
10GBASE-T Alien Crosstalk Baseline Proposal

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List of supporters:

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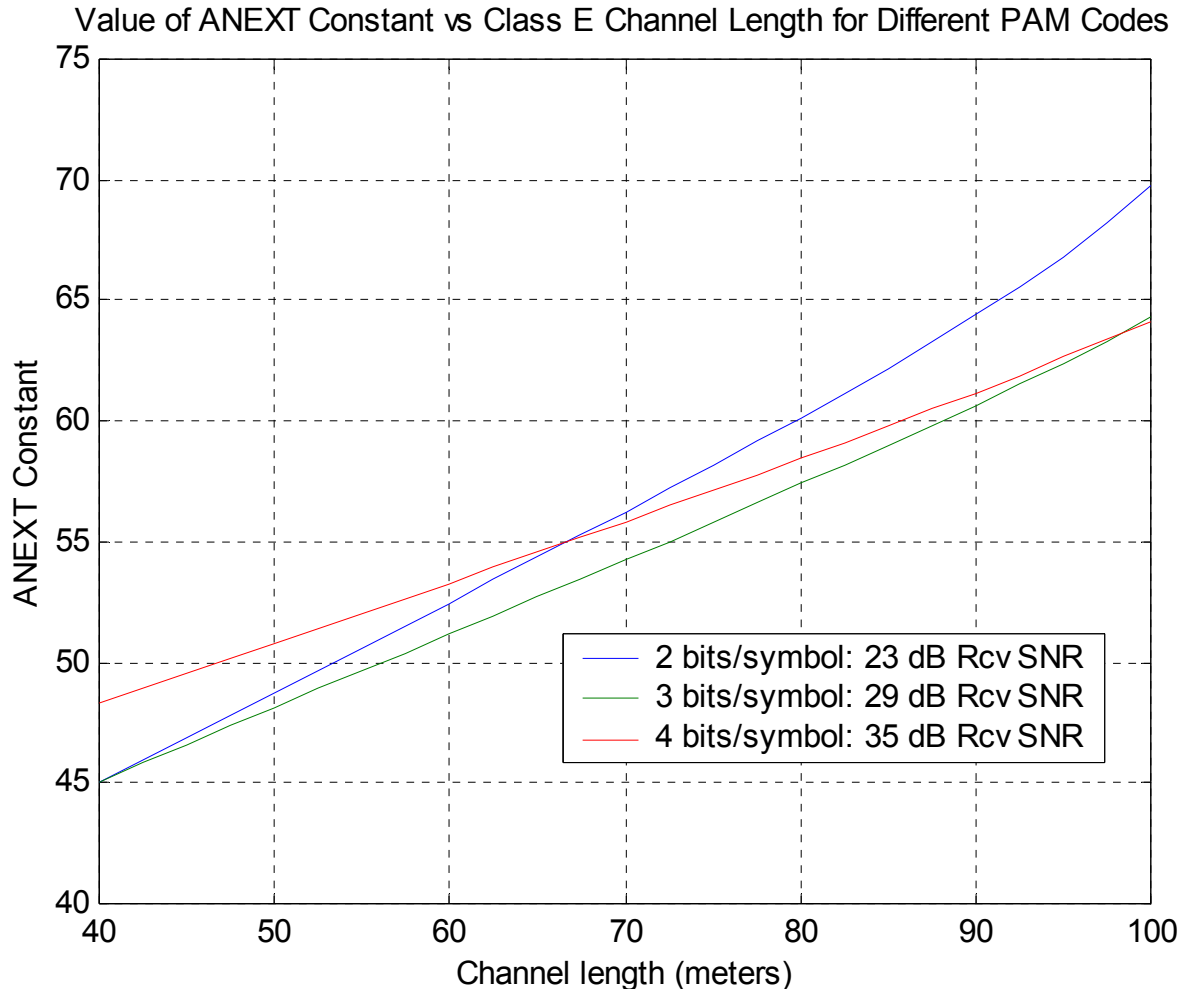
Sterling Vaden – Superior Modular

Overview

Purpose of presentation:

- **To propose a baseline for the 10GBASE-T link segment specification for alien crosstalk**
- **Introduce piecewise ANEXT limits to fit ANEXT measurement data of cabling**

