

Design of a Multi Chip Module for a general purpose readout electronics of MPGD:s

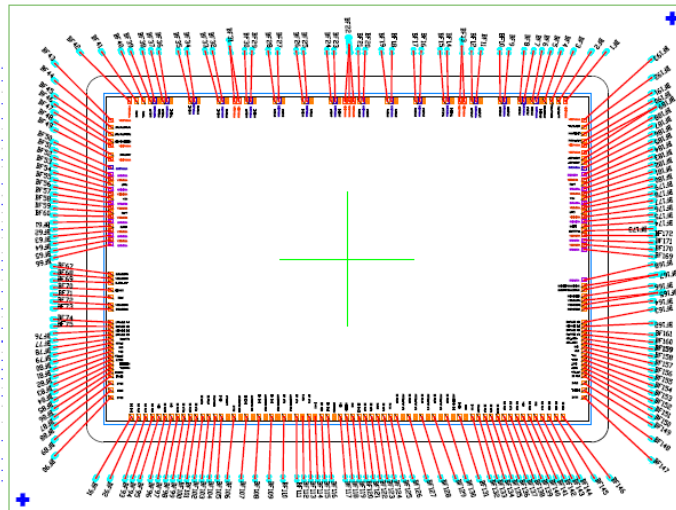
Status 19.10.2017

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Retrospect

- Possible solution at the time the project started time given the area constraints:
bond the die to an adaptor board.
A Swedish company was approached and they agreed to take on the project.
⇒ Several failures and problems.
- In the beginning of 2017 we found out that there a few companies that could package our dies in small enough capsules.
⇒ 25.2.2017 we terminated the contract with the Swedish company.
- 17.2.2017 We signed a contract with a French company, after having discussed and agreed upon some technical issues.

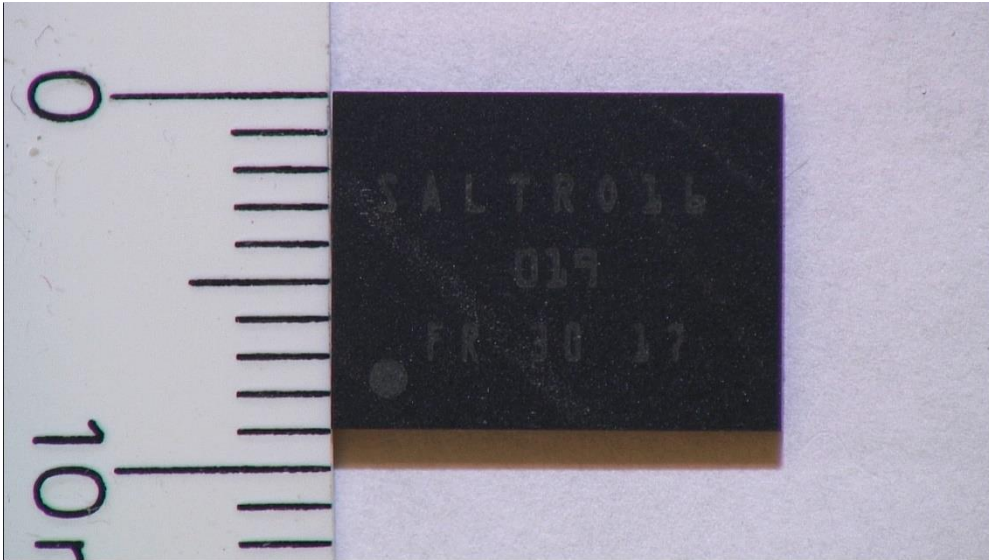
Bonding diagram:



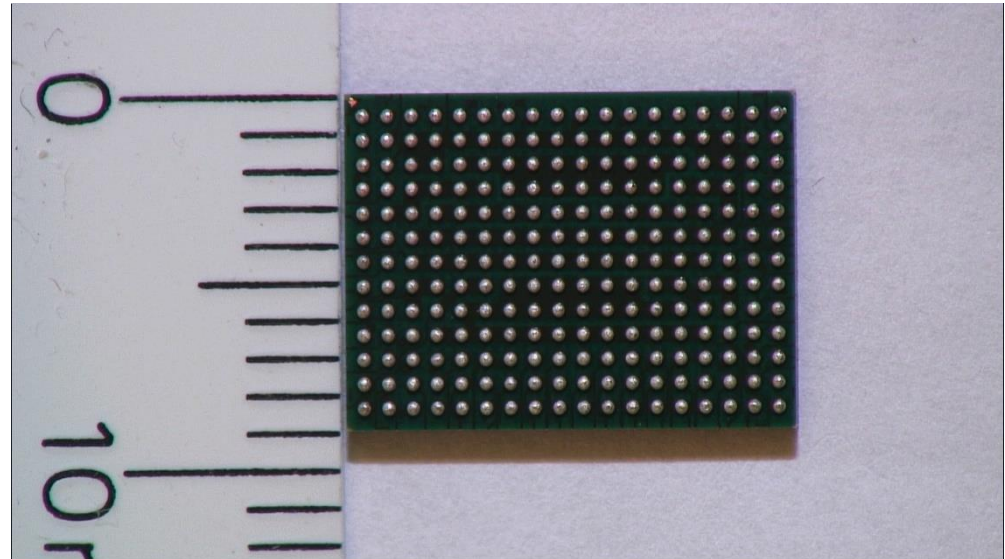
The available number of dies is 840, after having got an additional batch from CERN.
These are now at the French company.
The substrates for all 840 dies have been ordered.

