

## Universal Dual-channel FMC Carrier Board based on the mTCA.4

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To address the requirements of equipment interlock protection, time delay, and low-level tuning in linear accelerator systems, a universal dual-channel FMC carrier board based on the mTCA.4 standard has been developed. The board utilizes the Xilinx ZYNQ Ultrascale+ series chip, model XCZU19EG, equipped with two 64-bit DDR4 memories connected to the PS and PL respectively. It also supports PCIe3.0x4 and can be expanded to PCIe3.0x8.

The board is configured with two HPC sites. While one of the HPC sites does not have HB bank signals connected, all other pin signals are provided. The Zone.3 interface complies with the D1.1 standard protocol, ensuring compatibility with other related boards in the laboratory and supporting White Rabbit timing, among other features. Additionally, it includes one USB 3.0 interface, one Type-C interface, and one SD card slot, supporting multiple boot modes.

The PCB layout has been initially completed, and functional testing of the MMC module is currently underway.

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