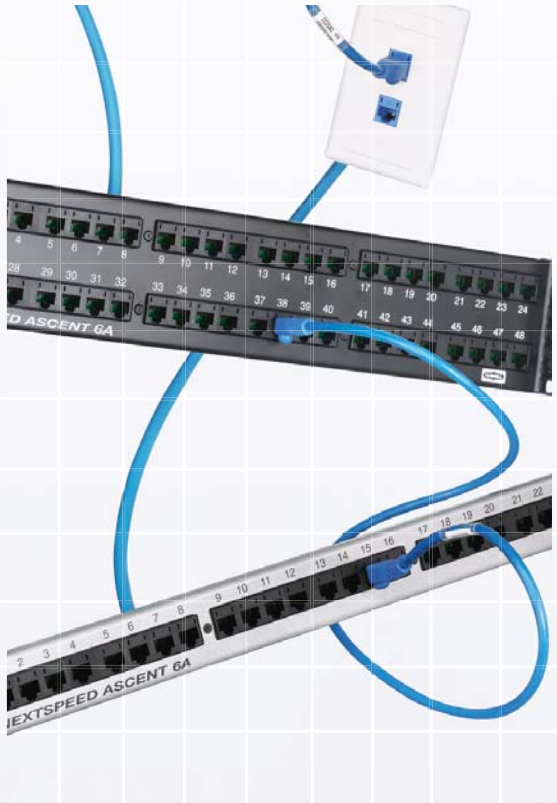
Hi Plug Lo Plug - Getting Component Performance

publication

technology



Hubbell Premise Wiring

Hi Plug Lo Plug!
Are you Really Getting Component Performance?

Plugs in low places…

Customers have always inquired about component testing and what is the real meaning of a High or Low test plug when looking at NEXT data. This test procedure and its meaning is not very obvious, it is quite cryptic and is tucked away in the back of the TIA 568-C standards documentation. However, the test procedure is very critical to the performance of the RJ45 and its category rating.

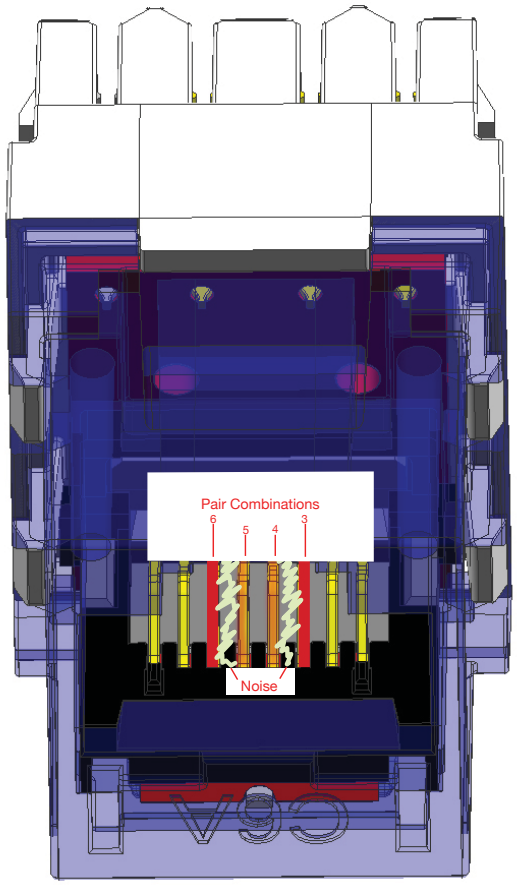
So what is it all about?

The answer turns out to be quite simple and is the pivotal point defining our entire industry… or at least the RJ45 portion of it. The high and low limit values refer to the upper and lower levels of allowable plug noise (NEXT) generated between two pairs. A component compliant jack is required to meet the specified category performance with all plugs at or between these defined limits. (see figure 1)

figure 1

Pair Combination	Low Plug (Maximum Noise)	High Plug (Minimum Noise)
3,6-4,5	-38.1 dB (12.4 mV)	-39.5 dB (10.6 mV)
1,2-3,6 and 3,6-7,8	-46.5 dB (4.7 mV)	-49.5 dB (3.3 mV)
1,2-4,5 and 4,5-7,8	-57 dB (1.4 mV)	-70 dB (0.3 mV)
1,2-7,8	-66 dB (0.5mV)	N/A dB

