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Next Generation SoC-based AMC developments at DESY

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In the last few years FPGA chip-makers have shifted their focus towards the development of System on Chip architectures with an ever growing level of peripherals integration to target the new needs of the telecommunication and datacenter markets. Following these trends, DESY and MTCA Technology Lab started the development a set of AMC cards to enable the MTCA market to benefit from these new architectures. This talk focuses on the results of these developments and both the newly available and currently under de-

velopment cards will be presented. Two universal FMC Carrier boards have been released:

• the DAMC-FMC2ZUP is high-end HPC FMC/FMC+ (VITA 57.4) carrier card

based on the Zynq Ultrascale+ MPSoC family of FPGAs. The board

supports a D1.1 compliant RTM module and offers many features

typically only provided by CPU AMCs like DisplayPort, USB and SATA.

• the DAMC-FMC1Z7IO is a cost-optimized I/O controller board based on the Zynq-7000 family of FPGAs, it provides a 48-signals connectivity on the front panel and also supports a LPC FMC mezzanine and a RTM compliant with class D1.1.

For Signal acquisition applications two digitizes are under development:

• the DAMC-DS812ZUP is a High Sampling Rate, low latency, Digitizer board based on the Zynq Ultrascale+ MPSoC family of FPGAs. The board provides 8 12-bit ADC channels sampling at 800MSPS, accessible either by coaxial connectors on the front panel or by a RTM compliant to the new RF1 class, and a flexible clocking scheme.

• the DAMC-DS5G14ZUP is a Digitizer card leveraging the new Zynq Ultrascale+ RFSoC family of FPGAs, it provides 8 14-bit ADC channels sampling at up to 5GSPS, accessible either through front panel or an RTM compliant to the new RF1 class, and 8 14-bit DAC channels at up to 10GSPS while also retaining many of the CPU-like features already available on the DAMC-FMC2ZUP.

Another recent addition to DESY portfolio is the DRTM-MXC, a RTM specifically designed to support Mobile PCI eXpress Modules, including high performance mobile graphics cards, that targets AI/ML applications.

DESY commitment to ease the development of MTCA electronics brought to the release of a ready to use MMC module. The MMC-Stamp is provided with pre-programmed firmware and allows engineers to focus on the main features of the new designs, relieving them from the task of complying with the MTCA underlying infrastructure management requirements.

Summary

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