



OPTICAL FIBER PRODUCTS MANUAL

FiberHome Telecommunication Technologies Co., Ltd.

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Company Profile

FiberHome Communications Technologies Ltd. is a leading equipment supplier and global solution provider in the field of information technology and telecommunications. This high-tech enterprise is under the State-owned Assets Supervision and Administration Commission of the State Council. It is also the largest enterprise located in Wuhan Optical Valley, China. FiberHome was founded in 1974, formerly known as Wuhan Post and Telecommunications Research Institute. After 50 years of continuous and in-depth development, its business has been extended to research and development, manufacturing, marketing and sales, and engineering services in four major fields, namely, fiber optic communications, data network communications, wireless communications and intelligent applications. In particular, the company has provided end-to-end solutions in opto-electronic devices, optical pre-fabricated rods, fiber optic cables and optical communication systems to many countries around the world.

FiberHome® Multi-Mode Optical Fiber (OM1)

Description

FiberHome 62.5/125 μm (A1-OM1) multimode optical fiber is a graded-index multimode optical fiber with a 62.5 μm core diameter and a 125 μm cladding diameter. The optical fiber is comprehensively optimized for performance at the 850nm and 1300nm operating wavelengths. The optical fiber has the high bandwidth and low attenuation, which is satisfying the sue at 850nm and 1300nm.

Application

Due to the low attenuation and high bandwidth, fiberhome 62.5/125 μm multimode optical fiber can be widely applied in local area networks (LAN), video, voice and data services. It's suited to gigabit ethernet (IEEE802.3z) using laser or light emitting diode (LED) sources. Because of the advantages of the manufacturing process (PCVD), such as extremely refined refractive index (RI) profile control, stability, etc. FiberHome 62.5/125 μm multimode fiber offer the highest bandwidth available in the market.

FiberHome 62.5/125 μm multimode optical fiber is applicable in all cable types including ribbon cable, loose tube stranded cable, slotted core cable, central tube cable and tight-buffer cable.

Norms

FiberHome 62.5/125 μm (A1-OM1) multimode fiber complies with or exceeds IEC60793-2-10 A1-OM1optical fiber specification.

FiberHome tightens many parameters so as to offer more conveniences to customers.

Characteristics

- Designed for use at 850nm and 1300nm
- Low attenuation and high bandwidth, which overfills the transmission demand of IEEE802.3z gigabit ethernet
- Good protection by dual layer UV coating
- Excellent strip force stability

Multimode Optical Fiber (OM1)			
Features	Conditions	Value	Unit
Optical Requirements			
Attenuation	850nm	≤ 2.9	dB/km
	1300nm	≤ 0.7	dB/km
Bandwidth	850nm	≥ 200	MHz • km
	1300nm	≥ 200	MHz • km
Numerical Aperture	-	0.275 ± 0.015	-
Effective Group Index Of Refraction (Neff)	850nm	1.493	-
	1300nm	1.488	-
Zero Dispersion Wavelength	-	1320~1365	nm
Zero Dispersion Slope	1320~1348nm	≤ 0.11	ps/(nm ² • km)
	1348~1365nm	≤ 0.001 (1458- λ_0)	ps/(nm ² • km)
Geometrical Requirements			
Core Diameter	-	62.5 ± 2.5	μm
Core Non-Circularity	-	≤ 5.0	%
Cladding Diameter	-	125 ± 2	μm
Cladding Non-Circularity	-	≤ 1.0	%
Core-Cladding Concentricity Error	-	≤ 1.5	μm
Coating Diameter	-	245 ± 7	μm
Coating-Cladding Concentricity Error	-	≤ 10	μm
Environmental Requirements (850nm & 1300nm)			
Temperature Dependence	-60°C ~ +85°C	≤ 0.1	dB/km
Water-Soaked Dependence	23°C, for 30 days	≤ 0.1	dB/km
Damp Heat Dependence	85°C and 85% RH, for 30 days	≤ 0.1	dB/km
Dry Heat	85°C, for 30 days	≤ 0.1	dB/km
Mechanical Requirements			
Proof Test	-	≥ 100	kpsi
Macro-Bend Induced Attenuation 100 turns Φ 75mm	850nm	≤ 0.5	dB
	1300nm	≤ 0.5	dB
Coating Strip Force	Typical Average Force	1.0~5.0	N
	Peak Force	1.3~8.9	N
Dynamic Stress Corrosion Susceptibility Parameter(N _d)	-	≥ 20	-
Delivery Length	1.1~16.8		km/reel

