



Micro-Optic PM Components

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1x2 & 2x2 Polarisation Maintaining (PM) Coupler

PMC-1x2 / PMC-2x2

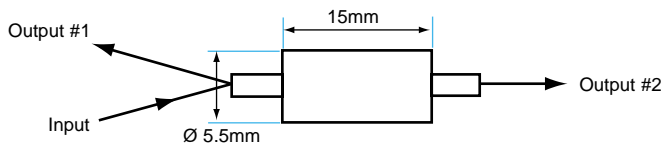
- Wavelength flat operation
- Low insertion loss
- High polarisation extinction ratio
- High uniformity
- High return loss
- High stability and reliability
- Compact inline package, 5.5mm OD

Applications:

- EDFA
- Communications
- CATV
- Instrumentation
- Sensor systems
- Multiple channel splitting

The polarisation maintaining (PM) coupler is a compact low loss micro-optic filter type inline PM coupler (1x2) which provides PM optical signal splitting (various splitting ratios available) over a wide bandwidth while preserving the polarisation with high extinction ratio. It can also be provided with a PM isolator integrated in the same package.

The 2x2 polarisation maintaining (PM) coupler is a low loss micro-optic filter type coupler (2x2) which provides PM optical signal coupling/splitting over a wide bandwidth while preserving the polarisation with high extinction ratio in a rugged package. It utilises advanced micro-optic filter technology to achieve high polarisation maintaining coupler performance.



Ordering Information - 1x2

| Wavelength | | Split Ratio | | PM Fibre | | Fibre Length | | Connectors | | | | |
|------------|----|-------------|----|----------|----|--------------|-------|------------|----|--------|----|----|
| 1550 | =1 | 50/50 | =1 | Bowtie | =1 | =1 | 1m | =1 | =1 | None | =0 | =0 |
| 1310 | =2 | Other | =2 | Panda | =2 | =2 | Other | =2 | =2 | FC/PC | =1 | =1 |
| Other | =3 | | | Other | =3 | =3 | | | | FC/APC | =2 | =2 |
| | | | | | | | | | | Other | =3 | =3 |

Ordering Information - 2x2

| Wavelength | | Configuration | | PM Fibre | | Length | | Cable | | Connectors | | |
|------------|----|---------------|----|----------|----|--------|----|-------|----|------------|----|----|
| 1550 | =1 | 2x2 | =2 | Bowtie | =1 | 1m | =1 | None | =0 | None | =0 | =0 |
| Other | =2 | | | Panda | =2 | Other | =2 | 3mm | =1 | FC/PC | =1 | =1 |
| | | | | Other | =3 | | | 900mm | =2 | FC/APC | =2 | =2 |
| | | | | | | | | Other | =3 | Other | =3 | =3 |

| Specifications | 1x2 | 2x2 |
|--|--|---|
| Split Configuration | - | 2x2 |
| Wavelength | 532, 680, 830, 980, 1060, 1125, 1310, 1480, 1550, 1620nm (± 20nm) * | 532, 680, 830, 980, 1060, 1125, 1310, 1480, 1550, 1620nm (± 20nm) * |
| Split Ratio | Standard: 50/50, 30/70, 20/80, 10/90, 5/95, 2/98, 1/99 (any split ratio from 0.1/99.9 to 50/50 is available) | - |
| Excess Loss (excluding splitting) | ≤0.8dB (typical <0.5dB) | ≤1.5dB max. (typical <1dB) |
| Insertion Loss (maximum) | - | ≤4.5dB (typ <4dB) |
| Directivity | - | ≥50dB |
| Split Uniformity | ≤0.5dB (typical <0.3dB) | ≤0.5dB |
| Polarisation Extinction Ratio (w/o connectors) | ≥20dB (typical >25dB) | ≥20dB |
| Return Loss | ≥50dB | ≥50dB |
| Optical Power | 300mW | 300mW |
| Fibre | PM fibre, all ports | PM fibre on all ports (Panda, Bowtie, etc.) |
| Operating Temperature | 0 to 70°C | 0 to 70°C |
| Storage Temperature | -40 to 85°C | -40 to 85°C |
| Package | Compact inline package, 5.5mm OD | Rugged package, H=20mm, W=55mm, L=120mm |

* Other wavelengths available

1xN Polarisation Maintaining Coupler

PMC-1xN

- Wavelength flat operation
- Low insertion loss
- High polarisation extinction ratio
- High uniformity
- High return loss
- High stability and reliability
- Rugged package

Applications:

- EDFA
- Communications
- CATV
- Instrumentation
- Sensor systems
- Multiple channel splitting

The 1xN polarisation maintaining (PM) coupler is a low loss micro-optic filter type coupler (1xN) which provides PM optical signal combining or splitting over a wide bandwidth while preserving the polarisation with high extinction ratio in a rugged package. It utilises advanced micro-optic filter technology to achieve high polarisation maintaining coupler performance.

Ordering Information

| Wavelength | | Config. | | PM Fibre | | Length | | Cable | | Connectors | | |
|------------|----|---------|-----|----------|----|--------|----|-------|----|------------|----|----|
| 1550 | =1 | 1x2 | =2 | Bowtie | =1 | 1m | =1 | None | =0 | None | =0 | =0 |
| 1310 | =2 | 1x4 | =4 | Panda | =2 | Other | =2 | 3mm | =1 | FC/PC | =1 | =1 |
| Other | =3 | 1x8 | =8 | Other | =3 | | | 900mm | =2 | FC/APC | =2 | =2 |
| | | Other | =xx | | | | | Other | =3 | Other | =3 | =3 |

| Specifications | 1x2 | 1x4 | 1x8 |
|---------------------------------|---|-------------------------|-------------------------|
| Split Configuration | - | - | - |
| Wavelength | 532, 680, 830, 980, 1060, 1125, 1310, 1480, 1550, 1620nm (± 20nm) | | |
| Excess Loss (maximum) | ≤0.8dB | ≤2.0dB | ≤2.0dB |
| Excess Loss (typical) | <0.5dB | <1.0dB | <1.5dB |
| Insertion Loss (maximum) | ≤3.8dB | ≤8.0dB | ≤11.0dB |
| Insertion Loss (typical) | <3.5 dB | <7.0dB | <10.5dB |
| Uniformity | ≤0.6dB | ≤0.8dB | ≤1.0dB |
| Polarisation Extinction Ratio** | ≥20dB | ≥20dB | ≥20dB |
| Return Loss | ≥50dB | ≥50dB | ≥50dB |
| Directivity | ≥50dB | ≥50dB | ≥50dB |
| Optical Power | | 300mW | |
| Operating Temperature | | 0 to 70°C | |
| Storage Temperature | | -40 to 85°C | |
| Fibre Type | PM fibre on all ports (Panda, Bowtie, etc.) | | |
| Size | Inline | H=20mm, W=55mm, L=120mm | H=24mm, W=80mm, L=120mm |

