# 915/1092nm WDM/Isolator/Tap PM Hybrid for Pulse Power

### **FEATURES**

#### **APPLICATIONS**

- Low Insertion Loss
- Epoxy-Free Optical Path
- High Reliability and Stability
- **Broadband Systems**
- Optical Amplifying Systems
- Telecommunication Networks

## **SPECIFICATIONS**

| Signal Wavelength Range λ2         nm         1092+-10           Pump Wavelength Range λ2         nm         915+-10           Excess Loss@23°C         Signal Channel@λ2         dB         ≤2.7         ≤4.2           Insertion Loss@23°C         Pump Channel@λ2         dB         ≤1.0         √0         14/-0.5%, 2+/-0.7%, 5+/-1.0%, 10%, 20%, 30%, 50%         √0         √0         14/-0.5%, 2+/-0.7%, 5+/-1.0%, 10%, 20%, 30%, 50%         √0   | Parameters                       |                            | Unit | Single Stage  | Dual Stage |
|--|----------------------------------|----------------------------|------|---|------------|
| Excess Loss@23°C         Signal Channel@λ1         dB         ≤2.7         ≤4.2           Insertion Loss@23°C         Pump Channel@λ2         dB         ≤1.0           Signal Tap Ratio         %         1+/-0.5%, 2+/-0.7%, 5+/-1.0%, 10%, 20%, 30%, 50%           Signal Isolation (23°C.         All SOP)         dB         ≥22         ≥40           Wavelength Isolation         Signal Channel@λ2         dB         ≥25         ≥40           Optical Return Loss         dB         ≥45         ≤45           Extinction Ratio         dB         ≥45         ≤45           Extinction Ratio         S Type         - Forward Pump, Only Slow Axis Working         F Type         - Forward Pump, Both Axis Working           Pump Direction         F Type         - Forward Pump, Only Slow Axis Working         PM850 Fiber, PM850 Fiber, PM850 Fiber (B)         10/125um PMDC Fiber (C). 15/130um PMDC Fiber (E)           Fiber Type         - Common and Signal Port         - Same Fiber, Corr. SM Fiber, PM850 Fiber, H/1780 Fiber, PM850 Fiber, H/1780 Fiber, PM850 Fiber, PM850 Fiber, H/1780 Fiber, PM850 Fiber, PM85   | Signal Wavelength Range λ1       |                            | nm   | 1092+/-10   |            |
| Insertion Loss@23°C  | Pump Wavelength Range λ2         |                            | nm   | 915+/-10  |            |
| Signal Tap Ratio         %         1+/-0.5%, 2+/-0.7%, 5+/-1.0%, 10%, 20%, 30%, 50%           Signal Isolation (23°C, All SOP)         dB         ≥22         ≥40           Wavelength Isolation (23°C, All SOP)         dB         ≥22         ≥40           Wavelength Isolation (23°C, All SOP)         dB         ≥25           Optical Return Loss         dB         ≥45           Extinction Ratio         dB         ≥45           Extinction Ratio         S Type         - Forward Pump, Only Slow Axis Working           Pump Direction         F Type         - Forward Pump, Only Slow Axis Working           B Type         - Backward Pump, Only Slow Axis Working           PM850 Fiber, PM980 Fiber or PM1060L Fiber (E)         10/125um PMDC Fiber (O), 15/130um PMDC Fiber (E)           10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W)         20/130um PMDC Fiber (O) or 25/250um PMDC Fiber (N)           PM980 Fiber, PM880 Fiber, PM880 Fiber, H1780 Fiber, PM890 Fiber (M) or H11060 Fiber (X)         Same Fiber, Corr. SM Fiber           Fiber Tensile Load         N         5           Max. Signal Average Power         mW         300           Max. Pump Average Power         W         0.3, 0.5, 1, 2, 3, 5, 10           Max. Peak Power for pulse         kW         0.1, 1, 2, 3, 5, 10, 15, 20           Operating Temperature </td <td>Excess Loss@23°C</td> <td>Signal Channel@λ1</td> <td>dB</td> <td>≤2.7</td> <td>≤4.2</td>  | Excess Loss@23°C                 | Signal Channel@λ1          | dB   | ≤2.7  | ≤4.2       |
| Signal Isolation (23°C. Wavelength Isolation         All SOP)         dB         ≥22         ≥40           Wavelength Isolation           Signal Channel@λ2         dB         ≥25           Pump Channel@λ1         dB         ≥12           Optical Return Loss         dB         ≥45           Extinction Ratio         dB         ≥45           Extinction Ratio         dB         ≥45           Pump Direction         F Type         -         Forward Pump, Only Slow Axis Working           Pump Direction         B Type         -         Forward Pump, Only Slow Axis Working           PM850 Fiber, PM980 Fiber only Slow Axis Working           PM850 Fiber, PM980 Fiber on PM1060L Fiber (E)           10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (W)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (W)           Pump Port (915nm)           Tap Port         -         Same Fiber, Corr. SM Fiber, PM880 Fiber, HI780 Fiber, PM980 Fiber (M) or HI1060 Fiber (X)           Tap Port         -         Same Fiber or Corr. SM Fiber           Max. Signal Average Power         M         0.3, 0.5, 1,  | Insertion Loss@23°C              | Pump Channel@λ2            | dB   | ≤1.0  |            |
