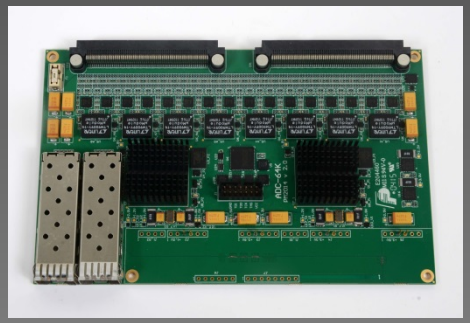
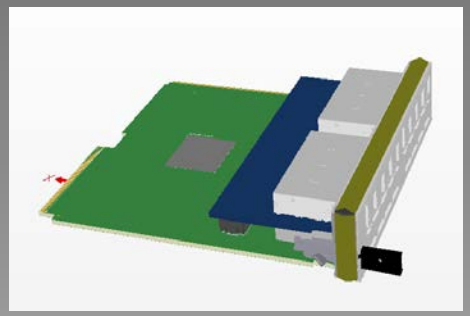
ADC for EMC

- PANDA EMC Readout Electronics

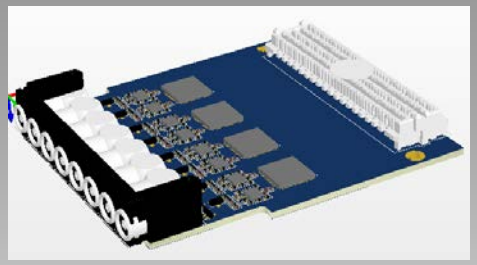
EMC SADC



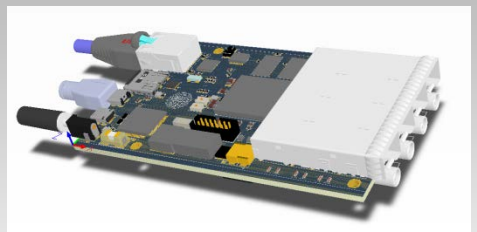
EMC Data Concentrator



Shashlyk ADC

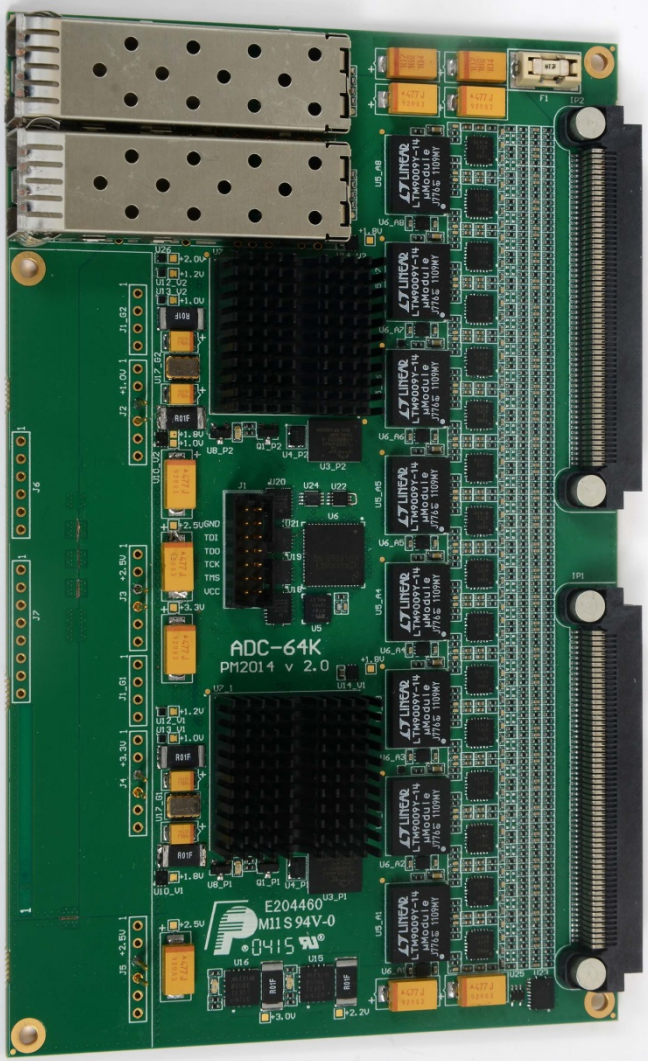


Stand Alone Data Concentrator



- ADC_64K_2

ADC_64K_2

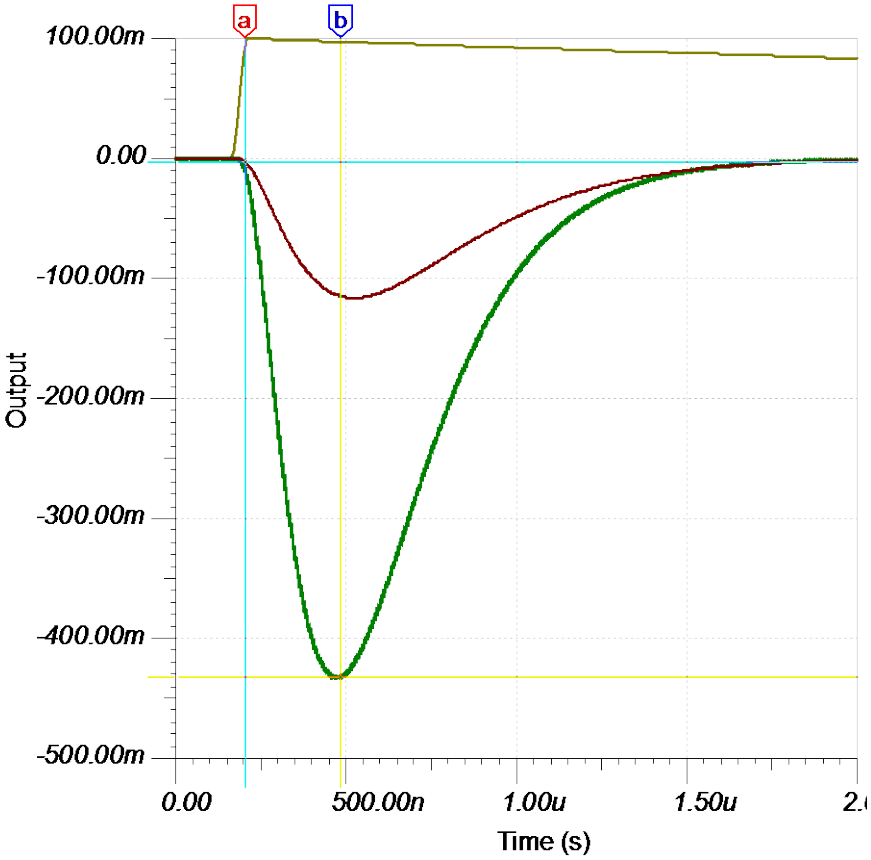


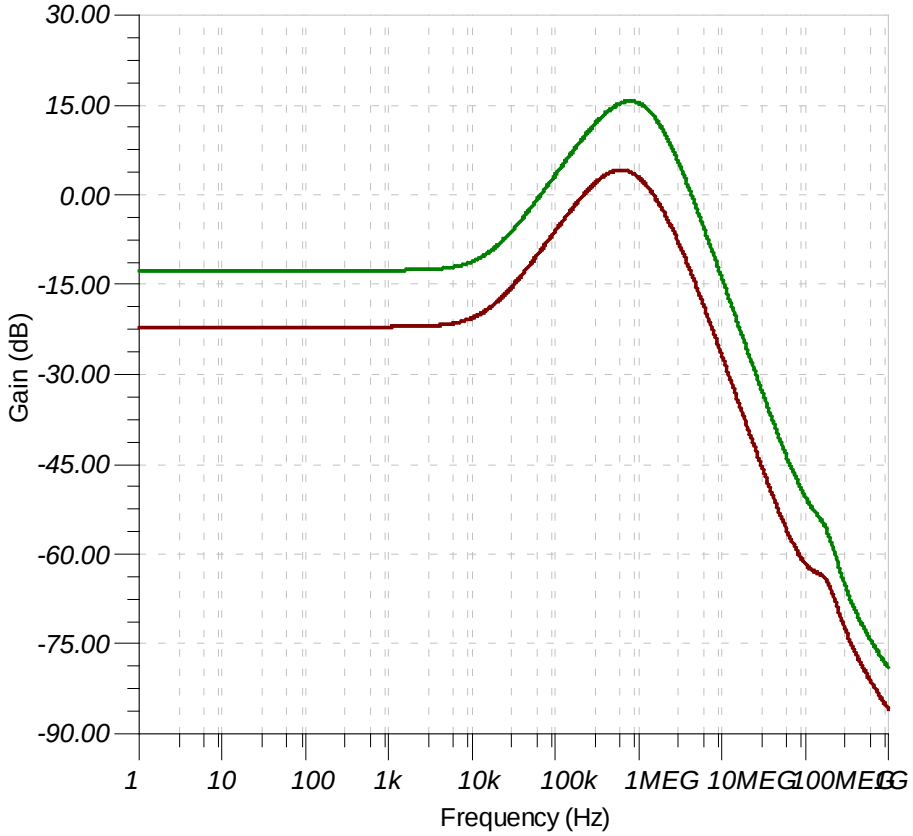
List of recent changes/improvements

1. Overall error correction
2. Input can be galvanically de-coupled from the ground
3. Improved analog/digital ground separation
4. All low-voltage power supplies can be distributed via backplane connectors
5. Space optimization
6. Baseline shifting (?)

