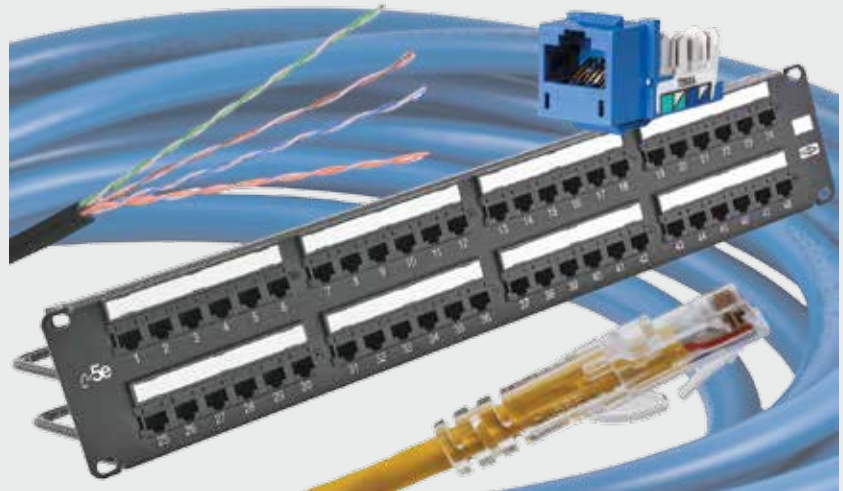


- Exceeds TIA Category 5e Component Compliant
- Exclusive 1-Punch Termination Reduces Termination Time by 75%
- Gigabit Ethernet Assurance
- Bulk Packaging Reduces Excess Waste on the Job



SPEEDGAIN® Category 5e is designed to support reliable Gigabit Ethernet performance. The SPEEDGAIN system is available in a variety of colors, lengths and configurations for multiple applications.



#### Features

- Guaranteed installed 4-conductor channel PSACR performance 6 dB above the Category 5e channel requirements on all SPEEDGAIN® Category 5e registered installations
- Channel bandwidth beyond 190 MHz
- SPEEDGAIN® Category 5e System delivers channel performance that exceeds all ISO/IEC 11801 Class D and ANSI/TIA/EIA-568-B Category 5e performance requirements
- Independent third-party verification

#### Applications

- 100BASE-T
- Broadband video
- Voice

#### Standards/Verifications

- Bit error rate tested ( $\leq 1 \times 10^{-10}$ )
- ANSI/TIA/EIA-568-C.2 Category 5e component, link and channel compliant
- Backward compatible Category 5e



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

**Throughput Assurance**

- 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 Hubbell 4-Connector Channel Active Testing

Frame Size	NEAR-END <sup>1</sup>		FAR-END <sup>1</sup>	
	64	1518	64	1518
Tx Frames <sup>2</sup>	10,615,207,854	10,929,180,587	10,615,182,902	10,929,169,928
Rx Frames <sup>2</sup>	10,615,182,902	10,929,169,928	10,615,207,854	10,929,180,597
Rx Bytes	679,371,705,728	16,590,479,950,704	679,373,302,656	16,590,496,131,066
CRC Errors <sup>3</sup>	0	0	0	0
Oversize	0	0	0	0
Frag/Undersize	0	0	0	0
BER ( $\leq 1 \cdot 10^{-10}$ )	0	0	0	0

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



**Channel Margin Guarantees\***

Parameter	Margin vs. TIA-568-C.2
Insertion Loss	10%
NEXT	8db
PSNEXT	9db
ACR	10db
PSACR	11db
Return Loss	6db
ACRF	10db
PSACRF	10db
PSANEXT	4db
PSAACRF	4db



**Standards**

- Verified to TIA-568-C.2 Category 5e component compliant
- IEC 60603 component compliant (Category 5e)
- IEEE 802.3 (Gigabit Ethernet)
- 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:



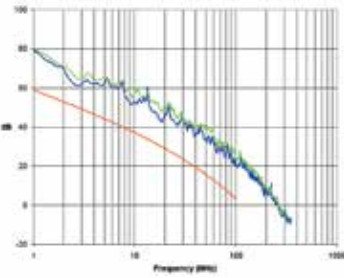
- Independent third party (ETL) verified performance
- System must be registered and installed in accordance with Hubbell's Mission Critical<sup>®</sup> warranty program
- PoE+ application assurance
- Backward compatibility
- Trained, qualified network of design-install partners
- BIM models (available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

● TIA Spec

● Average

● Worst Case

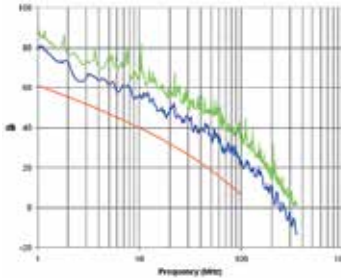
### Power-Sum ACR (PSACR)



