Fiber Cloud

Singlemode Fiber



Fibercloud optical fibers are manufactured using the advanced PCVD and OVD process. The optical fiber is coated with a double layer UV curable acryiate,type DLPC9.
Fibers show extremely refined refractive index profile control, excellent geometrical performance, low attenuation, high resistance to micro-bending,etc.



Low Loss Single-mode G.652.D optical Fiber 9/125μm

- G.652.D Single-mode Fiber supports Ethernet, Internet Protocol (IP), Asychronous Transfer Mode (ATM), Synchronous Distribution Network (SDH) and Wavelength Division Multiplexing (WDM).
- Entire wavelength window from 1260 nm to 1625 nm.
- Meet the demand of extended long distance transmission.



Bending Insensitive Single-mode G.657.A1 Fiber 9/125μm

- Short pitch cables for special application
- High performance optical network operating in O-E-S-C-L band
- High speed optical routes in buildings (FTTx)
- Cables with small bend radius



Bending Insensitive Single-mode G.657.A2 Fiber 9/125μm

- All types of fiber cables with different structures
- High performance optical network operating in O-E-S-C-L band
- High speed optical routes for Fiber-to-the-Home networks
- Cables with extreme low bending requirements
- Small-sized fiber cable and optical component



Ultra Bending Insensitive Single-mode G.657.B3 Fiber 9/125μm

- All types of fibre patch cord with different structures
- High speed optical routes for Fiber-To-The-Home(FTTH) networks
- Cables with extreme low bending requirements
- Small-sized optical component



Ultra Low Loss and Large Effective Area G.654 Fiber 9/125μm

- Lower attenuation level, long distance transmission
- The best choice for long-distance land transmission and submarine optical cables
- Excellent resistance to hydrogen damage and aging
- Support 40G/100G/400G systems



Low Loss Single-mode G.652D Optical Fiber

Low Loss Single-mode G.652D optical Fiber is designed specially for optical transmission systems*which operates over the entire wavelength window from 1260 nm to 1625 nm. By suppressing the water peak that occurs near 1383 nm in conventional Single-mode fibre due to hydroxyl (OH^-) ions absorption, G.652D Fibre is able to open E-band (1360 -1460nm) for operation, and consequently provides 100 nm more usable wavelengths. G.652D optical Fibre is effectively optimized for much lower attenuation level across the entire wavelength window from 1260 nm up to 1625 nm.

Applications

Thanks to its broad usable optical spectrum and outstanding attenuation performance, Low Loss Single-mode G.652.D Fiber is the optimum choice that supports various applications such as Ethernet, Internet Protocol (IP), Asychronous Transfer Mode (ATM), Synchronous Distribution Network (SDH) and Wavelength Division Multiplexing(WDM). Low Loss Singlemode G.652.D Fiber provides wider bandwidth and much lower signal attenuation for backbone, metropolitan area and access networks.

Norms

Low Loss Singlemode G.652.D fiber complies with or even exceeds the ITU-T Recommendation G.652.D and the IEC 60793-2-50 type B1.3 Optical Fiber Specification.

Characteristics

- Designed for operation over the full optical spectrum from 1260-1625 nm, and hence the transmission capacity is increased
- Much lower attenuation over the full optical spectrum from 1260nm to 1625 nm, which meet the demand of extended long distance transmission
- Outstanding optical performance supporting high-speed transmission technologies such as DWDM and CWDM
- Being compatible with existing 1310 nm equipment
- Good protection and excellent strip force stability
- Accurate geometrical parameters that insure low splicing loss and high splicing efficiency

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Characteristics		Conditions	Specified values	Units
Optical Characteristics				
Attenuation		1310nm	⩽0.32	[dB/km]
		1383nm(after H_2-aging)	⩽0.31	[dB/km]
		1550nm	⩽0.18	[dB/km]
		1625nm	⩽0.20	[dB/km]
Attenuation vs. Wavelength Max. α difference		1285-1330nm, in reference to 1310nm	⩽0.03	[dB/km]
		1525-1575nm, in reference to 1550nm	⩽0.02	[dB/km]
Dispersion Coefficient		1285-1340nm	-3.5 to 3.5	[ps/(nm·km)]
		1550nm	⩽18	[ps/(nm·km)]
		1625nm	⩽22	[ps/(nm·km)]
Zero Dispersion Wavelength (λ_0)		--	1300- 1324	[nm]
Zero Dispersion Slope (S_0)		--	⩽0.092	[ps/(nm²·km)]
Typical Value		--	0.086	[ps/(nm²·km)]
PMD	Maximum Individual Fibre	--	⩽0.1	[ps/$\sqrt{km}$]
	Link Design Value (M=20, Q=0.01%)	--	⩽0.06	[ps/$\sqrt{km}$]
	Typical Value	--	0.04	[ps/$\sqrt{km}$]
Cable Cutoff Wavelength (λ_{cc})		--	⩽1260	[nm]
Mode Field Diameter (MFD)		1310nm	8.7- 9.5	[μm]
		1550nm	9.8- 10.8	[μm]
Effective Group Index of Refraction (N_{eff})		1310nm	1.466	--
		1550nm	1.467	--
Point Discontinuities		1310nm	⩽0.05	[dB]
		1550nm	⩽0.05	[dB]
Geometrical Characteristics				
Cladding Diameter		--	125.0±0.7	[μm]
Cladding Non-Circularity		--	⩽1.0	[%]
Coating Diameter		--	235- 245	[μm]
Coating-Cladding Concentricity Error		--	⩽12.0	[μm]
Coating Non-Circularity		--	⩽6.0	[%]
Core-Cladding Concentricity Error		--	⩽0.6	[μm]
Curl(radius)		--	⩾4	[m]
Delivery Length		--	Up to 50.4	[km/reel]
Environmental Characteristics		**1310nm, 1550nm & 1625nm**		
Temperature Dependence Induced Attenuation		-60°C to +85°C	⩽0.05	[dB/km]
Temperature-Humidity Cycling Induced Attenuation		-10°C to +85°C, 98% RH	⩽0.05	[dB/km]
Watersoak Dependence Induced Attenuation		23°C, for 30 days	⩽0.05	[dB/km]
Damp Heat Dependence Induced Attenuation		85°C and 85% RH, for 30 days	⩽0.05	[dB/km]
Dry Heat Aging		85°C, for 30 days	⩽0.05	[dB/km]
Mechanical Specifications				
Proof Test		--	⩾9.0	[N]
		--	⩾1.0	[%]
		--	⩾100	[kpsi]
Macro-bend Induced Loss	100 Turns Around a Mandrel of 30 mm Radius	1625nm	⩽0.05	[dB]
	100 Turns Around a Mandrel of 25 mm Radius	1310nm and 1550nm	⩽0.05	[dB]
	1 Turn Around a Mandrel of 16 mm Radius	1550nm	⩽0.05	[dB]
Coating Strip Force		typical average force	1.5	[N]
		peak force	1.3- 8.9	[N]
Dynamic Fatigue Parameter (n_d)		--	⩾20	--