* Other wavelengths available ** Higher extinction ratio available upon request

Polarisation Maintaining Tap Coupler

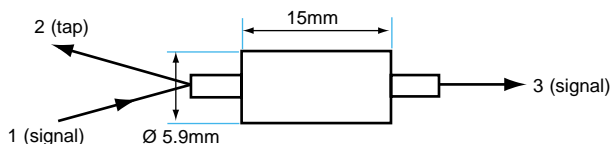
PMTAP

- *Wavelength flat operation*
- *Low insertion loss*
- *High polarisation extinction ratio*
- *High return loss*
- *High stability and reliability*
- *Compact inline package, 5.5mm OD*

Applications:

- *EDFA*
- *Communications*
- *CATV*
- *Instrumentation*
- *Sensor systems*

The polarisation maintaining (PM) tap coupler is a compact low loss micro-optic filter type inline coupler (1x2) which provides a signal tap for monitoring over a wide bandwidth while preserving the transmitted polarisation with high extinction ratio. It utilises advanced filter technology to yield high extinction ratio, low insertion loss, wide bandwidth and high return loss in a compact package. The tap coupler can be provided with a wide range of tap ratios. It can also be provided with a PM isolator integrated in the same package.



Ordering Information

PMTAP

I O Tap

| Wavelength | Grade | Tap | Signal Fibre | Tap Fibre | Connectors |
|------------|------------|--------|--------------|-----------|-----------------|
| 1550 | Premium =P | 10% =1 | Bowtie =1 | SMF28 =1 | None =0 =0 =0 |
| 1310 | Grade A =A | 5% =2 | Panda =2 | Other =2 | FC/PC =1 =1 =1 |
| Other | | 1% =4 | Other =3 | | FC/APC =2 =2 =2 |
| | | | Other =5 | | Other =3 =3 =3 |

Specifications

| | Premium Grade | A Grade |
|-----------------------------------|---|---------------------------------|
| Signal Wavelength | 830, 980, 1060, 1125, 1310, 1480, 1550, 1620nm (± 20 nm)* | |
| Tap Ratio | Any split ratio from 0.1/99.9 to 50/50 | |
| Excess Loss (excluding splitting) | ≤ 0.7 dB (0.5dB Typ) | ≤ 0.9 dB (<0.7dB Typ) |
| Polarisation Extinction Ratio | ≥ 20 dB (typ ≥ 25 dB) | ≥ 20 dB (typ ≥ 22 dB) |
| Return Loss | ≥ 55 dB | ≥ 50 dB |
| Optical Power | 300mW | |
| Fibre | PM fibre input and output (customer may specify type), SMF28 (250m) on tap port | |
| Operating Temperature | 0 to 70°C | |
| Storage Temperature | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

* Other wavelengths available

Polarisation Maintaining (Single Polarisation) Fibre Isolator - Single Stage

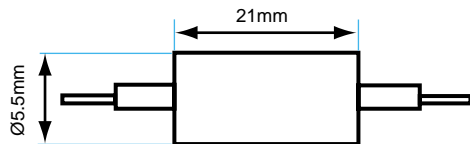
SPFI-SS

- High isolation
- Very low loss
- Very high thermal stability
- High extinction
- High return loss
- Compact inline package, 5.5mm OD

Applications:

- EDFA (PM)
- CATV fibre optic systems
- External modulator transmitters
- Fibre lasers
- Fibre gyros

The polarisation maintaining (single polarisation) fibre isolator eliminates back reflection and back scattering of optical signals in the transmitted polarisation and maintains the polarisation of the input light at high extinction. This single stage (SS) isolator features high isolation, very low insertion loss, high extinction ratio, high return loss, and very high thermal stability in a compact design.



Ordering Information

| SPFI-SS | | I O | | I O | | I O | |
|------------|------------|-----------|-------|--------------|-------|------------|-------|
| Wavelength | Grade | PM Fibre | | Fibre Length | | Connectors | |
| 1550 | =1 Premium | =P Bowtie | =1 =1 | 1m | =1 =1 | None | =0 =0 |
| 1310 | =2 Grade A | =A Panda | =2 =2 | Other | =2 =2 | FC/PC | =1 =1 |
| Other | =3 | Other | =3 =3 | | | FC/APC | =2 =2 |
| | | | | | | Other | =3 =3 |

Specifications

| | | Premium | A Grade |
|--|------|----------------------------------|----------------------|
| Centre Wavelength (λ_c) | | 1310, 1480, 1550nm | |
| Peak Isolation (λ_c , 23°C) | Typ. | ³ 45dB | ³ 40dB |
| Isolation (λ_c , 23°C) | Min. | ³ 38dB | ³ 37dB |
| Minimum Isolation ($\lambda_c \pm 15$ nm, 23°C) | Min. | ³ 32dB | ³ 30dB |
| Insertion Loss ($\lambda_c \pm 20$ nm, 23°C) | Typ. | ≤ 0.5 dB | ≤ 0.5 dB |
| Insertion Loss ($\lambda_c \pm 20$ nm, 0 to 70°C) | Max. | ≤ 0.65 dB | ≤ 0.8 dB |
| Extinction Ratio (PM fibre output) | Min. | ³ 22dB | ³ 20dB |
| Extinction Ratio (PM fibre output) | Typ. | ³ 25dB | ³ 25dB |
| Return Loss (Input/Output) | Min. | ³ 60/60dB | ³ 60/55dB |
| Optical Power | | 300mW | |
| Operating Temperature | | 0 to 70°C | |
| Storage Temperature | | -40 to 85°C | |
| Size | | Compact inline package, 5.5mm OD | |

Polarisation Maintaining (Single Polarisation) Fibre Isolator - Double Stage

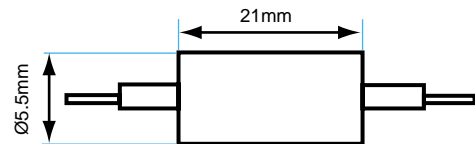
SPFI-DS

- Very high isolation
- Very low loss
- Very high thermal stability
- High extinction
- High return loss
- Compact inline package, 5.5mm OD

Applications:

- EDFA (PM)
- CATV fibre optic systems
- External modulator transmitters
- Fibre lasers
- Fibre gyros

The polarisation maintaining (single polarisation) fibre isolator eliminates back reflection and back scattering of optical signals in the transmitted polarisation and maintains the polarisation of the input light at high extinction. This double stage (DS) isolator features very high isolation, very low insertion loss, high extinction ratio, high return loss, and very high thermal stability in a compact design.



