

Accredited Standards Committee  
INCITS, Information Technology

Doc. Number: 13-128v1  
Date: 4/16/13  
Project:  
Reply to: Dean Wallace

TO: MEMBERSHIP of T11.2  
FROM: Dean Wallace Chair FC-PI-6 Working Group  
Subject: Approved minutes of FC-PI-6 ad hoc 2/06/13

AGENDA

1. Opening remarks and introductions
2. Attendance and membership
3. Approve agenda
4. Document Distribution
5. Review minutes of previous meeting
6. Review old action items
7. Call for patents
8. Liaison Reports
  - 8.1. None
9. Presentations
  - 9.1 Receiver BER target for 32GFC, Adam Healey, LSI, 13-058v0
  - 9.2 32GFC over backplane proposal, Adam Healey, LSI, 13-059v0
  - 9.3 32GFC chip to chip simulations, Ali Ghiasi, Broadcom, 13-056v0
  - 9.4 Response to FCIA for 128GFC MRD, Richard Johnson, Finisar, David Cunningham, Avago, 13-067v0
  - 9.5 FC-PI-6 comment resolution, Dean Wallace, QLogic, 13-002v1
- 10 Project review
  - 10.1 None
11. Review action items
12. Next meeting schedule
13. Adjourn

## RESULTS OF MEETING

### 1. Opening remarks and introductions

Dean Wallace, chair, led the meeting. He opened the meeting at 9:00am on Wednesday. He led a round of introductions, and thanked our host FCIA.

### 2. Attendance and Membership

Attendance at plenary meetings does count toward minimum attendance requirements for T11.2 membership. Working group meetings are open to any person or organization directly and materially affected by T11.2's scope of work but do not count toward minimum attendance for T11.2 membership.

The following people attended this meeting:

AGILENT TECHNOLOGIES, INC	Steve Sekel
AVAGO TECHNOLOGIES	Brian Misek
AVAGO TECHNOLOGIES	David Cunningham
DATA CENTER SYSTEMS	Jack Edwards
EMULEX	Hossein Hashemi
FCI	Miguel Conde
FINISAR	Andy Williams
FINISAR	jonathan king
FINISAR CORPORATION	Richard Johnson
IBM MICROELECTRONICS	David Stauffer
JDSU	Dave Lewis
LSI CORP.	Adam Healey
LUXTERA	Tom Palkert
MOLEX	Jay Neer
OFS FITEL LLC	Roman Shubochkin
PANDUIT CORPORATION	Jose Castro
SEMTECH CANADA INC.	David Brown
TE CONNECTIVITY	Michael Fogg
VITESSE SEMICONDUCTOR CORPORATION	Marty Spadaro

### 3. Approval of Agenda

The motion to approve the agenda was made by Hossein Hashemi, Emulex and approved by acclimation.

#### **4. Document distribution**

This section describes the availability of draft documents that are intended to be published as a result of work by the electrical working group.

Document distribution is now being done over the web. Documents relating to the electrical working group work can be found on the T11 website ([www.t11.org](http://www.t11.org)) by going to “documents” and searching on the key word electrical.

A summary of the presently active policy to document distribution is included for reference.

All presentations are posted electronically at the approved ftp within two weeks after the meeting. Format must be an approved electronic file format.

Presentations are defined as material shown publicly in the plenary or authorized working group meetings.

Submission of documents for T11 document numbers: An online system is now available to provide document numbers and accept the submission of documents. The system is accessed via the T11 web page at <http://www.t11.org>. Follow the “docs” link in the left hand frame, or at the bottom, and fill in a form giving details of the document. In order to complete the form, it will be necessary to enter a password. The password is given out at T11 meetings, or can be obtained from the T11 chair. Instructions will then be given about uploading the file to the ftp site.

We now use all electronic document distribution.

A T11.2 reflector is operational over the T11 site.

The committee forms its agenda by the following:

1. A call (reminder) for presentations by the chair three weeks in advance.
2. Those wanting to be on the agenda submit request including; title, presenter, time required, abstract.
3. Chair creates an agenda and posts two weeks before the meeting.
4. At the meeting it is the chair’s discretion to allow additional presentations.

#### **5 Review minutes of previous meeting and review of minutes from interim meeting**

Motion to approve December meeting minutes, Richard Johnson, Finisar moved to approve minutes, group approved by acclamation.

## **6 Review old action items**

SM table that gives the reach for 8GFC, 16GFC and 32GFC based on connector loss similar to what is used for the MM variants. Doug Coleman, Corning. Closed

What connector loss numbers are needed. Jack Edwards, DCS, carry-over

What are the datacenter requirements for 500 meters to 1Km and 2Km to 10Km. Jack Edwards, DCS. Carry-over

## **7 Call for patents**

The chair showed the slides for the patent policy in document 08-406v0. The presentation is also on the USB stick that was distributed.

