COMPLIANCE TESTING REPORT FOR AUSTRALIAN STANDARD AS/CA S008:2010 INCLUDING AMENDMENT NO. 1/2014 REQUIREMENTS FOR CUSTOMER CABLING PRODUCTS (INCLUDING RELEVANT CLAUSES OF IEC 60603-7)*

Client:	Radio Parts Group
Address:	562 Spencer Street West Melbourne 3003, VIC Australia.
Report Number:	0812RAD_LC7XYZ_S008
Date of Testing:	01 August to 03 August 2016
File Number:	RAD160725
Product Name:	SFTP CAT6A PATCH LEADS
Brand Name	PRO2
Product Model No:	LC7XYZ (XYZ represents any number from 000 to 999)
Product Description:	Shielded CAT6A Patch Leads
Result:	**Complies**
Compiled by:	Nina Rodoreda Testing Engineers
Approved by:	Martin Garwood Laboratory Manager
Date of Issue	12 August 2016

*** Refer to summary page for any conditions.**

SUMMARY OF COMPLIANCE WITH AUSTRALIAN STANDARD AS/CA S008:2010 including amendment No. 1/2014 (Including relevant clauses of IEC 60603-7)*

The CAT6A patch lead was supplied for AS/CA S008:2010 testing by Radio Parts of West Melbourne, VIC, Australia.

The Equipment Under Test (EUT) consisted of a length of cordage with RJ45 plugs fitted to both ends. The RJ45 (or 8P8C) plugs were shielded. Both ends had a moulded strain relief jackets between the RJ45 plugs and cordage. The cordage was shielded 4 pair construction with a braided shield around all 4 pairs. Each pair was shielded in Al-Foil. Each conductor comprised of seven (7) strands. The nominal diameter of each conductor strand was 0.148mm. The composition of the conductor insulation was stated as Foam-Polyethylene (FO-PE) and High Density Polyethylene (HDPE). The sheath was Polyvinyl chloride (CMR PVC). Please also refer to the photo in Appendix B and Product Specifications in Appendix C, at the rear of the report.

Due to the construction of the cordage, the EUT was tested to the relevant cord/cordage clauses of this standard and is not suitable for use as building cable (fixed wiring).

The EUT had the following sheath markings:
E213738-Y CMR (UL) C(UL) 4P 26AWG S/FTP CAT6A CONFORM TO ANSI/TIA-568-C.2 & ISO/IEC 11801

The requirements for labelling cable and cable products are specified in the ACMA Telecommunications Cabling (Customer Equipment and Customer Cabling) Notice.

The CAT6A patch lead **COMPLIES** with the tested clauses of AS/CA S008:2010.

Special conditions for compliance:
The Patch cords longer than 10 metres must comply with Clause 5.6.3 requirements for insulation and sheath materials.

Possible Test Case Verdicts:
- test case does not apply to the test object .....N(.A)
- test object does meet the requirements.....P(ass)
- test object does not meet the requirements .....F(ail)
- testing was not performed.....NT
- noted.....ND

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.	REQUIREMENTS		P
5.1	GENERAL Cabling products shall be physically distinguishable from products used for distribution or connection of AC mains supply.		P
5.2	MARKINGS		P
5.2.1	Labelling Notice		ND
5.2.2	Inappropriate markings Cabling products intended solely for telecommunications use shall not bear markings indicating hazardous services.		P
5.2.3	Additional markings (excluding cable markings)		N
5.2.3.1	International protection (IP) rating		N
5.2.3.2	Multidiscipline telecommunications connecting hardware		N
5.3	UNDERGROUND CONDUIT		N
5.4	CABLE DISTRIBUTION DEVICES		N
5.5	OPTICAL FIBRE DISTRIBUTION DEVICES AND ENCLOSURES Optical fire distribution devices and splice enclosures shall comply with AS/NZS 2211.1		N

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.6	CABLES		P
5.6.1	General A customer cable shall meet the requirements of Clauses 5.6.2 to 5.6.9 where specified in Clauses 5.6.10 to 5.6.18 of this Standard.		P
5.6.2	Conductor and optical fibre identification Shall use a system of identification such that all conductors, coaxial tubes or optical fibres within the cable are readily distinguishable visually form one another.	4 twisted pairs. Pairs are identified as: Blue, orange, green and brown. The matching mate in the twisted pair is white insulation.	P
5.6.3	Insulation and sheath material		NT
	(a) shall use insulation and sheath materials suitable for telecommunications purposes;	CMR PVC sheath FO-PE & HD-PE insulation	ND
	(b) Where PVC insulation or sheath materials are used, they shall comply with the requirements of Table 1 or 2, as applicable: and		NT
	Table 1 - PVC Insulation Requirements Tensile strength (unaged): 13 MPa Elongation (unaged): 100% Elongation (Aged): 50% of initial after 100C at 120h Volatile Loss: 20 g/m2 after 80C aging for 120h Volume Resistivity: 400GΩ m at 23C, 0.4GΩ m at 60C		N
	Table 2 - PVC Sheath Requirements Tensile strength (unaged): 12 MPa Elongation (Unaged): 100% Elongation (Aged): 50% of initial after 100C at 120h Volatile Loss: 20 g/m2 after 80C aging for 120h		NT
	(c) Where non-PVC insulation or sheath materials are used, they shall comply with the requirements of AS 1049 for-		NT
	(i) Tensile Strength Test (Aged/Unaged);		NT
	(ii) Elongation Test (Aged/Unaged); and		NT
	(iii) Shrinkback Tests for that particular type of insulation and sheath.		NT

