SAS Physical Working Group Minutes - July 11, 2006 T10/06-348r0

Attendance:

Ms. Fei Xie	Agilent Technologies
Mr. Bryan Kantack	Agilent Technologies, Inc.
Mr. Paul von Stamwitz	AMCC
Mr. Steven Wong	Comax Technology Inc
Mr. James A. Lott, Jr.	Dallas Semiconductor
Mr. Kevin Marks	Dell, Inc.
Mr. Ramez Rizk	Emulex
Mr. Douglas Wagner	FCI
Mr. David Freeman	Finisar
Mr. Michael Lawson	Finisar Corp.
Mr. Elwood Parsons	Foxconn Electronics
Mr. Mike Fitzpatrick	Fujitsu
Mr. Rob Elliott	Hewlett Packard Co.
Dr. William Ham	Hewlett Packard Co.
Mr. Barry Olawsky	Hewlett Packard Co.
Mr. Dan Colegrove	Hitachi Global Storage Tech.
Mr. James Rockrohr	IBM
Mr. George O. Penokie	IBM Corp.
Mr. Harvey Newman	Infineon Technologies
Mrs. Vicky Duerk	Intel
Mr. Schelto van Doorn	Intel Corp
Dr. Mark Seidel	Intel Corp.
Mr. Pak Seto	Intel Corp.
Mr. Dennis Moore	KnowledgeTek, Inc.
Mr. Praveen Viraraghavan	LSI Logic Corp
Mr. Jeffrey J. Gauvin	LSI Logic Corp.
Mr. Tim Hoglund	LSI Logic Corp.
Mr. Michael Jenkins	LSI Logic Corp.
Mr. John Lohmeyer	LSI Logic Corp.
Ms. Juan Wang	Marvell
Mr. David Geddes	Marvell Semiconductor, Inc.
Mr. Wei Zhou	Marvell Semiconductor, Inc.
Mr. Martin Czekalski	Maxtor Corp.
Mr. Galen Fromm	Molex Inc.
Mr. Hock Seow	NEC Electronics America, Inc
Mr. Michael Hopgood	Nvidia Corp.
Mr. Yuriy Greshishchev	PMC-Sierra
Mr. Tim Symons	PMC-Sierra
Mr. Alvin Cox	Seagate Technology
Mr. Daniel F. Smith	Seagate Technology
Mr. Benoit Mercier	STMicroelectonics
Mr. Stephen Finch	STMicroelectronics
Mr. Vit Novak	Sun Microsystems, Inc.
Mr. Doug Loree	Toshiba
Ms. Ashlie Fan	TycoElectronics
Mr. Dan Gorenc	TycoElectronics
Mr. Adrian Robinson	Vitesse Semiconductor
Mr. Gregory Tabor	Vitesse Semiconductor
Mr. Kevin Witt	Vitesse Semiconductor
Mr. Michael Yeager	Vitesse Semiconductor
Mr. Jeff Williams	Xiotech Corp.

51 People Present

1. Review of documents and proposals
1.1 Training sequence:
1.1.1 SAS-2 Start-up training sequence (05-397) [Newman]
http://www.t10.org/ftp/t10/document.05/05-397r5.pdf

Uses OOB at 1.5Gbps with a 9uS idle and a 10uS initial burst to "start the clock". The 59 10uS intervals start from the far end of the 609uS standard window. Later this was changed to a 10us idle at the end and 58 intervals for data.

Since OOB already requires the 1.5Gbps bursts, this proposal has a subset of the existing OOB requirement and is actually less demanding because of the relatively long signal bursts.

This OOB section has been moved to the existing G3 window following the G2 window rather than having “G2 supporting SSC” in the G3 slot. After this G3 window, the final speed negotiation window is entered at the highest common feature set enabled.

One suggestion was to make the intervals a binary code with a table to decode what it means. Present method uses the particular time area as positive indication of support if active signal.

The intervals may need to include an idle time if the squelch detector is used, as a discharge time may be required to accurately detect the presence of signal.

