



## MPO/MTP HYBRID PATCHCORD

Lightem offers a full range of MPO/MTP multifiber products, ranging from patchcords, fanout hybrid cable, truck cable, pigtails and cassette. The MPO/MTP, with the push-on/pull-off insertion release mechanism, provides consistent and repeatable interconnections up to 48 fibers for today's 40G and 100G network. MPO/MTP hybrid cable are custom-built with various type of connectors and special configuration. All connectors are factory polished and terminated with full testing before delivery.

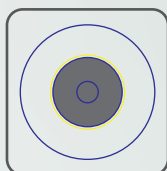
### Features

- Up to 24 fibers MTP/MPO per connector
- Halogen free (LSZH) and low smoke to IEC 61034 and EN 50286
- Flame retardant to IEC 60332-3C and EN 50266-2-4
- Non corrosive to IEC 60754-2 (FRNC) and EN 50267
- A pre-terminated, easy-to-install, high fiber density cabling solution
- Pre-installed grip option supports up to 450N loads.
- Singlemode, OM3, OM4 and OM5 fibers
- MTP / MPO connector complying ANSI HIPPI-6400 and IEC 61754-7 and TIA/EIA-604

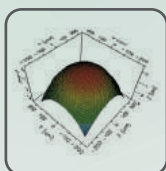
### Applications

- Equipment Interconnections
- Telecommunications networks
- Broadband/CATV networks
- Data communications networks, including high-bandwidth equipment
- Interconnections for parallel optical transmitters and receivers

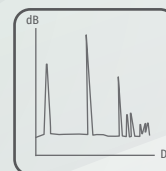
### 100% Lightem Assurance



Connector Surface Inspection



Geometric Inspection



Optical Inspection

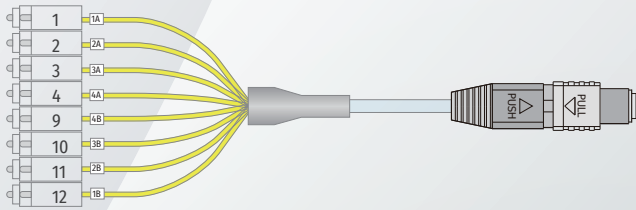
### Termination Specifications

| Parameter                     | MPO / MTP Values      |          |         |         |         |          |    |
|-------------------------------|-----------------------|----------|---------|---------|---------|----------|----|
|                               | Standard              |          |         | MM      | Premium |          | MM |
|                               | SM                    |          | UPC     |         | APC     | MM       |    |
| Insertion loss (each channel) | ≤0.75 dB              | ≤0.75 dB | ≤0.5 dB | ≤0.35dB | ≤0.35dB | ≤0.35 dB |    |
| Return loss (each channel)    | ≤-40 dB               | ≤-55 dB  | /       | ≤-40dB  | ≤-55dB  | /        |    |
| Test Wavelength               | 1310nm                |          |         | 850nm   |         |          |    |
| Ferrule                       | Composite             |          |         |         |         |          |    |
| Connector housing             | Composite             |          |         |         |         |          |    |
| Durability                    | ≤0.2 dB at 200 cycles |          |         |         |         |          |    |
| Operating Temperature         | -20° C ~ +70° C       |          |         |         |         |          |    |
| Storage Temperature           | -20° C ~ +70° C       |          |         |         |         |          |    |

| Parameter                     | SC/LC                 |         |         |
|-------------------------------|-----------------------|---------|---------|
|                               | Standard              |         | MM      |
|                               | SM                    |         |         |
| Insertion loss (each channel) | UPC                   | APC     | <-25 dB |
| Return loss (each channel)    | <-50 dB               | <-65 dB | /       |
| Test Wavelength               | 1310nm                |         |         |
| Ferrule                       | Composite             |         |         |
| Connector housing             | Composite             |         |         |
| Durability                    | ≤0.2 dB at 200 cycles |         |         |
| Operating Temperature         | -40° C ~ +85° C       |         |         |