Ordering Information

| SPFI-DS | | I O | | I O | | I O | |
|------------|------------|-----------|-------|--------------|-------|------------|-------|
| Wavelength | Grade | PM Fibre | | Fibre Length | | Connectors | |
| 1550 | =1 Premium | =P Bowtie | =1 =1 | 1m | =1 =1 | None | =0 =0 |
| 1310 | =2 Grade A | =A Panda | =2 =2 | Other | =2 =2 | FC/PC | =1 =1 |
| Other | =3 | Other | =3 =3 | | | FC/APC | =2 =2 |
| | | | | | | Other | =3 =3 |

Specifications

| | | Premium | A grade |
|--|------|----------------------------------|----------------------|
| Centre Wavelength (λ_c) | | 1310, 1480, 1550nm | |
| Peak Isolation (λ_c , 23°C) | Typ. | ³ 60dB | ³ 55dB |
| Peak Isolation (λ_c , 23°C) | Min. | ³ 55dB | ³ 50dB |
| Minimum Isolation ($\lambda_c \pm 20$ nm, 23°C) | Min. | ³ 50dB | ³ 45dB |
| Insertion Loss ($\lambda_c \pm 20$ nm, 23°C) | Typ. | ≤ 0.6 dB | ≤ 0.8 dB |
| Insertion Loss ($\lambda_c \pm 20$ nm, 0 to 70°C) | Max. | ≤ 0.9 dB | ≤ 1.1 dB |
| Extinction Ratio (PM fibre output) | Min. | ³ 22dB | ³ 20dB |
| Extinction Ratio (PM fibre output) | Typ. | ³ 25dB | ³ 25dB |
| Return Loss (Input/Output) | Min. | ³ 60/60dB | ³ 60/55dB |
| Optical Power | | 300mW | |
| Operating Temperature | | 0 to 70°C | |
| Storage Temperature | | -40 to 85°C | |
| Size | | Compact inline package, 5.5mm OD | |

Polarisation Maintaining (Two Polarisations) Fibre Isolator

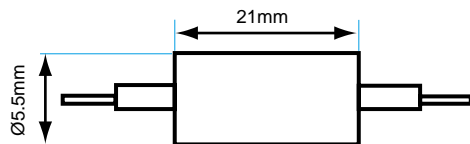
PMFI

- High isolation
- Low loss
- High thermal stability
- High extinction
- High return loss
- Compact inline package, 5.5mm OD

Applications:

- External modulator transmitters
- Fibre amplifiers
- Fibre lasers
- Telecom and CATV fibre optic systems
- Fibre-optic sensors

The polarisation maintaining (PM) fibre isolator (PMFI) is a true PM isolator. It simultaneously transmits two orthogonal polarisations and eliminates the back reflection and back scattering in the two orthogonal polarisations simultaneously (i.e. it is a true PM isolator as compared to single polarisation isolators). It maintains the polarisation of the input light with high extinction ratio in both polarisations. It features low insertion loss, high isolation, high extinction ratio, high return loss, and high stability in a compact design.



Ordering Information

| PMFI | | I O | | I O | | I O | |
|------------|------------|-----------|----|--------------|----|------------|----|
| Wavelength | Grade | PM Fibre | | Fibre Length | | Connectors | |
| 1550 =1 | Premium =P | Bowtie =1 | =1 | 1m =1 | =1 | None =0 | =0 |
| 1310 =2 | Grade A =A | Panda =2 | =2 | Other =2 | =2 | FC/PC =1 | =1 |
| Other =3 | | Other =3 | =3 | | | FC/APC =2 | =2 |
| | | | | | | Other =3 | =3 |

Specifications

| | Premium | Grade A |
|--|----------------------------------|----------------------|
| Centre Wavelength (λ_c) | 1550nm* | |
| Peak Isolation (λ_c , 23°C) | ³ 40dB | ³ 38dB |
| Minimum Isolation ($\lambda_c \pm 15$ nm, 23°C) | ³ 32dB | ³ 30dB |
| Insertion Loss Typical ($\lambda_c \pm 20$ nm, 23°C) | ≤ 0.5 dB | ≤ 0.6 dB |
| Insertion Loss Max ($\lambda_c \pm 20$ nm, 0 to 70°C) | ≤ 0.8 dB | ≤ 1.0 dB |
| PDL Between Two Major Axis | ≤ 0.1 dB | ≤ 0.15 dB |
| Return Loss (Input/Output) | ³ 60/60dB | ³ 55/55dB |
| Extinction Ratio (PM fibre output, slow and fast axis) | ³ 22dB | ³ 20dB |
| Optical Power | 300mW | |
| Operating Temperature | 0 to 70°C | |
| Storage Temperature | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

* Other wavelengths available

Integrated Polarisation Maintaining Fibre-Optic Tap/Isolator

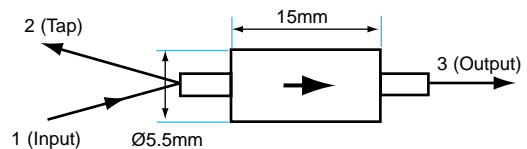
PMTAP-SPFI/SS

- High isolation
- Low loss
- High thermal stability
- High extinction
- High return loss
- Compact inline package, 5.5mm OD

Applications:

- EDFA (PM)
- CATV fibre optic systems
- External modulator transmitters
- Fibre lasers
- Fibre sensors

The polarisation maintaining (PM) fibre-optic tap/isolator combines the functionality of a PM isolator with a PM tap in one compact inline package thus providing significant advantages in performance, size, and cost. This hybrid product features high isolation, low insertion loss, high polarisation extinction ratio, high return loss, and high thermal stability in a compact design. A wide range of tap ratios are available.



