

# About the Special Issue on Devices



Masayoshi Ino  
Senior Managing Director

## Silicon Solutions

By adopting a compact organizational structure and offering rapid solutions which respond to market demands, Silicon Solutions Company (SiSC) aims to enhance customer satisfaction and gain a recognized enterprise value. On the basis of communications and network technology developed over many years, we intend to establish ourselves firmly in the digital communications market, and particularly, the personal and mobile equipment market, through our central focus on low power consumption technology. SiSC was formed by Oki Electric as a silicon device company at the start of the 21st century and the dawn of a technological revolution which will see the whole world interconnected by a global network. Entering its second year of operation, the company has had to endure an unprecedented recession in the semiconductor market, as problems such as the bursting of the IT bubble in the USA and the delay in Japan's restructuring within the global economy have coincided with surplus production capacity, and repeated terrorist attacks. Faced with such dramatic changes in circumstances, businesses, just like individuals, have to adapt constantly. We see no limits to the integration of systems into silicon and software, and through this belief, we will continue to respond to customers' expectations, by offering silicon solutions which have the outstanding quality that only Oki Electric can provide.

## SPA : Benefits and unique technologies

As the base architecture for our technology solutions, we have developed "SPA" (Silicon Platform Architecture), a total system development environment for hardware and software, which permits short-term realization of system LSIs. SPA reduces the customer's system development tasks, allowing them to supply products in record time. The first concrete result of SPA has been the integrated platform (PLAT(r) ("micro-plat")) based on a core CPU manufactured by the UK firm, ARM. Using the (PLAT, generic ARM microcomputer and PHS baseband LSI products, and the like, can be developed in a short time frame. What is more, we are the first Japanese firm to obtain certification for the very latest commercial version 1.1 of Bluetooth, the wireless communications standard for short-distance networking, which is expected to provide the basis of radio communications between all future electronic devices. We offer customers combined chipset and software

development kits. Not only this, faced with the problem of the enormous test times required for testing all the various functions of system LSIs, we have incorporated test facilitation circuits, leading to major reductions in both test times and system LSI costs.

Below, I would like to introduce some of our unique initiatives in communications & networking technology and low-power-consumption technology, taking a look at products, processes and packages which will further enhance Oki's reputation for excellence.

In the field of memory products, we are developing units based on unique technologies such as memories designed especially for mobile phones. In wafer processing, we have started mass production and shipment of LSIs for mobile phones, and other devices, based on the SOI (Silicon On Insulator) technology we have developed over the years, permitting major savings in power consumption. This has the obvious merit of removing the need for battery replacement in mobile phones due to the ultra-low level of power consumption. Moreover, the development of ferroelectric memories (FeRAM) to provide low-voltage low-power memories is also accelerating. In package technology, progress is being made in multi-chip packaging of the ultimate small, light-weight packages W-CSP (Wafer level Chip Size Package) adopted in mobile phones.

By adopting SCM (Supply Chain Management) as a production and delivery solution, we have started weekly production and hope to further consolidate our e-business systems through logistical improvements, Internet portals, etc., so that we can deliver a wide variety of products to our customers, quickly and punctually.

## Future developments

We are currently faster than anyone in getting total solution products to market, combining software with unique communications/network technologies and low-power-consumption technologies. We have already achieved zero emissions (complete elimination of waste products) at our Miyazaki Site, and are working tirelessly to create a clean and pleasant future.



**Tetsuzou Taniguchi**  
President  
Optical Component Company

**Environmental change in the optical component business**

The cycle of demand for back bone optical communications and tightening business conditions for telecommunications carriers has depressed the U.S. market, and this has had worldwide repercussions. However, there have been some startling developments in the Asian Internet market covering China and Japan, in particular, the spread of ADSL connections and increased mobile phone ownership. This surge in terminal-side communications capacity is expected to bring further increases in back bone system capacity.