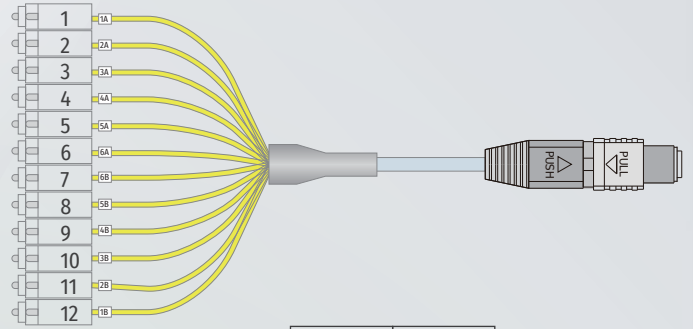
# Product MPO-LC/SC Diagram

12A - 12 Fibers, 5-8 channels unuse



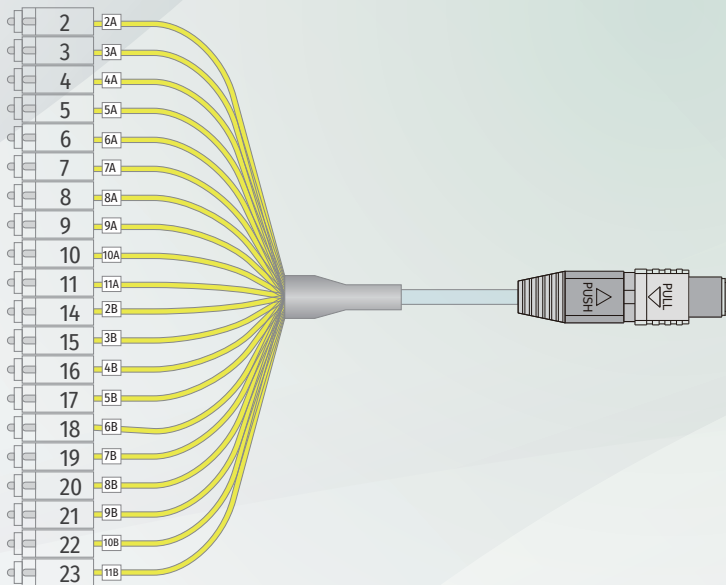
| Fiber | Marker |
|-------|--------|
| 1     | 1A     |
| 2     | 2A     |
| 3     | 3A     |
| 4     | 4A     |
| 5     | N/A    |
| 6     | N/A    |
| 7     | N/A    |
| 8     | N/A    |
| 9     | 4B     |
| 10    | 3B     |
| 11    | 2B     |
| 12    | 1B     |

12F - 12 fibers all channels use

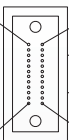


| Fiber | Marker |
|-------|--------|
| 1     | 1A     |
| 2     | 2A     |
| 3     | 3A     |
| 4     | 4A     |
| 5     | 5A     |
| 6     | 6A     |
| 7     | 6B     |
| 8     | 5B     |
| 9     | 4B     |
| 10    | 3B     |
| 11    | 2B     |
| 12    | 1B     |

24A - 24 fibers, 1, 12, 13, 24 channels unuse

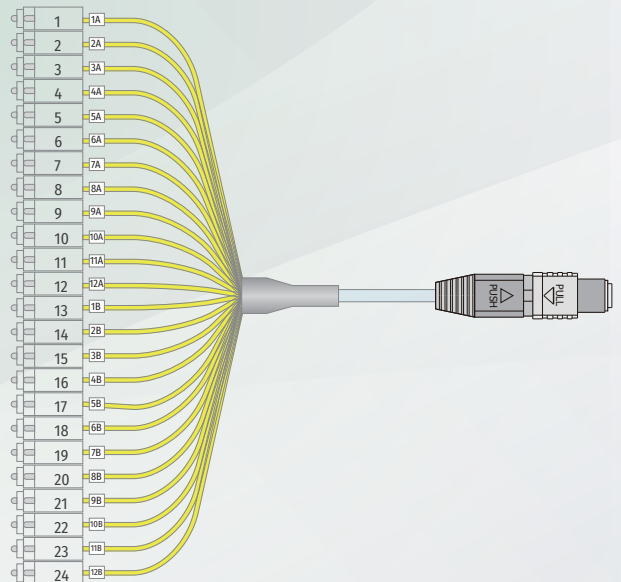


| Marker | Fiber |
|--------|-------|
| N/A    | N/A   |
| 2B     | 14    |
| 3B     | 15    |
| 4B     | 16    |
| 5B     | 17    |
| 6B     | 18    |
| 7B     | 19    |
| 8B     | 20    |
| 9B     | 21    |
| 10B    | 22    |
| 11B    | 23    |
| N/A    | N/A   |