Bending Insensitive Single-mode G.657.A1 Fiber

Bending insensitive single-mode fiber provides good resistance to macro-bending. It has low macro-bending sensitivity and low water-peak level. It is comprehensively optimized for use in O-E-S-C-L band (1260 -1625 nm). It offers good resistance to additional losses due to low macro-bending in the 1625 nm wavelength region. This not only supports L-band applications but also allows for easy installation without excessive care when storing the fiber, for example, in splicing cassettes. For cable use inside buildings, the fiber supports installation with small cable bending radii and compact organizers.

Applications

- Short pitch cables for special application
- High performance optical network operating in O-E-S-C-L band
- High speed optical routes in buildings (FTTx)
- Cables with small bend radius

Norms

Bending insensitive single mode G.657A1 fiber meets or exceeds the ITU-T Recommendation G.652.D/G.657.A1 including the IEC 60793-2-50 type B1.3/B6.a1 Optical Fiber Specification.

Characteristics

- Low attenuation satisfying the operation demand in O-E-S-C-L band
- Good bending loss resistance at short radius bends
- Low bending loss for highly demanding cable designs including ribbons
- Low PMD satisfying high bit-rate and long distance transmission requirements
- Accurate geometrical parameters that insure low splicing loss and high splicing efficiency

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Characteristics		Conditions	Specified values	Units
Optical Characteristics				
Attenuation		1310nm	≤0.35	[dB/km]
		1383nm(after H_2-aging)	≤0.35	[dB/km]
		1460nm	≤0.25	[dB/km]
		1550nm	≤0.21	[dB/km]
		1625nm	≤0.23	[dB/km]
Attenuation vs. Wavelength Max. α difference		1285-1330nm, in reference to 1310nm	≤0.03	[dB/km]
		1525-1575nm, in reference to 1550nm	≤0.02	[dB/km]
Dispersion Coefficient		1285-1340nm	-3.5 to 3.5	[ps/(nm·km)]
		1550nm	≤18	[ps/(nm·km)]
		1625nm	≤22	[ps/(nm·km)]
Zero Dispersion Wavelength (λ_0)		--	1300-1324	[nm]
Zero Dispersion Slope (S_0)		--	≤0.092	[ps/(nm²·km)]
Typical Value		--	0.086	[ps/(nm²·km)]
PMD	Maximum Individual Fibre	--	≤0.1	[ps/$\sqrt{km}$]
	Link Design Value (M=20, Q=0.01%)	--	≤0.06	[ps/$\sqrt{km}$]
	Typical Value	--	0.04	[ps/$\sqrt{km}$]
Cable Cutoff Wavelength (λ_{cc})		--	≤1260	[nm]
Mode Field Diameter (MFD)		1310nm	8.4-9.2	[μm]
		1550nm	9.3-10.3	[μm]
Effective Group Index of Refraction (N_{eff})		1310nm	1.466	--
		1550nm	1.467	--
Point Discontinuities		1310nm	≤0.05	[dB]
		1550nm	≤0.05	[dB]
Geometrical Characteristics				
Cladding Diameter		--	125.0±0.7	[μm]
Cladding Non-Circularity		--	≤0.7	[%]
Coating Diameter		--	235-245	[μm]
Coating-Cladding Concentricity Error		--	≤12.0	[μm]
Coating Non-Circularity		--	≤6.0	[%]
Core-Cladding Concentricity Error		--	≤0.5	[μm]
Curl(radius)		--	≥4	[m]
Delivery Length		--	Up to 50.4	[km/reel]
Environmental Characteristics		**1310nm, 1550nm & 1625nm**		
Temperature Dependence Induced Attenuation		-60°C to +85°C	≤0.05	[dB/km]
Temperature-Humidity Cycling Induced Attenuation		-10°C to +85°C, 98% RH	≤0.05	[dB/km]
Watersoak Dependence Induced Attenuation		23°C, for 30 days	≤0.05	[dB/km]
Damp Heat Dependence Induced Attenuation		85°C and 85% RH, for 30 days	≤0.05	[dB/km]
Dry Heat Aging		85°C, for 30 days	≤0.05	[dB/km]
Mechanical Specifications				
Proof Test		--	≥9.0	[N]
		--	≥1.0	[%]
		--	≥100	[kpsi]
Macro-bend Induced Loss	10 Turns Around a Mandrel of 15 mm Radius	1550nm	≤0.25	[dB]
	10 Turns Around a Mandrel of 15 mm Radius	1625nm	≤1.0	[dB]
	1 Turn Around a Mandrel of 10 mm Radius	1550nm	≤0.75	[dB]
	1 Turn Around a Mandrel of 10 mm Radius	1625nm	≤1.5	[dB]
Coating Strip Force		typical average force	1.5	[N]
		peak force	1.3-8.9	[N]
Dynamic Fatigue Parameter (n_d)		--	≥20	--



Bending Insensitive Single-mode G.657A2 Fiber

Bending insensitive single-mode G.657A2 fiber combines two attractive features: excellent low macro-bending sensitivity and low water-peak level. It is comprehensively optimized for use in O-E-S-C-L band (1260 -1625 nm). G.657A2's bending insensitive feature not only guarantees L-band applications but also allows for easy installation without excessive care when storing the fibre especially for FTTH networks application. Bending radii in fiber guidance ports can be reduced as well as minimum bend radii in wall and corner mountings.

Applications

- All types of fibre cables with different structures
- High performance optical network operating in O-E-S-C-L band
- High speed optical routes for Fiber-to-the-Home networks
- Cables with extreme low bending requirements
- Small-sized fiber cable and optical component

Norms

Bending insensitive single mode G.657A2 fiber meets or exceeds the ITU-T Recommendation G.652.D/G.657.A1/G.657.A2/G.657.B2 including the IEC 60793-2-50 type B1.3/B6.a1/B6.a2/B6.b2 Optical Fiber Specification.

