

3M Telecommunications
Solutions for Networks



3MTM VolitionTM Class EA / Category 6A Cabling System



3M™ Volition™

Class E_A / Category 6A Cabling System

In less than 10 years, the speed of local area networks (LAN) has gone from less than 10 Mb/s to several Gigabits per second. Market specialists foresee LAN requirements accelerating and a progression in bandwidth of horizontal cabling, traditionally on copper cables.

The 10 Gigabit Ethernet standard* (10GBASE-T) for twisted pair copper cabling is now a reality. The new revisions of international standards** on cabling systems ISO/IEC 11801 and TIA/EIA 568B respectively define Class E_A and Category 6A cabling which both offer a bandwidth of 500 MHz.

These developments mean that companies are now able to put in place a high-speed fibre optic backbone and migrate towards higher speed copper cabling in the horizontal. Many LAN administrators plan to install high performance copper cabling systems which make it possible to support both present and future applications. Also Class E_A / Category 6A cabling is increasingly used in data centres where higher speeds are essential.

Volition Network Solutions from 3M comply fully and economically with the advances in copper cabling standards.

10 Gigabit per second copper cabling technologies

The IEEE 802.3an group chose a maximum frequency of 500 MHz which doubles the frequency range of the original Category 6/Class E which is specified up to 250 MHz. The IEEE group also defined a new electrical parameter for the channel which is "alien cross talk" (AXT). AXT is all the electrical noise created on a cable or an RJ45 jack by neighbouring cables and jacks.

The number one interference in 10GBASE-T is AXT, the effects of which disturb not only the cables, particularly in the cable routes, but also the RJ45 jacks, especially in patching racks where there are many adjacent links.

Volition Class E_A / Category 6A Solution

Volition Class E_A / Category 6A is designed for Class E_A and Category 6A on twisted copper pairs in compliance with the most recent ISO/IEC and TIA standards for Channel and Permanent Link configurations.

The Volition Class E_A / Category 6A Solution is differentiated by the unequalled reduction of the effects of AXT over the entire channel.

The solution is comprised of a complete range of new RJ45 jacks, twisted pair copper cables, 19" patch panels and RJ45 patch cables.

The Volition Class E_A / Category 6A solution fully meets the requirements of a 10 Gb/s local area network infrastructure.

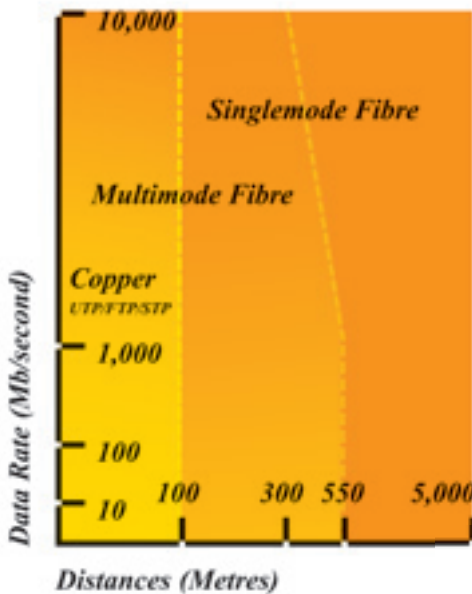
* Applications

IEEE 802.3an 10GBASE-T

** Reference standards

ISO/IEC 11801 Class E_A

TIA 568B.2-10 Category 6A



3M™ Volition™ RJ45 Jack





3M™ Volition™

Class E_A / Category 6A Cabling System

3M™ Volition™ Category 6A / Category 7 cables

The Volition Category 6A and Category 7 cables have been specially developed to ensure excellent immunity against AXT up to 500 MHz. All cables of Volition design have a general shield and/or screen per pair. Volition cables benefit from unequalled immunity to AXT (see Delta certificates).