Recently we received the first pre-series of 34 packaged chips and 40 empty capsules,
the latter of which will be used for soldering tests onto the MCM-board.

Top side

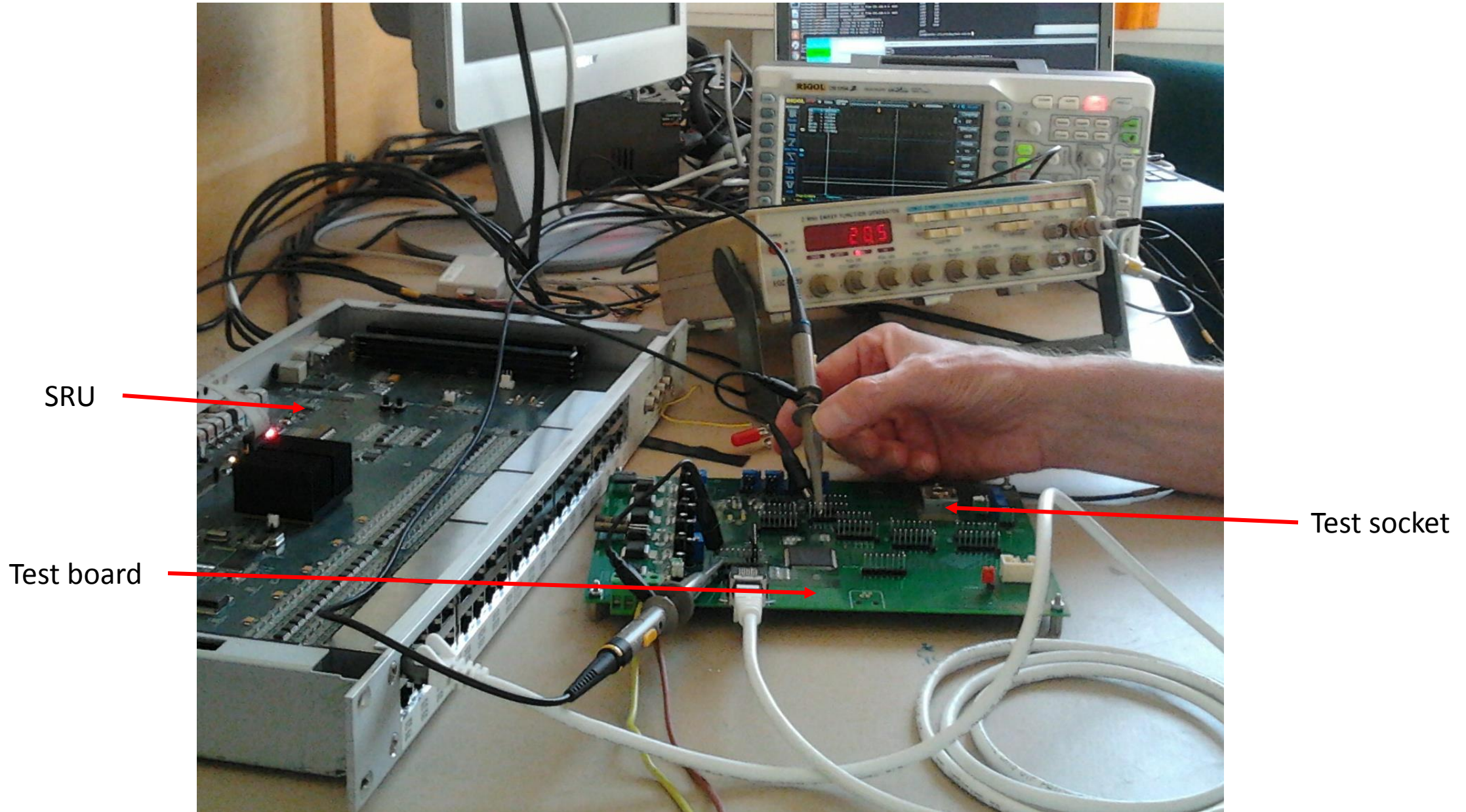


Bottom side

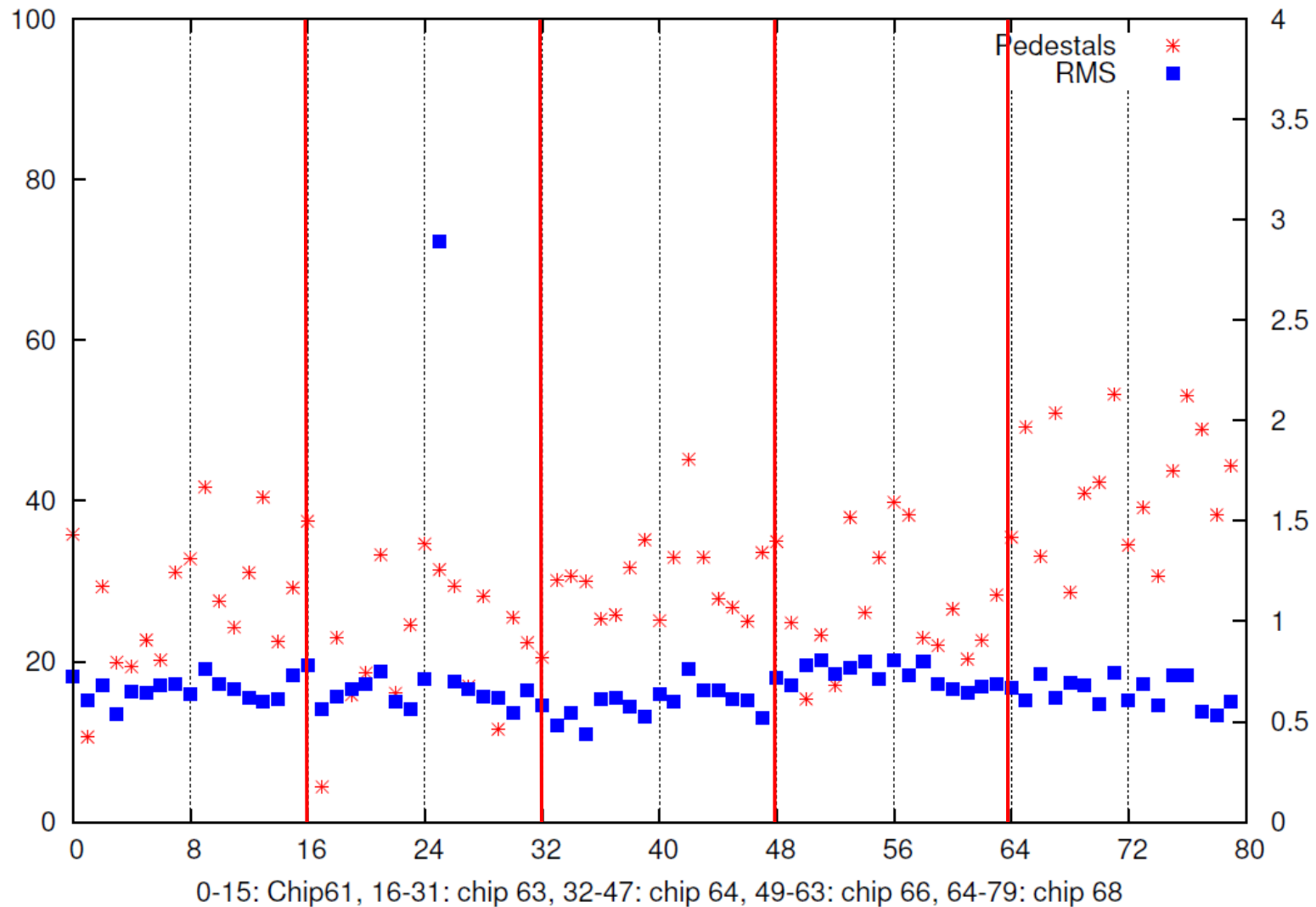


First tests have started just to see that there are signals coming through.

