



DOCUMENT REFERENCE

1. Optiviel Standard No : D-02F-G657A2
2. Optiviel Standard No : F8-02F-G657A2

DOCUMENT REVISION HISTORY

- Issue 1 : First Issue

AUTHORISATION			
	Position	Signature	Date
Originated by	DESIGN ENGINEER		08/12/2010
Approved by	SENIOR CABLE DESIGN		08/12/2010

CUSTOMER APPROVAL *)			
Name	Position	Signature	Date

*) To be approved by customer prior to contract awarded

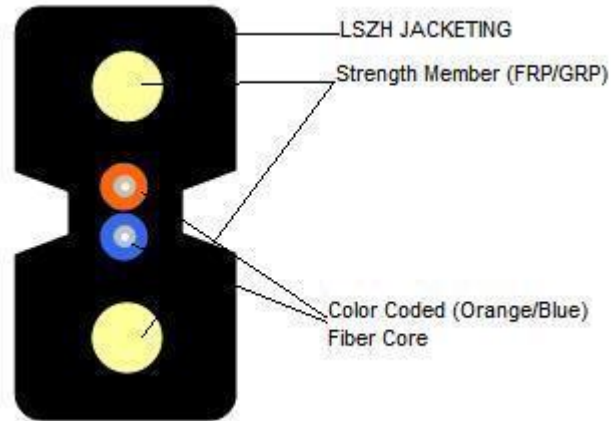


FIBER CHARACTERISTICS

<i>Refer to ITU-T G657A2</i>	
Material	Silica/Germanium Doped Silica
Index Profile	Step index/Matched cladding
Coating Characteristics	
Primary Coating Material	Dual Layer UV cured acrylate resin
External Coating Diameter	245 ± 5 µm
Coating /Cladding Concentricity	≤ 10 µm
Geometrical Characteristics	
Mode Field Diameter @1310 nm	8.6 ± 0.4 µm
Cladding Diameter	125.0 ± 0.7 µm
MFD/Cladding Concentricity Error	≤ 0.5 µm
Cladding non Circularity Error	≤ 1.0 %
Cable Cut-Off Wavelength (λ_{ccf})	≤ 1260 nm
Attenuation coefficients	
@1310 nm	≤ 0.35 dB/km
@1383 nm	≤ 0.35 dB/km
@1550 nm	≤ 0.21 dB/km
@1625 nm	≤ 0.25 dB/km
Attenuation Uniformity (1310 & 1550)	≤ 0.05 dB/km
Profile Uniformity (1310 & 1550)	≤ 0.05 dB
Dispersion Coefficients	
1285÷1330 nm	≤ 3.5 ps/(nm·km)
@1550 nm	≤ 18 ps/(nm·km)
@1625 nm	≤ 22 ps/(nm·km)
Zero Dispersion Wavelength	1300÷1324 nm
Zero Dispersion Slope S_0	≤ 0.092 ps/(nm ² ·km)
Polarisation Mode Dispersion (single drum)	≤ 0.1 ps/√km
PMD LINK	≤ 0.07 ps/√km
Mechanical Characteristics	
Proof Test	≥ 1.0 %
Macrobending Loss	
10 Turns around 15mm radius @1550nm	≤ 0.03 dB/km
10 Turns around 15mm radius @1625nm	≤ 0.1 dB/km
1 Turns around 10mm radius @1625nm	≤ 0.2 dB/km
1 Turns around 10mm radius @1550nm	≤ 1.0 dB/km



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Technical Parameters				
Parameter		Units	Value / Details	
Fibre Count			2	
Fiber Type			G657A1 or G657A2	
Strength Member			GRP 0.6mmx2	KFRP 0.6mmx2
Cable Dimension		Mm	2.0(±0.1) x 3.0(±0.1)	
Approx. Cable Weight		Kgs/km	7	
Dynamic		mm	30	30
Bending Radius	Dynamic	Mm	≥30	≥30
	Static	Mm	≥15	≥10
Tensile Strength	Installation	N	100	
	Operation		60	
Tensile Strength	Longterm	N/10cm	1000	
	Shortterm	N/10cm	500	
Operational Temperature		°C	-10 to +70	
Installation Temperature		°C	-5 to +50	
Transport/Storage Temperature		°C	-10 to +60	
Drum length m 2000		M	2000	



FTTH Outdoor Flat Cable with G657A Fibre

This cable comprises of 2 ITU-T G657A1 or G657A2 fibers. To identify the fibres, one is colored blue and the second is orange. The cable is of flat construction. Two 0.6mm Aramid Reinforced Plastic (KFRP) or Glass reinforced plastic (GRP) are applied as strength members. Both fibers and strength members are then sheathed with White/Natural LSOH material for indoor application. Sheath material is without UV resistant protection. The cable is for indoor applications and meets the requirements of IEC 60332-3-24.