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.6.4	Flammability A cable that is required to comply with this Clause shall pass the combustion propagation test of Method 5.6 including Appendix A and B of AS 1660.5.6.	Refer to table in Appendix A.	P
5.6.5	UV resistance Requirements of AS 1049 for cables exposed to UV radiation.		N
5.6.6	Metallic conductors		P
5.6.6.1	Conductor composition Any metallic conductors, other than copper-clad steel used as an inner conductor in coaxial cable, or copper-clad aluminium with a centre conductor greater than 2mm used as an inner conductor in coaxial cable- (1) shall be either plain or plated copper; (2) may be either a single, solid conductor or multi-stranded; (3) the DC resistance shall be less than the values given in Table 3; and (4) the conductor finish should be plain or tinned	Requirement: 182.6 Ω/km max. Measured: 146.88 Ω/km Stranded copper diam. = 0.148mm All pairs measured and average calculated.	P
5.6.6.2	Electrical withstand voltage A multi-conductor cable that is required to comply with this Clause by any of Clauses 5.6.10 to 5.6.18 of this Standard, when tested at a frequency of 50 Hz on at least 1 m length; (a) shall be able to withstand the appropriate AC voltage levels and test method listed in Table 4, without breakdown for a period of 60 s or a period of 2 s as stated; and (b) for Test 2 and 3, all cables/cordages shall comply to the Table 4 limits using the test specified in AS/NZS 3191 Table 2.1, test number 8(a), and using test method referred in Clause 3.5.1 of AS/NZS 1660.3.	Refer to Appendix A.	P

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.6.6.3	Mutual capacitance (a) The maximum mutual capacitance between the two wires forming a pair measured at any frequency in the range 800 Hz to 1000 Hz shall not exceed the relevant value given in table 5. (b) The measurement, referred to in Clause 5.6.6.3 (a) shall be performed on a minimum cable length of 100m (c) The mutual capacitance shall be corrected to a length of 1000m		P
5.6.6.4	Capacitance unbalance (a) The maximum capacitance unbalance between pairs measured at any frequency in the range 800 Hz to 1000 Hz shall not exceed the relevant value given in Table 5. (b) During the measurement referred to in Clause 5.6.6.4 (a), all conductors, other than those under test and the metallic shield (where applicable) shall be connected to earth. (c) The measurement shall be performed on a minimum cable length of 100m. (d) The capacitance unbalance between two pairs of wires with one pair designated 'A' and 'B' and the second pair designated 'C' and 'D'. (e) The capacitance unbalance shall be corrected to a length of 500m.		P
5.6.6.5	Insulation resistance (a) shall not be less than the relevant value given in Table 5; (b) the measurement shall be made on a minimum length of 100m of cable or cordage at a potential of 500Vd.c. ±50Vd.c. and the reading taken after the application of the voltage for 60s; and (c) the insulation resistance shall be corrected to a length of 1000m.	Requirement: 100MΩ/km min Measured: > 100MΩ/km Refer to Appendix A.	P
5.6.7	Metallic shield (a) any shield provided in the cable shall be electrically continuous; and (b) Where a foil shield is employed, a drain wire shall be placed in continuous contact with the metallic surface of the shield.		P