FiberHome® Multimode Optical Fiber (OM2/OM3/OM4)

Description

FiberHome multimode optical fiber (OM2/OM3/OM4) is designed specifically for high speed local area network (LAN) such as gigabit or higher speeds ethernet. With the extremely refined refractive index profile owing to the optimized PCVD process, fiberhome multimode optical fiber eliminates the differential mode delay (CMD) phenomenon observed on the conventional fibers in gigabit applications. Thus, there is no need for expensive CMC compensation. FiberHome multimode optical fiber satisfies the sue at 850nm and 1300nm. The maximum link distances (up to 2000 meter) for gigabit ethernet system are the longest distances available in the world.

Application

The outstanding optical performance of fiberhome multimode optical fiber makes it suitable for applications including not only high-speed LAN but also lower bit-rate systems such as FDDI, Ethernet, ATM, etc. FiberHome multimode optical fiber supports up to 2000 meter of link distances for lower bit-rate systems. A wide variety of light sources can be sued in combination with fiberhome multimode optical fiber, such as LEDs, 850nm VCSELs, 780nm CD lasers and 1300nm Fabry-Perot lasers.

FiberHome multimode optical fiber is applicable in all cable types including ribbon cable, loose tube stranded cable, slotted core cable, central tube cable and tight-buffer cable.

Norms

FiberHome multimode optical fiber complies with or exceeds IEC793-2-10 A1-OM2/OM3/OM4 optical fiber specifications.

Characteristics

- Designed for use at 850nm and 1300nm
- Suited to applications in gigabit ethernet and higher bit-rat systems
- No need to use expensive DMD compensation in gigabit ethernet
- Enabling the longest link distances compared with congener products
- Good protection by dual layer UV coating
- Excellent strip force stability
- Lower macro-bending loss

Multimode Optical Fiber (OM2)			
Features	Conditions	Value	Unit
Optical Requirements			
Attenuation	850nm	≤ 2.5	dB/km
	1300nm	≤ 0.8	dB/km
Effective Group Index Of Refraction (Neff)	850nm	1.475	-
	1300nm	1.473	-
Bandwidth	850nm	≥ 500	MHz · km
	1300nm	≥ 500	MHz · km
Numerical Aperture	-	0.20±0.015	-
Zero Dispersion Wavelength	-	1295~1340	nm
Zero Dispersion Slope	1295~1310nm	≤ 0.105	ps/(nm ² · km)
	1310~1340nm	≤ 0.000375 (1590- λ_0)	ps/(nm ² · km)
Point Discontinuities	1300nm	≤ 0.10	dB
Geometrical Requirements			
Core Diameter	-	50±2.5	μm
Core Non-Circularity	-	≤ 5.0	%
Cladding Diameter	-	125 ± 1	μm
Cladding Non-Circularity	-	≤ 1.0	%
Core-Cladding Concentricity Error	-	≤ 1.5	μm
Coating Diameter	-	245±7	μm
Coating-Cladding Concentricity Error	-	≤ 10	μm
Environmental Requirements (850nm & 1300nm)			
Temperature Dependence	-60°C~+85°C	≤ 0.1	dB/km
Water-Soaked Dependence	23°C, for 30 days	≤ 0.1	dB/km
Damp Heat Dependence	85°C and 85% RH, for 30 days	≤ 0.1	dB/km
Dry Heat	85°C, for 30 days	≤ 0.1	dB/km
Mechanical Requirements			
Proof Test	-	≥ 9.0	N
Macro-Bend Induced Attenuation 2 turns Φ 30mm	850nm	≤ 0.1	dB
	1300nm	≤ 0.3	dB
Macro-Bend Induced Attenuation 2 turns Φ 15mm	850nm	≤ 0.2	dB
	1300nm	≤ 0.5	dB
Coating Strip Force	Typical Average Force	1.0~5.0	N
	Peak Force	1.3~8.9	N
Dynamic Stress Corrosion Susceptibility Parameter (N _d)	-	≥ 20	-
Delivery Length	1.1~8.8		km/reel

