To search page

1970

1-Kbit DRAM (Intel, U.S.A.)

~ Integrated Circuit ~

In the 1960s, bipolar RAM first appeared as semiconductor memory. Subsequently MOS SRAM appeared, and Intel released the 256-bit PMOS SRAM 1101 in 1969. Regarding DRAM, in 1966 IBM's Robert H. Dennard invented a one-transistor DRAM cell and filed a patent in 1968. Meanwhile, apart from Dennard 's invention, Bill Regitz of Honeywell devised a 3-transistor DRAM cell and proposed to commercialize it to semiconductor manufacturers. Among semiconductor makers, Intel accepted the proposal of Regitz and started the development of DRAM and developed the 1K-bit PMOS DRAM 1102 as the first product, but because of several problems, it did not reach commercialization. It was 1103 that was redesigned by taking measures against the problems of 1102. Intel launched 1103 in October 1970. 1103 was a PMOS 1K bit product, same as 1102. 1103 was an explosive success, rapidly replacing the magnetic core memory that was used as a computer memory until then.

Looking at the success of Intel, many other semiconductor companies entered the DRAM business, surging like an avalanche. Meanwhile, the shift from PMOS to NMOS advanced. In 1971, NEC developed a 1Kbit NMOS-DRAM. TI led in the switch from three-transistor cell to one-transistor cell which Dennard's proposed and released a 4K DRAM, in 1973. Furthermore in 1973, MOSTEK launched a 4K DRAM of 16-pin package which adopted the address multiplex architecture to raise the packing density on the board. In this way, standard specification of DRAM was established as NMOS, 1-transistor cell, address multiplexing scheme.

The reason why the replacement of the magnetic core memory could be easily accomplished by DRAM, which had not been realized by the preceding bipolar memory or MOS RAM, was because of its low bit cost. Regardless of the disadvantage that a DRAM requiring refreshing operation, DRAM has continued to develop as the main player of semiconductor memory due to its low bit cost.

Version 2019/1/23