In the field of optical communications, various developments are being investigated, including 1Gbit/s APON (Asynchronous Transfer Mode Passive Network) for FTTH services which links to an access system at a bit rate permitting instantaneous connection of high-resolution moving images, 10 Gb VSR (Very Short Reach) networks for use in metro system signal transmission, and 40 Gbit/s DWDM (Dense Wavelength Division Multiplexing) for achieving high-speed, long-distance, WDM communications by further increasing long-haul, high-capacity transmission efficiency in trunk (back bone) systems.

**Expectations and Challenges**

Oki aims to be a consistent and reliable supplier of the cutting-edge products anticipated in this market, such as (1) Full Service Access Network (FSAN) specification APONs using Planar Lightwave Circuit (PLC) technology; (2) ultra-fast integrated circuits utilizing GaAs-WP technology for high-speed transmission up to 40G, and optical modules incorporating optical devices and mounting/ connecting technologies, such as EA (Electroabsorption) modulators, and the like; and (3) optical transceivers drawing the maximum possible performance out of these components to create extra added value (Fig.1). Moreover, our compact structure means that we can make swift business decisions and maintain our levels of excellence at all times, helping to build up customer confidence. To this end, our mission is to quickly identify the very newest technologies needed by customers in niche markets, so that we can rapidly offer new products to meet these needs.

**Optical Component Company (OCC) : Introduction**

OCC develops and manufactures GaAs high-speed LSIs, optical devices, and transceivers for sale principally in North America, as well as Europe, Japan and Asia.

In the field of GaAs high-speed LSIs, as well as supplying a high-speed 40G-Amp, and low-noise, low-power-consumption products, such as a 10 Gbit/s EA Driver, Pre-Amp and Limiting Amp, we are also developing InP type compound semiconductors for a 40 Gbit/s full line-up.

Our developments in optical devices include a 40 Gbit/s EA modulator, and electro-optical composite functional elements, such as a laser with built-in EA modulator. We have also been seeking increased functionality and compactification in PLC module devices, by using bare-chip surface mount technology. Another of our initiatives is aimed at achieving 300 mW-plus fibre output in a 1.4 μm-band high-output laser diode.

As for optical transceivers, we are already supplying module products capable of transmission reception at 10 Gbit/s, by combining the devices mentioned above, which show good component synergy and combine high functionality and high quality. Moreover, 40G optical transceivers are under development for the next product generation. In the field of access systems, we are responding to the speed gains of FSAN-specification APON modules using PLC technology.

This paper has given a brief introduction to our 40G EA modulator, GaAs IC set for optical transmission modules, 10 Gbit/s optical transceivers, PON optical transmission modules, and PLC optical transmission modules.

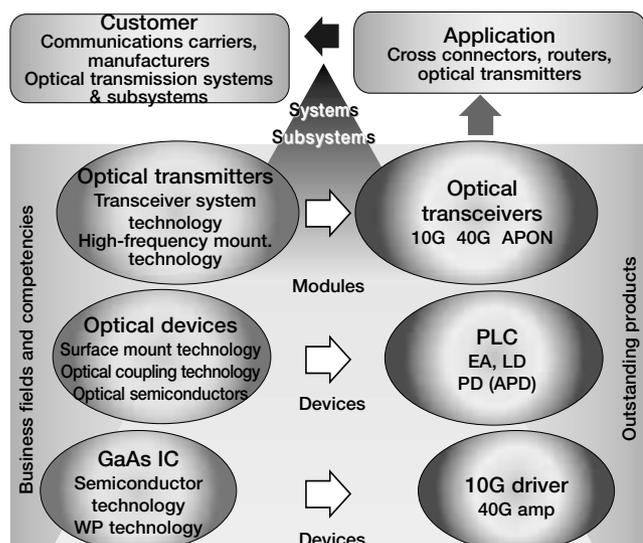


Fig. 1 OCC : Business fields and products.