Multimode Optical Fiber (OM3)			
Features	Conditions	Value	Unit
Optical Requirements			
Attenuation	850nm	≤ 2.5	dB/km
	1300nm	≤ 0.8	dB/km
Effective Group Index Of Refraction (N_{eff})	850nm	1.475	-
	1300nm	1.473	-
Bandwidth	850nm	≥ 1500	MHz · km
	1300nm	≥ 500	MHz · km
Effective Bandwidth	850nm	≥ 2000	MHz · km
Numerical Aperture	-	0.20 ± 0.015	
DMD	-	complies with or exceeds IEC 60793-2-10	-
Zero Dispersion Wavelength	-	1295~1340	nm
Zero Dispersion Slope	1295~1310nm	≤ 0.105	ps/(nm ² · km)
	1310~1340nm	≤ 0.000375 ($1590 - \lambda_0$)	ps/(nm ² · km)
Point Discontinuities	1300nm	≤ 0.10	dB
Geometrical Requirements			
Core Diameter	-	50 ± 2.5	μm
Core Non-Circularity	-	≤ 5.0	%
Cladding Diameter	-	125 ± 1	μm
Cladding Non-Circularity	-	≤ 1.0	%
Core-Cladding Concentricity Error	-	≤ 1.5	μm
Coating Diameter	-	245 ± 7	μm
Coating-Cladding Concentricity Error	-	≤ 10.0	μm
Environmental Requirements (850nm & 1300nm)			
Temperature Dependence	-60°C~+85°C	≤ 0.10	dB/km
Water-Soaked Dependence	23°C, for 30 days	≤ 0.10	dB/km
Damp Heat Dependence	85°C and 85% RH, for 30 days	≤ 0.10	dB/km
Dry Heat	85°C, for 30 days	≤ 0.10	dB/km
Mechanical Requirements			
Proof Test	-	≥ 9.0	N
Macro-Bend Induced Attenuation 2 turns Φ 30mm	850nm	≤ 0.1	dB
	1300nm	≤ 0.3	dB
Macro-Bend Induced Attenuation 2 turns Φ 15mm	850nm	≤ 0.2	dB
	1300nm	≤ 0.5	dB
Coating Strip Force	Typical Average Force	1.0~5.0	N
	Peak Force	1.3~8.9	N
Dynamic Stress Corrosion Susceptibility Parameter(N_d)	-	≥ 20	-
Delivery Length	1.1~8.8		km/reel

Multimode Optical Fiber (OM4)			
Features	Conditions	Value	Unit
Optical Requirements			
Attenuation	850nm	≤ 2.5	dB/km
	1300nm	≤ 0.8	dB/km
Effective Group Index Of Refraction (N_{eff})	850nm	1.475	-
	1300nm	1.473	-
Bandwidth	850nm	≥ 3500	MHz • km
	1300nm	≥ 500	MHz • km
Effective Bandwidth	850nm	≥ 4700	MHz • km
Numerical Aperture	-	0.20±0.015	-
DMD	-	complies with or exceeds IEC 60793-2-10	-
Zero Dispersion Wavelength	-	1295~1340	nm
Zero Dispersion Slope	1295~1310nm	≤ 0.105	ps/(nm ² • km)
	1310~1340nm	≤ 0.000375 (1590- λ_0)	ps/(nm ² • km)
Point Discontinuities	1300nm	≤ 0.10	dB
Geometrical Requirements			
Core Diameter	-	50±2.5	μm
Core Non-Circularity	-	≤ 5.0	%
Cladding Diameter	-	125 ± 1	μm
Cladding Non-Circularity	-	≤ 1.0	%
Core-Cladding Concentricity Error	-	≤ 1.5	μm
Coating Diameter	-	245±7	μm
Coating-Cladding Concentricity Error	-	≤ 10	μm
Environmental Requirements (850nm & 1300nm)			
Temperature Dependence	-60°C~+85°C	≤ 0.1	dB/km
Water-Soaked Dependence	23°C, for 30 days	≤ 0.1	dB/km
Damp Heat Dependence	85°C and 85% RH, for 30 days	≤ 0.1	dB/km
Dry Heat	85°C, for 30 days	≤ 0.1	dB/km
Mechanical Requirements			
Proof Test	-	≥ 9.0	N
Macro-Bend Induced Attenuation 2 turns Φ 30mm	850nm	≤ 0.1	dB
	1300nm	≤ 0.3	dB
Macro-Bend Induced Attenuation 2 turns Φ 15mm	850nm	≤ 0.2	dB
	1300nm	≤ 0.5	dB
Coating Strip Force	Typical Average Force	1.0~5.0	N
	Peak Force	1.3~8.9	N
Dynamic Stress Corrosion Susceptibility Parameter (N_d)	-	≥ 20	-
Delivery Length	1.1~8.8		km/reel

