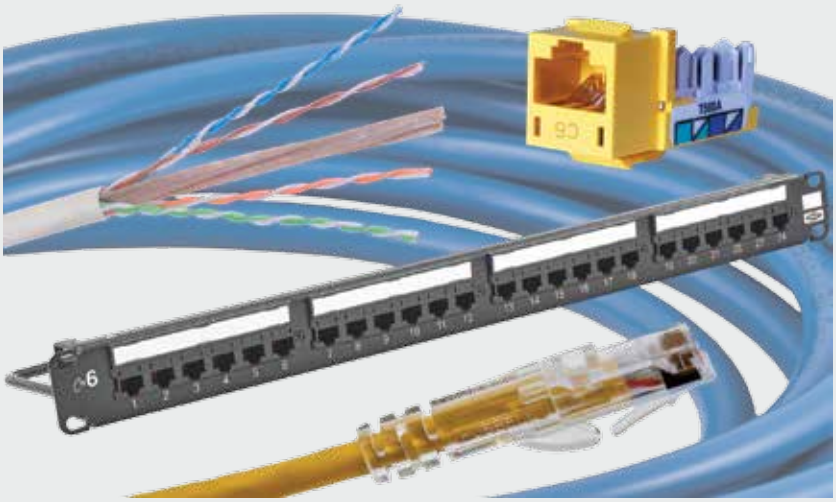
HUBBELL NEXTSPEED Category 6 Channel System

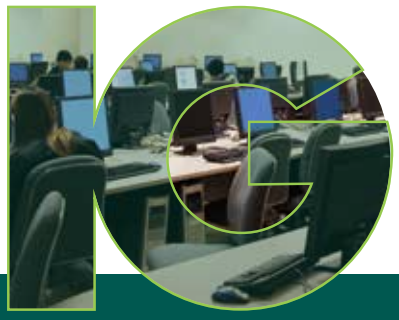
Cat 6

- Third Party Verified Category 6 Component
- Exclusive 1-Punch Termination Reduces Termination Time by 75%
- PoE+ Ready
- Bulk Packaging Reduces Excess Waste on the Job



Intertek

The NEXTSPEED® Category 6 system is designed to deliver headroom beyond 500MHz for dependable Multi-gigabit Ethernet applications. NEXTSPEED's extended bandwidth provides reliability with zero bit error rate performance for today's high speed digital communications.



Features

- Guaranteed installed 4-connector channel PSACR performance 8dB above Category 6 channel requirements on all Category 6 System registered installations*
- Minimum channel capacity of 10 Gbps maximizes dynamic performance for real world applications when qualified per TSB-155
- Maximum bandwidth allows for more than four connectors in a channel, exceeding all Category 6 channel requirements
- MISSION CRITICAL® 25-year system warranty

Applications

- 1000BASE-T
- PoE and PoE+
- VoIP
- Real time video

Standards/Verifications

- Supports IEEE 1000BASE-T
- Bit error rate tested ($\leq 1*10^{-10}$)
- ANSI/TIA-568-C.2 Category 6 component, link and channel compliant
- Third party verified, Intertek Testing Services (ETL)
- Backward compatible Category 5e

CISCO PARTNER Technology Developer

Hubbell is a Solution Developer Partner within the Cisco Developer Network Program

**Field verification by Hubbell approved handheld testers, attenuation measurements are excluded. All projects must be installed and registered by a HPW MCCI (MISSION CRITICAL Certified Installer). Accuracy level of handheld tester + 3dB.*

NEXTSPEED Category 6 Channel System

The Significance of Bit Error Rate (BER)

- Network support for existing and emerging technology
- Clean, error-free data transmission
- Provides noise reduction and immunity
- Return on investment
- Total cost of ownership

BER Test Results for NEXTSPEED® 6 Channel Active Testing

	NEAR-END[1]		FAR-END[1]	
Frame Size	64	1518	64	1518
Tx Frames[2]	10,037,068,049	11,791,614,540	10,037,044,035	11,791,619,271
Rx Frames[2]	10,037,044,035	11,791,619,271	10,037,068,049	11,791,614,540
Rx Bytes	642,370,818,240	17,899,678,053,378	642,372,355,136	17,899,678,871,720
CRC Errors[3]	0	0	0	0
Oversize	0	0	0	0
Frag/Undersize	0	0	0	0
BER ($\leq 1*10^{-10}$)	0	0	0	0

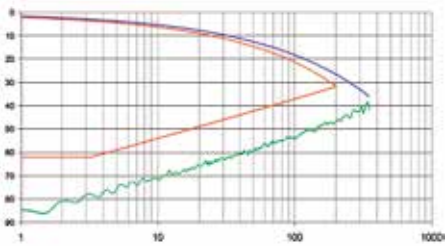
[1]Near-End and Far-End designations selected arbitrarily to distinguish the two ends of a system.
[2]Tx = Transmitted, Rx = Received
[3]CRC: Cyclic Redundancy Check

The Significance of PSACR

PSACR

Today, most applications operate under the 100MHz ceiling, however, as technology continues to push the bandwidth envelope, NEXTSPEED® Category 6 provides positive PSACR well beyond the Category 6 requirements, providing support for emerging applications.