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.6.8	Water penetration test Water Penetration specified in Clause 25, Method-F5B of IEC 60794-1-2.		N
5.6.9	Integral bearer or strengthener		N
5.6.10.	Cable with specific attributes Where a cable is claimed to have specific attributes, such as rodent or termite resistance or armouring strength, evidentiary documentation shall be made available on request to support the claim.		N
5.6.11	Metallic paired cable	Cable not supplied separately	N
5.6.11.1	General requirements Metallic paired cable, other than cordage, a cord or a special application cable, shall comply with the following Clauses: 5.6.2, 5.6.3, 5.6.4, 5.6.5, 5.6.6.1, 5.6.6.2, 5.6.6.3, 5.6.6.4, 5.6.6.5, 5.6.7, 5.6.8 and 5.6.9.		N
5.6.11.2	Construction A cable intended to carry a frequency of 300 Hz or greater shall be shielded or of twisted pair construction.		N
5.6.12	Cordage with metallic conductors	Cordage not supplied separately	N
5.6.12.1	General requirements Cordage with metallic conductors shall comply with the following Clauses: 5.6.2, 5.6.3, 5.6.4, 5.6.5, 5.6.6.1, 5.6.6.2, 5.6.6.3, 5.6.6.4, 5.6.6.5 and 5.6.7.		N
5.6.12.2	Conductor composition Conductors in metallic cordage should be of stranded or tinsel conductor construction when frequent movement of the cordage is anticipated.		N
5.6.13	Cords with metallic conductors		P
5.6.13.1	General requirements A cord with metallic conductor shall comply with the following Clauses: 5.6.2, 5.6.4, 5.6.5, 5.6.6.1, 5.6.6.2, 5.6.6.5 and 5.6.7		P
5.6.13.2	Cords exceeding a length of 10m A cord with metallic conductors that exceeds a length of 10m shall comply with Clause 5.6.13.1 and the following Clauses: 5.6.3, 5.6.6.3 and 5.6.6.4.		P

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.6.13.3	Cord anchorage or strain relief A cord with metallic conductors- (a) shall be secured in any plug or socket connected to a cord by an appropriate anchorage or strain relief; and (b) When subjected to a force of 45 N gradually applied between the cord and the plug or socket for a period of 60s, the cord shall not be longitudinally displaced by more than 2mm, nor show any appreciable strain at the connection.		P P P
5.6.14	Metallic jumper wire and jumper cable		N
5.6.15	Coaxial cable		N
5.6.16	Optical fibre cable		N
5.6.17	Blown fibre tube systems		N
5.6.18	Special application cables		N

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.7	CONNECTING HARDWARE, INCLUDING PLUGS AND SOCKETS OF ALL DESIGNS		P
5.7.1	General		P
5.7.1.1	Insulation resistance The insulation resistance between any two points which are required to be electrically insulated shall be a minimum of 100 MΩ. The insulation resistance measurement is to be made after 500V ± 50 V d.c. has been applied for a period of 60 s	Measured: > 100 MΩ	P
5.7.1.2	Contact resistance		P
5.7.1.2.1	Insulation Displacement contacts The contact resistance in connecting hardware other than the types of plugs and sockets covered in Clauses 5.7.2, 5.7.3 and 5.7.4 shall comply with the requirements of IEC 60352-4 Clause 12.3.1.	Insulation Displacement contacts as part of the plug, comply with requirements. 8 position modular sockets covered in Clause 5.7.2	P
5.7.1.2.2	Plug and socket connection For connectors using a plug and socket, other than the types of plugs and sockets described in Clauses 5.7.2, 5.7.3 and 5.7.4, the interface resistance of the overall mated connection or shield connection shall not exceed 50mΩ using the test method described in Clause 12.3.1 of IEC 60352-4.		N
5.7.1.3	Electric strength Electrically conductive elements normally at telecommunications network voltage (TNV) shall comply with Clause 6.4.2 (Voltage proof) of IEC 60603-7.	Refer to Appendix A.	P
5.7.1.4.	Protection against contact with exposed circuits Connectors, plugs and sockets with metallic conductors and shields shall comply with the probe test of Clause 6.2.1 (b) (Separation requirements) of AS/NZS 60950.1.		P
5.7.1.5	Weather resistance Plugs and sockets exposed to weather and damp areas shall have a minimum degree of protection of IPX3 against the ingress of water when tested in accordance with AS 60529.		N

AS/CA S008:2010			
Clause	Requirement - Test	Result - Remark	Verdict
5.7.1.6	Access to cable terminations All telecommunications terminations shall be enclosed or located to prevent unintentional contact with voltages other than SELV by a person who is not doing cabling work (e.g. an end-user).		P
5.7.1.7	Prohibited arrangements A connecting device's faceplate for telecommunications wiring shall not incorporate a low voltage fixed socket-outlet or switch.		N
5.7.2	Eight (8) position modular plugs and sockets In addition to the general requirements of Clause 5.7.1, eight (8) position modular plugs and sockets shall comply with the following Clauses of IEC 60603 7: 6.4.2 Voltage proof 6.4.3 Current - temperature derating 6.4.4 Initial contact resistance 6.6.1 Mechanical operation (Cycle) 6.6.2 Effectiveness of a connector coupling device	Refer to Appendix A.	P
5.7.3	Six (6) position modular plugs and sockets Six (6) position modular plugs and sockets shall- (a) be mechanically designed according to CFR FCC 68.500 (a) and (b) ; and (b) In addition to the general requirements of Clause 5.7.1, shall comply with the following Clauses of IEC 60603-7: 6.4.2 Voltage proof 6.4.3 Current - temperature derating 6.4.4 Initial contact resistance 6.6.1 Mechanical operation (Cycle) 6.6.2 Effectiveness of a connector coupling device		N
5.7.4	600 series plugs and sockets		N
5.8	CABLING PRODUCTS FOR UNDERGROUND AND AERIAL INSTALLATIONS		N

