Special Edition on 21st Century Solutions

21st Century Silicon Solutions

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Abstract

Silicon Solutions Company

As we enter the new millennium, we see the information revolution of the late 20th century giving rise to the dawn of the new Internet age with growing opportunities and challenges for new and evolving silicon-based technologies. It is with this awareness of real opportunity that Oki Electric Industry Co., Ltd. has redefined its semiconductor business as the Silicon Solutions Company or SiSC.

As a compact organization, SiSC will be well suited to adapting quickly to changes in the business environment, to improve corporate value by rapidly providing solutions that meet changing market demands, and to become a company that has a strong presence in the 21st century’s world of technology. In order to survive and champion intense market competition, SiSC must respond to technology requirements rapidly and achieve a strong global position. SiSC will provide cutting-edge silicon solutions that are not only hardware based, but include system-level integration of both hardware and software IP onto one integrated silicon-based platform. SiSC’s silicon solution technology is based on this concept.

What are silicon solutions?

As product development cycles become ever shorter and part procurement becomes more globalized, a truly global solution that reduces the customer’s development burden must be more than just a technology solution. It must be a total solution, even a production/delivery solution.

Constantly endeavoring to improve and enlarge our logic and system LSI, SiSC has developed a technology solution using “SPA” (Silicon Platform Architecture) as our basic architecture. By providing a total system development environment for software and hardware, SPA makes it possible to realize system-level LSI that meets the customer’s requirements for reduced development periods.

At SiSC, we are also working with SCM (Supply Chain Management) as an optimized production and delivery solution. With our SCM solution, we are working towards consolidating our e-business system using Internet portal web sites to provide a variety of products to our customers with increased speed and efficiency. At SiSC, we continue working closely with our customers to further consolidate and advance SCM and our e-business.

Example SPA Solution

As a concrete result of our SPA implementation, SiSC has newly brought to market a system-level integration platform called “µPLAT™” (micro PLAT). Using the µPLAT integration platform, SiSC and our customers are able to develop system LSI in a shorter period of time, meeting our customer’s 21st century development requirements. SiSC’s µPLAT architecture supports system LSI development as a total system development as a total system development environment for hardware and software, and uses ARM 7TDMI™-based (Advanced RISC Machines, Ltd.) CPU’s as its core.

We are expanding mobile µPLAT product offering which has a power saving function, marketing a mobile telephone communication protocol LSI family, as well as bringing forth unique products such as mobile adapters that connect game devices and mobile telephones together.

We are also actively developing 2.4-GHz BlueWare products using Bluetooth technology licensed to Oki by Telefonaktiebolaget LM Ericsson. Bluetooth is a wireless communication standard for Local Area Networks which is expected to connect diverse future electronic devices together using wireless transmission. Gallium Arsenide and bipolar elements were originally used for these products. However, by developing new, high-frequency circuit technology, we successfully developed and implemented high-frequency analog LSI using CMOS elements for our BlueWare products. SiSC will provide its customers with a chip-set, system development kit, and protocol software package. We are currently focused on combining baseband components with these elements onto a single chip.

Unique, Original Technology

At SiSC, we are committed to providing our customers with a truly global production/delivery solution using our global SPA solution strengths, our communication and network system technologies, and our high-speed, low power-consumption technologies. We are focused on using our unique and original product technology, process technology, and packaging technology to bring new, high-demand silicon-based technology products to market.

SiSC’s system memory product technologies include DRAM, mixed logic, and P2ROM (Production Programmed

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ROM. We are expanding our memory products based on these original technologies. These system memory products are used in a variety of electronic devices including personal entertainment electronics, and are enjoying wide market success.

Our continuing wafer process development supports SiSC’s product miniaturization efforts. We have successfully marketed LSI for mobile devices using our own, previously developed SOI (Silicon On Insulator) technology that greatly reduces power consumption. These very low power-consumption LSIs use our 0.35-m SOI process. Additionally, we have completed practical development of the next-generation process technology that will further miniaturize the L/S in our LSIs, and will enhance future product development.

A new packaging process that we use called WCSP (Wafer-level Chip Size Package) was developed by a new company, Integrated Electronics and Packaging Technologies, which we jointly established with Casio Computer Co., Ltd., in November of 1999. WCSP is a technology that can assemble components into a very small package the size of a chip. WCSP makes it possible to realize smaller and lighter mobile information devices with higher performance at a lower cost. We have begun mass production shipping of LSIs for mobile telephones which use this WCSP process.

Conclusion—Providing the Total Solution

Several technologies assure that SiSC will be a silicon solution company business able to take full advantage of coming technological and business market environments. These technologies include our communication/network technology which uses SPA to support system LSI solutions, our high-speed, low power-consumption process technology such as SOI, our compact and light packaging technology represented by WCSP that is used for mobile applications, and our software technology such as real-time OS. The cornerstone of our management commitment is to provide total solution products that satisfy our customers demands completely, rapidly, and more efficiently than anyone else.

Figure 1: SiSC’s Total Ability to Provide a Total System Solution