Value of ANEXT Coupling Constant (Y) with Constant SNR Constraint



- ANEXT is proposed dual-slope model; Y adjusted for target receive SNR

- Channel contains 4 connectors, 10% of channel length is patch cord

- Cat 6 ad hoc impairments

- NEXT
- FEXT
- Echo (RL)

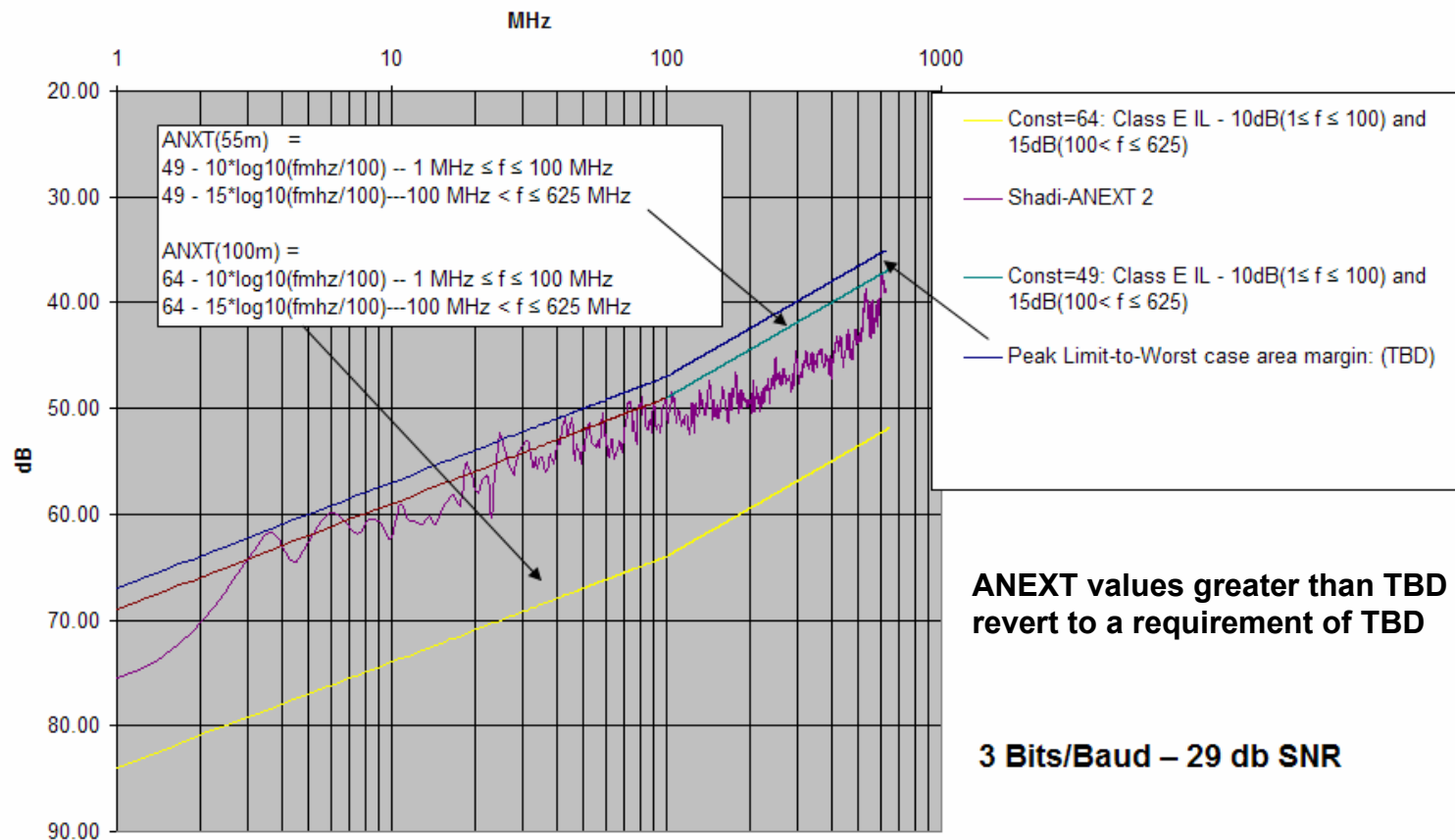
- Impairment cancellation:

- Echo = 55 dB
- NEXT = 40 dB
- FEXT = 25 dB
- Noise = -150 dBm/Hz

- Transmit power = 3 dBm

Class E: Alien crosstalk

Alien Crosstalk: $Y = \text{Constant} - m \cdot \text{Log}_{10}(f/100)$



Class E+ and Class F: Alien crosstalk

Alien Crosstalk: $Y = \text{Constant} - m \cdot \text{Log}_{10}(f/100)$

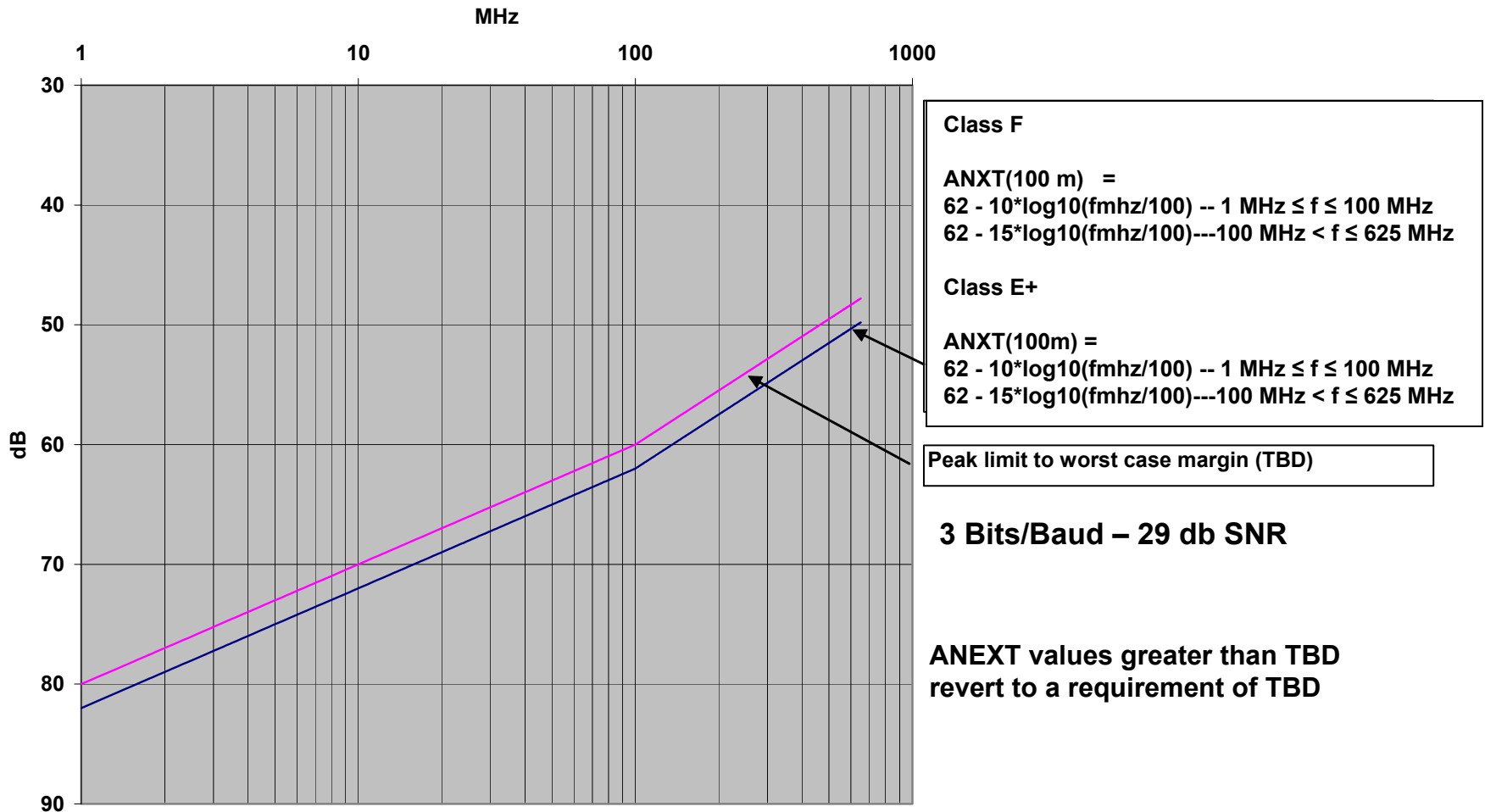


Table 1: 10GBASE-T Link Segment Types

Class	Media Type	IL	ANEXT - (numbers for further study)	AXTIR/Field Test (ffs)	Minimum Distance
CLASS E	UTP	Class E	<p>ANXT(55m) = <u>$1 \text{ MHz} \leq f \leq 100 \text{ MHz}$</u> $49 - 10 \cdot \log_{10}(\text{fmhz}/100)$ <u>$100 \text{ MHz} < f \leq 625 \text{ MHz}$</u> $49 - 10 \cdot \log_{10}(\text{fmhz}/100)$</p> <p>ANXT(100m) = <u>$1 \text{ MHz} \leq f \leq 100 \text{ MHz}$</u> $64 - 10 \cdot \log_{10}(\text{fmhz}/100)$ <u>$100 \text{ MHz} < f \leq 625 \text{ MHz}$</u> $64 - 15 \cdot \log_{10}(\text{fmhz}/100)$</p>	<p>ANXT (m*) = <u>$1 \text{ MHz} \leq f \leq 100 \text{ MHz}$</u> $Y - 10 \cdot \log_{10}(\text{fmhz}/100)$ <u>$100 \text{ MHz} < f \leq 625 \text{ MHz}$</u> $Y - 15 \cdot \log_{10}(\text{fmhz}/100)$</p>	at least 55 m to 100 m
CLASS E	FTP	Class E	<p>ANXT(100m) = <u>$1 \text{ MHz} \leq f \leq 100 \text{ MHz}$</u> $64 - 10 \cdot \log_{10}(\text{fmhz}/100)$ <u>$100 \text{ MHz} < f \leq 625 \text{ MHz}$</u> $64 - 15 \cdot \log_{10}(\text{fmhz}/100)$</p>	NA	100 m

Table 2: 10GBASE-T Link Segment Types