***** END OF REPORT BODY *****

Appendix A – Additional Test Data
Appendix B – Photographic Record of Sample
Appendix C – Specifications provided by the client

Appendix A	Additional test data		
Clause	Requirement - Test	Result - Remark	Verdict

Appendix A – Additional Test Data

5.6.4	TABLE: Flammability Test	P

No	Object	Duration of application of flame (S)	Time object remained alight after removal of flame (S)	Time until ignition of tissue paper (S)	Time until ignition of particle board (S)	Ignition of tissue paper	Particle board scorching	Extent of burning upwards (mm)* (>50mm)	Extent of burning downwards (mm)* (<540mm)	Result
1	CAT6A patch lead	60sec	32 sec	NI	NI	NI	NI	305mm	500mm	Pass

* Measured from lower edge of upper clamp. Start of burn was 475 mm from upper clamp. Limit for upward burn is > 50 mm and limit for downward burn is <540 mm from upper clamp (AS 1660.5.6).

LEGEND	
P	Pass
F	Does not comply
NA	Not applicable
NI	No ignition

NOTE:
INDIVIDUAL ITEMS OF THIS TEST REPORT SHOULD NOT BE QUOTED IN ISOLATION AS PROOF OF PRODUCT ACCEPTABILITY NOR APPLIED TO DIRECTLY ASSESS PERFORMANCE UNDER CONDITIONS OTHER THAN AS ENVISAGED BY THE REFERENCE SPECIFICATION, E.G. INDIVIDUAL FIRE TESTS TO PROVE AN OVERALL ACCEPTABLE FIRE HAZARD LEVEL.

Appendix A	Additional test data		
Clause	Requirement - Test	Result - Remark	Verdict

Appendix A – Additional Test Data

5.6.6.2	TABLE: Cable – Electrical Withstand Voltage		P
Test voltage applied between:		test voltage (V)	breakdown Yes / No
Blue wire to all other conductors and shield		700 V a.c. rms	No
White Blue wire to all other conductors and shield		700 V a.c. rms	No
Orange wire to all other conductors and shield		700 V a.c. rms	No
White Orange wire to all other conductors and shield		700 V a.c. rms	No
Green wire to all other conductors and shield		700 V a.c. rms	No
White Green wire to all other conductors and shield		700 V a.c. rms	No
Brown wire to all other conductors and shield		700 V a.c. rms	No
White Brown to all other conductors and shield		700 V a.c. rms	No
All conductors to sheath		700 V a.c. rms	No
Shield to sheath		1500 V a.c. rms	No

5.6.6.5	TABLE: Insulation Resistance		P
Test Voltage applied between:		Test Voltage (V)	Insulation Resistance (MΩ/km)
Wires forming a pair		500Vdc	>100 MΩ/km

Appendix A	Additional test data		
Clause	Requirement - Test	Result - Remark	Verdict

Appendix A – Additional Test Data

IEC 60603-7 Clauses of Section 5.7 Connecting hardware, including plugs and sockets of all designs