| Wavelength Isolation         Signal Channel@λ2         dB         ≥25           Pump Channel@λ1         dB         ≥12           Optical Return Loss         dB         ≥45           Extinction Ratio         dB         ≥18           Pump Direction         S Type         -         Forward Pump, Only Slow Axis Working           Fiber Type         B Type         -         Backward Pump, Only Slow Axis Working           PM850 Fiber, PM980 Fiber or PM1060L Fiber (E)         10/125um PMDC Fiber (O), 15/130um PMDC Fiber (E)           20/130um PMDC Fiber (O), 15/130um PMDC Fiber (W)         20/130um PMDC Fiber (O), 15/130um PMDC Fiber (R)           Same Fiber, Corr. SM Fiber, PM850 Fiber, HI780 Fiber, PM980 Fiber, HI780 Fiber, PM980 Fiber (M) or HI1060 Fiber (X)           Tap Port         -         Same Fiber Corr. SM Fiber           Fiber Tensile Load         N         5           Max. Signal Average Power         mW         300           Max. Pump Average Power         W         0.3, 0.5, 1, 2, 3, 5, 10           Max. Peak Power for pulse         kW         0.1, 1, 2, 3, 5, 10, 15, 20           Operating Temperature         °C         -40~85           Stainless Steel Tube (SST)         mm         (Ø)5.5x40   | Signal Tap Ratio                 |                            | %    | 1+/-0.5%, 2+/-0.7%, 5+/-1.0%, 10%, 20%, 30%, 50%      |            |
| Wavelength Isolation         Pump Channel@λ1       dB       ≥12         Optical Return Loss       dB       ≥45         Extinction Ratio       dB       S Type       -       Forward Pump, Only Slow Axis Working         Pump Direction       F Type       -       Forward Pump, Only Slow Axis Working         B Type       -       Backward Pump, Only Slow Axis Working         PM850 Fiber, PM980 Fiber or PM1060L Fiber (E)       10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W)         20/130um PMDC Fiber, PM980 Fiber or PM1060L Fiber (W)       20/130um PMDC Fiber, PM850 Fiber, PM850 Fiber, HI780 Fiber, PM980 Fiber, PM850 Fiber, PM980 Fiber (M) or HI1060 Fiber (X)         Fiber Tensile Load       N       5         Max. Signal Average Power       mW       300         Max. Pump Average Power       W       0.3, 0.5, 1, 2, 3, 5, 10         Max. Peak Power for pulse       kW       0.1, 1, 2, 3, 5, 10, 15, 20         Operating Temperature       °C       0~50         Stainless Steel Tube (SST)       mm       (Ø)5.5x40  | Signal Isolation (23°C, All SOP) |                            | dB   | ≥22   | ≥40        |
| Pump Channel@λ1 dB ≥12  Optical Return Loss dB ≥45  Extinction Ratio dB ≥18  Pump Direction F Type - Forward Pump, Only Slow Axis Working F Type - Forward Pump, Both Axis Working B Type - Backward Pump, Only Slow Axis Working PM850 Fiber, PM980 Fiber or PM1060L Fiber (€)  Common and Signal Port - Backward Pump, Only Slow Axis Working PM850 Fiber, PM980 Fiber or PM1060L Fiber (€)  10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W) 20/130um PMDC Fiber (O) or 25/250um PMDC Fiber (R)  Pump Port (915nm) - Same Fiber, Corr. SM Fiber, PM850 Fiber, H1780 Fiber, PM980 Fiber (M) or H11060 Fiber (X)  Tap Port - Same Fiber or Corr. SM Fiber  Fiber Tensile Load N 5  Max. Signal Average Power mW 300  Max. Pump Average Power W 0.3, 0.5, 1, 2, 3, 5, 10  Max. Peak Power for pulse kW 0.1, 1, 2, 3, 5, 10, 15, 20  Operating Temperature °C 0~50  Storage Temperature °C - 40~85  Stainless Steel Tube (SST) mm (Ø)5.5x40   | Wavelength Isolation             | Signal Channel@λ2          | dB   | ≥25   |            |
| Extinction RatiodB≥18S Type-Forward Pump, Only Slow Axis WorkingPump DirectionF Type-Forward Pump, Both Axis WorkingB Type-Backward Pump, Only Slow Axis WorkingPM850 Fiber, PM980 Fiber or PM1060L Fiber (E)10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W)20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)Pump Port (915nm)-Same Fiber, Corr. SM Fiber, PM850 Fiber, HI780 Fiber,PM980 Fiber (M) or HI1060 Fiber (X)Tap Port-Same Fiber or Corr. SM FiberFiber Tensile LoadN5Max. Signal Average PowermW300Max. Pump Average PowerW0.3, 0.5, 1, 2, 3, 5, 10Max. Peak Power for pulsekW0.1, 1, 2, 3, 5, 10, 15, 20Operating Temperature°C0~50Stainless Steel Tube (SST)mm(Ø)5.5x40   |                                  | Pump Channel@λ1            | dB   | ≥12   |            |
| Pump Direction   F Type   - Forward Pump, Only Slow Axis Working     F Type   - Forward Pump, Both Axis Working     B Type   - Backward Pump, Only Slow Axis Working     F Type   - Backward Pump, Only Slow Axis Working     PM850 Fiber, PM980 Fiber or PM1060L Fiber (E)     10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W)     20/130um PMDC Fiber (O) or 25/250um PMDC Fiber (R)     20/130um PMDC Fiber (O) or 25/250um PMDC Fiber (R)     20/130um PMDC Fiber (O) or 25/250um PMDC Fiber (R)     PM980 Fiber, Corr. SM Fiber, PM850 Fiber, HI780 Fiber, PM980 Fiber (M) or HI1060 Fiber (X)     PM980 Fiber (M) or HI1060 Fiber (X)     Fiber Tensile Load   N   5     Max. Signal Average Power   mW   300     Max. Pump Average Power   W   0.3, 0.5, 1, 2, 3, 5, 10     Max. Peak Power for pulse   kW   0.1, 1, 2, 3, 5, 10, 15, 20     Operating Temperature   °C   0~50     Storage Temperature   °C   -40~85     Package Dimension   Stainless Steel Tube (SST)   mm   (∅)5.5x40   | Optical Return Loss              |                            | dB   | ≥45   |            |
