

Fukuoka Cluster for Leading-edge System LSI Design Development



Fukuoka

Creating new industries in the area of system LSI design and development

Cluster Vision

"Silicon Sea Belt (SSB) Fukuoka Initiative" - For the Formation of System LSI Development Industry Cluster
 We aim to construct a world-class cluster that serves as an engine to revive the semiconductor industry in Japan by further enhancing concentration in Fukuoka area and that aims to become a world-leading hub of advanced system LSI design and development.

Fukuoka Prefecture has been vigorously promoting its original concept of the "Silicon Sea Belt Project"(SSB Project) with collective efforts of industry, academia and government. The concept of the SSB project is to aim to become a hub of system LSI design and development in the Asian region ("the Silicon Sea Belt", the area which links South Korea, Kyushu, Shanghai, Taiwan, Hong Kong, Singapore etc.) with intellectual resources and concentration of industry in the system LSI design field.

Project Overview

For the promotion of SSB Initiative, we have initiated the five main schemes as below, as well as started up System LSI Division.

) Human resources development

We established the College of System LSI, Fukuoka in 2001 to focus on system LSI design education and have nurtured 2,800 engineers so far.

) R&D Support

For R & D, we carried out 80 projects in 2006 to stimulate research and development of advanced system LSI throughout the region. It was based on both the Knowledge Cluster Initiative project and nascent consortium of regional R & D projects of the Ministry of Economy, Trade and Industry.

) Venture business development and support

We have supported system LSI-related small and medium-sized venture companies with our Knowledge Cluster Initiative program in cooperation with Fukuoka Prefecture, Fukuoka City, and Kitakyushu City. At the Fukuoka Institute of System LSI Design Industry, we offered services allowing use of EDA tools and financial assistance for LSI preproduction for small and medium-sized venture companies. The EDA tools were introduced in 2003 through the use of a grant from the Ministry of Economy, Trade and Industry. In addition, the EDA tools were used for a total of 14,800 hours by system LSI-related companies, which indicates that such service is a powerful incentive for venture companies to set up their offices in the Institute. Also for the development of semiconductor-related venture companies, we established a regional fund in 2005.

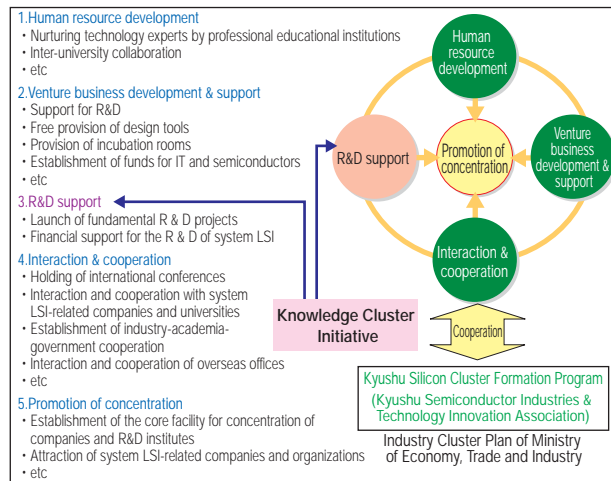
) Interaction & cooperation

Fukuoka Prefecture has been actively promoting "Silicon Sea-Belt Fukuoka Project" since 2003, and the Silicon Sea-Belt Summit is firmly established as a regular event. Next year will be the sixth annual Summit.

) Promotion of Concentration

The Fukuoka Institute of System LSI Design Industry was established in Nov. 2004 and has promoted development of human resources, research and development, and business development as well as has played the role of a fully-integrated core facility of the Silicon Sea Belt project.

In the Institute, there are System LSI Research Center of Kyushu University, FLEETS (Fukuoka Knowledge Cluster Research Laboratory for Advanced System LSI), College of System LSI, Fukuoka, as well as user-shared verification laboratories mainly for system LSI-related ventures.



We are working on the Silicon Sea-Belt Project, based on the five pillars, as a unique regional cluster policy

Project Director
Kazuyuki Hirakawa



Kazuyuki Hirakawa is a former general manager of the electronics devices group at Oki Electric Industry Co., Ltd

To Establish Core Design Technology to be the World-Class R & D Hub of Leading-edge System LSI

We have been working on the Silicon Sea-Belt project to invite and cluster LSI-related industry as a result of concentration of R&D, human resources development, and venture support. We positioned the Knowledge Cluster Initiative as the core operation of the Silicon Sea-Belt's R&D and promoted 7 themes as keys to fundamental technology.

As a result, we established the fundamental technology of system LSI and the business perspective of new packaging technology for Sip modules. Several researchers who used services of the Fukuoka IST have spun-off venture companies and established embedded software companies in Fukuoka as well. The Fukuoka Institute of System LSI Design and Industry is serving as the driving force for the system LSI cluster.

