

#### Attendance

Mr. Paul von Stamwitz	AMCC
Mr. Rob Elliott	Hewlett Packard Co.
Mr. Barry Olawsky	Hewlett Packard Co.
Mr. Harvey Newman	Infineon Technologies
Dr. Mark Seidel	Intel Corp.
Mr. Michael Jenkins	LSI Logic Corp.
Mr. Martin Czekalski	Maxtor Corp.
Mr. Richard Uber	Maxtor Corp.
Mr. John Sawdy	Meritec
Mr. Galen Fromm	Molex Inc.
Mr. Yuriy Greshishchev	PMC-Sierra
Mr. Alvin Cox	Seagate Technology
Mr. Doug Loree	Toshiba
Mr. Dan Gorenc	TycoElectronics
Mr. Kevin Witt	Vitesse Semiconductor
Mr. Benot Mercier	

16 people present

#### Agenda

##### 1. STA presentation (Marty)

<http://www.t10.org/ftp/t10/document.06/06-069r0.pdf>

Marty reviewed the STA presentation and the group discussed some of the aspects related to PHY.

##### Compatibility with 6G SATA:

Since 6G SATA is not defined yet, there is some concern that the 1-meter cable model does not require equalization. If long reach backplanes used port selectors, these are also likely to need equalization training that would not necessarily be required by the majority of SATA applications. Those individuals involved with both standards should keep this in mind as both interfaces are developed to maintain compatibility without adding burden to SATA.

##### Common electrical specification:

Expect internal and external 6Gbps specifications to be about the same format as they are in SAS 1.1. No major differences are anticipated.

##### 10-meter cable:

Do the characteristics allow it to be used with 1.5 and 3 Gbps transfer rates?

Discussed in detail later on call. May need to identify cables somehow or possibly system connector also.

##### Equalization schemes:

Data shows these are necessary for existing systems. Marty said the intent is not to define how equalization is designed in silicon, but to provide a means of using it.

##### SSC:

Discussed in detail later on call. Presents some challenges.

New topic: Speed shift due to error rate issues at higher speeds.

Rob indicated that there are hooks and handles in the protocol that allow intelligent systems to control negotiated speed at any link in the system.

Anticipate having another Monday night forum at the next T10 meeting.

## 2. 10-meter cable characteristics (Fromm)

Do the characteristics work at 3 Gbps with no equalization?

Equalization required for 6 Gbps?

Format for specification same as previous external cables?

Yuri and Galen to provide a draft specification first cut for the external cable. It will add to the existing version and have applicability to backplanes also.

Kevin made reference to S/N in previous document from November call. Insertion loss versus crosstalk ratio. See 06-011r1 page 7. <http://www.t10.org/ftp/t10/document.06/06-011r1.pdf>

## 3. Spread spectrum clocking

5000 ppm was used for SATA 1.5Gbps, could be 1250 or 1000 ppm for 6 Gbps since it is proportional to frequency?

Barry will provide additional data on SATA open box at 3Gbps and various ppm values at the March PHY working group meeting.

SSC Considerations:

What if two different speeds were used in the same device, initiator, or expander? This may cause the data clock issues if a common clock is used for multiple ports and they are running at different rates where some of the rates cannot include SSC.

How much elasticity buffer is required for SSC?

How is the SSC switched on and off?

What is the benefit versus ppm?

Will a drive, expander, or initiator at 3Gbps that is SAS only accept SSC at 3Gbps?

Jitter measurement is a concern.

Require turning off to measure jitter?

Does this introduce an EMI compliance issue?

Is SSC off during OOB and speed negotiation?

4. Since StatEye is not designed for 8b/10b encoding, should it be used in the PHY specification? Indication that 8b/10b is a little better pattern than StatEye uses, so since the difference is small and StatEye adds a small amount of margin, it should be okay as is.

5. What amount of time is required for equalization tuning?

Not discussed

6. Actions:

Yuri and Galen - provide a draft specification first cut for the external cable to be discussed on next call.

All - Will a drive, expander, or initiator at 3Gbps that is SAS only accept SSC at 3Gbps?

All - Investigate impact on SSC on design. A few details are mentioned under SSC

Considerations.

Barry - Provide additional data on SATA open box at 3Gbps and various ppm values at the March PHY working group meeting.

7. Schedule

Next call on Feb 16, 2006 (3 weeks). Delayed due to schedule conflict for Yuri and Galen.

PARTICIPANT INFORMATION:

All Participants should use the following information to reach the conference calls:

Toll Free Dial in Number: (866) 279-4742

International Access/Caller Paid Dial In Number: (309) 229-0118

PARTICIPANT CODE: 3243413

<https://seagate.webex.com/seagate>

Topic: SAS PHY working group

Date: Thursday, February 16, 2006

Time: 10:00 am, Central Standard Time (GMT -06:00, Chicago)

Meeting number: 822 135 571

Meeting password: 10meter