Volition cables are easy to install and do not require any special installation precautions. Connection to the Volition K10 RJ45 jack remains simple and familiar. Pulling in the cables is easy, due to the fact that their outer dimensions are very close to the current Volition Category 6 cables. Volition cables are available with LSOH (Low Smoke Zero Halogen) sheath.

| Description Horizontal Cable | 3M reference |
|---------------------------------|------------------|
| 4 pairs Category 6A FTP LSOH | VOL-6AFL4 |
| 2x4 pairs Category 6A FTP LSOH | VOL-6AFL8 |
| 4 pairs Category 6A UFTP LSOH | VOL-6AUFL4 |
| 2x4 pairs Category 6A UFTP LSOH | VOL-6AUFL8 |
| 4 pairs Category 7 S/FTP LSOH | VOL-10SFL4 |
| 2x4 pairs Category 7 S/FTP LSOH | VOL-10SFL8 |

Comparative studies show that competing Category 6A UTP cables have outer diameters larger than those of current Category 6 cables or are non-round shape. Cabling techniques to reduce AXT between 10 Gigabit UTP cables consist of moving the pairs further apart, strengthening the outer sheaths, placing an insulator or separator between the pairs and increasing the twist. The outer diameter of Category 6A UTP cables is thus increased. Another technique consists of making Category 6A UTP cables oval to reduce the risk in cable routes of one pair being adjacent to another pair with the same twist. This makes the cables harder to install and the cable bundles larger.

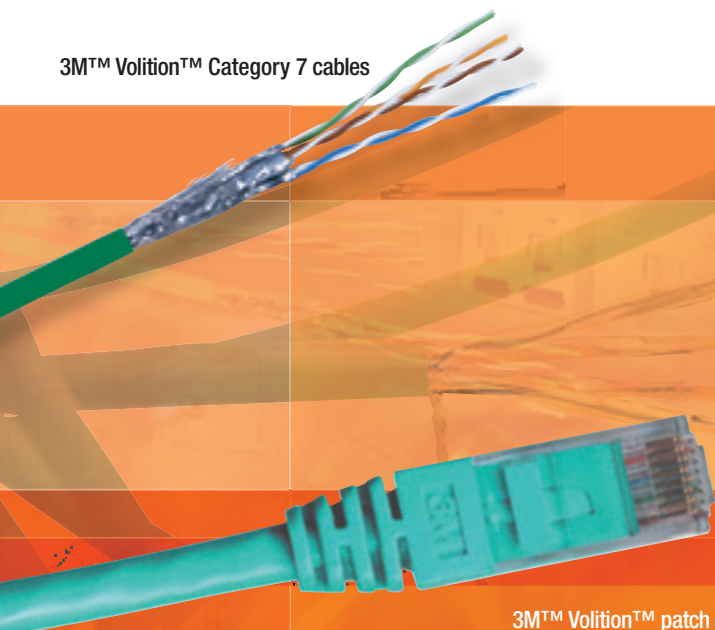
Volition patch cables

Volition patch cables have been specially designed to give excellent immunity against AXT up to 500 MHz, in particular to reduce the effect of AXT in patching racks where there are many adjacent links.

Volition patch cables have a general braid and a screen per pair. Volition patch cables benefit from unequalled immunity against AXT. Volition patch cables are available with LSOH (Low Smoke Zero Halogen) sheath.

| Description | In boxes of | 3M reference |
|--|-------------|---------------------|
| RJ45/RJ45 10G patch cord, SSTP LSOH turquoise cable length 1 m | 12 | VOL-10SFL-L1 |
| RJ45/RJ45 10G patch cord, SSTP LSOH turquoise cable length 2 m | 12 | VOL-10SFL-L2 |
| RJ45/RJ45 10G patch cord, SSTP LSOH turquoise cable length 3 m | 12 | VOL-10SFL-L3 |
| RJ45/RJ45 10G patch cord, SSTP LSOH turquoise cable length 5 m | 6 | VOL-10SFL-L5 |

