

## 1x2, 2x2 Fused PM Fiber Coupler 350nm-2300nm

### Features

- Low Excess Loss
- High Power Handling
- Both Slow and Fast Axes Working
- Telcordia GR-1221 Compliant

### Applications

- Optical Amplifier
- Power Monitoring
- Coherent Communication
- Fiber Gyroscope



### Specifications

| Parameters  | Unit | Values        |            |         |          |                     |                     |
|---|------|---------------|------------|---------|----------|---------------------|---------------------|
| Wavelength  | nm   | 350-450       | 450-680    | 680-900 | 900-1200 | 1200-1650           | 1650-2300           |
| Operating Wavelength Bandwidth                    | nm   | ±5            |            | ±10     |          | ±20                 |                     |
| Max Excess Loss (EL) <sup>[1]</sup>               | dB   | 1.5           | 1.2        | 0.8     | 0.6      | 0.4                 | 0.6                 |
| Max Loss for Each Connector                       | dB   | 1.5           | 1.2        | 0.5     | 0.3      | 0.3                 | 0.3                 |
| Coupling/Split Ratio                              | dB   | 1/99 to 50/50 |            |         |          |                     |                     |
| Polarization Extinction Ratio (ER) <sup>[2]</sup> | dB   | ≥14           | ≥16        | ≥18     | ≥18      | ≥18                 | ≥18                 |
| Fiber Type  | -    | PM350         | PM460      | PM630   | PM980    | PM1300              | PM1550              |
|   |      | PM405         | PM630      | PM780   | PM1300   | PM1550              | PM1950              |
|   |      | PM-S350-HP    | PM-S405-XP | PM850   | PM850    | -                   | PM2000              |
| Return Loss (RL)                                  | dB   | ≥50           |            |         |          |                     |                     |
| Directivity (DIR) <sup>[3]</sup>                  | dB   | ≥50           |            |         |          |                     |                     |
| Power Handling CW                                 | mW   | 50            | 50         | 100     | 1000     | 4000 <sup>[4]</sup> | 4000 <sup>[4]</sup> |
| Operating Temperature                             | °C   | -40 ~ +85     |            |         |          |                     |                     |
| Storage Temperature                               | °C   | -40 ~ +85     |            |         |          |                     |                     |

<sup>[1]</sup>  $EL=10 * \log_{10} (P_{in} \div (P_{out1} + P_{out2}))$ , P=power in mW,

<sup>[2]</sup> With connectors, ER-2dB, RL-5dB.

<sup>[3]</sup>  $DIR=10 * \log_{10} (P_{out2} \div P_{out1})$ , or  $DIR=10 * \log_{10} (P_{in2} \div P_{in1})$ , P=power in mW, test light input from Port1,

When test DIR at output port, coil all input fibers 3-5 turns around a 10-30mm diameter loop, This prevents back reflections into output port2, which would significantly lower DIR.

<sup>[4]</sup> Higher power up to 20W available on request.

<sup>[5]</sup> Test at room temperature without connectors. With connectors, IL+0.3dB, RL-5dB. For short wavelength, IL+1.5dB.

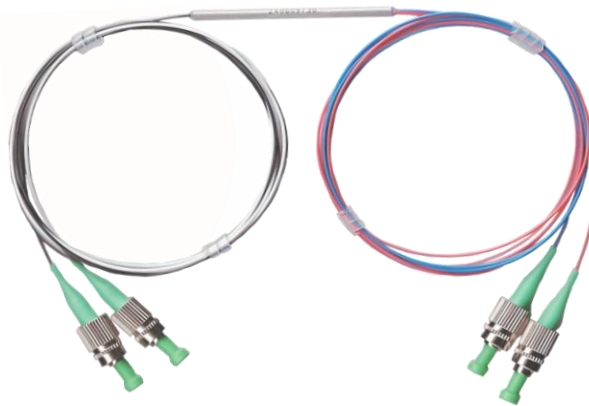
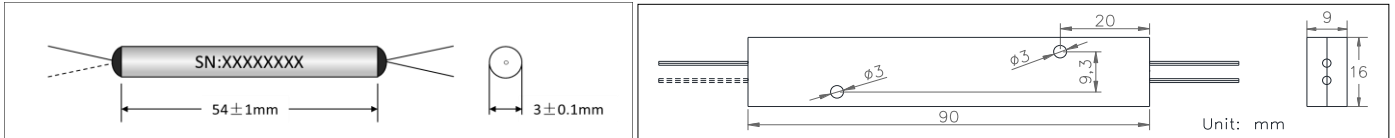
### Specifications (Insertion Loss Distribution)

