

1985

IC card microcontroller with on-chip EEPROM (Hitachi)

~ Integrated Circuit ~

Development of IC cards began in Europe and North America in the latter half of the 1970s with the aim of drastically improving the security and capacity shortage of information, which was a problem of magnetic stripe type cards. In 1985, Hitachi announced the contact type IC card microprocessor 65901 equipped with an electrically rewritable nonvolatile memory and CPU for the first time in Japan. 65901 was equipped with a dedicated 8-bit CPU and highly reliable MNOS type non-volatile memory. This is because the information security and the reliability of the memory device were particularly emphasized in the IC card microprocessor in which the financial application was supposed. Also in 1988, Sony developed a contactless IC card with built-in antenna.

As IC cards are used for infrastructure of information society such as finance, communication, transportation, information security such as tamper resistance and standardization of interface specifications become particularly important. In terms of information security, advanced cryptographic technologies such as DES and RSA have been adopted, and the processing performance of the on-board CPU and the capacity of mounted memories have been increasing. The product with 16bits or 32bits CPU, memory of 256k byte to 1 Mbyte have also been developed. Also, with respect to the design of the IC, careful attention is paid to countermeasures against information leakage by illegal means such as radio wave signal analysis occurring during operation and physical chip disassembly. Regarding standardization of interface specifications, it has been established by international organizations such as ISO for each application.

IC cards were adopted for prepaid card usage in European public phones in the 1980s and then rapidly adopted as SIM cards in European GSM mobile phones. Domestic mobile phones also adopt this SIM card system. For financial settlement applications, adoption by European banks progressed since the end of the 1980s, and banks ATM cards and credit cards also advanced into IC cards since the 1990s. Also, in 1995 applications for electronic money such as MONDEX in the United Kingdom also expanded. In the transportation sector, it was adopted in Hong Kong in 1997, and in Japan it has spread rapidly from SUICA in 2001 to JR companies, private railways, buses and so on. In addition to that, the use of IC cards such as digital broadcasting billing system, employee ID cards and student ID cards, basic resident registration cards, insurance cards and the like has spread throughout society.

IC cards that started with each of these applications are now extremely important in supporting the information social infrastructure of everyday life such as SUICA, EDY, wallet mobile and so on, expanding their applications while having mutual relations, such as settlement means, electronic money, transportation and mobile phones It has become a technology.

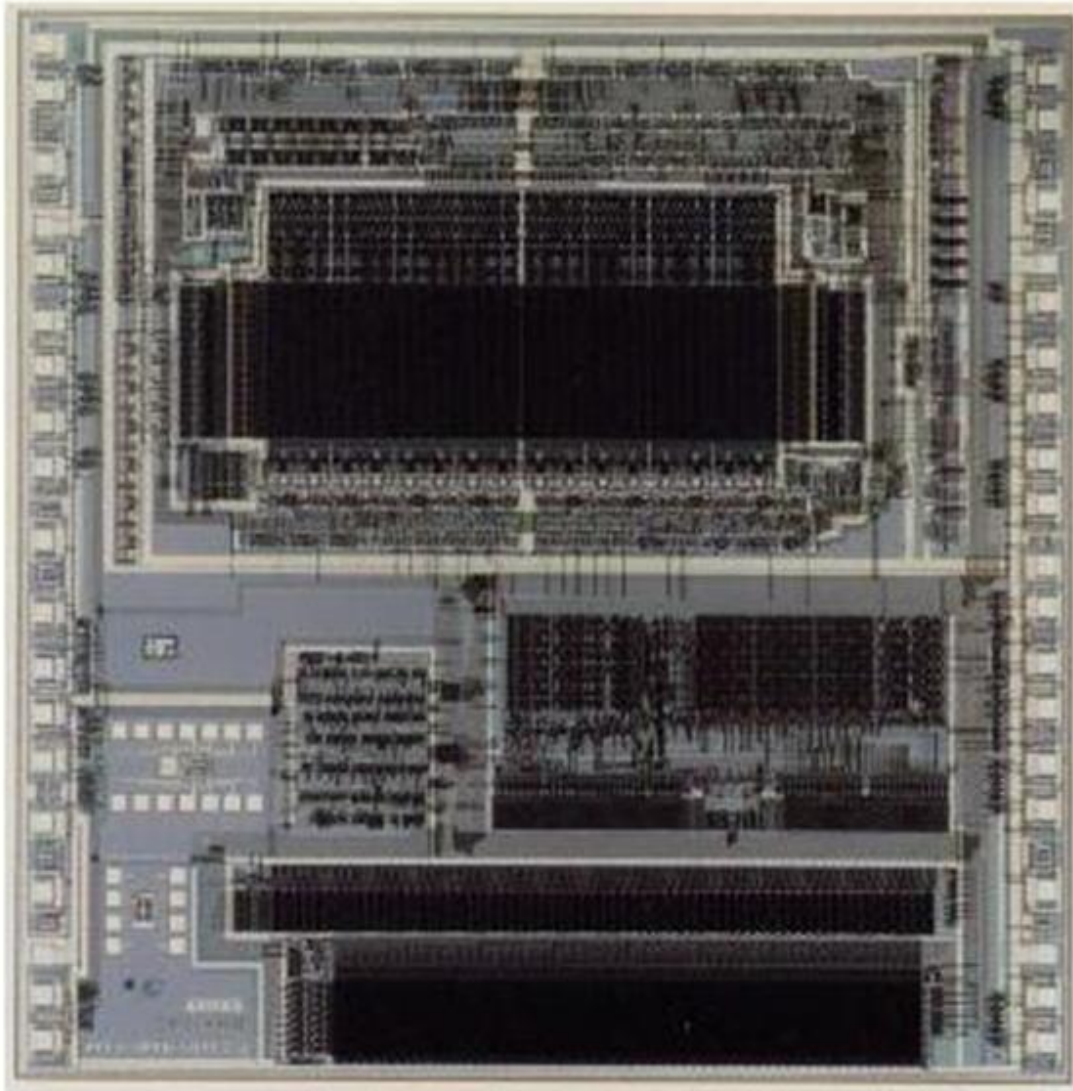


Fig. Die photo of IC Card Microprocessor HD65901
(By courtesy of Hitachi)