**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	79.0	79.7	58.9
4.0	62.0	64.0	46.5
8.0	57.2	60.7	39.5
10.0	53.2	56.6	37.1
16.0	47.2	52.4	31.7
20.0	46.9	49.4	28.9
25.0	42.4	46.9	26.1
31.3	41.4	43.3	23
62.5	29.7	33.7	12.2
100.0	21.6	25.0	3.4
200.0	8.0	9.6	-
250.0	0.2	1.6	-

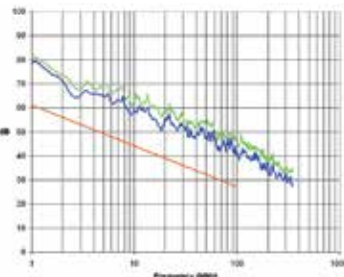
### Attenuation to Crosstalk Ratio (ACR)



**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	79.9	89.0	61.1
4.0	63.5	70.1	49.2
8.0	60.1	69.9	42.4
10.0	56.4	66.2	40.0
16.0	48.8	59.6	34.7
20.0	49.9	56.6	31.9
25.0	45.6	56.8	29.1
31.3	43.9	50.4	26.0
62.5	33.2	43.0	15.3
100.0	23.6	33.5	6.4
200.0	10.2	22.7	-
250.0	-1.0	9.0	-

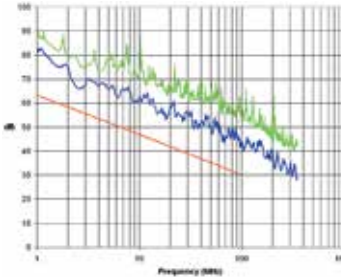
### Power-Sum Near-End Crosstalk (PSNEXT)



**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	79.2	81.5	61.1
4.0	65.6	67.7	50.9
8.0	62.4	65.9	45.8
10.0	59.1	62.5	44.1
16.0	54.8	60.0	40.7
20.0	55.5	57.9	39.0
25.0	52.0	56.5	37.4
31.3	50.8	54.1	35.7
62.5	45.4	49.3	30.6
100.0	41.9	45.3	27.1
200.0	36.3	39.6	-
250.0	31.7	35.6	-

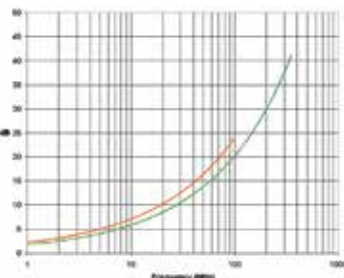
### Near-End Crosstalk (NEXT)



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

FREQ	WORST CASE	AVERAGE	TIA SPEC
1.0	81.7	81.7	63.3
4.0	67.2	82.0	53.6
8.0	65.3	81.7	48.6
10.0	62.2	82.0	47.0
16.0	56.4	82.2	43.6
20.0	58.5	81.7	42.0
25.0	55.3	80.6	40.4
31.3	54.8	79.4	38.7
62.5	48.9	75.6	33.6
100.0	43.9	73.3	30.1
200.0	40.2	68.5	-
250.0	33.2	62.2	-

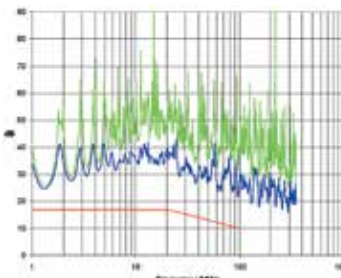
### Attenuation



**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	1.8	2.2
4.0	3.6	3.7	4.4
8.0	5.2	5.2	6.3
10.0	5.8	5.9	7.1
16.0	7.5	7.6	9.0
20.0	8.5	8.5	10.2
25.0	9.5	9.6	11.4
31.3	10.8	10.9	12.8
62.5	15.6	15.7	18.5
100.0	20.2	20.3	23.9
200.0	29.7	30.0	-
250.0	33.9	34.1	-

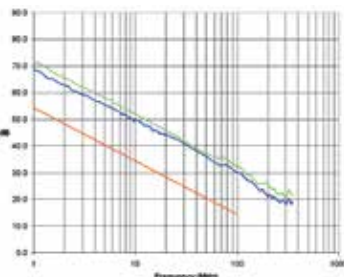
### Return Loss



**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	34.4	41.2	17.0
4.0	38.5	48.2	17.0
8.0	36.9	49.5	17.0
10.0	35.3	49.8	17.0
16.0	35.2	49.3	17.0
20.0	39.9	48.1	17.0
25.0	40.0	47.1	16.0
31.3	34.0	55.2	15.1
62.5	24.0	39.5	12.1
100.0	26.3	39.0	10.0
200.0	22.1	45.3	-
250.0	23.6	34.4	-

