

Xilinx CPLDs Satisfy High-Speed Processing Needs

Transtech Parallel Systems Ltd. (High Wycombe, United Kingdom) designs and manufactures a wide range of embedded multi-processing products for OEM, end-user and scientific research applications. Specializing in meeting the needs of demanding high-performance, high-bandwidth applications, Transtech's products include every state-of-the-art microprocessor available today.

For example, three new board-level products are based on the 200 MHz PowerPC 603eV and 604eV processors: two TSP family VMEbus boards, and the TTM610 board featuring the popular TRAM format. The TTM610 TRAM module combines the PowerPC processor with a T805 transputer and up to 32 Mbytes of high-speed Synchronous DRAM (SDRAM), and is tailored for scalable, high-performance multi-processor solutions. Shared SDRAM memory is used for inter-processor communication.

To take full advantage of these high-performance processors and memories, equally high-performance interface logic was required. This need, coupled with fast time-to-market requirements, led Transtech engineers to the Xilinx XC7300 and XC9500 CPLD families.

To support the fastest possible memory cycles, two XC7336-5 CPLDs were selected for implementing high-speed memory decode circuits on the TTM610 board. The XC7336 device was the only available CPLD that could perform the necessary decoding functions while maintaining a pin-to-pin delay of just 5 ns.

Two 108-macrocell XC95108-10 CPLD devices hold the more complex, high-speed state machine functions within the processor/memory interfaces. With an aggressive development schedule that dictated the parallel design of the logic and the PCB layout, the pin-locking capabilities of the XC9500 architecture proved crucial. In the words of Transtech design engineer Hugh Tarver, "The increased routability of the Xilinx

XC95108 CPLD enabled a number of logic design iterations to be completed without the risk of the XC95108 changing its pinout assignment. This enabled us to complete our transputer board design quickly and without PCB modification."

A further attraction of the XC95108 CPLD was its in-system-programming capabilities. High-density packaging was required for the densely-populated TTM601 and TSP boards. In-system-programming eliminated the extra handling of the 100-pin PQFP packages that would have been required if an external programmer were used.

Multiple XC7336 and XC95108 CPLDs implement similar high-speed processor-to-memory and processor-to-processor interfaces on the TSP family VME boards, which feature up to four PowerPC processors per board. All the CPLD designs were developed using the Xilinx XABEL-CPLD™ software package on a PC platform.

High-speed systems need high-speed logic. The combination of the high performance and flexible, highly-routable architectures of the Xilinx CPLD devices were essential to meeting the needs of Transtech Parallel Systems' new PowerPC-based, high-performance multiprocessing systems. ♦



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7