FiberHome® Multimode Optical Fiber (OM5)

Description

FiberHome multimode optical fiber reduces the differential mode delay (DMD) phenomenon observed on the conventional fibers in 10 gigabit applications. The bandwidth performance is extended to the 953 nm band, which can support multiple wavelength transmission applications. In addition, the OM5 / SWDM combination can better demonstrate the advantages of long-distance transmission in links with a transmission distance of 100G or higher speeds exceeding 100 m.

Application

FiberHome multimode optical fiber (OM5) can maximally support current and emerging high-speed Ethernet, fiber channel and fiber optic interconnection applications. In the data center design, it can fully support higher-speed (100Gb/s and 400Gb/s Ethernet, 16Gb/s and 32Gb/s Fiber Channel) data transmission requirements.

Norms

FiberHome multimode optical fiber (OM5) complies with or exceeds IEC 60793-2-10 A1-OM5 cabling standards.

Characteristics

- Suited to applications in 10 gigabit ethernet and higher bit-rat systems
- Precise control of refractive index profile
- Designed for use at 850nm and 1300nm, while supporting 850-950nm short-wavelength transmission
- Good protection by dual layer UV coating
- Excellent strip force stability
- Lower macro-bending loss
- Good mechanical and environmental performance

Next Generation Multimode Optical Fiber (OM5)			
Features	Conditions	Value	Unit
Optical Requirements			
Attenuation	850nm	≤ 2.5	dB/km
	953nm	≤ 1.8	dB/km
	1300nm	≤ 0.8	dB/km
Bandwidth	850nm	≥ 3500	MHz · km
	953nm	≥ 1850	MHz · km
	1300nm	≥ 500	MHz · km
Effective Bandwidth	850nm	≥ 4700	MHz · km
	953nm	≥ 2470	MHz · km
Numerical Aperture	-	0.20 ± 0.015	-
Effective Group Index Of Refraction (Neff)	850nm	1.475	-
	1300nm	1.473	-
DMD	-	complies with or exceeds IEC 60793-2-10	-
Zero Dispersion Wavelength	-	1297~1328	nm
Zero Dispersion Slope	1295~1310nm	≤ 0.105	ps/(nm ² · km)
	1310~1340nm	$S_0 \leq 4(-103) / 840(1 - (\lambda_0/840)^4)$	ps/(nm ² · km)
Point Discontinuities	1300nm	≤ 0.10	dB
Geometrical Requirements			
Core Diameter	-	50 ± 2.5	μm
Core Non-Circularity	-	≤ 5.0	%
Cladding Diameter	-	124.5 ± 1	μm
Cladding Non-Circularity	-	≤ 1.0	%
Core-Cladding Concentricity Error	-	≤ 1.5	μm
Coating Diameter	-	245 ± 7	μm
Coating-Cladding Concentricity Error	-	≤ 10	μm
Environmental Requirements (850nm & 1300nm)			
Temperature Dependence	-60°C~+85°C	≤ 0.1	dB/km
Water-Soaked Dependence	23°C, for 30 days	≤ 0.1	dB/km
Damp Heat Dependence	85°C and 85% RH, for 30 days	≤ 0.1	dB/km
Dry Heat	85°C, for 30 days	≤ 0.1	dB/km
Mechanical Requirements			
Proof Test	-	≥ 9.0	N
Macro-Bend Induced Attenuation 2 turns Φ 30mm	850nm	≤ 0.1	dB
	1300nm	≤ 0.3	dB
Macro-Bend Induced Attenuation 2 turns Φ 15mm	850nm	≤ 0.2	dB
	1300nm	≤ 0.5	dB
Coating Strip Force	Typical Average Force	1.0~5.0	N

	Peak Force	1.3~8.9	N
Delivery Length	1.1~8.8		km/reel

