

ADSS CABLE MODULO 12 – MICROMODULE

APPLICATION

Application	Micro module cable for aerial installation		
Cross Section (not to scale)	12-144 fibers 		
Configuration	• Micro module with 12 optical fibers and jelly inside • Easy to strip the micro module • Aramid yarns • Cable strand: Dry, with water blocking yarns and water blocking tape • Outer sheath: HDPE, with 4 FRP embedded in the sheath symmetrically		
Temperature Range	Storage and Transport: -40°C to +70°C	Installation: -5°C to +40°C	Operation: -40°C to +70°C
Standards	IEC 60793-1, IEC 60793-2, IEC 60794-4-20		

DIMENSIONS

Fiber Count		12	24	36	48	72	96	144
Modularity		12						
Module Ø	mm	1.35						
Outer Diameter	mm	8.0±0.5	8.5±0.5	9.5±0.5	9.5±0.5	11.5±4%	12.8±4%	12.8±4%
Weight/km	kg	46	52	64	67	95	112	114

MECHANICAL PROPERTIES

Fiber Counts	12	24	36	48	72	96	144
Tensile Strength (Tm)	1400N	1400N	1800N	2500N	2700N	3200N	3200N
Impact	5Nm						
Min. Bending Radius	Without tension 10D						

See Point 6: Test Methods

MARKING

Fiber Color	1	2	3	4	5	6	7	8	9	10	11	12
	Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Aqua
Module Color	1	2	3	4	5	6	7	8	9	10	11	12
	Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Aqua

Outer Sheath: Black, Ink print, Marking in 1 meter intervals as follows for example:

MFOxxxx///// H 36 FO G.652D M 12 <year> <week> <BatchNumber> <meter>

OPTICAL FIBER

Standard	ITU-T G.652D		
	Fiber attenuation (dB/km)	Before cable ≤0.34 @ 1310nm ≤0.20 @ 1550nm	After cable ≤0.36 @ 1310nm ≤0.23 @ 1500nm
	Zero Dispersion Wavelength	1300~1324 nm	
	Zero Dispersion Slope	≤0.092 ps/nm ² ·km	
	Cable Cutoff Wavelength (λ _{cc})	*≤1260 nm	
	PMD Max. Value	≤0.12 ps/√km	
Optical	PMD Average	≤0.1 ps/√km	
	PMD Link Design Value (M=20 cables, Q=0.01%)	≤0.06 ps/√km	
	Macro Bending Loss (100 turns; Φ50 mm) @ 1550nm (100 turns; Φ50 mm) @ 1625nm	≤0.05 dB ≤0.10 dB	
	Mode Field Diameter	9.2±0.4 μm @ 1310 nm 10.2±0.4 μm @ 1550 nm	
	Cladding Diameter	125±1.0 μm	
	Cladding Non Circularity	≤ 1.0%	
Geometric	Core/Clad Concentricity Error	≤ 0.6 μm	
	Proof Stress	≥ 0.69GPa	

*Remark: Cable cut-off wavelength according to IEC 60793-1-44-201 Annex A method A

Standard	ITU-T G.657A2		
	Fiber attenuation (dB/km)	Before cable ≤0.35 @ 1310nm ≤0.21 @ 1550nm	After cable ≤0.36 @ 1310nm ≤0.23 @ 1500nm
	Zero Dispersion Wavelength	1300~1324 nm	
	Zero Dispersion Slope	≤0.092 ps/nm ² ·km	
	Cable Cutoff Wavelength (λ _{cc})	*≤1260 nm	
	PMD Max. Value	≤0.2 ps/√km	
Optical	PMD Average	≤0.1 ps/√km	
	PMD Link Design Value (M=20 cables, Q=0.01%)	≤0.06 ps/√km	
	Macro Bending Loss (10 turns; Φ30 mm) @ 1550nm (10 turns; Φ30 mm) @ 1625nm (1 turns; Φ20 mm) @ 1550nm (1 turns; Φ20 mm) @ 1625nm (1 turns; Φ15 mm) @ 1550nm (1 turns; Φ15 mm) @ 1625nm	≤0.03 dB ≤0.10 dB ≤0.10 dB ≤0.20 dB ≤0.50 dB ≤1.00 dB	
	Mode Field Diameter	8.6±0.4 μm @ 1310 nm 9.6±0.5 μm @ 1550 nm	
	Cladding Diameter	125±0.7 μm	
Geometric	Cladding Non Circularity	≤ 1.0%	
	Core/Clad Concentricity Error	≤ 0.5 μm	
Mechanical	Proof Stress	≥ 1.05%	

*Remark: Cable cut-off wavelength according to IEC 60793-1-44-201 Annex A method A

TEST METHODS

Test	Conditions	Acceptance Criteria
Tension Loading IEC 60794-1-2 E1	Tensile strength: 2.1xCable weight Sample length: ≥25 m, 1 min	- Fiber strain≤0.33%, cable strain≤0.5% - Δa≤2 dB/km during test - Δa reversible
Crush IEC 60794-1-2 E3	Crush: 2000N/10cm Test: 1 min, number of tests: 3	Δa≤0.1dB
Impact IEC 60794-1-2 E4	5Nm, R = 300 mm, number of places/tests: 3	- Δa reversible - No damage
Torsion IEC 60794-1-2 E7	Sample length: 1 m, ± 180°, 20N, 5 cycles	- Δa≤0.1dB - No damage
Bend IEC 60794-1-2 E11	R=10D, 4 bends, 3 cycles	Δa reversible
Temperature Cycling IEC 60794-1-2 F1	-40°C → +70°C 12h each step, 2 cycles	Δa≤0.10dB/km
Water Penetration IEC 60794-1-2 F5	Sample: 3 m, water column height: 1m Test duration: 24 h	No water leakage (FRP not included)

All optical measurements at 1550 nm

Installation		NESC Light		NESC MEDIUM		NESC HEAVY	
Fiber Counts	Sag %	Max. Sag %	Allowed Span m	Max. Sag %	Allowed Span m	Max. Sag %	Allowed Span M
12	1.3	2.79	80	2.91	70	3.02	35
24	1.3	2.91	80	3.01	70	3.14	35
36	1.3	2.78	80	2.96	80	3.19	45
48	1.3	2.52	80	2.67	80	3.12	60
72	1.3	2.60	80	2.71	80	3.17	60
96	1.3	2.54	80	2.62	80	3.11	65
144	1.3	2.51	80	2.58	80	3.06	65

12F Sag Sheet

Fiber Counts	Span m	Installation*		NESC Light		NESC MEDIUM		NESC HEAVY	
		Sag %	Tension N	Sag %	Tension N	Sag %	Tension N	Sag %	Tension N
12	30	1.3	133	2.16	624	2.31	745	2.90	1212
	40	1.3	178	2.33	774	2.49	921	3.02	1355 (35m)
	50	1.3	222	2.47	911	2.65	1083	/	/
	60	1.3	267	2.59	1046	2.79	1236	/	/
	70	1.3	311	2.69	1172	2.91	1381	/	/
	80	1.3	356	2.79	1295	/	/	/	/

24F Sag Sheet

Fiber Counts	Span m	Installation*		NESC Light		NESC MEDIUM		NESC HEAVY	
		Sag %	Tension N	Sag %	Tension N	Sag %	Tension N	Sag %	Tension N
24	30	1.3	150	2.22	646	2.35	761	3.00	1205
	40	1.3	200	2.41	796	2.57	930	3.14	1341 (35m)
	50	1.3	251	2.55	938	2.74	1092	/	/
	60	1.3	301	2.69	1071	2.88	1244	/	/
	70	1.3	351	2.8`	1197	3.01	1390	/	/
	80	1.3	401	2.91	1320	/	/	/	/

36F Sag Sheet

Fiber Counts	Span m	Installation*		NESC Light		NESC MEDIUM		NESC HEAVY	
		Sag %	Tension N	Sag %	Tension N	Sag %	Tension N	Sag %	Tension N
36	30	1.3	184	2.16	743	2.26	855	2.83	1348
	40	1.3	246	2.32	923	2.44	1056	3.08	1650
	50	1.3	307	2.47	1086	2.60	1242	3.19	1794 (45m)
	60	1.3	369	2.58	1248	2.73	1417	/	/
	70	1.3	431	2.69	1399	2.85	1585	/	/
	80	1.3	492	2.78	1544	2.96	1747	/	/

48F Sag Sheet

Fiber Counts	Span m	Installation*		NESC Light		NESC MEDIUM		NESC HEAVY	
		Sag %	Tension N	Sag %	Tension N	Sag %	Tension N	Sag %	Tension N
48	30	1.3	193	1.98	811	2.07	937	2.55	1498
	40	1.3	257	2.12	1011	2.23	1161	2.76	1843
	50	1.3	321	2.24	1199	2.36	1371	2.95	2156
	60	1.3	386	2.34	1375	2.47	1570	3.12	2455
	70	1.3	450	2.43	1546	2.57	1760	/	/
	80	1.3	514	2.52	1708	2.67	1943	/	/

72F Sag Sheet

Fiber Counts	Span m	Installation*		NESC Light		NESC MEDIUM		NESC HEAVY	
		Sag %	Tension N	Sag %	Tension N	Sag %	Tension N	Sag %	Tension N
72	30	1.3	272	2.04	960	2.09	1069	2.57	1642
	40	1.3	363	2.19	1193	2.25	1321	2.81	2007
	50	1.3	454	2.31	1411	2.39	1557	3.00	2351
	60	1.3	545	2.42	1618	2.51	1780	3.17	2675
	70	1.3	636	2.52	1816	2.62	1994	/	/
	80	1.3	726	2.60	2007	2.71	2199	/	/

96F Sag Sheet

Fiber Counts	Span m	Installation*		NESC Light		NESC MEDIUM		NESC HEAVY	
		Sag %	Tension N	Sag %	Tension N	Sag %	Tension N	Sag %	Tension N
96	30	1.3	320	2.00	1089	2.02	1200	2.48	1811
	40	1.3	427	2.14	1357	2.18	1480	2.69	2224
	50	1.3	534	2.27	1603	2.31	1747	2.89	2599
	60	1.3	641	2.37	1844	2.42	2000	3.04	2957
	70	1.3	748	2.46	2071	2.52	2244	3.11	3136 (65m)
	80	1.3	855	2.54	2291	2.62	2471	/	/

144F Sag Sheet

Fiber Counts	Span m	Installation*		NESC Light		NESC MEDIUM		NESC HEAVY	
		Sag %	Tension N	Sag %	Tension N	Sag %	Tension N	Sag %	Tension N
144	30	1.3	326	1.98	1101	2.02	1200	2.46	1831
	40	1.3	435	2.13	1368	2.16	1494	2.66	2256
	50	1.3	544	2.24	1628	2.29	1767	2.84	2647
	60	1.3	653	2.3	1872	2.40	2025	3.00	3009
	70	1.3	761	2.42	2105	2.50	2268	3.06	3187 (65m)
	80	1.3	870	2.51	2325	2.58	2508	/	/