| Pump Direction         F Type         -         Forward Pump, Both Axis Working           B Type         -         Backward Pump, Only Slow Axis Working           Fiber Type         Common and Signal Port         -         Display (PMB50 Fiber, PM980 Fiber or PM1060L Fiber (E)           Fiber Type         -         Common and Signal Port         -         10/125um PMDC Fiber (Q) or 25/250um PMDC Fiber (W)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)           20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)  | Extinction Ratio                 |                            | dB   | ≥18   |            |
| B Type   | Pump Direction                   | S Type                     | -    | Forward Pump, Only Slow Axis Working                  |            |
| Common and Signal Port   -   |                                  | F Type                     | -    | Forward Pump, Both Axis Working                       |            |
| Common and Signal Port   -   10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W)   20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)   |                                  | В Туре                     | -    | Backward Pump, Only Slow Axis Working                 |            |
| Pump Port (915nm)   -   Same Fiber, Corr. SM Fiber, PM850 Fiber, HI780 Fiber, PM980 Fiber (M) or HI1060 Fiber (X)  | Fiber Type                       | Common and Signal Port     | -    | PM850 Fiber, PM980 Fiber or PM1060L Fiber (E)         |            |
| Pump Port (915nm)  |                                  |                            |      | 10/125um PMDC Fiber (O), 15/130um PMDC Fiber (W)      |            |
| Pump Port (915nm)  Pump Port (915nm)  Tap Port  Tap Port  Fiber Tensile Load  Max. Signal Average Power  Max. Pump Average Power  Max. Peak Power for pulse  Operating Temperature  Same Fiber, Corr. SM Fiber, PM850 Fiber, HI780 Fiber, PM980 Fiber, HI780 Fiber, PM980 Fiber, HI780 Fiber, PM980 |                                  |                            |      | 20/130um PMDC Fiber (Q) or 25/250um PMDC Fiber (R)    |            |
| Tap Port  Tap Port  Tap Port  Tap Port  Fiber Tensile Load  N  Same Fiber or Corr. SM Fiber  Max. Signal Average Power  Max. Pump Average Power  W  O.3, 0.5, 1, 2, 3, 5, 10  Max. Peak Power for pulse  Operating Temperature  Storage Temperature  Stainless Steel Tube (SST)  Package Dimension  Package Dimension  Package Dimension  Stainless Steel Tube (SST)  Tap Port  - Same Fiber or Corr. SM Fiber  0.3, 0.5, 1, 2, 3, 5, 10  0.3, 0.5, 1, 2, 3, 5, 10  0.3, 0.5, 1, 2, 3, 5, 10  0.4, 2, 3, 5, 10, 15, 20  0~50  (Ø)5.5x40  |                                  | Pump Port (915nm)          | -    | Same Fiber, Corr. SM Fiber, PM850 Fiber, HI780 Fiber, |            |
| Fiber Tensile Load  Max. Signal Average Power  Max. Pump Average Power  Max. Peak Power for pulse  Operating Temperature  Storage Temperature  Storage Dimension  N  5  MW  300  0.3, 0.5, 1, 2, 3, 5, 10  N  0.1, 1, 2, 3, 5, 10  Overating Temperature  Overating Temperature  Overating Temperature  Stainless Steel Tube (SST)  Mm  (Ø)5.5x40  |                                  |                            |      | PM980 Fiber (M) or HI1060 Fiber (X)                   |            |
| Max. Signal Average Power         mW         300           Max. Pump Average Power         W         0.3, 0.5, 1, 2, 3, 5, 10           Max. Peak Power for pulse         kW         0.1, 1, 2, 3, 5, 10, 15, 20           Operating Temperature         °C         0~50           Storage Temperature         °C         -40~85           Package Dimension         Stainless Steel Tube (SST)         mm         (Ø)5.5x40   |                                  | Tap Port                   | -    | Same Fiber or Corr. SM Fiber                          |            |
| Max. Pump Average Power         W         0.3, 0.5, 1, 2, 3, 5, 10           Max. Peak Power for pulse         kW         0.1, 1, 2, 3, 5, 10, 15, 20           Operating Temperature         °C         0~50           Storage Temperature         °C         -40~85           Package Dimension         Stainless Steel Tube (SST)         mm         (Ø)5.5x40  | Fiber Tensile Load               |                            | N    | 5   |            |
| Max. Peak Power for pulse kW 0.1, 1, 2, 3, 5, 10, 15, 20  Operating Temperature °C 0~50  Storage Temperature °C -40~85  Package Dimension Stainless Steel Tube (SST) mm (Ø)5.5x40  | Max. Signal Average Power        |                            | mW   | 300   |            |
| Operating Temperature  °C  0~50  Storage Temperature  °C  -40~85  Package Dimension  Stainless Steel Tube (SST) mm (Ø)5.5x40   | Max. Pump Average Power          |                            | W    | 0.3, 0.5, 1, 2, 3, 5, 10                              |            |
| Storage Temperature  °C  -40~85  Stainless Steel Tube (SST) mm (Ø)5.5x40   | Max. Peak Power for pulse        |                            | kW   | 0.1, 1, 2, 3, 5, 10, 15, 20                           |            |
| Package Dimension  Stainless Steel Tube (SST) mm (Ø)5.5x40   | Operating Temperature            |                            | °C   | 0~50  |            |
| Package Dimension ————————————————————————————————————   | Storage Temperature              |                            | °C   | -40~85  |            |
| Metal Box mm (L)120x(W)12x(H)10  | Package Dimension                | Stainless Steel Tube (SST) | mm   | (Ø)5.5x40   |            |
|  |                                  | Metal Box                  | mm   | (L)120x(W)12x(H)10                                    |            |