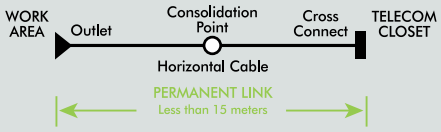
19dB above Category 6 Channel Requirements @100MHz



- Unsurpassed signal to noise ratio
- Greater network efficiency
- High bandwidth capacity
- Seamless network convergence
- Future-proofing

The Short Link Phenomenon

"Short Link" problems are typically defined as 15m or less, with multiple connections in close proximity. These connections, if unbalanced, create additional Near-End Crosstalk (NEXT) due to resonance effects. This resonance phenomenon is directly related to the overall Return Loss (RL) or balance of the end-to-end link.



The NEXTSPEED® Category 6 System combines Hubbell's "center balanced" Category 6 connectivity with optimally matched Category 6 enhanced cabling to provide exceptional Category 6 link/channel performance from 5 to 90 meters.

Channel Margin Guarantees*

Parameter	Margin vs. TIA-568-C.2
Insertion Loss	3%
NEXT	4db
PSNEXT	5db
ACR	4db
PSACR	5db
Return Loss	4db
ACRF	6db
PSACRF	7db
PSANEXT	4db
PSAACRF	4db

Standards

Intertek

- ETL verified to TIA-568-C.2 Category 6 component compliant
- IEEE 802.3an
- IEEE 802.3at
- UL Listed 1863

**Channel margin guarantees are based on third party testing, field testing and in-house laboratory testing. Field test results of each channel may vary, depending upon installation, tester accuracy and overall system design. All channel margin guarantees are based on 4-connector channel configurations.*

Comprehensive Warranty Coverage and Support

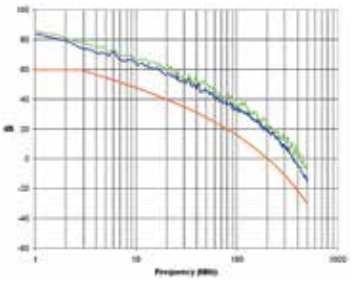
Hubbell 10G Systems provide comprehensive coverage for applications and performance headroom, along with training and support services:

- Independent third party (ETL) verified performance
- System must be registered and installed in accordance with Hubbell's Mission Critical® warranty program
- PoE+ application assurance
- Backward compatibility
- Trained, qualified network of design-install partners
- BIM models (available on Autodesk® Seek; visit seek.autodesk.com)

Cat 6

TIA Spec · Average · Worst Case

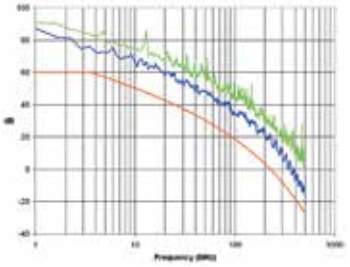
Power-Sum ACR (PSACR)



PSACR: Difference between the attenuation and the Power-Sum NEXT at a given frequency (signal to noise ratio). Available bandwidth is the point where PSACR is equal to zero.

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	83.7	85.2	59.7
10.0	65.0	67.0	47.9
31.3	50.4	52.6	34.5
62.5	40.4	45.1	24.2
100.0	33.6	35.8	15.9
155.0	25.9	30.6	6.6
200.0	18.3	21.2	0.3
250.0	14.0	18.2	-5.8
350.0	2.6	9.4	-16.4
500.0	-15.5	-9.6	-30.2

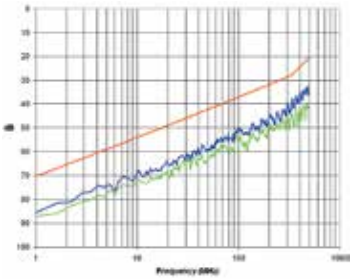
Attenuation to Crosstalk Ratio (ACR)



ACR: Difference expressed in dB between the signal attenuation produced by a cable and the near-end crosstalk (NEXT).

