

Cat6 Overview and Testing Document

What is Category 6?

Unlike earlier cabling standards Category 6 is a 200MHz classification. The Category 6 standard is an integral part of the 2nd editions of the ISO 11801, TIA 568A and En5017. Initially there were only two parameters proposed for Category 6. These were that any Category 6 solution must use the existing RJ45 plug and jack format. The second was that the Powersum ACR must be positive to 200 MHz. As the standards have developed, additional parameters have been added. These standards continue to be developed and represent the pinnacle of performance for structured cabling systems.

The intention behind the Category 6 standard is to provide the state-of-the-art 4-pair cabling system. The different and more stringent handling requirements for Category 6 components demand additional training, even for installers well used to the demands of Category 5e installation practices. Time, care and a high level of technical expertise are essential when installing Category 6. Even slight variations in the termination of links can have a massive effect on the overall performance of the system. It is for these reasons, that it is essential to select an installer who has an existing track record of successfully installing Category 6. With the comprehensive backing of Molex, under the Certified Installer (CI) program, SMT has the experience and track record you need to be sure that your Category 6 solution will perform for you now and in the future.

Category 6 Consortium Participant's Product Information

* TIA Engineering Committee Participant Only
** TIA Member and Engineering Committee Participant
Avaya**
KRONE, Inc.**
Berk-Tek**
Leviton Voice & Data Div.**
Commscope**
Mohawk/CDT*
Suttle
Molex, Inc.*
Draka Comteq*
Nordx/CDT*
Fluke Networks**
Ortronics**
General Cable**

Panduit**
Graybar**
RiT Technologies**
Hellermann Tyton**
The Siemon Company**
Hitachi Cable Manchester Inc.*
Superior Modular Products*
Hubbell Premise Wiring*
Superior TelecommuniCations, Inc.
Ideal Industries**
Tyco Electronics/AMP
NETCONNECT**
Intertek Testing Service**
UL, Underwriters Laboratories, Inc.*
Xmultiple*

Why do I need all the bandwidth of category 6?

There are few applications today that require 200 MHz of bandwidth.

Bandwidth precedes data rates just as roads come before the cars that travel them. . Therefore doubling the bandwidth is like adding twice the number of lanes on a highway. The trends of the past and the predictions for the future indicate that data rates have been doubling every 18 months. Current applications running at 1 Gb/s are really pushing the limits of Category 5e cabling. As streaming media applications such as video and multi-media become commonplace, the demands for faster data rates will increase and spawn new applications that will benefit from the higher bandwidth offered by Category 6. This is exactly what happened in the early '90s when the higher bandwidth of Category 5 cabling compared to Category 3 caused most local area network (LAN) applications to choose the better media to allow simpler, cost effective, higher speed LAN applications, such as 100BASETX. It is also important to note that cabling infrastructure is generally considered a 10 year investment as opposed to two or three years for electronics. Work considered. With additional throughput requirements right around the corner, it makes sense to plan ahead. *Note: Bandwidth is defined as the highest frequency up to which positive power sum ACR (attenuation-to-crosstalk ratio) is greater than zero.*

TESTING

Xmultiple uses outside third party labs for all cable testing. China and Taiwan have many testing facilities which can certify that a Cat 6 connector complies with TIA-568.

Testing facilities such as UL and Intertek/ETL SEMKO provide assessment services for various Xmultiple connector and component products as well. In addition, tester manufacturer participates in programs with these facilities. These services are much wider in scope than simply verifying the accuracy and calibration of a particular

testing device. Calibration services are also part of the services provided by these third party labs.

In regards to the Xmultiple connectors certified for Category 6. These connectors are tested in Category 6 systems which are installed in the third party labs. Both channel and permanent testing are part of these tests with the Xmultiple connectors. Cat 6 channel testing is still in the standard. This test is performed for Xmultiple connectors to be certified to the CAT6 standards. The certification is issues relating to the installation, bend radius of the cable, etc.. These CAT6 tests are also effected by the correct design of all the elements in the CAT6 cabling facility in which the testing takes place.

You should expect to get passing results if both the link adapter interface and the mating jack which is part of the link are both compliant to Category 6 requirements. This is true of the Xmultiple connector testing.

Category 6 system testing equipment is manufactured by many companies. The highest performance level of testing equipment is used in our Xmultiple test. We conduct two test with different equipment to make our certification with "field tester A" and a "field tester B" used at the site and to perform the channel and Xmultiple connector test. The result between the two equipment testing devices should have the same results and pass all testing. There is some differences usually experience between different testers.

There may be calibration differences between the testers. Our engineers and the third party laboratory engineers look at the detailed results for each tester. It may be that the channel configuration is just barely passing with tester B and with tester A the test is passing at a high level. If this happens during the test, our engineers will determine why tester B is not at the same level as tester A. All test equipment has a level of accuracy and repeatability. These levels are stated in the tester documentation. Also with Cat 6 cabling, the magnitude of many parameters being measured is much lower than that of Cat5e. The measurement frequency range is also much wider. So while it may appear that two testers have greatly different results (in dB), the total difference may be less than the Level III accuracy requirements.

Conclusion:

Xmultiple connectors and components are tested with third party assistance. CAT6 is one of the highest levels of standards for copper wire being used in networking systems. The communications industry has wrongly predicted copper's barrier of obsolescence for more than 30 years. Each time we drew a line in the sand and said this is the maximum; we were swept aside by the awesome technical developments of the communications cabling industry and all of its related infrastructure providers. With the emergence of 10MB over copper wire this, media is more important than ever.