Characteristics

- Extremely high bending loss resistance in the 7.5 to 15 mm bending radius range
- Full compatibility with all G.652 fibers for any applications
- Low attenuation satisfying the operation demand in O-E-S-C-L band
- Low PMD satisfying high bit-rate and long distance transmission requirements
- Low bending loss for highly demanding cable designs including ribbons
- Accurate geometrical parameters that insure low splicing loss and high splicing efficiency
- High n_d-value satisfying long operational lifetime in minimum bend radius

Fiber Cloud

Characteristics		Conditions	Specified values	Units
Optical Characteristics				
Attenuation		1310nm	≤0.35	[dB/km]
		1383nm(after H_2-aging)	≤0.35	[dB/km]
		1460nm	≤0.25	[dB/km]
		1490nm	≤0.23	[dB/km]
		1550nm	≤0.21	[dB/km]
		1625nm	≤0.23	[dB/km]
Attenuation vs. Wavelength Max. α difference		1285-1330nm, in reference to 1310nm	≤0.03	[dB/km]
		1525-1575nm, in reference to 1550nm	≤0.02	[dB/km]
Zero Dispersion Wavelength (λ_0)		--	1300-1324	[nm]
Zero Dispersion Slope (S_0)		--	≤0.092	[ps/(nm²·km)]
PMD	Maximum Individual Fibre	--	≤0.1	[ps/$\sqrt{km}$]
	Link Design Value (M=20, Q=0.01%)	--	≤0.06	[ps/$\sqrt{km}$]
	Typical Value	--	0.04	[ps/$\sqrt{km}$]
Cable Cutoff Wavelength (λ_{cc})		--	≤1260	[nm]
Mode Field Diameter (MFD)		1310nm	8.4-9.2	[μm]
		1550nm	9.3-10.3	[μm]
Effective Group Index of Refraction (N_{eff})		1310nm	1.466	--
		1550nm	1.467	--
Point Discontinuities		1310nm	≤0.05	[dB]
		1550nm	≤0.05	[dB]
Geometrical Characteristics				
Cladding Diameter		--	125.0±0.7	[μm]
Cladding Non-Circularity		--	≤0.7	[%]
Coating Diameter		--	235-245	[μm]
Coating-Cladding Concentricity Error		--	≤12.0	[μm]
Coating Non-Circularity		--	≤6.0	[%]
Core-Cladding Concentricity Error		--	≤0.5	[μm]
Curl(radius)		--	≥4	[m]
Delivery Length		--	Up to 50.4	[km/reel]
Environmental Characteristics		**1310nm, 1550nm & 1625nm**		
Temperature Dependence Induced Attenuation		-60°C to +85°C	≤0.05	[dB/km]
Temperature-Humidity Cycling Induced Attenuation		-10°C to +85°C, 98% RH	≤0.05	[dB/km]
Watersoak Dependence Induced Attenuation		23°C, for 30 days	≤0.05	[dB/km]
Damp Heat Dependence Induced Attenuation		85°C and 85% RH, for 30 days	≤0.05	[dB/km]
Dry Heat Aging		85°C, for 30 days	≤0.05	[dB/km]
Mechanical Specifications				
Proof Test		--	≥9.0	[N]
		--	≥1.0	[%]
		--	≥100	[kpsi]
Macro-bend Induced Loss	10 Turns Around a Mandrel of 15 mm Radius	1550nm	≤0.03	[dB]
	10 Turns Around a Mandrel of 15 mm Radius	1625nm	≤0.1	[dB]
	1 Turn Around a Mandrel of 10 mm Radius	1550nm	≤0.1	[dB]
	1 Turn Around a Mandrel of 10 mm Radius	1625nm	≤0.2	[dB]
	1 Turn Around a Mandrel of 7.5 mm Radius	1550nm	≤0.5	[dB]
	1 Turn Around a Mandrel of 7.5 mm Radius	1625nm	≤1.0	[dB]
Coating Strip Force		typical average force	1.5	[N]
		peak force	1.3-8.9	[N]
Dynamic Fatigue Parameter (n_d)		--	≥20	--



Ultra Bending Insensitive Single-mode G.657.B3 Fiber

Ultra fiber is designed specifically for Fiber-To-The-Home (FTTH), enterprise network and any other applications where ultra low bending-loss at small bending radii is needed.

Applications

- All types of fiber patch cord with different structures
- High speed optical routes for Fiber-To-The-Home(FTTH) networks
- Cables with extreme low bending requirements
- Small-sized optical component

Norms

Ultra fiber's macrobending performance and optical performance are superior to those recommended in ITU-T G.657.B3 and IEC 60793-2-50 B6.b3. Down to 5 mm bending radius, Ultra can meet the complex installation conditions in MDU and FTTH, such as wall corner, stapling, high load tension, etc.

Characteristics

- Superior to standard ITU-T G.657.B3 fiber, bending radius down to as small as 5mm and full compatibility with all G.652.D fibers
- Low attenuation satisfying the operation demand in O-E-S-C-L band
- Low bending loss for highly demanding cable designs including ribbons
- Accurate geometrical parameters and large MFD which insure low splicing loss and high splicing efficiency
- High and value satisfying long service life in minimum bend radius