Cable Marking:

It is proposed to ink jet print printed on the outer sheath of the cable, one meter intervals. A proposed text is shown below, where ‘ N ‘ represents the meter marking :

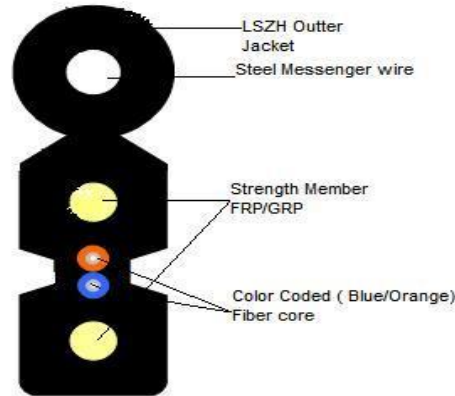
“ N OPTIVIEL [number of fiber & fiber type][cable type] FTTH INDOOR
[year] N+1 ”

Fiber Colors		
No.	1	2
Color	Blue	Orange

Cable Configuration					
Number of					Cable Weight
Fiber	KFRP/GRP strength member		Width	Height	
			Nominal (mm)	Approx(mm)	Approx (Kg/km)
2	2		2 - 2.5	3 - 3.5	17-18



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Technical Parameters				
Parameter		Units	Value / Details	
Fibre Count			2	
Fiber Type			G657A1 or G657A2	
Strength Member			GRP 0.6mmx2	KFRP 0.6mmx2
Messenger wire			Galvanized steel , 1.2mm diameter	
Cable Dimension		Mm	2.0(±0.1) x 3.0(±0.1)	
Approx. Cable Weight		Kgs/km	17	
Dynamic		mm	30	30
Bending Radius	Dynamic	Mm	≥30	≥30
	Static	Mm	≥15	≥10
Tensile Strength	Installation	N	100	
	Operation		100	
Tensile Strength	Longterm	N/10cm	1000	
	Shortterm	N/10cm	500	
Operational Temperature		°C	-10 to +70	
Installation Temperature		°C	-5 to +50	
Transport/Storage Temperature		°C	-10 to +60	
Drum length m 2000		M	2000	



FTTH Outdoor Flat Cable with G657A Fibre

This cable comprises of 2 ITU-T G657A2 fibers. To identify the fibres, one is colored blue and the second is orange. The cable is of flat construction. Two 0.5mm Aramid Reinforced Plastic (KFRP) or Glass reinforced plastic (GRP) are applied as strength members. One galvanized steel messenger wire of 1,2mm in diameter is embedded in the cable structure act as a hanging wire in aerial installation. Fibers, strength members, and messenger wire are then sheathed with LSOH material for outdoor application. Sheath material is with UV resistant protection. The cable is for outdoor applications.

Cable Marking:

It is proposed to ink jet print printed on the outer sheath of the cable, one meter intervals. A proposed text is shown below, where ‘ N ‘ represents the meter marking :

“ N OPTIVIEL [number of fiber & fiber type][cable type] FTTH OUTDOOR
[year] N+1 ”

Fiber Colors		
No.	1	2
Color	Blue	Orange

Cable Configuration					
Number of			Width	Height	Cable Weight
Fiber	KFRP/GRP strength member	Messenger wire			
			Nominal (mm)	Approx(mm)	Approx (Kg/km)
2	2	1	2 - 2.5	5 - 5.5	17-18



Main Mechanical and Environmental Characteristics

Performance Tests and Test Methods	
Parameter	Test Method and Acceptance Criteria
Tensile Strength	Test Method IEC 60794-1-2-E1 Short term load = 130N for 5 minutes Long term load = 60N for 60 minutes Acceptance Criteria: Attenuation Increase maximum 0,03db/km at 1550nm No Fiber break and no sheath damage
Crush Resistance	Test Method IEC 60794-1-2-E3 Applied load 1200N Crush load for 10 minutes and 10 second release (one point and one time) Acceptance Criteria: Attenuation change during and after loading shall not more than 0.03dB at 1550nm . No fibre breaks or cable damage
Impact Resistance	Test Method IEC 60794-1-2-E4 Applied load: 0,3kg , 3 cycles each , at 5 locations 1m apart Acceptance Criteria: Attenuation change during and after loading shall not more than 0.03dB at 1550nm . No fibre breaks or cable damage
Repeat Bending	Test Method IEC 60794-1-2-E6 Bending radius of 250mm, bending 90deg to left and right with 7kg load 30 cycles per minute at 100second, and release for 10 second Acceptance criteria: Attenuation change during and after loading shall not more than 0.03dB at 1550nm . No fibre breaks or cable damage



Test and Controls on Finished Cables

NO	TEST / CONTROL	FREQUENCY SAMPLING	TEST METHOD/ INSTRUMENTATION	ACCEPTANCE AUTHORITY
1	Attenuation at 1310 nm	100 % of the fiber optic 100 % of the drums	IEC 793-1 C1C O.T.D.R	Quality Control Applied to Single Mode fiber
2	Attenuation at 1550 nm	100 % of the fiber optic 100 % of the drums	IEC 793-1 C1C O.T.D.R	Quality Control Applied to Single Mode fiber
3	Cable dimensional control (Diameter, Thickness)	10 % of the drums	IEC 811-1-1	Quality Control

Default Manufacture Drumplan :

Standard length perdrums is : 2000 and 4000 M with tolerance of +/-2%

*Side View



*Above view

