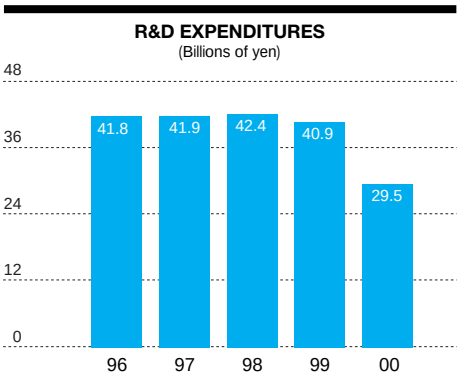
Oki Group emphasizes speed in R&D activities for its three main segments of telecommunications systems, information systems and electronic devices to realize its vision of "network solutions for a global society." Research covers a broad range of areas, integrating the advanced technologies from our three key segments. Such R&D leads us to further investigation in new areas that consequently bring about shifts in the paradigm, and initiate new business possibilities. Our goal is to draw on the results of our research as soon as possible. We also research themes that are directly related to current areas of business. During the year under review, we achieved the following results.



Telecommunications Systems

- Our new L-band erbium doped fiber amplifiers (EDFAs) for ultra-broadband optical communications networks are capable of repeating optical signals exceeding 1 terabits per second over distances greater than 3,000 kilometers.
- The wavelength division multiplex (WDM) technology, a high-speed routing that employs an optical add/drop multiplexer, switches transmission circuits in a fraction of a millisecond among 32 wavelengths.
- Oki's optical MUX/DEMUX module carries out optical time division multiplexing (OTDM), operating at a 40-gigabit-per-second transmission bit-rate.
- We are also using the JINI™ protocol of Sun Microsystems, Inc., to develop a range of network application interface technologies that permit access—independent of time and place—to services from numerous types of terminals over broadband networks.

The OTDM MUX module is a basic building block for a return-to-zero (RZ) or a soliton transmitter and operates at 40 gigabits per second (or OC-768 standard). The module multiplexes two 19.9-gigabit-per-second electrical non-RZ signals and converts to a 39.8-gigabit-per-second optical RZ signal.

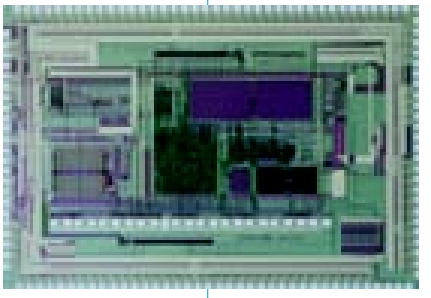
Information Systems

- An ITS road to vehicle communications system we devised can send broadband multimedia data using radio-on-fiber (ROF) technology.
- By adopting clustering architecture, we improved our software-based MCU server—a core element enabling multipoint video conferencing to be scalable and fault-tolerant.
- We formulated a parallel video on demand server system that features enhanced scalability because of its high-performance parallel video file system structure.
- A compact iris-recognition device we developed is small enough to fit in the user's palm.
- The NEWPRED error resilience coding mode jointly developed with NTT was accepted by the International Organization for Standardization as the standard for Version 2 of MPEG-4 Visual.

This millimeter-wave band ROF road to vehicle communications system was delivered to the Ministry of Posts and Telecommunications' Communications Research Laboratory (CRL), for ITS trials. The system consists of a central base station, local base stations, optical fiber to connect the base stations and on-board vehicle equipment. ITS exclusive services, such as ETC systems, and ITS multipurpose services, such as PHS and BS, are collected and converted to the millimeter-wave band at the central base station. This station sends the optical signals along the optical fiber to the local base stations placed along the road. The local base stations then convert the optical signals to electric signals and transmit them to the on-board vehicle equipment using an antenna.

Electronic Devices

- We developed a SOI technology that reduces the power consumption of LSIs for mobile devices to one-fifth previous requirements. A next-generation SOI process technology was also developed.
- We also developed ferroelectric random access memory (RAM) devices that can operate with a power source of less than 2 volts.



A custom mobile device LSI test manufactured with our fully depleted SOI technology. The microcontroller unit, power circuits, memories (mask ROM and static RAM) and LCD driver components are integrated onto a single chip, reducing power consumption to one-fifth previous requirements.