Fiber Cloud

Characteristics		Conditions	Specified values	Units
Optical Characteristics				
Attenuation		1310nm	≤0.35	[dB/km]
		1383nm (after H_2-aging)	≤0.35	[dB/km]
		1550nm	≤0.21	[dB/km]
		1625nm	≤0.23	[dB/km]
Attenuation vs. Wavelength Max. α difference		1285-1330nm, in reference to 1310nm	≤0.03	[dB/km]
		1525-1575nm, in reference to 1550nm	≤0.02	[dB/km]
Zero Dispersion Wavelength (λ_0)		--	1300-1324	[nm]
Zero Dispersion Slope (S_0)		--	≤0.092	[ps/(nm²·km)]
PMD	Maximum Individual Fibre	--	≤0.1	[ps/$\sqrt{km}$]
	Link Design Value (M=20, Q=0.01%)	--	≤0.06	[ps/$\sqrt{km}$]
	Typical Value	--	0.04	[ps/$\sqrt{km}$]
Cable Cutoff Wavelength (λ_{cc})		--	≤1260	[nm]
Mode Field Diameter (MFD)		1310nm	8.2-9.0	[μm]
		1550nm	9.1-10.1	[μm]
Effective Group Index of Refraction (N_{eff})		1310nm	1.468	--
		1550nm	1.469	--
Point Discontinuities		1310nm	≤0.05	[dB]
		1550nm	≤0.05	[dB]
Geometrical Characteristics				
Cladding Diameter		--	125.0±0.7	[μm]
Cladding Non-Circularity		--	≤0.7	[%]
Coating Diameter		--	235-245	[μm]
Coating-Cladding Concentricity Error		--	≤12.0	[μm]
Coating Non-Circularity		--	≤6.0	[%]
Core-Cladding Concentricity Error		--	≤0.5	[μm]
Curl(radius)		--	≥4	[m]
Delivery Length		--	Up to 25.2	[km/reel]
Environmental Characteristics				
Temperature Dependence Induced Attenuation		-60°C to +85°C	≤0.05	[dB/km]
Temperature-Humidity Cycling Induced Attenuation		-10°C to +85°C, 98% RH	≤0.05	[dB/km]
Watersoak Dependence Induced Attenuation		23°C, for 30 days	≤0.05	[dB/km]
Damp Heat Dependence Induced Attenuation		85°C and 85% RH, for 30 days	≤0.05	[dB/km]
Dry Heat Aging		85°C, for 30 days	≤0.05	[dB/km]
Mechanical Specifications				
Proof Test		--	≥9.0	[N]
		--	≥1.0	[%]
		--	≥100	[kpsi]
Macro-bend Induced Loss	1 Turn Around a Mandrel of 10 mm Radius	1550nm	≤0.03	[dB]
	1 Turn Around a Mandrel of 10 mm Radius	1625nm	≤0.1	[dB]
	1 Turn Around a Mandrel of 7.5 mm Radius	1550nm	≤0.08	[dB]
	1 Turn Around a Mandrel of 7.5 mm Radius	1625nm	≤0.25	[dB]
	1 Turns Around a Mandrel of 5 mm Radius	1550nm	≤0.15	[dB]
	1 Turns Around a Mandrel of 5 mm Radius	1625nm	≤0.45	[dB]
Coating Strip Force		typical average force	1.5	[N]
		peak force	1.3-8.9	[N]
Dynamic Fatigue Parameter (n_d)		--	≥20	--



Ultra Low Loss and Large Effective Area G.654 Fiber

For the next generation optical transmission network, lower attenuation or larger effective area of the fiber can help the system meet 3U (Ultra high speed, Ultra largecapacity, Ultra long-haul) features. Now G654 Fiber can deliver you larger effective area and lower attenuation.

Applications

- Larger effective area reduces nonlinear effect and enables higher signal power launched into thetransmission system.
- Enable higher transmission speeds with more wavelengths over ultra long-haul distances.
- Lower attenuation level which meets the demand of extended long distance transmission.
- Reduce number of repeaters and minimize CAPEX and OPEX
- Lower bending induced loss to meet complicated deployment conditions and cable structures.

Norms

G654 fiber complies with or exceeds the ITU-T G.654.B/E recommendation and IEC 60793-2-50 B1.2 specification.

How to calculate the contribution of larger effective area and lower attenuation?

Based on the formula of OSNR, lower attenuation and larger effective area will increase OSNR of optical transmission system. And FOM (Figure of Merit) is established to calculate the contribution of effective area and attenuation. As shown in the table, G654 ultra low loss and large effective area fiber can providegreater performance improvement than ultra low loss fiber below, or low loss and large effective fiber.

$$OSNR_{out}=\frac{P_{ch}}{S\cdot P_{ch}\cdot NF\cdot N_{Spans}}$$

P_{ch}: $\infty A_{eff}/n_2$; $S\cdot P_{ch}\cdot NF\cdot N_{Spans}$: ∞; attenuation α (dB/km)

$$\text{Fiber FOM(dB)}=10\log\left[\frac{A_{eff}/n_{2ref}}{A_{effref}\cdot n_2}\right]-[\alpha(\text{dB/km})-\alpha_{ref}(\text{dB/km})]\cdot L-10\log\left[\frac{L_{eff}}{L_{effref}}\right]$$

Increase A_{eff} | Lower Att. | Increase L_{eff}

$$L_{eff}=\frac{1-e^{-\alpha T}}{\alpha}$$

$$\alpha=\frac{\ln 10}{10}\alpha_{dB/km}$$

Fiber Type	Att.	Aeff.	FOM
SSMF(Ref.)	0.2	80	/
LL	0.18	80	1.6
ULL	0.17	80	2.3
ULL	0.15	80	3.8
LL-LAF	0.18	130	4.9
ULL-LAF	0.16	110	5.8
ULL-LAF	0.16	130	6.4

Fiber Cloud

Characteristics		Conditions	Specified values		Units
Optical Specifications					
Nominal Effective Area		1550nm	110	125	[μm²]
Mode Field Diameter		1550nm	11.4-12.2	12.0-13.0	[μm]
Attenuation		1550nm	⩽0.17		[dB/km]
		1625nm	⩽0.20		[dB/km]
Attenuation vs. Wavelength Max. α Difference		1525-1575nm, in reference to 1550nm	⩽0.02		[dB/km]
		1550-1625nm, in reference to 1550nm	⩽0.03		[dB/km]
Dispersion Coefficient		1550nm	⩽23		[ps/nm · km]
		1625nm	⩽27		[ps/nm · km]
Dispersion Slope		1550nm	0.050- 0.070		[ps/nm² · km]
PMD	Maximum Individual Fibre	--	⩽0.1		[ps/√km]
	Link Design Value (M=20, Q=0.01%)	--	⩽0.06		[ps/√km]
	Typical Value	--	0.04		[ps/√km]
Cable Cutoff Wavelength (λ_{cc})		--	⩽1520		[nm]
Effective Group Index of Refraction		1550nm	1.463	1.465	--
Point Discontinuities		1550nm	⩽0.05		[dB]
Geometrical Specifications					
Cladding Diameter		--	125.0±1.0		[μm]
Cladding Non-Circularity		--	⩽1.0		[%]
Coating Diameter		--	235- 255		[μm]
Coating-Cladding Concentricity		--	⩽12		[μm]
Coating Non-Circularity		--	⩽6		[%]
Core-Cladding Concentricity		--	⩽0.6		[μm]
Fibre Curl (Radius)		--	⩾4		[m]
Delivery Length[1]		--	Up to 25.2		[km/reel]
Environmental Specifications			**@1550nm & 1625nm**		
Temperature Dependence		-60°C to +85°C	⩽0.05		[dB/km]
Temperature-Humidity Cycling		-10°C to +85°C, 98% RH	⩽0.05		[dB/km]
Water Immersion		23°C, for 30 days	⩽0.05		[dB/km]
Damp Heat		85°C , 85% RH, for 30 days	⩽0.05		[dB/km]
Heat Aging		85°C, 30 days	⩽0.05		[dB/km]
Mechanical Specificationss					
Proof Test[2]		--	⩾9.0		[N]
		--	⩾1.0		[%]
		--	⩾100		[kpsi]
Macro-bend Induced Loss	100 Turns Around a Mandrel of 30 mm Radius	1550nm	⩽0.10		[dB]
		1625nm	⩽0.10		[dB]
Coating Strip Force		typical average force	1.5		[N]
		peak force	1.3- 8.9		[N]
Dynamic Fatigue Parameter (n_d)		--	⩾20		--

Remark: 1.Other delivery lengths are available. 2.Higher proof test level is available.