Ordering Information

PMTAP-SPFI/SS

| Wavelength | Grade | Tap % | PM Fibre | SM Fibre | Length | Connectors |
|------------|------------|----------|-----------|----------|----------|------------|
| 1550 =1 | Premium =P | 10% =1 | Bowtie =1 | SMF28 =1 | 1m =1 | None =0 |
| 1310 =2 | Grade A =A | 5% =2 | Panda =2 | Other =2 | Other =2 | FC/PC =1 |
| Other =3 | | 1% =4 | Other =3 | | | FC/APC =2 |
| | | Other =5 | | | | Other =3 |

Specifications

| | Premium Grade | A Grade |
|---|--|-------------------------------|
| Centre Wavelength (λ_c) | 1550nm, 1480nm, 1300nm | |
| Tap Split Ratio | Any split ratio from 0.1/99.9 to 20/80* | |
| Tap Split Ratio Tolerance | ` 20% of specified tap ratio (example for 1% tolerance is ` 0.2% or 0.8-1.2%) | |
| Peak Isolation (λ_c , 23°C) | ³ 38dB (typ >40dB) | ³ 37dB (typ >38dB) |
| Isolation Over Wavelength ($\lambda_c \pm 15$ nm, 23°C) | ³ 32dB | ³ 30dB |
| Excess Loss ($\lambda_c \pm 20$ nm) excluding power in tap | ≤ 0.90 dB (typ <0.5dB) | ≤ 1.1 dB (typ <0.6dB) |
| Output Extinction Ratio | ³ 22dB (typ >25dB) | ³ 20dB (typ >22dB) |
| Return Loss (Input/Output) | ³ 55/55dB | ³ 50/50dB |
| Optical Power | 300mW | |
| Operating Temperature | 0 to 70°C | |
| Storage Temperature | -40 to 85°C | |
| Fibre Type | PM fibre on signal input and output ports, SMF fibre on tap port | |
| Size | Compact inline package, 5.5mm OD | |

* Other Ratios Available

Polarisation Maintaining (PM) WDM for EDFA

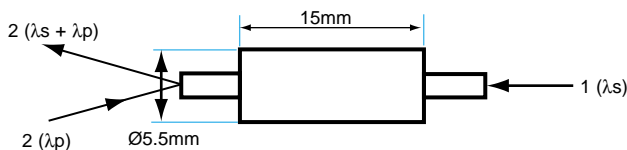
PMWDM-EDFA

- Low loss
- High extinction ratio
- High return loss
- Wide bandwidth
- High stability and reliability
- Compact inline package, 5.5mm OD

Applications:

- Pump/signal WDM for EDFA
- Multiplexing two pump lasers for higher pump power
- Sensor systems

The polarisation maintaining (PM) WDM for EDFA multiplexes polarised signal with pump and maintains the output signal with high extinction ratio. All signal input and output fibres are polarisation maintaining (PM) fibres. It utilises advanced micro-optic filter technology to yield wideband, low insertion loss, high polarisation extinction, high return loss in a compact package. This product can also be used (with minor modification) to multiplex two pump lasers for higher pump power. It can also be provided with a PM isolator integrated in the same package.



Ordering Information

PMWDM-EDFA

| Signal Wavelength | Pump | Signal Fibre | Pump Fibre | Connectors |
|-------------------|-----------|--------------|------------|------------|
| 1550 =1 | 980nm =1 | Bowtie =1 | Flexcor =1 | None =0 |
| Other =2 | 1480nm =2 | Panda =2 | SMF28 =2 | FC/PC =1 |
| | Other =3 | Other =3 | Other =3 | FC/APC =2 |
| | | | | Other =3 |

Specifications

| | | |
|-------------------------|---|---|
| Pump Wavelength | 980nm (± 20nm) | 1450-1490nm |
| Signal Wavelength | 1550nm (± 20nm) | 1550nm (± 20nm) |
| Insertion Loss (signal) | ≤0.8dB (0.5dB typical) | ≤0.8dB (0.5dB typical) |
| Insertion Loss (pump) | ≤0.8dB (0.5dB typical) | ≤0.8dB (0.5dB typical) |
| Extinction Ratio | ³ 20dB (typ >25dB) | |
| Return Loss | ³ 50dB (typ >55dB) | |
| Directivity | ³ 60dB | |
| Fibre | PM fibre on 1550nm input port and multiplexed output port, Flexcor on pump port | PM fibre on 1550nm input port and multiplexed output port, SMF28 on pump port |
| Optical Power | 300mW | |
| Operating Temperature | 0 to 70°C | |
| Storage Temperature | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

Polarisation Maintaining (PM) WDM-1300/1550

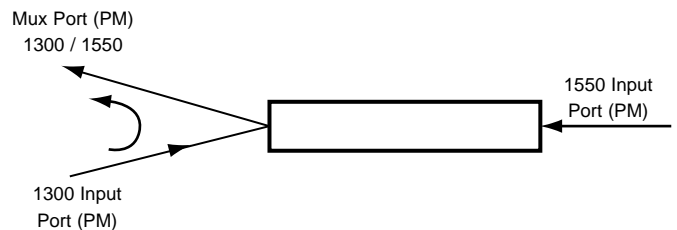
PMWDM-1300/1550

- Low loss
- High extinction ratio
- High return loss
- Wide bandwidth
- High stability and reliability
- Compact inline package, 5.5mm OD

Applications:

- PM signal WDM

The polarisation maintaining (PM) WDM multiplexes PM signals (1300/1550) and maintains the output polarisation with high extinction ratio using advanced micro-optic filter technology. All input and output fibres are polarisation maintaining. It utilises advanced filter technology to yield wideband, low insertion loss, high polarisation extinction, high return loss in a compact package. This product can also be used to multiplex other wavelengths. It can also be provided with a PM isolator integrated in the same package.



