UltraPass™ Fiber

SF-MD

Product Information

PI-1103
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SAMSUNG's UltraPass™ fiber is advanced Medium Dispersion Fiber* suitable for long haul and metro-core networks and high speed wideband (S + C + L band) Dense Wavelength Division Multiplexing (DWDM) transmission of today and tommorrow. Its eligibly-designed dispersion characteristics reduce various non-linear effects which are particularly deleterious in dense wavelength division multiplexing systems. It also enables network operators to use wide wavelength operating window throughout the wavelength range of 1460~1625 nm (S, C and L band) to cope with ever growing demand for more bandwidth. The industry leading low PMD makes the fiber suitable for use in 10 Gb/s or even higher speed DWDM networks.

UltraPass™ fiber complies with ITU-T G.656 requirements, which are more advanced standards for wideband optical transmission where Samsung has significantly involved in the standardization process.

* Medium Dispersion Fiber (MDF, ITU-T G.656) is classified as chromatic dispersion 0f 2 ~ 14 ps/nm/km in 1460 ~ 1625 nm wavelength, distinguishable from former Non-Zero Dispersion Shifted Fiber (NZ-DSF, ITU-T G.655) for long-Haul networks and standard WDM transmission in C-band.

UltraPass™ Fiber's Values to Customers

Optimized Performance

Typical dispersion values (~8.5 ps/nm^2•km @ 1550 nm) are high enough to minimize non-linear effects, but low enough to minimize dispersion compensation needs and to deploy of 40 G systems to boost capacity easily

Extended Reach

UltraPass™ fiber permits current 100 GHz DWDM system to extend their reach and even for 50 GHz system, providing lower system cost, due to reduced power penalties from suppressed non-linear effects

Deferred Investment

Lower non-linear effects enable UltraPass™ fiber to defer use of more expensive L-band from the fact that it can carry more densely spaced channels in less expensive C-band than those of standard NZDSF

Wide Range of Operating Bandwidth

UltraPass™ fiber provides zero dispersion point below the S-band and positive dispersion above 1,440 nm thus, exhibits DWDM compatibility across S, C, and L-band for capacity expansion

Flexibility of Choice

Service providers are not forced to choose between DWDM efficiency and higher bit rates. The eligibly-designed dispersion characteristics support both possible migration paths

Better Non-linear Effect Management

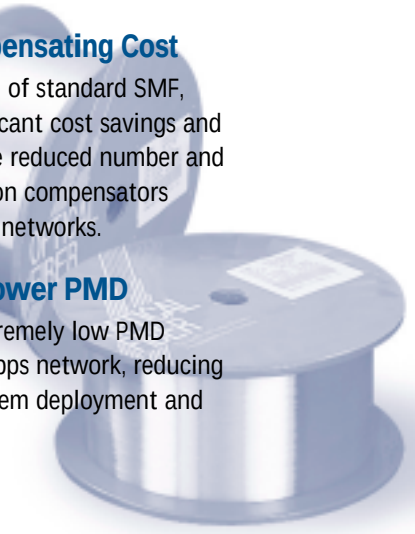
UltraPass™ fiber shows the ideal balance of dispersion high enough for good cross channel non-linearity management, and low enough for self-phase modulation control (Self-phase modulation effects become critical in 40 G systems)

Lower Dispersion Compensating Cost

By dispersion at half the level of standard SMF, UltraPass™ fiber offers significant cost savings and easier system design from the reduced number and cost effectiveness of dispersion compensators needed when deploying 40 G networks.

Cost Effectiveness by Lower PMD

UltraPass™ fiber achieves extremely low PMD enough to fully support 40 Gbps network, reducing barriers to cost-effective system deployment and on-going operation