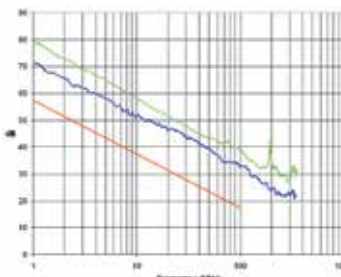
### Power-Sum Equal Level Far-End Crosstalk (PSELFEXT)



**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	68.8	71.7	54.4
4.0	57.1	59.8	42.4
8.0	51.8	54.1	36.4
10.0	49.3	52.0	34.4
16.0	45.4	47.8	30.4
20.0	43.9	45.9	28.4
25.0	42.8	43.9	26.5
31.3	40.6	41.6	24.5
62.5	33.6	35.7	18.5
100.0	30.1	32.1	14.5
200.0	21.0	25.4	-
250.0	19.7	22.1	-

### 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	71.4	79.3	57.4
4.0	59.9	66.6	45.4
8.0	54.1	60.2	39.4
10.0	51.5	58.1	37.4
16.0	48.0	53.6	33.3
20.0	46.4	51.6	31.4
25.0	46.1	49.4	29.5
31.3	43.2	47.3	27.5
62.5	36.6	41.8	21.5
100.0	32.4	39.0	17.4
200.0	23.5	35.9	-
250.0	22.3	29.3	-

**Jacks, SPEEDGAIN® Category 5e**



The HXJ5E jack supports 10/100/1000BASE-T applications with usable bandwidth of 190 MHz.

Color	Catalog No.	Color	Catalog No.
Black	<b>HXJ5EBK</b>	Office White	<b>HXJ5EOW</b>
Blue	<b>HXJ5EB</b>	Orange	<b>HXJ5EOR</b>
Electric Ivory	<b>HXJ5EEI</b>	Purple	<b>HXJ5EP25*</b>
Gold	<b>HXJ5EGL25*</b>	Red	<b>HXJ5ER</b>
Gray	<b>HXJ5EGY</b>	White	<b>HXJ5EW</b>
Green	<b>HXJ5EGN</b>	Yellow	<b>HXJ5EY</b>

Note: Add **25** to Catalog Number for 25-pack.

\*Gold and Purple available in 25-pack only.

**UTP Cable, Category 5e, 4-pair**

Description	REELEX® Plenum Box	REELEX® Riser Box
SPEEDGAIN® Cat 5e	<b>C5EPRPxx</b>	<b>C5EPRRxx</b>
Cat 5e	<b>C5ERPxx</b>	<b>C5ERRxx</b>



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.

**110 Block Kit**

Category 5e performance in a cost-effective 110 block system.



Description	Catalog No.
50-pair kit with 4-pair blocks	<b>110BLK50FTK4</b>
100-pair kit with 4-pair blocks	<b>110BLK100FTK4</b>
300-pair kit with 4-pair blocks	<b>110BLK300FTK4</b>

**Patch Panels, SPEEDGAIN® Category 5e**



This universal panel is rugged, feature rich and provides performance that exceeds ANSI/TIA/EIA-568-B.2.

Ports	Height	Format	Color	Catalog No.
24	1.75"	Standard	Black	<b>HP5E24*</b>
48	3.50"	Standard	Black	<b>HP5E48*</b>
24	1.75"	Angled	Black	<b>HP5E24A</b>
48	3.50"	Angled	Black	<b>HP5E48A</b>

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

**Patch Cords, SPEEDGAIN® Category 5e**



Designed to guarantee application assurance, the HC5E Category 5e patch cords are center balanced with SPEEDGAIN® 5e patch panels and jacks to deliver positive PSACR to 190MHz with enhanced warranty protection.

Description	Catalog No.
Cat 6A patch cord	<b>HC5Exxyy</b>

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' and **20** = 20'.

**110 Patch Cords**



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

Length	110 to 110 Catalog No.	110 to RJ45 (T568B) Catalog No.
3'	<b>PC110C5EL3</b>	<b>PC119C5EL3</b>
5'	<b>PC110C5EL5</b>	<b>PC119C5EL5</b>
7'	<b>PC110C5EL7</b>	<b>PC119C5EL7</b>
9'	<b>PC110C5EL9</b>	<b>PC119C5EL9</b>
12'	<b>PC110C5EL12</b>	<b>PC119C5EL12</b>