Fiber Cloud

Multimode Fiber



Multimode fiber is a common choice to achieve 10 Gbit/s speed over distances required by LAN enterprise and datacenter applications, There are several kinds of multimode fiber types avalable for high-speed network installationsand each with a different reach and data-rate capability. With so many options, it can be tough to select the mossuitable multimode fiber. Fibercloud provides OM1, OM2, OM3, OM4 and OM5 optical fiber for you to choose.

OM1

First type of fiber with LED light source 62.5/125μm

- Local area networks (LAN).
- Video, voice and data services.
- Gigabit Ethernet using laser or LED light sources.
- 500m(@850) in 1Gigabit
- 1000m(@1300) in 1Gigabit.

OM2

Common MFF used for premises applications 50/125μm

- Local area networks (LAN)
- Video, voice and data services
- Gigabit Ethernet using laser or LED light sources
- Very low macro-bendingsensitivity
- 750m(@850) in 1G networks
- 2000m(@1300) in 1G networks

OM3

Laser-optimized MMF for 10G Ethernet networks 50/125μm

- Data centers
- Data storage networks
- High-performance computing centers
- Office centers
- Local area networks (LAN)
- 1&10&40&100&400Gb/s Ethernet
- 300m in 10G networks
- 140m in 40/100G networks

OM4

Popular MMF that enhances system cost benefts 50/125μm

- Data centers
- Data storage networks
- High-performance computing centers
- Office centers
- Local area networks (LAN)
- 1&10&40&100&400Gb/s Ethernet
- 550m in 10G
- 170m in 40/100G
- Single&double-wavelength transmission from 400Gb/s to 1.6Tb/s

OM5

Improvement of the previous multimode fiber types 50/125μm

- Ultra High Speed Data Centers
- Data storage networks
- High-performance computing centers
- Office centers
- Local area networks (LAN)
- Support SWDM technology
- 440m in 40G
- 150m in 100G
- Single&Multi-wavelength transmission from 40Gb/s to 400Gb/s

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OM1(62.5/125μm) Mutimode Fiber



Fibercloud OM1(62.5/25um) multimode fiber complies with or exceeds ISO/IEC 11801-1 OM1 specification, IEC 60793-2-10 A1-OM1 specification, and TIA-492AAAF A1-OM1 specification.

Characteristics	Conditions	Specified values	Units
Geometry Characteristics			
Core Diameter	--	62.5±2.5	[μm]
Core Non-Circularity	--	⩽5.0	[%]
Cladding Diameter	--	125.0±1.0	[μm]
Cladding Non-Circularity	--	⩽1.0	[%]
Coating Diameter	--	245±7	[μm]
Coating/Cladding Concentricity Error	--	⩽10.0	[μm]
Coating Non-Circularity	--	⩽6.0	[%]
Core/Cladding Concentricity Error	--	⩽1.5	[μm]
Delivery Length	--	up to 17.6	[km/reel]
Optical Characteristics			
Attenuation	850nm	⩽2.7	[dB/km]
	1300nm	⩽0.6	[dB/km]
Overfilled Modal Bandwidth	850nm	⩾200	[MHz·km]
	1300nm	⩾500	[MHz·km]
Numerical Aperture	--	0.275±0.015	--
Group Refractive Index	850nm	1.496	--
	1300nm	1.491	--
Zero Dispersion Wavelength, λ_0	--	1320~1365	[nm]
Zero Dispersion Slope, S_0	1320nm⩽ λ_0 ⩽1348nm	⩽0.11	[ps/(nm²·km)]
	1348nm⩽ λ_0 ⩽1365nm	⩽0.001(1458-λ_0)	[ps/(nm²·km)]
Macrobending Loss	--	--	--
100 Turns @ 37.5 mm Radius	850nm	⩽0.50	[dB]
	1300nm	⩽0.50	[dB]
Backscatter Characteristics	**1300nm**		
Step (Mean of Bidirectional Measurement)	--	⩽0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	⩽0.10	[dB]
Attenuation Uniformity	--	⩽0.10	[dB/km]
Environmental Characteristics	**850nm & 1300nm**		
Temperature Cycling	-60°C to 85°C	⩽0.10	[dB/km]
Temperature-Humidity Cycling	-10°C to 85°C, 4% to 98% RH	⩽0.10	[dB/km]
Water Immersion	23°C, 30 days	⩽0.10	[dB/km]
Dry Heat	85°C, 30 days	⩽0.10	[dB/km]
Damp Heat	85°C, 85% RH, 30 days	⩽0.10	[dB/km]
Mechanical Specification			
Proof Test	--	⩾9.0	[N]
	--	⩾1.0	[%]
	--	⩾100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	⩾1.3, ⩽8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter (n_d, typical)	--	20	--

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OM2(50/125μm) Bend Insensitive Multimode Fiber

Fibercloud OM2(50/125um) Bend Insensitive Multimode Fiber complies with or exceeds ISO/IEC 11801-1 OM2 specification, IEC 60793-2-10 A1-OM2 specification, and TIA-492AAAF.

