

Center Tuned Components - Are you getting the best component performance?

Component Compliance

ANSI/TIA-568-C.2 describes the methods and procedures for verifying component compliance of category level connectors, plugs and cable. For those who are not experts in testing, these procedures can be very difficult to understand. Recent discussions and even litigation have brought to light the serious life safety risks and transmission performance deficits of non-compliant and counterfeit cables that do not comply with standards. Yet, rarely do we discuss the performance implications associated with having connectors or plugs that are not component compliant.

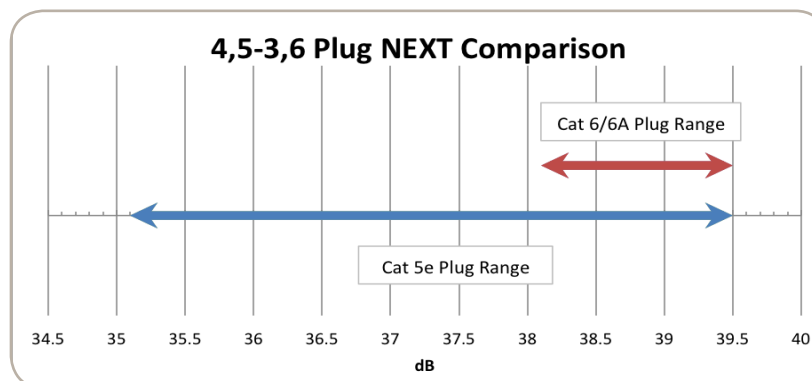
The ANSI/TIA-568-C standards dictate the category performance of the connector and plug based on several parameters including Far End Cross Talk (FEXT) and Return Loss (RL). In addition, the standard outlines very specific procedures to verify Near End Cross Talk (NEXT) requirements for component compliance. Testing for connectors is typically conducted utilizing a test plug which is centered for NEXT performance. The test plug can be thought of as perfect embodiment of a patch cord plug and measures the performance of the connector as though it were placed in a channel. For most pair combinations of a connector's NEXT measurement, there are additional defined plug values, which need to be used. One is higher than the centered test plug, and the other is lower than the centered test plug. These plug values are shown in Table 1. The tested connector must meet or exceed the crosstalk requirements when evaluated with these high and low plug values.

Table 1: Cat6A Test Plug Values @ 100MHz

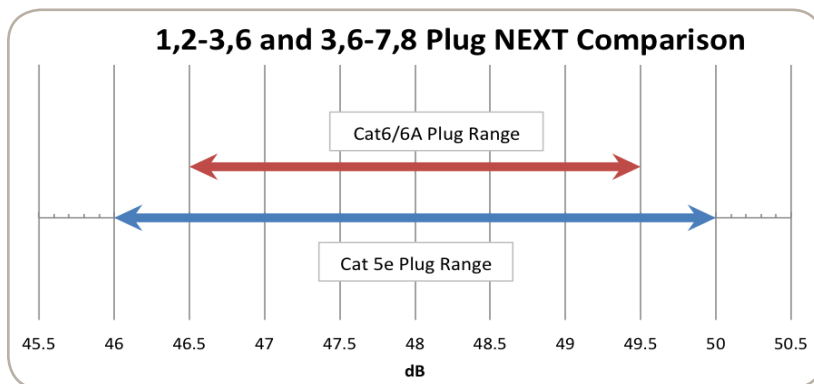
PAIR COMBINATION	LOW PLUG VALUE	HIGH PLUG VALUE
4,5-3,6	38.1 dB	39.5 dB
1,2-36 and 3,6-7,8	46.5 dB	49.5 dB
4,5-12 and 4,5-7,8	57.0 dB	70.0 dB
1,2-7,8	66.0 dB	N/A

A Little Background

The reason for the plug ranges is a matter of history. When the Category 5 standard was being developed, OCC's laboratory (one of the first to incorporate computer controlled test systems) measured a large number of plugs available at that time. The results were analyzed statistically and the high and low ranges were agreed upon by the TIA 42.7 Copper Cabling Systems Sub-Committee. As technology progressed and frequencies increased, the ranges were tightened and refined. To maintain backwards compatibility, the tighter, higher category plug values had to be a subset of the lower category plug values. (See figures below).



Center Tuned Components - Are you getting the best component performance?



The process has changed slightly during the development of TIA-568-C.2, where the mated performance with limit plugs can be derived mathematically. However, verification of the performance with the high and low limit “plugs” is still required.

Why is this so important?

Any connector or jack design must compensate for the NEXT of the plug if the application is to work properly over the channel. The only trouble is, the plug can have a NEXT measurement in the range of any values shown in Table 1. For a connector to work with both the low and high plug values, the compensation technology must aim for the center of the two. A jack which attempts to compensate only a low plug will certainly miss the mark with the high plug, and vice versa. A balance must be struck between the two. A jack that is not Center Tuned and component compliant will degrade the performance of any system into which it is installed. Choosing a Center Tuned component will ensure that the customer's system will maintain exceptional performance no matter which patch cord is plugged into it, or whose cable is installed. This gives the customer maximum flexibility while still maintaining the transmission performance required by the application.

Being Center Tuned

Because all OCC copper components are tuned to the center of the Test Plug compliance (ANSI/TIA-568-C.2, Annex C), they offer complete interoperability. This means that if you mate an OCC connector to a plug that is tuned to the high or low plug values of the defined spectrum, the mated connection will still pass the mated NEXT limit for connecting hardware. In many cases, this design allows OCC components to improve the performance of a system. As an added benefit to being Center Tuned, OCC components perform better at shorter lengths as well as typical 90 and 100 meter testing lengths. And because we manufacture to this industry standard as well as our own stringent requirements, our products are consistent and provide performance margin well above customer expectations. In addition, you get the benefit of a USA made product – which can help with ARRA and Buy America initiatives that have been put in place domestically.