Ordering Information

PMWDM-1300/1550

| Wavelength 1 | Wavelength 2 | PM Fibre | Fibre Length | Connectors |
|--------------|--------------|-----------|--------------|------------|
| 1550 =1 | 1310nm =1 | Bowtie =1 | 1m =1 | None =0 |
| Other =2 | Other =2 | Panda =2 | Other =2 | FC/PC =1 |
| | | Other =3 | | FC/APC =2 |
| | | | | Other =3 |

Specifications

| | |
|-------------------------|----------------------------------|
| First Wavelength | 1300nm (± 20nm) |
| Second Wavelength | 1550nm (± 20nm) |
| Insertion Loss (signal) | ≤0.8dB (0.5dB typical) |
| Insertion Loss (pump) | ≤0.8dB (0.5dB typical) |
| Extinction Ratio | ³ 20dB (typ >25dB) |
| Return Loss | ³ 50dB (typ >55dB) |
| Directivity | ³ 60dB |
| Fibre | PM fibre on all ports |
| Optical Power | 300mW |
| Operating Temperature | 0 to 70°C |
| Storage Temperature | -40 to 85°C |
| Size | Compact inline package, 5.5mm OD |

Integrated Polarisation Maintaining Fibre-Optic WDM/Isolator

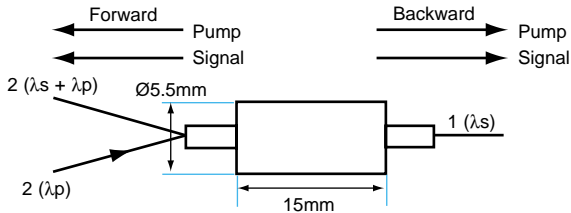
PMWDM-SPFI/SS

- High isolation
- Low loss
- High thermal stability
- High extinction
- High return loss
- Compact inline package, 5.5mm OD

Applications:

- EDFA (PM)
- CATV fibre optic systems
- External modulator transmitters
- Fibre lasers
- Fibre sensors

The integrated polarisation maintaining (PM) fibre-optic WDM/isolator combines the functionality of a PM isolator (1550nm) with a PM-WDM in one compact inline package thus providing significant advantages performance, size, and cost. This integrated hybrid product features high isolation, low insertion loss, high extinction ratio, high return loss, and high thermal stability in a compact design. A range of WDM multiplexing is available.



Ordering Information

PMWDM-SPFI/SS

| Signal | Pump | Signal Fibre | Pump Fibre | Connectors | Isolator |
|----------|----------|--------------|------------|------------|-------------|
| 1550 =1 | 980 =1 | Bowtie =1 | Flexcor =1 | None =0 | Forward =F |
| Other =2 | 1480 =2 | Panda =2 | SMF28 =2 | FC/PC =1 | Backward =B |
| | Other =3 | Other =3 | Other =3 | FC/APC =2 | |
| | | | | Other =3 | |

Specifications

| | | |
|--|---|---|
| Pump Wavelength | 980nm (± 20 nm) | 1450-1490nm |
| Signal Wavelength (λ_c) | 1550nm (± 20 nm) | 1550nm (± 20 nm) |
| Peak Isolation (λ_c , 23°C) | ³ 40dB (typ 45dB) | ³ 40dB (typ 45dB) |
| Isolation (λ_c , 23°C) | ³ 37dB (typ 40dB) | ³ 37dB (typ 40dB) |
| Minimum Isolation ($\lambda_c \pm 15$ nm, 23°C) | ³ 30dB (typ >32dB) | ³ 30dB (typ >32dB) |
| Insertion Loss (signal) | ≤ 1.1 dB (0.8dB typical) | ≤ 1.1 dB (0.8dB typical) |
| Insertion Loss (pump) | ≤ 1.1 dB (0.8dB typical) | ≤ 1.1 dB (0.8dB typical) |
| Extinction Ratio | ³ 20dB (typ >25dB) | |
| Return Loss | ³ 50dB (typ >55dB) | |
| Directivity | ³ 60dB | |
| Fibre | PM fibre on 1550nm input port and multiplexed output port, Flexcor on pump port | PM fibre on 1550nm input port and multiplexed output port, SMF28 on pump port |
| Optical Power | 300mW | |
| Operating Temperature | 0 to 70°C | |
| Storage Temperature | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

Polarisation Maintaining (PM) Fibre-Optic Circulator

PMFC

Applications:

- Bi-directional transmission systems
- WDM & DWDM transmission systems
- Add/drop multiplexers
- Fibre optic amplifiers
- CATV networks
- Optical test instrumentation

- Low loss
- High extinction ratio
- High isolation
- High return loss
- Compact in-line package

The three port in-line polarisation maintaining (PM) fibre optic circulator routes PM optical signals in a unidirectional sequential order from port 1 to 2 and port 2 to 3 while maintaining the polarisation with high extinction ratio. It features low insertion loss, high isolation, high extinction ratio, high return loss and high stability and reliability. The PM circulator is packaged in a small size reliable in-line package compatible with all demanding applications.

Ordering Information

PMFC-3P

| Wavelength | Grade | PM Fibre | Fibre Length | Cable | Connectors |
|------------|------------|-----------|--------------|----------|------------|
| 1550 =1 | Premium =P | Bowtie =1 | 1m =1 | None =0 | None =0 |
| Other =2 | Grade A =A | Panda =2 | Other =2 | 3mm =1 | FC/PC =1 |
| | | Other =3 | | 900mm =2 | FC/APC =2 |
| | | | | Other =3 | Other =3 |

Specifications

| | Grade P | Grade A |
|---|--|------------------------------|
| Number of Ports | 3 | |
| Configuration | 1 to 2, 2 to 3 (all in slow axis) | |
| Centre Wavelength λ_c | 1550 (± 20 nm) | |
| Insertion Loss ($\lambda_c \pm 20$ nm, 0-60°C) | ≤ 0.8 dB (typ 0.5dB) | ≤ 1.0 dB (typ 0.6dB) |
| Extinction ratio ($\lambda_c \pm 20$ nm, 23°C) | ³ 20dB (typ 25dB) | ³ 20dB (typ 25dB) |
| Isolation ($\lambda_c \pm 20$ nm, 23°C, 2-1) | ³ 20dB | ³ 20dB |
| Isolation ($\lambda_c \pm 20$ nm, 23°C, 3-2) | ³ 20dB | ³ 20dB |
| Directivity (1 to 3 or 3 to 1) | ³ 50dB | ³ 50dB |
| Return Loss | ³ 50dB | ³ 50dB |
| Optical Power | 300mW (higher power available upon request) | |
| Operating Temperature | 0 to 70°C | |
| Storage Temperature | -40 to 80°C | |
| Package | Compact inline package, 5.5mm OD | |

Inline Polarisation Pump Combiner

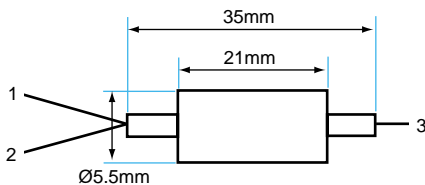
PDM-IL-980

- Low insertion loss,
- High optical power,
- High polarisation extinction,
- High return loss,
- High stability and reliability,
- Compact inline package, 5.5mm OD

Applications:

- Combining light from two pump lasers for higher pump power,
- Combining or splitting two orthogonally polarised light beams,
- Fibre lasers,
- Passive redundancy switch,
- Instrumentation,

The inline polarisation pump combiner combines two input 980nm pumps into one output. This product is designed to handle high optical power with low insertion loss. It features an inline compact package with 5.5mm OD. Various PM fibres can be used at the input ports. The output can be either SMF or PM fibre. PM and SM connectors are available.



Ordering Information

| PDM-IL-980 | | In Out | | | | |
|------------|---------------|---------------|----------|------------|--|--|
| Wavelength | Grade | Fibre Type | Length | Connectors | | |
| 980 | =1 Premium =P | Bowtie =1 =1 | 1m =1 | None =0 | | |
| Other | =2 Grade A =A | Panda =2 =2 | Other =2 | FC/PC =1 | | |
| | | Flexcor =4 =4 | | FC/APC =2 | | |
| | | Other =5 =5 | | Other =3 | | |

Target Specifications

| | Premium Grade | A Grade |
|-----------------------------------|--|----------------------------------|
| Wavelength | 980 20nm | |
| Insertion Loss | ≤0.8dB (typ <0.5dB) | ≤1.0dB (typ <0.6dB) |
| Return Loss | ³ 50dB | ³ 50dB |
| Extinction Ratio (as splitter) | ³ 20dB (typ >25dB) | ³ 20dB (typ >22dB) |
| Optical Power | 300mW | 300mW |
| Fibre | PM on input ports, SM on output port (PM output optional) | |
| Operating Temp. | 0 to 70°C | |
| Storage Temp. | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

Inline Polarisation Pump Combiner

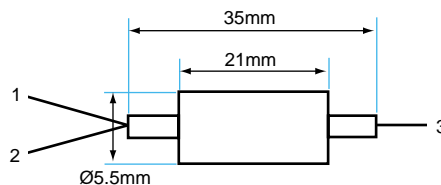
PDM-IL-1060

- Low insertion loss,
- High optical power,
- High polarisation extinction,
- High return loss,
- High stability and reliability,
- Compact inline package, 5.5mm OD

Applications:

- Combining light from two pump lasers for higher pump power,
- Combining or splitting two orthogonally polarised light beams,
- Fibre lasers,
- Passive redundancy switch,
- Instrumentation,

The inline polarisation combiner combines two input 1060nm signals into one output. This product is designed to handle high optical power with low insertion loss. It features an inline compact package with 5.5mm OD. Various PM fibres can be used at the input ports. The output can be either SMF or PM fibre. PM and SM connectors are available.



Ordering Information

| PDM-IL-1060 | | In Out | | | | |
|-------------|---------------|---------------|----------|------------|--|--|
| Wavelength | Grade | Fibre Type | Length | Connectors | | |
| 1060 | =1 Premium =P | Bowtie =1 =1 | 1m =1 | None =0 | | |
| Other | =2 Grade A =A | Panda =2 =2 | Other =2 | FC/PC =1 | | |
| | | Flexcor =4 =4 | | FC/APC =2 | | |
| | | Other =5 =5 | | Other =3 | | |

Target Specifications

| | Premium Grade | A Grade |
|-----------------------------------|--|----------------------------------|
| Wavelength | 1060 20nm | |
| Insertion Loss | ≤0.8dB (typ <0.5dB) | ≤1.0dB (typ <0.6dB) |
| Return Loss | ³ 50dB | ³ 50dB |
| Extinction Ratio (as splitter) | ³ 20dB (typ >25dB) | ³ 20dB (typ >22dB) |
| Optical Power | 300mW | 300mW |
| Fibre | PM on input ports, SM on output port (PM output optional) | |
| Operating Temp. | 0 to 70°C | |
| Storage Temp. | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

Inline Polarisation Pump Combiner

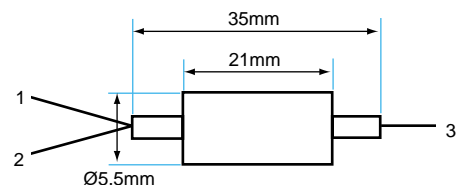
PDM-IL-1480

- Low insertion loss,
- High optical power,
- High polarisation extinction
(as splitter),
- High return loss,
- High stability and reliability,
- Compact inline package, 5.5mm OD

Applications:

- Combining light from two pump lasers for higher pump power,
- Combining or splitting two orthogonally polarised light beams,
- Passive redundancy switch,
- Instrumentation,

The inline polarisation pump combiner combines two input 1480nm pumps into one output. This product is designed to handle high optical power with low insertion loss. It features an inline compact package with 5.5mm OD. Various PM fibres can be used at the input ports (Panda, Bowtie, etc.). The output can be either SMF or PM fibre. PM and SM connectors are available.



Ordering Information

| PDM-IL-1480 | | In Out | | | | |
|-------------|---------------|--------------|----------|------------|--|--|
| Wavelength | Grade | Fibre Type | Length | Connectors | | |
| 1480 | =1 Premium =P | Bowtie =1 =1 | 1m =1 | None =0 | | |
| Other | =2 Grade A =A | Panda =2 =2 | Other =2 | FC/PC =1 | | |
| | | SMF28 =4 =4 | | FC/APC =2 | | |
| | | Other =5 =5 | | Other =3 | | |

Target Specifications

| | Premium Grade | A Grade |
|-----------------------------------|--|----------------------------------|
| Wavelength | 1400-1500nm | |
| Insertion Loss | ≤0.6dB (typ <0.5dB) | ≤0.8dB (typ <0.6dB) |
| Return Loss | ³ 55dB | ³ 50dB |
| Extinction Ratio (as splitter) | ³ 20dB (typ >25dB) | ³ 20dB (typ >22dB) |
| Optical Power | 300mW | |
| Fibre | PM on input ports, SM on output port (PM output optional) | |
| Operating Temp. | 0 to 70°C | |
| Storage Temp. | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

* Higher power available upon request

Inline Fibre Optic Polariser

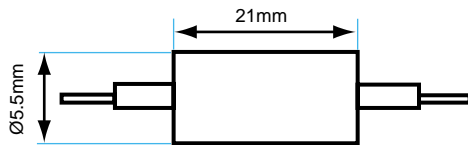
FOP

- High extinction ratio
- Low loss
- High thermal stability
- High return loss
- Compact (5.5mm OD)

Applications:

- Optical transmission systems
- EDFA
- Instruments

The inline fibre optic polariser offers high extinction ratio, low loss, and high return loss performance over a wideband wavelength range in a compact inline package. Various PM or SM fibre options are available for the input and output ports.