- ADC_64K_2

ADC_64K_2 input

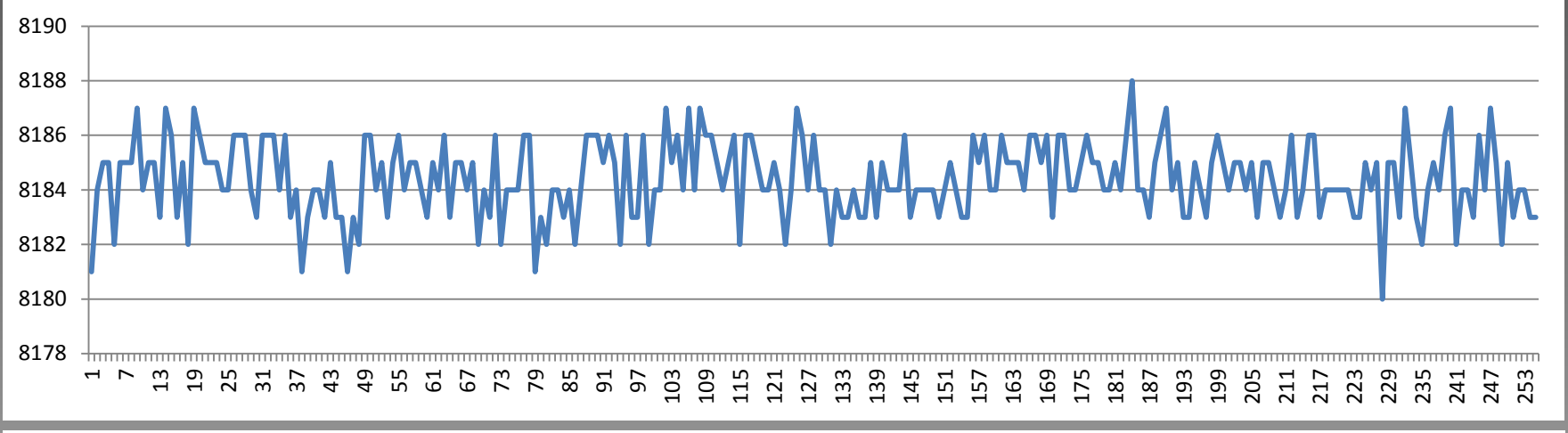




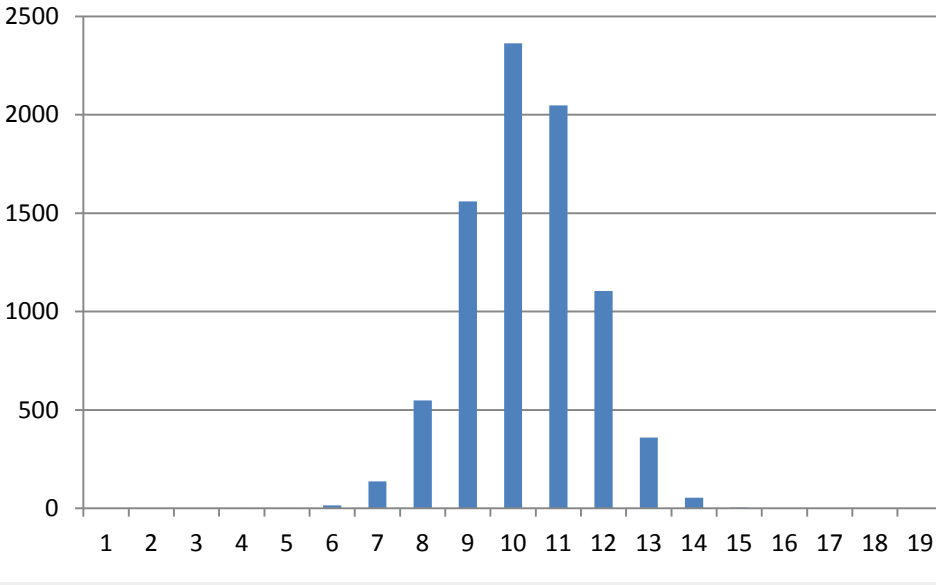
ADC for EMC

- ADC_64K_2

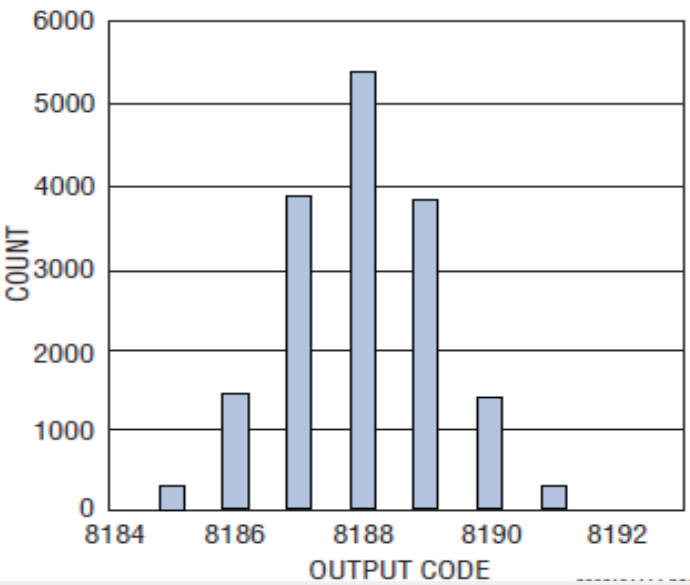
Noise Track



ADC-64K2 – open input

