

SYNCUSTECH

CASE STUDY

Semiconductors

- Controller for Wafer Cleaning Equipment



Controller for Wafer Cleaning Equipment

PROJECT SCOPE



The controller employed in semiconductor manufacturing processes must meet the high reliability and performance standards required in the high-tech industry due to its special characteristics. In other words, the controller should be able to minimize the down time against any unexpected faults, provided with the convenience of easy maintenance procedure in order to easily recover the system operation fast from those temporary troubles. As well the controller should have the expansion capability more than 3 slots of PCI, PCIe & other expandable ports for added high performance functions.

CLIENT'S CHALLENGE



The one of most frequently incurring troubles in existing control systems is the shutdown of controller system caused by CPU cooling fan failure. However, the controller manufacturers should inevitably use the CPU cooling fan as they have to select the Intel Desktop Solution in order to secure high performance computing power. Besides, these small size controllers, being the system should be embedded inside of semiconductor process equipment usually holding 5~8 controllers, requires certainly simple and compact device designs, and at the same time has to furnish a somewhat conflicting configuration demand for multiple numbers of expansion slots. The existing controller is designed with CPU board and backplanes to obtain the desired expansion, but this conventional solution accompanies with the requiring customized design for the backplane and chassis.

SOLUTION AND IMPLEMENTATION



SyncusTech has completed the basic design process employing the fan-less type Mini ITX EMB-QM87 embedded with Intel® QM87 chipset in order to simultaneously gain powerful performance and solid CPU operation with no cooling fan. In addition, SyncusTech made full use of basic motherboard expansion capability breaking with the backplane type expansion mostly employed by the competitive foreign products. In other words, dividing the PCIe x16 with 8:8 or 8:4:4 ratio makes it possible to provide the combination of 2slots - PCIe x8 or 1slot - PCIe x8 and 2slots - PCIe x4 configurations only with the design and application of Riser Card. The application of mPCIe to PCI 2slot Riser Card allows the expansion configuration of 3slots - PCIe and 2slots - PCI ports providing the best solution for users. As the controller is designed based on the optimum compatibility with motherboard, there is absolutely no problem in operation even with those multiple axis motion control cards requiring lots of complicated functions. Taking the advantage of such trouble-free basic configuration, unlike the conventional products, the controller allows the compact device design.



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CONCLUSION AND BENEFITS



By developing the customized hardware, not only the long term supply but also the stabilization of LAN communication can be ensured. And in spite that annual demand is relatively small, company U can be supplied the customized system at competitive price. Furthermore, the level of customer satisfaction has been also greatly improved because the customer is able to secure the prompt technical support against any sorts of troubles. Presently, Company U is reviewing the feasibility of employing the EMB-Q77 Rackmount System applied to LCD equipment to the semiconductor equipment as well.



Features

- Intel® QM87 chipset with 4th generation Intel® Core™ CPU
- 3-slot model: 1 x PCIe x 16, 2 x PCI (Versatile Expansion Interface)
- Three independent video outputs support high resolution
- Dual 2.5" SATA HDD bay design fulfills high storage demand
- Compact Size Aluminum BoxPC

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