

## **1149.1 Working Group Meeting Minutes. November 10, 2009**

### **Attendees:**

CJ Clark  
Francisco Russi  
Bill Tuthill  
Ken Parker  
Wim Driessen  
Adam Ley  
Carol Pyron  
Roland Latvala

### **Agenda:**

Identify a volunteer to take minutes  
Relaxing "IN" on port definition to support observe only on compliance Enable  
INIT  
Figure for Multidriver  
Review of comments on Ballot Recirculation

### **Notes:**

Meeting Called to order at 11:04am EST

### **Identify someone to take minutes.**

Bill Tuthill volunteered to take minutes

### **Relaxing "IN" on port definition to support observe only on compliance enables.**

1) if you have a in/out signal in your port that doesn't show up in your boundary register it could be treated as an error or warning.

2) Special case of an IN port that is called a compliance enable. If compliance enable shows up in boundary register that is an error. Relax second error. That it is ok to have IN on compliance enable. In/out which doesn't appear in boundary register. This is common and checker needed to downgrade to warning. Strict checking vs standard checking

Adam: Violation of schematic check. Usage tools not strictly described.  
Best served to focus on rules or restrictions in main body and deal with BSDL as secondary item.

CJ will take the 1149.1 base draft and begin marking it up.

Ken wants to post it on website with line numbers to make it easier to zero in on issues

CJ will post draft on website with line numbers to make it easier to refer to items in discussion

Francisco brings up questions on multiple compliance patterns on a signal compliance pin. A set of patterns to get to compliance enable.

CJ feels this is out of scope of what we are trying to accomplish here.

## INIT

Carol does not have anything new to report at this meeting.

### Figure for multi driver.

Fred Chong would take this on, but was not at meeting to give update.

### Review of comments of Ballot Recirculation.

#### 1. *Comment #10* - Tom Langford

“add to draft a section to identify other standards based on 1149.1”

Carol wants to point to another document that shows the other standards that are based on 1149.1 so that it would be a living document and not fixed in the 1149.1 standard.

<AI>CJ will take action to look at possibilities to add document to website and which standards should be referenced

#### 2. *Comment #9*- Doug Way.

“Section B.8.14.3.7 The <disable result> element WEAK0 / WEAK1 "used for asymmetrical drivers, such as TTL open-collector or ECL open-emitter outputs, when a pull-down or a pull-up is external to the component."

Proposed change: BSDL should describe component only, not circuitry external to component. for component, Z should be used.”

Adam ,CJ, Ken do not agree that this would be a good change.

Adam- Weak 0 Weak 1 used to identify open collector or open emitter. If we use HIGH Z than association is lost

CJ- Weak 1/ Weak0 is important in standard. Allows it to identify a construct that is present and test for it. Would loose information if just used Z

Carol asks if Asymmetric drivers still use Weak1/Weak0 today?

CJ- still sees Weak1/Weak0 used a lot.

It is decided that no action should be taken

#### 3. *Comment #8* – Doug Way

“B.8.8.3 rule d) "shall not appear" should be "may appear" to support 1149.6.

Also, some components now have complementary clocks which should be grouped. This is rumored to be in a supplement, but I haven't located the supplement.

Proposed change:”

<Associated port> may appear as a <port ID> in a <cell spec> in the subsequent <boundary-scan register description>

Adam feels this relates to the observe only item.

<AI> CJ will make changes for observe only and this will probably fix this item

4. Comment #7 – Doug Way

“In EXTEST, either the configuration should be as defined on the card or, better, determined by the value of a cell shifted into the boundary register. E.g. internal pull-up/down resistors selected by a configuration pin on the component. This would enable better testing of pull-up/down resistors on the card.”

Proposed change

Add section to deal with I/O configuration.

CJ – this seems to be touching on INIT, with some talk about internal pullups/pulldown

Adam points out that Doug is referring to section 8.8.1 concerning rules on EXTEST instruction.

Carol thinks Doug is referring to a specific implementation of a chip. Should be superseded better by INIT

CJ will get back with Doug to get input

Leave this issue in INIT camp and will solve the problem for Doug.

Adam thinks he is looking for something beyond INIT.

This issue will be tabled until speaking to Doug. Without Doug’s input it is speculation

5. Comment #6 – Doug Way

“If implemented, this could allow greater flexibility in selection of devices used to test non-boundary scan components or flash programming. Components could be disabled and the bypass register would be selected. The scan chain would be shorter, reducing the test time.”

Proposed change :

8.2.1 recommendation f) Include HIGHZ in the list of instructions supported by components.

Adam – High Z has implementation issues that are not always understood. Clamp instruction is more flexible. Would argue for Clamp and not High Z. or Both but not only High Z.

Carol says to do both.

Adam this change does not belong in rule F. It needs it’s own section.

CJ – this is an area to update/modernize . Change F to include High Z and Clamp. Section 8.2.2 should be modernize so it is not referring to self test capabilities.

Adam doesn’t want to loose the idea of self test capabilities.

Discussion on Private Instruction as well.

Adam - self test is not private. If it is declared as private that is ok but not it’s intent to remain private.

CJ- possibly new business is to look at section 8.3

Adam doesn’t want to loose the guidance of paragraph F – public instruction for self test.