Note: 1. Specifications are for device without connectors; Specifications may change without notice.

2. To add connectors, IL is 0.7dB higher, RL is 5dB lower, ER is 2dB Lower, Connector key is aligned to slow axis.

ROHS Compliant

- 3. Only guarantee 1W continuous wave (CW) power thru testing for connectors added.
- 4. Devices for higher optical power or with other type fiber or consigned fiber are also available; Devices can only work in the core of Double Cladding (DC) Fiber, Cladding Power must be stripped before connecting the device.

#### **ORDERING INFORMATION (PN)**

**FPHT-9109-C C NN - C** P NN NN -CC/CCC - H NN - (NN) -(C) Stage Pump Type Tap Ratio Pump Fiber Tap Port Fiber Average Power Peak Power Pump Power Package Fiber Type Fiber Sleeve Fiber Length Connector Type S= Single S= S Type 01= 1% P=PM850 Fiber P=Same Fiber 03=300mW 01=100W 05=500mW M=Metal Box 2=PM850Fiber N=Without Connector 05=0.5m B= Bare fiber D=Dual F= F Type 05=5% Y=Same Fiber S=Corr. SM Fiber 1= 1kW 1=W Blank for SST H=PM980 Fiber 10=1.0m FC/APC=FC/APC Connector L= Loose Tube B= B Type 10=10% S=Corr. SM Fiber 10= 10kW 10=W LC/PC=LC/PC Connector E=PM1060L Fiber 15=1.5m 2= 2mm Cable **50=50**% H=HI780 Fiber SC/UPC=SC/UPC Co 20=20kW *Blank* for 300mW R=25/250 PMDC Fiber 3= 3mm Cable 20=2.0m