Filure of the final speed negotiation window shall be handled by a higher-level layer (not the PHY).

If there was a failure at the highest negotiated speed and the initiator/expander changed the supported options, then how would it reset to full capability if the device was changed?

A concern was raised that using the scrambler in the training sequence may involve the link layer. Since the last interval in the configuration window is idle, the training data may start at the beginning of the final speed negotiation window, but shall start by the end of a defined RCDT (not necessarily the same length of time as the previous RCDT’s). Input is needed on how long this RCDT should be.

How is the final speed negotiation window completed? Should there be ALIGN0/ALIGN1 after TRAINdone is exchanged to verify dword sync?

4.1.2 <Use previous title> (06-324 and 336) [Wassal and Watson]
http://www.t10.org/ftp/t10/document.06/06-324r0.pdf
http://www.t10.org/ftp/t10/document.06/06-336r0.pdf

Posting issue resulted in the creation of 06-336 as an updated revision of 06-324.
Discussion was limited on this proposal, as 05-397r5 has a significant impact on several of the figures.

4.1.3 SAS-2 PHYSICAL address frame (06-301) [Elliott]
http://www.t10.org/ftp/t10/document.06/06-301r1.pdf

Not discussed. 05-397r5 eliminates the need for the address frame as currently described in this proposal.

4.2 Spread spectrum clocking:
4.2.1 SAS-2 Spread-spectrum clocking by upspreading (06-263) [Elliott]
http://www.t10.org/ftp/t10/document.06/06-263r3.pdf

The SNW-3 window needs to tell the receiver what type of SSC it will receive. This is being worked in 05-397.

The SSC step rate is limited by the jitter specification. The profile itself is not defined.

There is a basic issue in that this proposal assumes that certain segments of the SAS 1.1 transmission path will accept SSC at 1.1 rates. Only three suppliers have answered the question and they gave a positive response.

The downspreading range for SAS was changed to +0/-2500 ppm so that the SAS drive is not tasked with such a wide range. The expander still must tolerate +2500/-5000 ppm plus clock tolerance to support SATA. This puts a heavier burden on expander and initiator receiver devices that support connection of SATA devices.

Several editorial issues were noted by Rob and will be included in his update.

It was determined that his dword calculations in the annex table were off by a factor of two.

An update is forthcoming.

4.2.2 SAS-2 Spread Spectrum Clocking Options (06-267) [Witt, Tabor, Robinson]
http://www.t10.org/ftp/t10/document.06/06-267r0.pdf

This proposal is now historical data that was not reviewed during the meeting. This information has been discussed on conference calls and has had significant impact on influencing the present version of 06-263.

5. New Business
5.1 BERTScope ISI Board (06-258) [Newman]
http://www.t10.org/ftp/t10/document.06/06-258r0.pdf

This information was quickly looked at as a reminder since it was presented at the last face-to-face, but not posted until afterwards. The TCTF is not as lossy as some channels that are already candidates for use at 6Gbps. The TCTF is just a load for testing the transmitter device.

5.2 Adaptive DFE operating on real world data traffic (06-335r0) [Zhou]
http://www.t10.org/ftp/t10/document.06/06-335r0.pdf

The presentation illustrates a Marvel approach to process real data in a Lecroy SDA 6000 scope. This method tests the actual signal at the compliance point. Both this method and StatEye require a reference receiver, which needs to be defined before dealing with how to process.

6. Review of Recommendations
None

7. Meeting Schedule
Weekly calls beginning 7/20.

Next conference call July 20, 2006

PARTICIPANT INFORMATION:

Toll Free Dial in Number: (866) 279-4742
International Access/Caller Paid Dial In Number: (309) 229-0118

PARTICIPANT CODE: 3243413

Webex information:
https://seagate.webex.com/seagate
Topic: SAS-2 PHY WG
Date: Thursday, July 20, 2006
Time: 10:00 am, Central Daylight Time (GMT -05:00, Chicago)
Meeting number: 826 515 680
Meeting password: 6gbpsSAS

8. Adjournment at 5:38pm