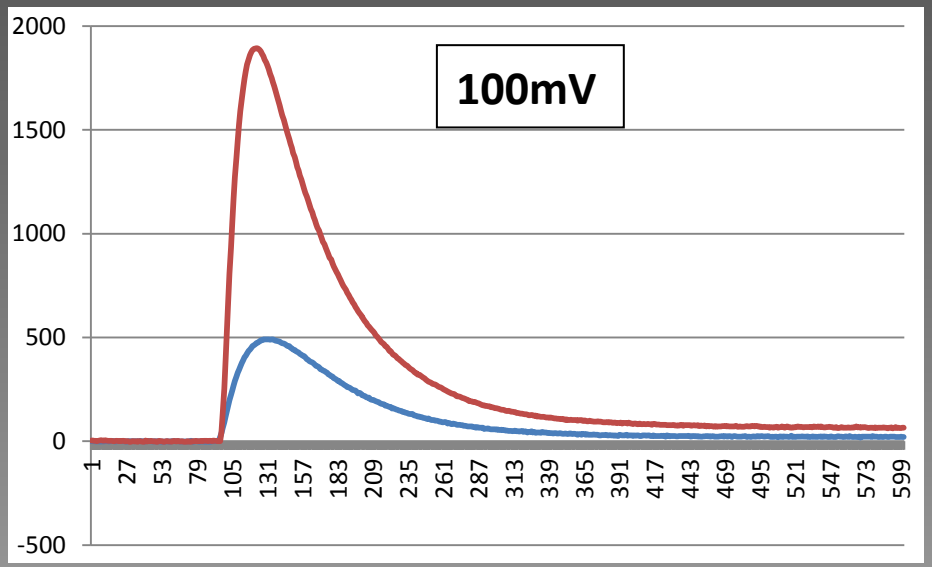


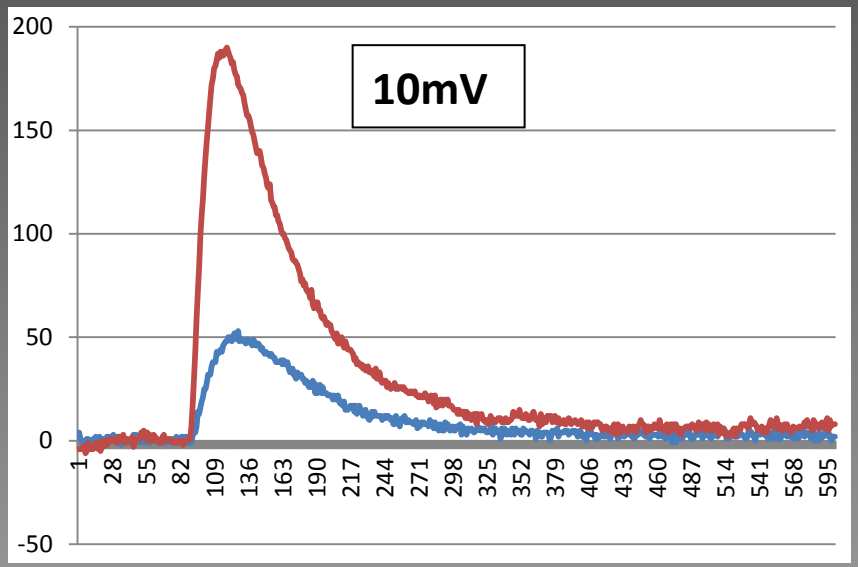
LTM9009-14: Shorted Input Histogram

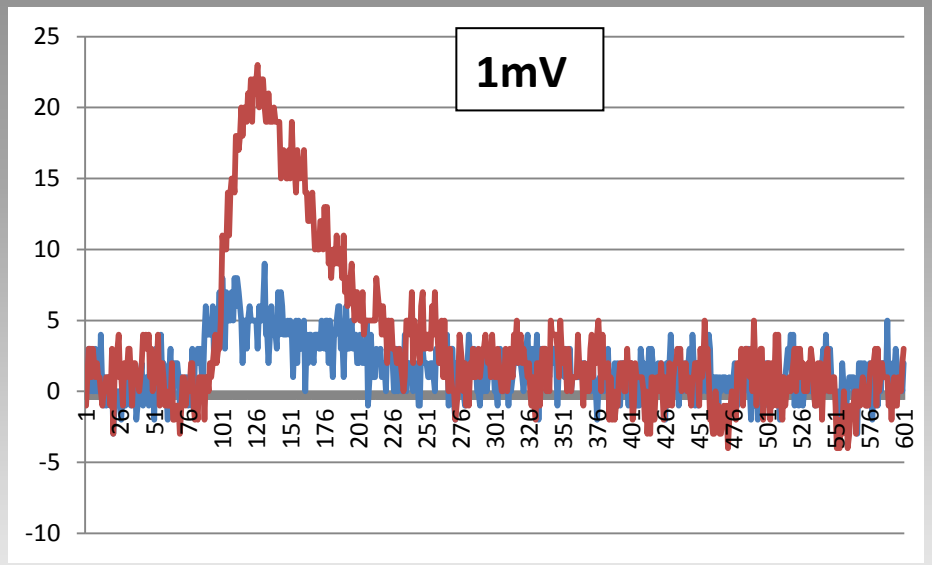


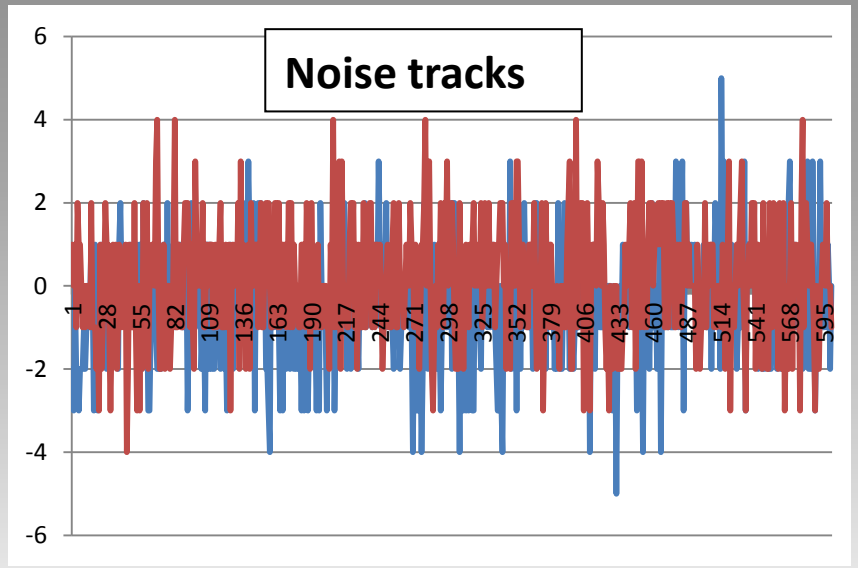
ADC for EMC