In the second stage of the Knowledge Cluster Initiative, we are promoting R&D to commercialize technology seeds on the basis of market needs.

Cluster Headquarters

- President.....Wataru Aso (Governor, Fukuoka Prefecture)
- Project Director.....Kazuyuki Hirakawa
- Chief Scientist.....Hiroto Yasuura (Professor and Director, System LSI Research Center, Kyushu University)
- Science and Technology Coordinator... Masato Tsuru, Koichi Hatano

Core Organization

Fukuoka Industry, Science & Technology Foundation

Participating Research Organizations (Bold: Core Research Organization)

- Industry...Logic Research Co., Ltd., FUJITSU LABORATORIES Ltd., Jedat Innovation Inc., Ueno Seiki Co., Ltd., Kyushu Mitsumi Co., Ltd., New Japan Radio Co., Ltd. SONY Semiconductor Kyushu Co., Ltd., Saga Electronics Co., Ltd., FUKURYO SEMICONDUCTOR ENGINEERING CORPORATION, System JD Co., Ltd., Software Research Associates Nishi-Nihon, Inc., SHARP CORPORATION, Network Application Engineering Laboratories Ltd., TOYO Corporation, CATS CO., LTD., etc.
- Academia...**Graduate School of Information Science and Electrical Engineering (Kyushu University)**, **System LSI Research Center (Kyushu University)**, Graduate School of Engineering (Kyoto University), **Faculty of Engineering (Fukuoka University)**, Kyushu Institute of Technology, Waseda University
- Government...Institute of Systems & Information Technologies/KYUSHU, Fukuoka Industrial Technology Center, Fukuoka Industry, Science & Technology Foundation (Fukuoka IST)

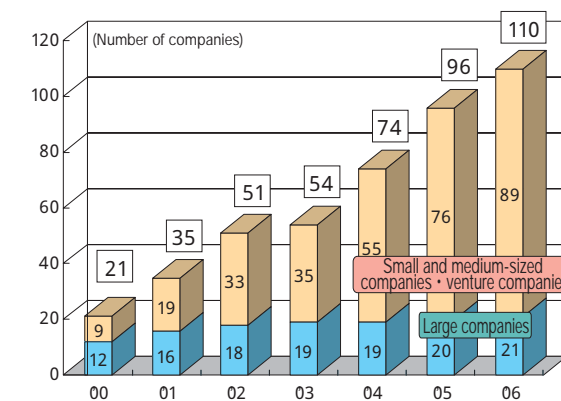
Main Results

1. About 110 system LSI-related companies have gathered in Fukuoka. Compared to the beginning of the project, the number of such companies has increased over 5 times.

2. Successfully developed commercial software with embedded software tools

To improve reliability for embedded software development, we focused on R&D technology that can track massive and complex problems of state transition tables. We have also developed a testing tool called Garakabu that works in coordination with the ZIPC CASE tool from Cats Co Ltd. Cats has set up an institute at the Fukuoka Institute of System LSI Design and Industry.

The number of small and medium-sized companies and venture companies has increased from 8 to 89.
 About 20% of system LSI researchers nationwide were concentrated in Fukuoka.



Cluster of system LSI-related companies in Fukuoka prefecture



ZIPC(Upper) & Garakabu(Lower)

Development of next-generation LSI architectures

Part where circuitry can be modified to meet the requirements of users after product shipment

LSI itself observes the use patterns of the user

Optimization of reconfigurable circuits and software based on results of observation

Establishing SiP module design technology

Memory chip mounting using SiP technology

Development of embedded software development technology

Embedded software which can be optimized for user requirements

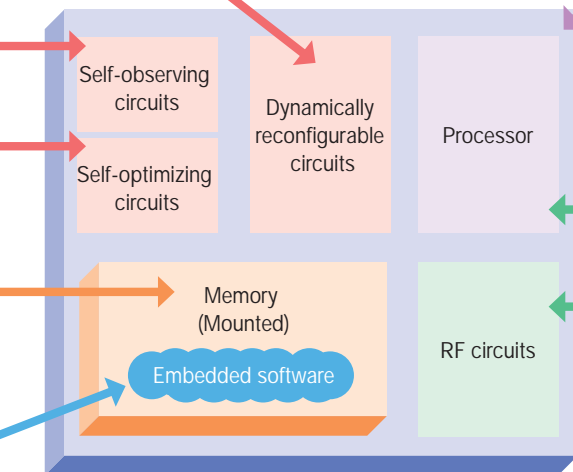
Development of next-generation system LSI design support technology

New design tools

Development of system LSI with ultra-low power consumption for mobile applications

High-performance processors with ultra-low power consumption

LSI chips with high-speed wireless communication circuits and low power consumption



Concept of next-generation system LSI