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	87.4	90.9	60.0
10.0	67.9	74.0	50.5
31.3	53.2	62.3	37.2
62.5	42.5	59.2	27.0
100.0	35.2	43.3	18.7
155.0	29.8	36.8	9.5
200.0	21.8	34.4	3.3
250.0	15.3	24.4	-2.8
350.0	3.5	18.2	-13.4
500.0	-16.3	-1.3	-27.1

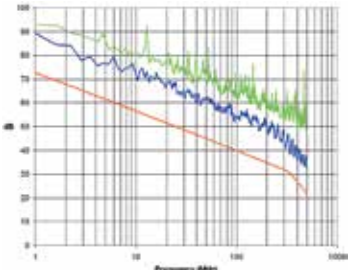
Power-Sum Near-End Crosstalk (PSNEXT)



PSNEXT: The unwanted signal coupling from multiple transmitters at the near-end into a pair measured at the near-end.

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	85.5	87.1	70.3
10.0	70.5	72.6	54.2
31.3	60.9	62.8	45.8
62.5	55.2	59.8	40.6
100.0	50.6	54.9	37.1
155.0	50.6	54.9	33.8
200.0	45.8	49.1	31.9
250.0	46.4	49.8	30.2
350.0	41.9	47.6	26.9
500.0	31.8	37.8	20.4

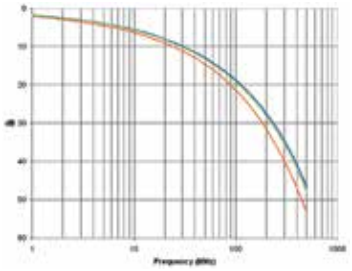
Near-End Crosstalk (NEXT)



NEXT: The noise coupled from one pair onto another pair at the near-end.

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	89.3	89.3	72.7
10.0	73.6	74.7	56.8
31.3	63.4	66.2	48.5
62.5	57.1	62.0	43.4
100.0	54.8	57.8	40.0
155.0	54.5	54.5	36.7
200.0	50.1	54.1	34.8
250.0	47.7	53.1	33.1
350.0	42.8	49.6	29.7
500.0	32.6	42.7	22.0

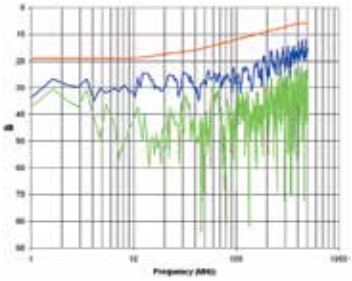
Attenuation



Attenuation: The decrease in magnitude of transmission signal strength between points, expressed in dB as the ratio of output to input signal level.

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	1.8	1.9	2.1
10.0	5.5	5.6	6.2
31.3	10.0	10.3	11.3
62.5	14.5	14.8	16.4
100.0	18.7	19.1	21.2
155.0	23.7	24.3	27.2
200.0	27.4	28.0	31.5
250.0	31.0	31.8	35.9
350.0	37.7	38.7	43.5
500.0	46.8	48.0	53.4

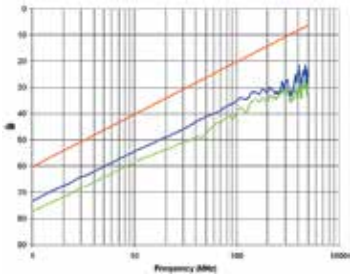
Return Loss



Return Loss: Ratio of the signal reflected back at the transmitter relative to the original signal sent. In a full duplex application, like 1000BASE-T, significant Return Loss can cause network errors.

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	33.9	37.2	19.0
10.0	31.0	43.6	19.0
31.3	24.4	47.0	16.5
62.5	25.0	36.0	14.1
100.0	26.2	45.0	12.0
155.0	21.0	37.8	10.1
200.0	24.7	41.3	9.0
250.0	16.8	45.2	8.0
350.0	15.4	42.4	6.6
500.0	16.1	44.0	6.0

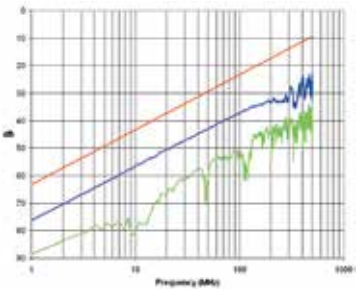
Power-Sum Equal Level Far-End Crosstalk (PSELFEXT)



PSELFEXT: A computation of the unwanted signal coupling from multiple transmissions at the near-end into a pair measured at the far-end and normalized to the received signal level.

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	73.4	77.3	60.3
10.0	54.7	58.9	40.5
31.3	45.6	50.8	30.4
62.5	39.7	43.8	24.4
100.0	35.1	39.4	20.3
155.0	31.9	34.8	16.5
200.0	32.0	35.8	14.2
250.0	31.8	33.5	12.3
350.0	31.7	34.3	9.4
500.0	23.3	31.5	6.3

Equal Level Far-End Crosstalk (ELFEXT)



ELFEXT: A measure of the unwanted signal coupling from a transmitter at the near-end into another pair measured at the far-end and relative to the received signal level.