- ADC_64K_2

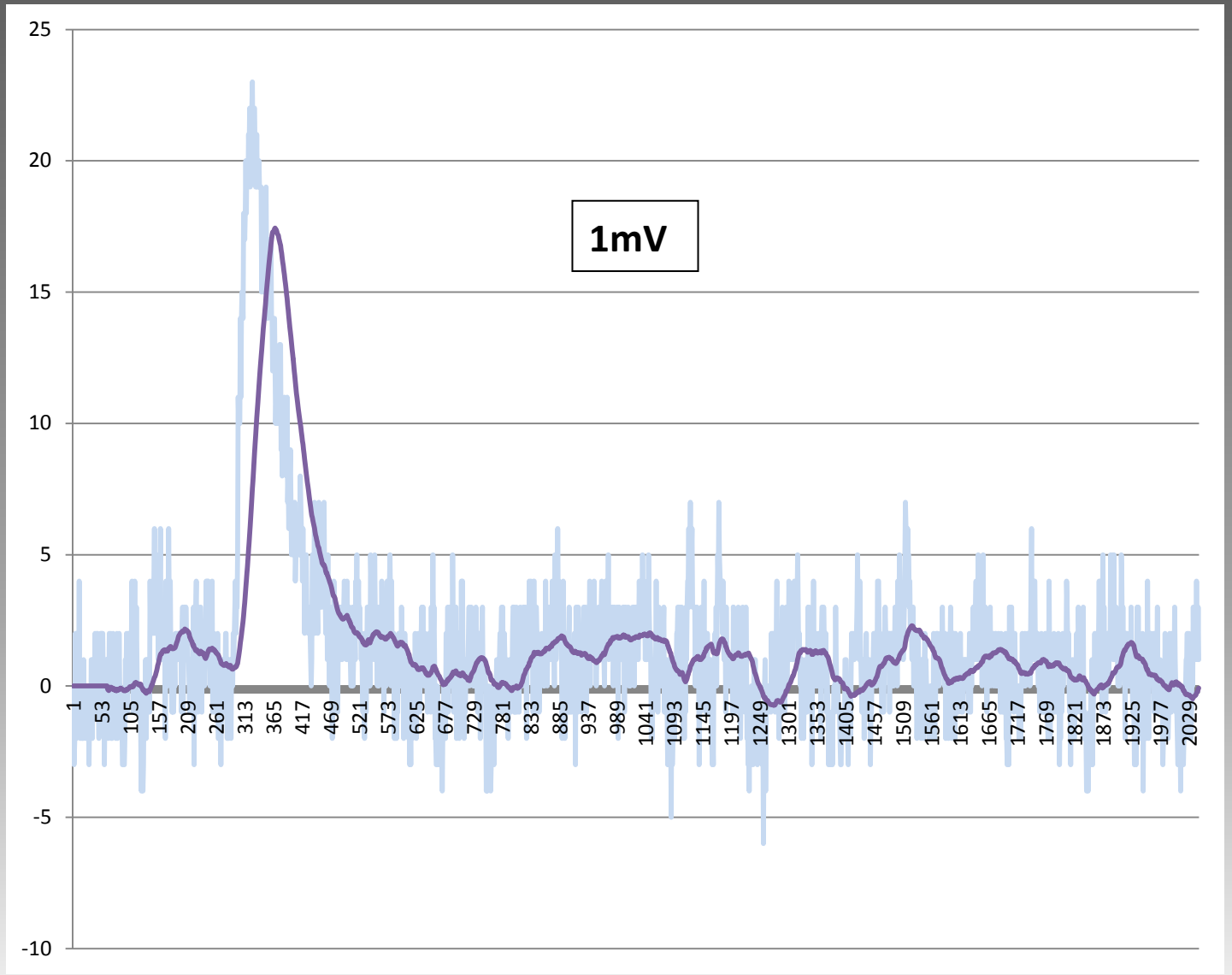








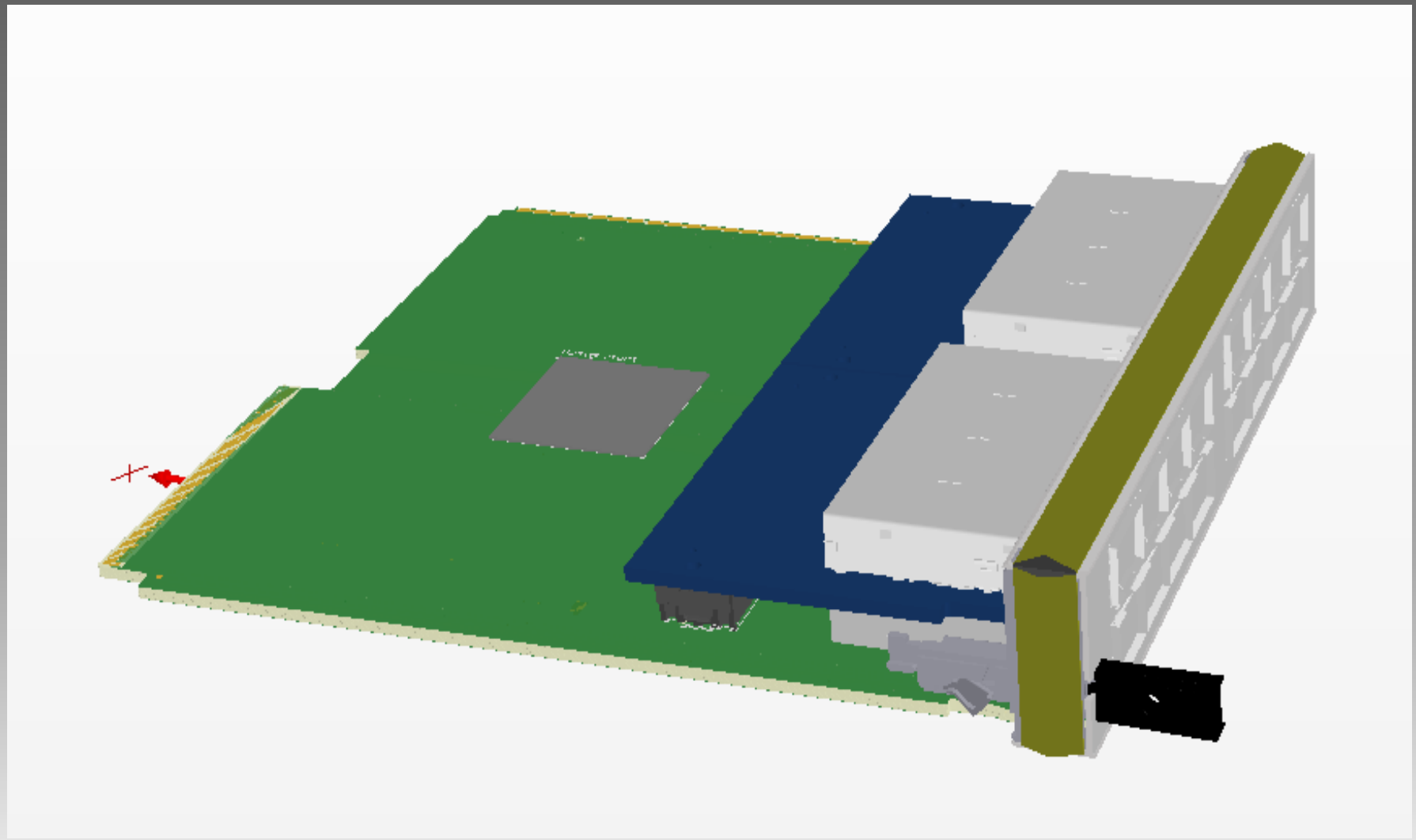
ADC for EMC
- ADC_64K_2



EMC DAQ

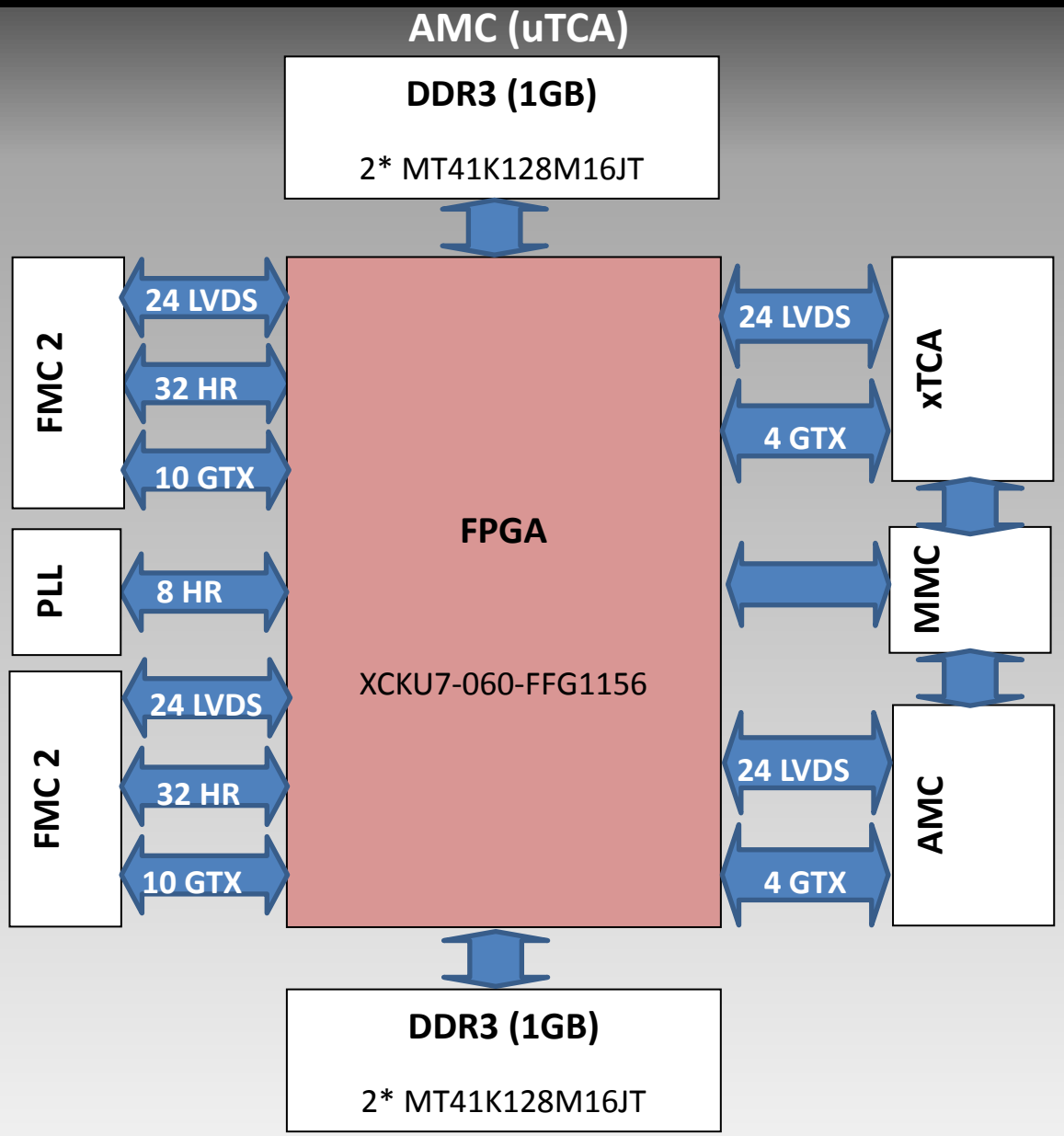
- Data Concentrator Board

AMC (uTCA)



