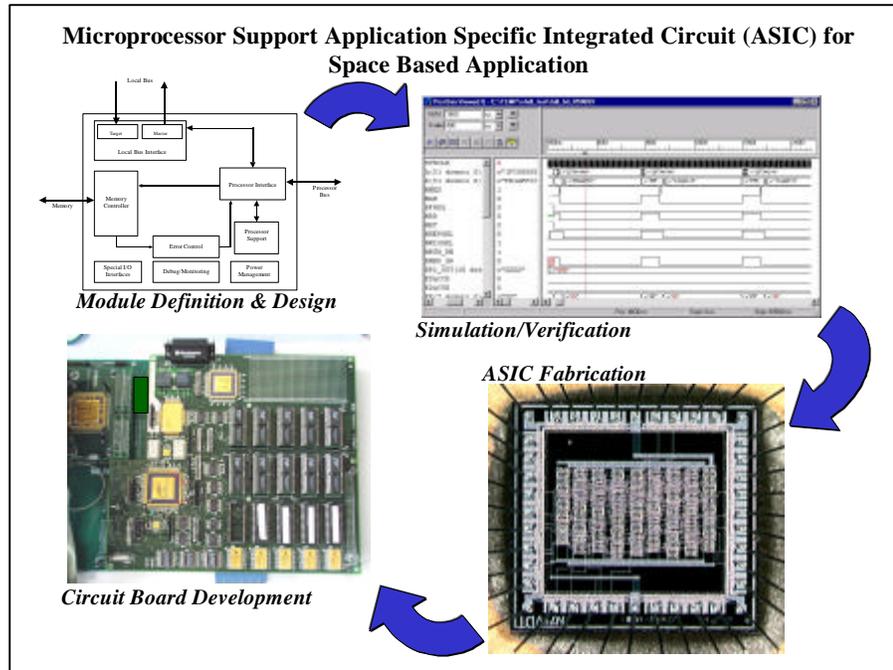


Integrated Circuit (ASIC) for Space Based Application

A11



Objective

High-end embedded processors require a variety of support functions such as memory control, watchdog timers, clock managers, etc. Currently these functions are implemented in individual IC components and are not designed with the reliability enhancement features needed for space environment applications. This effort will incorporate these functions into a single support ASIC using a very modular approach to allow support of a wide variety of processors and applications. The ASIC will also incorporate fault-tolerant features to meet space environment reliability requirements.

Why Needed

On past projects all required support functions have been implemented using one or more field programmable gate arrays (FPGA). With processor speeds continuing to increase, the use of FPGAs in providing the required support functions is becoming a challenge and in many cases may create a bottleneck in performance if the FPGA is not fast enough. For example, a processor may be capable of accessing memory with no wait states but to implement Error Detection and Correction (EDAC) in an FPGA may require the addition of several wait states which significantly reduces system performance. In addition to FPGA speed, another factor affecting the use of FPGAs is gate capacity. To implement all the required support functions for a space based processor board may require several FPGAs. This then adds to the processor board size, weight and power, which is not desirable for space based applications. This is also a concern when attempting to implement all the support functions using discrete integrated circuits (IC). The library of support modules could continually be expanded to meet any future project processor board requirements. This ever-increasing module library along with the in-house ASIC experience would be a tremendous benefit to any future projects.

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