Ordering Information

| FOP | | I O | | I O | | I O | | | | | | | |
|------------|-------|---------------|-------|-----|--------|-----|------------|-------|----|----|--------|----|----|
| Wavelength | Grade | Configuration | Fibre | | Length | | Connectors | | | | | | |
| 1550 | =1 | P =P | SM-SM | =1 | SMF28 | =1 | =1 | 1m | =1 | =1 | None | =0 | =0 |
| 1480 | =2 | A =A | SM-PM | =2 | Bowtie | =2 | =2 | Other | =2 | =2 | FC/PC | =1 | =1 |
| 1310 | =3 | | PM-PM | =3 | Panda | =3 | =3 | | | | FC/APC | =2 | =2 |
| Other | =4 | | | | Other | =4 | =4 | | | | Other | =3 | =3 |

Specifications

| | P Grade | A Grade | P Grade | A Grade |
|---|---|----------------------|----------------------|----------------------|
| | SM-PM | | PM to PM | |
| Centre Wavelength (λ_c) | 532, 630, 830, 980, 1060, 1310, 1480, 1550, 1620nm* | | | |
| Bandwidth | ± 20 nm | | | |
| Extinction Ratio (Minimum) | ³ 25dB | ³ 22dB | ³ 25dB | ³ 22dB |
| Extinction Ratio (Typical) | >30dB | >25dB | >30dB | > 25dB |
| Insertion Loss Max ($\lambda_c \pm 30$ nm, 23°C) | ≤ 0.7 dB | ≤ 0.8 dB | ≤ 0.8 dB | ≤ 0.9 dB |
| Insertion Loss Typical ($\lambda_c \pm 30$ nm, 23°C) | ≤ 0.4 dB | ≤ 0.5 dB | ≤ 0.5 dB | ≤ 0.6 dB |
| Return Loss (Input/Output) | ³ 55/55dB | ³ 50/50dB | ³ 55/55dB | ³ 50/50dB |
| Optical Power | 300mW | | | |
| Operating Temperature | 0 to 70°C | | | |
| Storage Temperature | -40 to 85°C | | | |
| Size | Compact inline package, 5.5mm OD | | | |

* Other wavelengths available

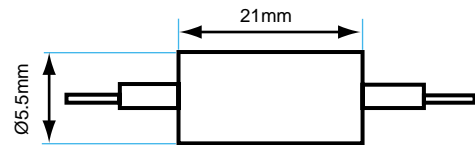
Polarisation Maintaining (PM) Faraday Rotator

PMFR

Applications:

- CATV fibre optic systems
- External modulator transmitters
- Fibre lasers
- Fibre gyros
- Very low loss
- Very high thermal stability
- High extinction
- High return loss
- Compact inline package, 5.5mm OD

The Polarisation Maintaining (PM) Faraday Rotator (PMFR) provides a 45° rotation in either transmission direction. The input and output fibres are PM fibres aligned so that the output fibre major axis are at 45° from the input fibre. Therefore in one direction, transmission will be maintained along the same axes (slow @ slow or fast @ fast). In the opposite direction, the axes will be switched. It features very low insertion loss, high extinction ratio, and high return loss. In a compact package.



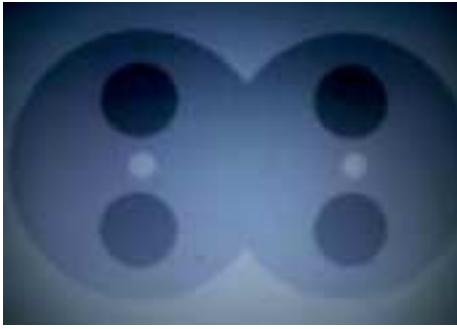
Ordering Information

| PMFR | | Grade | | Fibre Type | | Fibre Length | | Connectors | |
|------------|-------|------------|--------------|------------|----------|--------------|--|------------|--|
| Wavelength | Grade | Fibre Type | Fibre Length | Connectors | | | | | |
| 1550 | =1 | Premium =P | Bowtie =1 | 1m =1 | None =0 | | | | |
| 1310 | =2 | Grade A =A | Panda =2 | Other =2 | FC/PC =1 | | | | |
| Other | =3 | Other =3 | FC/APC =2 | | | | | | |
| Other | =3 | | | | | | | | |

Specifications

| | Premium Grade | A Grade |
|--|----------------------------------|------------------------|
| Centre Wavelength (λ_c) | 1310, 1480, 1550nm* | |
| Spectral Width | ± 20 nm | |
| Typical Insertion Loss ($\lambda_c \pm 10$ nm, 23°C) | 0.5dB | 0.6dB |
| Maximum Insertion Loss ($\lambda_c \pm 10$ nm, 23°C) | ≤ 0.6 dB | ≤ 0.8 dB |
| Extinction Ratio (PM fibre output) | ³ 22dB | ³ 20dB |
| Return Loss | ³ 60/55dB | ³ 55/50dB |
| Faraday Rotation Angle ($\lambda_c, 23^\circ\text{C}$) | $45^\circ \pm 1^\circ$ | $45^\circ \pm 2^\circ$ |
| Optical Power | 300mW | |
| Operating Temperature | 0 to 70°C | |
| Storage Temperature | -40 to 85°C | |
| Size | Compact inline package, 5.5mm OD | |

* Other wavelengths available



1x2 (2x2) Fused Polarisation - Maintaining Fibre Splitter

Features

- Low Excess Loss
- High Extinction Ratio
- High Power Handling
- Both of 1x2 or 2x2 are Available

