Lab3
Board Testing using Boundary Scan
(IEEE 1149.1)

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1. **Introduction**

The goal of the lab is to get experience and knowledge about board testing using the Boundary Scan IEEE 1149.1 standard.

The following techniques will be used:

- Interconnect test

The following tools will be used:

- Trainer1149
- Graphical tool of choice

1.1. **Input**

The files needed to solve the lab can be downloaded from the following link:

www.ida.liu.se/~TDDC33/labs/download/lab3.tar.gz

2. **Assignment 1: Design modification for IEEE 1149.1**

![Figure 1 TDDC33 board design](image)

Figure 1 TDDC33 board design

- Draw, using a graphical tool, a new, modified design of the TDDC33 board presented in Figure 1, where the IEEE 1149.1 interface (TDI, TDO, TMS, and TCK) is included.

3. **Assignment 2: Interconnect test**

- Use the Trainer1149 to write an interconnect program (vectors and instructions) for the design TwoChips.nl. The test program shall detect at least one fault for each of the following four types of faults.
  - Stuck-at 1
  - Stuck-at 0
  - Wired-AND short
  - Wired-OR short
  - Dominant fault

- Verify the test program by introducing faults in the design.

Report the following for the design:

- Test instructions and test vectors and the fault that it detects (e.g. Stuck-at 0 at net2).
4. **Examination and submission**

4.1. **Oral examination**

Prepare to show your results and to answer questions about the lab assignments during the lab sessions. Notify the lab assistant!

4.2. **Written examination**

- Write a report containing the results from Assignment 1 and Assignment 2.
- Write a short summary of your personal experience of the lab (will not be graded). This summary can for instance contain comments on the level of difficulty, the instructions, the tools, and possible improvements.
- Place the report inside a Laboration report cover, which should be signed and submitted to the lab assistant. (The Laboration report cover can be found by the printers.)
- The deadline for submitting the lab is presented on the course web-page.

Good Luck!