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Optical Specifications

Parameters		Specification
Attenuation	1310 nm	≤ 0.36 dB/km
	1385 nm	≤ 1.0 dB/km
	1450 nm	≤ 0.26 dB/km
	1550 nm	≤ 0.22 dB/km
	1625 nm	≤ 0.25 dB/km
Point Discontinuities	1550 nm	≤ 0.05 dB
Mode Field Diameter	1550 nm	8.7 ~ 9.7 μm
Cable cutoff Wavelength (λ_{cc})		≤ 1260 nm
Chromatic Dispersion	1460 nm	≥ 2.0 ps/(nm·km)
	1530 ~ 1565 nm	6.0 ~ 10.0 ps/(nm·km)
	1565 ~ 1625 nm	8.0 ~ 13.8 ps/(nm·km)
	Zero dispersion wavelength	≤ 1440 nm
PMD_Q *	1550 nm	≤ 0.04 ps/$km^{1/2}$
PMD Max. Individual Value	1550 nm	≤ 0.1 ps/$km^{1/2}$
Macro-bending @ 1550 nm, ⌀60 mm, 100 turns		≤ 0.05 dB
Macro-bending @ 1550 nm, ⌀32 mm, 1 turn		≤ 0.5 dB

* PMD_Q : PMD(Polarization mode dispersion) Link Design Value calculated in accordance with IEC 60794-3: 2001, section 5.5, Method 1, September 2001

Dimensional Specifications

Parameters		Unit	Specification
Glass	Clad Diameter	μm	125 ± 0.7
	Core Non-circularity	%	≤ 0.8
	Core-Clad Concentricity Error	μm	≤ 0.5
	Fiber Curl	m	≥ 4
Coating	Coating Diameter	μm	245 ± 5 (Uncolored)
	Coating Non-circularity	%	≤ 5.0
	Coating-Clad Concentricity Error	μm	≤ 10.0

Fiber Length

- Standard: 25.2 km, 50.4 km per spool
- Other fiber lengths up to 50.4 km per spool are available upon request

Mechanical Specifications

Parameters	Unit	Specifications
Proof Test Level	GPa (Kpsi)	≥ 0.69 (≥100)
Coating Strip Force	N	1.0 ~ 8.9
Dynamic Fatigue Parameter [N_d]	-	≥ 20
Dynamic Tensile Strength (Gauge Length: 0.5 m)	GPa	Mean value ≥ 4.0

Environmental Specifications

Parameters	Specifications
Temperature Dependence (-60 ℃ ~ +85 ℃)	≤ 0.05 dB @ 1550 nm & 1625 nm
Temp.-Humidity Cycling (-10 ℃ ~ +85 ℃, 98% RH)	≤ 0.05 dB @ 1550 nm & 1625 nm
Water Immersion at 23 ℃	≤ 0.05 dB @ 1550 nm & 1625 nm
Heat Aging (85 ℃, 85% RH, 30 days)	≤ 0.05 dB @ 1550 nm & 1625 nm

Typical Performance Charateristics

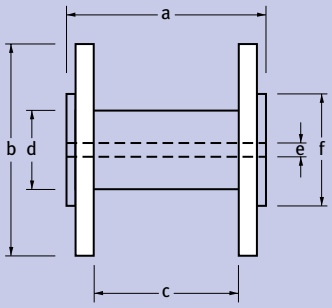
Parameters		Typical Values
Attenuation	1310 nm	0.34 dB/km
	1380 nm	0.50 dB/km
	1450 nm	0.25 dB/km
	1550 nm	0.20 dB/km
	1625 nm	0.22 dB/km
Dispersion	1310 nm	- 8.9 ps/(nm·km)
	1550 nm	8.6 ps/(nm·km)
	1625 nm	13.2 ps/(nm·km)
Effective area		68 μm^2
Zero dispersion wavelength		1424 nm
Dispersion slope		0.062 ps/(nm^2·km)

Packaging and Test Certification

PACKAGING

- Optical fiber is wound on a shipping spool for which dimensions are:

a= width of outside flanges	120 mm
b= flange diameter	248 mm
c= width of inside flanges	95 mm
d= barrel out-diameter	150 mm
e= bore diameter	25.4 + 0.5 / -0.1 mm
f= wing diameter	160 mm



LABEL

- The label attached to each shipping spool contains at least the following information:
  - Fiber I.D.
  - Fiber Length
  - Attenuation at 1550 nm &1625 nm
  - Mode Field Diameter at 1550 nm

TEST CERTIFICATION

- One copy of a test certification sheet is enclosed in the shipping carton.
- The sheet contains at least the following information.
  - Fiber I.D.
  - Fiber Length
  - Attenuation at 1550 nm &1625 nm
  - MFD at 1550 nm
  - Zero Dispersion Wavelength, Dispersion Slope, Dispersion at 1550 nm
  - Geometry of the fiber and coating
  - PMD at 1550 nm

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