## **8 Liaison Reports**

There were no liaison reports.

## **9 Presentations**

### **9.1 Receiver BER target for 32GFC, Adam Healey, LSI, 13-058v0**

The probability for transmission errors was reviewed for 16GFC and 32GFC. The probability for codeword errors was reviewed and a graph of the probability of a codeword error versus a bit error was reviewed. It was proposed to use the same effective probability of a transmission word error for 32GFC that is used for 16GFC. A non FEC target of  $1 \times 10^{-6}$  BER can be applied to every FC use case with varying degrees of margin.

The group agreed on this non FEC BER target.

### **9.2 32GFC over backplane proposal, Adam Healey, LSI, 13-059v0**

Alpha points will be specified instead of Epsilon points for 32GFC. Test fixtures are defined for access points. Work of IEEE 802.3bj is being leveraged. The transmit parameters were reviewed. The channel operating margin (COM) input requirements were reviewed. Differences between FC and Ethernet were highlighted and discussed. The receive signal tolerance requirements were reviewed. This presentation represents the first cut for 32GFC over electrical backplanes.

**The group unanimous voted to use this presentation as the starting point for the FC-PI-6 EA variant.**

Operating under the procedures of the American National Standards Institute. INCITS SECRETARIAT, Information Technology Industry Council (ITI), 1250 Eye street NW, Suite 200, Washington DC, 20005-3922, Email: [incits@itc.org](mailto:incits@itc.org) Telephone 202-737-8888, FAX 202-638-4922

### **9.3 32GFC chip to chip simulations, Ali Ghiasi, Broadcom, 13-056v0**

IEEE 802.3bm is investigating a chip to chip interface that has 15dB loss. This work is applicable to the 32GFC chip to module requirements. Several different transmitters were simulated. Larger amplitude driver, using standard jitter. Smaller amplitude driver with lower jitter and faster rise/fall time. The eye diagrams over multiple different channels were reviewed.

Results suggest that a receiver sensitivity less than 100mV will be required for a 15dB channel.

### **9.4 Response to FCIA for 128GFC MRD, Richard Johnson, Finisar, David Cunningham, Avago, 13-067v0**

A QSFP will not share the same optimal parameter space as a SFP solution. Further study needs to be done to determine optimal parameters and reach for a four lane QSFP based solution.

Recommendation is to do this in a subsequent document as the work on this new variant will slow up the single lane variant of FC-PI-6.

The response to the FCIA is:

The initial investigation of a four lane 128GFC solution shows that the existing single 32GFC will not support 128GFC without significant technical work. The existing 32GFC variant has had extensive technical work to reach 100 meters. The additional impairments of the multi-lane variant would cause the 32GFC parameters to have to be modified and this would take a significant amount of work and disrupt the 32GFC standard release. Because of this T11.2 is recommending that FC-PI-6 be released with the 32GFC single lane variant and another project, FC-PI-x be started to address 128GFC. Until the work starts on FC-PI-x the reach for 128GFC will not be known.

T11.2 also recommends that the 128GFC four lane variant work be included in FC-FS-4 so that when FC-PI-x becomes available the single lane and multilane variants will both be addressed.

The FC-PI-x ad hoc is going to examine the feasibility of the following variants:

- Four lane MM
- Four lane SM
- Four lane passive electrical
- Duplex SM fibre

A project proposal will be put together for FC-PI-x and will be presented at the April 2013 meetings.

## **9.5 FC-PI-6 comment resolution, Dean Wallace, QLogic, 13-002v1**

Informal comment resolution has started on the 0.02 version of FC-PI-6

All 77 technical comments have been resolved.

The group is requesting that the editor generate another document that includes all of the latest acceptable technical contributions and the accepted comments.

Another round of information comment resolution will then happen on this document.

Current best guess for a T11.2 letter ballot is at the conclusion of the June plenary meetings.

## **10 Project Review**

There was no project review.

## **11 Review action items**

Is the module plus trace loss number of 1.5dB that is used in the loss calculations accurate, Richard Johnson, Finisar, Dave Lewis, JDSU, closed

Generate FC-PI-7 project proposal, Dean Wallace, QLogic, closed

## **12 Next meeting schedule**

Wednesday 06/05/13 from 9:00 to 5:30 in Albuquerque, NM

Request two teleconference.

## **13. Motion to adjourn**

Motion to adjourn: Ali Ghiasi, Broadcom