Minutes of SAS PHY Working Group conference call June 21, 2007 T10/07-291r0

Attendance:

Mr. Jesse Jaramillo	Amphenol
Mr. Greg McSorley	Amphenol
Mr. Mickey Felton	EMC
Mr. Mike Fitzpatrick	Fujitsu
Mr. Barry Olawsky	Hewlett Packard Co.
Mr. Rob Elliott	Hewlett Packard Co.
Mr. Harvey Newman	Infineon Technologies
Mr. Anthony Sanders	Infineon Technologies
Dr. Mark Seidel	Intel Corp.
Mr. Michael Jenkins	LSI Logic Corp.
Mr. Bernhard Laschinsky	LSI Logic Corp.
Mr. Hock Seow	NEC Electronics America, Inc.
Mr. Rick Hernandez	PMC-Sierra
Mr. Guillaume Fortin	PMC-Sierra
Mr. Yuming Tao	PMC-Sierra
Mr. Joseph Chen	Samsung
Mr. Alvin Cox	Seagate Technology
Mr. Daniel Smith	Seagate Technology
Mr. Benoit Mercier	STMicroelectonics
Mr. Bent Hessen-Schmidt	Synthesys Research, Inc.
Mr. Kees Propstra	Tektronix, Inc.
Mr. Mahbubul Bari	Vitesse Semiconductor
Mr. Larry McMillan	WDC
Mr. Ramya Dissanayake	WDC
Mr. Sanjay Sethi	

25 in attendance

1. StatEye update
SAS-2 Channel StatEye Simulation Results [Witt]
http://www.t10.org/ftp/t10/document.07/07-253r1.pdf

After a couple of parameter settings adjustments, the program is now producing results. The data pattern is still not 8b10b so the results are pessimistic, but Anthony Sanders (StatEye author) was on the call and available for questions and comments. Version five simulation results should be available at the July face-to-face meeting and an alpha version available in August. The comment was made that the transmitter might be better modeled with a Bessel filter. Version five uses Python and will incorporate statistical restrictions of 8b10b encoding.

Mahbubul shared hardware measurements using an Agilent 12G generator with LeCroy scope to produce the output as seen after the DFE to verify StatEye simulations. Results were similar. He will post after the presentation is completed. Since the StatEye data pattern was used for the hardware simulation, it would be interesting to see results with a data pattern conforming to 8b10b.

2. CJTPAT versus JTPAT **(Not discussed)**
Should we stick with CJTPAT as the required pattern and not allow JTPAT as an equivalent? Discussion leaned toward CJTPAT being a more stringent test since it includes a wider spectral content.
Question to all:
Do the header and CRC need to be valid? If these are generated by a tester that just makes up fake data, is that acceptable for the test?

2. Review of Annex B since de-embedding has a significant impact at 6Gbps. **(Not discussed)**

3. JTF
We discussed the Synthesis Research proposal to help close the measurement accuracy. After considerable discussion the values below were arrived at to help close the window of the measurement device versus the value being measured. Synthesis Research and Tektronix do not have issues with the values, but feedback is needed from other test equipment manufacturers. Items 1 and 3 were modified to be limited to the upper half of the original proposed values. These are highlighted in bold print below. With reference to eye diagrams and the filtering used, SAS-2 can use the JTF while hardware being tested to previous versions of the specification will continue to be specified with the single pole filter.

The Reference Clock characteristics are controlled by the resulting JTF (Jitter Transfer Function) characteristics obtained by taking the time difference between the PLL output (the Reference Clock) and the data stream sourced to the PLL. The PLL CLTF -3 dB corner frequency, and other adjustable CLTF parameters such a peaking, are determined by the value required to meet the requirements of the JTF.
The JTF shall have the following characteristics for an encoded D24.3 pattern (1100110011 0011001100). This is the MFTP which is a test pattern that has clock-like characteristics and a transition density of 0.5.
1) The -3 dB corner frequency of the JTF shall be **2.6 MHz +/- 0.5 MHz**.
2) The magnitude peaking of the JTF shall be 3.5 dB maximum.
3) The attenuation at 30 KHz +/-1% shall be **72 dB to 75 dB**.
The JTF -3dB corner frequency and the magnitude peaking requirements shall be measured with sinusoidal PJ applied, with a peak-to-peak amplitude of 0.3 UI +/-10%. The relative attenuation at 30 KHz shall be measured with sinusoidal phase (time) modulation applied, with a peak-to-peak amplitude of 20.8 ns +/-10%.

4. SAS-2 6Gbps PHY Electrical Specification
http://www.t10.org/ftp/t10/document.07/07-063r8.pdf

The text has been updated regarding the transmitter specification incorporation into SAS-2r10. Discussed a few of the areas, but offline review is needed. Alvin will continue to update and start on the receiver section. Please comment to the reflector or to Alvin directly.

5. Interim meeting

An interim meeting needs to be set up in August so the PHY section can be completed by the September T10 meeting. Details are being worked and should be available in the next few days.

6. Next call June 28.

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