

tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP[®] Male/48x LC APC duplex 9/125 μ OS2



tSML - tde Semi Modular Link

tSML is a modular developed cabling system, which consists of two core components: module and trunk cable. The system components, preterminated with connectors and tested ex works, facilitate very fast installation of both twisted pair and fiber-optic cables. Ready-made trunk cables, providing a high number of pairs or fibers, can simply be plugged together using patch panels. Up to 96x LC duplex and/or 48 x RJ45 of haven can be accommodated in such a way on 1U. At the heart of the System are MPO/MTP[®] and Telco connectors, with which 12 optical fibers or 24 copper pairs can be connected simultaneously. Fiber-optic and twisted pair modules can be combined on 1U within a panel without difficulty.

The tSML HD module can be used only in conjunction with the tSML HD patch cord.



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Technical Data

| | |
|----------------|---|
| Box | stainless steel |
| Front plate | stainless steel |
| Entry | 8 x MPO/MTP [®] Male adapter (green) back |
| Exit | 48 x LC APC duplex adapter (green) front |
| Dimensions | 19", 0.5 U, depth: 11 cm |
| Identification | silkscreen at the front |
| | 19" mounting set enclosed |
| | QS-Managementsystem ISO 9001, ISO 14001 and TL 9000 |

tSML - FO Modules 19"/ 0.5U

| | |
|-------------|------------------------|
| Box | stainless steel |
| Front plate | stainless steel |
| Dimensions | 19", 0.5U, depth 11 cm |

FO Adapters

| | |
|--------------|-------------------------|
| Type | LC Quad |
| Application | Singlemode OS2 APC |
| Design | with flange |
| Footprint | SC Duplex |
| Color | Green |
| Material | Plastic |
| Sleeve | Zirconia Straight Split |
| Shutter | -- |
| Manufacturer | tde |

FO Adapters

| | |
|-----------------|--------------------------|
| Type | MPO/MTP [®] |
| Application | Singlemode OS2 APC |
| Design | without Flange |
| Connector style | SC Simplex |
| Key Orientation | Type A, Key up/down |
| Color | Green |
| Material | Plastic |
| Sleeve | -- |
| Shutter | -- |
| Standards | IEC 61754-7 TIA 604-5 |
| Manufacturer | US Conec |

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FO Connectors

The end faces of the connectors are optimized by means of Lasercleaving and machine polish. The MPO/MTP[®] plug has a defined fiber height of 1 - 3.5 μ m. The max. adjacent fiber height difference is 0.2 μ m and for all fibers 0.3 μ m.

Connector

| | |
|-------------------|---|
| Type | MPO/MTP [®] APC Male Push Pull Locking with Elite Pins (green) |
| Ferrule | 12 Fiber SM Elite [®] ferrule, PPS |
| Boot colour | Black |
| Temperature range | -40°C bis +75°C |
| Manufacturer | tde/US Conec |

Optical Performance

| Fiber | Type | Wavelength | Insertion loss typ. | Insertion loss max. | Return loss min. |
|-----------------|--------------------------|----------------|---------------------|---------------------|------------------|
| 9/125 μ OS2 | MPO/MTP [®] APC | 1310 / 1550 nm | ≤ 0.10 dB | 0.20 dB | 75 dB |

FO Connectors

| | |
|-----------------------|--|
| Connector Type | LC APC Unibody Simplex |
| Housing | Plastic, Green |
| Ferrule | Zirconia Straight Split, Spring-loaded Axially |
| Ferrule Hole | 125.5 μ |
| Ferrule Concentricity | ≤ 0.6 μ |
| Mating Cycles | 500 |
| Operating Temperature | -40°C up to +75°C |
| Strain Relief to | 100 N |
| Manufacturer | tde |

Optical performance

| Fiber | Type | Wavelength | Insertion loss typ. | Insertion loss max. | Return loss min. |
|-------------|--------|----------------|---------------------|---------------------|------------------|
| 9/125 μ | LC APC | 1310 / 1550 nm | ≤ 0.10 dB | 0.18 dB | 75 dB |

FO Fiber

| | |
|----------------------------|---|
| Type | Corning SMF-28e+ [®] 09/125 μ OS2 G.652.D singlemode fiber |
| Maximum Attenuation | At 1310 nm max. 0.33 - 0.35 dB/km At 1383 ± 3 nm max. 0.31 - 0.35 dB/km At 1490 nm max. 0.21 - 0.24 dB/km At 1550 nm max. 0.19 - 0.20 dB/km At 1625 nm max. 0.20 - 0.23 dB/km |
| Attenuation vs. Wavelength | Range: 1285 - 1330 nm; Ref. λ : 1310 nm; Max. Difference: 0.03 dB/km Range: 1525 - 1575 nm; Ref. λ : 1550 nm; Max. Difference: 0.02 dB/km |

