

Minute of the MCC-DSM Design Meeting held on 15th November 2001

(Periodic meeting on MCC project progress)

Present: Roberto Beccherle, Giacomo Comes (from Bonn), Giovanni Darbo, Claudia Gemme, Paolo Morettini, Paolo Musico, Ettore Ruscino, Carlo Schiavi.

1. General information.

The design of the MCC-DSM has been completed last week and the GDSII file sent to LBNL. The whole reticule, having two FE-I chips, a MCC-DSM, opto-chips and test chips has been sent to the "DRC Committee" at IBM. Meanwhile the FE-I team is trying to complete flat LVS on the whole FE chip (2.5 M transistors). Submission should be by the weekend.

2. Preparation for next MCC (pre-production) design.

Giovanni says that for next submission we have to look at some simulation / analysis of the design that for lack of time we skipped now. Amongst the things we must to look at more in depth:

- Power distribution inside the chip: the tool that seems to be appropriate for the job is PowerMill (from Synopsys). E. Mandelli has used this tool for FE-I and he is the person to contact for information. *Action*: Roberto will check if we have the PowerMill licence from Europractice and he will contact E.Mandelli to get started with the program.
- Standard Cell parameterisation for 1.8 and 2.0 V: we should get parameters for Standard Cells at lower voltage for best, typical and worst conditions. Also the I/O pad library from LBL must be characterised and interface parameters for the SRAM are missing. Paolo Musico says that he found perl scripts for automatic extraction of Synopsys parameters from Spice simulation. He will look at them. It has been decided to discuss the characterisation of Standard Cells at the next Pixel Week in December.
- Pad library synchronisation: Giacomo implemented some modification to the Pixel pad library, originally made by Peter Denes. Since FE-I and MCC-DSM use the same library, the two libraries must be synchronised.
Action: Giacomo will contact Peter to merge changes into a single library for next designs.
- Cleanup and backup of the design:
Action: Roberto with help from Giovanni will do cleanup and reorganisation of directories.

Roberto reports on the software changes in preparation for the new MCC design. The updates are:

- IC 4.4.5: From current Cadence IC_4.4.3 version. The new version is compatible with the current data-base and DSM kit from RAL.
- Silicon Ensemble 5.3: From current 5.2 version. We expect more stability, but also seems to give substantial differences in extracted parasitic (people working on an APE chip in Pisa found 20% higher propagation delay using Hyper Extract parasitic extraction in version 5.3 respect to 5.2).

Some work done on the MCC design could be of more general interest. In particular bugs found in the RAL kit has to be reported to RAL, while technology files to work with 5 metals may interest other users and could be added to the RAL kit.

3. Preparation for testing MCC-DSM.

MCC-DSM should come from foundry by the beginning of January 2002. One wafer will be cut and the MCC dice will be shipped to Genova. Few dice will be packaged into the usual 84 ceramic packages (7 packages are still available from previous chips). With expected high yield, the 7 packages should be enough for the first tests. In consideration that once the MCC will be debugged other laboratories might need packaged chips (Turbo PLL/PCC development), Giovanni will buy some more packages. The packages will be also used for the next MCC designs. We foresee 3 test setups: HP-16700 Analyser, MCC exerciser, wafer tests. The first two will be made in Genova, while the test of a whole wafer will be made by Delta in Denmark only if the first two are passed. More in details the 3 test setups:

- HP-16700 analyser. Aim of this setup is to measure maximum working frequency, power consumption, scan chain test, faults in the chips. Ettore has prepared a breadboard with a MCC socket and connector to grab to the HP-16700 (the same board can be customised for Flex Hybrid and irradiation test in conjunction with the MCCex).

Action: Ettore will load on the card the components needed for the application and will check the signals before the end of the year.

Action: Paolo Mo. will implement the interface between SimPix and HP-16700 before Christmas.

- MCCExerciser. This setup is the ideal test bench for the extensive event building capabilities of the MCC. MCCex is integrated in SimPix, adapter board for MCC-DSM has been made by Ettore. This setup, with additional cable driver/receiver and support cards already made for the test of MCC-D0, will be also used to do irradiation test on MCC-DSM next Spring. MCCex is also used in the Flex Hybrid test system.

Action: Paolo Morettini with help from Ettore will put the system to work for MCC-DSM.

- Wafer Test: Paolo Musico says that he contacted several firms to do wafer test on MCC. The only firm he found, able of testing 8" wafer is the Danish Delta. They ask for 4 week to setup the system (tooling + software) and 2 weeks for testing the wafer. The offer from Delta is split into 3 items: Tooling, software setup, test of one wafer. Each of them is about 1/3 of the total. We have decided to place the order this year. In case the test at home of the first chip indicate that it is not worth to do it on wafer, we lose 1/3 of the sum (software) while the other 2/3 will be used for the next chip (if pinout stays the same). Doing so we can speed up the test.

Action: Paolo Musico will ask for a bid to Delta.

All the test procedures need generation of test vectors. Roberto will look at a way of generating consistent sets of test vectors.

4. Documentation and Publications.

Giovanni says that we must update and complete the technical documentation. In particular, specification documents written for MCC-D2 must be converted to MCC-DSM, and missing information added. This technical documentation must be prepared also in view of the MCC FDR (4-Jun-02).

We believe that it is time to write articles on the activities. Giovanni proposes to complete the article on MCC-AMS/D0/D2 as soon as possible. In our pipeline there are an article on MCC-DSM for late Spring/Summer and an article on irradiation results where D0 and the forecoming DSM results will be included. A technical paper on SimPix may be of interest too.

Action: Giovanni collects the missing material for the first article and makes a first draft as soon as possible.

Action: Paolo Morettini will write technical documentation to use SimPix.

Next meeting will be arranged after the December Pixel Week