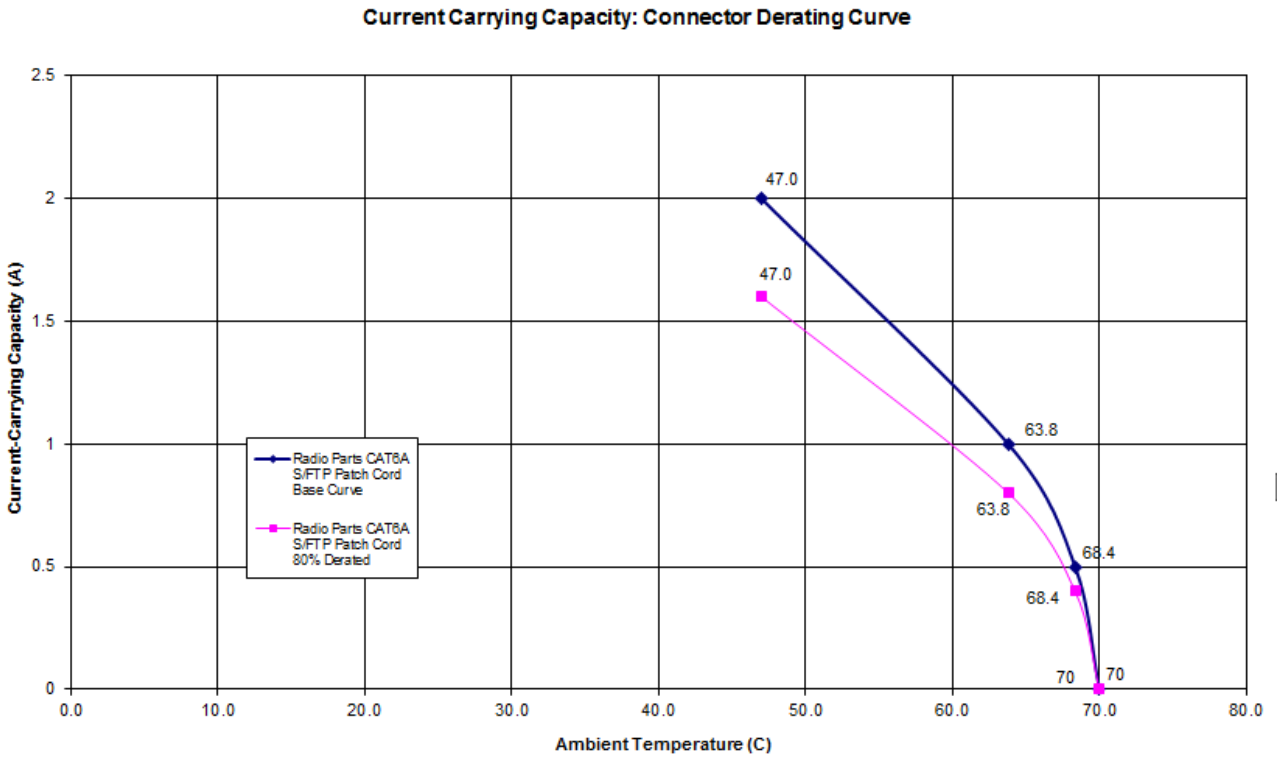
5.7.1.3 & 5.7.2	IEC 60603-7 Clause 6.4.2 Voltage proof		P
	IEC 512-2, Test 4a Standard atmospheric conditions. Mated connectors. 1000 VDC or AC peak, contact to all contacts. 1500 VDC or AC peak, all contacts to shield.		P
	Test method used (A, B or C) and details to be specified.	Method = A Duration = 60 seconds Current Limit = 2 mA See also below.	P

Test Voltage applied between:	Test Voltage (V)	breakdown Yes / No
Each contact to all other contacts and body(shield)	1000 V a.c. peak	No
All contacts to body(shield)	1500 V a.c. peak	No

Appendix A	Additional test data		
Clause	Requirement - Test	Result - Remark	Verdict

Appendix A – Additional Test Data

5.7.2 & 5.7.3	IEC 60603-7 Clause 6.4.3 Current-temperature derating		P
	IEC 512-3, Test 5b Standard atmospheric conditions. All contacts.		P



Appendix A	Additional test data		
Clause	Requirement - Test	Result - Remark	Verdict