Class	Media Type	IL	ANEXT (numbers for further study)	AXTIR/Field Test (ffs)	Minimum Distance
CLASS F	S/FTP	Class F	$ANXT(100m) =$ <u>$1\text{ MHz} \leq f \leq 100\text{ MHz}$</u> $62 - 10 \cdot \log_{10}(fmhz/100)$ <u>$100\text{ MHz} < f \leq 625\text{ MHz}$</u> $62 - 15 \cdot \log_{10}(fmhz/100)$	NA	100 m
CLASS E+	UTP	Class F	$ANXT(100m) =$ <u>$1\text{ MHz} \leq f \leq 100\text{ MHz}$</u> $62 - 10 \cdot \log_{10}(fmhz/100)$ <u>$100\text{ MHz} < f \leq 625\text{ MHz}$</u> $62 - 15 \cdot \log_{10}(fmhz/100)$	NA	100 m

Class E IL versus ANEXT Correction (ffs)

Length	ANEXT (@100 MHz)	Class E IL (@250 MHz)
30.00	41.80	11.67
32.50	42.50	12.53
35.00	43.30	13.40
37.50	44.00	14.27
40.00	44.80	15.13
42.50	45.60	16.00
45.00	46.30	16.87
47.50	47.10	17.73
50.00	47.80	18.60
52.50	48.60	19.47
55.00	49.40	20.33
57.50	50.10	21.20
60.00	50.90	22.07
62.50	51.70	22.93
65.00	52.40	23.80

Length	ANEXT (@100 MHz)	Class E IL (@250 MHz)
67.50	53.20	24.67
70.00	54.00	25.53
72.50	54.80	26.40
75.00	55.50	27.27
77.50	56.30	28.13
80.00	57.10	29.00
82.50	57.90	29.87
85.00	58.70	30.73
87.50	59.50	31.60
90.00	60.40	32.47
92.50	61.20	33.33
95.00	62.10	34.20
97.50	63.00	35.07
100.00	63.90	35.93

3 Bits/Baud – 29 db SNR

Motion

Move that the Task Group approve the ANEXT specifications provided in Table 1 and Table 2 of this proposal as the basis for the D1.0 Clause 55 link segment ANEXT specifications.

Moved By: Larry Cohen

Seconded By:

Yes: No: Abstain: