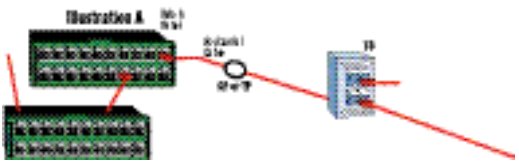
Transmission Performance Specifications for Field Testing of UTP Cabling Systems

This bulletin provides users with the opportunity to use comprehensive test methods to validate the transmission performance characteristics of installed Category 5 and lower grade UTP cabling systems. The categories of UTP cabling systems in this bulletin also correspond with the UTP cabling categories of ANSI/TIA/EIA-568-A. Additional transmission performance and applicable field test requirements are referenced in TSB95, '568-A-5, and '568-B.2.

Horizontal Channel Performance Specified in TIA/EIA TSB67 (Illustration A)
TIA/EIA TSB95 (Category 5)
TIA/EIA-568-A-5 (Category 5e)

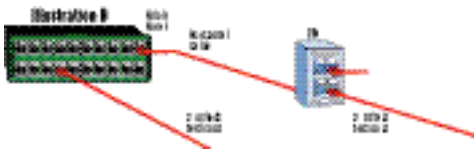


Transmission Performance Comparison @ 100 MHz
for Category 5/Category 5e/Class D (A-2) Channels

Channel	TIA/EIA Category 5 (@ 100 MHz)	TIA/EIA Category 5e (@ 100 MHz)	ISO/IEC Class D (A-2) (@ 100 MHz)
Attenuation (dB)	24.0	24.0	24.0
NEXT (dB)	27.1	30.1	27.1
ELFEXT (dB)	17.0	17.4	17.0
Return Loss (dB)	8.0	10.0	10.0
ACR (dB)	3.1	6.1	3.1

Permanent Link Test Configuration

Performance Specified in TIA/EIA TSB67 (Illustration B)
TIA/EIA TSB95 (Category 5)
TIA/EIA-568-A-5 (Category 5e)



Transmission Performance Comparison @ 100MHz

for Category 5/Category 5e/Class D (A-2) Permanent Links

Permanent Link	TIA/EIA Category 5 (@ 100 MHz)	TIA/EIA Category 5e (@ 100 MHz)	ISO/IEC Class D (A-2) (@ 100 MHz)
Attenuation (dB)	21.6	21.6/94m	20.6/90m
NEXT (dB)	29.3	32.3	29.3
ELFEXT (dB)	17.0	20.0	19.6
Return Loss (dB)	10.1	12.0	12.0
ACR (dB)	7.7	10.7/94m	8.7/90m

Class D Attenuation values are calculated based on 90 meters horizontal cable plus two connectors (no flexible cord contribution) that meet ISO/IEC 11801. Class D NEXT values are based on voltage summation of the near-end connector and horizontal cable.

Some points specified for TSB67 transmission field testing for UTP cabling systems are:

- UTP cabling systems are comprised of cables and connecting hardware specified in TIA/EIA-568-A.
- Required test parameters include wire-map, length, attenuation, and crosstalk.
- Two levels of pass or fail are indicated, depending on measured margin compared to minimum specifications. Testing of NEXT loss is required in both directions.
- Level II equipment meets the most stringent requirements for TSB67 measurement accuracy. Level IIe equipment will be required to verify Category 5e and Class D (A-2) performance. Level III equipment will be required to verify Category 6* & Class E performance.
- Requirements are intended for performance validation and are provided in addition to '568-A requirements on components and installation practices.

Nominal Velocity of Propagation (NVP)

Category	CMR NVP	CMP NVP
Category 3	64	65
Category 5	70	72
Category 5e	70	72
Category 6*	70	72

*Category 6 industry standards are currently under development