Characteristics	Conditions	Specified values	Units
Geometry Characteristics			
Core Diameter	--	50±2.5	[μm]
Core Non-Circularity	--	≤5.0	[%]
Cladding Diameter	--	125.0±1.0	[μm]
Cladding Non-Circularity	--	≤1.0	[%]
Coating Diameter	--	245±7	[μm]
Coating/Cladding Concentricity Error	--	≤10.0	[μm]
Coating Non-Circularity	--	≤6.0	[%]
Core/Cladding Concentricity Error	--	≤1.5	[μm]
Delivery Length	--	up to 17.6	[km/reel]
Optical Characteristics			
Attenuation	850nm	≤2.3	[dB/km]
	1300nm	≤0.6	[dB/km]
Overfilled Modal Bandwidth	850nm	≥500	[MHz·km]
	1300nm	≥500	[MHz·km]
Numerical Aperture	--	0.200±0.015	--
Group Refractive Index	850nm	1.482	--
	1300nm	1.477	--
Zero Dispersion Wavelength, λ_0	--	1295-1340	[nm]
Zero Dispersion Slope, S_0	1295nm≤λ_0≤1310nm	≤0.105	[ps/(nm²·km)]
	1310nm≤λ_0≤1340nm	≤0.000375 (1590-λ_0)	[ps/(nm²·km)]
Macrobending Loss	--	--	--
2 Turns @ 15 mm Radius	850nm	≤0.1	[dB]
	1300nm	≤0.3	[dB]
2 Turns @ 7.5 mm Radius	850nm	≤0.2	[dB]
	1300nm	≤0.5	[dB]
Backscatter Characteristics	**1300nm**		
Step (Mean of Bidirectional Measurement)	--	≤0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	≤0.10	[dB]
Attenuation Uniformity	--	≤0.08	[dB/km]
Environmental Characteristics	**850nm & 1300nm**		
Temperature Cycling	-60°C to 85°C	≤0.10	[dB/km]
Temperature-Humidity Cycling	-10°C to 85°C, 4% to 98% RH	≤0.10	[dB/km]
Water Immersion	23°C, 30 days	≤0.10	[dB/km]
Dry Heat	85°C, 30 days	≤0.10	[dB/km]
Damp Heat	85°C, 85% RH, 30 days	≤0.10	[dB/km]
Mechanical Specification			
Proof Test	--	≥9.0	[N]
	--	≥1.0	[%]
	--	≥100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	≥1.3, ≤8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter (n_d, typical)	--	20	--

Fiber Cloud



OM3(50/125μm) Bend Insensitive Multimode Fiber

Fibercloud OM3 Bend Insensitive Multimode Fiber comply with or exceed ISO/IEC 11801-1 OM3 specifications, IEC 60793-2-10 A1-OM3 specfications, and TIA-492AAAF A1-OM3 specifications.

Characteristics	Conditions	Specified values	Units
Geometry Characteristics			
Core Diameter	--	50±2.5	[μm]
Core Non-Circularity	--	⩽5.0	[%]
Cladding Diameter	--	125.0±1.0	[μm]
Cladding Non-Circularity	--	⩽0.6	[%]
Coating Diameter	--	245±7	[μm]
Coating/Cladding Concentricity Error	--	⩽10.0	[μm]
Coating Non-Circularity	--	⩽6.0	[%]
Core/Cladding Concentricity Error	--	⩽1.0	[μm]
Delivery Length	--	up to 8.8	[km/reel]
Optical Characteristics			
Attenuation	850nm	⩽2.4	[dB/km]
	1300nm	⩽0.6	[dB/km]
--	--	MaxBand® OM2+/OM3/OM4 Bend Insensitive	
Overfilled Modal Bandwidth	850nm	⩾700/⩾1500/⩾3500	[MHz·km]
	1300nm	⩾500/⩾500/⩾500	[MHz·km]
Effective Modal Bandwidth	850nm	⩾950/⩾2000/⩾4700	[MHz·km]
Application support distance on	--	--	--
40GBASE-SR4 / 100GBASE-SR10[1]	850nm	-/140/170	[m]
10GBASE-SR	850nm	150/300/550	[m]
1000BASE-SR	850nm	750/1000/1100	[m]
DMD Specification	Compliant with and more stringent than the requirements of IEC 60793-2-10		--
Numerical Aperture	--	0.200±0.015	--
Group Refractive Index	850nm	1.482	--
	1300nm	1.477	--
Zero Dispersion Wavelength, λ_0	--	1295-1340	[nm]
Zero Dispersion Slope, S_0	1295nm⩽λ_0⩽1310nm	⩽0.105	[ps/(nm²·km)]
	1310nm⩽λ_0⩽1340nm	⩽0.000375(1590-λ_0)	[ps/(nm²·km)]
Macrobending Loss[2]	--	--	--
2 Turns @ 15 mm Radius	850nm	⩽0.1	[dB]
	1300nm	⩽0.3	[dB]
2 Turns @ 7.5 mm Radius	850nm	⩽0.2	[dB]
	1300nm	⩽0.5	[dB]
Backscatter Characteristics	**1300nm**		
Step (Mean of Bidirectional Measurement)	--	⩽0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	⩽0.10	[dB]
Attenuation Uniformity	--	⩽0.08	[dB/km]
Environmental Characteristics	**850nm & 1300nm**		
Temperature Cycling	-60°C to 85°C	⩽0.10	[dB/km]
Temperature-Humidity Cycling	-10°C to 85°C, 4% to 98% RH	⩽0.10	[dB/km]
Water Immersion	23°C, 30 days	⩽0.10	[dB/km]
Dry Heat	85°C, 30 days	⩽0.10	[dB/km]
Damp Heat	85°C, 85% RH, 30 days	⩽0.10	[dB/km]
Mechanical Specification			
Proof Test	--	⩾9.0	[N]
	--	⩾1.0	[%]
	--	⩾100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	⩾1.3, ⩽8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter (n_d, typical)	--	20	--

Remarks: 1. Support distances considering maximum cable attenuation of 3.0 dB/km at 850 nm, maximum total splice/connector loss of 1.0 dB and VCSELs maximum RMS spectral width ⩽ 0.45 nm

2. The launch condition for the macrobending loss measurement fulfils that described in IEC 61280-4-1.

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OM4(50/125μm) Ultra Bend Insensitive Multimode Fiber

