFSAM-①①-②-③-④

①①: Wavelength	②: Connector Type	③: Fiber Type	④: Fiber Length
55 - 1550 nm	N - None	B - 250 μm bare fiber	1 - 1.0 m
SS - Specify		L - 900 μm loose tube	S - Specify
		S - Specify	

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