



## 1.5μm (2+1) x1 Pump and PM Signal Combiner

### Key Features

- High Power Transfer Efficiency
- Low signal insertion loss
- High PER
- High power package
- Freely selectable signal and pump wavelength
- Custom Configurations Available

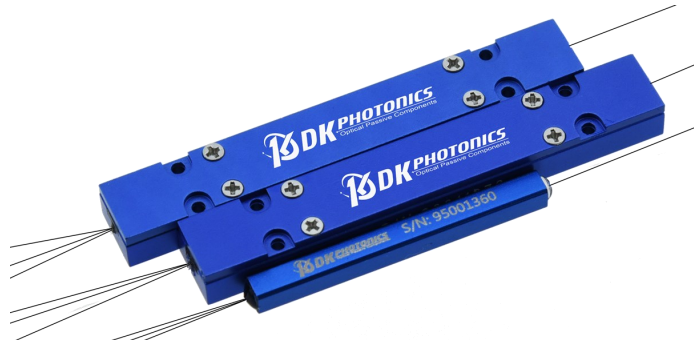
### Applications

- Pumping of fiber laser and amplifier
- Pumping of multi-core and large mode area fibers (LMA)
- Pump combiner for Nd-, Yb-, Er-, Ho-, Tm-fiber
- Industrial, Biomedical, Telecommunication
- Metrology, Life Science, Imaging, Quantum optics
- Gravitational wave detection, Atom cooling and trapping

DK Photonics' (2+1) x1 Multimode Pump and PM Signal Combiner is designed for high power applications. It features exceptional optical characteristics. These devices can combine N pump lasers and 1 signal channel into one fiber and create a high-power pump laser source, delivering the combined power for applications in industrial, military, medical and telecommunications markets. It has a heat sink package and a hole for temperature monitoring.

DK Photonics' Multimode Pump and PM Signal Combiners offer efficient power transfer for high power applications like direct diode materials processing and pump cascading with a maximum conservation of brightness. The Multimode Combiners can be designed to meet a wide range of power handling configurations, number of input fibers and adaptation to different fiber types.

We can produce Pump and PM Signal Combiner including (2+1) x1, (6+1) x1, (18+1) x1 and so on. Pump fiber, signal fiber and output fiber type and the configuration can be customized. If you do not see a Pump and Signal Combiner from the standard configurations that meet your needs, we welcome the opportunity to review your desired specification and quote a custom Pump and Signal Combiner. Requests for custom pump fiber, signal fiber, output fiber type and the configuration, the handling power or other specific needs will be readily addressed. DK Photonics can respond to custom requirements with short lead times.



### Performance Specifications (Typical Configuration)

| Parameters                         | Values                                |
|------------------------------------|---------------------------------------|
| Signal Operating Wavelengths       | 1530-1575nm                           |
| Pump Operating Wavelengths         | 780-1000nm                            |
| Number of Multimode Inputs         | 2                                     |
| Number of Signal Ports             | 1                                     |
| Number of Output Ports             | 1                                     |
| Pump Input Fiber                   | 105/125μm, NA0.22                     |
| Signal Input Fiber                 | PM-GDF-1550 (PM 9/130μm, NA0.12/0.46) |
| Output Fiber                       | PM-GDF-1550 (PM 9/130μm, NA0.12/0.46) |
| Min. Pump Efficiency               | 90%                                   |
| Max. Signal Insertion Loss         | 0.50dB                                |
| Min. Polarization Extinction Ratio | 18 dB                                 |
| Power per Multimode Input          | 50W                                   |
| Optical Return Loss - Pumps        | >35dB                                 |
| Optical Isolation                  | >20dB                                 |
| Max. M <sup>2</sup>                | 1.3                                   |
| Operating Temperature              | 0~75°C                                |
| Storage Temperature                | -40~85°C                              |

Remark:

\* Other configuration and higher power handling can be customized.

\* Other pump fibers 106.5/125μm, NA0.22, or 135/155μm, NA0.22 can be customized.

\* All combiners default with bare fiber, 0.8m length of pigtail, please contact us for special request.

## For more Info

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## 1.5μm (2+1) x1 Pump and PM Signal Combiner

### General Configuration:

| Type     | Signal Wave-length(nm) | Pump fiber   | Input signal fiber | Output fiber | Max. Signal IL | Min. PER(dB) | Min. Pump Effi. | Max. Power Handling |
|----------|------------------------|--------------|--------------------|--------------|----------------|--------------|-----------------|---------------------|
| (2+1) ×1 | 1530-1575              | 105/125 0.22 | PM1550-XP          | PM-GDF-1550  | 0.5dB          | 18dB         | 90%             | 50W/leg             |
| (2+1) ×1 | 1530-1575              | 105/125 0.22 | PM-GDF-1550        | PM-GDF-1550  | 0.5dB          | 18dB         | 90%             | 50W/leg             |
| (2+1) ×1 | 1530-1575              | 105/125 0.22 | PM12/130 DC        | PM12/130 DC  | 0.5dB          | 18dB         | 90%             | 50W/leg             |
| (2+1) ×1 | 1530-1575              | 105/125 0.22 | PM12/130 DC        | PM25/300 DC  | 0.7dB          | 16dB         | 95%             | 100W/leg            |

Remark:

- \* Other configuration and higher power handling can be customized.
- \* Other pump fibers 106.5/125μm, NA0.22, or 135/155μm, NA0.22 can be customized.
- \* All combiners default with bare fiber, 0.8m length of pigtail, please contacts us for special request.
- \* (1+1) x1 combiner also applies to the above specifications.

### Package Information:

| Package Type    | P1      | P2      | P3      | P4        |
|-----------------|---------|---------|---------|-----------|
| Dimensions (mm) | Φ4.0x60 | 65x12x7 | 80x12x8 | 100x15x10 |

\*Due to ongoing design improvements, the package size is subject to change. According to the different configuration, power handling, and fiber core diameter, we will choose the appropriate package size. Please contact DK Photonics for confirmation.

\*High power device package must be mounted onto heat sink (active cooling is suggested) with thermal paste.

### Order information P/N: PMPSC-A-B-C-D-E-F-G-H

When you inquire, please provide the correct P/N number according to our ordering information, and attach the appropriate description would be better. If need any connector, we do not recommend choosing a 250μm bare fiber pigtail.

| A                          | B                                 | C                 | D                                       | E                | F                | G                | H                                      |
|----------------------------|-----------------------------------|-------------------|---|------------------|------------------|------------------|--|
| Port                       | Pump Type                         | Signal Wavelength | Power per Multi-mode Input              | Pump Fiber       | Signal Fiber     | Output Fiber     | Fiber length                           |
| 11: (1+1)X1<br>21: (2+1)X1 | F:Forward pump<br>B:Backward pump | 15:1550nm         | 10:10W<br>25:25W<br>50:50W<br>XX: Other | XXX (fiber code) | XXX (fiber code) | XXX (fiber code) | 08:0.8m(default)<br>10:1.0m<br>20:2.0m |

**Part Number Example:** PMPSC-21-F-15-20-105/125/22-P12/130/20D-P12/130/20D-08

**Description:** (2 + 1) × 1 Pump and PM Signal Combiner, 1550nm signal wavelength, Forward pump, 20W per pump power, 105/125μm,0.22NA input pump fiber, PM12/130um,NA0.20/0.46 input signal and output fiber, 0.8m fiber length.

### Ordering Information for Custom Parts

If you need to customize other specifications, please provide detailed description for your requirement.