

Attendees:

Mike Ricchetti  
Brad Ishihara  
Adam Ley  
Mark Moyer  
Sabih Sabih  
Frank Toth  
Neil Jacobson  
Bruce Jorgens ???  
Ken Parker  
Carl Barnhart  
John Rohrbaugh  
Jeff Rearick  
Sung Chung  
Ted Eaton  
Bill Eklow  
Benny Lai

- The objective of the working group for this meeting was to come up with a specification of an input buffer which met the following criteria:
  - Need a working, robust circuit
  - Can be implemented by chip designer
  - Can be specified in document
  - Meets defect coverage requirements
  - Can provide diagnostic resolution (goal)
  - Should handle Differential AC coupled, Differential DC coupled and single ended AC coupled nets
- As background, the group reviewed simulation results which were presented by Carl Barnhart (see simulation link on website)
- Group then discussed the proposal made by Charles Moore on chip talk back link
  - Bias and hysteresis were major problems and differences between the alternative approaches were discussed.
  - During the discussion – it was suggested that additional defects be added to the defect list (shorts between devices with skewed TCK's, wrong or shorted bypass caps, incorrect terminating resistor value) – the group decided that these defects fit more into a “parametric” type defect and were not
  - Group also discussed whether it would be better to deal with transitions or levels
- Sung Chung presented more information on how/when to capture the input data (Sung's presentation will be posted on the web shortly)

- Based on the information presented and discussed in the morning the group was fairly certain that a working circuit could be designed. The group then proceeded to develop a “black box” specification.

## Tuesday

- Carl presented a “black box” description of what the input receiver needs to do  
2 example circuits shown  
Question – are there any technologies that rely on current monitoring vs voltage monitoring (ask Robert S.)
- The comment was made that it would be worth showing the black box in the entire context (from input of driver to output of receiver). Sung presented a picture which clearly presents this.
- The group defined a transition as a change from logical 0 to logical 1 and vice versa. There was discussion that edges be the only form of information transfer. Amplitude, slew, duration will be used to define the transition. These numbers should be in the functional specification given to and provided by the chip designer. Same specs apply to both test mode and mission mode receiver. Need to specify width and height rejection spec as well (glitch rejection)
- In looking at the coverage model for the black box, it appears that there still may be some unresolved issues with respect to DC EXTEST. DC EXTEST must still be supported to test for the shorted capacitor defect. It appeared that there may be some issues with the black box circuits.
- Jeff presented an alternative which multiplexed a DC offset to the comparator (multiplexed against Hysteresis (RC) input). DC offset was against a recovered reference voltage. This circuit looks like it may work for both AC and DC EXTEST.
- The circuit was run against Benny Lai and Charles Moore to see if there would be issues from the chip designers. Both seemed ok with the design. Carl will run the circuit against Robert Shulke this week.
- The black box specification was recently distributed to the entire working group. Please see email posted by Carl Barnhart on 9/5. Please review and send comments to Carl or post comments on the Talk Back page.

The group then came up with a list of short term action items. They are as follows:

1. Carl will finish the black box description and release it to the working group during the week of the 4<sup>th</sup>.

2. Ken will add Carl's black box description to his draft and continue work based on results from the working group meeting
3. Carl will modify the existing simulation circuit based on black box approach
4. Carl will get in touch with Robert during the week of the 4<sup>th</sup> to make sure that he is ok with the black box approach (this has already happened)
5. Bill to try to line up simulation help for Carl
6. Bill will organize a working group teleconference during the week of the 10<sup>th</sup> to review the face to face meeting and discuss the black box approach.
7. Bill to work on PAR request and present status to the working group during the teleconference.
8. Bill and board tiger team to begin to work on "Digital Layer"