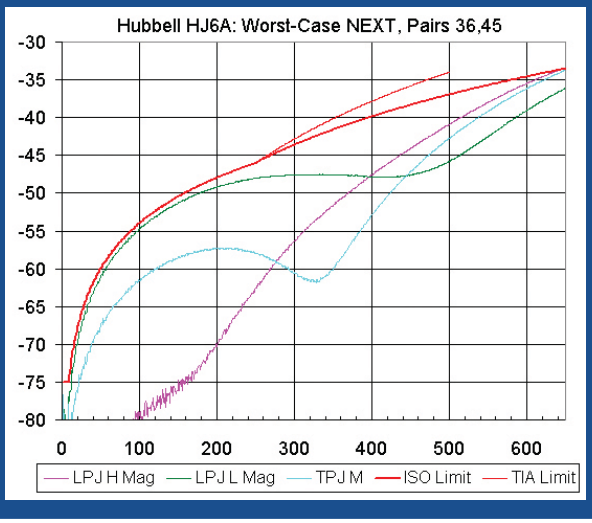
Category 6A plug is defined by the above limits by pair combinations at 100 MHz.



Why is this so important?

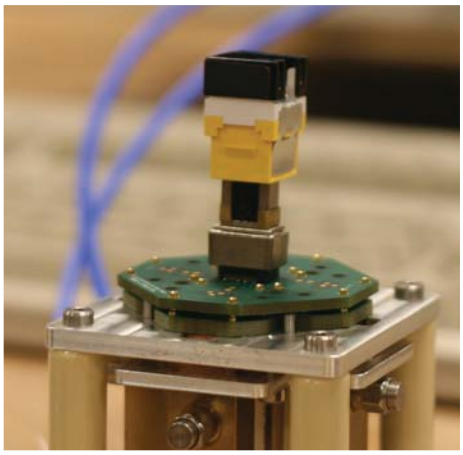
A manufacturer designing a jack compensating for noise in the plug has to know how much noise they are trying to cancel out. Think of it as an old fashioned scale, where balance is only achieved if both sides of the scale contain equal mass. A C6A Jack needs to maintain at least –54 dB @ 100 MHz (less than 2 mV of noise) for all of the above values and pair combinations. Having components that do not meet these specified levels, leaves the customer unsure of exactly what they are getting or most importantly how it is going to work when the application (10GBASE-T) is transmitting over the infrastructure. Having components that are compatible or channel rated does not mean that the connections meet these stringent limits. Compliance with the whole range of plugs ensures backward compatibility with C5e and C6, interoperability between manufacturers and provides assurance that the installed cabling will be usable with any active equipment manufacturer's product.

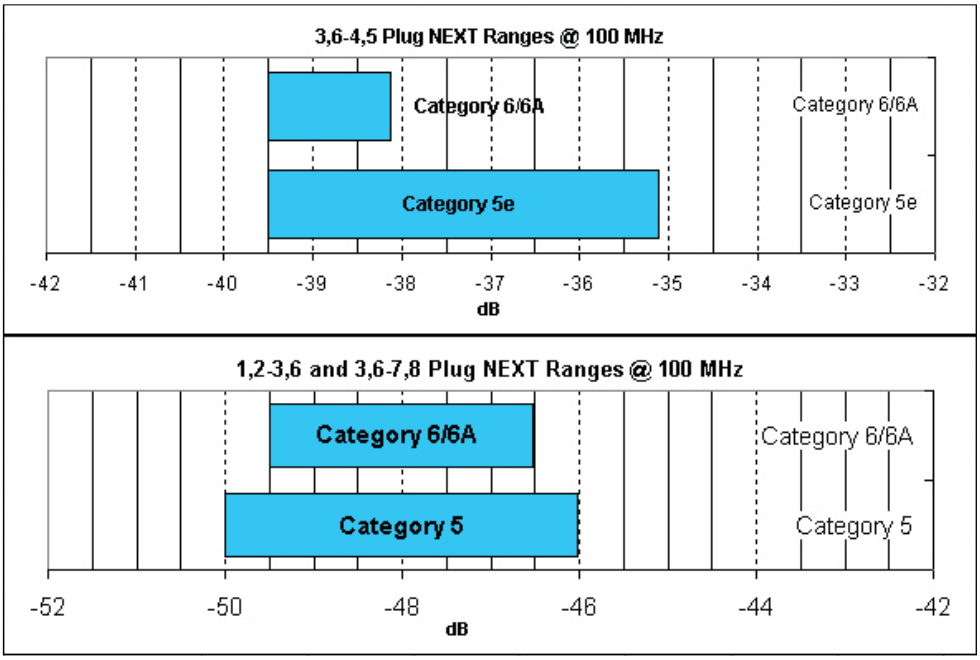
HJ6A Worst Case NEXT.
Pair Combination 3,6 - 4,5



Background Check…

The test procedure originated during the development of Category 5, where the committee evaluated many of the commercially available "typical" RJ45 plugs in order to establish the expected range of crosstalk. The range of crosstalk varied so vastly that the committee was forced to develop a specification for RJ45 category rated plug parameters. As the market migrated to higher categories the ranges became much tighter allowing for better connector performance when mated with their respective plugs. However, in order to maintain backward compatibility, the ranges were chosen to be subsets of previous category ranges (See figures below).





The process has changed slightly during the development of TIA568-C.2, where the mated performance with limits plugs can be derived mathematically. However, verification of the performance with the limit "plugs" is still required.

Okay, so…

When a manufacturer publishes a report of the worst case NEXT performance values, you should always look to see if the mated performance is with the worst-case plug values (High and Low). This proves that the manufacturer's connector was designed to cancel out the NEXT with all standard compliant plugs, providing true component compliance and interoperability.

Plug defines component, ensures compliance, backward compatibility and open architecture.
Always Ask for a 3rd Party verified test report confirming manufacturers claims!

NEXTSPEED® Ascent Category 6A Jacks

The NEXTSPEED® Ascent Category 6A jack exceeds TIA and ISO Category 6A component specifications, delivering extended bandwidth and reliability for all LAN, multimedia and Power over Ethernet applications.

Delivery: 1 per Bag/Carton of 25.				25 per Bag/Carton of 1			
Catalog No.	**HJ6AXX**	✓10G	✓6A	Catalog No.	**HJ6AXX25**	✓10G	✓6A

XX = See Jack Color Options below.

AL=Almond	**BK**=Black	**B**=Blue	**EI**=Electric Ivory	**GL**=Gold	**GY**=Gray	**GN**=Green	**LA**=Light Almond
OW=Office White	**OR**=Orange	**P**=Purple	**R**=Red	**TI**=Telco Ivory	**W**=White	**Y**=Yellow	

NEXTSPEED® Ascent, Category 6A, Component Patch Panels

The **NEXTSPEED®** Ascent Category 6A Panels are third party verified for TIA and ISO Category 6A component specifications and are the perfect solution for the datacenter delivering extended bandwidth and reliability for all IEEE Ethernet applications.

Format	Width	Color	Catalog No.		
Standard	19" (483)	Black	**HP6AXXU**	✓10G	✓6A
Standard	19" (483)	Silver	**HP6AXXUS**	✓10G	✓6A
Angled	19" (483)	Black	**HP6AXXAU**	✓10G	✓6A

Replace "**XX**" with port size: "**24**" = 24 ports; "**48**" = 48 ports

NEXTSPEED® Ascent Category 6A Patch Cords

Color: Gray

Catalog No.	**HC6AxxYY**	✓10G	✓6A

xx = Standard Color:
"**B**" = Blue; "**GY**" = Gray For other colors replace color designation with one of the following:
OR = Orange, **R** = Red, **GN** = Green, **P** = Purple, **W** = White

YY = Standard Length:
"0**1**" = 3'; "**03**" = 3'; "**05**" = 5'; "**07**" = 7'; "**10**" = 10'; "**15**" = 15'; "**20**" = 20'.
MTO lengths: 25', 30', 35', 40', 45', 50', 55', 60', 75', and 100'.

NEXTSPEED® Ascent Category 6A Cable

Color	Catalog No. Riser Spool (1000' length)			Catalog No. Plenum Spool (1000' length)		
Blue	**C6ASRB**	✓10G	✓6A	**C6ASPB**	✓10G	✓6A
Gray	**C6ASRGY**	✓10G	✓6A	**C6ASPGY**	✓10G	✓6A
White	**C6ASRW**	✓10G	✓6A	**C6ASPW**	✓10G	✓6A
Yellow	**C6ASRY**	✓10G	✓6A	**C6ASPY**	✓10G	✓6A

NEXTSPEED® Ascent Category 6A Trunk Cable Assemblies

BIDnet™ Pre-Terminated Cable Assemblies are Make-to-Order items. Please call our Inside Sales Team for lead-time and availability. ✓10G ✓6A

- 100% tested.
- High performing factory terminations eliminate installation labor and preparation.
- Balanced, pre-terminated cable assemblies provide improved channel performance.

NEXTSPEED® Ascent Category 6A Field Termination Kits

Description*	Catalog No.		
64-Pair Kit with legs and 16 connecting blocks*	**6110FTK64WL**	✓10G	✓6A
64-Pair Kit w/o legs and 16 connecting blocks*	**6110FTK64NL**	✓10G	✓6A
192-Pair Kit with legs and 64 connecting blocks*	**6110FTK192WL**	✓10G	✓6A

* 6-110, 4-pair connecting blocks.

See page E14 for more information.

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