Test set-up



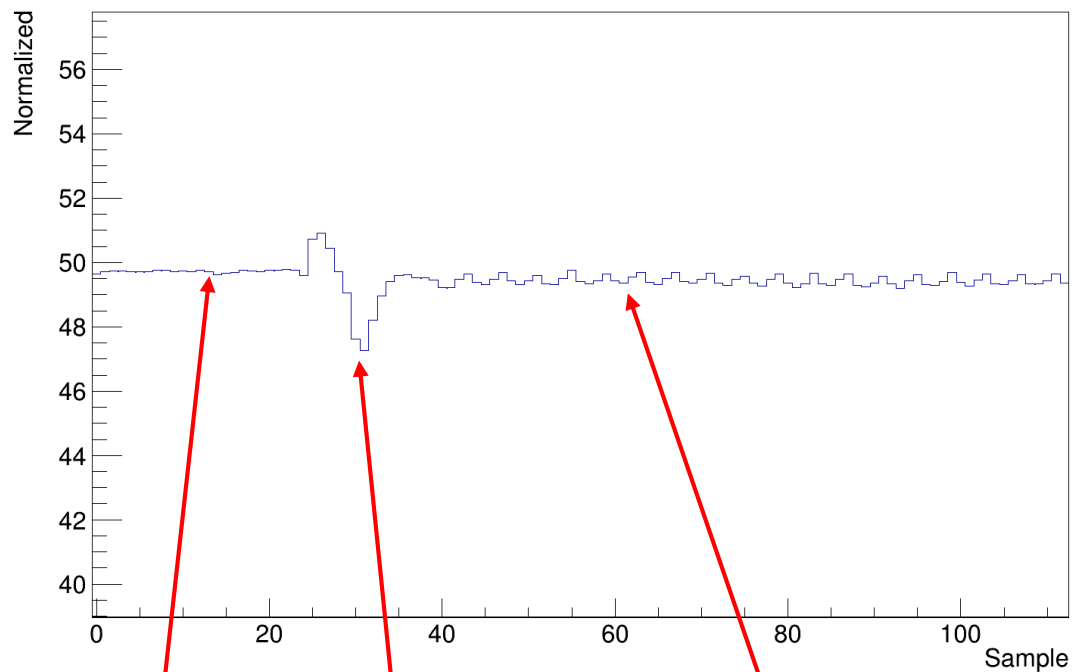
Pedestals (left y-scale) and rms (right y-scale) for 5 chips
(gain=12.5,shaping=120,decay=0.5V)



The average RMS noise is around 0.7 ADC channels \Rightarrow equivalent number of electrons \approx 350

Pedestal

Norm samples run 19879 ch 1 entries 200



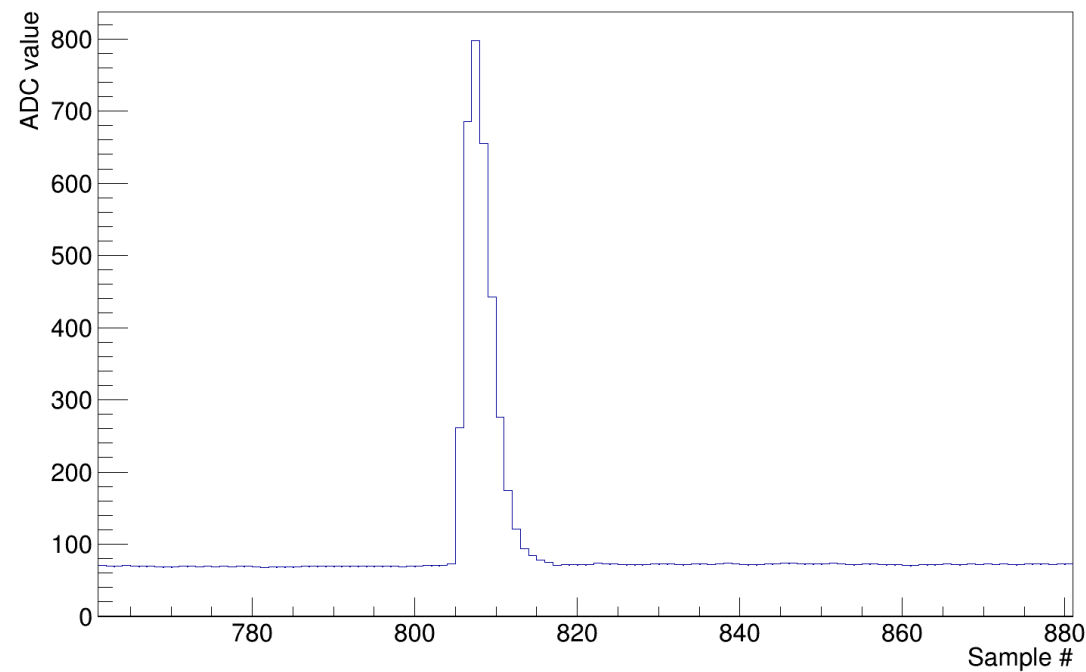
Pedestal
before trigger

Pedestal after trigger

Trigger

Signal

Run 19777 Event 2 Channel_14



Summary

A contract has been signed with a French company for packaging our SALTRO16-chips.

The first pre-series has been delivered.

Tests of these have started.

After successful tests: The full production will start.

The modifications of the MCM-board will be done.

Soldering tests of the empty packages onto the MCM-board will be performed.