| Parameters   | Unit        | Values |          |          |          |            |          |          |         |     |
|--|-------------|--------|----------|----------|----------|------------|----------|----------|---------|-----|
| Coupling/Split Ratio                                   | %           | 1/99   | 2/98     | 5/95     | 10/90    | 20/80      | 30/70    | 40/60    | 50/50   |     |
| Coupling/Split Ratio Tolerance <sup>[1]</sup>          | %           | ±0.3   | ±0.5     | ±0.7     | ±1.0     | ±2.0       | ±2.0     | ±2.5     | ±3.0    |     |
| Typ. Insertion Loss at $\lambda_c$ (IL) <sup>[1]</sup> | 350-450nm   | dB     | 22.5/1.5 | 19/1.6   | 15/1.7   | 12/1.9     | 8.8/2.5  | 7.0/3.0  | 5.8/3.7 | 4.5 |
|  | 450-680nm   | dB     | 22/1.2   | 18.6/1.3 | 14.5/1.4 | 11.5/1.6   | 8.5/2.1  | 6.8/2.6  | 5.5/3.3 | 4.2 |
|  | 680-900nm   | dB     | 21.5/0.7 | 18.2/0.8 | 14.2/0.9 | 11.0/0.1.1 | 8.0/1.6  | 6.0/2.3  | 4.8/3.0 | 3.8 |
|  | 900-1200nm  | dB     | 21.5/0.5 | 18.2/0.6 | 14.2/0.7 | 11.0/0.95  | 8.0/1.45 | 6.0/2.05 | 4.8/2.7 | 3.6 |
|  | 1200-1650nm | dB     | 21.5/0.4 | 18.2/0.5 | 14.2/0.6 | 11.0/0.85  | 8.0/1.35 | 6.0/1.95 | 4.8/2.6 | 3.4 |
|  | 1650-2300nm | dB     | 21.5/0.5 | 18.2/0.6 | 14.2/0.7 | 11.0/0.95  | 8.0/1.45 | 6.0/2.05 | 4.8/2.7 | 3.6 |

<sup>[1]</sup> Test/calculate without connector loss.

**Package Information**

|                   |                       |                  |                     |
|-------------------|-----------------------|------------------|---------------------|
| Configuration     | 1x2 or 2x2            |                  |                     |
| Fiber Length      | 1m, others on request |                  |                     |
| Pigtail Type      | 250µm Bare Fiber      | 900µm Loose Tube | 2mm/3mm Loose Cable |
| Dimensions(mm)    | φ3x54                 | φ3x54            | 90x16x9             |
| Approx Weight (g) | 30                    | 45               | 60                  |



**Ordering Information**

CP- ①①-②③③③-④④④④-⑤⑤⑤⑤⑤-⑥⑥⑥⑥-⑦⑦⑦⑦⑦⑦-⑧⑨⑨⑨-⑩⑩⑩⑩⑩⑩

|   |                |  |
|---|----------------|--|
| ① | Type           | PS=PM Fiber Standard Coupler;  |
| ② | Grade          | P=Grade P;   |
| ③ | Port Type      | 1x2; 2x2;  |
| ④ | Wavelength     | 350; 390; 405; 450; 488; 532; 635; 767; 780; 810; 850; 880; 980; 1000; 1030; 1040; 1053; 1064; 1070; 1100; 1111; 1150; 1200; 1210; 1230; 1250; 1270; 1290; 1310; 1330; 1350; 1370; 1390; 1410; 1430; 1450; 1470; 1490; 1510; 1530; 1545; 1550; 1570; 1590; 1600; 1610; 1620; 1650; 1690; 1700; 1740; 1790; 1800; 1850; 1900; 1930; 1950; 1970; 2000; 2030; 2050; 2100; 2300; |
| ⑤ | Coupling Ratio | 1/99; 2/98; 5/95; ... ; 50/50;   |
| ⑥ | Pigtail Type   | 250=250µm Fiber; 900=900µm Loose Tube; 2000=2mm Loose Cable; 3000=3mm Loose Cable;   |
| ⑦ | Fiber Type     | PM460; PM980; ...; PM1950;   |
| ⑧ | Length         | 1=1m; X=Other;   |
| ⑨ | Connector      | NE=None; FA=FC/APC; FC=FC/UPC; SA=SC/APC; SC=SC/UPC; LC=LC/UPC; XX=Others;   |
| ⑩ | Package        | 3x54; 90x16x9;   |

## **Application Notes**

### Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled polished (APC).

### Fiber Cleanliness

Fibers with smaller core diameters (<5  $\mu\text{m}$ ) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

### Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed above table specified, if higher power handling is needed, please contact OPNETI technicians.

### Optical Path

All of our fused fiber couplers are bidirectional, means that all ports can be used as an input.

Coupler split ratio configuration refer to:

<https://opneti.com/uploads/couplerconfig.mp4>