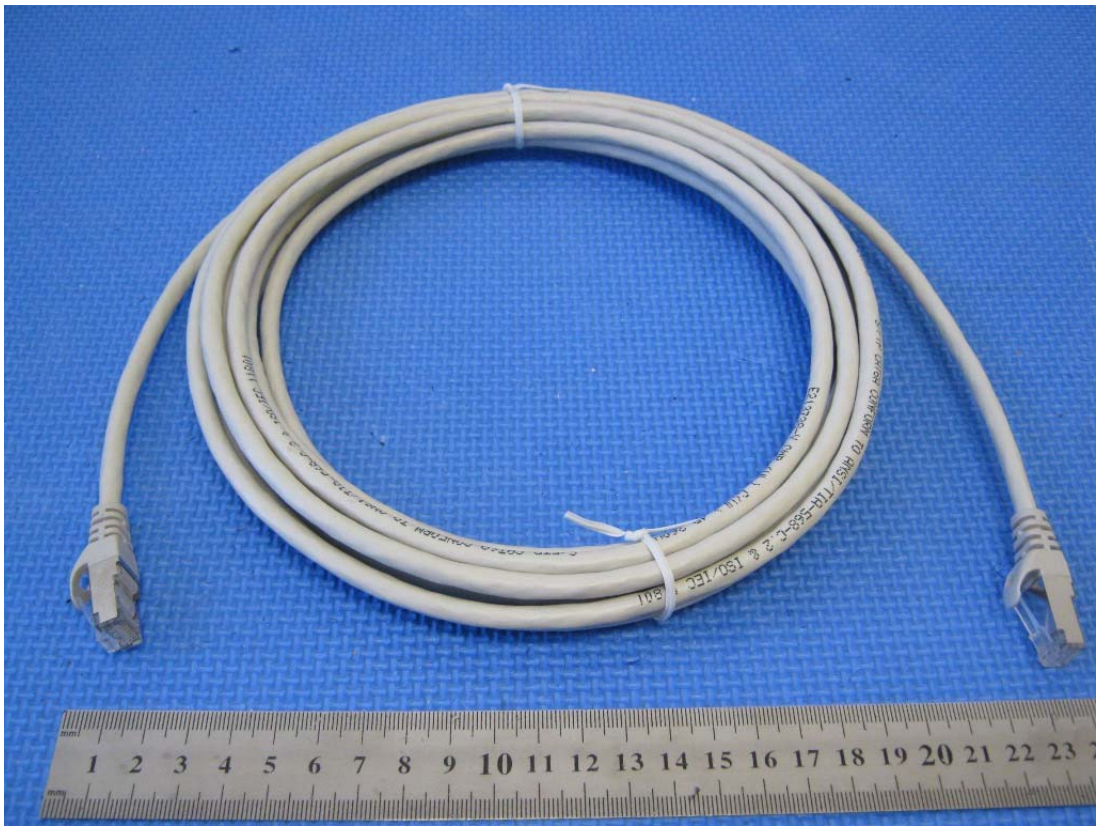
Appendix A – Additional Test Data

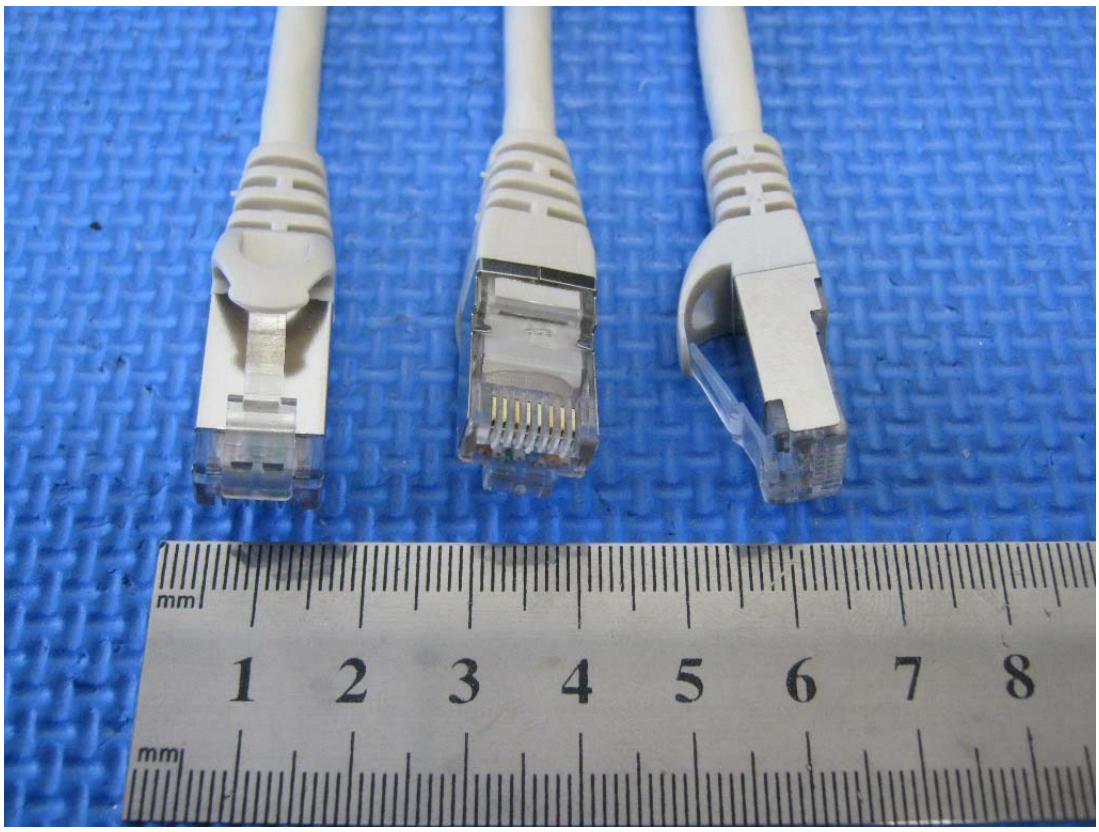
5.7.2 & 5.7.3	IEC 60603-7 Clause 6.4.4 Initial contact resistance		P
	IEC 512-2, Test 2a Standard atmospheric conditions Mated connectors. Connection points as specified in IEC603-7 figure 27. Requirement = 20mΩ max	Test current <100mA DC, emf of test circuit <20mV DC. Both polarities. Measured: < 13.15 mΩ	P

5.7.2 & 5.7.3	IEC 60603-7 Clause 6.6.1 Mechanical operation (Cycle)		P
	IEC 512-5, Test 9a Speed 10mm/s max. Rest: 1s min. (unmated) PL1: 750 operations; PL2: 2500 operations.	Compliance is checked by visual inspection, contact resistance, insulation resistance and voltage tests. PL1	P