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| | |
|---|--|
| Macrobend Loss | Mandrel Diameter:32mm; Number of Turns: 1; Wavelength: 1550nm; Induced Attenuation: ≤0.03 dB Mandrel Diameter:50mm; Number of Turns: 100; Wavelength: 1310nm; Induced Attenuation: ≤0.03 dB Mandrel Diameter:50mm; Number of Turns: 100; Wavelength: 1550nm; Induced Attenuation: ≤0.03 dB Mandrel Diameter:60mm; Number of Turns: 100; Wavelength: 1625nm; Induced Attenuation: ≤0.03 dB |
| Point Discontinuity | Wavelength: 1310 nm; Point Discontinuity: ≤ 0.05 dB Wavelength: 1550 nm; Point Discontinuity: ≤ 0.05 dB |
| Cable Cutoff Wavelength (λ_{ccf}) | $\lambda_{ccf} \leq 1260$ nm |
| Mode-Field Diameter | At 1310 nm = 9.2 ± 0.4 μm At 1550 nm = 10.4 ± 0.5 μm |
| Dispersion | At 1550 nm = ≤ 18.0 [ps/(nm*km)] At 1625 nm = ≤ 22.0 [ps/(nm*km)] |
| | Zero Dispersion Wavelength (λ_0): 1310 nm $\leq \lambda_0 \leq$ 1324 nm Zero Dispersion Slope (S_0): ≤ 0.092 ps/(nm ² *km) |
| Polarization Mode Dispersion (PMD) | PMD Link Design Value = ≤ 0.06 ps/√km Maximum Individual Fiber = ≤ 0.1 ps/√km |
| Norm | ITU-T Recommendation G.652 (Tables A, B, C, and D) IEC Specifications 60793-2-50 Type B1.3 TIA/EIA 492-CAAB Telcordia Generic Requirements GR-20-CORE ISO 11801 OS2 |

Dimensional Specifications

| | |
|--------------------------------|-----------------------------|
| Fiber Curl | ≥ 4.0 m radius of curvature |
| Cladding Diameter | 125.0 ± 0.7 μm |
| Core-Clad Concentricity | ≤ 0.5 μm |
| Cladding Non-Circularity | ≤ 0.7% |
| Coating Diameter | 242 ± 5 μm |
| Coating-Cladding Concentricity | < 12 μm |

Environmental Specifications

| Environmental Test | Test Condition | Induced Attenuation 1310 nm, 1550 nm & 1625 nm |
|------------------------------|-----------------------------|--|
| Temperature Dependence | -60°C to +85°C | ≤ 0.05 |
| Temperature Humidity Cycling | -10°C to +85°C up to 98% RH | ≤ 0.05 |
| Water Immersion | 23°C ± 2°C | ≤ 0.05 |
| Heat Aging | 85°C ± 2°C | ≤ 0.05 |
| Operating Temperature Range | -60°C to +85°C | |

Mechanical Specifications

| | |
|------------|--|
| Proof Test | The entire fiber length is subjected to a tensile stress ≥ 100 kpsi (0.7 GPa). |
| Length | Fiber lengths available up to 63.0 km/spool. |

Performance Characterizations

| | |
|--------------------|--------|
| Core Diameter | 8.2 μm |
| Numerical Aperture | 0.14 |

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| | |
|---|--|
| Zero Dispersion Wavelength (λ_0) | 1317 nm |
| Zero Dispersion Slope (S_0) | 0.088 ps/(nm ² *km) |
| Effective Group Index of Refraction | 1310 nm: 1.4676 1550 nm: 1.4682 |
| Fatigue Resistance Parameter (nd) | 20 |
| Coating Strip Force | Dry: 0.6 lbs (3N) Wet: 14 days room temperature: 0.6 lbs (3N) |
| Rayleigh Backscatter Coefficient (for 1 ns Pulse Width) | 1310 nm: -77 dB 1550 nm: -82 dB |

Product variants & accessories

| Art.-No. | Description |
|---------------------|--|
| TSML-M48LCAD/MPP09E | tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP [®] Male/48x LC APC duplex 9/125 μ OS2 |
| TSML-M48LCD/MPP09E | tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP [®] Male/48x LC duplex 9/125 μ OS2 |
| TSML-M48LCD/MPP50G3 | tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP [®] Male/48x LC duplex 50/125 μ OM3 |
| TSML-M48LCD/MPP50G4 | tSML - HD FO Module 19"/0.5U straight 8x MPO/MTP [®] Male/48x LC duplex 50/125 μ OM4 |