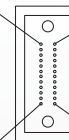


| Fiber | Marker |
|-------|--------|
| N/A   | N/A    |
| 2     | 2A     |
| 3     | 3A     |
| 4     | 4A     |
| 5     | 5A     |
| 6     | 6A     |
| 7     | 7A     |
| 8     | 8A     |
| 9     | 9A     |
| 10    | 10A    |
| 11    | 11A    |
| N/A   | N/A    |

24F - 24 fibers all channels use



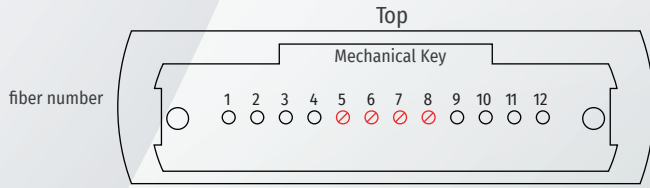
| Marker | Fiber |
|--------|-------|
| 1B     | 13    |
| 2B     | 14    |
| 3B     | 15    |
| 4B     | 16    |
| 5B     | 17    |
| 6B     | 18    |
| 7B     | 19    |
| 8B     | 20    |
| 9B     | 21    |
| 10B    | 22    |
| 11B    | 23    |
| 12B    | 24    |



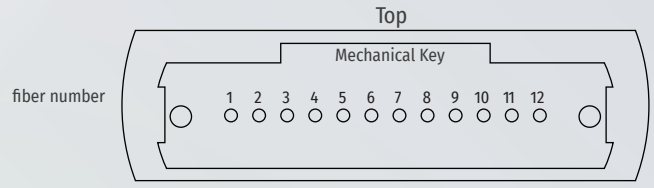
| Fiber | Marker |
|-------|--------|
| 1     | 1A     |
| 2     | 2A     |
| 3     | 3A     |
| 4     | 4A     |
| 5     | 5A     |
| 6     | 6A     |
| 7     | 7A     |
| 8     | 8A     |
| 9     | 9A     |
| 10    | 10A    |
| 11    | 11A    |
| 12    | 12A    |

## MPO Connector Pinouts

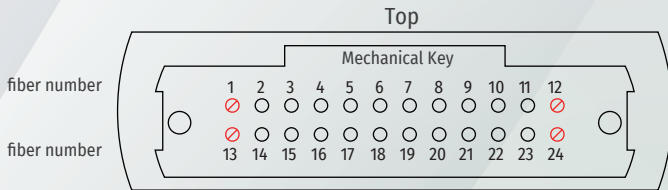
12A- 12 fibers, 5-8 channels unuse



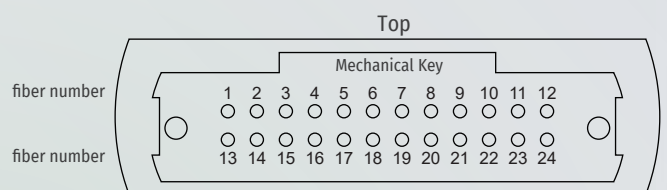
12F - 12 fibers all channels use



24A - 24 fibers, 1, 12, 13, 24 channels unuse



24F - 24 fibers all channels use



- Used
- ⊗ Not used

## Fiber Specifications (Singlemode)

| Characteristics                           |              | G652D                           | G657A1                          | G657A2                          |
|---|--------------|---------------------------------|---------------------------------|---------------------------------|
| <b>Optical Characteristics</b>            |              |                                 |                                 |                                 |
| Attenuation                               | 1310nm       | ≤ 0.40 dB/km                    | ≤ 0.40 dB/km                    | ≤ 0.40 dB/km                    |
|   | 1383nm*      | ≤ 0.34 dB/km                    | ≤ 0.35 dB/km                    | ≤ 0.35 dB/km                    |
|   | 1460nm*      | -                               | ≤ 0.25 dB/km                    | ≤ 0.25 dB/km                    |
|   | 1490nm*      | -                               | -                               | ≤ 0.23 dB/km                    |
|   | 1550nm       | ≤ 0.30 dB/km                    | ≤ 0.30 dB/km                    | ≤ 0.30 dB/km                    |
|   | 1625nm*      | ≤ 0.23 dB/km                    | ≤ 0.23 dB/km                    | ≤ 0.23 dB/km                    |
| Attenuation vs. Wavelength                | 1285-1330nm* | ≤ 0.03 dB/km                    | ≤ 0.03 dB/km                    | ≤ 0.03 dB/km                    |
| Max. α difference                         | 1525-1575nm* | ≤ 0.02 dB/km                    | ≤ 0.02 dB/km                    | ≤ 0.02 dB/km                    |
| Dispersion coefficient                    | 1285-1340nm  | ≥ -3.4 ≤ 3.4 ps/(nm · km)       | ≥ -3.4 ≤ 3.4 ps/(nm · km)       | -                               |
|   | 1550nm       | ≤ 18 ps/(nm · km)               | ≤ 18 ps/(nm · km)               | -                               |
|   | 1625nm       | ≤ 22 ps/(nm · km)               | ≤ 22 ps/(nm · km)               | -                               |
| Zero dispersion wavelength                |              | 1312±12 nm                      | 1300-1324 nm                    | 1300-1324 nm                    |
| Zero dispersion slope                     |              | ≤ 0.091 ps/nm <sup>2</sup> · km | ≤ 0.092 ps/nm <sup>2</sup> · km | ≤ 0.092 ps/nm <sup>2</sup> · km |
| Typical value                             |              | 0.086 ps/nm <sup>2</sup> · km   | 0.086 ps/nm <sup>2</sup> · km   | 0.04 ps/nm <sup>2</sup> · km    |
| <b>PMD</b>                                |              |                                 |                                 |                                 |
| Maximum Individual Fibre                  |              | ≤ 0.1 ps/√km                    | ≤ 0.1 ps/√km                    | ≤ 0.1 ps/√km                    |
| Link Design Value(M=20,Q=0.01%)           |              | ≤ 0.06 ps/√km                   | ≤ 0.06 ps/√km                   | ≤ 0.06 ps/√km                   |
| Typical value                             |              | 0.04 ps/√km                     | 0.04 ps/√km                     | 0.04 ps/√km                     |
| Cable cutoff wavelength λ <sub>cc</sub>   |              | ≤ 1260 um                       | ≤ 1260 nm                       | ≤ 1260 nm                       |
| Mode field diameter(MFD)                  | 1310nm       | 8.7-9.5 um                      | 8.4-9.2um                       | 8.4-9.2 um                      |
|   | 1550nm       | 9.9-10.9 um                     | 9.3-10.3 um                     | 9.3-10.3 um                     |
| Effective group index of refraction(Neff) | 1310nm       | 1.466                           | 1.466                           | 1.466                           |
|   | 1550nm       | 1.467                           | 1.467                           | 1.467                           |
| Point discontinuities                     | 1310nm       | ≤ 0.05 dB                       | ≤ 0.05 dB                       | ≤ 0.05 dB                       |
|   | 1550nm       | ≤ 0.05 dB                       | ≤ 0.05 dB                       | ≤ 0.05 dB                       |
| <b>Geometrical Characteristics</b>        |              |                                 |                                 |                                 |
| Cladding diameter                         |              | 125.0±0.7 um                    | 125.0±0.7 um                    | 125.0±0.7 um                    |
| Cladding non-circularity                  |              | ≤ 1.0 %                         | ≤ 0.7 %                         | ≤ 0.7 %                         |
| Coating diameter                          |              | 245.0±7 um                      | 245.0±5 um                      | 245.0±5 um                      |
| Coating-cladding concentricity error      |              | ≤ 12.0 um                       | ≤ 12.0 um                       | ≤ 12.0 um                       |
| Coating non-circularity                   |              | ≤ 6.0 %                         | ≤ 6.0 %                         | ≤ 6.0 %                         |
| Core-cladding concentricity error         |              | ≤ 0.6 um                        | ≤ 0.5 um                        | ≤ 0.5 um                        |
| Curl(radius)                              |              | ≥ 4 m                           | ≥ 4 m                           | ≥ 4 m                           |
| Delivery length                           |              | 2.1 to 50.4 km/reel             | 2.1 to 50.4 km/reel             | 2.1 to 50.4 km/keel             |