Applications

- Optical Amplifiers
- Power Monitoring
- Coherent Comm.
- Fibre Gyroscope

Ordering Information

| Wavelength | Structure | Splitting Ratio | Grade | Package | Fibre Type | Pigtail | Fibre Length | Connector |
|------------|-----------|-----------------|-----------|-----------------|------------|------------|--------------|-----------|
| 4=1550nm | 1=1x2 | 50=50:50 | P=Premium | S ₁₁ | 1=Panda | S=250 μm | 0=0.5m | 0=None |
| 5=1480nm | 2=2x2 | 60=60:40 | A=A grade | | | Bare fibre | 1=1.0m | |
| 7=1310nm | | 70=70:30 | | | | | X=other | |
| | | 80=80:20 | | | | | | |
| | | 90=90:10 | | | | | | |
| | | 95=95:5 | | | | | | |
| | | 98=98:2 | | | | | | |
| | | 99=99:1 | | | | | | |

1x2 (2x2) Splitter - Splitting Ratio & Its Tolerance

| Ratio | Premium Grade | A Grade |
|-------|---------------|---------|
| 99/1 | +/-0.5 | +/-0.6 |
| 95/5 | +/-1.5 | +/-1.7 |
| 90/10 | +/-2.2 | +/-2.4 |
| 80/20 | +/-2.5 | +/-3.0 |
| 70/30 | +/-3.0 | +/-3.7 |
| 60/40 | +/-4.0 | +/-4.8 |
| 50:50 | +/-5.0 | +/-6.0 |



1x2 (2x2) Fused Hybrid PM Fibre Tap

Features

- Low Excess Loss
- High Extinction Ratio
- High Power Handling
- Both of 1x2 or 2x2 are Available

Applications

- Optical Amplifiers
- Power Monitoring
- Telecomm Systems
- Test Equipment

Ordering Information

| Wavelength | Structure | Splitting Ratio | Grade | Package | Fibre Type | Pigtail | Fibre Length | Connector |
|------------|-----------|-----------------|-----------|-----------------|------------|------------|--------------|-----------|
| 4=1550nm | 1=1x2 | 90=90:10 | P=Premium | S ₁₁ | 1=Panda | S=250 μm | 0=0.5m | 0=None |
| 5=1480nm | 2=2x2 | 95=95:05 | A=A grade | | | Bare fibre | 1=1.0m | |
| 7=1310nm | | 98=98:02 | | | | | X=other | |
| | | 99=99:01 | | | | | | |

1x2 (2x2) Hybrid Tap Splitting Ratio & Its Tolerance

| Splitting Ratio | Max. Splitting Ratio Tolerance (%) Premium Grade | A Grade |
|-----------------|--|---------|
| 99.5/0.5 | +/-0.2 | +/-0.3 |
| 99/1 | +/-0.4 | +/-0.5 |
| 98/2 | +/-0.6 | +/-0.8 |
| 95/5 | +/-1.5 | +/-1.8 |
| 90/10 | +/-2.0 | +/-2.5 |



1x3 (3x3) Fused Hybrid PM Fibre Tap

Features

- Low Excess Loss
- High Extinction Ratio
- High Power Handling
- Both of 1x3 or 3x3 are Available

Applications

- Optical Amplifiers
- Power Monitoring
- Telecomm Systems
- Test Equipment

Ordering Information

| Wavelength | Structure | Splitting Ratio | Grade | Package | Fibre Type | Pigtail | Fibre Length | Connector |
|------------|-----------|-----------------|-----------|-----------------|------------|------------|--------------|-----------|
| 4=1550nm | 3=1x3 | 90=05:90:05 | P=Premium | S ₁₁ | 1=Panda | S=250 μm | 0=0.5m | 0=None |
| 5=1480nm | A=3x3 | 95=2.5:95:2.5 | A=A grade | | | Bare fibre | 1=1.0m | |
| 7=1310nm | | 98=01:98:01 | | | | | X=other | |
| | | 99=0.5:99:0.5 | | | | | | |

1x3 (3x3) Hybrid Tap Splitting Ratio & Its Tolerance

| Splitting Ratio | Max. Splitting Ratio Tolerance (%) | | | |
|-----------------|------------------------------------|----------|-----------|----------|
| | Premium Grade | | A Grade | |
| | Main Port | Tap port | Main Port | Tap Port |
| 0.5/99/0.5 | +/-0.4 | +/-0.2 | +/-0.5 | +/-0.3 |
| 1/98/1 | +/-0.6 | +/-0.4 | +/-0.8 | +/-0.5 |
| 2.5/95/2.5 | +/-1.5 | +/-0.8 | +/-1.8 | +/-1.0 |
| 5/90/5 | +/-2.0 | +/-1.2 | +/-2.5 | +/-1.3 |
| 10/80/10 | +/-2.5 | +/-1.5 | +/-3.0 | +/-1.8 |

Specifications

| | | 1x2 or 2x2 Splitter | | 1x2 (2x2) Hybrid Tap | | 1x3 (3x3) Hybrid Tap | |
|-----------------------|-----|---------------------|-----|----------------------|-----|----------------------|-----|
| | | Premium | A | Premium | A | Premium | A |
| Central Wavelength | nm | 1310, 1480, 1550 | | | | 1310, 1480, 1550 | |
| Bandwidth | nm | +/-20 | | | | +/-20 | |
| Excess Loss | Typ | 0.2 | 0.3 | 0.2 | 0.3 | 0.3 | 0.4 |
| Excess Loss | Max | 0.4 | 0.6 | 0.3 | 0.5 | 0.5 | 0.8 |
| PER for Through Port | Min | 20 | 17 | 20 | 17 | 20 | 17 |
| Return Loss | Min | 50 | | 50 | | 50 | |
| Directivity | Min | 55 | | 55 | | 55 | |
| Operating Temperature | °C | -0 to +70 | | -0 to +70 | | -0 to +70 | |
| Storage Temperature | °C | -40 to +85 | | -40 to +85 | | -40 to +85 | |
| Package Dimensions | mm | S11:3.0 (•)Å60 (L) | | S11:3.0 (•)Å60 (L) | | S11:3.0 (•)Å60 (L) | |

Note: 1. All specifications are for operation at slow-axis and room temperature. 2. Central wavelength can be customised for different applications. 3. The specifications are subject to change without notification.