CJ notes that there is use of INTEST on FPGAs/CPLDs however outside of this space INTEST isn’t used much. Not able to test chip with INTEST or RUNBIST. Recommendation to put these instructions into chip makes standard look outdated.

More discussion needed regarding the inclusion/exclusion of INTEST/RUNBIST instructions

**At 12:00pm the meeting was extended to continue going through Ballot Comments.**

Roland – modernizing instructions INTEST and RUNBIST. Update verbiage of instructions so people would be more apt to use.

CJ doesn't think we can get to where we want to go by changing instruction.

Ken thinks we are speculating on why we don't use those instructions. Perhaps some silicon chip designers could shed some light.

Carol – Not keen on providing the level of testing to customers that these instructions would give.

Adam not promoting the recommendation of keeping INTEST or RUNBIST. Does not want to loose guidance of self test though Present idea more generally.

Adam – 8.2.2 could use some work. It is a description that follows 8.2.1 should be deleted but modernized.

#### 6. Comment #5 – Doug Way

“TRST\* not included in discussion of interconnection of components compatible with this standard”

Adam – clause 4.7 – unfortunate omission to not include TRST in how devices are interconnected.

Ken- Show broadcast TMS and Broadcast TCK. Should there be a Broadcast TRST in Figure.

CJ offers to redo figures with TRST.

Adam – wouldn't touch figures but add to 4.7.2 the proper role of TRST in the system.

CJ would prefer to have them connected for the ease of board level testing

Carol always presents TRST pin.

CJ – the pin is probably tied off to ground or connected to board level connection.

Doug wants to test the TRST to see that components are connected to TRST.

<AI>CJ will meld suggestions into verbiage in standard and possibly modify a figure to show TRST. Add a figure and little text to address TRST

#### 7. Comment #4 – Doug Way

“Add comment that TRST\* may normally be driven from power-on-reset on the card to initialize the test logic within the component.”

Adam - 4.6.2 description of TRST itself.

CJ- figure 6.8 misinterpreted . Should have pulled down at board level

<AI> Adam to add comment. Update figure 6.8

#### Comment #3 – Doug Way

“Datasheets for some devices imply that TRST\* needs to be low for normal operation. In many cases this is not accurate.”

Rule 4.6.1 covers this.

CJ – 4.6.2. has some wording that could be changed.

Adam – 1149.7 includes new profile for TRST pin. Defaults to internal pull down instead of pull up. Make 1149.1 the same.

CJ would be behind this.

Adam will update language for any proposed change for this section.

Ken – do we need a rule that says the function of the board is not interfered with TRST held low.

CJ – fact that devices require you to drive TRST low to get them to work in EXTEST mode. Do we want to address this?

Roland – text also added regarding pulsing reset or TLR state?

8. Comment #2 – Doug Way

“Standard should be revised according to comments below. There may be other revisions to be made as well.”

This comment is informative.

9. Comment #1 – Ken Parker

A subsequent IEEE Standard (Std 1149.6-2003) mentions an Errata for this standard (Std 1149.1) which it claims fixes a defect in 1149.1. Please see this note in Std 1149.6-2003, section 7.2.2 on page 70. It reads:

"There is a fine point to note for differential inputs, which would be identified in a Port\_Grouping attribute. In IEEE Std 1149.1-2001, Annex B, Boundary-Scan Description Language, rule d) in B.8.8.3 effectively disallows a Boundary-Scan Register cell to be described as being attached to the <associated port> of a <twin group>. That is, by this rule a cell cannot be attached to the negative leg of a differential input pair. This rule is in error and an Errata Bulletin on the standard is being published. Permissions r) in 11.5.1 and s) in 11.6.1 in IEEE Std 1149.1-2001 allow observe-only cells to be attached to any signal pin. This means that a differential input pin pair may have observe-only cells associated with both legs. Thus, when coding the Boundary-Scan Register description of differential inputs, use "observe\_only" rather than "input" to describe the cell function of the associated leg. (See examples in 7.6.)"

This errata was never published or attached to 1149.1, and this disparity should be addressed as part of this re-affirmation. I do vote for re-affirmation because the 1149.1 standard is vitally useful today and is the foundation for other standards, 1149.4, 1149.6 and 1532.

Ken – this comment is regarding things that came up in the 1149.6. working group meetings and have been already brought up in 1149.1

**Call for new business** at 12:42pm EST

Carol – Spreadsheet. Add other open items.

Ken – Section B10 2.4.1. Table B.7 – B.11 would need updating for Sampling change.

Meeting Officially adjourned at 12:48pm EST.

**Next Meeting:** Tuesday, November 17, 2009 11:00 am EST

**Action Items:**

- CJ will post 1149.1 draft on website with line numbers to make it easier to refer to items in discussion
- Comment #10 CJ will take action to look at possibilities to add to the 1149.1WG website a document which shows which standards are based on 1149.1
- Comment #8 CJ will make changes to draft for observe only
- Comment #7 CJ will get in touch with Doug to get input regarding Comments
- Comment #5 CJ will Add a figure and little text to address TRST use with interconnection of components
- Comment #4 Adam to add comment about TRST. Update figure 6.8
- Comment #3 Adam will update language for any proposed change for this section.