



## Relating Multi-Gigabit SNR measurements with Channel Measurements

This article shows the relationship of Multi-Gigabit SNR (Signal to Noise Ratio) measurements with Standards compliant CHANNEL Test.

Multi-Gigabit SNR is the overall headroom for data transmission taking into account the combined effects of Insertion Loss, Return Loss, Crosstalk, Delay, Delay Skew, TCL, ELTCTL.

CHANNEL Test measurements give the performance of individual parameters against Test Limits defined in TIA/ISO Standards.

CHANNEL Under Test	Channel Test Margin (dB)				Multi-Gigabit SNR (dB)		
	Return Loss	NEXT	Insertion Loss	ACRF	2.5G	5G	10G
Cat6A 6.4m	7	4.9	2.7	18.4	12.5	8.2	4.4
Cat6A 21.4m	8.8	6.1	2.3	16.1	12.7	6.5	3.5
Cat6A 98.1m	6	3.1	0.3	18.4	9.9	4.5	2.4
Cat6A 83.2m	6.4	0.9	0.5	-1.3	9.6	2.4	FAIL
Cat6 53m	4.3	2.4	1.3	9.3	10.9	6.3	3.5
Cat6 92.9m	8.9	-2.9	0.2	-0.2	9.8	3.4	FAIL
Cat5e 107.6m	7.5	8.2	0	12.2	8.8	2.2	FAIL

Summary :

Cat6A CHANNEL can support 2.5G/5G/10G over 100m

Cat6 CHANNEL can support 2.5G/5G/10G over 55m.

Cat6 CHANNEL can support 2.5G/5G over 100m

Cat5e CHANNEL can support 2.5G/5G over 100m

AlienCrosstalk effects have not been considered for above MultiGigabit Tests.

Installations that PASS Cat5e & Cat6 Channel & Permanent Link tests may not be able to operate at desired speeds due to AlienCrosstalk from adjacent Cables in bundles.

A Multi-Gigabit Validation test with 3dB SNR Margin can ascertain that the Network will operate reliably at the specified speed.

1. Cat6A Channel Length = 6.4m



14/03/19 08:49 Main 21%

**0417** PASS

TIA - Cat 6A Channel




**Summary** Wiremap **Details**

	Result
Length(m)	6.4
Delay(ns)	32.0
Resistance( $\Omega$ )	1.5
NEXT(dB)	4.9
RL(dB)	7.0
IL(dB)	2.7
PSNEXT(dB)	7.0

**Multi-Gig** **100M/1G** **PoE**

Rate	SNR (dB)	Limit (dB)	Margin (dB)
10G	4.4	0.0	4.4
5G	8.2	0.0	8.2
2.5G	12.5	0.0	12.5

2. Cat6A Channel Length = 21.4m



14/03/19 09:12 Main 27%

**0418** PASS

TIA - Cat 6A Channel




**Summary** Wiremap **Details**

	Result
Length(m)	21.4
Delay(ns)	105.0
Resistance( $\Omega$ )	4.0
NEXT(dB)	6.1
RL(dB)	8.8
IL(dB)	2.3
PSNEXT(dB)	8.0

**Multi-Gig** **100M/1G** **PoE**

Rate	SNR (dB)	Limit (dB)	Margin (dB)
10G	3.5	0.0	3.5
5G	6.5	0.0	6.5
2.5G	12.7	0.0	12.7

3. Cat6A Channel Length = 98.1m

14/03/19 09:15 Main 28%

0419 PASS

TIA - Cat 6A Channel

Summary **Wiremap** Details

	Result
Length(m)	98.1
Delay(ns)	504.0
Resistance( $\Omega$ )	16.9
NEXT(dB)	3.1
RL(dB)	6.0
IL(dB)	0.3
PSNEXT(dB)	4.6

Multi-Gig **100M/1G** PoE

Rate	SNR (dB)	Limit (dB)	Margin (dB)
10G	2.4	0.0	2.4
5G	4.5	0.0	4.5
2.5G	9.9	0.0	9.9

4. Cat6A Channel Length = 83.2m

14/03/19 09:33 Main 32%

0421 FAIL

TIA - Cat 6A Channel

Summary **Wiremap** Details

	Result
Length(m)	83.2
Delay(ns)	417.0
Resistance( $\Omega$ )	17.2
NEXT(dB)	0.9
RL(dB)	6.4
ACRF(dB)	-1.3
IL(dB)	0.5

Multi-Gig **100M/1G** PoE

Rate	SNR (dB)	Limit (dB)	Margin (dB)
10G	-	-	-
5G	2.4	0.0	2.4
2.5G	9.6	0.0	9.6

5. Cat6 Channel Length = 53.0m

14/03/19 09:52 Main 3%

**0429** **PASS**

TIA - Cat 6 Channel

**Summary** **Wiremap** **Details**

	Result
Length(m)	53.0
Delay(ns)	265.0
Resistance( $\Omega$ )	11.6
NEXT(dB)	2.4
RL(dB)	4.3
IL(dB)	1.3
PSNEXT(dB)	2.2

**Multi-Gig** **100M/1G** **PoE**

Rate	SNR (dB)	Limit (dB)	Margin (dB)
10G	3.5	0.0	3.5
5G	6.3	0.0	6.3
2.5G	10.9	0.0	10.9

6. Cat5e Channel Length = 107.6m

14/03/19 10:30 Main 0%

**0433** **PASS**

TIA - Cat 5e Channel

**Summary** **Wiremap** **Details**

	Result
Length(m)	107.6
Delay(ns)	540.0
Resistance( $\Omega$ )	21.7
NEXT(dB)	8.2
RL(dB)	7.5
IL(dB)	0.0
PSNEXT(dB)	10.7

**Multi-Gig** **100M/1G** **PoE**

Rate	SNR (dB)	Limit (dB)	Margin (dB)
10G	-	-	-
5G	2.2	0.0	2.2
2.5G	8.8	0.0	8.8