

Keeping the Clause 146 PSAXT Requirements Reasonable

George Zimmerman

CME Consulting, Inc. / ADI, APL Group, Aquantia, BMW, Cisco,
CommScope, SenTekSe

Steffen Graber

Pepperl+Fuchs

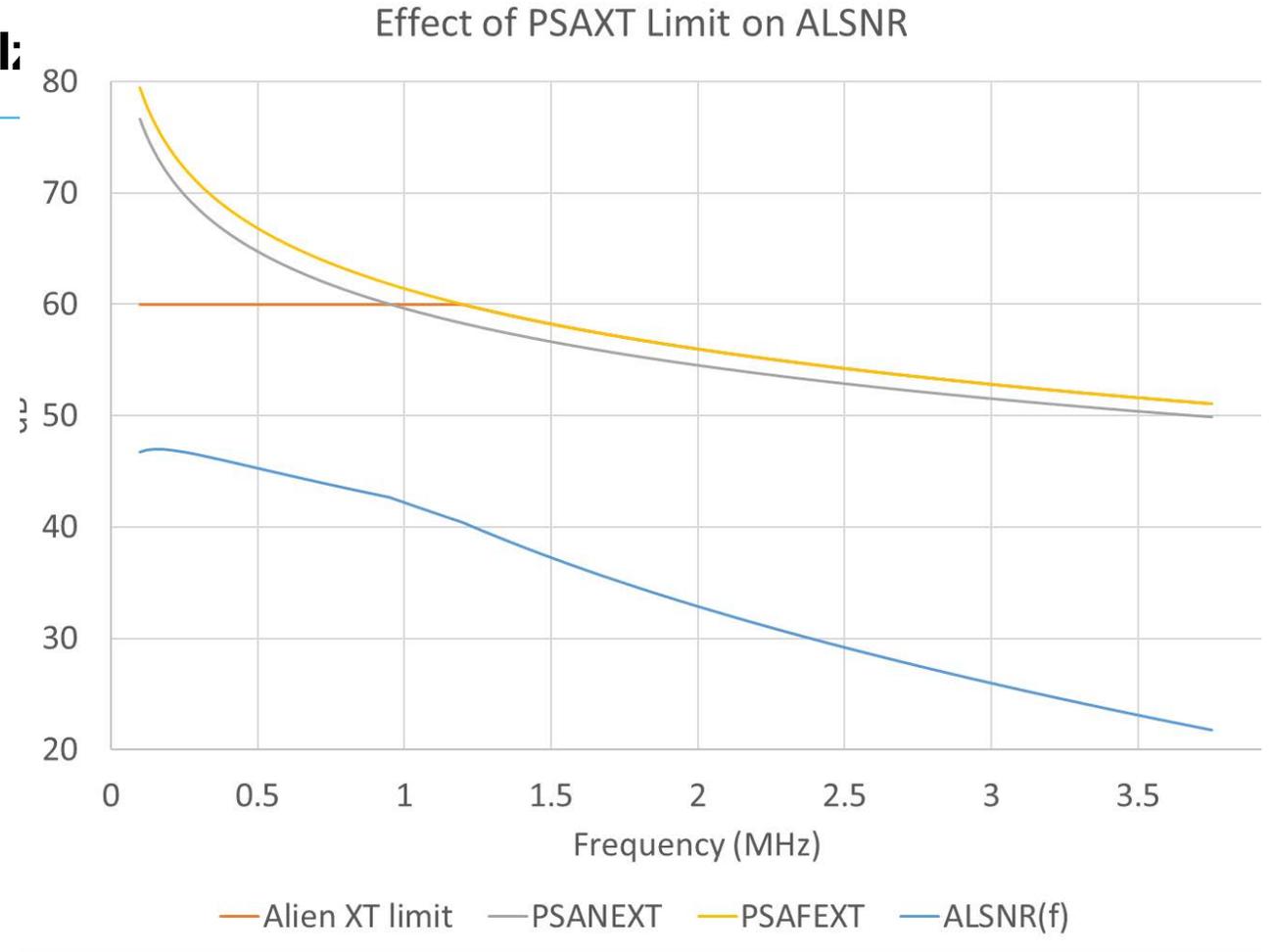
Alien Crosstalk in T1L

- We derived alien crosstalk in Clause 146 based on shielded cabling, but didn't really look at measurement & installation issues
- We also didn't look at what the PHY needs
- Because Clause 146 goes down to 0.1 MHz, the usual curves get down to alien crosstalk losses > 75 dB
- These levels are greater than usual specifications allow for measurement and are much more than a PHY requires.

Limiting at 60 dB limits Alien-limited Sal: SNR ~ 1.5 dB

- Consistent with other BASE-T1 PHYs, including shielded systems

Freq (MHz)			BASE T1 Spec
1	2	3	
60	55	52	T1L PSANEXT
60	56	53	T1L PSAFEXT
52	48	47	CI96 PSANEXT
56	50	47	CI96 PSAACRF
74	71	69	CI97 typeA PSANEXT
84	79	76	CI97 typeA PSAACRF
65	65	65	CI97 typeB PSANEXT
70	70	70	CI97 typeB PSAACRF



- Consistent with practical limits of echo cancellation of 50-55 dB (in worst-case insertion loss)
- Likely to have negligible or unmeasurable effect on performance

Proposed Solution

- Usual 802.3 PHYs cap the maximum crosstalk loss required to allow for both of these
- For example, Clause 97 Type B link segment says: “The power sum AACRF between a disturbed type B link segment and the disturbing type B link segment shall meet the values determined using Equation (97–28) or 70 dB, whichever is less.”
- At page 168 line 50, change as shown: “The power sum ANEXT loss between a disturbed 10BASE-T1L link segment and other disturbing 10BASE-T1L link segments shall meet the values determined using Equation (146–14) or 60 dB, whichever is less.”
- At page 169 line 28, change as shown: “The power sum AFEXT between a disturbed 10BASE-T1L link segment and other disturbing 10BASE-T1L link segments shall meet the values determined using Equation (146–16) or 60 dB, whichever is less.”