ADDISON
OMS CABLING SYSTEM

Company Profile

Addison cabling system originated as a cabling solution produced and marketed by Caledonian Cables Ltd located at Sussex, England. Founded in 1978, Caledonian Cables originally entered the market as an OEM manufacturer of data cables. Shortly after, we developed other connectivity hardware to support the cabling industries. It was not until 1997 that Caledonian entered the data cabling market with complete solutions branded under Addison for the twisted pair network environment.

Caledonian & Addison, produces a wide range of cables for communication, power and electronics in its primary plants in UK, Italy and Spain. To stay in front, we continually keep expanding our manufacturing capabilities in more low cost region such as Romania, Taiwan, Malaysia etc. This low-cost manufacturing facilities enable us provide a flexible, scalable global system that delivers superior operational performance and optimal results for our customers.

Our extensive global network of manufacturing facilities gives us significant scale and the flexibility to fulfill our customer requirements. This global presence provides design and consultancy solutions that are combined with core cable manufacturing, logistic services, and vertically integrated with our E commerce technologies, to optimize customer operations by lowering costs and reducing time to market.

With over hundreds of different cabling & networking products, Addison offers one of the most complete lines of fiber and copper cabling solutions. Our superior product performances backed by an extensive list of value-added services, provide leading edge within every cable series and for every application.

Caledonian & Addison has been respected for its high standards of quality, excellent service level, competitive pricing and a unique and innovative spirit. With our latest technologies, we are both inspired and well-positioned to meet the changing needs of our customers. We have the resources to diversify and to enhance our product lines and services. We understand the need for change and with our accurate planning, we are ready for the future and the promise of new marketing opportunities. Our tradition of growth through excellence is assured.

Our Design Centers work closely with customers to constantly improve its standard range of products and technologies and to develop customized, country and industry-specific solutions. Caledonian & Addison has established an extensive network of design, manufacturing, and logistics facilities in the world's major markets to serve the growing outsourcing needs of both multinational and regional customers.

Table of Contents

Open Matrix System (OMS)

The OPEN MATRIX SYSTEM (OMS) is designed by Addison Laboratory based on the open matrix concept and designed to be equipped with superior connectivity components and cables, with the aim of delivering a system that meets or outperforms any of the top cabling connectivity solutions available today.

◎ Performance Specification

To assure customers of significant channel headroom, OMS components are required to meet following performance specifications:

1. In the Bit Error Rate tests, the OMS components must pass specifications of IEEE 802.3ab with zero bit errors.

2. In the Permanent Link or Channel Link tests, the OMS components must exceed industry specifications for PS NEXT, PS ELFEXT, and Return Loss with minimum margin across the entire frequency range as follows:

Link/Channel Tests	CAT5e	CAT6
PSNEXT	4dB	3dB
PSELFEXT	4dB	3dB
Return Loss	4dB	3dB

OMS assures a minimum 3dB for category 6 and 4 dB margin for category 5e. OMS is more than just a warranty program. This is a unique combination of performance assurance, open-architecture, and manufacturer warranty. With combination of all these benefits, OMS is unequaled in the marketplace.

System Warranty

Addison extends link or channel warranty for system installations made by a certified installer in accordance with EIA/TIA 568B and ISO/IEC 11801 standard.

This 30 Year warranty assures that products comprising the system will be free from defects in material or workmanship. The product should include Addison cables together with connecting hardware from recognized suppliers.

The system will support any current or future application that supports transmission over the system in accordance with application standards at the time of manufacture. In case of a valid claim, this warranty covers repair, replacement or credit of any faulty product, and reasonable cost of labor to remedy the warranty claim. This warranty only applies to projects which have utilized 100% Addison cabling product in the network (i.e., both horizontal and backbone) and after proper certification has been obtained. Other than cables, installers are free to choose from any of the recognized connectivity suppliers or purchase Addison connectivity hardware to make up the whole OMS cabling system.

◎ OMS Permanent Link Warranty

This warranty covers the Permanent Link of the network, which includes the cable and connecting hardware. This warranty does not cover other elements of the channel, such as patch cords, equipment cords and faceplates etc.

Addison will honor claims on this warranty for 30 years, on condition that the electrical performance provided by the combination of the different components of the permanent link have been certified by Addison to meet the industry standard, as defined by the TIA 568 latest standard for the Permanent Link in force at the time of purchase with the following conditions:

1. All the connectivity equipment used in the network must be supplied by one or more of the approved suppliers AND each component must be UL or ITS/ETL listed, or verified by an independent testing agency to meet the TIA 568 standard in force at the time of purchase. Please contact Addison sales for the approved connectivity manufacturers.

2. Each link or Channel in the network must be field tested and have passed all TIA 568 requirements. The whole system must be designed and installed by BICSI Certified or Addison approved installers.

◎ OMS Channel Warranty

This warranty covers the channel link of the network. The OMS Channel Warranty will cover all components of the channel, which include telecommunications outlet, horizontal cabling, patch panels, patch cords and the equipment cords.

Addison will honor claims on this warranty for 30 years under the same condition of OMS Link Warranty.

Addison offers OMS program as a Lifetime Applications Assurance and Extended product warranty that ensures all the system components will exceed the applicable standard requirement together with supporting any current and future application. Addison makes this extended product warranty available to BISCI or Addison certified installers to offer identical assurances and warranties to their customers for certified OMS System installations.

◎ Exclusion

These warranties cover the reasonable cost of labor to remedy a warranty claim, but do not cover the cost of any products or associated labor not sold or provided by Addison, and are not transferable from original installation.

Data & Fiber Optic Cables

Data & Fiber Optic Cables 〉〉〉〉〉〉〉

Enhanced Category 5 Cables

◎ **Applications:**

10Base-T, 100Base-T4, 100Base-TX, 100Base-VG-ANYLAN, 155Mbps ATM, 622Mbps ATM, 1000Base-T

◎ **Standards:**

ISO/IEC 11801, ANSI/TIA/EIA-568-B

◎ **Product Construction Matrix:**

|	U/UTP	F/UTP	SF/UTP
Conductor	24AWG Solid Plain Copper	24AWG Solid Plain Copper	24AWG Solid Plain Copper
Insulation	PE	PE	PE
Screen	Nil	Overall Aluminum Tape Screen	Overall Aluminum Tape Screen & Copper Wire Braid
Drain Wire	Nil	1/0.5 mm	Nil
Jacket	PE/PVC/LSF/LSZH/LSFROH	PE/PVC/LSF/LSZH	PE/PVC/LSF/LSZH/LSFROH
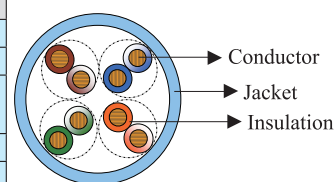
Remark: PE- Polyethylene; PVC- Polyvinyl Chloride; LSF- Low Smoke & Fume; LSZH- Low Smoke Zero
Halogen; LSFROH-Low Smoke Flame Retardant Zero Halogen (to IEC60332-3C); PVC can be
offered in CMX, CM, CMR and CMP grade

Cat5e U/UTP

◎ **Working Frequency:**

1-100MHz

◎ **Technical Parameters:**

☆ Characteristic Impedance: 100　15Ω (1-100MHz)
☆ Nominal Velocity of Propagation(NVP): CMX, CM, CMR,
LSZH 69%; CMP 72%
☆ Maximum Mutual Capacitance: 5.6nF/100m
☆ Maximum Capacitance Unbalance: 330pF/100m
☆ Maximum DC Resistance: 9.38Ω/100m
☆ Maximum Resistance Unbalance: 5%
☆ Maximum Propagation Delay Skew: 30ns/100m
☆ Maximum Propagation Delay: 536ns/100m@100MHz
☆ Minimum Bending radius: 10 x Overall Diameter
☆ Voltage Rating: 80V rms
☆ Maximum Pulling Load: 80N
☆ Working Temperature: -5℃ ~+50℃
☆ Storage Temperature: -20℃ ~+60℃
☆ Flame Retardancy: UL 1581 (CM Jacket); UL 1666 (CMR Jacket); UL 910 (CMP Jacket); IEC 60332-1(FRPVC
& LSZH Jacket); IEC 60332-1 and IEC 60332-3C (LSFROH Jacket)
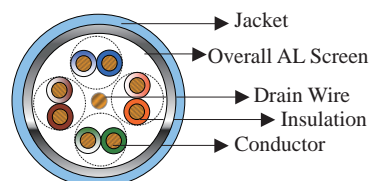
Cat5e F/UTP
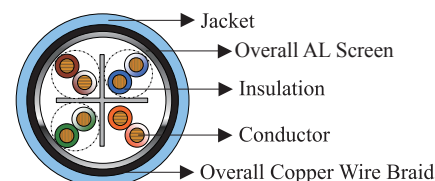
Cat5e SF/UTP

◎ **Product Certification:**

E222756

◎ **Cable Parameters:**

Construction	Conductor Diameter (mm)	Diameter Over Insulation (mm)	Pairs	Screen	Overall Diameter (mm)	Jacket
U/UTP	0.5/0.51	0.91	4	Nil	5.1	PVC/LSZH
U/UTP	0.5/0.51	0.91	4	Nil	5.5	LSFROH
U/UTP	0.5/0.51	0.91	4	Nil	5.3	PE
F/UTP	0.53	1.00	4	Overall Aluminum Tape Screen	6.3	PVC/LSZH
F/UTP	0.53	1.00	4	Overall Aluminum Tape Screen	6.5	PE
SF/UTP	0.53	1.00	4	Overall Aluminum Tape Screen & Copper Wire Braid	6.6	PVC /LSZH
SF/UTP	0.53	1.00	4	Overall Aluminum Tape Screen & Copper Wire Braid	7.0	LSFROH
SF/UTP	0.53	1.00	4	Overall Aluminum Tape Screen & Copper Wire Braid	6.8	PE

◎ Product Highlights:

☆ Provide excellent bandwidth beyond 100 MHz.

☆ Meet the strict flame retardancy and environmental requirements in Europe and US.

☆ Different jacket materials available for choice.

☆ Guaranteed ACR Value > 0 dB @ 200 MHz.

☆ Special purpose cables can be offered according to customer request.

☆ Different jacket color options available for choice.

◎ Transmission Properties:

FREQ (MHz)	NEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	IL (dB/100m)	RL (dB/100m) Minimum Value/ Typical Value/ Standard Value	ACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	ELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSNEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value
1	68.3/74.0/65.3	2.0	20.2/26.0/20.2	66.3/72.0/63.3	64.8/69.0/63.8	65.0/71.0/62.3	63.3/69.0/60.3	61.8/66.0/60.8
4	59.3/65.0/56.3	4.1	23.0/29.0/23.0	55.2/60.9/52.2	52.7/57.0/51.7	56.3/62.0/53.3	52.2/57.9/49.2	49.7/54.0/48.7
8	54.8/61.0/51.8	5.8	24.5/30.5/24.5	49.0/55.2/46.0	46.7/51.0/45.7	51.8/58.0/48.8	46.0/52.2/43.0	43.7/48.0/42.7
10	53.3/59.0/50.3	6.5	25.0/31.0/25.0	46.8/52.5/43.8	44.8/49.0/43.8	50.3/56.0/47.3	43.8/49.5/40.8	41.8/46.0/40.8
16	50.3/56.0/47.3	8.2	25.0/31.0/25.0	42.1/47.8/39.1	40.7/45.0/39.7	47.4/53.0/44.3	39.1/44.8/36.1	37.7/42.0/36.7
20	48.8/55.0/45.8	9.3	25.0/31.0/25.0	39.5/45.7/36.5	38.7/43.0/37.7	45.8/52.0/42.8	36.5/42.7/33.5	35.7/40.0/34.7
25	47.3/53.0/44.3	10.4	24.3/30.3/24.3	36.9/42.6/33.9	36.8/41.0/35.8	44.3/50.0/41.3	33.9/39.6/30.9	33.8/38.0/32.8
31.25	45.9/52.0/42.9	11.7	23.6/29.6/23.6	34.2/40.3/31.2	34.9/39.0/33.9	42.9/49.0/39.9	31.2/37.3/28.2	31.9/36.0/30.9
62.5	41.4/47.0/38.4	17.0	21.5/27.5/21.5	24.4/30.0/21.4	28.8/33.0/27.8	38.4/44.0/35.4	21.4/27.0/18.4	25.8/30.0/24.8
100	38.3/44.0/35.3	22.0	20.1/26.1/20.1	16.3/22.0/13.3	24.8/29.0/23.8	35.3/41.0/32.3	13.3/19.0/10.3	21.8/26.0/20.8
155	35.5/41.0/32.5	28.1	18.8/24.8/18.8	7.4/12.9/4.4	20.9/25.0/19.9	32.5/38.0/29.5	4.4/9.9/-1.4	17.9/22.0/16.9
200	33.7/40.0/30.7	32.4	18.0/24.0/18.0	1.3/7.6/-1.7	19.7/24.0/18.7	30.0/37.0/27.7	-1.7/4.6/-4.7	16.7/21.0/15.7
310	32.3/38.0/29.3	41.8	17.3/23.3/17.3	N/A	11.0/15.0/10.0	29.3/35.0/26.3	N/A	14.0/18.0/13.0
350	30.1/36.0/27.1	44.9	17.3/23.3/17.3	N/A	8.1/12.0/7.1	27.1/33.0/24.1	N/A	11.1/15.0/10.1

* Data for 100MHz above are for reference only

◎ Ordering Information:

Model	Product Description
AD-BC-CAT5EUTP4PCM24	U/UTP Cat5e 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EFTP4PCM24	F/UTP Cat5e 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5ES-FTP4PCM24	SF/UTP Cat5e 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EUTP4PLH24	U/UTP Cat5e 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5EFTP4PLH24	F/UTP Cat5e 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5ES-FTP4PLH24	SF/UTP Cat5e 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5EUTP4PFRLH24	U/UTP Cat5e 4 Pairs, LSFROH Grade (IEC60332-1 & IEC60332-3C)
AD-BC-CAT5ES-FTP4PFRLH24	SF/UTP Cat5e 4 Pairs, LSFROH Grade (IEC60332-1 & IEC60332-3C)
AD-BC-CAT5EUTP4PPE24	Outdoor U/UTP Cat5e 4 Pairs (Water-blocking / UV Resistant)
AD-BC-CAT5EFTP4PPE24	Outdoor F/UTP Cat5e 4 Pairs (Water-blocking / UV Resistant)
AD-BC-CAT5ES-FTP4PPE24	Outdoor SF/UTP Cat5e 4 Pairs (Water-blocking / UV Resistant)

Cat5e U/UTP   Cat5e F/UTP   Cat5e SF/UTP

Category 6 Cables

◎ **Applications:**

10Base-T4, 100Base-TX, 100Base-VG-ANYLAN, 155MbpsATM, 622 Mbps ATM, 1000Base-T, 10GBase-T

◎ **Standards:**

ISO / IEC 11801, EN50173, TIA / EIA 568-B

◎ **Product Construction Matrix:**

	U/UTP	F/UTP	U/FTP	SF/UTP	S/FTP
Conductor	23AWG Solid Plain Copper	23AWG Solid Plain Copper	23AWG Solid Plain Copper	23AWG Solid Plain Copper	23AWG Solid Plain Copper
Insulation	PE	PE	PE	PE	PE
Screen	Nil	Overall Aluminum Tape Screen	Individual Aluminum Tape Screen	Overall Aluminum Tape Screen & Copper Wire Braid	Individual Aluminum Tape Screen & Overall Copper Wire Braid
Drain Wire	Nil	1/0.5 mm	1/0.5 mm	Nil	Nil
Jacket	PE/PVC/LSF/LSZH/LSFROH	PE/PVC/LSF/LSZH		PE/PVC/LSF/LSZH/LSFROH	

Remark: PE- Polyethylene; PVC- Polyvinyl Chloride; LSF- Low Smoke & Fume; LSZH- Low Smoke Zero Halogen; LSFROH-Low Smoke Flame
Retardant Zero Halogen (to IEC60332-3C); PVC can be classified as CMX, CM, CMR and CMP

◎ **Working Frequency:**

1-250MHz

◎ **Technical Parameters:**

☆ Characteristic Impedance: 100　15Ω (1-250MHz)
☆ Nominal Velocity of Propagation (NVP): CMX, CM, CMR, LSZH 69%; CMP 72%
☆ Maximum Mutual Capacitance: 5.6nF/100m
☆ Maximum Capacitance Unbalance: 330pF/100m
☆ Maximum DC Resistance: 7.5Ω/100m
☆ Maximum Resistance Unbalance: 3%
☆ Maximum Propagation Delay Skew: 30ns/100m (1-125MHz)
☆ Maximum Propagation Delay: 536ns/100m@100MHz
☆ Minimum Bending radius: 10 x Overall Diameter
☆ Maximum Pulling load: 80N
☆ Working Temperature: -20℃ ~ +60℃
☆ Storage Temperature: -5℃ ~ +50℃
☆ Flame Retardancy:
UL 1581 (CM Jacket); UL 1666 (CMR Jacket)
UL 910 (CMP Jacket); IEC 60332-1 (FRPVC & LSZH Jacket)
IEC 60332-1 & IEC 60332-3C (LSFROH Jacket)

◎ **Product Certification:**

E222756 (UL)

◎ Product Categories:

Construction	Conductor Diameter (mm)	Diameter Over Insulation (mm)	Pairs	Screen	Overall Diameter (mm)	Jacket
U/UTP	0.57/0.58	1.02	4	Nil	6.0	PVC/LSZH
U/UTP	0.57/0.58	1.02	4	Nil	6.5	LSFROH
U/UTP	0.57/0.58	1.02	4	Nil	6.2	PE
F/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen	6.3	PVC/LSZH
F/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen	6.5	PE
U/FTP	0.57/0.58	1.02	4	Individual Aluminum Tape Screen	7.5	PVC/LSZH
SF/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen & Copper Wire Braid	6.6	PVC/LSZH
SF/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen & Copper Wire Braid	7.1	LSFROH
S/FTP	0.57/0.58	1.02	4	Individual Aluminum Tape Screen & Overall Copper Wire Braid	8.0	PVC/LSZH
S/FTP	0.57/0.58	1.02	4	Individual Aluminum Tape Screen & Overall Copper Wire Braid	8.4	LSFROH

◎ Product Highlights:

☆ Provide excellent bandwidth beyond 250 MHz.
☆ Support 10 Gigabit Ethernet application.
☆ Meet the strict flame retardancy and environmental requirements in Europe and US.
☆ Different jacket materials available for choice.
☆ Guaranteed ACR Value > 0dB @ 250MHz.
☆ Special purpose cables can be offered according to customer request.
☆ Different jacket color options available for choice.

◎ Transmission Properties:

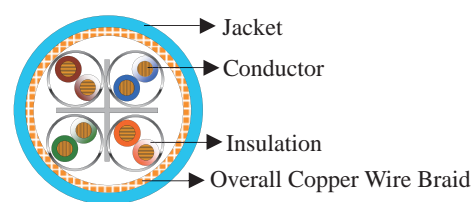| FREQ (MHz)	NEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	IL (dB/100m)	RL (dB/100m) Minimum Value/ Typical Value/ Standard Value	ACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	ELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSNEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value
1	77.3/87.0/74.3	2.0	20.0/21.5/20.0	75.2/85.0/72.2	68.8/80.0/67.8	75.3/85.0/72.3	73.2/83.0/70.2	65.8/70.0/64.8
4	68.3/77.0/65.3	3.8	23.0/24.7/23.0	64.4/73.0/61.4	56.8/66.0/55.8	66.3/74.0/63.3	62.5/71.0/59.5	53.8/63.0/52.8
8	63.8/72.0/60.8	5.3	24.5/25.5/24.5	58.4/67.0/55.4	50.7/61.0/49.7	61.8/70.0/58.8	56.5/65.0/53.5	47.7/58.0/46.7
10	62.3/70.0/59.3	6.0	25.0/28.0/25.0	56.3/64.0/53.3	48.8/57.0/47.8	60.3/68.0/57.3	54.3/62.0/51.3	45.8/54.0/44.8
16	59.2/66.0/56.2	7.6	25.0/28.0/25.0	51.6/59.0/48.6	44.7/52.0/43.7	57.2/64.0/54.2	49.6/57.0/46.6	41.7/49.0/40.7
20	57.8/65.0/54.8	8.5	25.0/28.0/25.0	49.3/57.0/46.3	42.8/50.0/41.8	55.8/63.0/52.8	47.3/55.0/44.3	39.8/47.0/38.8
25	56.3/63.0/53.3	9.5	24.3/27.0/24.3	46.8/5 4.0/43.8	40.8/47.0/39.8	54.3/61.0/51.3	44.8/52.0/41.8	37.8/44.0/36.8
31.25	54.9/61.0/51.9	10.7	23.6/26.5/23.6	44.1/51.0/41.1	38.9/45.0/37.9	52.9/59.0/49.9	42.1/49.0/39.1	35.9/42.0/34.9
62.5	50.4/57.0/47.4	15.4	21.5/24.6/21.5	34.9/42.0/31.9	32.9/38.0/31.9	48.4/55.0/45.4	32.9/40.0/29.9	29.9/35.0/28.9
100	47.3/53.0/44.3	19.8	20.1/23.7/20.1	27.4/33.0/24.4	28.8/34.0/27.8	45.3/51.0/42.3	25.4/31.0/22.4	25.8/31.0/24.8
200	42.8/48.0/39.8	29.0	18.0/22.2/18.0	13.6/21.0/10.6	22.8/27.0/21.8	40.8/46.0/37.8	11.6/19.0/8.6	19.8/24.0/18.8
250	41.3/46.0/38.3	32.8	17.3/21.6/17.3	8.3/14.0/5.3	20.8/24.0/19.8	39.3/44.0/36.3	6.3/12.0/3.3	17.8/21.0/16.8
300	37.1/45.0/37.1	36.4	16.8/20.7/16.8	0.5/11.0/0.5	18.3/23.0/18.3	35.1/43.0/35.1	-1.5/9.0/-1.5	15.3/20.0/15.3
350	36.1/44.0/36.1	39.8	16.3/20.3/16.3	-3.8/6.6/-3.8	16.9/21.0/16.9	34.1/42.0/34.1	-5.8/4.6/-5.8	13.9/18.0/13.9
400	35.3/43.0/35.3	43.0	15.9/16.8/15.9	-7.9/2.6/-7.9	15.8/20.0/15.8	33.3/41.0/33.3	-9.9/0.6/-9.9	12.8/17.0/12.8
450	34.5/42.0/34.5	46.3	15.5/16.5/15.5	-10.5/-1.1/-10.5	14.7/18.0/14.7	32.5/40.0/32.5	-12.5/-3.1/-12.5	11.7/15.0/11.7
500	33.8/41.0/33.8	48.9	15.2/16.1/15.2	-15.3/-6.2/-15.3	13.8/18.0/13.8	31.8/39.0/31.8	-17.3/-8.2/-17.3	10.8/15.0/10.8
550	33.2/41.0/33.2	51.8	14.9/15.7/14.9	-18.6/-12.0/-18.6	12.9/17.0/12.9	31.2/39.0/31.2	-20.6/-14.0/-20.6	9.9/13.0/9.9
600	32.4/33.0/32.4	54.5	14.7/15.0/14.7	-21.9/-21.0/-21.9	12.2/14.0/12.2	30.6/31.0/30.6	-23.9/-23.0/-23.9	9.2/11.0/9.2

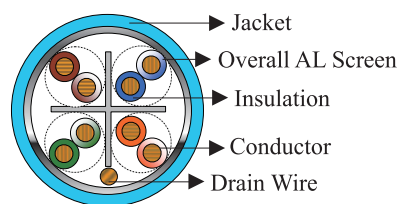*Data for 250MHz above are for reference only

◎ Ordering Information:

Model	Product Description
AD-BC-CAT6UTP4PCM23	U/UTP Cat6 4Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6FTP4PCM23	F/UTP Cat6 4Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6S-FTP4PCM23	SF/UTP Cat6 4Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6STP4PCM23	U/FTP Cat6 4Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6S-FTP4PCM23	SF/UTP Cat6 4Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6UTP4PLH23	U/UTP Cat6 4Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT6FTP4PLH23	F/UTP Cat6 4Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT6STP4PLH23	U/FTP Cat6 4Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT6UTP4PFRLH23	U/UTP Cat6 4Pairs, LSFROH Grade (IEC60332-1&IEC60332-3C)
AD-BC-CAT6S-FTP4PFRLH23	SF/UTP Cat6 4Pairs, LSFROH Grade (IEC60332-1&IEC60332-3C)
AD-BC-CAT6SFTP4PFRLH23	S/FTP Cat6 4Pairs, LSFROH Grade (IEC60332-1&IEC60332-3C)
AD-BC-CAT6UTP4PPE23	Outdoor U/UTP Cat6 4Pairs (Water Blocking /UV Resistant)
AD-BC-CAT6FTP4PPE23	Outdoor F/UTP Cat6 4Pairs (Water Blocking /UV Resistant)
AD-BC-CAT6S-FTP4PPE23	Outdoor SF/UTP Cat6 4Pairs (Water Blocking /UV Resistant)
AD-BC-CAT6STP4PPE23	Outdoor STP Cat6 4 Pairs (Water Blocking /UV Resistant)
AD-BC-CAT6SFTP4PPE23	Outdoor S/FTP Cat6 4 Pairs (Water Blocking /UV Resistant)

▶ Jacket
▶ Insulation
▶ Conductor

Cat6 U/UTP

▶ Jacket
▶ Overall AL Screen
▶ Insulation
▶ Conductor
▶ Drain Wire

Cat6 F/UTP

▶ Jacket
▶ Conductor
▶ Drain Wire
▶ Insulation
▶ Individual AL Screen

Cat6 U/FTP

▶ Jacket
▶ Conductor
▶ Insulation
▶ Overall Copper Wire Braid

Cat6 S/FTP

▶ Jacket
▶ Conductor
▶ Overall AL Screen
▶ Insulation
▶ Overall Copper Wire Braid

Cat6 SF/UTP

Augmented Category 6 Cables

◎ **Applications:**

10Base-T4, 100Base-TX, 100Base-VG-ANYLAN, 155MbpsATM, 622 Mbps ATM, 1000Base-T, 10GBase-T

◎ **Standards:**

ISO / IEC 11801, EN50173, TIA / EIA 568-B

◎ **Product Construction Matrix:**

	U/UTP	F/UTP	U/FTP	SF/UTP	S/FTP
Conductor	23AWG Solid Plain Copper	23AWG Solid Plain Copper	23AWG Solid Plain Copper	23AWG Solid Plain Copper	23AWG Solid Plain Copper
Insulation	PE	PE	PE	PE	PE
Screen	Nil	Overall Aluminum Tape Screen	Individual Aluminum Tape Screen	Overall Aluminum Tape Screen & Copper Wire Braid	Individual Aluminum Tape Screen & Copper Wire Braid
Drain Wire	Nil	1/0.5 mm	1/0.5 mm	Nil	Nil
Jacket	PE/PVC/LSF/LSZH/LFLSFROH	PE/PVC/LSF/LSZH	PE/PVC/LSF/LSZH/LSFROH		

Remark: PE- Polyethylene; PVC- Polyvinyl Chloride; LSF- Low Smoke & Fume; LSZH- Low Smoke Zero Halogen; LSFROH-Low Smoke Flame Retardant Zero Halogen (to IEC60332-3C); PVC can be classified as CMX, CM, CMR and CMP

◎ **Working Frequency:**

1-500MHz

◎ **Technical Parameters:**

☆ Characteristic Impedance: 100 ± 15Ω (1-250MHz); 100 ± 22Ω (100-500Mhz)
☆ Nominal Velocity of Propagation (NVP): CMX, CM, CMR, LSZH 69%; CMP 72%
☆ Maximum Mutual Capacitance: 5.6nF/100m
☆ Maximum Capacitance Unbalance: 330pF/100m
☆ Maximum DC Resistance: 7.5Ω/100m
☆ Maximum Resistance Unbalance: 3%
☆ Maximum Propagation Delay Skew: 30ns/100m (1-125MHz)
☆ Maximum Propagation Delay: 536 ns/100m @ 100MHz
☆ Minimum Bending radius: 10 x Overall Diameter
☆ Maximum Pulling load: 80N
☆ Working Temperature: -20℃ ~+ 60℃
☆ Storage Temperature: -5℃ ~ +50℃
☆ Flame Retardancy:
    UL 1581 (CM Jacket); UL 1666 (CMR Jacket);
    UL 910 (CMP Jacket); IEC 60332-1 (FRPVC & LSZH Jacket);
    IEC 60332-1 & IEC 60332-3C (LSFROH Jacket)

◎ **Product Certification:**

E222756

◎ Product Categories:

Construction	Conductor Diameter (mm)	Diameter Over Insulation (mm)	Pairs	Screen	Overall Diameter (mm)	Jacket
U/UTP	0.57/0.58	1.02	4	Nil	8.5	PVC/LSZH
U/UTP	0.57/0.58	1.02	4	Nil	8.9	LSFROH
U/UTP	0.57/0.58	1.02	4	Nil	8.7	PE
F/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen	6.3	PVC/LSZH
F/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen	6.5	PE
U/FTP	0.57/0.58	1.02	4	Individual Aluminum Tape Screen	7.5	PVC/LSZH
SF/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen & Copper Wire Braid	6.6	PVC/LSZH
SF/UTP	0.57/0.58	1.02	4	Overall Aluminum Tape Screen & Copper Wire Braid	7.2	LSFROH
S/FTP	0.57/0.58	1.02	4	Individual Aluminum Tape Screen & Overall Copper Wire Braid	8.0	PVC/LSZH
S/FTP	0.57/0.58	1.02	4	Individual Aluminum Tape Screen & Overall Copper Wire Braid	8.4	LSFROH

◎ Product Highlights:

☆ Provide excellent NEXT and attenuation performance beyond 500 MHz.

☆ Support 10 Gigabit Ethernet application.

☆ Meet the strict flame retardancy and environmental requirements in Europe and US.

☆ Different jacket materials available for choice.

☆ Special purpose cables can be offered according to customer request.

☆ Different jacket color options available for choice.
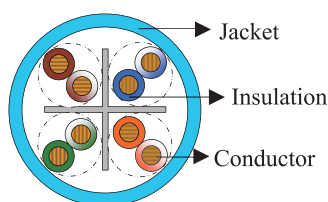
◎ UTP Cat 6A Transmission Properties:

FREQ (MHz)	NEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	IL (dB/100m)	RL (dB/100m) Minimum Value/ Typical Value/ Standard Value	ACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	ELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSNEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value
1	74.3/95.0/74.3	2.0	20.0/28.0/20.0	72.2/94.0/72.2	67.8/92.0/67.8	72.3/92.0/72.3	70.2/90.0/70.2	64.8/85.0/64.8
4	65.3/88.0/65.3	3.7	23.0/30.0/23.0	61.4/88.0/61.4	55.8/80.0/55.8	63.3/83.0/63.3	59.5/80.0/59.5	52.8/73.0/52.8
8	60.8/85.0/60.8	5.3	24.5/33.0/24.5	55.4/83.0/55.4	49.7/75.0/49.7	58.8/80.0/58.8	53.5/76.0/53.5	46.7/70.0/46.7
10	59.3/83.0/59.3	5.9	25.0/36.0/25.0	53.3/78.0/53.3	47.8/72.0/47.8	57.3/77.0/57.3	51.3/72.0/51.3	44.8/65.0/44.8
16	56.2/80.0/56.2	7.6	25.0/36.0/25.0	48.6/74.0/48.6	43.7/68.0/43.7	54.2/74.0/54.2	46.6/68.0/46.6	40.7/61.0/40.7
20	54.8/78.0/54.8	8.3	25.0/36.0/25.0	46.3/71.0/46.3	41.8/65.0/41.8	52.8/73.0/52.8	44.3/66.0/44.3	38.8/59.0/38.8
25	53.3/77.0/53.3	9.5	24.3/35.0/24.3	43.8/69.0/43.8	39.8/63.0/39.8	51.3/71.0/51.3	41.8/63.0/41.8	36.8/57.0/36.8
31.25	51.9/76.0/51.9	10.4	23.6/34.0/23.6	41.1/67.0/41.1	37.9/62.0/37.9	49.9/70.0/49.9	39.1/60.0/39.1	34.9/55.0/34.9
62.5	47.4/70.0/47.4	14.9	21.5/33.5/21.5	31.9/57.0/31.9	31.9/56.0/31.9	45.4/65.0/45.4	29.9/51.0/29.9	28.9/49.0/28.9
100	44.3/68.0/44.3	19.0	20.1/33.0/20.1	24.4/50.0/24.4	27.8/52.0/27.8	42.3/62.0/42.3	22.4/44.0/22.4	24.8/45.0/24.8
200	39.8/65.0/39.8	27.4	18.0/31.0/18.0	10.6/38.0/10.6	21.8/46.0/21.8	37.8/58.0/37.8	8.6/32.0/8.6	18.8/39.0/18.8
250	38.3/62.0/38.3	31.0	17.3/30.5/17.3	5.3/33.0/5.3	19.8/44.0/19.8	36.3/56.0/36.3	3.3/27.0/3.3	16.8/37.0/16.8
300	37.1/61.0/37.1	34.2	16.8/29.0/16.8	0.5/29.0/0.5	18.3/42.0/18.3	35.1/55.0/35.1	-1.5/24.0/-1.5	15.3/35.0/15.3
350	36.1/60.0/36.1	37.1.	16.3/28.0/16.3	-3.8/26.0/-3.8	16.9/41.0/16.9	34.1/54.0/34.1	-5.8/20.0/-5.8	13.9/34.0/13.9
400	35.3/59.0/35.3	40.0	15.9/27.0/15.9	-7.9/21.0/-7.9	15.8/40.0/15.8	33.3/53.0/33.3	-9.9/15.0/-9.9	12.8/33.0/12.8
450	34.5/58.0/34.5	46.3	15.5/26.5/15.5	-10.5/18.0/-10.5	14.7/40.5.0/14.7	32.5/52.0/32.5	-12.5/11.0/-12.5	11.7/32.5/11.7
500	33.8/57.0/33.8	45.3	15.2/26.0/15.2	-15.3/15.0/-15.3	13.8/39.0/13.8	31.8/51.0/31.8	-17.3/9.0/-17.3	10.8/32.0/10.8
625	32.4/53.0/32.4	51.1	14.5/25.0/14.5	-23.1/31.0/-23.1	11.8/36.0/11.8	30.4/50.0/30.4	-25.1/5.0/-25.1	8.8/29.0/8.8

* Data for 250MHz above are for reference only

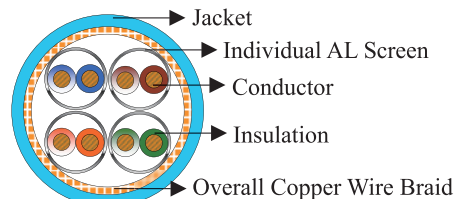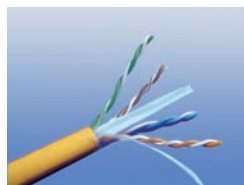◎ **F/UTP & SF/UTP Cat 6A Transmission Properties:**

FREQ (MHz)	NEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	IL (dB/100m)	RL (dB/100m) Minimum Value/ Typical Value/ Standard Value	ACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	ELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSNEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value
1	74.3/86.0/74.3	2.0	20.0/33.0/20.0	72.2/84.0/72.2	67.8/91.0/67.8	72.3/81.0/72.3	70.2/80.5/70.2	64.8/84.0/64.8
4	65.3/77.0/65.3	3.7	23.0/35.5/23.0	61.4/73.0/61.4	55.8/79.0/55.8	63.3/72.0/63.3	59.5/70.0/59.5	52.8/72.0/52.8
8	60.8/75.0/60.8	5.3	24.5/36.0/24.5	55.4/70.0/55.4	49.7/74.0/49.7	58.8/69.0/58.8	53.5/66.0/53.5	46.7/69.0/46.7
10	59.3/71.0/59.3	5.9	25.0/38.0/25.0	53.3/66.0/53.3	47.8/71.0/47.8	57.3/65.0/57.3	51.3/62.0/51.3	44.8/64.0/44.8
16	56.2/68.0/56.2	7.6	25.0/35.2/25.0	48.6/61.0/48.6	43.7/67.0/43.7	54.2/62.0/54.2	46.6/58.0/46.6	40.7/60.0/40.7
20	54.8/67.0/54.8	8.3	25.0/35.0/25.0	46.3/59.0/46.3	41.8/65.0/41.8	52.8/61.0/52.8	44.3/55.0/44.3	38.8/59.0/38.8
25	53.3/65.0/53.3	9.5	24.3/34.0/24.3	43.8/57.0/43.8	39.8/63.0/39.8	51.3/60.0/51.3	41.8/53.0/41.8	36.8/57.0/36.8
31.25	51.9/64.0/51.9	10.4	23.6/33.1/23.6	41.1/54.0/41.1	37.9/61.0/37.9	49.9/54.0/49.9	39.1/50.0/39.1	34.9/54.0/34.9
62.5	47.4/59.0/47.4	14.9	21.5/32.2/21.5	31.9/44.0/31.9	31.9/55.0/31.9	45.4/58.0/45.4	29.9/41.0/29.9	28.9/48.0/28.9
100	44.3/56.0/44.3	19.0	20.1/31.6/20.1	24.4/38.0/24.4	27.8/51.0/27.8	42.3/50.0/42.3	22.4/34.0/22.4	24.8/44.0/24.8
200	39.8/52.0/39.8	27.4	18.0/29.8/18.0	10.6/25.0/10.6	21.8/45.0/21.8	37.8/45.0/37.8	8.6/20.5/8.6	18.8/38.0/18.8
250	38.3/50.0/38.3	31.0	17.3/28.7/17.3	5.3/19.0/5.3	19.8/43.0/19.8	36.3/44.0/36.3	3.3/15.0/3.3	16.8/36.0/16.8
300	37.1/49.0/37.1	34.2	16.8/28.0/16.8	0.5/14.0/0.5	18.3/38.0/18.3	35.1/43.0/35.1	-1.5/10.0/-1.5	15.3/31.0/15.3
350	36.1/48.0/36.1	37.1	16.3/27.5/16.3	-3.8/9.0/-3.8	16.9/37.0/16.9	34.1/41.0/34.1	-5.8/7.0/-5.8	13.9/30.0/13.9
400	35.3/47.0/35.3	40.0	15.9/27.0/15.9	-7.9/7.0/-7.9	15.8/36.0/15.8	33.3/40.0/33.3	-9.9/3.0/-9.9	12.8/29.0/12.8
450	34.5/47.0/34.5	46.3	15.5/26.5/15.5	-10.5/6.0/-10.5	14.7/35.0/14.7	32.5/39.0/32.5	-12.5/2.0/-12.5	11.7/27.5/11.7
500	33.8/47.0/33.8	45.3	15.2/26.0/15.2	-15.3/5.0/-15.3	13.8/34.0/13.8	31.8/38.0/31.8	-17.3/0.0/-17.3	10.8/27.0/10.8
625	32.4/45.0/32.4	51.1	14.5/25.0/14.5	-23.1/1.0/-23.1	11.8/33.0/11.8	30.4/37.0/30.4	-25.1/-3.9/-25.1	8.8/26.0/8.8

◎ **U/FTP & S/FTP Cat 6A Transmission Properties:**

FREQ (MHz)	NEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	IL (dB/100m)	RL (dB/100m) Minimum Value/ Typical Value/ Standard Value	ACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	ELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSNEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value
1	87.0/90.0/74.3	2.0	20.0/28.0/20.0	85.0/88.0/72.2	73.8/75.0/67.8	85.0/88.0/72.3	83.0/86.0/70.2	70.8/72.0/64.8
4	80.0/90.0/65.3	3.7	23.0/30.0/23.0	76.0/86.0/61.4	61.8/75.0/55.8	78.0/88.0/63.3	74.0/84.0/59.5	58.0/72.0/52.8
8	80.0/90.0/60.8	5.3	24.5/33.0/24.5	74.7/84.0/55.4	55.7/75.0/49.7	78.0/88.0/58.8	72.7/82.0/53.5	52.7/72.0/46.7
10	80.0/90.0/59.3	5.9	25.0/36.0/25.0	74.0/84.0/53.3	53.8/74.0/47.8	78.0/88.0/57.3	72.0/82.0/51.3	50.8/71.0/44.8
16	80.0/90.0/56.2	7.6	25.0/36.0/25.0	72.4/82.0/48.6	49.7/70.0/43.7	78.0/88.0/54.2	70.4/80.0/46.6	46.7/67.0/40.7
20	80.0/90.0/54.8	8.3	25.0/36.0/25.0	71.5/81.0/46.3	47.8/68.0/41.8	78.0/88.0/52.8	69.5/79.0/44.3	44.8/65.0/38.8
25	80.0/90.0/53.3	9.5	24.3/35.0/24.3	70.5/80.0/43.8	45.8/68.0/39.8	78.0/88.0/51.3	68.5/78.0/41.8	42.8/65.0/36.8
31.25	80.0/90.0/51.9	10.4	23.6/34.0/23.6	69.3/79.0/41.1	43.9/64.0/37.9	78.0/88.0/49.9	67.3/77.0/39.1	40.9/61.0/34.9
62.5	75.3/90.0/47.4	14.9	21.5/33.5/21.5	59.9/74.0/31.9	37.9/58.0/31.9	69.1/83.0/45.4	57.9/72.0/29.9	34.9/55.0/28.9
100	71.1/85.0/44.3	19.0	20.1/33.0/20.1	51.3/65.0/24.4	33.8/54.0/27.8	69.1/83.0/42.3	49.3/63.0/22.4	30.8/51.0/24.8
200	71.1/85.0/39.8	27.4	18.0/31.0/18.0	42.1/56.0/10.6	27.8/51.0/21.8	69.1/83.0/37.8	40.1/54.0/8.6	24.8/48.0/18.8
250	71.1/85.0/38.3	31.0	17.3/30.5/17.3	38.2/52.0/5.3	25.8/48.0/19.8	61.7/78.0/36.3	36.2/50.0/3.3	22.8/45.0/16.8
300	63.7/80.0/37.1	34.2	16.8/29.0/16.8	27.3/43.0/0.5	24.3/45.0/18.3	61.7/78.0/35.1	25.3/41.0/-1.5	21.2/42.0/15.3
350	63.7/80.0/36.1	37.1	16.3/28.0/16.3	23.9/40.0/-3.8	23.9/45.0/16.9	61.7/78.0/34.1	21.9/38.0/-5.8	19.9/42.0/13.9
400	63.7/80.0/35.3	40.0	15.9/27.0/15.9	20.7/37.0/-7.9	21.8/45.0/15.8	61.7/78.0/33.3	18.7/35.0/-9.9	19.7/42.0/12.8
450	63.7/80.0/34.5	46.3	15.5/26.5/15.5	17.4/33.0/-10.5	20.5/42.0/14.7	61.7/78.0/32.5	15.4/31.0/-12.5	17.5/39.0/11.7
500	63.7/80.0/33.8	45.3	15.2/26.0/15.2	14.8/31.0/-15.3	19.8/42.0/13.8	61.7/78.0/31.8	12.8/29.0/-17.3	16.8/39.0/10.8
625	60.0/70.0/32.4	51.1	14.5/25.0/14.5	5.5/15.5/-23.1	18.8/42.0/11.8	58.0/68.0/30.4	9.9/26.0/-25.1	16.0/39.0/8.8

Augmented Category 6 Cables
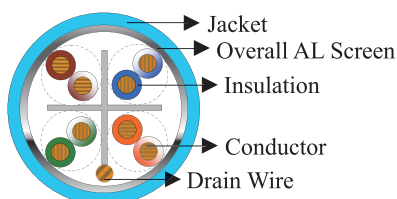
◎ Ordering Information:

Model	Product Description
AD-BC-CAT6AUTP4PCM23	U/UTP Cat6A 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6AFTP4PCM23	F/UTP Cat6A 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6AS-FTP4PCM23	SF/UTP Cat6A 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6ASTP4PCM23	U/FTP Cat6A 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6ASFTP4PCM23	S/FTP Cat6A 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT6AUTP4PLH23	U/UTP Cat6A 4 Pairs, LSZH Grade (IEC 60332-1)
AD-BC-CAT6AFTP4PLH23	F/UTP Cat6A 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT6ASTP4PLH23	U/FTP Cat6A 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT6AUTP4PFRLH23	U/UTP Cat6A 4 Pairs, LSFROH Grade (IEC60332-1 & IEC60332-3C)
AD-BC-CAT6AS-FTP4PFRLH23	SF/UTP Cat6A 4 Pairs, LSFROH Grade (IEC60332-1 & IEC60332-3C)
AD-BC-CAT6ASFTP4PFRLH23	S/FTP Cat6A 4 Pairs, LSFROH Grade (IEC60332-1 & IEC60332-3C)
AD-BC-CAT6AUTP4PPE23	Outdoor U/UTP Cat6A 4 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT6AFTP4PPE23	Outdoor F/UTP Cat6A 4 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT6AS-FTP4PPE23	Outdoor SF/UTP Cat6A 4 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT6ASTP4PPE23	Outdoor U/FTP Cat6A 4 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT6ASFTP4PPE23	Outdoor S/FTP Cat6A 4 Pairs (Water-blocking /UV Resistant)

Jacket
Insulation
Conductor

Cat6A U/UTP

Jacket
Overall AL Screen
Insulation
Conductor
Drain Wire

Cat6A F/UTP

Jacket
Conductor
Drain Wire
Insulation
Individual AL Screen

Cat6A U/FTP

Jacket
Individual AL Screen
Conductor
Insulation
Overall Copper Wire Braid

Cat6A S/FTP

Jacket
Conductor
Overall AL Screen
Insulation
Overall Copper Wire Braid
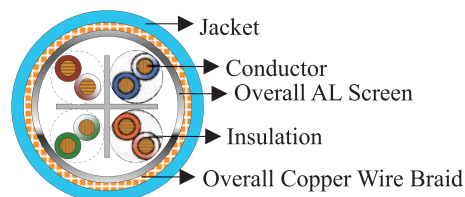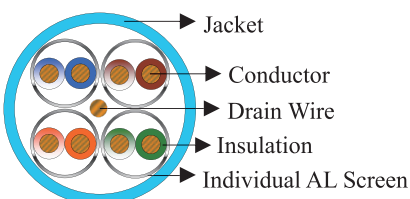
Cat6A SF/UTP

Category 7 Cables

◎ **Applications:**

155MbpsATM, 622MbpsATM, 1000Base-T, 10GBase-T

◎ **Standards:**

IEC61156-5 CAT7, EN 50288-4-1

◎ **Product Construction Matrix:**

	U/FTP	S/FTP
Conductor	22/23AWG Solid Plain Copper	22/23AWG Solid Plain Copper
Insulation	PE	PE
Screen	Individual Aluminum Tape Screen	Individual Aluminum Tape Screen & Overall Copper Wire Braid
Drain Wire	7/0.2 mm	Nil
Jacket	PE/PVC/LSF/LSZH/LSFROH	PE/PVC/LSF/LSZH/LSFROH

Remark: PE- Polyethylene; PVC- Polyvinyl Chloride; LSF- Low Smoke & Fume; LSZH- Low Smoke Zero Halogen; LSFROH-Low Smoke Flame Retardant Zero Halogen (to IEC60332-3C); PVC can be classified as CMX, CM, CMR and CMP

◎ **Working Frequency:**

1-600MHz

◎ **Technical Parameters:**

☆ Characteristic Impedance: 100　15Ω (1-250MHz); 100　22Ω (100-500Mhz)
☆ Nominal Velocity of Propagation (NVP): 79%
☆ Maximum Mutual Capacitance:5.6nF/100m
☆ Maximum DC Resistance: 5.9Ω/100m (22AWG); 7.5Ω/100m (23AWG)
☆ Maximum Resistance Unbalance:5%
☆ Maximum Propagation Delay Skew: 30ns/100m (1-125MHz)
☆ Maximum Propagation Delay: 536 ns/100m@100MHz
☆ Minimum Bending radius: 10 x Overall Diameter
☆ Voltage Rating: 60V rms
☆ Maximum Pulling load: 80N
☆ Working Temperature: -20℃ ~ +60℃
☆ Storage Temperature: -5℃ ~ +50℃
☆ Flame Retardancy: UL 1581 (CM Jacket); UL 1666 (CMR Jacket); UL 910 (CMP Jacket); IEC 60332-1 (FRPVC & LSZH Jacket); IEC 60332-1and IEC 60332-3C (LSFROH Jacket)

◎ **Product Categories:**

Construction	Conductor Diameter (mm)	Diameter Over Insulation (mm)	Pairs	Screen	Overall Diameter (mm)	Jacket
S/FTP	0.57/0.64	1.02	4	Individual Aluminum Tape Screen & Overall Copper Wire Braid	8.4/9.1	PVC/LSZH
S/FTP	0.57/0.64	1.02	4	Individual Aluminum Tape Screen & Overall Copper Wire Braid	8.4/9.1	LSFROH
U/FTP	0.57/0.64	1.02	4	Individual Aluminum Tape Screen	7.5/8.5	PVC/LSZH
U/FTP	0.57/0.64	1.02	4	Individual Aluminum Tape Screen	7.5/8.5	LSFROH

◎ **Product Highlights:**

☆ Provide excellent bandwidth beyond 600 MHz.
☆ Support 10 Gigabit Ethernet application.
☆ Meet the strict flame retardancy and environmental requirements in Europe and US.
☆ Different jacket materials available for choice.

◎ **Tranmission Properties:**

FREQ (MHz)	NEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	IL (dB/100m)	RL (dB/100m) Minimum Value/ Typical Value/ Standard Value	ACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PP ELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSNEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value
1	90.0/100.0/80.0	2.0	20.0/23.0/20.0	88.0/98.0/78.0	85.0/90.0/80.0	87.0/97.0/77.0	85.0/95.0/75.0	82.0/87.0/77.0
4	90.0/100.0/80.0	3.6	23.0/26.0/23.0	86.4/96.0/76.4	85.0/90.0/80.0	87.0/97.0/77.0	83.4/93.0/73.4	82.0/87.0/77.0
10	90.0/100.0/80.0	5.7	25.0/28.0/25.0	84.3/94.0/74.3	79.0/90.0/74.0	87.0/97.0/77.0	81.3/91.0/71.3	76.0/87.0/71.0
16	90.0/100.0/80.0	7.2	25.0/28.0/25.0	83.3/92.0/72.8	74.9/90.0/69.9	87.0/97.0/77.0	80.3/89.0/69.8	71.9/87.0/66.9
20	90.0/100.0/80.0	8.1	25.0/28.0/25.0	82.5/91.0/71.9	73.0/90.0/68.0	87.0/97.0/77.0	79.5/88.0/68.9	70.0/87.0/65.0
31.25	90.0/100.0/80.0	10.1	23.6/26.0/23.6	80.0/90.0/69.9	69.1/90.0/64.1	87.0/97.0/77.0	77.0/87.0/66.9	66.1/87.0/61.1
62.5	90.0/100.0/75.5	14.5	21.5/24.0/21.5	76.0/85.0/61.0	63.1/85.0/58.1	80.0/97.0/72.5	73.0/82.0/58.0	60.1/82.0/55.1
100	90.0/100.0/72.4	18.5	20.1/23.0/20.1	72.5/75.0/53.9	59.0/80.0/54.0	87.0/97.0/69.4	69.5/72.0/50.9	56.0/77.0/51.0
200	90.0/100.0/67.9	26.8	18.0/23.0/18.0	65.0/70.0/41.1	53.0/75.0/78.0	87.0/97.0/64.9	62.0/67.0/38.1	50.0/72.0/45.0
250	95.0/90.0/66.5	30.2	17.3/23.0/17.3	50.0/58.0/36.3	51.0/70.0/46.0	92.0/87.0/63.5	47.0/55.0/33.3	48.0/67.0/43.0
300	95.0/90.0/65.3	33.3	17.3/23.0/17.3	59.0/55.0/32.0	49.5/66.0/44.5	92.0/87.0/63.3	56.0/52.0/29.0	46.5/63.0/41.5
600	80.0/90.0/60.8	48.9	17.3/20.0/17.3	32.0/50.0/11.9	43.4/60.0/38.4	77.0/87.0/57.8	29.0/47.0/8.9	40.4/57.0/35.4

◎ **Ordering Information:**

Model	Product Description
AD-BC-CAT7STP4PCM22	U/FTP Cat7 22AWG 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT7STP4PCM23	U/FTP Cat7 23AWG 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT7SFTP4PCM22	S/FTP Cat7 22AWG 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT7SFTP4PCM23	S/FTP Cat7 23AWG 4 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT7STP4PLH22	U/FTP Cat7 22AWG 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT7STP4PLH23	U/FTP Cat7 23AWG 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT7SFTP4PLH22	S/FTP Cat7 22AWG 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT7SFTP4PLH23	S/FTP Cat7 23AWG 4 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT7STP4PFRLH22	U/FTP Cat7 22AWG 4 Pairs, LSFROH Grade (IEC6060332-1 & IEC6060332-3C)
AD-BC-CAT7STP4PFRLH23	U/FTP Cat7 23AWG 4 Pairs, LSFROH Grade (IEC6060332-1 & IEC6060332-3C)
AD-BC-CAT7SFTP4PFRLH22	S/FTP Cat7 22AWG 4 Pairs, LSFROH Grade (IEC6060332-1 & IEC6060332-3C)
AD-BC-CAT7SFTP4PFRLH23	S/FTP Cat7 23AWG 4 Pairs, LSFROH Grade (IEC6060332-1 & IEC6060332-3C)

Jacket
Conductor
Drain Wire
Insulation
Individual AL Screen

Cat7 U/FTP

Jacket
Individual AL Screen
Conductor
Insulation
Overall Copper Wire Braid
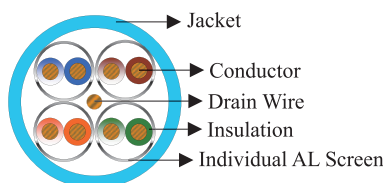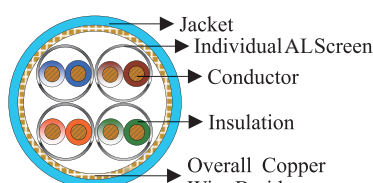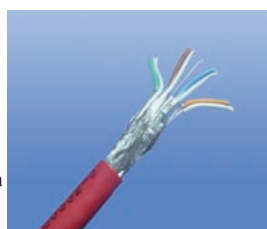
Cat7 S/FTP

Category 3 Multipair Cables

◎ **Applications:**

10Base-T, 100Base-T4

◎ **Standards:**

ISO/IEC11801, ANSI/TIA/EIA-568-B
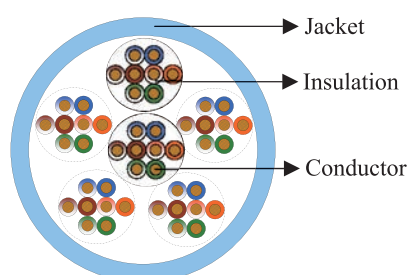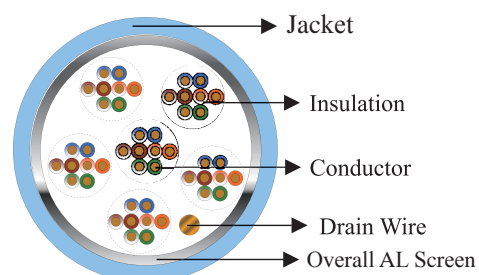
◎ **Product Construction Matrix:**

		U/UTP	F/UTP
Conductor	Material	Solid Plain Copper	Solid Plain Copper
	Stranding(No./mm)	1/0.5	1/0.5
	Gauge	24AWG	24AWG
Insulation	Material	PE	PE
	Diameter	0.86 mm	0.86 mm
Screen	Material	Nil	Aluminum /Polyester Tape
Drain Wire	Material	Nil	1/0.5 mm
Assembly	No of Pairs	25/50/100	25/50/100
Jacket	Material	PE/PVC/LSF/LSZH	PE/PVC/LSF/LSZH

Remark: PE- Polyethylene; PVC- Polyvinyl Chloride; LSF- Low Smoke & Fume; LSZH- Low Smoke Zero Halogen; LSFROH-Low Smoke Flame Retardant Zero Halogen (to IEC60332-3C); PVC can be classified as CMX, CM, CMR and CMP
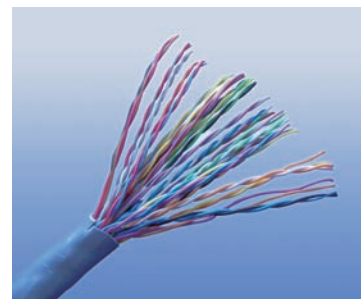
◎ **Working Frequency:**

1-16MHz

◎ **Product Certification:**

E222756 (UL)

◎ **Technical Parameters:**

☆ Characteristic Impedance: 100 15Ω
☆ Nominal Velocity of Propagation (NVP): 69%
☆ Maximum DC Resistance: 9.38Ω/100m
☆ Maximum Resistance Unbalance: 5%
☆ Maximum Propagation Delay Skew: 30 ns/100m
☆ Maximum Propagation Delay: 536 ns/100m@100 MHz
☆ Minimum Bending radius: 10 x Overall Diameter
☆ Voltage Rating: 60V rms
☆ Maximum Pulling load: 80N
☆ Working Temperature: -20℃ ~ +60℃
☆ Storage Temperature: -5℃ ~ +50℃
☆ Flame Retardancy: UL 1581 (CM Jacket); UL 1666 (CMR Jacket); UL 910 (CMP Jacket); IEC 60332-1 (FRPVC & LSZH Jacket); IEC 60332-1 and IEC 60332-3C (LSFROH Jacket)

◎ **Product Categories:**

FREQ (MHz)	NEXT(dB/100m) Minmum Value/Typical Value/Standard Value	IL (dB/100m)	SRL(dB/100m) Minmum Value/Typical Value/Standard Value
1	43.0/48.0/41.0	2.6	13.0/16.0/12.0
4	34.0/38.0/32.0	5.6	13.0/16.0/12.0
8	29.0/33.0/26.0	8.5	13.0/16.0/12.0
10	28.0/33.0/26.0	9.8	13.0/16.0/12.0
16	25.0/30.0/23.0	13.1	11.0/14.0/10.0

◎ **Product Highlights:**

☆ Provide excellent bandwidth beyond 600 MHz.

☆ Support 10 Gigabit Ethernet application.

☆ Meet the strict flame retardancy and environmental requirements in Europe and US.

☆ Different jacket materials available for choice.

◎ Ordering Information:

Model	Product Description
AD-BC-CAT3UTP25PCM24	U/UTP Cat3 25 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT3UTP50PCM24	U/UTP Cat3 50 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT3UTP100PCM24	U/UTP Cat3 100 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT3UTP25PLH24	U/UTP Cat3 25 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT3UTP50PLH24	U/UTP Cat3 50 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT3UTP100PLH24	U/UTP Cat3 100 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT3UTP25PPE24	Outdoor U/UTP Cat3 25 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT3UTP50PPE24	Outdoor U/UTP Cat3 50 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT3UTP100PPE24	Outdoor U/UTP Cat3 100 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT3FTP25PCM24	F/UTP Cat3 25 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT3FTP50PCM24	F/UTP Cat3 50 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT3FTP100PCM24	F/UTP Cat3 100 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT3FTP25PLH24	F/UTP Cat3 25 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT3FTP50PLH24	F/UTP Cat3 50 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT3FTP100PLH24	F/UTP Cat3 100 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT3FTP25PPE24	Outdoor F/UTP Cat3 25 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT3FTP50PPE24	Outdoor F/UTP Cat3 50 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT3FTP100PPE24	Outdoor F/UTP Cat3 100 Pairs (Water-blocking /UV Resistant)

Cat3 U/UTP

Cat3 F/UTP

Jacket
Insulation
Conductor

Jacket
Insulation
Conductor
Drain Wire
Overall AL Screen

Category 3 Multipair Cables

Category 5 Multipair Cables

◎ **Applications:**

10Base-T, 100Base-T4, 100Base-TX, 100Base-VG-ANYLAN, 155Mbps ATM, 622Mbps ATM

◎ **Standards:**

ISO/IEC 11801, ANSI/TIA/EIA-568-B

◎ **Product Construction Matrix:**

		U/UTP	F/UTP	SF/UTP
Conductor	Material	Solid Plain Copper	Solid Plain Copper	Solid Plain Copper
	Stranding(No./mm)	1/0.5	1/0.5	1/0.5
	Gauge	24AWG	24AWG	24AWG
Insulation	Material	PE	PE	PE
	Diameter	0.86 mm	0.86 mm	0.86 mm
Screen	Material	Nil	Overall Aluminum Tape Screen	Overall Aluminum Tape Screen & Copper Wire Braid
Drain Wire	Material	Nil	1/0.5 mm	1/0.5 mm
Assembly	No of Pairs	25/50/100	25/50/100	25/50/100
Jacket	Material	PE/PVC/LSF/LSZH	PE/PVC/LSF/LSZH	PE/PVC/LSF/LSZH

Remark: PE-Polyethylene; PVC-Polyvinyl Chloride; LSF-Low Smoke & Fume; LSZH-Low Smoke Zero Halogen; LSFROH-Low Smoke Flame Retardant Zero Halogen (to IEC60332-3C); PVC can be classified as CMX, CM, CMR and CMP

◎ **Working Frequency:**

1-100MHz

◎ **Product Certification:**

E222756 (UL)

◎ **Technical Parameters:**

☆ Characteristic Impedance: 100 15Ω
☆ Nominal Velocity of Propagation(NVP): 69%
☆ Maximum DC Resistance: 9.38Ω/100m
☆ Maximum Mutual Capacitance: 5.6 nF/100m
☆ Maximum Capacitance Unbalance: 330 pF/100m
☆ Maximum Resistance Unbalance: 5%
☆ Maximum Propagation Delay Skew: 30 ns/100m
☆ Maximum Propagation Delay: 536 ns/100m@100 MHz
☆ Minimum Bending radius: 10 x Overall Diameter
☆ Voltage Rating: 60V rms
☆ Maximum Pulling load: 80N
☆ Working Temperature: -20 ℃ ~ +60℃
☆ Storage Temperature: -5℃ ~ + 50℃
☆ Flame Retardancy: UL 1581 (CM Jacket); UL 1666 (CMR Jacket); UL 910 (CMP Jacket); IEC 60332-1 (FRPVC & LSZH Jacket); IEC 60332-1 & IEC 60332-3C (LSFROH Jacket)

◎ **Product Highlights:**

☆ Provide excellent bandwidth beyond 100 MHz.
☆ Designed for use in data and voice backbone application.
☆ Meet the strict flame retardancy and environmental requirements in Europe and US.
☆ Easily identifiable color code for ease of installation.

◎ Transmission Properties:

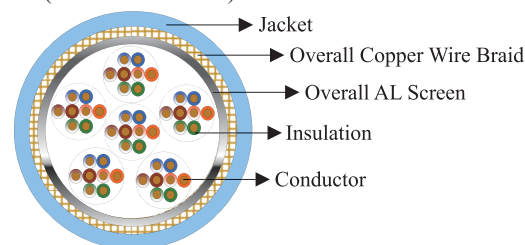| FREQ (MHz)	NEXT(dB/100m) Minimum Value/Typical Value/Standard Value	IL (dB/100m)	SRL (dB/100m) Minimum Value/Typical Value/Standard Value
1	64.0/71.0/62.0	2.0	24.5/26.0/23.0
4	55.0/62.0/53.0	4.0	24.5/26.0/23.0
8	49.5/57.0/48.0	5.7	24.5/26.0/23.0
10	49.0/56.0/47.0	6.4	24.5/26.0/23.0
16	44.9/52.0/44.0	8.2	24.5/26.0/23.0
20	42.5/48.0/42.0	9.2	24.5/26.0/23.0
25	42.0/48.0/41.0	10.3	24.5/26.0/23.0
31.25	40.6/48.0/39.0	11.6	22.5/24.0/21.0
62.5	36.1/43.0/35.0	16.9	19.5/22.0/18.0
100	34.0/40.0/32.0	21.8	17.5/20.0/16.0

◎ Ordering Information:

Model	Product Description
AD-BC-CAT5UTP25PCM24	U/UTP Cat5 25 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5UTP50PCM24	U/UTP Cat5 50 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5UTP100PCM24	U/UTP Cat5 100 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5UTP25PLH24	U/UTP Cat5 25 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5UTP50PLH24	U/UTP Cat5 50 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5UTP100PLH24	U/UTP Cat5 100 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5UTP25PPE24	Outdoor U/UTP Cat5 25 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT5UTP50PPE24	Outdoor U/UTP Cat5 50 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT5UTP100PPE24	Outdoor U/UTP Cat5 100 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT5FTP25PCM24	F/UTP Cat5 25 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5FTP50PCM24	F/UTP Cat5 50 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5FTP100PCM24	F/UTP Cat5 100 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5FTP25PLH24	F/UTP Cat5 25 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5FTP50PLH24	F/UTP Cat5 50 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5FTP100PLH24	F/UTP Cat5 100 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5FTP25PPE24	Outdoor F/UTP Cat5 25 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT5FTP50PPE24	Outdoor F/UTP Cat5 50 Pairs (Water-blocking /UV Resistant)
AD-BC-CAT5FTP100PPE24	Outdoor F/UTP Cat5 100 Pairs (Water-blocking /UV Resistant)

Cat5 U/UTP

- Jacket
- Insulation
- Conductor

Cat5 F/UTP

- Jacket
- Insulation
- Conductor
- Drain Wire
- Overall AL Screen

Cat5 SF/UTP

- Jacket
- Overall Copper Wire Braid
- Overall AL Screen
- Insulation
- Conductor
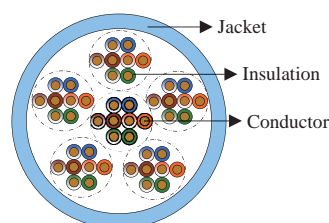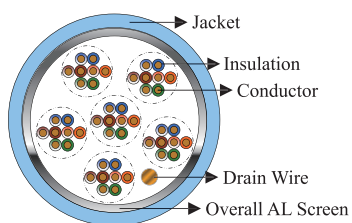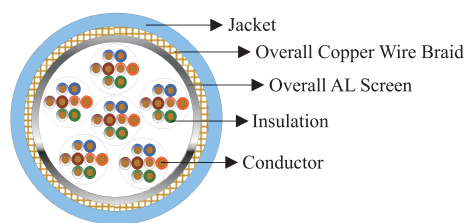
Enhanced Category 5 Multipair Cables

◎ **Applications:**

10Base-T, 100Base-T4, 100Base-TX, 100Base-VG-ANYLAN, 155Mbps ATM, 622Mbps ATM, 1000Base-T

◎ **Standards:**

ISO/IEC 11801, ANSI/TIA/EIA-568-B

◎ **Product Construction Matrix:**

		U/UTP	F/UTP	SF/UTP
Conductor	Material	Solid Plain Copper	Solid Plain Copper	Solid Plain Copper
	Stranding(No./mm)	1/0.5	1/0.5	1/0.5
	Gauge	24AWG	24AWG	24AWG
Insulation	Material	PE	PE	PE
	Diameter	0.86 mm	0.86 mm	0.86 mm
Screen	Material	Nil	Overall Aluminum Tape Screen	Overall Aluminum Tape Screen & Copper Wire Braid
Drain Wire	Material	Nil	1/0.5 mm	1/0.5 mm
Assembly	No of Pairs	25/50/100	25/50/100	25/50/100
Jacket	Material	PE/PVC/LSF/LSZH		

Remark: PE- Polyethylene; PVC- Polyvinyl Chloride; LSF- Low Smoke & Fume; LSZH- Low Smoke Zero Halogen; LSFROH-Low Smoke Flame Retardant Zero Halogen (to IEC60332-3C); PVC can be classified as CMX, CM, CMR and CMP

◎ **Working Frequency:**

1-100MHz

◎ **Product Certification:**

E222756 🆄🅛

◎ **Technical Parameters:**

☆ Characteristic Impedance: 100 15Ω
☆ Nominal Velocity of Propagation(NVP): 69%
☆ Maximum DC Resistance: 9.38Ω/100m
☆ Maximum Mutual Capacitance: 5.6nF/100m
☆ Maximum Capacitance Unbalance: 330pF/100m
☆ Maximum Resistance Unbalance: 5%
☆ Maximum Propagation Delay Skew: 30 ns/100m
☆ Maximum Propagation Delay: 536ns/100m@100MHz
☆ Minimum Bending radius: 10 x Overall Diameter
☆ Voltage Rating: 60V rms
☆ Maximum Pulling load: 80N
☆ Working Temperature: -20℃ ~ +60℃
☆ Storage Temperature: -5℃ ~+50℃
☆ Flame Retardancy: UL 1581 (CM Jacket); UL 1666 (CMR Jacket); UL 910 (CMPJacket); IEC 60332-1 (FRPVC & LSZH Jacket); IEC 60332-1 & IEC 60332-3C (LSFROH Jacket)

◎ **Product Highlights:**

☆ Provide excellent bandwidth beyond 200 MHz.

☆ Designed for use in data and voice backbone application.

☆ Meet the strict flame retardancy and environmental
  requirements in Europe and US.

☆ Easily identifiable color code for ease of installation.

☆ Different jacket options available for choice.
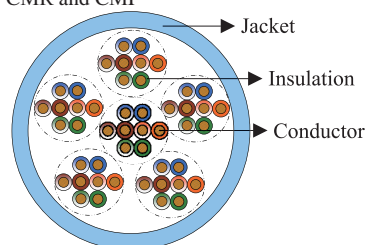
Cat5e U/UTP
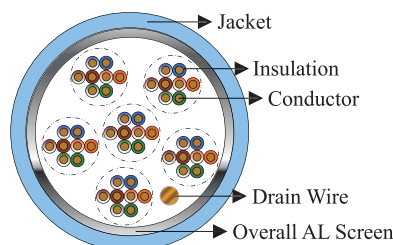
Cat5e F/UTP

Cat5e SF/UTP

◎ Transmission Properties:

FREQ (MHz)	NEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	IL (dB/100m)	RL (dB/100m) Minimum Value/ Typical Value/ Standard Value	ACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	ELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSNEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSACR (dB/100m) Minimum Value/ Typical Value/ Standard Value	PSELFEXT (dB/100m) Minimum Value/ Typical Value/ Standard Value
1	68.3/74.0/65.3	2.0	20.2/26.0/20.2	66.3/72.0/63.3	64.8/69.0/63.8	65.3/71.0/62.3	63.3/69.0/60.3	61.8/66.0/60.8
4	59.3/65.0/56.3	4.1	23.0/29.0/23.0	55.2/60.9/52.2	52.7/57.0/51.7	56.3/62.0/53.3	52.2/57.9/49.2	49.7/54.0/48.7
8	54.8/61.0/51.8	5.8	24.5/30.5/24.5	49.0/55.2/46.0	46.7/51.0/45.7	51.8/58.0/48.8	46.0/52.2/43.0	43.7/48.0/42.7
10	53.3/59.0/50.3	6.5	25.0/31.0/25.0	46.8/52.5/43.8	44.8/49.0/43.8	50.3/56.0/47.3	43.8/49.5/40.8	41.8/46.0/40.8
16	50.3/56.0/47.3	8.2	25.0/31.0/25.0	42.1/47.8/39.1	40.7/45.0/39.7	47.4/53.0/44.3	39.1/44.8/36.1	37.7/42.0/36.7
20	48.8/55.0/45.8	9.3	25.0/31.0/25.0	39.5/45.7/36.5	38.7/43.0/37.7	45.8/52.0/42.8	36.5/42.7/33.5	35.7/40.0/34.7
25	47.3/53.0/44.3	10.4	24.3/30.3/24.3	36.9/42.6/33.9	36.8/41.0/35.8	44.3/50.0/41.3	33.9/39.6/30.9	33.8/38.0/32.8
31.25	45.9/52.0/42.9	11.4	23.6/29.6/23.6	34.2/40.3/31.2	34.9/39.0/33.9	42.9/49.0/39.9	31.2/37.3/28.2	31.9/36.0/30.9
62.5	41.4/47.0/38.4	17.0	21.5/27.5/21.5	24.4/30.0/21.4	28.8/33.0/27.8	38.4/44.0/35.4	21.4/27.0/18.4	25.8/30.0/24.8
100	38.3/44.0/35.3	22.0	20.1/26.1/20.1	16.3/22.0/13.3	24.8/29.0/23.8	35.3/41.0/32.3	13.3/19.0/10.3	21.8/26.0/20.8
155	35.5/41.0/32.5	28.1	18.8/24.8/18.8	7.4/12.9/4.4	20.9/25.0/19.9	32.5/38.0/29.5	4.4/9.9/1.4	17.9/22.0/16.9
200	33.7/40.0/30.7	32.4	18.0/24.0/18.0	1.3/7.6/-1.7	19.7/24.0/18.7	30.0/37.0/27.7	-1.7/4.6/-4.7	16.7/21.0/15.7

◎ Ordering Information:

Model	Product Description
AD-BC-CAT5EUTP24PCM24	U/UTP Cat5e 24 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EUTP48PCM24	U/UTP Cat5e 48 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EUTP24PLH24	U/UTP Cat5e 24 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5EUTP48PLH24	U/UTP Cat5e 48 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5EFTP24PCM24	F/UTP Cat5e 24 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EFTP48PCM24	F/UTP Cat5e 48 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EFTP24PLH24	F/UTP Cat5e 24 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5EFTP48PLH24	F/UTP Cat5e 48 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5ES-FTP24PCM24	SF/UTP Cat5e 24 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5ES-FTP48PCM24	SF/UTP Cat5e 48 Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5ES-FTP24PLH24	SF/UTP Cat5e 24 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5ES-FTP48PLH24	SF/UTP Cat5e 48 Pairs, LSZH Grade (IEC60332-1)
AD-BC-CAT5EUTP24PPE24	Outdoor U/UTP Cat5e(4 6) Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EUTP48PPE24	Outdoor U/UTP Cat5e(4 12) Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EFTP24PPE24	Outdoor U/UTP Cat5e(4 6) Pairs, CM Grade (Non-Plenum)
AD-BC-CAT5EFTP48PPE24	Outdoor U/UTP Cat5e(4 12) Pairs, CM Grade (Non-Plenum)
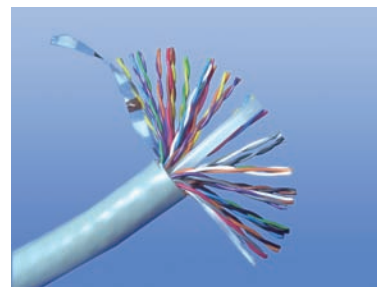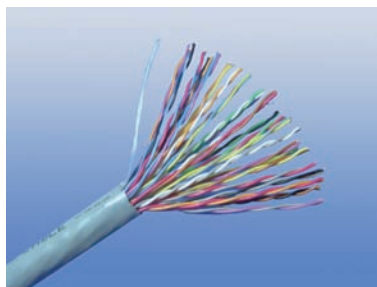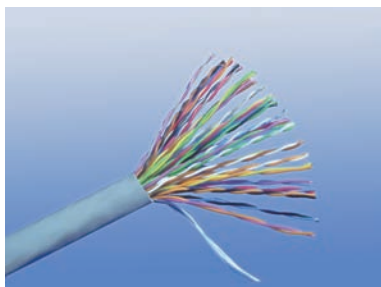
Fiber Cable Design

◎ Product Highlights:

☆ Central Strength Members:

For high strength and flexibility required for outdoor cables to be easily pulled or blow into ducts, the preferred central strength member material is steel. The steel is hot-rolled with anti-corrosion treatment. The steel central member is continuous throughout the cable length. It is coated with plastic, having a diameter dictated by the cable geometry. Stranded steel is used when light cable and high flexibility are required. Stranded steel is characterized by high modulus and tensile strength, not easily generated Hydrogen due to oxidization, which in turn may effect the fiber attenuation. As an alternative option to steel, FRP can be used as central strength member. The dielectric nature of glass fibers renders them immune to electromagnetic interference (EMI) and lighting. Dielectric cables can be laid in unprotected conduits and even in air handing spaces and plenums, as there is no danger of electrical shock.

☆ Jelly :

Jelly is characterized by higher dripping point and long term stability.

☆ Corrugated Steel Tape:

Steel tape is usually coated with polymer on both sides. The polymer coating enhances the adhesion of the steel to the jacket material during extrusion, creating an extremely rugged cable. The steel tape provides protection against water penetration and corrosion, also providing necessary physical protection. The steel tape can be corrugated to increase the tensile strength, thus enhancing cable flexibility. Besides, steel tape also renders the cables immune to lighting and provides rodent protection.

☆ Aluminum Moisture Barrier:

The aluminum moisture barrier prevents ingress from water penetration and also provides good physical protection. It is a critical element for providing water-blocking protection for the fiber cables.

☆ Jacket Materials:

PE:

Polyethylene (PE) is used as cable jackets mostly for outdoor applications. It is characterized by high tensile strength and resistance to abrasion. PE will not crack or become brittle at low temperature and will retain its mechanical properties and stability at high temperature. With the inclusion of carbon black in the formulation. PE can have extremely good aging properties and high UV and weather resistance to most chemicals and solvents.

PVC:

Polyvinyl Chloride (PVC) is used mostly for indoor applications. PVC material is flexible and flame retardant. It does not allow fire to propagate along the cable when ignited. PVC is characterized by high tensile strength and abrasion resistance. It will not crack or deteriorate when used indoors and at moderate temperatures.

LSZH:

Low Smoke Zero Halogen compound (LSZH) is used mostly for indoor applications. LSZH material is flexible and flame retardant, meeting flammability requirements of IEC 60332-1 and IEC 60332-3C. Besides, LSZH material emits low amounts of smoke, complying to IEC 61034 and does not emit toxic, corrosive halogen gases complying to IEC 60754-1 standard.

◎ Standards:

1） Fiber testing is carried out in accordance to TIA/EIA-455, IEC-794-1 and EN-187000 standards.

2） Fiber optic cables meet Bellcore standard in the outdoor environment.

3） LSZH jacket meets IEC60332-1 & IEC60332-3C standards.

◎ Fiber Characteristics:

SINGLE MODE FIBERS

Parameter	Standard Single Mode Fiber per ITU-T G.652D	Non-Zero Dispersion Shifted Fiber per ITU-T G.655	Non-Zero Dispersion Shifted Fiber per ITU-T G.656	Units
Fiber Code	9	8	7	
Attenuation, Loose Tube Cables @1310nm @1550nm @1625nm	≤0.35 ≤0.22 ≤0.25	- ≤0.22 ≤0.26	- ≤0.22 ≤0.26	dB/km
Attenuation Tight Buffer Cables @1310nm @1550nm	≤0.38 ≤0.28	- -		dB/km
Dispersion 1260-1360nm (O Band) 1460-1530nm (S Band) 1530-1565nm (C Band) 1565-1565nm (L Band)	≤0.35 - ≤18.0 ≤22.0	N/A - 1-10 7-12	- 2-7 7-10 10-14	ps/(nm∗km)
Zero Dispersion Wavelength	1311 11	<1520	<1420	nm
Mode Field Diameter @1310nm @1550nm	9.2 0.5 10.4 1.0	N/A 8.5 0.6	- 9.0 0.5	μm
Cable Cut-off Wavelength	≤1260	<1450	<1310	nm
Cladding Diameter	125 1.0	125 1.0	125 1.0	μm
Core/Cladding Concentricity Error	≤0.5	≤0.5	≤0.6	μm
Cladding Non-Circularity	≤1.0	≤1.0	≤1.0	%
Coating Diameter	245 10	245 10	245 10	μm
Proof-Test Level	0.7	0.7	0.7	GN/㎡

MULTIMODE FIBERS

Parameter	50/125μm		62.5/125μm	Units
Fiber Code	5	4	6	
ISO/IEC11801	OM2	OM3	OM1	
Attenuation, Loose Tube Cables @850nm @1300nm	≤2.8 ≤0.9		≤3.2 ≤1.0	dB/km
Attenuation Tight Buffer Cables @850nm @1300nm	≤3.0 ≤1.0		≤3.5 ≤1.0	dB//km
Bandwidth @850nm @1300nm	≥500 ≥800	≥2000 ≥500	≥200 ≥500	MHz∗km
Numerical Aperture	0.20 0.015		0.275 0.015	-
Core Diameter	50 3		62.5 3	μm
Cladding Diameter	125 2		125 2	μm
Core Non Circularity	≤6		≤6	%
Cladding Non-Circularity	≤2		≤2	%
Core/Cladding Offset	≤3		≤3	μm
Coating Diameter	245 10		245 10	μm
Proof-Test Level	0.7		0.7	GN/㎡

Multi Loose Tube Fiber Optic Cables

◎**Applications:**

Long distance outside telephone, CATV, Data, communications.

◎ **Installations:**

Installed in duct, self supporting (Figure 8 self supporting or ADSS All dielectric self supporting) and direct burial (with armoring).

◎ **Construction:**

The cable consists of 5 to 36 elements stranded in up to 3 layers around a central strength member and bound in a jacket. The elements are usually fiber containing tubes. However, fillers are also used, when needed to preserve cable geometry. Two to twelve color coded fibers are loosely laid in each tubes filled with water-blocking gel.

◎ **Technical Parameters:**

☆ Maximum Transmission Distance: 6km (Single Mode); 0.3km (Multimode)
☆ Maximum Pulling Load: 1500-2700 N (Short Term Installation); 900-1500N (Long Term Installation)
☆ Minimum Bending Radius:
    Short Term Installation: 20 x Overall Diameter
    Long Term Installation: 10 x Overall Diameter (Non Armored); 20 x Overall Diameter (Armored)
☆ Twist (Torsion Length): 125 x Overall Diameter
☆ Working Temperature: -40℃ ~ +70℃ (PE sheath)
☆ Storage Temperature: -50℃ ~ +70℃ (PE sheath)

◎ **Product Highlights:**

☆ All the fiber containing tubes are placed in concentric layers around the central member; through the control of the twist length, the fiber cable can achieve better pulling load and operating temperature.
☆ Tube Materials are water resistant and can sustain high tension. Being filled with special water-blocking gel, the tube can provide water protection for the fibers inside the tube.
☆ Central Member, which is usually either made of dielectric FRP, or solid/ stranded steel coated with polyethylene, are placed at the centre of the cables.

◎ **Ordering Information:**

AD-MLA-B-C- D-E-F-G-H-I-J-K-L
A: Loose Tube Diameter
    B = 2.1 mm; C = 2.5 mm; D = 2.8 mm; E = 3.0 mm; F = 3.2 mm
B: Fiber Types
    0=Fibers and copper conductors in cable; 1=Two or more fiber types in a cable
    4=50/125 Multimode (OM3); 5=50/125 Multimode (OM2);
    6=62.5/125 Multimode (OM1); 7= NZDS SM fiber per G.656;
    8=NZDS SM fiber per G.655; 9=Standard SM fiber per G.652D
C: No. of Tubes: 1-36
D: No. of Fibers per Tube: 2 - 12
E: Central Member: S=Solid steel; SR-Stranded Steel; F=Dielectric (FRP)
F: Inner jacket options
    2Y =PE; Y =PVC; H =LSZH
G: Armour options
    Blank=No armour; T=Corrugated steel tape armour; W=Steel wire armour
    B=Bronze armour; D=Fiber glass armour; TW= Steel tape + Steel wire armour
H: Jacket material options
    2Y =PE; Y =PVC; H =LSZH; 8Y= PA
    11Y=PU; A=Aluminium moisture barrier; T=Anti-termite protection
I: Water-blocking options for cable core
    X=No water-blocking; J= Water-blocking gel in tubes; JD=Water-blocking gel in tubes+ dry water-blocking in cable core interstices; JJ= Water-blocking gel in tubes and cable core interstices
J: Water-blocking options or cables with more than one jacket
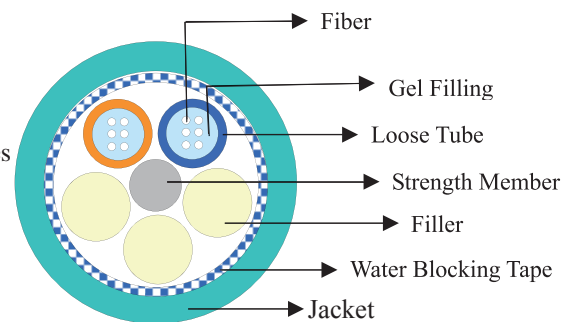   X=No water-blocking; J=Water-blocking gel between jackets; D=Dry water-blocking between cable jackets;
K: Strength member options
    A=Aramid yarn; AG=Aramid yarn and fiber glass yarn; G=Fiber glass yarn
L: General options
    SS=Fig-8 self-supporting; UW=Under Water

Fiber

Gel Filling

Loose Tube

Strength Member

Filler

Water Blocking Tape

Jacket
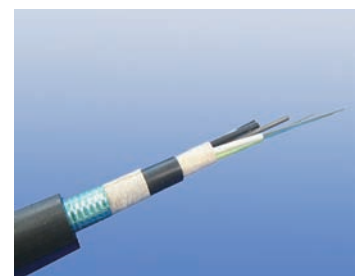
Central Loose Tube Fiber Optic Cables

◎ **Applications:**

Long distance telephone, CATV, Data communications.

◎ **Installations:**

Installed in duct, self supporting (Figure 8 self supporting or ADSS All dielectric self supporting) and direct burial (with armouring).

◎ **Construction:**

The cable consists of a single tube containing 2 up to 24 fibers, which is filled with water-blocking gel. When the cable contains more than 12 fibers, they are divided in two groups. A colored thread identifies each group. Physical protection and tensile strength are provided by aramid yarn or fiberglass wound around the tube. Either PE or LSZH jacket can be used. A ripcord is located under the jacket to facilitate jacket removal.

◎ **Technical Parameters:**

☆ Maximum Transmission Distance: 6km (Single Mode); 0.3km (Multimode)
☆ Maximum Pulling Load: 1500N (Short Term Installation); 900N (Long Term Installation)
☆ Maximum Compressive load: 3000N (3.3mm loose tube diameter); 5000N (4.5mm loose tube diameter)
☆ Twist (Torsion Length): 125 x Overall Diameter
☆ Working Temperature: -20℃ ~ +70℃ (PE sheath)
☆ Storage Temperature: -40℃ ~ +70℃ (PE sheath)

◎ **Product Highlights:**

☆ Small diameter and light weight.
☆ Through the control of the fiber exceed length which is the key technology in optical fiber manufacture, the fiber cable can achieve better pulling load and operating temperature.
☆ Tube Materials are water resistant and can sustain high tension. Being filled with special water-blocking gel, the tube can provide water protection for the fibers inside the tube.
☆ Compact construction of the fiber cores can prevent the fiber to shrink back. This can sustain higher tensile stress and achieve better flexibility.
☆ Wide operating temperature range.

◎ **Ordering Information:**

AD-CLA-B-C-D-E-F-G-H-I-J

A: Loose Tube Diameter
   A = 2.1 mm; B = 2.5 mm
B: Fiber Types:
   0=Fibers and copper conductors in cable; 1=Two or more fiber types in a cable
   4=50/125 Multimode (OM3); 5=50/125 Multimode (OM2);
   6=62.5/125 Multimode (OM1); 7= NZDS SM fiber per G.656;
   8=NZDS SM fiber per G.655; 9=Standard SM fiber per G.652D
C: No of Tubes: 1-24
D: Inner jacket options
   2Y =PE; Y =PVC; H =LSZH
E: Armour options
   Blank=No armour; T=Corrugated steel tape armour; W=Steel wire armour;
   B=Bronze armour; D=Fiber glass armour; TW= Steel tape + Steel wire armour
F: Jacket material options
   2Y =PE; Y =PVC; H =LSZH; 8 Y =PA; 11Y =PU;
   A=Aluminium moisture barrier; T=Anti-termite protection
G: Water-blocking options for Cable Cores
   X=No water-blocking; J= Water-blocking gel in tubes; JD=Water-blocking gel in tubes + dry water-blocking in cable core interstices; JJ= Water-blocking gel in tubes and cable core interstices.
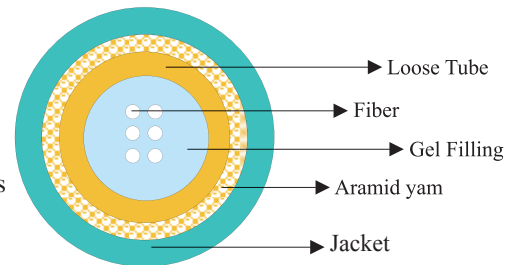H: Water-blocking options for Cables with more than one Jacket
   X=No water-blocking; J=Water-blocking gel between jackets; D=Dry water-blocking between cable jackets
I: Strength member options
   A=Aramid yarn; AG=Aramid yarn and fiberglass yarn; G=Fiberglass yarn
J: General options：
   SS=Fig-8 self-supporting; UW=Under Water

Loose Tube
Fiber
Gel Filling
Aramid yam
Jacket
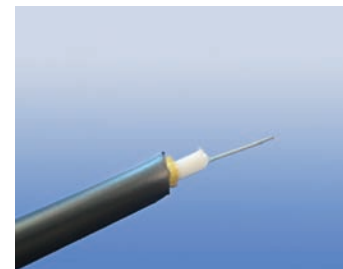
Tight Buffer Distribution Fiber Optic Cables

◎ **Applications:**

Short and medium distance, indoor and protected environments. Offered as a riser, plenum, or general purpose cable, it is used for interconnection of distribution boxes, or the distribution boxes and customer equipments, and between floors.

◎ **Installations:**

Installed along the wall, the roof, interlayer, canal and indoor.

◎ **Construction:**

The cable contains 4 to 72 fibers individually buffered to 0.9 mm in a tight or semi tight construction and coded. The cable structure depends on the number of fibers: The 4 to 12 fiber cables contain individual fibers without sub-units,In the 16 to 72 fiber cables the fibers are grouped in the sub-units. In the 4 to 12 fiber cables, the individual fibers are stranded and protected by aramid yarn and a PVC or LSZH jacket. In the 16 to 72 fiber cables, the fibers are grouped into sub-units which are laid helically along the cable axis. Each sub-unit contains 4 to 6 fibers, aramid yarn and a PVC or LSZH jacket. The 72 fiber cable consists of twelve sub-units, nine of them are stranded around a central element made of 3 sub-units.

◎ **Technical Parameters:**

☆ Maximum Transmission Distance: 6km (Single Mode); 0.3km (Multimode)
☆ Maximum Pulling Load: 100N(Short Term Installation);60N(Long Term Installation)
☆ Minimum Bending Radius:
  Short Term Installation: 20 x Overall Diameter
  Long Term Installation: 10 x Overall Diameter (Non-Armoured);
                    20 x Overall Diameter (Armoured)
☆ Twist (Torsion Length): 125 x Overall Diameter.
☆ Working Temperature: -10℃ ~ +70℃ (PE sheath)
☆ Storage Temperature: -20℃ ~ +70℃ (PE sheath)

Fiber

Loose Tube   Jacket

Aramid yam

◎ **Product Highlights:**

☆ Small diameter and light weight.
☆ The high tension characteristics of the aramid yarn serving as strength member
  can offer good stability in the transmission performance.
☆ Compact and flexible construction are especially suitable for indoor installations.
☆ Tight Buffer fibers are made from fiber rods with good linearity and low extruding output. By careful calibration of the vacuum pumping equipment, the uniformity of the outer diameter of the tight buffer fibers can be easily achieved with excellent strip ability.
☆ LSZH jackets can be offered for indoor application for which flame retardancy is required.
☆ Cutting edge production equipment, good quality materials and optimized process ensure low induced attenuation within the operating temperature range.
☆ Fiber geometry are strictly monitored to ensure superior transmission performance.

◎ **Ordering Information:**

AD-MTA-B-C-D-E-F-G-H-I-J-K-L
A: Small Unit Diameter
 A=0.9mm (12 core);
  B=3.6mm (12-16 core);
  C=4.2mm (24-72 core)
B: Fiber Types
  0=Fibers and copper conductors in cable; 1=Two or more fiber types in a cable
  4=50/125 Multimode (OM3); 5=50/125 Multimode (OM2)
  6=62.5/125 Multimode (OM1); 7= NZDS SM fiber per G.656
  8=NZDS SM fiber per G.655; 9=Standard SM fiber per G.652D
C: No of Fibers per Tubes: 4-72
D: Subunit Jacket Material
  Y=PVC; H=LSZH
  11Y=PU; 0=No subunit (0-12 core fiber)
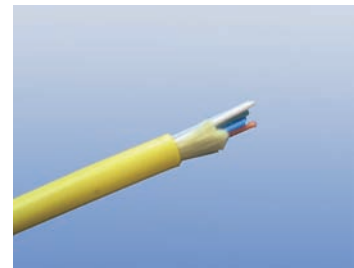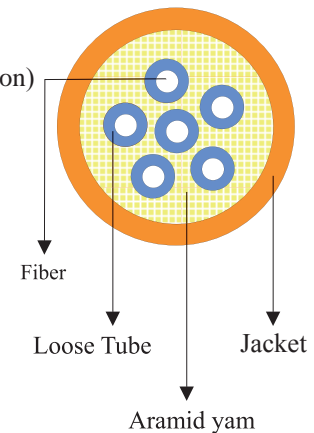
E: Central Member

    A=Aramid yarn; F=Dielectric (FRP)

F: Inner Jacket Options

    2Y=PE; Y=PVC; H=LSZH

G: Armour Options

    Blank=No armour; T=Corrugated steel tape armour; W=Steel wire armour

    B=Bronze armour; D=Fiber glass armour; TW= Steel tape + Steel wire armour

H: Jacket Material Options

    2Y=PE; Y=PVC; H=LSZH

    11Y=PU; A=Aluminium moisture barrier; T=Anti-termite protection

I: Water-blocking Options for Cable Cores

    X= No water-blocking; J=Cable core gel in tubes; D=Dry water-blocking in cable core interstices

J: Water-blocking Options for Cables with more than one Jacket

    X=No Water-blocking; J= Water-blocking gel between jackets; D=Dry water-blocking between cable jackets

K: Tight Buffer Types

    VT=Standard TB; YT=Tactical level

    CG=Jelly filled, Semi tight buffered; CD=Dry, Semi tight buffered

L: Strength member options

    A=Aramid yarn; AG=Aramid yarn and fiber glass yarn; G=Fiber glass yarn
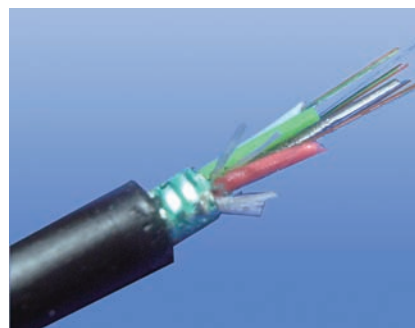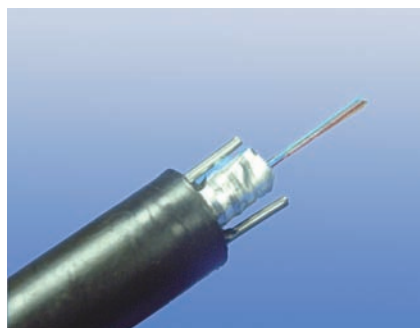
Connecting Hardware

Cat5e & Cat6/6A Keystone Jacks

◎ **Basic Features:**

☆ Significant margin over ANSI/TIA 568-B, ISO/IEC 11801and EN 50173.

☆ Twists are maintained to within 1/2" (12.7mm).

☆ Work in standard keystone jack opening (0.58" x 0.78" or 14.7mm x 20.1mm).

☆ Unshielded and shielded versions available for choice.

☆ Accept 110 punch down tools or Krone punch down tools.

☆ Color coded for 568A and 568B wiring scheme.

☆ Swept frequency tested up to 150MHz for Cat5e jacks, 300 MHz for Cat 6 jacks and 500 MHz for Cat6A jacks.

◎ **Technical Parameters:**

☆ Made of UL-94V high impact and fire-retardant ABS material. ABS material is characterized by good impact, chemical & fire resistance. UL94V-0 is the highest standard on fire resistance.

☆ Beryllium copper contacts for superior connectivity, with 100μ" nickel baseboard furnished with 50μ" gold plating.

☆ Support 22 -26AWG wire gauge.

☆ Plug Retention Force: 10kg (minimum)

☆ Plug & Keystone Jack Contact Force: 100 g.

☆ Insertion Life Cycle: 1,000 cycles (minimum) / I.D.C 250 cycles (minimum)

☆ Insulation Resistance: 500MΩ

☆ Contact Resistance: 20MΩ

☆ Current Rating: 1.5 Amps

☆ DC Resistance: Max.0.1Ω

☆ Dielectric Withstand Voltage: 1,000VAC RMS @ 60Hz/1 min

☆ Operating Temperature: - 10℃ ~ 60℃

☆ Storage Temperature: -40℃ ~ 70℃

◎ **Product Certification:**

E223921 (UL)

◎ **Product Highlights:**

☆ Full seal design ensures reliable termination and stability.

☆ Supplied with a color coded dust cover for dust and dampness protection.

☆ IDC contact design eliminates need to strip individual conductors and ensures reliable termination.

☆ With a patented technology, all twists are maintained to within 1/2", improving the NEXT value to a great extent.

☆ Dust caps/retention caps offer termination with strain relief.

☆ Rear part of the jack printed with EIA 568B pin assignment to ensure fast termination.

☆ Being component tested, the jacks can work in harmony with lower class products.

☆ Provide extra NEXT margin in support of future gigabit application.

☆ Provide fully shielded design to ensure the best screening performance.

☆ Toolless design can speed up the installation process and save installation costs.

☆ 100% full shield design can improve EMI/RFI performance. Shield at the jack rear part can effectively protect IDC termination against EMI interference. They allow flexible grounding for shielded cable for each IDC.

☆ Shielded panels incorporate 360℃ stainless steel for full EMI (Electro-magnetic Immunity) shielding required by EN 50173.

☆ UL, ETL approved.
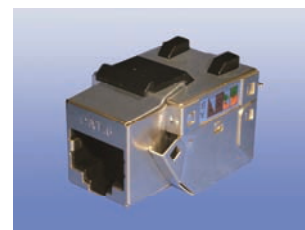
☆ Compact design can support high density installation.

CAT5e Unshielded
Keystone Jack

CAT5e Shielded
Keystone Jack

CAT6 Unshielded
Keystone Jack

CAT6 Shielded
Keystone Jack

◎ **Transmission Properties:**

Cat5e Jacks

FREQ (MHz)	IL (dB/100m)	NEXT(dB/100m) MinimumValue/Typical Value/ Standard Value	ELFEXT (dB/100m) MinimumValue/Typical Value/ Standard Value	RL (dB/100m) MinimumValue/Typical Value/ Standard Value
1	0.1	85.0/65.0	80.0/65.0	52.0/30.0
4	0.1	75.0/65.0	71.0/63.1	50.0/30.0
8	0.1	68.0/64.9	66.0/57.0	46.0/30.0
10	0.1	66.0/63.0	64.0/55.1	44.0/30.0
16	0.2	62.0/58.9	60.0/51.0	40.0/30.0
20	0.2	60.0/57.0	58.0/49.1	38.0/30.0
25	0.2	58.0/55.0	56.0/47.1	37.0/30.0
31.25	0.2	56.0/53.1	54.0/45.2	35.0/30.0
62.5	0.3	50.0/47.1	48.0/39.2	29.0/24.0
100	0.4	47.0/43.0	44.0/35.1	26.0/20.0

Cat6 Jacks

FREQ (MHz)	IL (dB/100m)	NEXT(dB/100m) MinimumValue/Typical Value/ Standard Value	ELFEXT(dB/100m) MinimumValue/Typical Value/ Standard Value	RL(dB/100m) MinimumValue/Typical Value/ Standard Value
1	0.1	85.0/75.0	83.0/75.0	52.0/30.0
4	0.1	80.0/75.0	74.0/71.1	53.0/30.0
8	0.1	77.0/75.0	69.0/65.0	55.0/30.0
10	0.1	76.0/74.0	67.0/63.1	56.0/30.0
16	0.1	72.0/69.9	62.0/59.0	57.0/30.0
20	0.1	72.0/68.0	61.0/57.0	59.0/30.0
25	0.1	69.0/66.0	59.0/55.1	59.0/30.0
31.25	0.11	67.0/64.1	58.0/53.2	56.0/30.0
62.5	0.16	61.0/58.1	52.0/47.2	42.0/28.0
100	0.20	57.0/54.0	48.0/43.1	33.0/24.0
200	0.28	52.0/48.0	42.0/37.1	21.0/18.0
250	0.32	47.0/46.0	40.0/35.1	17.0/16.0

Cat6A Jacks

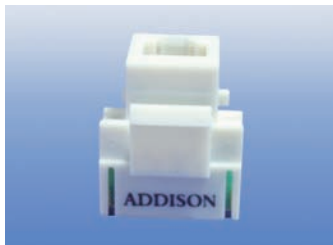| FREQ (MHz)	IL (dB/100m)	NEXT(dB/100m) MinimumValue/Typical Value/ Standard Value	ELFEXT(dB/100m) MinimumValue/Typical Value/ Standard Value	RL(dB/100m) MinimumValue/Typical Value/ Standard Value
1	0.1	104.0/94.0	120.0/110	84.0/68.0
4	0.1	92.0/82.0	108.0/98.0	82.0/56.0
8	0.1	86.0/75.9	102.0/91.9	66.0/49.9
10	0.1	84.0/74.0	100.0/90.0	64.0/48.0
16	0.1	80.0/69.9	96.0/85.9	60.0/43.9
20	0.1	78.0/68.0	94.0/84.0	59.0/42.0
31.25	0.11	75.0/64.1	90.0/80.1	54.0/38.1
62.5	0.16	68.0/58.1	84.0/74.1	48.0/32.1
100	0.20	64.0/54.0	80.0/70.0	44.0/28.0
200	0.28	58.0/48.0	74.0/64.0	38.0/22.0
250	0.32	56.0/46.0	72.0/62.0	36.0/20.0
300	0.36	53/42.9	70.0/60.5	34.0/18.5
350	0.41	50/40.2	69.0/59.1	33.0/17.1
400	0.45	48/37.9	68.0/58.0	32.0/16.0
450	0.49	36.0/35.8	67.0/56.9	31.0/14.9
500	0.53	44.0/34.0	66.0/56.0	30.0/14.0

Cat 7 Jacks

◎ **Product Highlights:**

☆ Full seal design ensures reliable termination and stability, with much better performance than Cat6 and Cat6A.

☆ Shielded jacks incorporate 360℃ stainless steel for full EMI (Electro-magnetic Immunity) shielding required by EN 50173. It is fabricated entirely from heavy steel for good stability.

☆ With a patented technology, all twists are maintained to within 8mm, improving the NEXT value to a great extent.

☆ Suitable or digital, voice and image and data transmission according to EN50173 standard.

☆ Significant margin over DIN 44312-5 and ISO/IEC Cat 7 draft F channel.

☆ Being component tested, the jacks can work in harmony with Cat 6 or lower class products.

☆ Provide extra NEXT margin in support of future gigabit application.

Voice Keystone Jacks

◎ **Transmission Properties:**

FREQ (MHz)	IL (dB/100m)	NEXT (dB/100m) Typcial Value/Standard Value	ELFEXT (dB/100m) Typcial Value/Standard Value	RL (dB/100m) Typcial Value/Standard Value
1	0.1	85.0/65.0	80.0/65.0	52.0/30.0
4	0.1	75.0/65.0	71.0/63.1	50.0/30.0
8	0.1	68.0/64.9	66.0/57.0	46.0/30.0
10	0.1	66.0/63.0	64.0/55.1	44.0/30.0
16	0.2	62.0/58.9	60.0/51.0	40.0/30.0

◎ **Ordering Information:**

Part No.	Description
AD-KM-C5E-A/B-XX	CAT5e Unshielded T568A/B Keystone Jack
AD-KM-C5EU-A/B-XX	CAT5e Unshielded T568A/B Tooless Keystone Jack
AD-KM-C5ES-A/B-XX	CAT5e Shielded T568A/B Keystone Jack
AD-KM-C5ESU-A/B-XX	CAT5e Shielded T568A/B Tooless Keystone Jack
AD-KM-C6-A/B-XX	CAT6 Unshielded T568A/B Keystone Jack
AD-KM-C6U-A/B-XX	CAT6 Unshielded T568A/B Tooless Keystone Jack
AD-KM-C6S-A/B-XX	CAT6 Shielded T568A/B Keystone Jack
AD-KM-C6SU-A/B-XX	CAT6 Shielded T568A/B Tooless Keystone Jack
AD-KM-C6A-A/B-XX	CAT6A Unshielded T568A/B Keystone Jack
AD-KM-C6AS-A/B-XX	CAT6A Shielded T568A/B Keystone Jack
AD-KM-C7S-A/B-XX	CAT7 Shielded T568A/B Keystone Jack
AD-TM-90-XX	T568A/B Keystone Voice Jack

*XX is the color code:

BK= Black; RD= Red; GN= Green; YL= Yellow; BL= Blue; WH= White; OR= Orange; GY= Gray; IV= Ivory White

Keystone Faceplates

◎ **Basic Features:**

☆ Work with RJ45, BNC, ST, F connectors or others.
☆ USA, UK & European style for selection.
☆ Flat & angled types for selection.
☆ Available in 1,2,4,6 ports for USA style; 1,2,4 ports for UK & European style; 1,2,3 ports for Horizontal style.
☆ Come with mounting screws and built-in identification labels.
☆ Complete system for flush (in wall) and modular furniture.
☆ Able to match with the keystone modules. Keystone jacks can be snapped in and out individually.
☆ Dimension:
   UK style: 86mm x 86mm
   USA style: 114mm x 70mm
   European style: 80mm x 80mm
☆ Apply UL94V-0 high-impact, fire-retardant ABS material.
☆ Dust cover is provided for dust and dampness protection.

◎ **Product Highlights:**

☆ Provide full product series for the multimedia applications.
☆ The screws are covered up by peripheral frame, providing elegant appearance.
☆ Fine modular design.
☆ Aesthetic design.
☆ Come with shutters for different installation environment.
☆ The surface undergoes special treatment, preventing the faceplate from being damaged by scratching.
☆ The faceplate can be disassembled on one side, providing ease of installation.
☆ Highly stable and high density plastic can ensure product durability, preventing discoloration.
☆ Angled design can provide more elegant and aesthetic outlook.
☆ Most suitable for SOHO environment.

◎ **Ordering Information:**

☆ British Style Keystone Faceplates

Part No.	Description	Size	Type
AD-KF-UK-01-180	1 Port UK Keystone Faceplate	86mm×86mm	
AD-KF-UK-02-180	2 Port UK Keystone Faceplate	86mm×86mm	
AD-KF-UK-04-180	4 Port UK Keystone Faceplate	86mm×86mm	
AD-KF-UK-01-45	1 Port UK Keystone Angled Faceplate	86mm×86mm	
AD-KF-UK-02-45	2 Port UK Keystone Angled Faceplate	86mm×86mm	

☆ European Style Keystone Faceplates

Part No.	Description	Size	Type
AD-KF-E-01-180	1 Port UK Keystone Faceplate	80mm×80mm	
AD-KF-E-02 -180	2 Port UK Keystone Faceplate	80mm×80mm	

☆ USA Style Keystone Faceplates

Part No.	Description	Size	Type
AD-KF-US-01-180	1 Port US Keystone Faceplate	114mm×70mm	
AD-KF-US-02-180	2 Port US Keystone Faceplate	114mm×70mm	
AD-KF-US-04-180	4 Port US Keystone Faceplate	114mm×70mm	
AD-KF-US-06-180	6 Port US Keystone Faceplate	114mm×70mm	

4 Port Keystone Faceplate

US Keystone Faceplate

1/2 Port UK Keystone Faceplate

1/2 Port UK Keystone Angled Faceplate

Multimedia Gang Frames

◎ **Basic Features:**

☆ Work with RJ45, BNC, ST, F connectors or others.
☆ Able to match with the keystone modules. Keystone jacks can be snapped in and out individually.
☆ 1" or 1 ^{1}/2" gang frames for selection.
☆ Come with mounting screws and built-in identification or labels.
☆ Apply UL94V-0 high-impact and fire retardant ABS material.
☆ Come with transparent designation labels.

◎ **Product Highlights:**

☆ Provide full product series for the multimedia applications.
☆ The screws are covered up by peripheral frame, providing elegant appearance.
☆ Aesthetic design.
☆ The adapters can be easily unloaded at the front, providing ease of installation.
☆ The identification labels can be removed easily without tool.

◎ **Ordering Information:**

Part No.	Description	Size	Type
AD-GF-UK-S2-XX	UK Style 1" Single Gang Frame	50mm 25mm	86mm 86mm
AD-GF-UK-S2A-XX	UK Style1 1^1/2" Single Gang Frame	50mm 37.5mm	86mm 86mm
AD-GF-UK-S4-XX	UK Style 1" Double Gang Frame	50mm 50mm	86mm 86mm
AD-GF-US-SM-XX	USA Style Single Gang Frame	50mm 75mm	70mm 114mm
AD-GF-US-DM-XX	USA Horizontal Style Double Gang Frame	110mm 50mm	114mm 114mm

A-UK Style Double Gang Frame
B-UK Style Single Gang Frame
C-UK Horizontal Style Angled Double Gang Frame
D-USA Style Single Gang Frame

A   B   C   D

Surface Mount Boxes

◎ **Basic Features:**

☆ House any keystone jacks available in the market.
☆ Secure the box to any surface, baseboard and furniture.
☆ Mount easily with supplied screws or double-sided adhesive tapes.
☆ Provide labeling behind a transparent clip-on cover.
☆ Built in optional shutter door to keep the jack clean.
☆ Color icons to indicate data or voice ports.
☆ Apply UL94V-0 high-impact and fire retardant ABS materials.
☆ Dust covers for dust and dampness protection.

◎ **Ordering Information:**

Part No.	Description
AD-SMB-K1	1 Port Surface Mount Box
AD-SMB-K2	2 Port Surface Mount Box
AD-SMB-K4	4 Port Surface Mount Box
AD-SMB-K6	6 Port Surface Mount Box
AD-SMB-K8	8 Port Surface Mount Box

Remarks: Mounting screws and adhesive backing included
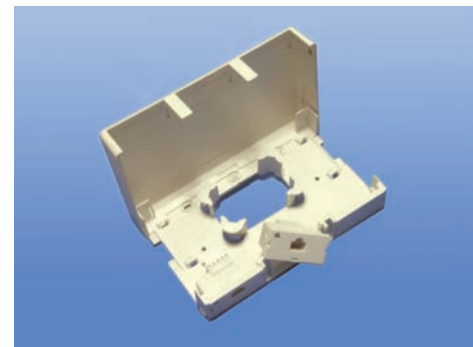
Cat5e & Cat6/6A Patch Panels

◎ **Basic Features:**

☆ Significant margin over ANSI/TIA-568-A(TSB-40A), ISO/IEC 11801 & 50173 standard.
☆ Meet EIA 310D standard.
☆ A pair punch sequence enables a pair twist within 1/2" (12.7mm) of termination.
☆ Shielded and unshielded version for selection.
☆ Snap in and integrated design for choice.
☆ 110 and Krone type for selection.
☆ 568A and 568B wiring for selection.
☆ 16, 24 & 48 ports for selection.

◎ **Product Certification:**

E223921 (UL)

24 Port Cat5e Patch Panel

◎ **Technical Parameters:**

☆ Made of UL-94V-0 high-impact & fire retardant ABS material.
☆ Beryllium copper contact: 50 micro inch gold-plated pins over 100 micro inch nickel layer.
☆ Support 22 -26AWG wire gauge.
☆ Insertion Life Cycle: 1,000 cycles (minimum) / I.D.C 250 cycles (minimum)
☆ Current Rating: 1.5 Amps
☆ Dielectric Withstand Voltage: 1,000VAC RMS @ 60Hz/min
☆ The modular design allows different types of modules to be placed in the same patch panel, saving space in the compact environment. The patch panels use the same RJ45 jacks as that used in the work area, thus reducing spare part quantity and maintenance cost.
☆ Provide superior performance for internal, cross connect and consolidation point installation.
☆ Optional titanium design provides more elegant outlook.
☆ Cables can be fixed at the front part of the panel by use of wiring, providing strain relief for the cables, maintaining the bending radius of the cables and improving the attenuation and return loss performance.
☆ Patented design in PCB board enhances NEXT performance and innovative punch down and cable management design enhances the product durability, providing more convenient management of the patch panels.
☆ All panels are power sum swept frequency tested for Cat5e up to 155Mz and Cat6 up to 300 Mz.
☆ Operating Temperature: 0℃ ~+60℃
☆ Storage Temperature: -40℃ ~+60℃

◎ **Transmission Properties:**

☆ Please refer to the technical data of the keystone jack.

◎ **Product Highlights:**

☆ Space saving & high density 19 panel design for 24 ports.
☆ Color coded icon identification tag for ease of installation.
☆ Write-on designation labels with clear holders on the front panel for system identification.

24 Port Cat6 Patch Panel

☆ 100% full shield design can improve EMI/RFI performance. They allow flexible grounding for shielded cable for each IDC pin.
☆ Shielded panels incorporate 360℃ stainless steel for full EMI (Electro-magnetic Immunity) shielding required by EN 50173.
☆ IDC connectors with large space on each pair help improve crosstalk performance.
☆ Cat 6 patch panels can be backward compatible with Cat5e or lower class products.
☆ Contacts are plated with galvanized platinum, achieving better conductivity and NEXT performance.

◎ Ordering Information:

☆ Unshielded CAT5e Patch Panel

Part No.	Description	Size		Dimension	Wiring
AD-PP-16-C5E-A/B	Unshielded CAT5e 16 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-24-C5E-A/B	Unshielded CAT5e 24 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-IS-PP-24-C5E-A/B	Unshielded CAT5e 24 Port Smart Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-48-C5E-A/B	Unshielded CAT5e 48 Port Patch Panel	3.6"	19"	2U	T568A/B
A D-IS-PP-48-C5E-A/B	Unshielded CAT5e 48 Port Smart Patch Panel	3.6"	19"	2U	T568A/B

☆ Unshielded CAT6 Patch Panel

Part No.	Description	Size		Dimension	Wiring
AD-PP-16-C6-A/B	Unshielded CAT6 16 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-24-C6-A/B	Unshielded CAT6 24 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-IS-PP-24-C6-A/B	Unshielded CAT6 24 Port Smart Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-48-C6-A/B	Unshielded CAT6 48 Port Patch Panel	3.6"	19"	2U	T568A/B
AD-IS -PP-48-C6-A/B	Unshielded CAT6 48 Port Smart Patch Panel	3.6"	19"	2U	T568A/B

☆ Unshielded CAT6A Patch Panel

Part No.	Description	Size		Dimension	Wiring
AD-PP-16-C6A-A/B	Unshielded CAT6A 16 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-24-C6A-A/B	Unshielded CAT6A 24 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-48-C6A-A/B	Unshielded CAT6A 48 Port Patch Panel	3.6"	19"	2U	T568A/B

☆ Shielded CAT5e Patch Panel

Part No.	Description	Size		Dimension	Wiring
AD-PP-16-C5ES-A/B	Shielded CAT5e 16 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-24-C5ES-A/B	Shielded CAT5e 24 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-IS-PP-24-C5ES-A/B	Shielded CAT5e 24 Port Smart Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-48-C5ES-A/B	Shielded CAT5e 48 Port Patch Panel	3.6"	19"	2U	T568A/B

☆ Shielded CAT6 Patch Panel

Part No.	Description	Size		Dimension	Wiring
AD-PP-16-C6S-A/B	Shielded CAT6 16 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-24-C6S-A/B	Shielded CAT6 24 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-IS-PP-24-C6S-A/B	Shielded CAT6 24 Port Smart Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-48-C6S-A/B	Shielded CAT6 48 Port Patch Panel	3.6"	19"	2U	T568A/B

☆ Shielded CAT6A Patch Panel

Part No.	Description	Size		Dimension	Wiring
AD-PP-16-C6AS-A/B	Shielded CAT6A 16 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-24-C6AS-A/B	Shielded CAT6A 24 Port Patch Panel	1.8"	19"	1U	T568A/B
AD-PP-48-C6AS-A/B	Shielded CAT6A 48 Port Patch Panel	3.6"	19"	2U	T568A/B

Blank Patch Panel

Cat5e UTP Patch Panel

Cat6 UTP Patch Panel

Cat6 FTP Patch Panel

Cat7 Patch Panels

◎ **Product Highlights:**

☆ Provide superior performance for internal, cross connect and fixed installation.
☆ The Cat7 patch panels can be backward compatible with Cat 6 or lower class products.
☆ 100% full shield design can improve EMI/RFI performance. They allow flexible grounding for shielded cable for each IDC pin.
☆ With black coating and rust resistant finishing, the panels come with no mounting screw on the front for more elegant appearance.
☆ Rear cover with wire management bar for maintaining proper bending radius of the cables.
☆ Support gigabit Ethernet application.
☆ Provide extra NEXT margin in support of future gigabit application. Contacts are plated with galvanized platinum, achieving better conductivity and NEXT performance.
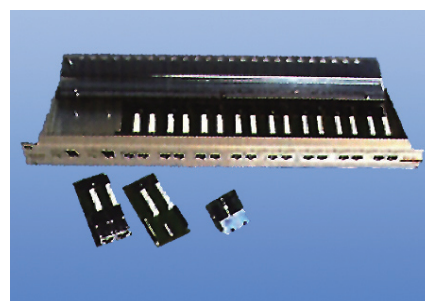
◎ **Ordering Information:**

Part No.	Description	Size	Dimension	Wiring
AD-PP-16-C7S-A/B	Shielded CAT7 16 Port Patch Panel	1.8" 19"	1U	T568A/B
AD-PP-24-C7S-A/B	Shielded CAT7 24 Port Patch Panel	1.8" 19"	1U	T568A/B
AD-PP-48-C7S-A/B	Shielded CAT7 48 Port Patch Panel	3.6" 19"	2U	T568A/B

Blank Patch Panels

◎ **Features:**
☆ Available in 16, 24 and 48 ports.
☆ Come with standard size in EIA 19".
☆ Come with exchangeable multimedia inserts for different connectors.
☆ Write on & erasable designation label for each port on the front panel.

◎ **Ordering Information:**

Part No.	Description	Size
AD-PP-BB-16	16 port Blank Patch Panel	1.8" 19"
AD-PP-BB-24	24 port Blank Patch Panel	1.8" 19"
AD-PP-BB-48	48 port Blank Patch Panel	5.4" 19"

110 Patch Panels

◎ **Basic Features:**

☆ Being UL approved, the panels provide optimum performance, exceeding TIA/EIA 568-A & ISO/IEC 11801 requirement.

☆ Made of UL94V-0 high-impact and fire retardant ABS material.

☆ Insertion Life Cycle: 500 cycles (minimum)

☆ Available with/without legs on the block base. Panels without leg are suitable for mounting in the cabinets. Patch panels with legs are suitable for mounting on the wall.

☆ Available in 32, 50, 64, 100, 200, 300 pairs for selection.

☆ Accept 22-26 AWG (0.4mm-0.64mm) solid or stranded cable.

☆ Available in Cat 5e and Cat 6 options for selection.

☆ Come with wire management and cover for selection.

☆ Block base and wiring connectors can be ordered separately for maximum flexibility.

☆ Fit for connection between patch cords and consolidation points.

☆ Connecting blocks are 110 IDC type phosphor bronze termination.

110 Patch Panel Without Legs

◎ **Product Highlights:**

☆ Working in harmony with 110 wiring connectors, the Cat5e patch panels can be component and tested with significant margin up to 155 MHz and Cat 6 products can be component and channel tested with significant margin up to 250 MHz.

☆ 360 degree pair isolation enhances near-end crosstalk performance.

☆ The conductors on the 110 patch panel can be easily stripped during termination to save installation time.

☆ Come with wire management bars to secure the cables in place for ease of termination.

☆ Termination can be done easily with special tool.

110 Patch Panel With Legs

110 Wiring Connectors

◎ **Basic Features:**

☆ 4 and 5 pair 110 connectors available.

☆ Available in Cat5e and Cat 6 options.

☆ Contacts are plated with 2μm silver.

◎ **Technical Parameters:**

☆ Minimum Insertion Life Cycles: 1,000 cycles

☆ Operating Temperature: 0℃ ~ +60℃

☆ Storage Temperature: - 40℃ ~ +60℃

☆ Maximum Current Rating: 0.1Ω

☆ Maximum Direct Resistance Unbalance: 5 MΩ

4 Pair Wiring Connector

◎ **Product Highlights:**

☆ Cat5e and Cat 6 connectors provide optimum performance for NEXT in support of 10G Ethernet application.

☆ Each panel comes with colored designation labels and independent pair separator to ensure easy plug and play installation.

☆ Can be marked with color designation label to identify the pair configuration on each connector.

☆ Accept both 110 and Krone type termination.

☆ Connectors are stackable for space saving.

☆ Easy insertion for ease of installation.

5 Pair Wiring Connector

110 Cross Connect System   **36**
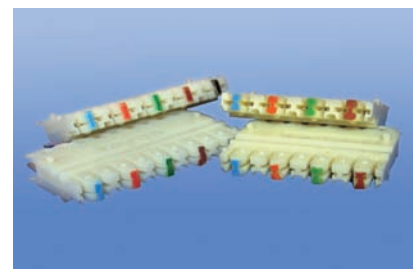
110 Backplanes

◎ Basic Features:

☆ Made of fine steel, not easily damaged by scratching.
☆ Designed for 110 system, suitable for data patch panels & cable management panels.
☆ 1U backplane fits for fixing the cable management panels in the cabinet; 2U backplane fits for fixing patch panels in the cabinet.

◎ Product Highlights:

☆ Light & durable.
☆ Specially designed for cable routing.

◎ Ordering Information:

Part No.	Description
AD-110C5E-WBP-200-2U	CAT5e 200 Pairs 110 Wiring Block w/o Legs (Panel Type in 2U)
AD-110C5E-WBP-100-1U	CAT5e 100 Pairs 110 Wiring Block w/o Legs (Panel Type in 1U)
AD-110C5E-WB-300	CAT5e 300 Pairs 110 Wiring Block w/o Legs
AD-110C5E-WB-100	CAT5e 100 Pairs 110 Wiring Block w/o Legs
AD-110C5E-WB-50	CAT5e 50 Pairs 110 Wiring Block w/o Legs
AD-110C5E-WB-300L	CAT5e 300 Pairs 110 Wiring Block with Legs
AD-110C5E-WB-100L	CAT5e 100 Pairs 110 Wiring Block with Legs
AD-110C5E-WB-50L	CAT5e 50 Pairs 110 Wiring Block with Legs
AD-110C5E-C5	CAT5e 5 pair Wiring Connector
AD-110C5E-C4	CAT5e 4 pair Wiring Connector
AD-110C6-WB-32	CAT6 32 Pairs 110 Wiring Block w/o Legs
AD-110C6-WB-48	CAT6 48 Pairs110 Wiring Block w/o Legs
AD-110C6-WB-64	CAT6 64 Pairs110 Wiring Block w/o Legs
AD-110C6-WB-96	CAT6 96 Pairs 110 Wiring Block w/o Legs
AD-110C6-WB-32L	CAT6 32 Pairs 110 Wiring Block with Legs
AD-110C6-WB-48L	CAT6 48 Pairs 110 Wiring Block with Legs
AD-110C6-WB-64L	CAT6 64 Pairs 110 Wiring Block with Legs
AD-110C6-WB-96L	CAT6 96 Pairs 110 Wiring Block with Legs
AD-110C6-C4	CAT6 4 pair Wiring Connector
AD-110LH	Designation Label holder
AD-110DL	Designation Label
AD-110-BB-1U	1U Backplane for Patch Panel/Cable Management Panel
AD-110-BB-2U	2U Backplane for Patch Panel/Cable Management Panel

1U Cable Management Panel
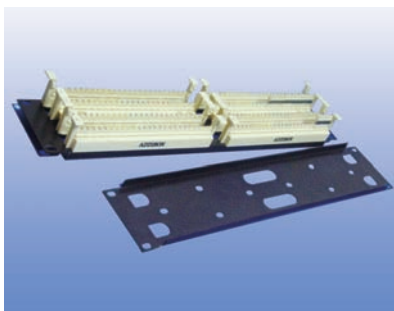
CAT5e 100 Pairs 110 Wiring Block w/o Legs
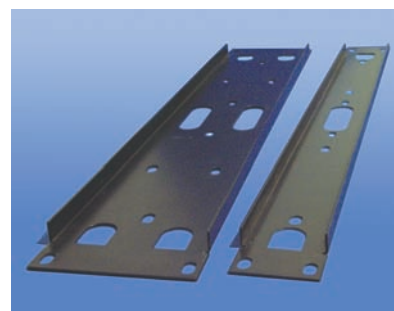
1U/2U 110 Patch Panel

Cable Management Panels

◎ Basic Features:

☆ Manage cables at the front and rear of racks for managing cable installations in an extremely neat appearance.
☆ Maintain cable bending radius.
☆ Available in both 1U and 2U options.
☆ Fit for data patch panels & 110 patch panels.
☆ Metal and plastic types for selection.
☆ Normal & duct types for selection.
☆ Large capacity duct for managing cables quickly.
☆ Mounting to standard rackmount 19" racks.
☆ Manage patch cords, providing appropriate route for the horizontal or backbone wiring and patch cords.

◎ Product Highlights:

☆ Each cable management panel can work independently, not interfering with other cable management panels.
☆ Provide cable management at the rear of rack, suitable for different cable installation requirement. Cables can be managed quickly at the rear part, thus providing effective cable management in a compact environment.
☆ Metal design enhances the product durability.
☆ The special routing design of the panel can maintain the bending radius of the cables effectively.

◎ Ordering Information:

Part No.	Description	Dimensions	
AD-RP-M-FR-1U	1U Cable Management Panel (Metal Type) with rings at the front and rear	1.8"	19"
AD-RP-M-F-1U	1U Cable Management Panel (Metal Type) with rings at the front	1.8"	19"
AD-RP-M-FR-2U	2U Cable Management Panel (Metal Type) with rings at the front and rear	3.6"	19"
AD-RP-M-F-2U	2U Cable Management Panel (Metal Type) with rings at the front	3.6"	19"
AD-DP-M-FR-1U	1U Duct Panel (Metal Type) with ducts at the front and rear	1.8"	19"
AD-DP-M-F-1U	1U Duct Panel (Metal Type) with 1 duct at the front	1.8"	19"
AD-DP-M-FR-2U	2U Duct Panel (Metal Type) with ducts at the front and rear	3.6"	19"
AD-DP-M-F-2U	2U Duct Panel (Metal Type) with 1 duct at the front	3.6"	19"
AD-110WM	110 Cable Management Panel without legs	3.6"	19"
AD-110-WM-L	110 Cable Management Panel with legs	3.6"	19"
AD-110-WM-1U	1U 110 Cable Management Panel without legs	1.8"	19"

1U Cable Management Panel   Duct Type Cable Management Panel   110 Cable Management Panel
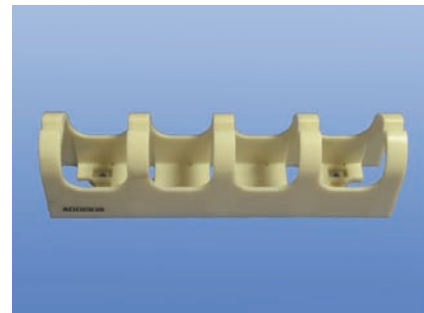
Data Patch Cords

◎ **Basic Features:**

☆ Using 24, 26AWG 4 pairs UTP, FTP, STP patch cables.
☆ Cord Length: 1m to 15m for selection.
☆ Outer Jacket: PVC/FRPVC/LSZH.
☆ Two ends terminated with 50μ" gold plated RJ 45 plug by moulding in one motion.
☆ Pin assignment for RJ 45 plug follows the T568B wiring scheme.
☆ Being UL approved, the cords are compliant with TIA/EIA 568B, ISO/IEC-11801 Cat 5e/Cat 6 Standard.
☆ Wide range of cord colors for selection for meeting different color coding requirement, in compliant with EIA/TIA 606 standard. Cord colors: Yellow, Blue, Green, White, Orange, Purple, Red, Grey.
☆ Used for interconnection between patch panels and data jacks.

◎ **Technical Parameters:**

☆ Compatible with RJ45 plug.
☆ Impedance: 100Ω   15%
☆ Diameter over conductor: 0.18mm
☆ Overall Diameter: 5.1mm (UTP Cat5e); 5.4mm (FTP Cat5e);
                                   6.0mm (UTP Cat6); 6.5mm (FTP/STP Cat6)
☆ Number of Pairs: 4 prs
☆ Minimum Insertion Cycle: 1000 cycles
☆ Minimum Plug Force: 30 lb
☆ Operating Temperature: -20℃ ~ +60℃

◎ **Product Highlights:**

☆ Every patch cords are strictly tested for NEXT and return loss, complying to TIA/EIA 568 & ISO/IEC 11801 component standard. To ensure component compliancy, each patch cord will be individually tested with Fluke DSP-PCI patch cord adaptor for component testing.
☆ Contacts feature gold plating, complying with FCC part 68 F to achieve longer product life cycle.
☆ Twists are maintained within 1/2" (12.7mm) for superior NEXT performance. 37mm long boots are used to ensure the best bending radius and which are critical for achieving the best return loss performance.
☆ Durable plugs provide good resistance to corrosion, extreme temperature and air contaminants.
☆ Innovative 360 degree crimp can provide excellent strain relief and prevent the cord from pair deforming.
☆ Cat 6 patch cords are backward compatible with Cat5e and lower class products.
☆ Using stranded patch cable for better flexibility in accordance with EIA/TIA 606 standard.
☆ The RJ45 plugs and the cables are terminated with PVC injection moulding to prevent the plug and the plating parts to get oxidized.

Cat 5e UTP Patch Cord

Cat 5e FTP Patch Cord

Cat 6 UTP Patch Cord

Cat 6 FTP Patch Cord

◎ Ordering Information:

Part No.	Description
AD-CAT5EUTP4PM001CM26A-XX	CAT 5e UTP, 1 Meter (26 AWG Stranded)
AD-CAT5EUTP4PM003CM26A-XX	CAT 5e UTP, 3 Meter (26 AWG Stranded)
AD-CAT5EUTP4PM005CM26A-XX	CAT 5e UTP, 5 Meter (26 AWG Stranded)
AD-CAT5EFTP4PM001CM26A-XX	CAT 5e FTP, 1 Meter (26 AWG Stranded)
AD-CAT5EFTP4PM003CM26A-XX	CAT 5e FTP, 3 Meter (26 AWG Stranded)
AD-CAT5EFTP4PM005CM26A-XX	CAT 5e FTP, 5 Meter (26 AWG Stranded)
AD-CAT6UTP4PM001CM26A-XX	CAT 6 UTP, 1 Meter (26 AWG Stranded)
AD-CAT6UTP4PM003CM26A-XX	CAT 6 UTP, 3 Meter (26 AWG Stranded)
AD-CAT6UTP4PM005CM26A-XX	CAT 6 UTP, 5 Meter (26 AWG Stranded)
AD-CAT6AUTP4PM001CM24A-XX	CAT 6A UTP, 1 Meter (24 AWG Stranded)
AD-CAT6AUTP4PM003CM24A-XX	CAT 6A UTP, 3 Meter (24 AWG Stranded)
AD-CAT6AUTP4PM005CM24A-XX	CAT 6A UTP, 5 Meter (24 AWG Stranded)
AD-CAT6FTP4PM001CM26A-XX	CAT 6 FTP, 1 Meter (26 AWG Stranded)
AD-CAT6FTP4PM003CM26A-XX	CAT 6 FTP, 3 Meter (26 AWG Stranded)
AD-CAT6FTP4PM005CM26A-XX	CAT 6 FTP, 5 Meter (26 AWG Stranded)
AD-CAT6ASTP4PM001CM27A-XX	CAT 6A STP, 1 Meter (27 AWG Stranded)
AD-CAT6ASTP4PM003CM27A-XX	CAT 6A STP, 3 Meter (27 AWG Stranded)
AD-CAT6ASTP4PM005CM27A-XX	CAT 6A STP, 5 Meter (27 AWG Stranded)

P.S.: Patch cord of 24, 26, 27AWG are available according to customer's requirements.

◎ Ordering Options:

AD-AAAAA-BBB-CCC-DEEE-FFF-GG-XX

AAAAA: Cable Standard

CAT3, CAT5, CAT5e, CAT6, CAT6A

BBB: Cable Type Family

UTP = Unscreened Cable; FTP = Overall Screened Cable; STP= Individually Screened Cable

CCC: No of Cable Pairs

4P= 4 Pairs; 25P= 25 Pairs

DEEE: Length

F003=3 Feet; F005 =5 Feet; F007 = 7 Feet

M001=1 Meter; M002 =2 Meter; M003 = 3 Meter

*FFF**: Fire Performance Rating

CM=Normal PVC, CM grade; CMR= FRPVC, CMR Riser Grade; CMP=FEP, CMP Plenum Grade; FR=FRPVC, to IEC 60332-1; LH=LSZH grade, to IEC60754-1 & IEC 61034 P1/2

GG: Cable Gauge Size

24A = 24 AWG; 26A = 26 AWG

XX: Jacket Color

01=Yellow; 02=Blue; 03=Green 04=White; 05=Orange; 06=Purple; 07=Red; 08=Grey
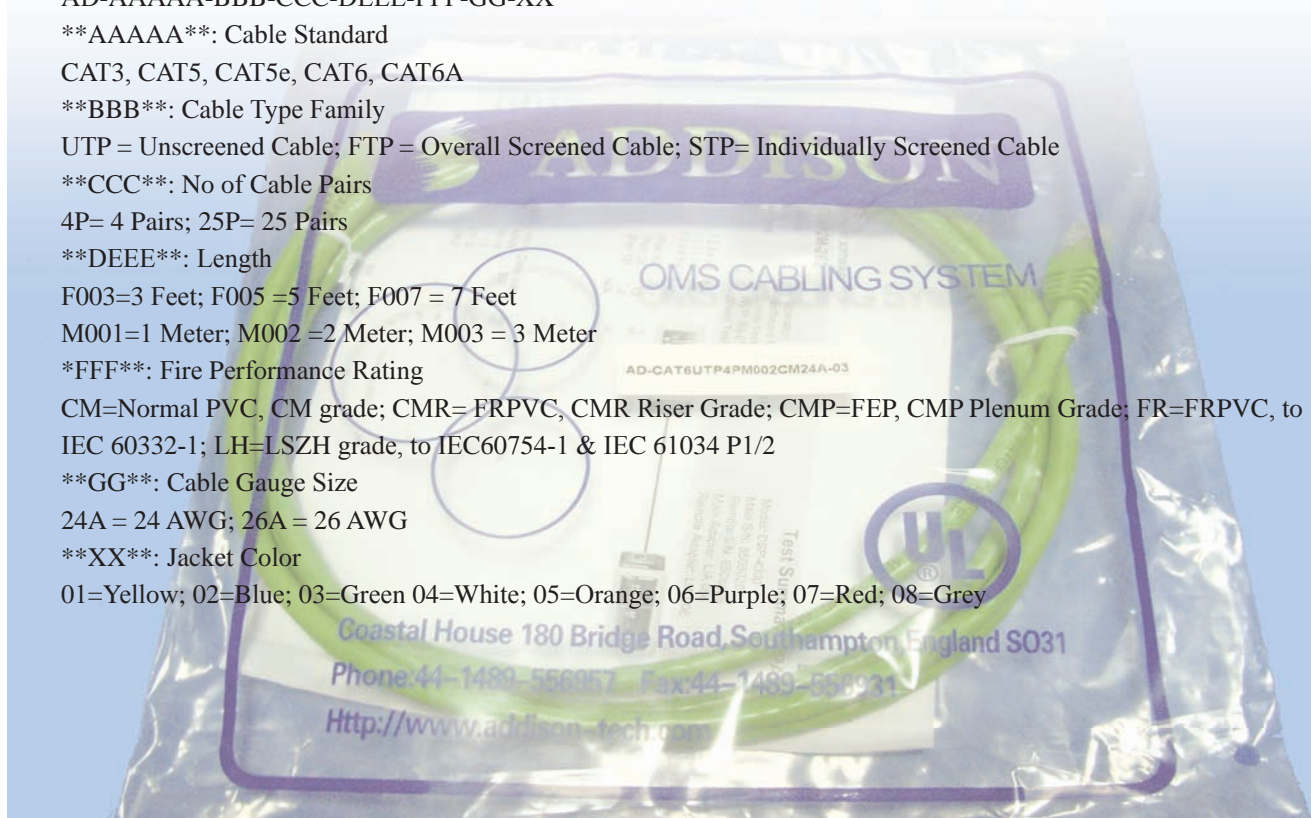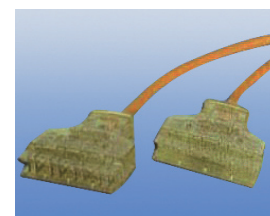
Data Patch Cords

110 Patch Cords

◎Basic Features:

☆ Using stranded 24/26 AWG patch cables for cord assembly.
☆ Cord length available in 1m to 15m for selection.
☆ Connector Types: 110 connectors or RJ45 8 port plugs.
☆ One end terminated with 50μ"gold plated RJ 45 plug and another end terminated with 110 connector.
☆ Outer Jacket: PVC, FRPVC, LSZH.
☆ Applicable Standards: ANSI/TIA/EIA-568B , ISO/IEC 11801Cat5e/Cat6 Standard.
☆ Cord Colors: Yellow, Blue, Green, White, Orange, Purple, Red, Grey.
☆ Used to connect the network card to the hub or switch.
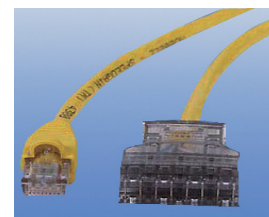
Cat 5e 110 to RJ45 Patch Cord

◎ Technical Parameters:

☆ Can accommodate RJ45 jacks.
☆ Impedance: 100Ω   15%
☆ Number of Termination pairs: 1- 4 Pairs
☆ Minimum Insertion Life Cycle: 1,000 cycles
☆ Minimum Plug Retention Force: 30 lbs

Cat5e 110 to 110 Patch Cord

◎ Product Highlights:

☆ Every patch cord is individually tested for NEXT and return loss, complying to TIA/EIA-568B, ISO/IEC 11801 standard for component testing.
☆ With a patented technology, all twists are maintained within 1/2", improving the NEXT value to a great extent.
☆ Durable jack design features to be corrosion resistant, heat resistant and not to be easily contaminated.
☆ Using stranded patch cables for higher flexibility and better bending radius, complying to EIA/TIA 606 standard.

◎ Ordering Information:

Part No.	Description
AD-CAT5EUTP4PM001CM26A-XX-1A-4P	CAT 5e UTP 4 Pairs, 1 Meter, 110 to RJ45 (26 AWG Stranded)
AD-CAT5EUTP4PM003CM26A-XX-1A-4P	CAT 5e UTP 4 Pairs, 3 Meter, 110 to RJ45 (26 AWG Stranded)
AD-CAT5EUTP4PM005CM26A-XX-1A-4P	CAT 5e UTP 4 Pairs, 5 Meter, 110 to RJ45 (26 AWG Stranded)
AD-CAT5EUTP4PM001CM26A-XX-11-4P	CAT 5e UTP 4 Pairs, 1 Meter, 110 to 110 (26 AWG Stranded)
AD-CAT5EUTP4PM003CM26A-XX-11-4P	CAT 5e UTP 4 Pairs, 3 Meter, 110 to 110 (26 AWG Stranded)
AD-CAT5EUTP4PM005CM26A-XX-11-4P	CAT 5e UTP 4 Pairs, 5 Meter, 110 to 110 (26 AWG Stranded)
AD-CAT6UTP4PM001CM26A-XX-1A-4P	CAT 6 UTP 4 Pairs, 1 Meter, 110 to RJ45 (26 AWG Stranded)
AD-CAT6UTP4PM003CM26A-XX-1A-4P	CAT 6 UTP 4 Pairs, 3 Meter, 110 to RJ45 (26 AWG Stranded)
AD-CAT6UTP4PM005CM26A-XX-1A-4P	CAT 6 UTP 4 Pairs, 5 Meter, 110 to RJ45 (26 AWG Stranded)
AD-CAT6UTP4PM001CM26A-XX-11-4P	CAT 6 UTP 4 Pairs, 1 Meter, 110 to 110 (26 AWG Stranded)
AD-CAT6UTP4PM003CM26A-XX-11-4P	CAT 6 UTP 4 Pairs, 3 Meter, 110 to 110 (26 AWG Stranded)
AD-CAT6UTP4PM005CM26A-XX-11-4P	CAT 6 UTP 4 Pairs, 5 Meter, 110 to 110 (26 AWG Stranded)

P.S.: Patch cord of 22, 23, 24, 26, 27AWG are available according to customers requirements.

◎ Ordering Options:

AD-AAAAA-BBB-CCC-D-EEE-FFF-GG-HH-II-J
Ordering Code is the same as that for data patch cords except for the inclusion of the connector types and number of termination pairs.
II: Connector Types
1A=110 to RJ45 (T568A); 1B=110 to RJ45 (T568B);11=110 to 110
J: Number of termination pairs
1P=1pr; 2P=2pr; 3P=3pr; 4P=4pr

Modular Plugs

◎ Basic Features:

☆ Fit for both stranded or solid cable for flexibility.

☆ Eight-conductor modular plug works with round cable.

☆ Used with standard termination tools.

☆ Load bar eases wire insertion while maintaining 1/2" twist requirements.

☆ Clear plastic cover keeps the conductor colors and positions visible for termination.
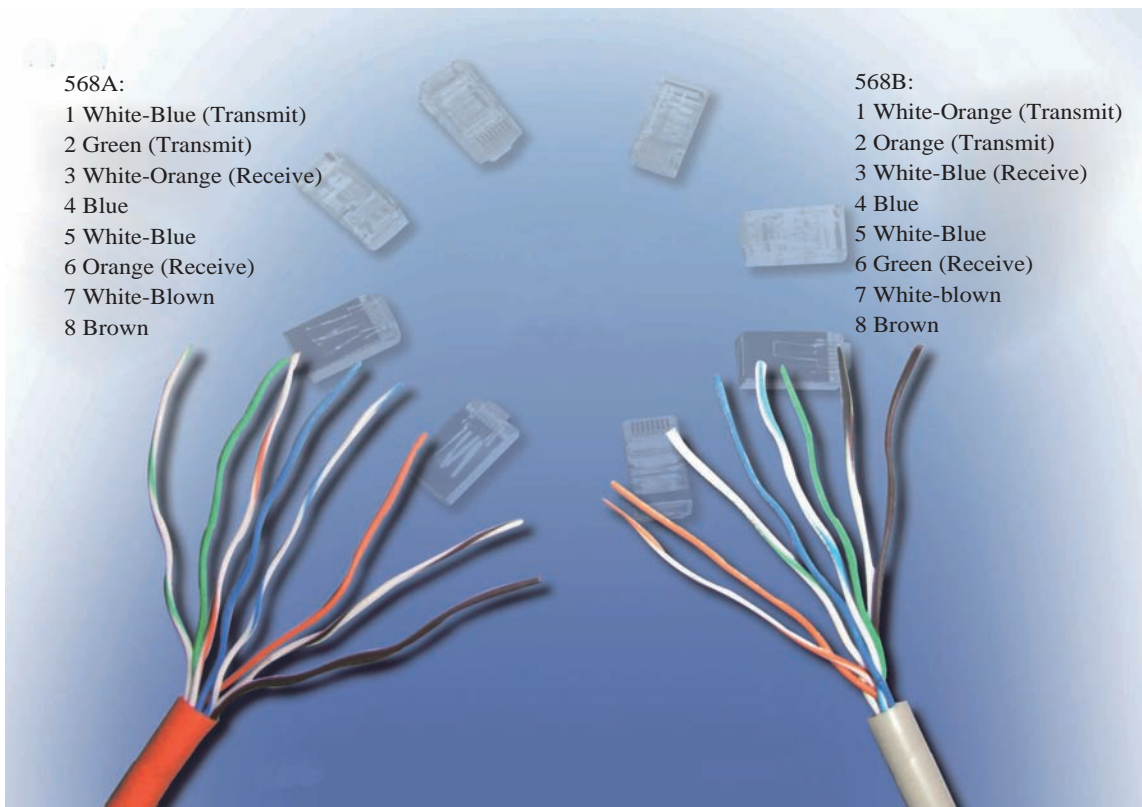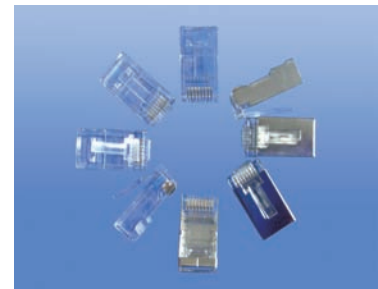
◎ Ordering Information:

Part No.	Description
AD-MP-RJ11-44-AB	4P4 C RJ-11 Connector
AD-MP-RJ12-64-AB	6P4C RJ-12 Connector
AD-MP-RJ12-66-AB	6P6C RJ-12 Connector
AD-MP-RJ45-88-AB	8P8C RJ-45 Connector
AD-MP-RJ45-88S-AB	8P8C Shielded RJ-45 Connector

A: Gold-plating Options
3=3μ"; 6=6μ"; 15=15μ"; 30=30μ"; 50=50μ"
B: Connector Options
N= Normal; S= Short

568A:
1 White-Blue (Transmit)
2 Green (Transmit)
3 White-Orange (Receive)
4 Blue
5 White-Blue
6 Orange (Receive)
7 White-Blown
8 Brown

568B:
1 White-Orange (Transmit)
2 Orange (Transmit)
3 White-Blue (Receive)
4 Blue
5 White-Blue
6 Green (Receive)
7 White-blown
8 Brown

Fiber Patch Cords

◎ **Basic Features:**

☆ Simplex or duplex fibers for selection.
☆ Different fiber connectors for selection.
☆ Ferrule Material: Ceramic, stainless steel, polymer
☆ Outer Jacket: PVC, FRPVC, LSZH
☆ Connector Types: ST/SC/FC/SMA905 or 906/D4/BICONIC/FDDI/MTRJ/LC/E2000/ DIN/EC
☆ FC, SC, ST, LC, MU connectors offered in either PC, UPC, APC polishing.
☆ Complying to applicables standards such as TIA/EIA-568 and IEC 874-1.
☆ Used for Ethernet, fiber optic system, video transmission, CATV and cable TV etc.

◎ **Technical Parameters:**

☆ Cladding Diameter: 125μm
☆ Core Diameter: 50/62.5μm (multimode); 9/125μm (single-mode)
☆ Tensile Strength: 15Kgf (except for 0.9mm)
☆ Diameter: 3mm/2mm
☆ Minimum Bending Radius: 10 x Overall Diameter
☆ Working Temperature: -40℃ ~ +75℃
☆ Storage Temperature: -50℃ ~ +85℃
☆ Minimum Insertion Life Cycles: 1000 times
☆ Single mode fiber patch cord (in general): Insertion Loss ≤ 0.3 dB (APC/UPC);
   Return Loss ≥ 50dB (UPC); ≥ 60dB (APC)
☆ MTRJ single mode fiber patch cord: Insertion loss ≤ 0.5 dB; Return Loss ≥ 35 dB
☆ Multimode fiber patch cord (in general):
   Insertion Loss ≤ 0.3 dB (PC); ≤ 0.3 dB (UPC); ≤ 0.3 dB (APC)
   Return Loss ≥ 35 dB (PC); ≥ 50 dB (UPC); ≥ 60 dB (APC)
☆ MTRJ multimode fiber patch cord: Insertion loss ≤ 0.5 dB; Return Loss ≥ 20 dB
☆ Change on insertion loss for mechanical characteristics:
   Interchangeability: 0.2dB
   Repeatability (Insertion: 1,000 times): 0.2dB
   Anti pulling load: 0.2dB (10Kg tension/3.0mm fiber)
   Anti Vibration: 0.2dB (Vibration: 10-58Hz; Amplitude: 1.5mm, 10Hz/min, 2 hrs)
☆ Change on insertion loss for environmental characteristics:
   Temperature Cycle: 0.2dB (-40℃ ~ +80℃ 5 cycles)
   High Temperature Test: 0.2dB (High Temperature: 85℃,100 hrs)
   Low Temperature Test: 0.2dB (Low Temperature: -40℃, 100 hrs)
   Humidity Test: 0.2dB (65℃, 93% relative humidity, 100 hrs)

◎ **Product Highlights:**

☆ Using extra high precision ceramic ferrule with small concentricity error and core diameter, better insertion loss and return loss can be achieved for optimized transmission performance.
☆ All fiber surface parameters such as the apex offset, fiber height and radius of curvature comply to IEC standard.
☆ Besides attenuation and back reflection testing, cords are also checked by interferometer for fiber surface parameters, including radius of curvature, apex offset and fiber heights for different FC, ST, SC, LC and MU connector types.
☆ Simplex, duplex and fan-outs can be offered.
☆ Different jacket such as PVC and LSOH grade available for selection.
☆ Low insertion loss and high return loss, with excellent interchangeability and repeatability.
☆ Durability, damp-proofing, resistant to coupling stress, high pull tension and adaptation to different harsh environment such as dampness, extreme temperature, impact and vibration in accordance to ANSI/TIA and ISO/IEC standard.
☆ Environmentally stable, meeting Telcordia requirement.

ST, SC, FC (PC/UPC/APC) Fiber Patch Cord

◎ **Basic Features:**

☆ PC, UPC or APC polishing for selection.

☆ Low insertion loss and high return loss.

☆ The SC connectors for SC-SC fiber patch cords are of push pull design, being fit for 3.0mm fiber patch cords.

☆ The ST connectors for ST-ST fiber patch cords are of metal ring design, being fit for 3.0mm fiber patch cords.

☆ The ST connectors of LC-ST fiber patch cords are of metal ring design, being fit for 2.0mm fiber patch cords.

☆ The SC connectors of LC-SC fiber patch cords are of push pull design, being fit for 2.0mm fiber patch cords.

☆ Significant margin over ANSI/TIA/EIA 568 standard.

☆ Fiber Surface Parameters

Radius of Curvature: 5~12cm (APC); 7~25cm (PC)

Apex Offset: $\leq$ 100μm

Fiber Height: +100 ~ -100 nm

Deviation Angle: 8   0.3

◎ **Technical Parameters:**

	PC		UPC	APC
	Simplex	Duplex		
Insertion Loss	≤0.3dB		≤0.3dB	≤0.3dB
Return Loss	≥45dB	≥35dB	≥50dB	≥60dB
Working Temperature	-20℃~70℃		-20℃~70℃	-20℃~70℃
Storage Temperature	-25℃~80℃		-25℃~80℃	-25℃~80℃
Maximum change in Insertion Loss with repeated insertion	0.1dB		0.1dB	0.1dB
Maximum Insertion /Withdrawal	≥1000 times		≥1000 times	≥1000 times

ST-ST Duplex Patch Cord

SC-SC Duplex Patch Cord
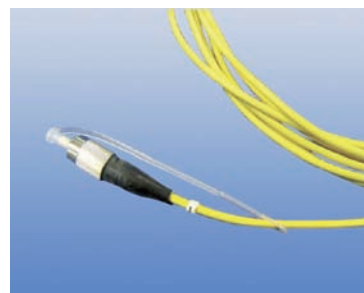
FC-FC Simplex Patch Cord

MTRJ、MU、LC Fiber Patch Cords

◎ Basic Features:

☆ Push-pull connection, fast and reliable.
☆ Low insertion loss and high return loss.
☆ Being compact and light weight, it can provide high-density installation.
☆ 1.25um ceramic ferrule sfis for both single mode and multimode cables.
☆ MTRJ connector/adaptors are fit for duplex zip and round cords together with ribbon fiber cables.
☆ LC connector/adaptors are fit for simplex /duplex zip cords and MU connector /adaptor is fit for simplex zip cords.
☆ Used for different fiber optic system, fiber optic connector, CATV and testing equipment etc.

◎ Technical Parameters: (LC/MU)

	PC		UPC
	Simplex	Duplex	
Insertion Loss	≤0.4dB		≤0.4dB
Return Loss	≥45dB	≥35dB	≥50dB
Working Temperature	-20℃~70℃		-20℃~70℃
Storage Temperature	-25℃~80℃		-25℃~80℃
Maximum change in Insertion Loss with repeated insertion	0.1dB		0.1dB
Maximum Insertion /Withdrawal	≥1000 times		≥1000 times

LC Simplex Patch Cord

MU Simplex Patch Cord

◎ Electrical Specification Parameter: (MTRJ)

	PC		UPC
	Simplex	Duplex	
Insertion Loss	≤0.5dB		≤0.6dB
Return Loss	≥35dB	≥20dB	≥45dB
Working Temperature	-20℃~70℃		-20℃~70℃
Storage Temperature	-25℃~80℃		-55℃~85℃
Maximum change in Insertion Loss with repeated insertion	0.1dB		0.1dB
Maximum Insertion /Withdrawal	≥1000 times		≥1000 times

MTRJ Simplex Patch Cord

MTRJ Duplex Patch Cord

SMA、FDDI Fiber Patch Cords

◎ Basic Features:

☆ SMA connectors are interchangeable and come with good surface polishing.
☆ FDDI connectors are equipped with built-in identification labels.
☆ FDDI connectors meet ANSI3T95 FDDI PMD standard.
☆ SMA connectors are suitable for use in LAN and low speed system test.
☆ FDDI connectors are suitable for duplex system, FDD backbone network and IEEE802.4 Token Bus.

◎ Technical Parameters: (SMA, FDDI)

	SMA	FDDI
Insertion Loss	≤0.3dB	≤0.3dB
Return Loss	≥35dB	≥45dB
Working Temperature	-40℃~80℃	-40℃~80℃
Storage Temperature	-55℃~85℃	-55℃~85℃
Maximum change in Insertion Loss with repeated insertion	0.2dB	0.2dB
Maximum Insertion /Withdrawal	≥1000 times	≥1000 times

SMA Simplex Patch Cord

FDDI Duplex Patch Cord

◎ Ordering Information:

Part No.	Description
AD-ST/ST-D9M001CON-II-JJ	Single Mode ST/ST-ST/ST Duplex 1 Meter PVC Fiber Patch Cord
AD-ST/ST-D9M003CON-II-JJ	Single Mode ST/ST-ST/ST Duplex 3 Meter PVC Fiber Patch Cord
AD-ST/ST-S9M001CON-II-JJ	Single Mode ST/ST Simplex 1 Meter PVC Fiber Patch Cord
AD-ST/ST-S9M003CON-II-JJ	Single Mode ST/ST Simplex 3 Meter PVC Fiber Patch Cord
AD-SC/SC-D6M001CON-II-JJ	Multimode 62.5/125 μm SC/SC-SC/SC Duplex 1 Meter PVC Fiber Patch Cord
AD-SC/SC-D6M003CON-II-JJ	Multimode 62.5/125 μm SC/SC-SC/SC Duplex 3 Meter PVC Fiber Patch Cord
AD-SC/SC-S6M001CON-II-JJ	Multimode 62.5/125 μm SC-SC Simplex 1 Meter PVC Fiber Patch Cord
AD-SC/SC-S6M003CON-II-JJ	Multimode 62.5/125 μm SC-SC Simplex 3 Meter PVC Fiber Patch Cord
AD-ST/ST-D5M001CON-II-JJ	Multimode 50/125 μm ST/ST-ST/ST Duplex 1 Meter PVC Fiber Patch Cord
AD-ST/ST-D5M003CON-II-JJ	Multimode 50/125 μm ST/ST-ST/ST Duplex 3 Meter , PVC Fiber Patch Cord
AD-ST/ST-S5M001CON-II-JJ	Multimode 50/125 μm ST-ST Simplex 1 Meter PVC Fiber Patch Cord
AD-ST/ST-S5M003CON-II-JJ	Multimode 50/125 μm ST-ST Simplex 3 Meter PVC Fiber Patch Cord
AD-ST/ST-D4M001CON-II-JJ	OM3 Multimode 50/125 μm ST/ST-ST/ST Duplex 1 Meter PVC Fiber Patch Cord
AD-ST/ST-D4M003CON-II-JJ	OM3 Multimode 50/125 μm ST/ST-ST/ST Duplex 3 Meter PVC Fiber Patch Cord
AD-ST/ST-S4M001CON-II-JJ	OM3 Multimode 50/125 μm ST-ST Simplex 1 Meter PVC Fiber Patch Cord
AD-ST/ST-S4M003CON-II-JJ	OM3 Multimode 50/125 μm ST-ST Simplex 3 Meter PVC Fiber Patch Cord
AD-SC/SC-D4M001CON-II-JJ	OM3 Multimode 50/125 μm SC/SC-SC/SC Duplex 1 Meter PVC Fiber Patch Cord
AD-SC/SC-D4M003CON-II-JJ	OM3 Multimode 50/125 μm SC/SC-SC/SC Duplex 3 Meter PVC Fiber Patch Cord
AD-SC/SC-S4M001CON-II-JJ	OM3 Multimode 50/125 μm SC-SC Simplex 1 Meter PVC Fiber Patch Cord
AD-SC/SC-S4M003CON-II-JJ	OM3 Multimode 50/125 μm SC-SC Simplex 3 Meter PVC Fiber Patch Cord
AD-ST-S4M001CON-II-JJ	OM3 Multimode 50/125 μm ST, Simplex 1 Meter PVC Pigtail
AD-SC-S4M001CON-II-JJ	OM3 Multimode 50/125 μm SC Simplex 1 Meter PVC Pigtail
AD-ST-S9M001CON-II-JJ	Single Mode ST Simplex 1 Meter PVC Pigtail
AD-SC-S9M001CON-II-JJ	Single Mode SC Simplex 1 Meter PVC Pigtail
AD-ST-S6M001CON-II-JJ	Multimode 62.5/125 μm ST Simplex 1 Meter PVC Pigtail
AD-SC-S6M001CON-II-JJ	Multimode 62.5/125 μm SC Simplex 1 Meter PVC Pigtail
AD-ST-S5M001CON-II-JJ	Multimode 50/125 μm ST Simplex 1 Meter PVC Pigtail
AD-SC-S5M001CON-II-JJ	Multimode 50/125 μm SC Simplex 1 Meter PVC Pigtail

◎ Ordering Code:

AD-AB-C-D-EFFF-G-HH-II-JJ
ABLeft/Right Connector Types
ST=ST; SC=SC; FC=FC; SMA905=SMA905; SMA906=SMA906; FD=FDDI; MT=MTRJ; LC=LC (FC, SC, ST, LC, MU Connector: PC, UPC, APC for selection)
CCable Type Family
S=Simplex; D=Duplex Zip
DFiber Types
9=Single-mode 9/125μm; 6=Multimode 62 5/125 μm; 5=Multimode 50/125μm; 4=Multimode 50/125μm (OM3)
EFFFLength
F003 =3 Feet; F005 =5 Feet; F007 =7 Feet; M001 =1 Meter; M002 =2 Meter; M003 =3 meter
GFerrule Types
C=Ceramic; S= Stainless Steel; P= Polymer
HH Fire Performance Rating
ON = Normal PVC, OFN grade; OR = FRPVC, OFNR Riser Grade; OP=FEP, OFNP Plenum Grade; FR=FRPVC, to IEC 60332 -3C; LH= LSZH grade to IEC 60754-1, IEC 61034 P1/2
IIJacket colors
01-Yellow; 02-Blue; 03-Green; 04-White; 05-Orange; 06-Purple; 07-Red; 08-Grey
JJFiber Outer Diameter
09= Φ 0.9mm; 20= Φ 2.0mm; 30= Φ 3.0mm

Fiber Optic Adapters

◎ **Basic Features:**

☆ Low insertion Loss.
☆ Low back reflection.
☆ Compliant with JIS, IEC and Bellcore Standard.
☆ Excellent concentricity.
☆ Ease of installation.

◎ **Physical Properties:**

☆ Fiber Types: 3.0mm or 900µm tight buffer type
☆ Core Diameter: 62.5/125µm; 50/125µm, 9/125 µm

◎ **Electrical Properties:**

☆ High Durability: 0.2dB loss after 500 cycles.
☆ Insertion Loss: 0.15dB (Single mode); 0.2dB (Multimode)

◎ **Ordering Information:**

AD-FA-A-B-C-D

A: In/Out Connector Types
　　FC=FC/PC; MTM=MTRJ/Pin Type; SC/FC=SC-FC;
　　FCA=FC/APC; MTF=MTRJ/Hole Type; SC/LC=SC-LC;
　　SC=SC/PC; E2000=E2000; FD/ST=FDDI-ST;
　　SCA=SC/APC; FD=FDDI; ES/ST=ESCON-ST;
　　ST=ST; LC=LC; ES=ESCON

B: Sleeve Types
　　SC = Single mode Zirconia Sleeve
　　MC = Multimode Zirconia Sleeve
　　MB = Multimode Phosphor Bronze Sleeve

C: Cord Types
　　S= Simplex
　　M= Duplex

D: Housing Types
　　P=Plastic
　　MS=Metal Square Type (FC)
　　MD=Metal D Type (FC)
　　ML=Metal Thread Type (ST)

LC Type
FDDI Type
FC Type
ST Type
SC Type
ST Type
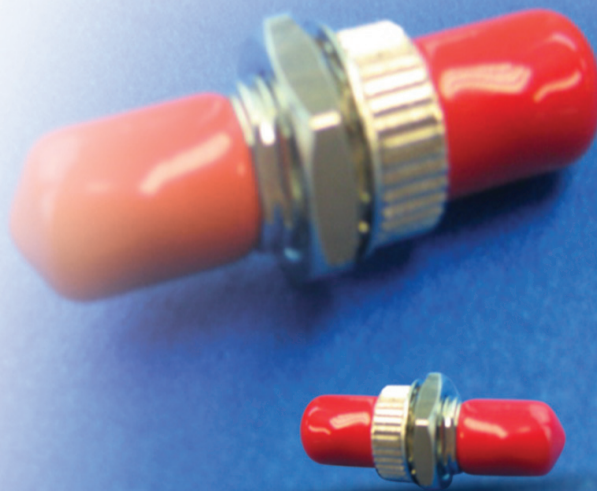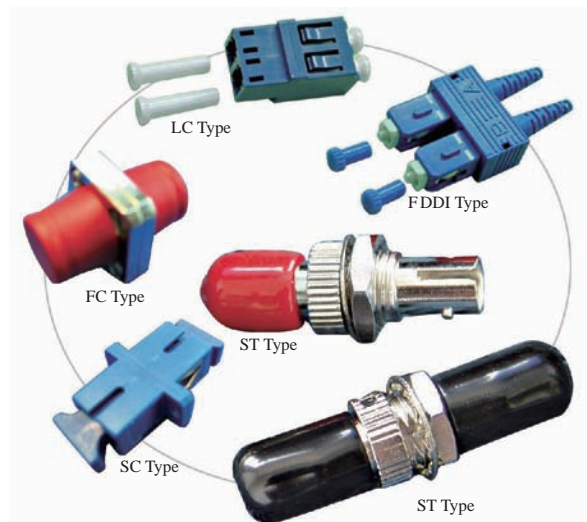
Fiber Optic Connectors

◎ Basic Features:

☆ 25μm zirconia ferrules with wide range of fiber optic connector sizes (125μm-128μm) for choice.
☆ Fit for single-mode or multimode fiber cables.
☆ Pre-radiused ferrules for fast polishing.
☆ Wide range of the boot colors and diameter for selection.
☆ APC version available for single mode connectors.
☆ Low insertion loss and high return loss.

◎ Physical Properties:

☆ Fiber Optic Connector Types: 3.0 mm jacketed or 900μm tight-buffered.
☆ Fiber Optic Connector Compatibility: 62.5/125μm and 50/125μm (Multimode); 9/125μm (Single-mode)

◎ Electrical Properties:

☆ Insertion Loss: ≤ 0.15dB (Single mode); ≤ 0.3dB (Multimode).
☆ Return Loss: ≥ 30dB (PC Polishing)
　　　　　　　 ≥ 40dB (SPC Polis hing)
　　　　　　　 ≥ 50dB (UPC Polishing)
　　　　　　　 ≥ 60dB (APC Polishing)

LC Type

ST Type

FC Type

MTRJ Type

SC Type
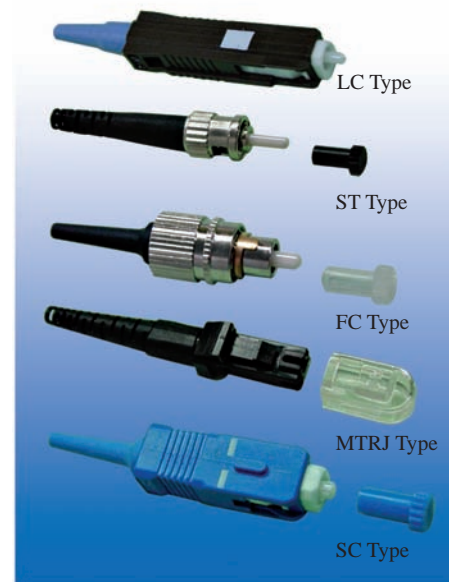
◎ Ordering Information:

AD-FC- A-B-C-D-E
A: Fiber Optic Connectors Types
　FC=FC/PC; ST=ST; E2000=E2000; SMA905=SMA905;
　FCA=FC/APC; LC=LC; FD=FDDI; SMA906=SMA906;
　SC=SC/PC; MTM=MTRJ/Male Type; MU=MU; D4=D4;
　SCA=SC/APC; MTF=MTRJ/ Female Type; ES=ESCON; DIN=DIN47256 (LSA)
B: Mode Types
　S= Single mode
　M= Multimode
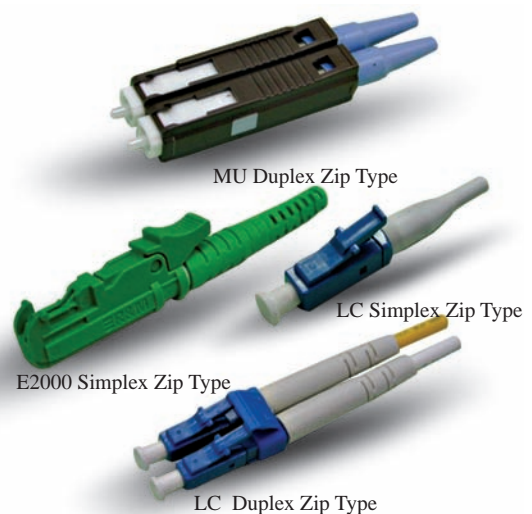C: Fiber Optic Connector Sizes
　125=125μm
　126=126μm
　127=127μm
　128=128μm
D: Housing Types
　S= One Piece Type
　D= Typical Type
E: Cable Boot Types
　09 = For 0.9 mm cable
　16 = For 1.6 mm cable
　18 = For 1.8 mm cable
　20 = For 2.0 mm cable
　24 = For 2.4 mm cable
　30 = For 3.0 mm cable

MU Duplex Zip Type

LC Simplex Zip Type

E2000 Simplex Zip Type

LC Duplex Zip Type

Wall Mount Fiber Patch Panels

◎ **Basic Features：**

☆ Available in beige or black colour.
☆ Available for mounting on wall directly.
☆ Available for 12, 16, 24 port terminations.
☆ Metal door with optional lock for security.
☆ Available for FC, SC, and ST adaptor panels.
☆ Compact design with two compartments in one box, one is for incoming fiber cables and pigtails for splicing, and the other is for patch cord terminations.
☆ Housing made of high-strength stainless steel.
☆ Protection standard: IP55, IP65, IP66 for selection.
☆ All cable holes sealed by rubber grommets for fiber protection.
☆ Reliable cable fixing, stripping, grounding and protection devices.
☆ Made of stainless steel for protection against oxidization.

◎ **Technical Parameters:**

☆ Working Temperature: -40℃ ~ +85℃
☆ Insulation Resistance (between the cabinet and the earthing device): >1000MΩ/500V(DC)
☆ Dielectric Strength (between the cabinet and the earthing device): on-puncture, no arc-over under 3000VDC/1min

◎ **Product Highlights:**

☆ Housing protected by double layer coating gives a shiny and elegant outlook.
☆ Metal door designed to be re-openable for ease of installation and maintenance.
☆ All the cable holes are sealed by dust proof rubber grommets which can be removed easily for fiber splicing.
☆ IP 55/56 rated housing features high tensile strength, weather and corrosion resistance, offering protection against accidental damage.
☆ All the corners of the panels are rounded off and the surfaces are treated with electrostatic spraying for more elegant appearance.
☆ The double layer heat insulating housing improve the heat preservation performance, avoiding water condensation on the surface.
☆ The metal door protected by waterproof lock and 3 point locking system provides a tight seal of the body.
☆ Suitable for ribbon and non ribbon fiber cables.
☆ Clear designation labels for the fiber route.

◎ **Ordering Information:**

Part No.	Description
AD-WFTB-12S	12 Port Wall Mount Fiber Patch Panel
AD-WFTB-24S	24 Port Wall Mount Fiber Patch Panel
AD-WFTB-48S	48 Port Wall Mount Fiber Patch Panel
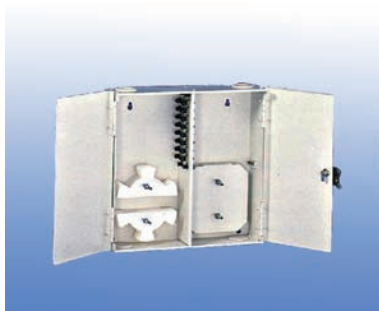
12 Port Wall Mount Fiber Patch Panel   24 Port Wall Mount Fiber Patch Panel

Rackmount Fiber Patch Panels

◎ **Basic Features:**

☆ One enclosure accommodates 12, 24 and 48 port terminations.

☆ Modular adaptor panels for ease of installation and maintenance.

☆ Available for FC, SC and ST adaptor panels.

☆ Slide out feature as an option.

☆ Fit for 19" Rack Cabinet.

☆ Cable holes sealed by rubber grommets.

◎ **Technical Parameters:**

☆ Working Temperature: -40℃ ~ +85℃

☆ Insulation Resistance: ≥ 1000 MΩ/500V(DC)

◎ **Product Highlights:**

☆ All the cable holes are sealed by dust proof rubber grommets which can be removed easily for fiber splicing.

☆ High density fiber management, accommodating up to 288 fibers in 4U space.

☆ Splicing tray equipped with inlet device at the front and rear part for ease of installation.

☆ Adjustable clamp ring fit for fixing the fiber patch cord and cables, reducing the tension caused by the use of splicing tray.

☆ Fiber panels are stackable to save space for future expansion.

☆ Fixing device provided for fixation of the cables for maintaining the bending radius of the cables.

☆ Splicing kits provided for direct fiber splicing inside the fiber panel.

◎ **Ordering Information:**

Part No.	Description
AD-RFTB-12-1U	12 Port 1U Rackmount Fiber Patch Panel
AD-RFTB-24-1U	24 Port 1U Rackmount Fiber Patch Panel
AD-RFTB-48-2U	48 Port 2U Rackmount Fiber Patch Panel
AD-RFTB-12S-1U	12 Port 1U Rackmount Fiber Patch Panel with Splicing
AD-RFTB-24S-1U	24 Port 1U Rackmount Fiber Patch Panel with Splicing
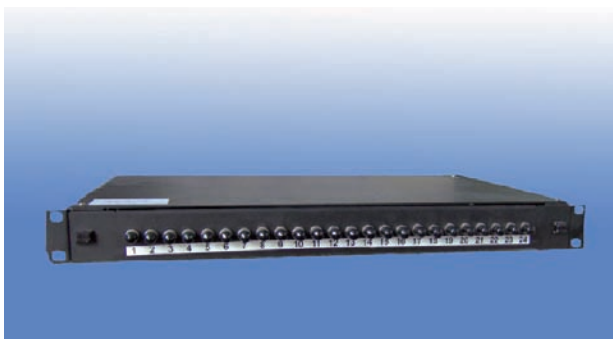
24 Port 1U Rackmount Fiber Patch Panel

12 Port 1U Rackmount Fiber Patch Panel With Splicing

5-Pair IDC Punchdown Tools

◎ **Basic Features:**

☆ Two ends equipped with blade.
☆ They can crimp and cut the wire in one cycle with built in wire cutter and stripper.
☆ Clear identification label on the tool for ease of positioning the wires during crimping.
☆ Their spring-loaded and adjustable impact features allow working with wires of various thickness. Bayonet-style blade mount allows blade to be changed quickly and easily.
☆ Manufactured from heavy-duty metal and strong engineering plastics.
☆ Main body is fabricated from copper whereas the grip is made of engineering plastics.

◎ **Product Highlights:**

☆ Push just once for five perfect twisted-pair termination.

IDC Punchdown Tools

◎ **Basic Features:**

☆ Fit for both keystone jacks and IDC faceplates.
☆ Terminate wire on both cable and cross-connect sides of 110 connecting blocks.
☆ Supplied with exchangeable blades.
☆ 110 and Krone types for selection.
☆ Fit for cross connecting between cables, 110 jacks and patch panels.
☆ Manufactured from heavy-duty metal and strong engineering plastics.
☆ Main body is fabricated from copper whereas the grip is made of engineering plastics.

◎ **Product Highlights:**

☆ Two ends are equipped with blade. It can crimp and cut the wire in one cycle with built in wire cutter and stripper.
☆ Clear identification labels on the tools for ease of positioning the wires during crimping.
☆ Come with texture plastic grip to avoid slipping.
☆ Its spring-loaded and adjustable impact feature allows working with wires of various thickness.
☆ Bayonet-style blade mount allows blades to be changed quickly and easily

Modular Crimping Tools

◎**Basic Features:**

☆ Fit for UTP/STP solid/stranded cables.
☆ Can terminate 4P, 6P, and 8P connectors.
☆ Manufactured from heavy-duty metal and the grip is made of engineering plastics.
☆ 8P plug with high carbon finishing.

◎**Product Highlights:**

☆ It can crimp and cut the wire in one motion.
☆ Modular holders made of light weight and durable Al-Zn alloy to ensure fast crimping.
☆ Suitable for solid and stranded cables.

Cable Strippers

◎ **Basic Features:**

☆ The cable strippers provide an easy method for stripping both coaxial and UTP cables.

☆ Fit for 3.5-9cm round or flat cables.

☆ V or U stripping method can be used to suit different jacket shape.

☆ Blade can be adjusted for Hi/Low impact force settings to suit different jacket thickness.

☆ Blade distance can be adjusted to suit different cable stripping requirement.

☆ The jacket of UTP cables can be extracted by just stripping in 3 to 6 circles.

◎ **Technical Parameters:**

☆ One replacement blade and one board are included for positioning the wires in a proper position.

☆ Come with blades for stripping coaxial cables.

☆ Interchangeable blades are suitable for both stranded/solid UTP/STP cables.

◎ **Product Highlights:**

☆ The jacket of UTP cable can be extracted by just stripping in 3 circles.

☆ Stripping of both the screen and the jacket for the STP cable can be done without damaging the conductors.

Part No.	Description
AD-DL-315DR	5 Pair Termination Tool
AD-TOL-110-IT-M	Metal Type 110 Punch Down Tool
AD-TOL-K-IT-M	Metal Type Krone Punch Down Tool
AD-TOL-110-ITB	Replacement Blade for 110 Type
AD-TOL-K-ITB	Replacement Blade for Krone Type
AD-DL-2068	Crimping Tool for 4 & 6 position RJ45/RJ11/RJ12 plug
AD-DL-2068R	Crimping Tool for 6 & 8 position (with ratchet) RJ45/RJ11/RJ12 Plug
AD-DL-3468	Crimping Tool for 4. 6 &8 position RJ45/RJ11/RJ12 Plug
AD-DL-5468R	Crimping Tool for 4. 6 & 8 position (with ratchet) RJ45/RJ11/RJ12 Plug
AD-AS-4864	Crimping Tool for 4. 6 & 8 position (with ratchet) RJ45/RJ11/RJ12 Plug
AD-TOL-110-UCS	UTP/STP Cable Stripper
AD-DL-501B	UTP/STP Cable Stripper (with blade)
AD-HT-223H	Fiber Cable Stripper
AD-HT-C151	Aramid Yarn Cutter
AD-DL-2068K	110 Punch Down Tool/Crimping Tool/UTP Cable Stripper Tool Set
AD-DL-3032K	Fiber Cable Stripper/Aramid Yarn Cutter Tool Set

Open Racks

◎ **Basic Features:**

☆ Attractive appearance.
☆ There are 3 types of open rack in sizes ranging form 28U to 46U.
☆ Maximum Load Capacity: 440lbs (200kg)
☆ Fabricated entirely from heavy steel for good stability.
☆ Base holes for Floor installation (A type) and base installation (B type).
☆ Side holes per each frame used for the passage of cables in the event of inter-connecting of open rack. 3 to 12 interconnecting holes per each frame for row inter-connecting purposes.
☆ Face mounting holes complying to the EIA/TIA standard.
☆ Mounting holes on the rear channel used for fixing cables and accessories.

◎ **Ordering Information:**

☆ A Type (Floor-Mounting Format) - Standard configuration is recommended if the access floor is well established.
☆ B Type (Free-Standing Format) - With the addition of base, it is fit when many cables have to be arranged through cable tray.
☆ C Type (Mobile-Format) - With the addition of base and casters, it is fit for easy access to the equipment.

Part No.	Unit	Height		W550/19"		Weight	
		mm	inch	Depth	Type	kg	Ibs
AD-OR-35A-2235	46U	2200	86.61	350	A	26	57
AD-OR-35A-1835	37U	1800	70.86	350		23	50
AD-OR-35A-1435	28U	1400	55.11	350		20	44
AD-OR-35B-2260	46U	2500	88.58	600	B	35	77
AD-OR-35B-1860	37U	1850	72.83	600		32	70
AD-OR-35B-1460	28U	1450	57.08	600		29	74
AD-OR-35C-2235	46U	2285	89.96	600	C	81	81
AD-OR-35C-1835	37U	1885	74.21	600		74	74
AD-OR-35C-1435	28U	1458	58.46	600		68	68

※ Standard items include frame L/R, top & bottom brackets together with cage nuts/screws.
※ Optional items include base plate, base moulding and casters/ leveling feet.

Cabinets

◎ **Basic Features:**

☆ Standard components include top & bottom base, 4 frames, top panel, 2 side panels, rear door, 5 cable tie bars (for 37U or higher), mounting hardware kit, and leveling feet.
☆ Made of high tensile strength die castings, aluminum extrusions and aluminum sheet.
☆ Having removable side panels for easy access or for interconnecting purposes.
☆ Standard color for the win rack cabinets is light beige or dark beige; custom colors are available.

◎ **Product Categories:**

☆ There are three types of cabinets which are designed for different installation purposes.

A Type (Floor Mounting Format) - A standard configuration is recommended where access floor is established.
B Type (Free Standing Format) - It has base cable tray at the bottom part and it serves as the substitute for access
C Type (Mobile Format) - With the wheels at the bottom, it is easy for moving.

◎ **Standard Components:**

☆ Top & bottom base.
☆ Basic frame.
☆ Top and side panel.
☆ Rear door can be easily detached with the spring pin hinges. The ventilation holes are at the top and bottom of the rear door. Air filter units are installed in both areas.
☆ Front door has option of flexi glass, steel, or safety glass which are right-hand hinged normally.
☆ Eye bolt holes are ready by knock-out-punch on the top cover panel.
☆ Cable tie bars and accessory kit.
☆ Fixing bracket is optional for A & C Type but basic for B Type. This prevents cabinets from shaking and falling down due to vibration or external shock.

EMI Shielded Cabinets

◎ **Basic Features:**

☆ The equipments inside the shielded cabinets will be protected from the outer sources of EMI, and the possible EMI from the internal devices will be blocked by tight sealed structure of the cabinet.

☆ The interior aluminium is chromated. Steel sheet is zinc galvanized and coated separately.

☆ Follow the basic design of standard cabinet.

☆ Steel door/acryl door as options.

◎ **Standard Components:**

☆ Side conductive gasket inserted along the 4 sides groove of the side panel provides tight contact with the body.

☆ Conductive mesh filter for both EMI blocking and air filtering.

☆ Door conductive gasket provides a sealed tight for the body.

☆ Conductive rubber can be trimmed by the volume of the cable.

Dustproof Cabinets

◎ **Basic Features:**

☆ Follow the basic design of standard cabinet.

☆ Dustproof cabinets are used in the place where are lots of dust, such as production lines to protect the inside equipments.

☆ Steel door/acryl door as options.

◎ **Standard Components:**

☆ Side elastic gasket runs along the 4 sides of groove on the side panels.

☆ Washable urethane air filter.

☆ Door elastic gasket, which provides a tight seal of the body.

☆ Urethane foam.

◎ **Ordering Information:**

AD-FC-AAA-BCC-DD-E-(R)(W)

AAA

B76=600mm Width 19" (For standard communication equipment)

B77=700mm Width 19" (For network devices with many cables)

B73=700mm Width 23" (For switching equipment)

BCC

A21=A Type 2165mm; B22=B Type 2250mm; C22=C Type 2200mm

A19=A Type 1965mm; B20=B Type 2050mm; C20=C Type 2000mm

A17=A Type 1765mm; B18=B Type 1850mm; C18=C Type 1800mm

A15=A Type 1565mm; B16=B Type 1650mm; C16=C Type 1600mm

A13=A Type 1365mm; B14=B Type 1450mm; C14=C Type 1400mm

A11=A Type 1165mm; B12=B Type 1250mm; C12=C Type 1200mm

A09=A Type 965mm; B10=B Type 1050mm; C10=C Type 1000mm

A07=A Type 715mm; B08=B Type 800mm; C07=C Type 750mm

DD

90=900mm

75=750mm

60=600mm

E

S Type X=76 (To secure rear wiring space between panel mounting rails and front door)

L Type X=146 (To secure rear wiring space between panel mounting rails and front door)

R Back Rail Aperture

W - W1 EMI Unshielded

W2 Dust-proof

Real Time Patching System

Real Time Patching System ❯❯❯❯❯❯❯

Real Time Patching System

ADDIMAX real time patching system is implemented by deploying intelligent hardware components and scanners throughout the network. With the use of sophisticated software, ADDIMAX affords maximal control of network connectivity, system security and data loss, ultimately increasing network efficiency.

◎ ADDIMAX Master

ADDIMAX Master manages the physical network. The Master includes an SNMP agent, allowing the management software to receive all relevant data. ADDMAX Master is connected to all the scanners, monitoring all the connectivity changes between any two ports. It collects, saves, and transmits connectivity data from the Scanners via the Expanders and updates the AddView for the Enterprise Management Station.

◎ ADDIMAX Expander

The Addimax Expander is used to expand the capabilities of the Master. This is achieved by cascading Expanders from the downlink ports of the Master. Each downlink port of a Master is connected to the Level 1 Expander . Many levels of Expanders can be cascaded from the downlink ports of upper level Expanders. The Expander allows all devices connected to its downlink ports to communicate with all devices on its uplink port. The Scanners are connected to the downlink ports of Expanders.

◎ ADDIMAX Scanner

Addimax Scanners are connected to the Smart Patch Panels with Scanner Attachment Cords. The Scanner monitors all ports on these panels. In addition to the core scanning functionality, the scanner acts as the mediator between the Control Pad, which is used to control system processes, and the Master. The Control Pad may be connected to any scanner, both controlling the specific scanner, locally, and sending/receiving instructions to/from the master via the Expander. Scanners are mounted in various sites to report patch panel connectivity information to the Master, which contains the SNMP agent.

◎ADDIMAX Patch Panel

ADDIMAX Smart Patch Panels are usually installed in double representation, conforming to TIA/EIA 568B and ISO 11801 requirement. The double representation can provide all the necessary patching and interchangeability. Smart patch panel involves a simple labor saving termination using standard 110 termination tools. With enhanced cable retention fixture, the patch panel cannot be easily displaced during installation.

◎ ADDIMAX Fiber Patch Panel

Addimax Fiber Patch Panel is an intelligent, high density solution for real time physical network management. The panel supports both single mode and multimode adapters, providing comprehensive solutions for cable protection, grounding and splicing. Its pull out drawer enable ease of access to the fiber. The panels can be connected to the system and continuously scan the connectivity configuration of all the patch cords and report it vias SNMP to the network management station. Besides, with wide range of fiber optic accessories, including fiber management clips, splice cassettes, cable grounding kits, cable entry glands, it can provide comprehensive splicing solutions for fiber cables.

◎ADDIMAX Data Patch Cord

Addimax Smart Patch Cord comprises a length of nine-wire flexible smart jumper cable, terminated with two ten-position RJ-45 plugs at the ends. The data signal is transferred over the four twisted pairs of the cable. An additional ninth wire transfers the scanning signal. The ten-position plugs are standard RJ-45 plugs, configured with two additional contacts (numbers 0 and 9), mounted externally to the standard eight contacts. Contact number 9 is used for the scanning signal.

◎ ADDIMAX Fiber Cords

Addimax Smart Patch Cords feature a duplex fiber cable and single 28AWG copper wire in a common jacket. The copper wire is used for scanning data between the ports. Different fiber connectors can be offered for selection.
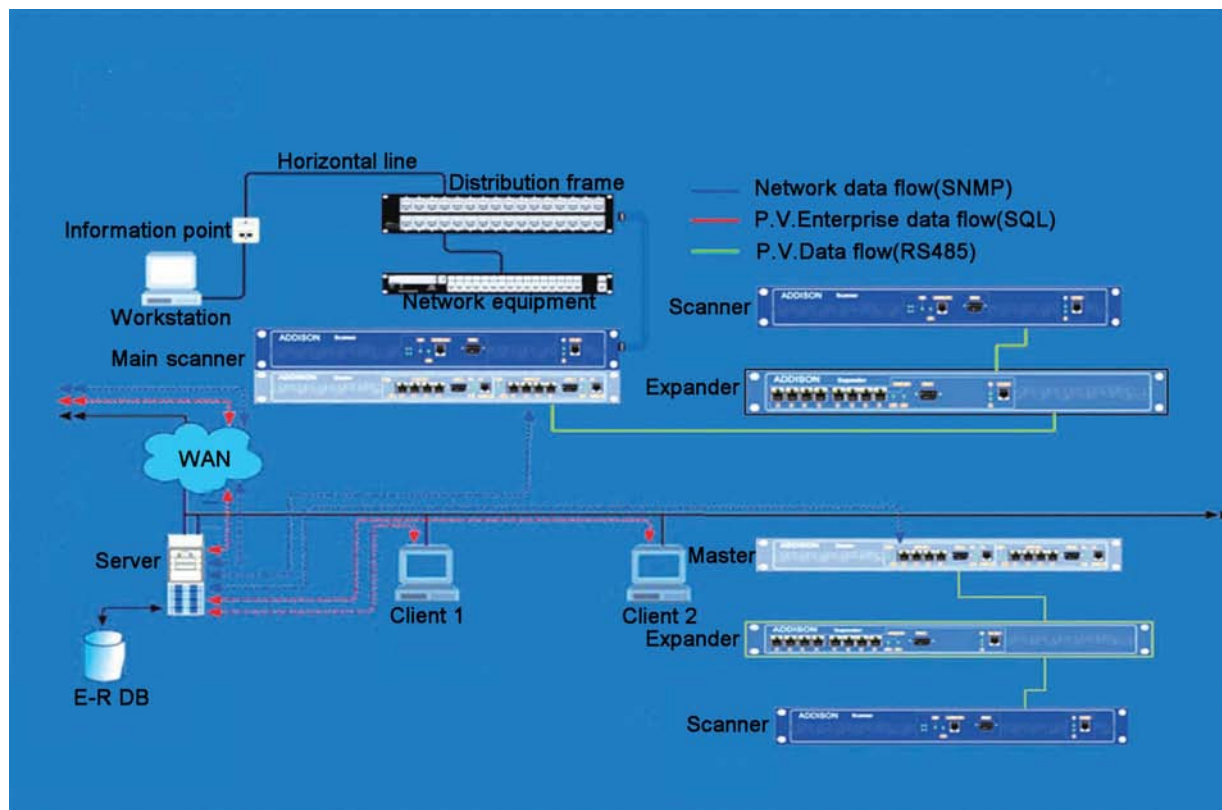
◎ ADDIMAX Scanner Connecting Cable

Round Flat Attachment Cords are available in UTP and STP models. Flat attachment cores are available in UTP models. Addimax Scanners are connected to SMART Patch Panels with Scanner Attachment Cords.

◎ ADDIMAX Application Software

Addview provides an accurate view of network connectivity and service status. It continuously monitors physical connectivity, setting security levels, stopping unauthorized connection to the network, detecting unauthorized device and physical layer intrusion, thus ultimately enhancing network security and protection. ADDVIEW is web based, providing effective centralized or distributed monitoring.

◎ Ordering Information:

Part No	Description
AD-IS-MAIN	ADDIMAX Master
AD-IS-EXP	ADDIMAX Expander
AD-IS-SCAN	ADDIMAX Scanner
AD-IS-FCAUTP00X	Cat A Flat Scanner Connecting Cable (Unshielded)
AD-IS-FCBUTP00X	Cat B Flat Scanner Connecting Cable (Unshielded)
AD-IS-RFCAUTP00X	Cat A Round Scanner Connecting Cable (Unshielded)
AD-IS-RFCBUTP00X	Cat B Round Scanner Connecting Cable (Unshielded)
AD-IS-PP-24-C5E-A/B	Cat5e Unshielded 24 Port Smart Patch Panel
AD-IS-PP-24-C6-A/B	Cat6 Unshielded 24 Port Smart Patch Panel
AD-IS-RFTB-48	48 Port Smart Fiber Patch Panel
AD-IS-BC-CAT5EUTP4PM002	Cat5e Unshielded 2M Smart Data Patch Cord
AD-IS-BC-CAT6UTP4PM001	Cat6 Unshielded 1M Smart Data Patch Cord
AD-IS-BC-SC/SC-S9M001CON	9/125 μm SC-SC Simplex 1M PVC Smart Fiber Cord
AD-IS-BC-ST/ST-S5M002CON	Multi Mode 50/125 μm ST-ST Simplex 2M PVC Smart Fiber Cord
AD-IS-BC-LC/LC-S6M002CON	Multi Mode 62.5/125 μm LC-LC Simplex 2M PVC Smart Fiber Cord
AD-IS-BC-MT/MT-S4M001CON	OM3 Multi Mode 50/125 μm MTRJ-MTRJ Simplex 1M PVC Smart Fiber Cord

Real Time Patching System

Cabling Solutions

Cabling Solutions ⟩⟩⟩⟩⟩⟩⟩

Matrix 5E Copper Cabling Solutions

Matrix 5E offers both unshielded and shielded system, in full compliant with EIA/TIA 568-B.2 and ISO 11801 D channel, providing significant margin in both return loss and NEXT, in support of many different networking requirements, including 1000Base-T, Broadband video, 3D video and other multimedia applications.

☆ Matrix 5E Unshielded System

Part No.	Description
AD-PP-24-C5E-A/B	Cat 5e 24 Port Unshielded Patch Panel
AD-KM-C5E-A/B-XX	Cat 5e Unshielded Data Jack
AD-BC-CAT5EUTP4PCM24	Cat 5e UTP 4 Pairs PVC Cable
AD-CAT5EUTP4PM001CM26A-XX	Cat 5e 1m UTP Power Sum PVC Patch Cord
AD-CAT5EUTP4PM003CM26A-XX	Cat 5e 3m UTP Power Sum PVC Patch Cord
AD-CAT5EUTP4PM005CM26A-XX	Cat 5e 5m UTP Power Sum PVC Patch Cord

☆ Matrix 5E Shielded System

Part No.	Description
AD-PP-24-C5ES-A/B	Matrix 5e 24 Port Shielded Patch Panel
AD-KM-C5ES-A/B-XX	Matrix 5e Shielded Data Jack
AD-BC-CAT5EFTP4PCM24	Cat 5e FTP 4 Pairs PVC Cable
AD-CAT5EFTP4PM001CM26A-XX	Cat 5e 1m FTP Power Sum PVC Patch cord
AD-CAT5EFTP4PM003CM26A-XX	Cat 5e 3m FTP Power Sum PVC Patch cord
AD-CAT5EFTP4PM005CM26A-XX	Cat 5e 5m FTP Power Sum PVC Patch cord

☆ Worst Values and Typical Values for Matrix 5E Channel (1-100Mhz)

|	Worst Margin	Typical Margin
INSERTION LOSS	5%	10%
NEXT	3 dB	8.5dB
PSNEXT	5.5dB	9.5dB
ELFEXT	4.5dB	10.5dB
PSELFEXT	5.5dB	11.5dB
RL	1.0dB	5.5dB

Matrix 5E is a high performance cabling system. With the use of impedance matching components, the data error rates of the channels are highly reduced, thus increasing the transmission performance and efficiency to a great extent. Matrix 5E components work in full harmony with the cables, significantly increasing the margin for both permanent link and channel testing, thus highly reducing the interference during the data transmission.

Matrix 5E far exceeds the requirement TIA/EIA and ISO 11801, providing extra channel margin to ensure sure pass in any handheld tester during the field site testing. The typical NEXT value of Matrix 5E is around 8 dB whereas the worst value exceeds 3 dB.

Matrix 5E provides extended working frequency up to 350 MHz. Through the special design in the twist distance in the cable pairs, the cables can be tested up to 350 MHz which provides the best support for the current and future multimedia applications. Matrix 5E cables fulfill the testing procedures as governed by ASTM6 D4566, complying with Power Sum requirement, which is very critical for reducing signal distortion as this is the total sum of the crosstalk from each of the other pairs in the cable and this will more accurately reveal the actual crosstalk performance of the cables.

In 2002, Addison launched out enhanced Shielded system, which effectively provides superior EMI/RFI capability for the cabling system. External interference source usually has very adverse effect on the system performance and to reduce these interference, Matrix 5E enhanced shielded system adopts either the individually shielded or individually shielded plus overall shielded cable. These cables are highly recommended for environments with great interference sources which may significantly affects the attenuation, NEXT and also ELFEXT performance.

Matrix 5E can offer different jacket types such as PVC, LSOH, LSFROH, CMR, CMP for meeting different fire performance requirements.
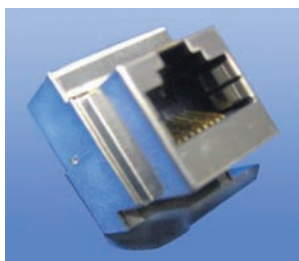
Matrix 6 1G Copper Cabling Solutions

Matrix 6 provides both unshielded and shielded system, in full compliant with EIA/TIA568-B.2 and ISO 11801 E channel, providing significant margin for both return loss and NEXT. This provides strong support for different applications such as 1000 Base-T, broadband video, 3D video, 10GBase-T and other multimedia applications.

☆ Matrix 6 Unshielded System

Part No.	Description
AD-PP-24-C6-A/B	Cat 6 24 Port Unshielded Patch Panel
AD-KM-C6-A/B-XX	Cat 6 Unshielded Data Jack
AD-BC-CAT6UTP4PCM23	Cat 6 UTP 4 Pairs PVC Cable
AD-CAT6UTP4PM001CM26A-XX	Cat 6 1m UTP Extended Frequency PVC Patch Cord
AD-CAT6UTP4PM003CM26A-XX	Cat 6 3m UTP Extended Frequency PVC Patch Cord
AD-CAT6UTP4PM005CM26A-XX	Cat 6 5m UTP Extended Frequency PVC Patch Cord

☆ Matrix 6 Shielded System

Part No.	Description
AD-PP-24-C6S-A/B	Cat 6 24 Port Shielded Patch Panel
AD-KM-C6S-A/B-XX	Cat 6 Shielded Data Jack
AD-BC-CAT6STP4PCM23	Cat 6 STP 4 Pairs PVC Cable
AD-BC-CAT6SFTP4PCM23	Cat 6 SFTP 4 Pair PVC Cable
AD-CAT6FTP4PM001CM26A-XX	Cat 6 1m FTP Extended Frequency PVC Patch Cord
AD-CAT6FTP4PM003CM26A-XX	Cat 6 3 m FTP Extended Frequency PVC Patch Cord
AD-CAT6FTP4PM005CM26A-XX	Cat 6 5 m FTP Extended Frequency PVC Patch Cord

☆ Worst Values and Typical Values for Matrix 6 Channel (1-250Mhz)

	Worst Margin	Typical Margin
INSERTION LOSS	5%	6%
NEXT	6dB	8dB
PSNEXT	7dB	9dB
ELFEXT	6dB	8dB
PSELFEXT	7dB	9dB
RL	4dB	5dB

Matrix 6 system provides a 4 connector channel solution, using impedance matching data jacks to work in harmony with patch panels, significantly increasing the margin for both the channel and permanent link testing. The centered design of the products has optimized the product to the greatest extent.

Matrix 6 far exceeds the requirement TIA/EIA and ISO 11801, providing extra margin to ensure sure pass in any handheld tester during the field site testing. The typical NEXT headroom of Matrix 6 is around 8 dB whereas the worst headroom value exceeds 6 dB.

Matrix 6 system can work under 500 MHz extended frequency in support of the future 10G applications. Every components in Matrix 6 system features special patented design in order to guarantee significant margin for offering an adequate buffer margin in any harsh installation environment. Patch cord is a very important component in a channel. Addison launches out the extended frequency patch cord in compliant to the EIA/TIA component requirement, providing significant margin in NEXT in a channel testing.

Matrix 6 can offer different jacket types such as PVC, LSOH, LSFROH, CMR, CMP for meeting different fire performance requirements.

Matrix 6A 10G Copper Cabling Solutions

Since the approval of 10G 802.6ae standard for fiber optic cable, in 2002, a working committee for 10GBASE T was set for studying the feasibility of running 10Gbps over 100m drive distance. This is a horizontal cabling system advocated by TI568-B and ISO/IEC 11801 for Cat 6E class or better system in support of future gigabit applications.

In 2006, Addison launched out Matrix6A cabling system. Matrix 6A is a system design based on Cat 6E class, in compliant with IEEE 802.3an standard. Matrix 6A 10G system can run 100 meters for 10GBase-T. According to IEEE 802.3, the between channel crosstalk (which is called AXTalk) requirement is very important in the signal to noise ratio. In general, for a channel length of 55m or less, Cat 6 cable may well meet the transmission requirements to support 10GBASE-T. But for a drive distance from 55m to 100m, an augmented cabling system is required for delivering 10 Gigabit performance. Matrix 6A is a system designed for delivering better AXTalk performance than Cat 6 or Class E for support of 10GBASET traffic. Matrix 6A system can work under 500 MHz extended frequency. Every component in Matrix 6A 10G features special design in order to guarantee significant margin for offering a comfortable buffer in any harsh installation environment.
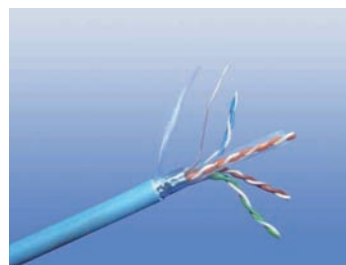
☆ Matrix 6A 10G Unshielded System

Part No.	Description
AD-PP-24-C6A-A/B	Cat 6A 10G 24 Port Unshielded Patch Panel
AD-KM-C6A-A/B-XX	Cat 6A 10G Unshielded Data Jack
AD-BC-CAT6AUTP4PCM23	Cat 6A 10G UTP 4 Pair PVC Cable
AD-CAT6AUTP4PM001CM26A-XX	Cat 6A 10G 1m UTP Extended Frequency PVC Patch Cord
AD-CAT6AUTP4PM003CM26A-XX	Cat 6A 10G 3m UTP Extended Frequency PVC Patch Cord
AD-CAT6AUTP4PM005CM26A-XX	Cat 6A 10G 5m UTP Extended Frequency PVC Patch Cord

☆ MATRIX 6A 10G Shielded System

Part No.	Description
AD-PP-24-C6AS-A/B	Cat 6A 10G 24 Port Shielded Patch Panel
AD-KM-C6AS-A/B-XX	Cat6A 10G Shielded Data Jack
AD-BC-CAT6ASTP4PCM23	Cat 6A 10G STP 4 Pair PVC Cable
AD-BC-CAT6ASFTP4PCM23	Cat 6A 10G SFTP 4 Pair PVC Cable
AD-CAT6ASTP4PM001CM26A-XX	Cat 6A 10G 1m STP Extended Frequency PVC Patch Cord
AD-CAT6ASTP4PM003CM26A-XX	Cat 6A 10G 3m STP Extended Frequency PVC Patch Cord
AD-CAT6ASTP4PM005CM26A-XX	Cat 6A 10G 5m STP Extended Frequency PVC Patch Cord

☆ Worst Values and Typical Values for Matrix 6A 10G Unshielded Channel (1-500Mhz)

	Worst Margin	Typical Margin
INSERTION LOSS	7%	8%
NEXT	2dB	6dB
PSNEXT	2dB	6dB
ELFEXT	3dB	6dB
PSELFEXT	3dB	7dB
RL	2dB	4dB

☆ Worst Values and Typical Values for Matrix 6A 10G Shielded Channel (1-500Mhz)

	Worst Margin	Typical Margin
INSERTION LOSS	7%	8%
NEXT	7dB	9dB
PSNEXT	8dB	10dB
ELFEXT	8dB	10dB
PSELFEXT	9dB	11dB
RL	4dB	5.5dB

Crosstalk measures signal coupling from one wire pair to another within a twisted pair cabling link. It is measured by NEXT and FEXT. The crosstalk between wire pairs in different bundles is negligible in 1000BASE-T application. However, for 10Gb/s Ethernet, due to higher frequencies, the crosstalk coupling, which is called AXTalk, now occurs between wire pairs in different cabling links routed in proximity to each other. AXTalk becomes the most significant disturbance or noise source for the 10GbE applications.

AXTalk will be measured as Alien NEXT (ANEXT) between wire pairs, as well as Alien FEXT (AFEXT). Since the combined impact of many wire pairs in the bundle upon the victim wire pair must be assessed, Power Sum Alien NEXT (PSANEXT) and Power Sum Alien FEXT (PSAFEXT) must be computed for the victim wire pair. AXTalk Margin Calculation (ACMC) is a combined PSANEXT and PSANEXT average margin.

AXTalk has to be considered only between links that run in the same cable bundle. Therefore, the smaller the bundle size, the less significant is the AXTalk. The best bundle size is 12 links, with maximum links not exceeding 24. ANEXT is generated in the first 20m of the bundle as it is highly affected by the connectivity hardware such as patch panel, patch cord and wire management.

It is not practical or necessary to test all of your links for Alien Crosstalk compliance. The TIA does not specify a sample plan. However, the IEC has defined a sampling plan of 1% or 5 links whichever is the greatest. For 10GBASE-T or TSB-155 testing, the longest links in the installation will be selected as the disturbed cables as these will almost always be the worst performing links in terms of PS AXtalk. For Augmented Category 6 or Class Ea testing, the longest links and shortest links in the installation will be selected to be the disturbed cables as these will almost always be the worst performing links in terms of PS ANEXT and PS AACR-F.

ADDISON adopts Fluke DTX 1800 Cable Analyser to perform the field certification. The tester supports two different 10GBASE-T standard, namely TSB-155 and TIA/EIA-568-B.2-10. TSB-155 only formulates guidelines and is not a standard. According to TSB, for any installed Cat 6 links, Alien Crosstalk (AXTALK), the crosstalk between wire pairs in adjacent cables, should be certified to pass the specified test parameters over the bandwidth required to support 10GBASE-T (1 through 500 MHz). General expectations are that AXTALK for Cat 6 UTP cables less that 55 meters in length will meet the requirements for 10GBASE-T.

And TIA defines a new cabling type that is called Augmented Category 6 (Cat 6A) and Augmented Class E (EA). The new Augmented cabling types define a higher level of performance for the cabling performance as well as for the Alien Crosstalk characteristics of a cabling system. The Augmented cabling types are being designed to support 10GBASE-T over a full 100 m horizontal channel.

The field certification process for 10Gig includes two phases: The first phase certifies the transmission capacity of each individual link. The test limit are identical to the limits for Cat 6 (Class E) up to 250MHz, but the testing frequency range is extended to 500Mhz to support much higher data rates of 10G/bs Ethernet technology. The second phase encompasses certification of the cabling links for compliance with the Alien Crosstalk performance requirements. Alien Crosstalk certification for 10GBASE-T should include testing of some links in a bundle to verify compliance with AXTALK test parameters such as PSANEXT and PSAACR-F

The setup of Alien NEXT measurement between two links is shown in figure 1.The Main DTX-1800 unit is plugged into the disturbed cabling link (the victim link) and the Remote unit is plugged into a disturber link. The two test units measure the Alien Near End Crosstalk between all the wire pairs of the two cabling links. The alien Crosstalk communication module must be installed in each tester unit and that these two modules must be connected with a patch cord. Also the two cables in the test procedure must be terminated with the special Link Terminators. The Main tester is connected to DTX AxTalk Analyser which controls the tests and automatically upload the alien crosstalk measurement results between all the wire pairs of the two measured links and calculate the Power sum alien crosstalk test parameters for the victim link. All the possible NEXT between two cabling links counts 16 combinations.

Figure 2 shows the connections of the testers to measure the pair to pair Alien FEXT between cables in a bundle. The two tester units are now connected at different ends of the bundle. A spare cabling link can be used to provide the synchronization path between the main and remote tester units. The open ends of the links involved in the test must be terminated by the same type of plug as used for Alien NEXT testing. The DTX test kit always verify that each link is properly terminated before conducting the AXTalk tests.
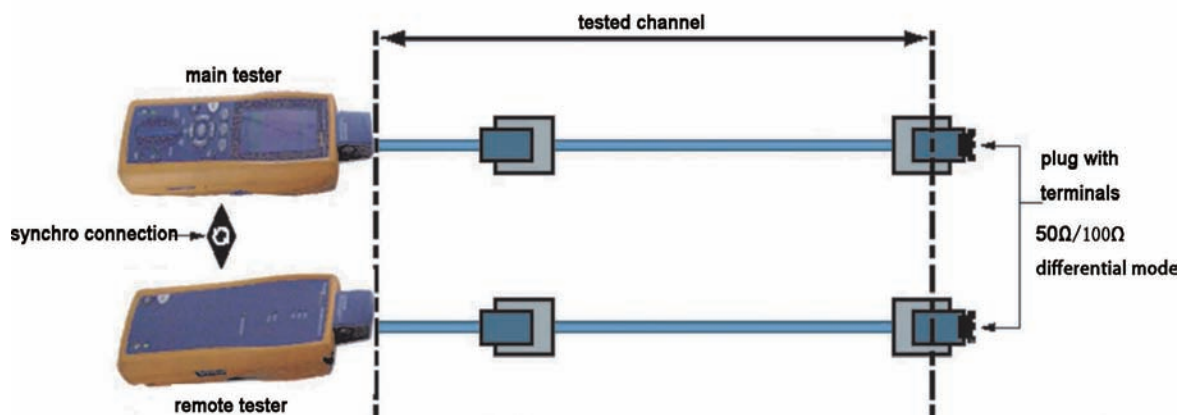
Fig1- Pair to pair Alien NEXT measurements. The main and remote units are set side by side at one end of the cabling bundle under test. These units are plugged into different cables. The Alien Crosstalk Communication Modules plugged into the main and smart remote units are connected with a patch cord to provide the measurement synchronization that allows the testers to perform all of the pair to pair Alien NEXT measurements.
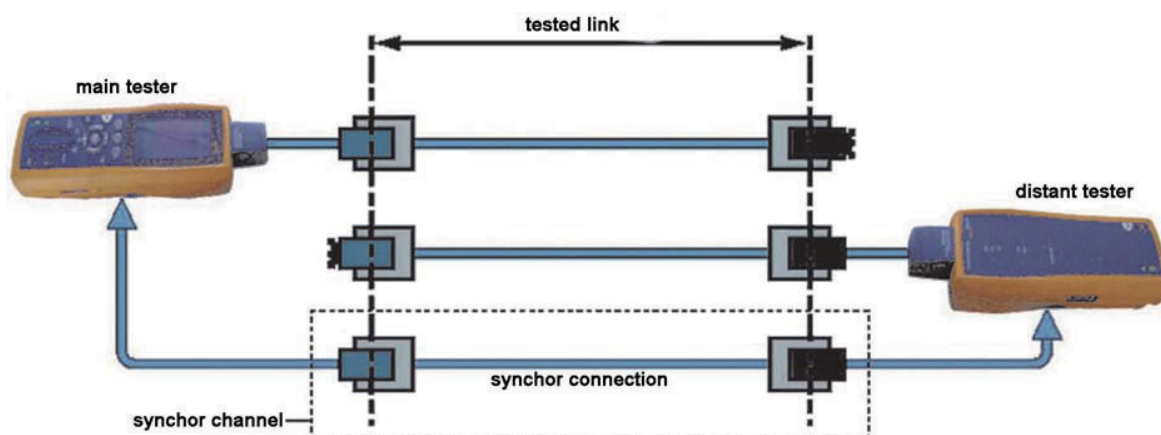

Fig2 - Pair to pair Alien FEXT measurements. The main and remote units are plugged into different cabling links at opposite ends of bundle under test. A spare channel in this bundle connects the synchronization modules plugged into each of the testers to allow the testers to perform all of the pair to pair FEXT measurements between the wire pairs of two selected cabling links.