\*Attenuation loss of barefiber

# Fiber Specifications (Multimode)

| Characteristics                            |                                  | OM3/OM4   | OM5  |
|--|----------------------------------|---|--|
| Geometry Characteristics                   |                                  |   |  |
| Core Diameter                              |                                  | 50±2.5 μm   | 50±2.5 μm  |
| Core Non-circularity                       |                                  | ≤5.0 %  | ≤5.0 %   |
| Cladding Diameter                          |                                  | 125.0±1.0 μm  | 125.050±1.0 μm   |
| Cladding Non-circularity                   |                                  | ≤0.6 %  | ≤0.6 %   |
| Coating Diameter                           |                                  | 245±7 μm  | 245±7 μm   |
| Coating/Cladding Concentricity Error       |                                  | ≤10.0 μm  | ≤10.0 μm   |
| Coating Non-circularity                    |                                  | ≤6.0 %  | ≤6.0 %   |
| Core/Cladding Concentricity Error          |                                  | ≤1.0 μm   | ≤1.0 μm  |
| Delivery Length                            |                                  | up to 8.8 km/ reel                                      | up to 8.8 km/ reel                                       |
| Optical Characteristics                    |                                  |   |  |
| Attenuation                                |                                  |   |  |
|  | 850nm                            | ≤3.5 dB/km  | ≤3.5 dB/km   |
|  | 953nm*                           | -   | ≤1.7 dB/km   |
|  | 1300nm                           | ≤1.5 dB/km  | ≤1.5 dB/km   |
| Overfilled Modal Bandwidth                 |                                  |   |  |
|  | 850nm                            | ≥1500/≥3500 MHz · km                                    | ≥3500 MHz · km   |
|  | 953nm                            | -   | ≥1850 MHz · km   |
|  | 1300nm                           | ≥500/≥500 MHz · km                                      | ≥500 MHz · km  |
| Effective Modal Bandwidth                  |                                  |   |  |
|  | 850nm                            | ≥2000/≥4700 MHz · km                                    | ≥4700 MHz · km   |
|  | 953nm                            | -   | ≥2470 MHz · km   |
| 10Gb/sWDM                                  |                                  | -100/150 m  | 150 m  |
| 40Gb/sWDM                                  |                                  | 300/500 m   | 440 m  |
| 40GBASE-SR4 / 100GBASE SR10                |                                  | 850nm   | 1000/1100 m  |
| 10GBASE-SR                                 |                                  | 850nm   | -  |
| 1000BASE-SR                                |                                  | 850nm   | -  |
| DMD Specification                          |                                  | -   | -  |
| Numerical Aperture                         |                                  | 0.200±0.015   | 0.200±0.015  |
| Group Refractive index                     |                                  | 1.482   | 1.482  |
|  |                                  | 1.477   | 1.477  |
| Zero Dispersion Wavelength, λ <sub>0</sub> |                                  | 1295-1340 nm  | 1297-1328 nm   |
| Zero Dispersion Slope, S <sub>0</sub>      |                                  | -   | ≤4(-103)/(840λ√840) <sup>4</sup> ps/nm <sup>2</sup> · km |
|  |                                  | -   | -  |
| Zero Dispersion Slope, S <sub>0</sub>      |                                  |   |  |
|  | 1295nm ≤ λ <sub>0</sub> ≤ 1310nm | ≤0.105 ps/nm <sup>2</sup> · km                          | -  |
|  | 1310nm ≤ λ <sub>0</sub> ≤ 1340nm | -   | -  |
|  | 1320nm ≤ λ <sub>0</sub> ≤ 1348nm | ≤0.000375(1590-λ <sub>0</sub> ) ps/nm <sup>2</sup> · km | -  |
|  | 1348nm ≤ λ <sub>0</sub> ≤ 1365nm | -   | -  |

\*Attenuation loss of barefiber

## Ordering Information