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	76.2	88.6	63.3
10.0	56.9	81.1	43.5
31.3	46.7	60.3	33.4
62.5	41.0	53.1	27.4
100.0	37.4	52.8	23.3
155.0	34.1	44.0	19.5
200.0	33.2	45.4	17.2
250.0	33.0	43.4	15.3
350.0	33.6	42.0	12.4
500.0	24.6	40.5	9.3

Jacks, NEXTSPEED® Category 6

The XJ6 jack supports data center 10GbE applications to 55 meters with usable bandwidth exceeding 500 MHz.

Color	Catalog No.	Color	Catalog No.
Black	**HXJ6BK**	Office White	**HXJ6OW**
Blue	**HXJ6B**	Purple	**HXJ6P25***
Gold	**HXJ6GL25***	Red	**HXJ6R**
Gray	**HXJ6GY**	White	**HXJ6W**
Green	**HXJ6GN**	Yellow	**HXJ6Y**

*Note: Add **25** to Catalog Number for 25-pack.*
**Gold and Purple available in 25 pack only.*

Patch Panels, NEXTSPEED® Category 6

Patch panels are supplied with labeling for T568B wiring. The 8-port adapter's fully enclosed shell protects the PCB from contaminants and errant terminations, and also allows icons to be installed on each jack port for identification.

Ports	Height	Format	Color	Catalog No.
24	1.75"	Standard	Black	**HP624***
48	3.50"	Standard	Black	**HP648***
24	1.75"	Angled	Black	**HP624A**
48	3.50"	Angled	Black	**HP648A**

Add 'W**' to Catalog Number for White panel.*

Patch Cords, NEXTSPEED® Category 6

HC6 patch cords feature verified Category 6 performance and incorporate a patented ISO Termination method. This unique termination process is designed to control Near-End Cross Talk (NEXT), increase performance and reduce Return Loss (RL).

Description	Catalog No.
Cat 6 patch cord	**HC6xxyy**

xx = Color: ***BK*** *(Black)*, ***B*** *(Blue)*, ***GN*** *(Green)*, ***GY*** *(Gray)*, ***OR*** *(Orange)*, ***P*** *(Purple)*, ***R*** *(Red)*, ***W*** *(White) and* ***Y*** *(Yellow)*

yy = *Length:* ***01*** = *1'*, ***03*** = *3'*, ***05*** = *5'*, ***07*** = *7'*, ***10*** = *10'*, ***15*** = *15'*, ***20*** = *20' and* ***25*** = *25'*

UTP Cable, NEXTSPEED® Category 6, 4-pair

NEXTSPEED® Category 6 cable provides considerable margin above all electrical transmission performance requirements specified in TIA/EIA-568-B.2 and ISO/IEC 11801 (2nd edition) standards.

Description	Plenum Spool	Riser Spool
Cat 6 Enhanced	**C6ESPxx**	**C6ESRxx**
	REELEX® Plenum Box	REELEX® Riser Box
Cat 6	**C6RPxx**	**C6RRxx**
Cat 6 Link	**C6RPExx**	**C6RRExx**

xx = Color: ***B*** *(Blue)*, ***GY*** *(Gray)*, ***W*** *(White) and* ***Y*** *(Yellow)*
Note: All category rated cable is packaged in 1000 foot quantities.
REELEX® is licensed and patented by Windings Inc.

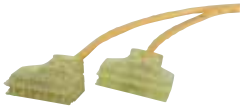
6-110 Block Kit

The perfect high-performance consolidation point, the NEXTSPEED® 6-110 punch down blocks provide an ideal 10GbE solution.

Description	Catalog No.
64-pair kit with legs and 16 connecting blocks	**6110FTK64WL**
64-pair kit w/o legs and 16 connecting blocks	**6110FTK64NL**
192-pair kit with legs and 64 connecting blocks	**6110FTK192WL**

Note: 6-110, 4-pair connecting clips

6-110 Patch Cords



Available with 110-to-110 or 110-to-RJ45 connectors, these patch cords provide modularity and quick termination to our 6-110 connecting blocks.

Length	6-110 to 6-110 Catalog No.	6-110 to RJ45 (T568B) Catalog No.
3'	**6110PCL3**	**6119PCL3**
5'	**6110PCL5**	**6119PCL5**
7'	**6110PCL7**	**6119PCL7**
9'	**6110PCL9**	**6119PCL9**
12'	**6110PCL12**	**6119PCL12**

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