IEEE P802.3bq 25G/40GBASE-T Task Force Informal Communication

Source:	IEEE P802.3bq 25G/40GBASE-T Task Force[1]	
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Subject:	Informal Communication in reply to Incoming Liaison 25N2547, Cabling to Support 25GBASE-T	
Approval:	Agreed to at IEEE 802.3bq meeting, Macau, China, 15 March 2016	

Dear Dr. Oehler,

On behalf of the IEEE P802.3bq Task Force, I would like to thank you for your liaison letter 25N2547 dated March 11, 2016, and for providing a copy of the ISO/IEC TR 11801-9905 draft, “Guidelines for the use of installed cabling to support 25GBASE-T application. This document is a compilation of comments from IEEE 802.3bq task force participants after an initial review during our meeting in Macau, March 2016

The note in Clause 4.1 indicating that the channel transmission performance specified in the TR is consistent with the 25GBASE-T requirements in IEEE 802.3bq is encouraging to IEEE 802.3bq PHY designers interested in creating a single PHY that will support the 25GBASE-T application. Any changes to the cabling specifications will have significant impact on the PHY design complexity and it is with this precept in mind that we have the following requests and questions regarding several technical and editorial issues.

Technical Comments and Questions

1. P802.3bq-specified alien crosstalk requirements must be met to ensure the noise budget for receivers is not exceeded. We note that in many areas of the TR, coupling attenuation is used as an alternative metric to alien crosstalk. This creates a degree of

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uncertainty about the noise entering the receiver, especially in the installed base where installation conditions and practices may vary significantly causing link segments to exceed the specified budget.

2. ISO/IEC TR 11801-9905 Clause 4.2 has alternative link segment (channel) specifications to those in Clause 4.1, which creates confusion as to which clause applies to the PHY design. We are not sure why Clause 4.2 specifies alternative requirements for the same parameters; effectively creating a dual specification within the ISO TR 11801-9905 working draft.

3. There is text that needs clarification on Line 311 of ISO/IEC TR 11801-9905 Clause 4.2 on the topic of Cat 7A qualification. Specifically, it is stated that “Before Qualification is started the manufacturer should be contacted if the installed cable is rated up to 1 250MHz.” Should this read, “…the manufacturer should be contacted to determine if the installed cable…” And, if the cable is rated up to 1 250MHz, does this imply that no qualification testing is necessary? Because of connector and installation factors, just having a cable qualified to 1 250MHz from the manufacturer is not sufficient to address the other necessary elements of the P802.3bq link segment requirements.

4. ISO/IEC TR 11801-9905 Clause 4.3, Line 445 on the topic of Cat 7 components lacks detail. In addition, the statement: “It is expected that Channels made out of Cat 7 components do support 25GBASE-T up to 12 m.” is problematic. Because there are many more parameter considerations involved in designing a PHY than insertion loss magnitude and alien crosstalk levels, it is very difficult to predict actual achieved SNR using length-based assessment. For example, cable artifacts such as IL nulls, RL spikes, and excess crosstalk in portions of the frequency band above 600 MHz will probably not be eliminated or sufficiently reduced by shortening the link length. Salz SNR assessments are complemented by detailed cabling requirements to provide a predictable framework that PHY designers can use to optimize their PHYs for equalization, front-end parameters, and cancellation of echo and crosstalk. We are concerned that an approach that permits reduced channel lengths will create dual requirements for the PHY; one set implied by the ISO/IEC TR and one set in P802.3bq. The link segment specifications contained in P802.3bq represent the results of tradeoffs in these areas and we are concerned that relaxing individual parameters outside of this tradeoff framework will create interoperability issues.

Editorial Issues and Observations

1. ISO/IEC TR 11801-9905 Clause 4.1.11.1, Table 21 contains a length relaxation of PSANEXT. This appears to be an editorial oversight since neither Class I or Class II specifications in ISO/IEC 11801-1 have this relaxation.

2. In ISO/IEC TR 11801-9905, Line 343, the pair to pair NEXT limits on cat7A are different from ISO/IEC 11801 Amd2.1 as shown below:

F_A	$1 \le f \le 1\,000$	$-20 \lg \left(10^{\frac{102{,}4 - 15 \lg(f)}{-20}} + 2 \times 10^{\frac{113{,}3 - 20 \lg(f)}{-20}} \right)$ c, d

3. In ISO/IEC TR 11801-9905, PSACR-N vs PSNEXT (Cat7A) - ACR-N and PSACR-N are derived by subtracting the IL from the NEXT and PSNEXT of the cable, respectively. It is unclear why these additional parameters are included or whether PSACR-N may supersede the PSNEXT requirement.

Sincerely,

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