AXTalk is the biggest challenge for 10G application. In particular, AXTalk is the most significant disturbance in unshielded system. For Matrix 6A unshielded system, Addison redesign the cable structure by increasing the jacket thickness, changing the twisting distance, and using a bigger separator in order to reduce the interference between different pairs, thus eliminating the ANEXT to a significant extent.

Matrix 6A shielded system adopts F/UTP, U/FTP or S/FTP cables for improving the attenuation, NEXT and AXTalk performance, to support 10G transmission over 100m channel length. Compared with the MATRIX 6A unshielded system, MATRIX 6A shielded system can achieve an improved shannon capacity of around 35Gbps, better ANEXT by around 20dB and reduced EMI interference. In gigabit Ethernet, at least Shannon capacity of 15.9 Gbps is required for the transmission ability. Shannon capacity is basically the ability to carry data current which goes down as noise increases. Alien crosstalk is this type of noise. In Matrix 6A unshielded system, around 17-20 Gbps can be achieved for Shannon capacity and the margin is not too high. Thus, it is recommended to adopt shielded system with better Shannon capacity in support of gigabit application.

Matrixlight 10G Optic Fiber Cabling Solutions

With the falling cost of the Ethernet equipment, 10GBase-T has become the prevailing trend in the system design. Basically, the data transmission rate for horizontal cabling and backbone bears a ratio of 1:10 to avoid any traffic congestion. Currently, Cat 6 is widely used for the horizontal cabling, which provides 1000Mbps to the desk. To ensure smooth network traffic, 10G fiber optic cable should be used in backbone.

Optic fiber cables become the best choice because of the compact size, high transmission capacity and bandwidth. Optic transmitter is mainly of two categories: One is LED using multimode fiber as the transmission media and the other is laser using single mode fiber cable as the transmission media. Single mode cable can certainly fulfill the 10G Ethernet requirement but the cost of laser equipment is extremely high. Traditional multimode fiber cable can support 10G application over a short distance of around 50m and may not be adequate for supporting the backbone traffic. To support 10G Ethernet application, VCSEL (Vertical cavity surface emitting lasers) was then developed. VCSEL combines the strong characteristics of laser including response time, narrow transmission bandwidth and the special strength of LED such as high coupling efficiency and low equipment cost. Special 50/125μm fiber cable is designed to work in harmony with VCSEL equipment at 850nm wavelength for supporting 10Gbps over 300m drive distance and 1000Mbps over 900m drive distance. Relatively speaking, the cost of optimized 50/125μm fiber cable is slightly higher than traditional fiber cable. In June 2002, IEEE approved the new standard for 10G Ethernet. In September 2002, the ISO/IEC 11801 also standardized a new categorization for the multimode fiber cables. Under the new categorization, multimode fiber cables are classified under OM1, OM2 and OM3 category. OM1 refers to the traditional 62.5μm fiber cables. OM2 refers to the traditional 50μm fiber cables and OM3 refers to the optimized 50μm fiber cables. The bandwidth of traditional 62.5μm is only 200MHz under 850 nm wavelength and 500MHz under 1300nm wavelength. This bandwidth is far inadequate for supporting 10G Ethernet application. However, with the invention of OM3 fiber cable, 10G Ethernet application can now be fully supported with OM3 fiber cable which can offer 2000MHz bandwidth at 850nm wavelength.

☆ Below are the bandwidth and the maximum transmission distance of different fiber cables for 10G Ethernet application

Fiber Type	Bandwidth 850nm MHz*km	Bandwidth 1300nmMHz*km	1Gbps Transmission Distance		10Gbps Transmission Distance		Fiber Class
Multimode			@850nm	@1300nm	@850nm	@1300nm	
Traditional 62.5/125μm	200	500	200m	550m	33m	300m	OM1
Traditional 50/125μm 802.3z	500	500	550m	550m	82m	300m	OM2
Traditional50/125μm ADDISON	500	800	550m	950m	82m	450m	OM2
50/125μm-100	600	1200	750m	2000m	100m	650m	OM2+
0/125μm-150	700	500	750m	550m	150m	300m	OM2+
50/125μm-300	1500	500	1000m	550m	300m	300m	OM3
50/125μm-550	3500	500	1000m	550m	550m	550m	OM3+

☆ Below are the attenuation and chromatic dispersion values for different fiber types

		Traditional Single Mode Fiber	Zero Water Peak Fiber	Non Zero Disperson Shifted Fiber	
				Long Haul	Metro Area
Nominal Attenuation Values (dB/km)	1310nm	0.33	0.34	N/A	0.35
	1383nm	0.40	0.31	0.32	0.32
	1550nm	0.19	0.19	0.20	0.20
	1625nm	0.21	0.21	0.21	0.21
Nominal Chromatic Disperson Values (dB/km)	1310nm	0	0	N/A	-11.5
	1550nm	16.5	16.5	4.5	4.5
	1625nm	23	23	10.5	8.5

☆ Below are the transmission speed of different light sources

|	LED	VCSEL	DFB/FP Laser Diodes
Cost	Low	Moderate	High
Application	Multimode fiber	Multimode fiber	Single mode fiber
Maximum Speed Supported	1Gbps	12.5Gbps	40Gbps
Active Transmission Speed	622Mbps	10Gbps	40Gbps

In view of emerging 10Gbps Ethernet requirement, Addison put forward 10Gbps fiber solution, MATRIXLIGHT system. MATRIXLIGHT is a 10Gbps fiber system offering OM3 50/125 fiber cables and single mode fiber cables in full compliant with IEC 60793-2 and TIA 492AAAC DMD. Working with VCSEL, the OM3 fiber cable can support 10Gbps with transmission speed over 300m, complying to ISO/IEC11801-2nd standard. Addison OM3 fiber cable can support low cost 10Gbps serial transmission technology. In 10Gbps Base-SR, there are two operating bandwidths. One is the 1500/500 MHz/km and the other is 2000MHz/km, both supporting 850nm light source, and generally support backbone and fiber to the desk solution. Addison OM3 fiber cables works in full harmony with the fiber patch panels and components in order to support the existing network topology and can be deployed in either the backbone or horizontal cabling. Lastly, Addison single mode cable features a very low attenuation of 0.7dB/km, which significantly increases the transmission distance from 5 Km supported by 1Gbps to 40 Km supported by 10Gbps.

Traditional multimode fiber cannot be deployed in long distance transmission. Following the wide installation base for Cat 6 systems, it is expected that 10Gbps fiber cable will be widely used in the backbone cabling. Before 1000Mbps Ethernet come into play, selection of fiber types is very straight forward. With a drive distance of 2,000m and transmission speed of OC-12 (622Mb/s), 62.5/125μm multimode fiber cable is adequate for any applications. Beyond this distance and speed, single mode fiber cable will be deployed. With the development of OM3 multimode fiber in the industry, the transmission distance can be greatly increased under the 850nm wavelength. With the use of OM3 fiber cables and VCSEL, the OM3 fiber solution becomes the best cost effective cabling solutions. When transmission distance exceed 1,000m, single mode cable is still the only solution right now, the transmission distance of single mode cable can reach 5000m at 1310nm wavelength for 1000Mbps speed rate and 10000m for 10Gbps rate. When transmission distance is less than 1,000m, OM3 50μm multimode fibers can be considered for 1,000Mbps application but for 10Gbps application, single mode cable has to be used. When transmission distance is less than 300m, OM3 multimode cable can be used in both the 1000Mbps and 10Gbps application.

Addison has upgraded the multimode fiber from OM1 to OM3 and even OM3+ which can provide support of 10Mbps transmission over 550m and also 1000Mbsp over 1100m. Further, Addison has also launched out single mode Zero Water Peak fiber cables to support full bandwidth transmission. Addison 10Gbase-SR OM3 fiber cable features low cost and high efficiency, thus ensuring the highest return in the system investment and becomes the most preferred fiber to the desk solution in the industry.
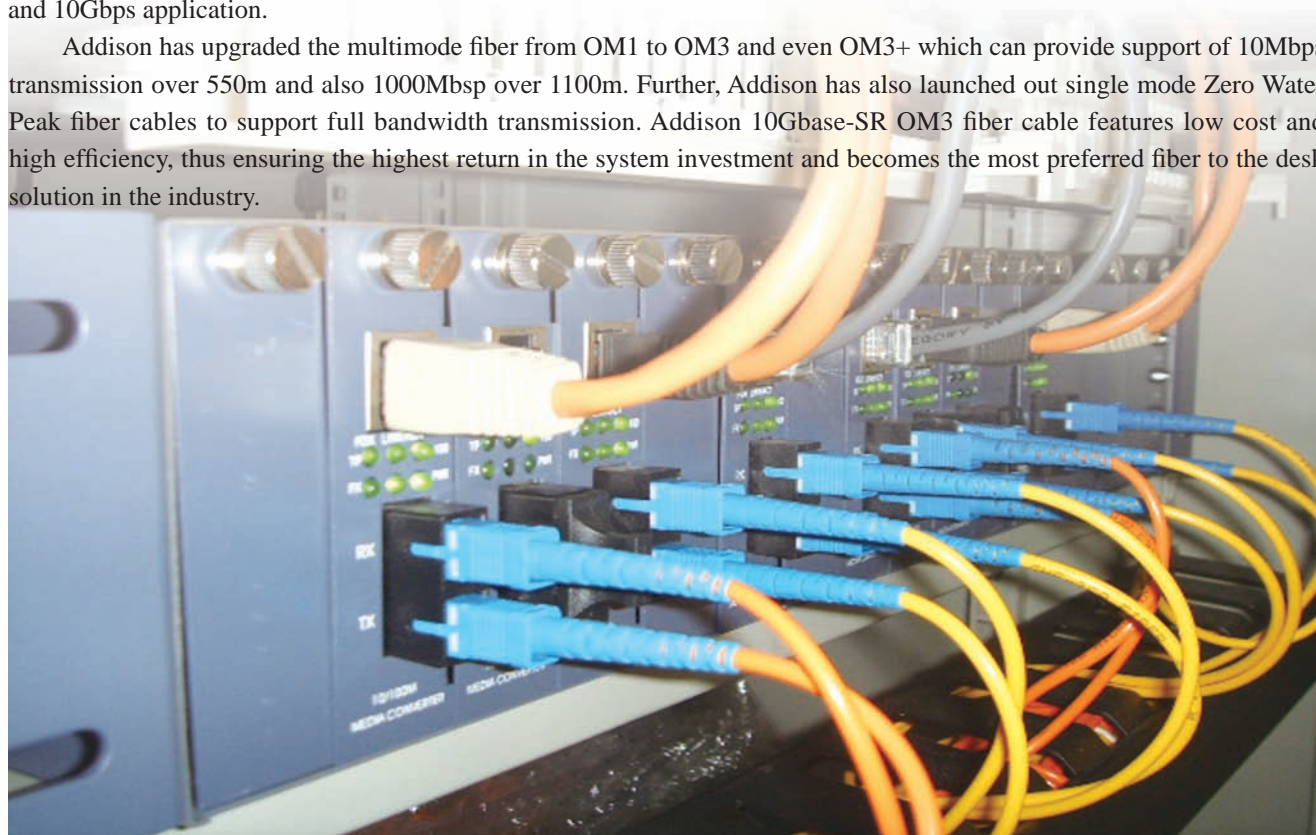
Fire Performance Standard

Fire Performance Standard ❯❯❯❯❯❯❯

Fire Performance Standard

At present, in cable industry, Fire Retardant, Low Smoke Halogen Free (LSZH), Low Smoke Fume (LSF) and Fire Resistant cables are all described as Fire survival Cables.

◎ Flame Retardant

Fire retardant cables are designed for use in fire situations where the spread of flames along a cable route needs to be retarded. Due to relative low cost, fire retardant cables are widely used as fire survival cables. No matter the cables are installed in single wire or in bundles, during a fire, the flame spread will be retarded and the fire will be confined to a small area, thus reducing the fire hazard due to fire propagation.

◎ Low Smoke & Halogen Free & Fire Retardant (LSZH)

LSZH cables are not only characterized by the fire retardant performance but also by the halogen free properties, thus offering low corrosivity and toxicity. During a fire, the LSZH cables will emit less smoke and acid gases which may damage the human being and expensive equipment. Compared with normal PVC cables, LSZH cables outperform by their fire retardancy, low corrosivity and low smoke emission properties, however, normal PVC cables have better mechanical and electrical properties.

◎ Low Smoke Fume (LSF)

The low halogen content and low corrosivity of low smoke fume cables lies somewhat in between that of fire retardant cables and LSZH cables. LSF cables also contain halogen but the content is much less than that of PVC cables. LSF cables are designed to reduce the spread of fire, toxic gases and smoke during fire. The LSF cables are usually manufactured from flame retardant PVC blended with HCL additive and smoke absorbent. These materials help improve the fire performance of the LSF cables.

◎ Fire Resistant (FR)

Fire resistant cables are designed to maintain circuit integrity of those vital emergency services during the fire. The individual conductors are wrapped with a layer of fire resisting mica/glass tape which prevents phase to phase and phase to earth contact even after the insulation has been burnt away. The fire resistant cables exhibit same performance even under fire with water spray or mechanical shock situation.

◎ Fire Performance Class

The main concerns for the cables in their fire survival properties are their flame spread, smoke characterization and gas toxicity. In American fire standard, the concern lies more on the first two and it differs from the European standard which concerns all these aspects. In USA, it is believed that the fire hazard is mainly due to CO toxic gas emitted and the heat release during the conversion of CO to CO_2 during the fire. Therefore, to control the heat release is the most important concern for reducing the fire hazard. However, in European countries, halogen content, the corrosivity of the gases, the smoke density and the toxicity of the gas are equally important factors affecting the safety and survival of human during a fire.

IEC Standard for Flame Retardancy

The European Electrical Committee categorizes the fire performance of the cables into three classes, namely IEC 60332-1, IEC 60332-2, IEC 60332-3, IEC 60332-1 and IEC 60332-2 are used to assess the flame propagation characteristics of a single wire. IEC 60332-3 is used to assess the flame propagation characteristics of bundled cables. Comparatively speaking, IEC 60332-3 for bundled cables is more demanding than IEC 60332-1 for single wires.

◎ IEC 60332-1/BS 4066-1 (Flame Test On Single Vertical Insulated Wires/Cables)

This test details a method of test for the assessment of the flame propagation characteristics of a single wire or cable. In this test, a 60cm cable sample is fixed vertically inside a metallic box and a 175mm long flame is applied at 45℃ from a gas burner placed at 450mm from the top at the upper portion. The specimen is deemed to have passed this test, if after burning has ceased, the charred or affected position does not reach within 50mm of the lower edge of the top clamp which is equivalent to 425mm above the point of flame application. The test method is not suitable for the testing of some small wires due to the melting of the conductors during the time of application of the flame.

◎ IEC 60332-3/BS 4066-3 (Flame Test On Bunched Wires/Cables)

IEC60332-3C describes a method of type approval testing to define the ability of bunched cables to resist fire propagation. In this test, a cable specimen, consisting of number of 3.5m length of cables are fixed to a vertical ladder tray where they are applied with a flame from a gas burner for a specified times under controlled air flow. Four categories (A, B, C & D) are defined and distinguished by test duration and the volume of non metallic material of the sample under test. The cable specimen is deemed to have met the requirements of the standard if, after burning has ceased, the extent of charred or affected portion does not reach a height exceeding 2.5m above the bottom edge of the burner.

UL Standard for Fire Retardancy

If a cable can pass a specified UL fire standard, an UL performance verification mark can be applied onto the cable jacket illustrating both the UL class and the number. There are five primary fire testing standards as follows.

◎ CMP (Plenum Flame Test/ Steiner Tunnel Test)

Plenum rated cables meet the NFPA -262 standard (formerly known as UL910) which provides the most stringent requirement of all the tests. Cable samples on a horizontal tray in a tunnel type of chamber are burned at 87.9KW (300,000 BTU/Hr) for 20 minutes. To qualify for a plenum rating the cable specimen musthave the flame spread of less than 5 feet or 1.5 meters with a smoke density during the test of (a) 0.5 peak and 0.15 maximum average. The CMP cables are usually installed in air ventilation ducts and air returns widely used in Canada and USA. The fire retardant properties of CMP cables are much better than that of normal LSZH cables complying with IEC 60332-1 and IEC 60332-3.
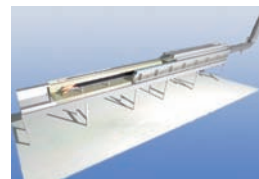
◎ CMR (Riser Flame Test)

Riser rated cables meets UL1666. Cable samples on a vertical shaft are burned at 154.5KW (527,500 BTU/Hr) for 30 minutes. To qualify for a riser rating, cable specimen must have the flame spread of less than 12 feet beyond the ignition point. This test does not look at the smoke density or toxicity. Riser rated cables are suitable for vertical shafts not defined as an environmental air plenum.

◎ CM (Vertical Tray Flame Test)

General purpose cables meet UL 1581. Cable samples on a 8 feet vertical tray are burned at 20KW (70,000 BTU/Hr) for 20 minutes. The cable specimen is deemed to pass the test if the flame spread will not extend to the upper portion and extinguish by itself. UL 1581 is similar to IEC 60332-3C except for that the number of testing samples is different. This test does not look at the smoke density or toxicity. The CMG cables are usually used in runs penetrating single floor. These cables cannot be installed in vertical pathways.

◎ CMG (Vertical Tray Flame Test)

These general purpose cable also meet UL1581. CM and CMG are similar and both are recognized in Canada and USA. This test does not look at the smoke density or toxicity. The CMX cables are usually used in runs penetrating single floor. The cables cannot be installed in vertical pathways.

◎ CMX (Vertical Wire Flame Test)

The restricted cables meet UL1581 Limited-use. The test consists of 25 feet long ventilated tunnel. The cable specimen is placed on a ladder inside the tunnel and the flame of 30,000 BTU/Hr is applied to the cable 15 seconds on and 15 seconds off five times for a total exposure to the flame of 1 minute and 15 seconds. To qualify for this test, after the test flame is removed the cable specimen can flame for not more than 60 seconds and the charred portion will not exceed by 25%. UL 1581 VW-1 is similar to IEC 60332-1 except for the difference in the time for flame applied. This test does not look at the smoke density or toxicity. The CMG cables are suitable for use in dwellings and for use in raceway. These cables cannot be installed in bundles and must be protected in metal conduit. This type of cable is chosen as the minimum requirement for commercial installations.

Standard for Fire Resistance

Fire resistant cables are designed for maintaining circuit integrity during a fire. The IEC and the BS adopted two different standards, namely the IEC 60331 and BS 6387.Comparatively speaking, the fire performance requirement for BS 6387 is more demanding.

◎ IEC60331 Fire Resistance Test

A cable sample is placed over a gas burner and connected to an electrical supply at its rated voltage. Fire is applied for a period of 3 hours. The temperature on the cable is between 750℃ and 800℃. After 3 hours, the fire and the power is switched off. 12 hours later, the cable sample is reenergized and must maintain its circuit integrity.

◎ BS6387 Fire Resistance Test

BS6387 specifies the performance requirements for cables required to maintain circuit integrity under fire conditions. It details the following methods to categorize the cables according to cable withstand capacities.

Resistance to fire alone - the cables is tested by gas burner flame while passing a current at its rate voltage. Four survival categories are defined Cat A (3 hours at 650℃), Cat B (3 hours at 750℃), Cat C (3 hours at 950℃), and Cat S (20 minutes at 950℃).

Resistance to fire with water spray - a new sample of cable is exposed to flame at 650℃ for 15 minutes while passing a current at its rated voltage and then the spray is turned on to give exposure to both fire and water for a further 15 minutes. A single survival category W is defined if the cables surpassed the testing requirement.

Resistance to fire with mechanical shock - the final requirement is mechanical shock damage. A fresh sample is mounted on a backing panel in an S bend and is exposed to flames while the backing panel is stuck with a steel bar with the same diameter as the cables under test every 30 seconds for 15 minutes. The cables will be tested under the following temperatures: X (650℃ /15min), Y(750℃ /15min) and Z (950℃ /15min). The highest standard for BS 6387 is CWZ.

Horizontal Burning Test
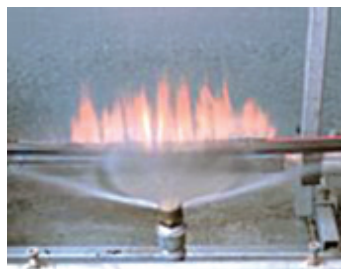
Water Spray Burning Test

Mechanical-Shock Burning Test

Fire Performance Standard

Standard for Halogen & Smoke Emission, Corrosivity & Toxicity

◎ IEC 60754-1/BS6425-1 (Emission of Halogen)

This specifies a test for determination of the amount of halogen acid gas other than the hydrofluoric acid evolved during combustion of compound based on halogenated polymers and compounds containing halogenated additives taken from cable constructions. Halogen includes Florine, Chlorine, Bromine, Iodine and Astatine. All these elements are toxic by their nature. In this test, when the burner is heated to 800℃, 1g sample is placed inside and the HCL is absorbed into water inside the chamber fed with air flow. The water is then tested with its acidity. If the hydrochloric acid yield is less than 5 mg/g, the cable specimen is categorized as LSZH. If the hydrochloric acid yield lies between 5mg/g to 15mg/g, the cable specimen is categorized as LSF. IEC60754-1 cannot be used for measuring the exact HCL yield if the yield is less than 5mg/g. This test cannot determine if the cable is 100% halogen free or not. To determine if the cable specimen is 100% halogen free or not, IEC60754-2 has to be employed.

◎ IEC 60754-2 (Corrosivity)

This test specifies a method for the determination of degree of acidity of gases evolved during combustion of the cable specimen by measuring its pH and conductivity. The specimen is deemed to pass this test if the pH value is not less than 4.3 when related to 1 litre of water and conductivity is less than 10us/min. When the HCL yield lies between 2mg/g and 5mg/g, a cable specimen can pass IEC 60754-1 but its pH value will likely be less than 4.3 and therefore cannot pass the IEC 60754-2 test.

◎ IEC 61034-1/ASTM E662 (Emission of Smoke)

This specifies a test for determination of smoke density. The 3 metre cube test measures the generation of smoke from electric cables during fire. A light beam emitted from a window is projected across the enclosure to a photo cell connected to a recorder at the opposite window. The recorder is adjusted to register from 0% for complete obscuration to 100% luminous transmissions. A 1 metre cable sample is placed in the centre of the enclosure and is applied with a fire. The minimum light transmission is recorded. The result is expressed as percentage of light transmitted. The specimen is deemed to pass this test (IEC61034-1 & 2) if the value is greater than 60%. The higher the light transmittance, the less smoke emitted during a fire.

◎ ISO4589-2/BS2863 (Oxygen Index LOI)

This is a test for assessing the oxygen index of the material in accordance with the test method specified in ASTM D2863-95 (Measuring the minimum oxygen concentration to support candle-like combustion of plastics). At room temperature when the oxygen content in the air exceeds the oxygen index, the material will burn by itself automatically. The higher the oxygen index, the more retardant the cable will be. For example, if the oxygen index of a material is 21%, it means that the material will burn by itself even at room temperature because at room temperature the normal oxygen content is 21%. In general, the oxygen index of a LSZH cables ranges from 33% to 42%.
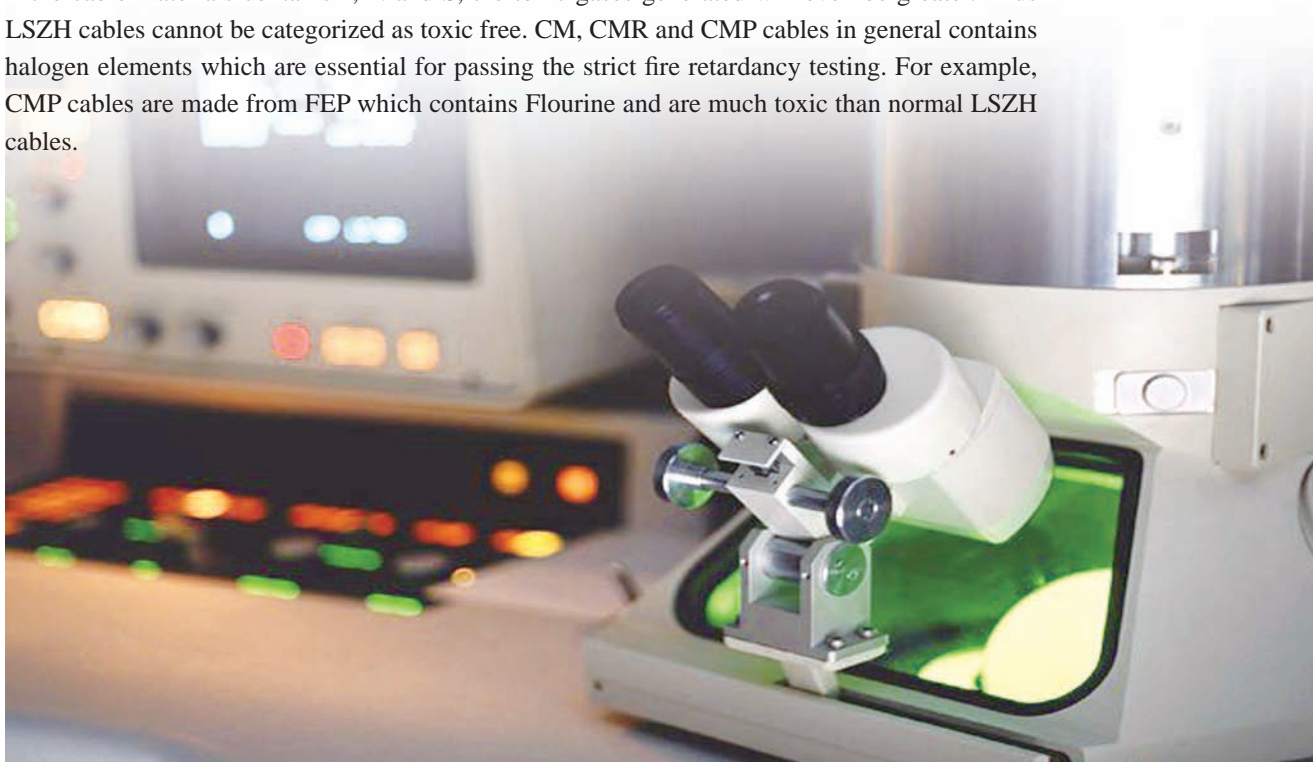
◎ ISO4589-3/BS2782.1 (Temperature Index TI)

This is a test for assessing the performance of a material when it is tested in accordance with BS2782 Part 1 Method 143A and 143B. The oxygen index of a material will drop when the temperature rises. When the temperature rises and the oxygen index drops to 21%, the material will burn automatically. This temperature is defined as temperature index. For example, the temperature index of coal is 50%. When the temperature climbs to 150℃, its oxygen index drop to 21% and the coal will burn by itself automatically. The temperature index of the coal will then be defined as 150 ℃. In general, the temperature index of LSZH cables ranges from 250 ℃ to 300℃.

◎ ES713 (Toxicity Index)

This is a test defined by Naval Engineering Standard which is a directed at the analysis of a specified set of gaseous species which are commonly present in the combustion products of materials used in military application and which may cause lethality at the time of a fire. In this test, a 1g cable specimen is completely burnt inside a sealed chambers of volume 0.7-1m3 using a burner fed with air and gas to give a non-luminous flame. The resulting chamber atmosphere is quantitatively analysed for a specified set of gases. For each gas, the measured concentration (C_i) is scaled up for 100g and the concentration is recalculated as though the combustion products is diffused into a volume of exactly 1m3. The resulting concentration (C_8) is expressed as the ratio of critical factor (C_f) which is equal to the concentration of this gas considered fatal to human for 30 minutes exposure. The ratio C_8/C_f is summed for all gases detected to give the toxicity index. The higher the toxicity index, the more toxic the cable materials is. In general, the toxicity index of LSZH materials are less than 5. LSZH cable will also emit toxic CO and if the cable materials contains P, N and S, the toxic gases generated will even be greater. Thus LSZH cables cannot be categorized as toxic free. CM, CMR and CMP cables in general contains halogen elements which are essential for passing the strict fire retardancy testing. For example, CMP cables are made from FEP which contains Flourine and are much toxic than normal LSZH cables.

ADDISON