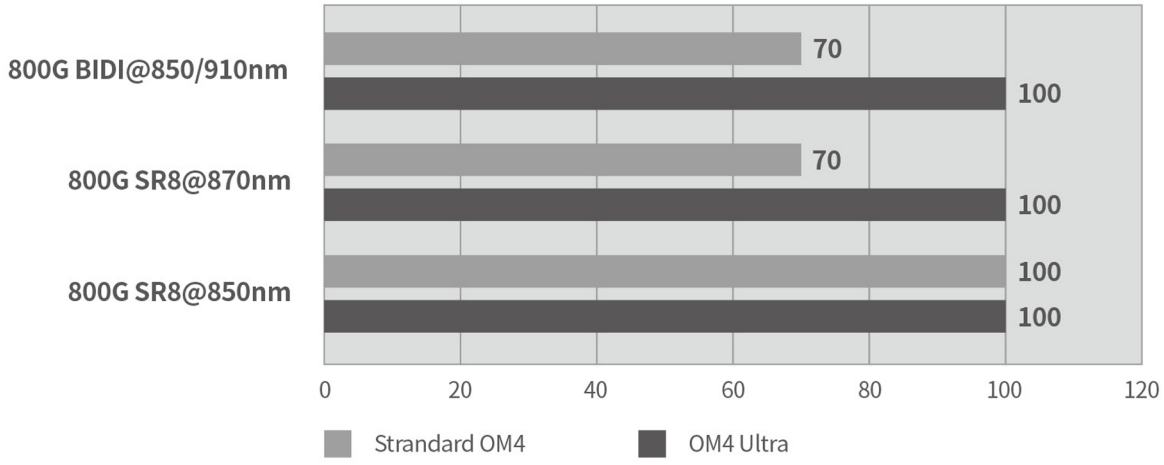
Fibercloud OM4 Ultra Bending Insensitive Multimode Fiber are designed for 100G/Lane and Terabit BiDi technology, offering high bandwidth in the wavelength range of 850nm -870nm & 910nm. It can compensate the center wavelength shift of 100G/Lane ransceivers,ensuring smooth upgrades to 400G, 800G, and higher data rates for data center. It is fully ack-ward compatible with legacy OM4 and OM5 fiber. Compared to OM5, it is more cost-effectiveand can maintain significant cost and power advantages in high-speed links.

OM4 Ultra ending insensitive Multimode Fiber comply with or exceed ISO/IEC 11801-1 OM4 specifications, IEC 60793-2-10 A1-OM4 specifications, and TIA-492AAAF A1-OM4 specifications.

Features	Benefits and Applications
• Optimized for 100G/Lane transmission system • High effective mode bandwidth in wavelength range of 850~870nm & 910nm • Backward compatibility with legacy OM4 fibre	• Support single-wavelenght and double-wavelength transmission system form 400Gb/s to 1.6Tb/s
• Superior geometry uniformity • Low attenuation • High bandwidth • Low differential mode delay (DMD)	• Data centers • Office centers • Data storage networks • Local area networks • High-performance computing centers • 1 & 10 & 40 & 100 & 400 Gb/s Ethernet
• Very low macro-bending sensitivity	• Supports the use and installation of optical cables with a small bending radius
• Coated with proprietary dual layer UV curable acrylate	• High resistance to micro-bending • Optimized performance in tight-buffer cable applications • Stable performance over a wide range of environmental conditions

System Link Length

OM4 Ultra Bending Insensitive Multimode Fiber can support transmission distances of 100m in 100G/Lane and Treabit BiDi links whitch comply with or exceed IEEE 802.3db specification and Terabit BiDi MSA specification.



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Characteristics	Conditions	Specified values	Units
Geometry Characteristics			
Core Diameter	--	50±2.5	[μm]
Core Non-Circularity	--	≤5.0	[%]
Cladding Diameter	--	125.0±1.0	[μm]
Cladding Non-Circularity	--	≤0.6	[%]
Coating Diameter	--	245±7	[μm]
Coating/Cladding Concentricity Error	--	≤10.0	[μm]
Coating Non-Circularity	--	≤6.0	[%]
Core/Cladding Concentricity Error	--	≤1.0	[μm]
Delivery Length	--	up to 8.8	[km/reel]
Optical Characteristics			
Attenuation	850nm	≤2.4	[dB/km]
	910nm	≤2.0	[dB/km]
	1300nm	≤0.6	[dB/km]
Overfilled Modal Bandwidth	850nm	≥3500	[MHz·km]
	1300nm	≥500	[MHz·km]
Effective Modal Bandwidth	850nm-870nm	≥4700	[MHz·km]
	910nm	≥3100	[MHz·km]
Link Length	800GBase-SR8 / 800GBaseSR-4.2	100	[m]
Numerical Aperture	--	0.200±0.015	--
Group Refractive Index	850nm	1.482	--
	1300nm	1.477	--
Zero Dispersion Wavelength, λ_0	--	1295-1340	[nm]
Zero Dispersion Slope, S_0	1295nm≤λ_0≤1310nm	≤0.105	[ps/(nm²·km)]
	1310nm≤λ_0≤1340nm	≤0.000375 (1590-λ_0)	[ps/(nm²·km)]
Macrobending Loss[2]	--	--	--
2 Turns @ 15 mm Radius	850nm	≤0.1	[dB]
	1300nm	≤0.3	[dB]
2 Turns @ 7.5 mm Radius	850nm	≤0.2	[dB]
	1300nm	≤0.5	[dB]
Backscatter Characteristics	**1300nm**		
Step (Mean of Bidirectional Measurement)	--	≤0.10	[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	≤0.10	[dB]
Attenuation Uniformity	--	≤0.08	[dB/km]
Environmental Characteristics	**850nm & 1300nm**		
Temperature Cycling	-60°C to 85°C	≤0.10	[dB/km]
Temperature-Humidity Cycling	-10°C to 85°C , 4% to 98% RH	≤0.10	[dB/km]
Water Immersion	23°C , 30 days	≤0.10	[dB/km]
Dry Heat	85°C , 30 days	≤0.10	[dB/km]
Damp Heat	85°C , 85% RH , 30 days	≤0.10	[dB/km]
Mechanical Specification			
Proof Test	--	≥9.0	[N]
	--	≥1.0	[%]
	--	≥100	[kpsi]
Coating Strip Force	typical average force	1.5	[N]
	peak force	≥1.3, ≤8.9	[N]
Dynamic Stress Corrosion Susceptibility Parameter (n_d, typical)	--	20	--

Remarks: 1. The launch condition for the macrobending loss measurement fulfils that described in IEC 61280-4-1.