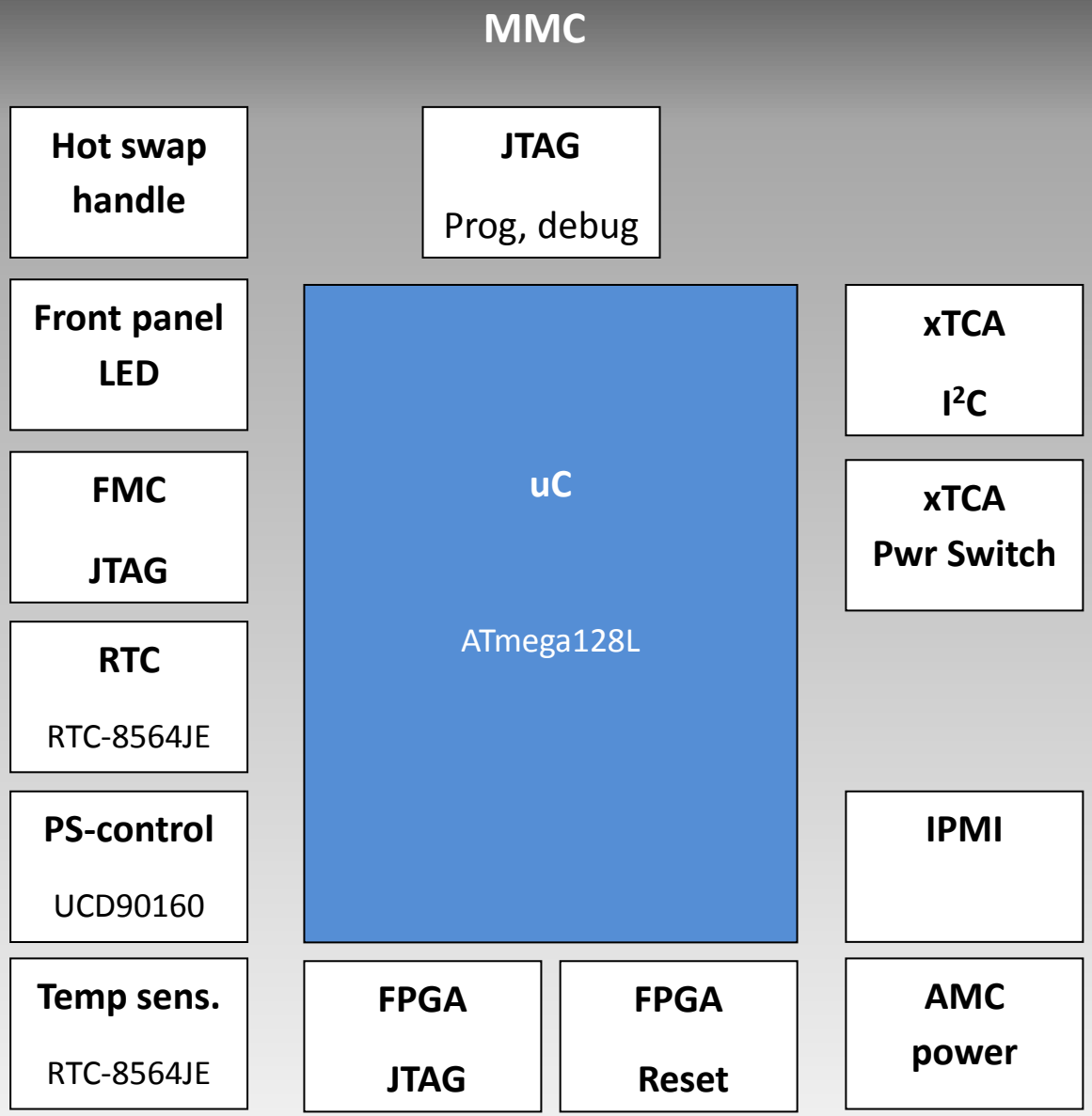
EMC DAQ

- Data Concentrator Board



EMC DAQ

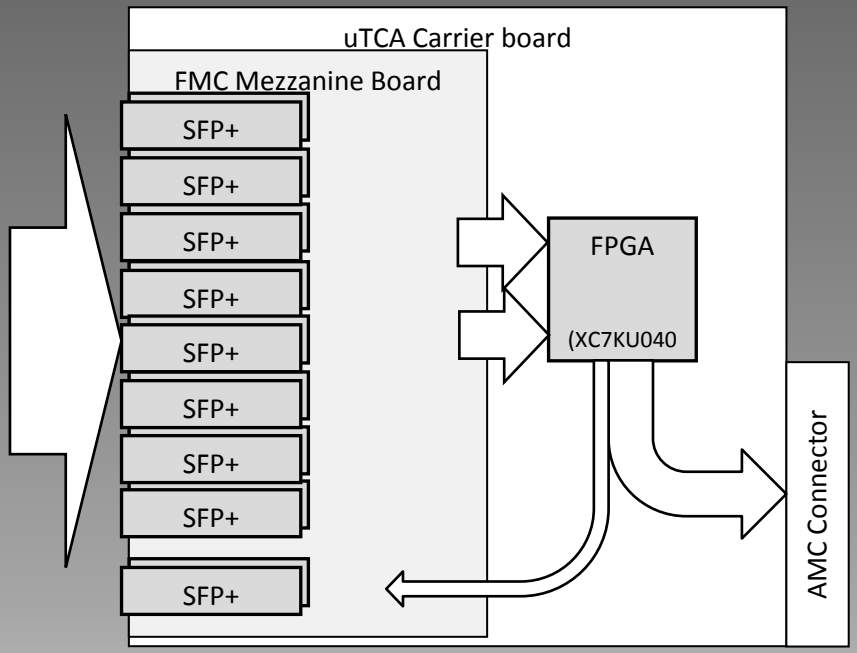
- Data Concentrator Board

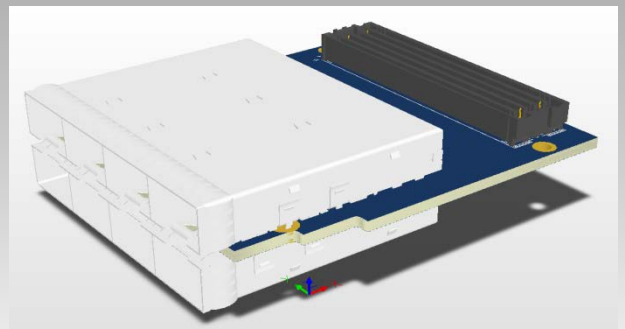


ADC for EMC

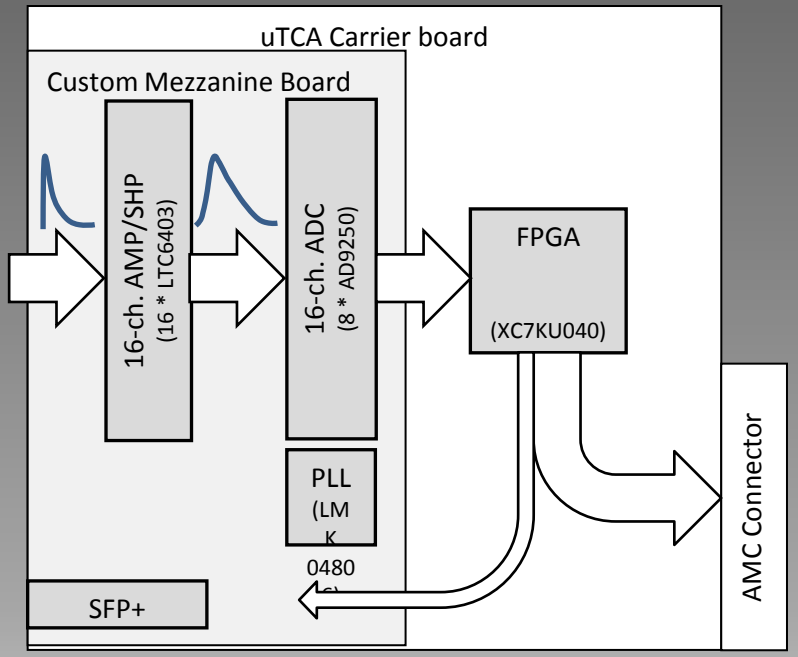
- Common Platform

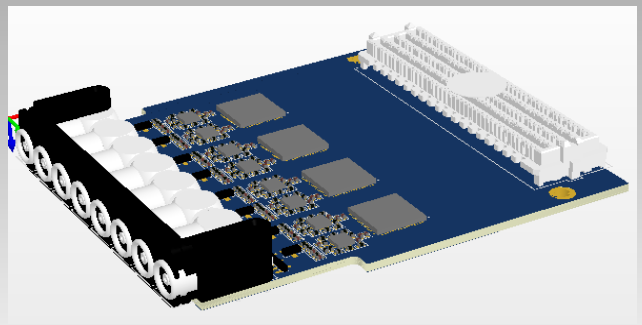
Optical Data Concentrator





Shashlyk 250 MSPS 14-bit ADC





EMC DAQ

- Shashlyk ADC

We may consider the following options for the SADC chips with JESD204B interface:

1. **LTC2123** - 2-ch, 14-bit, 250 MSPS, 860 mW - a'132$ @100pc
2. **ADS42JB49** - 2-ch, 14-bit, 250 MSPS, 1700 mW - a'125$ @100pc
3. **ADS42JB69** - 2-ch, 16-bit, 250 MSPS, 1700 mW - a'185$ @100pc
4. **ADS42JB69** - 2-ch, 16-bit, 370 MSPS, 1600 mW - a'265$ @100pc

Option 1 is technically the easiest solution due to the lowest power and size.
Option 2 is a little cheaper, but dissipates double as much power as option 1 and the chip size makes it the layout more difficult.
Options 3 and 4 have much better performance, but are more expensive.
Of the options 2,3,4 the last one is relatively the easiest to design.

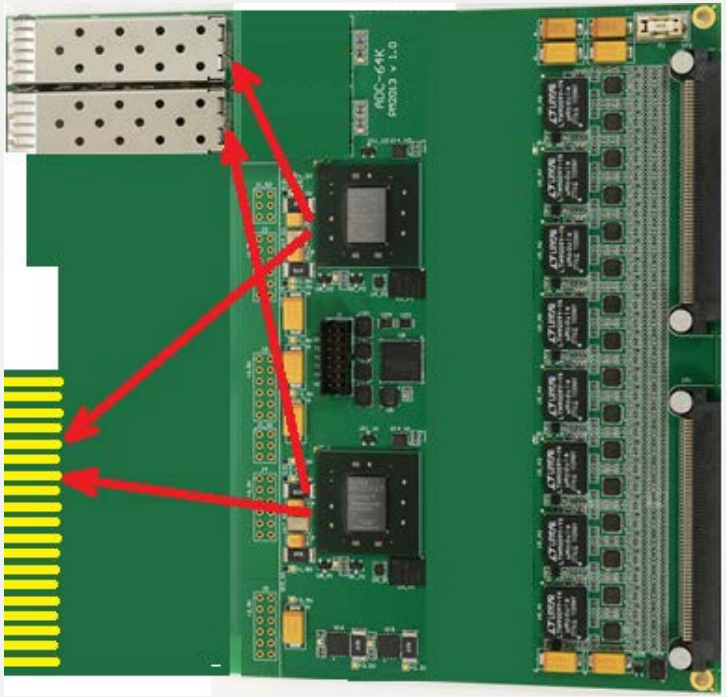
EMC DAQ

- Shashlyk ADC

1. AMC (xTCA) carrier with FMC mezzanines:

The costs of the AMC carrier (ca. 2500 $) and the FMC (ca. 500 $) per 16 channels.
The cost of the system would then be ca:

260$/ch - (14-bit/240 MSPS version)
320$/ch - (16-bit 370 MSPS version)
To this one should add the costs of crates.