5.7.2 & 5.7.3	IEC 60603-7 Clause 6.6.2 Effectiveness of connector coupling devices		P
	IEC 512-8, Test 15f All types: 50 N for 60 ± 5 s. Requirement: Connectors shall remain fully engaged and there shall be no loss of electrical continuity. Latching and unlatching of coupling locks shall be operational and certain.		P

Appendix B – Photographic Record of Sample





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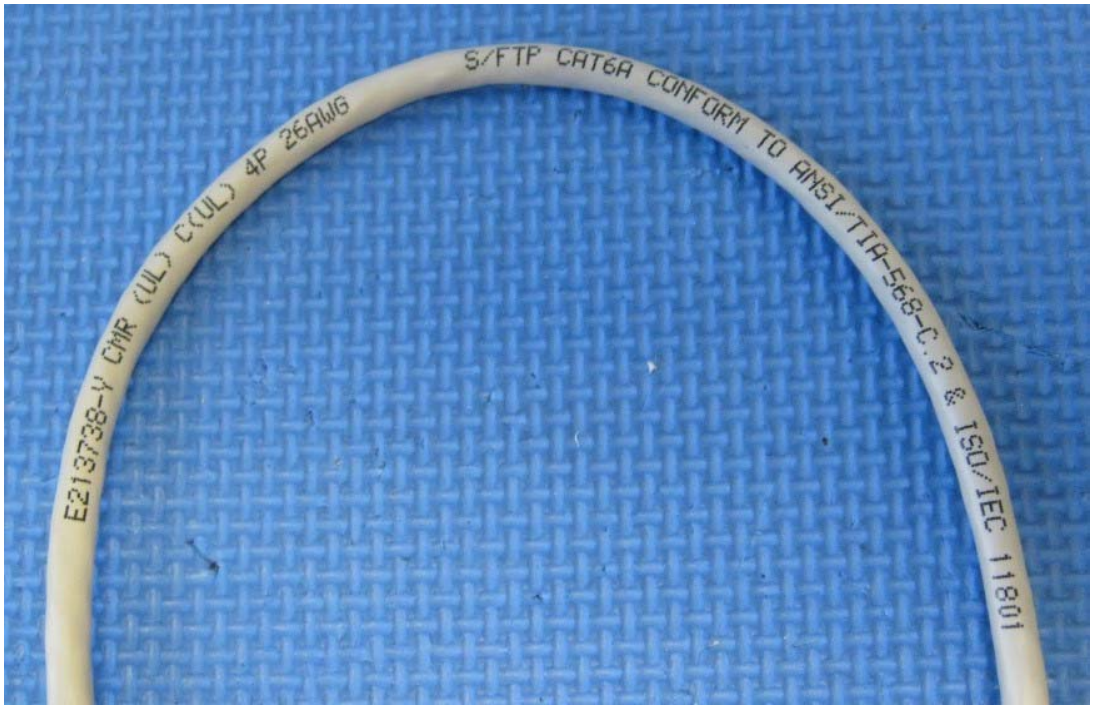
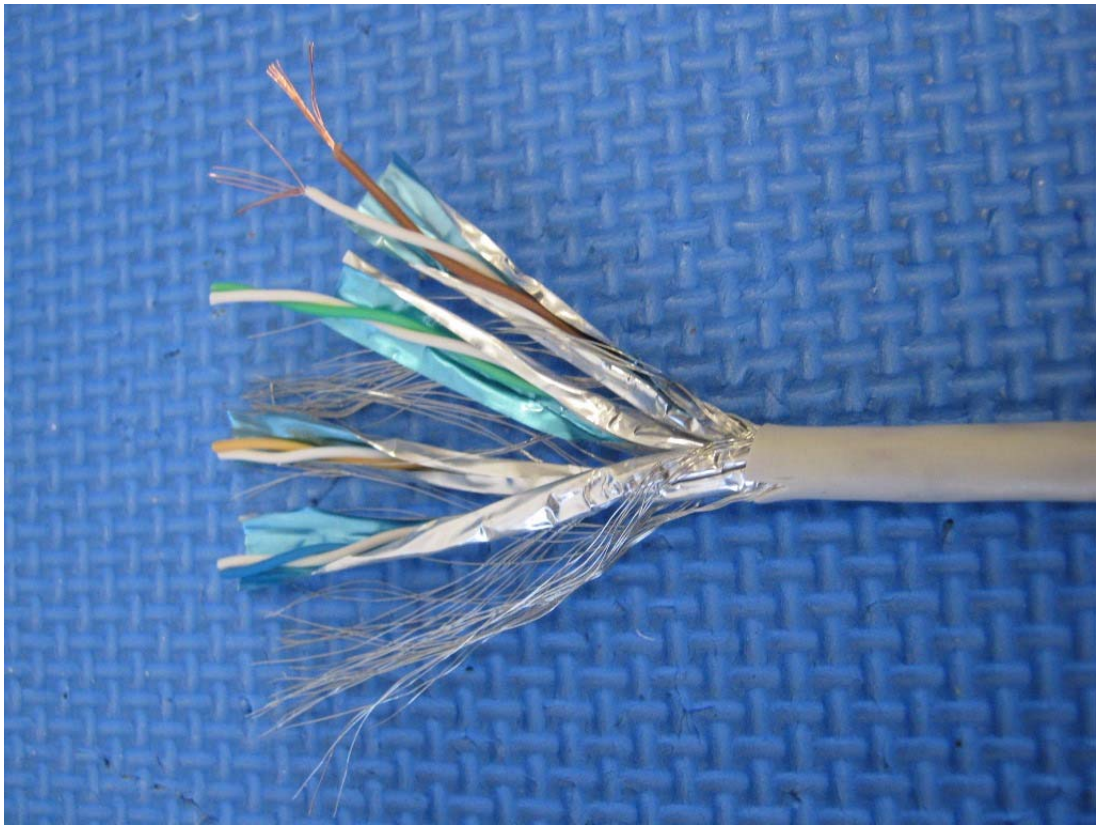




