2+1x1 Multimode Power Combiner with Active PM Signal Feedthrough
Fused Fiber Tapered Fiber Bundle

Gooch & Housego proprietary manufacturing techniques allow the precise fusion of multimode pump fibers to a PM signal feed-through fiber with a passive input and an active PM dual clad output fiber. This provides high coupling efficiency over a wide pump wavelength range.

Inclusion of the splice between the passive and active signal fiber within the combiner housing removes the need for an external splice reducing potential back-scatter to the pump sources.

Available in a standard (2+1)x1 configuration, the combiner can be fabricated from a range of industry standard fibers for ease of splicing to commercially available laser diodes, signal and gain fibers. Custom variants using non-standard fibers are available on request.

Please contact the sales team for further information.

Key Features
• 1.5 µm & 1.0 µm PM signal fibers available
• All fiber construction
• High power design
• High coupling efficiency
• PM axis maintained
• Custom configurations available

Applications
• Cladding pumped fiber lasers
• Cladding pumped fiber amplifiers
• Telecoms
• Medical
• Industrial
• Defense
### Optical Specifications

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump Input fiber NA</td>
<td>0.15 or 0.22</td>
</tr>
<tr>
<td>Pump Input wavelength</td>
<td>780 - 1000 nm</td>
</tr>
<tr>
<td>Signal input wavelength</td>
<td>1530 - 1565 nm or 1030 - 1090 nm (1064 nm)</td>
</tr>
<tr>
<td>Pump (MM) transmission efficiency²</td>
<td>≥ 80% (typ. &gt; 90%)</td>
</tr>
<tr>
<td>Signal transmission efficiency³</td>
<td>≥ 90% (typ. &gt; 95%)</td>
</tr>
<tr>
<td>Signal PER (polarisation extinction ratio)³</td>
<td>≥17 dB (typ. &gt; 20 dB)</td>
</tr>
<tr>
<td>Return loss</td>
<td>≥ 40 dB</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>0 - +65°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 - +85°C</td>
</tr>
</tbody>
</table>

1. All specifications are for operation at room temperature.
2. MM Transmission efficiencies based on typical system mode fill conditions and 0.5 m pigtails. Measurements performed outside of active fiber absorption band, typically reported at 1120 nm.
3. Signal (feed-through) transmission efficiency and PER measured outside of active fiber absorption band, typically reported at 1310 nm.
## Order code

Order codes are comprised of a standard device prefix (e.g. TFB) followed by code letters or numbers which correspond to available options.

**Sample:** TFB-P50212X71 (2+1x1 TFB, PM 1550nm signal feedthrough, 2 pump 105/125 µm 0.22 NA fiber inputs, 1550 nm core active DCF output, high power housing, 1 m pigtails).

<table>
<thead>
<tr>
<th>Order code</th>
<th>①</th>
<th>②</th>
<th>③</th>
<th>④</th>
<th>⑤</th>
<th>⑥</th>
<th>⑦</th>
<th>⑧</th>
<th>⑨</th>
</tr>
</thead>
<tbody>
<tr>
<td>T F B P</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>X</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

1. **Signal wave length**
   - Code: 64
   - 1064 nm
   - Code: 50
   - 1550 nm

2. **Configuration (No. of pump inputs)**
   - Code: 2
   - 2 pump inputs

3. **Pump input fiber**
   - Code: 1
   - 105/125 µm

4. **Pump input fiber NA**
   - Code: 1
   - 0.15
   - Code: 2
   - 0.22

5. **Active DCF output fiber**
   - Code: X
   - Customer Specific

6. **Housing**
   - Code: 3
   - Regular high power ø3 mm x 65 mm (max)
   - Code: 7
   - Level 1 high power 5 mm² x 65 mm max

7. **Pigtail length**
   - Code: 0
   - 0.5 m
   - Code: 1
   - 1 m

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1 Signal wavelengths of 1064 nm or 1550 nm assume using passive single-clad input fiber equivalent to customer specified active DCF.
2 Active DCF specified by customer
3 Maximum housing lengths shown.
4 The 3 mm cylindrical package is recommended for pump powers up to 10 W per port. The high power L1 housing is suitable for pump powers up to 50 W per port. Adequate heat-sinking is required for high power operation. For more information please contact the G&H sales team.
5 Minimum pigtail lengths.

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For further information

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