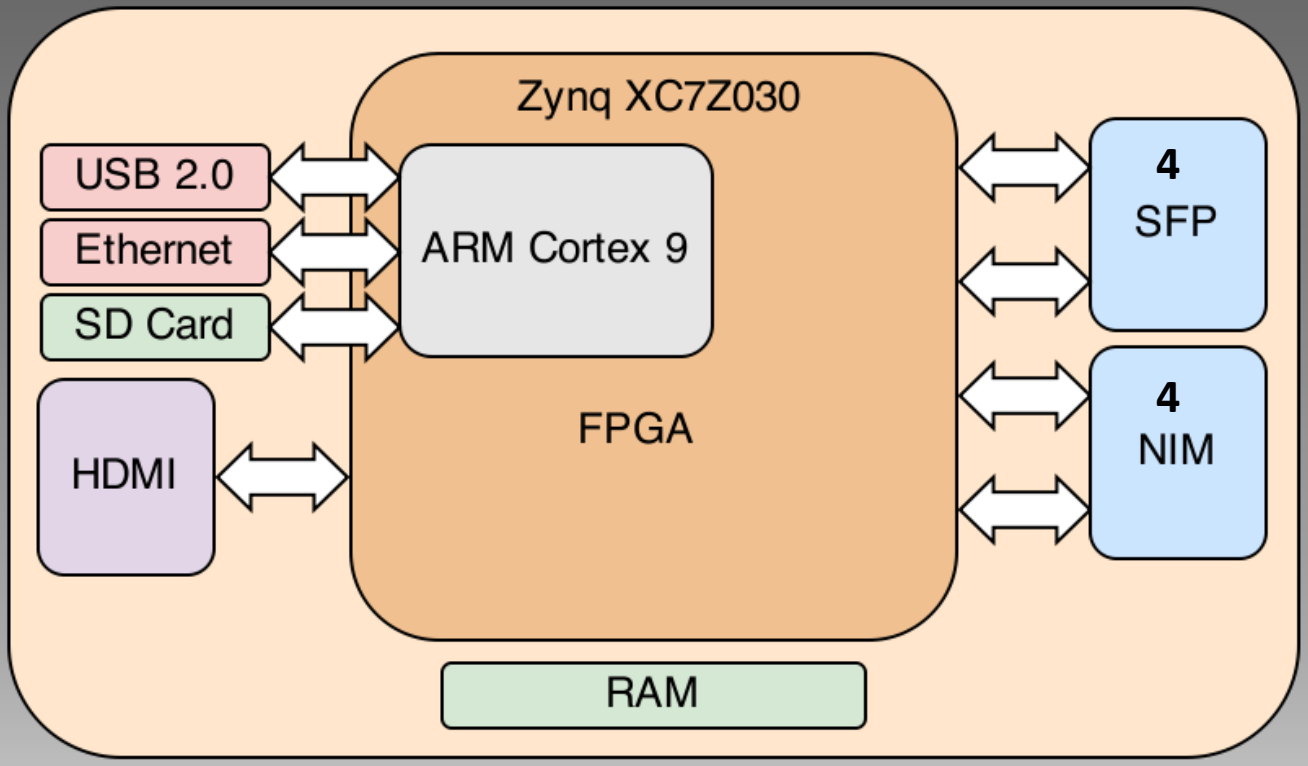
2. Current 64-ch EMC ADC design adapted to AMC (xTCA):

50..60$/ch (14-bit/125 MSPS version)
+ 1/4 crates.

EMC DAQ

- Data Concentrators

Stand Alone Optical Concentrator Board



Based on ZED-board from Avnet

Diploma work of:

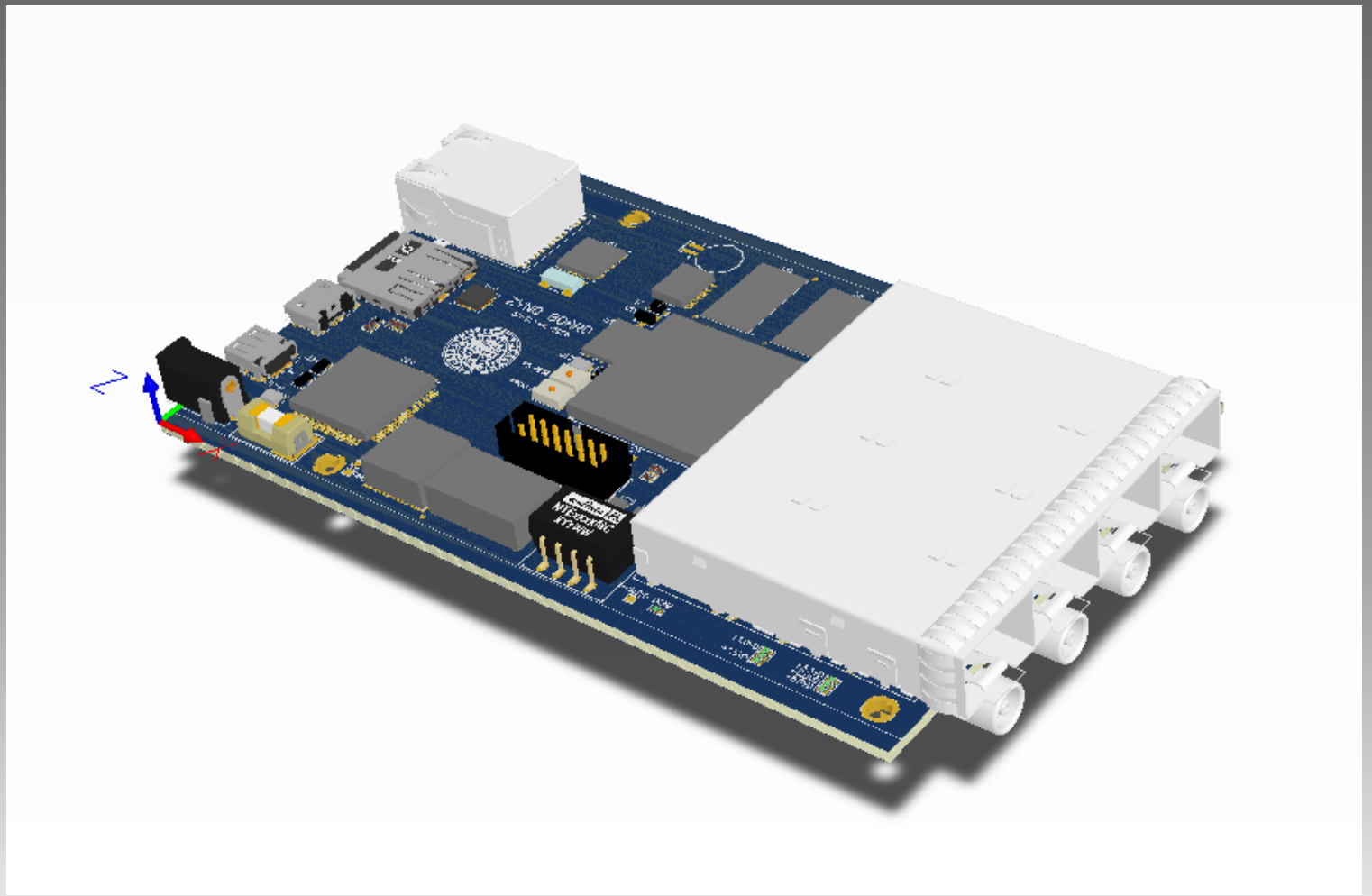
- Panagiotis Stamatakopoulos

- George Ntounas

EMC DAQ

- Data Concentrators

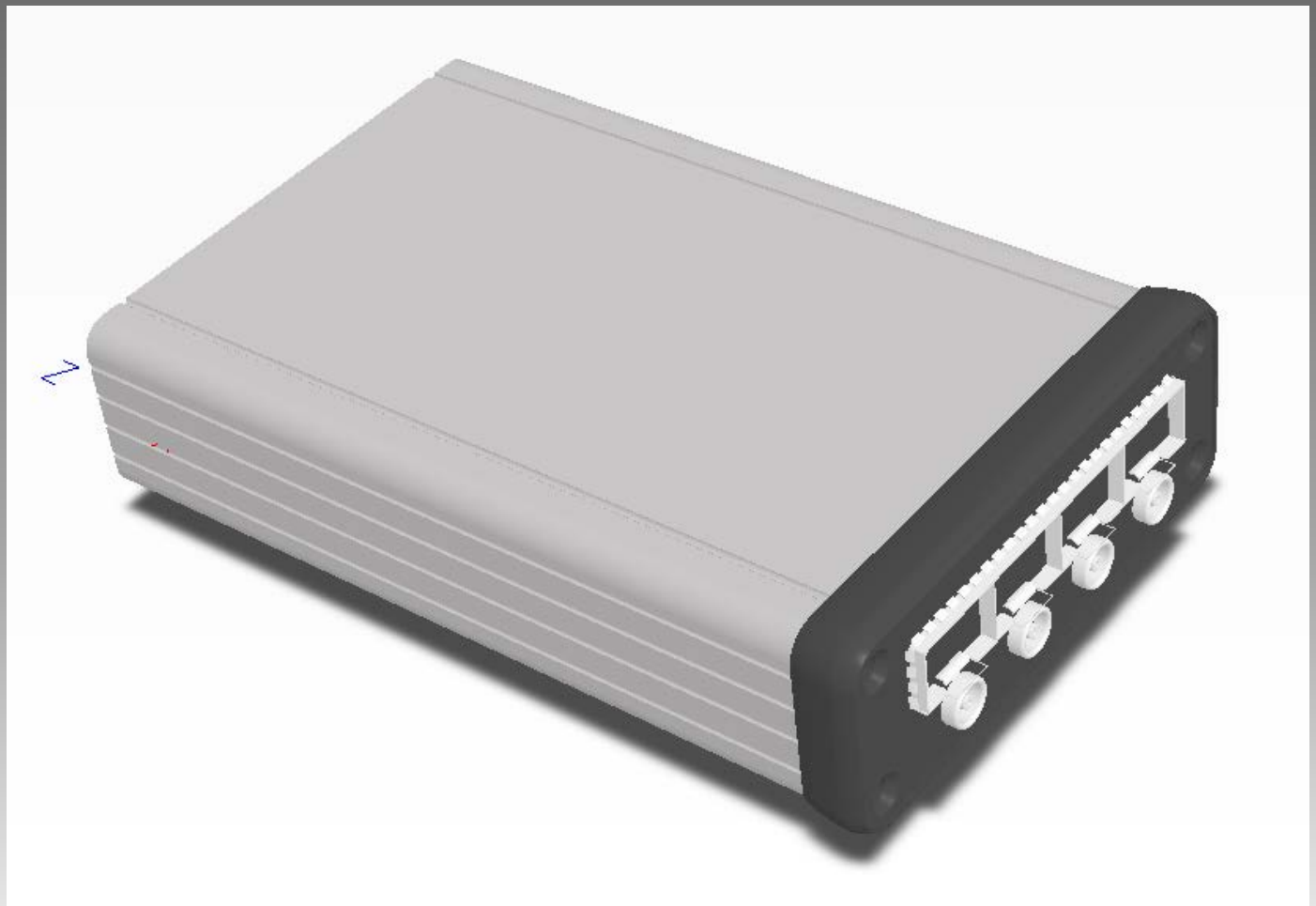
Stand Alone Optical Concentrator board



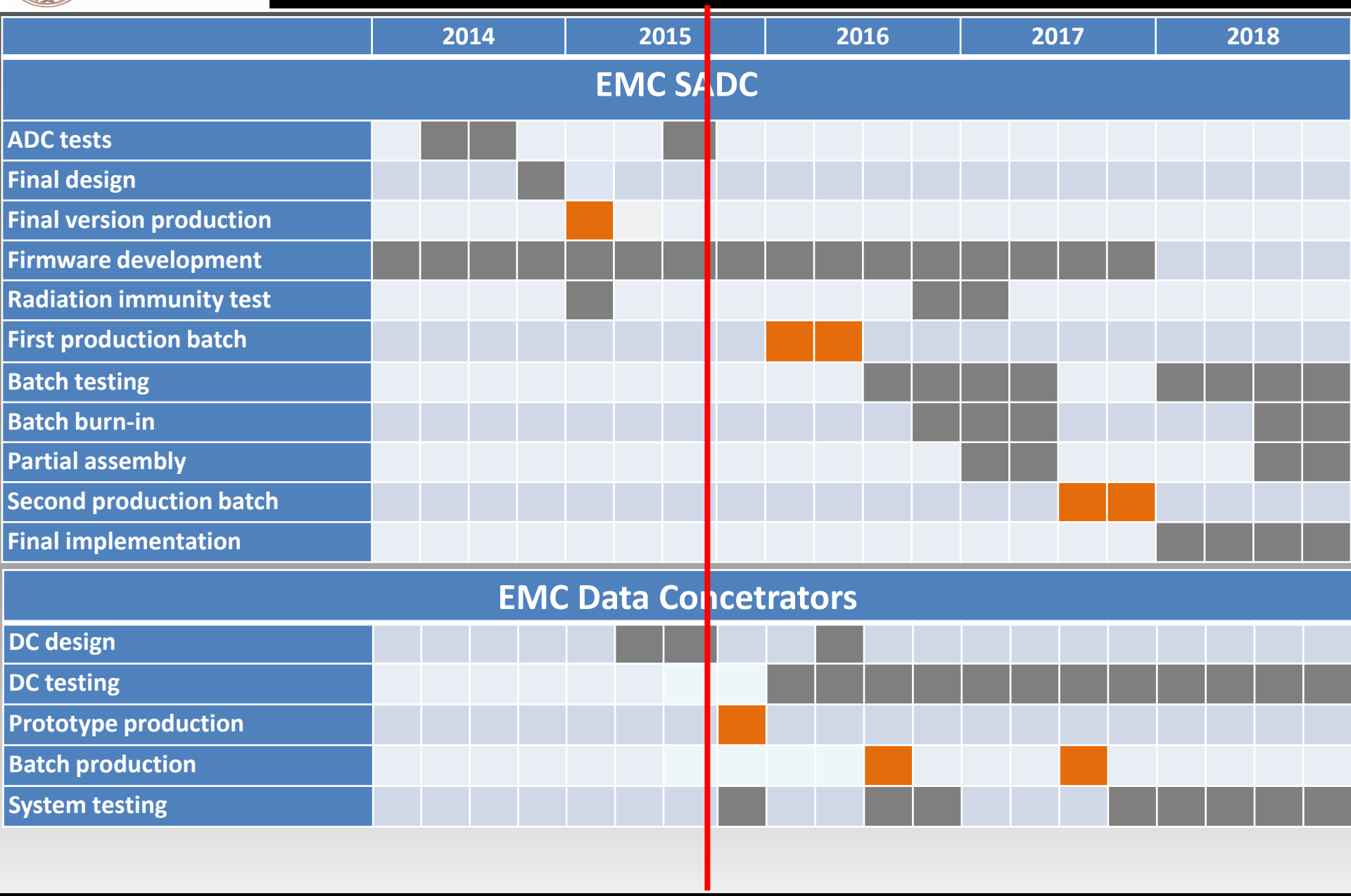
EMC DAQ

- Data Concentrators

Stand Alone Optical Concentrator board



ADC for EMC
- Schedule



Manpower

	Uppsala
Hardware design	- Pawel Marciniewski
System integration	- Postdoc
	Stockholm
Firmware	- PhD Marcus Preston
	KVI Groningen
Firmware	- Peter Schakel
	Uni Bonn
Firmware/Integration	- PhD (Johannes Muellers)

Thank You !