Appendix C – Specifications provided by the client

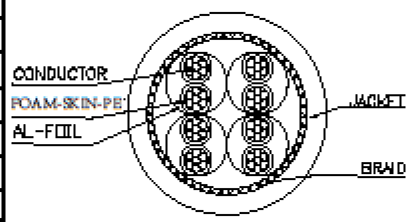
for S/FTP CAT6A 26AWG STRANDED CABLE

Configuration & physical Characters:

Type of cable		S/FTP
Length per reel		
Number of pairs		4
Field of application		indoor
Category		Cat.6A
Conductor	Material	Bare Copper
	Size	26AWG
		7/0.148±0.005 mm
Insulation	Material	FO-PE&HD-PE
	Thickness	0.27±0.15 mm
	Diameter	0.99± 0.02mm
	Color code	Blue/White
		Orange/White
		Green/White
		Brown/White
Shield	Al Foil	0.035×10mm/0.045×10mm
	Braiding	(TC)16X5X1/0.12MM
Jacket	Material	CMR PVC
	Thickness	MIN at any point: 0.53mm MAX AVG: 0.59mm
	Diameter	0.56±0.3mm
	Colors	per request
	Aging at 100°C for 168Hrs	MIN ELONGATION RETENTION:75%
		MIN TENSILE STRENGTH RETENTION:70%

Electric Characters:

1.Spark Test	1500±250VOC
2.Mutual Capacitance	560pF/100m Max
3.Conductor Resistance	MAX14.0Ω/100m at 20°C
4.Capacitance Unbalance	MAX 330pF/100m
5. Resistance Unbalance	MAX3%
6.Impedance	100±15Ω



Marking:

Premise Cable Electrical Table(TIA Cat 6A Channel)

Freq (Mhz)	Insert loss(dB)	NEXT (dB)	RL (dB)	RCA-N(dB)	ACR-F (dB)	PSNEXT(dB)	PSACRN (dB)	PSACR F(dB)
1	3.0	65.0	19.0	62.0	63.3	62.0	59.0	60.3
4	4.2	64.1	19.0	58.9	51.2	60.5	56.4	48.2
8	5.8	58.2	19.0	52.4	45.2	55.6	49.8	42.2
10	6.5	56.6	19.0	50.1	43.3	54.0	47.5	40.3
16	8.2	53.2	18.0	45.0	39.2	50.6	42.4	36.2
20	9.2	51.6	17.5	42.5	37.2	49.0	39.8	34.2
25	10.2	50.0	17.0	39.8	35.3	47.3	37.1	32.3
31.25	11.5	48.4	16.5	36.9	33.4	45.7	34.2	30.4
62.5	16.4	43.4	14.0	27.0	27.3	40.6	24.2	24.3
100	20.9	39.9	12.0	19.0	23.3	37.1	16.2	20.3
200	30.1	34.8	9.0	4.7	17.2	31.9	1.8	14.2
250	33.9	33.1	8.0	-0.8	15.3	30.2	-3.7	12.3
350	40.6	30.3	6.6	-10.3	12.4	27.3	-13.3	9.4
500	49.3	26.1	6.0	-23.2	9.3	23.2	-26.1	6.3

Standard: ISO/IEC 11801; ANSI/TIA-568-C.2

Edition: OR

DIMENSIONS ARE IN mm	TOLERANCES ARE	DRAWN Jason	APPROVED	REV.	P/N:
	FRACTIONS DECIMALS ANGLES	DATE 07/25/2016	DATE	A	DESCRIPTION S/FTP CAT6A 26AWG STRANDED CABLE
MOLD NO.	.X±0.20	SHEET OF			
	.XX±0.12	SIZE A4	SCALE N.T.S		

Accredited for compliance with ISO / IEC 17025.
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