3M™ Volition™ Category 7 cables



3M™ Volition™ patch cables



Volition patch panels

Volition patch panels are modular and can accommodate up to 24 RJ45 ports in one unit of rack space (1U). Their modular design makes them easy to install on site in 19" racks. All Volition patch panels have an earth stud which permits continuity of earth with the RJ45 K10 jacks.

| Description | In boxes of | 3M reference |
|--|-------------|--------------|
| Panel for 16 ports, keystone not fitted, 1U, brushed alu | 1 | VOL-PPCAF16K |
| Panel for 24 ports, keystone not fitted, 1U, brushed alu | 1 | VOL-PPCAF24K |
| Panel for 32 ports, keystone not fitted, 2U, brushed alu | 1 | VOL-PPCAF32K |
| Panel for 48 ports, keystone not fitted, 2U, brushed alu | 1 | VOL-PPCAF48K |
| Panel for 16 ports, keystone not fitted, 1U, black alu | 1 | VOL-PPCBF16K |
| Panel for 24 ports, keystone not fitted, 1U, black alu | 1 | VOL-PPCBF24K |
| Panel for 32 ports, keystone not fitted, 2U, black alu | 1 | VOL-PPCBF32K |
| Panel for 48 ports, keystone not fitted, 2U, black alu | 1 | VOL-PPCBF48K |

Volition extended 20 year warranty

3M Telecommunications offers an extended 20 year warranty for the entire range of components in the Volition Class E_A / Category 6A system.

3M Telecommunications guarantees the electrical performance of the Volition Class E_A / Category 6A solution in relation to the specifications ISO/IEC 11801 and TIA/EIA 568B for cabling systems of the new Class E_A and Category 6A in compliance with the standards ISO/IEC 11801 and TIA/EIA 568B for Channel and Permanent Link configurations.

Advantages of the Volition Class E_A / Category 6A solution

The new Volition Class E_A / Category 6A solution has been designed in compliance with Class E_A and Category 6A ISO/IEC and TIA standards for Channel and Permanent Link configurations.

The Volition Class E_A / Category 6A is differentiated by the unequalled reduction of the effects of AXT on its entire channel.

It offers double the bandwidth of the current Category 6 / Class E cabling.



3M™ Volition™ patch panel





| Electrical parameters (typical values) 11801 | Margins "Permanent Link" Amendment 2 ISO/IEC 11801 2 nd edition: 2002 "Class E _A " | Margins "Channel" Amendment 1 ISO/IEC 2 nd edition: 2002 "Class E _A " |
|---|--|---|
| Insertion Loss | 4 % | 7 % |
| NEXT | 2 dB | 3 dB |
| PSNEXT | 2.5 dB | 4 dB |
| ACR-F | 7 | 8 |
| PSACR-F | 9 | 10 |
| Return Loss | 3 dB | 6,5 dB |

3M

The Volition™ solution is an innovation from the 3M Telecommunications Laboratories. 3M is the fifth largest brand in the world and is renowned for its commitment to research and development and its sense of innovation. The Volition Class E_A / Category 6A solution has been specially designed for 10 Gigabit Ethernet connections on twisted pairs (10GBASE-T) in compliance with cabling systems standards ISO/IEC 11801 and TIA/EIA 568B for Class E_A and Category 6A.

The Volition Class E_A / Category 6A solution is an innovation which has been patented by the 3M Telecommunications Laboratories.

Advantages of 3M Telecommunications

3M Telecommunications has dedicated more than 40 years of study to designing and improving networks. 3M continues to follow the evolution of information technology and to develop high performance solutions which meet the increasing need for bandwidth. Thanks to its network of branches in 60 countries in the world, 3M is in a position to offer world class service support on three levels: certified installation training, assistance with the design of networks and on-site assistance with installation.





**3M Telecommunications
Europe, Middle East & Africa
c/o 3M Deutschland GmbH**

Carl-Schurz-Str. 1
D-41453 Neuss
Germany

Tel.: ++49(0)2131/14-5999

Fax: ++49(0)2131/14-5998

Internet: www.3MTelecommunications.com/eu

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