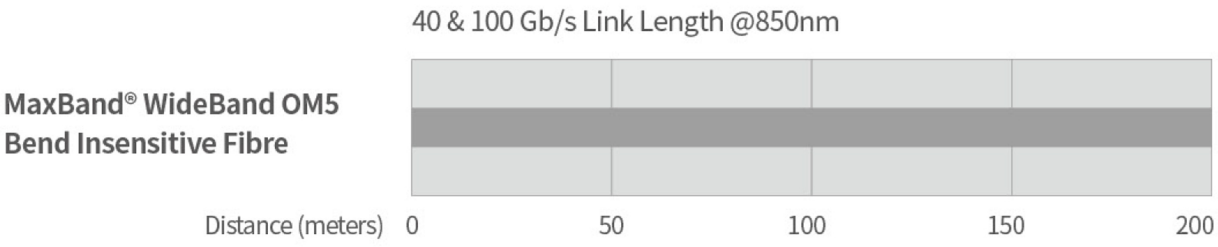
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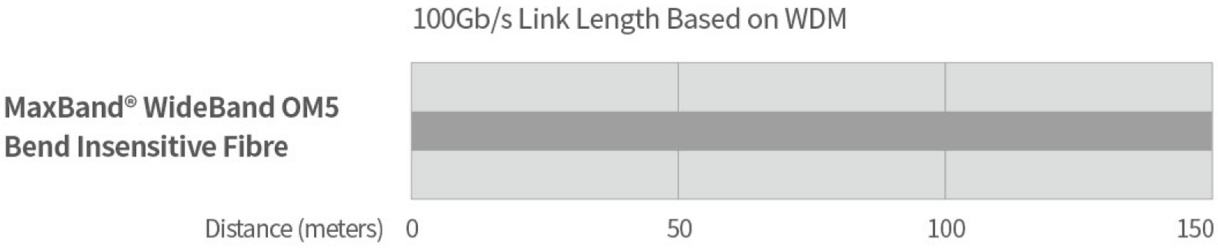
OM5(50/125μm) Bend Insensitive Multimode Fiber

Fibercloud OM5 Bend insensitive Multimode Fiber is a 50μm laser-optimized multimode fiber designed for short wavelength division multiplexing (SWDM) applications. Unlike legacy OM4 multimode fiber with high bandwidth at 850nm, OM5 Bend Insensitive Multimode Fiber has high bandwidth in the 850-950nm window and maintaining backward compatiblity with legacy OM4 fiber. WideBand OM5 and multi-wavelength transceivers are a viable solution for 100Gb/s and 400Gb/s multi-wavelength systems.
Fibercloud OM5 Bend insensitive Multimode Fiber complies with or exceeds ISO/IEC 11801-4 OM5 specification, IEC 60793-2-10 A1-0M5 specification, and TIA-492AAAF A1-OM5 specification.

Features	Benefits and Applications
• Designed for multi-wavelength systems • High bandwidth in the wavelength range of 850-950nm • Backward compatiblity with legacy OM4 fibre	• Support single-wavelength and multi-wavelength transmission system from 40Gb/s to 400Gb/s
• Superior geometry uniformity • Low attenuation • High bandwidth • Low differential mode delay (DMD)	• Data centers • Office centers • Data storage networks • Local area networks (LAN) • High-performance computing centers a
• Very low macro-bending sensitivity	• Supports the use and installation of optical cables with a small bending radius
• Coated with YOFC's proprietary dual layer UV curable acrylate	• High resistance to micro-bending • Optimized performance in tight-buffer cable applications • Stable performance over a wide range of environmental conditions

System Link Length





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Characteristics	Conditions	Specified values		Units
Geometry Characteristics				
Core Diameter	--	50±2.5		[μm]
Core Non-Circularity	--	⩽5.0		[%]
Cladding Diameter	--	125.0±1.0		[μm]
Cladding Non-Circularity	--	⩽0.6		[%]
Coating Diameter	--	245±7		[μm]
Coating/Cladding Concentricity Error	--	⩽10.0		[μm]
Coating Non-Circularity	--	⩽6.0		[%]
Core/Cladding Concentricity Error	--	⩽1.0		[μm]
Delivery Length	--	up to 8.8		[km/reel]
Optical Characteristics				
Attenuation	850nm	⩽2.4		[dB/km]
	953nm	⩽1.7		[dB/km]
	1300nm	⩽0.6		[dB/km]
Overfilled Modal Bandwidth	850nm	⩾3500		[MHz·km]
	953nm	⩾1850		[MHz·km]
	1300nm	⩾500		[MHz·km]
Effective Modal Bandwidth	850nm	⩾4700		[MHz·km]
	953nm	⩾2470		[MHz·km]
Application support distance on	--	--		--
100Gb/s WDM[1]	--	150		[m]
40Gb/s WDM[1]	--	440		[m]
40GBASE-SR4 / 100GBASE-SR10[2]	850nm	200		[m]
Numerical Aperture	--	0.200±0.015		--
Group Refractive Index	850nm	1.482		--
	1300nm	1.477		--
Zero Dispersion Wavelength, λ_0	--	1297-1328		[nm]
Zero Dispersion Slope, S_0	--	⩽4 (-103) / (840 (λ_0/840)^4)		[ps/(nm^2·km)]
Macrobending Loss[3]	--	@850nm	@1300nm	--
2 Turns @ 15 mm Radius	--	⩽0.1	⩽0.3	[dB]
2 Turns @ 7.5 mm Radius	--	⩽0.2	⩽0.5	[dB]
Backscatter Characteristics	**850nm & 1300nm**			
Step (Mean of Bidirectional Measurement)	--	⩽0.10		[dB]
Irregularities Over Fibre Length and Point Discontinuity	--	⩽0.10		[dB]
Attenuation Uniformity	--	⩽0.08		[dB/km]
Environmental Characteristics	**850nm & 1300nm**			
Temperature Cycling	at -60°C to 85°C	⩽0.10		[dB/km]
Temperature-Humidity Cycling	at -10°C to 85°C and 4% to 98% RH	⩽0.10		[dB/km]
Water Immersion	at 23°C for 30 days	⩽0.10		[dB/km]
Dry Heat	at 85°C for 30 days	⩽0.10		[dB/km]
Damp Heat	at 85°C and 85% RH for 30 days	⩽0.10		[dB/km]
Mechanical Specification				
Proof Test	--	⩾9.0		[N]
	--	⩾1.0		[%]
	--	⩾100		[kpsi]
Coating Strip Force	typical average force	1.5		[N]
	peak force	⩾1.3, ⩽8.9		[N]
Dynamic Stress Corrosion Susceptibility Parameter (n_d, typical)	--	20		--

Remarks:1. Support distance with SWDM transceivers http://www.swdm.org/msa/

2. Support distances considering maximum cable attenuation of 3.0 dB/km at 850 nm, maximum total splice/connector loss of 1.0 dB and VCSELs maximum RMS spectral width ⩽ 0.45 nm

3. The launch condition for the macrobending loss measurement fulfils that described in IEC 61280-4-1.