

DAMC-FMC2ZUP a MPSoC based FMC+ carrier card

Wednesday 4 December 2019 15:30 (15 minutes)

The ecosystem of FMC/FMC+ carriers in MicroTCA (Advanced Mezzanine Card form factor) is very diverse. The requirements for such a board are very demanding, sometimes even opposing to each other, and the definition of a specification that will satisfy most of the use cases without crossing the boundary of the 80W available for an AMC card is a challenging task.

Presented here is the DAMC-FMC2ZUP, a modern and high-performance FMC+ carrier in AMC form factor, that hosts a Xilinx Zynq UltraScale+ MPSoC. The FPGA has a total of 52 transceivers (32 GTH, 16 GTY, 4 GTR) providing support to the diverse communication interfaces towards the FMC slots, backplane and RTM. The four cores ARM-A53 processor with Mali graphics, and the availability of DisplayPort and USB interfaces over the USB type-C connector allow to use this board as a replacement to an additional CPU card for not so high demanding applications.

The availability of an independent dual core ARM-R5 that is certified for safety critical applications allows the user to implement either or both real-time and safety related applications.

The design supports different methods of synchronization to an external timing system and already includes all the necessary electronics to implement a White Rabbit endpoint when paired with the external SFP breakout board.

DAMC-FMC2ZUP is a versatile platform ideal to perform control tasks around a particle accelerator. Combined with the modularity of the MicroTCA platform it can be a building block for a larger system.

The discussion will be concluded with an overview of possible approaches to overcome the power limitations in the future.

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Session Classification: Session 3: Products presentations