

# Features of 80186, 80286, 80386 *Pentium family processors*

**Table 6. Intel Family of **Microprocessor Bus** and Memory Sizes**

<b>Microprocessor</b>	<b>Data Bus Width</b>	<b>Address Bus Width</b>	<b>Memory Size</b>
→ 8086	16	20	1M
→ 8088	8	20	1M
→ 80186	16	20	1M
80188	8	20	1M
→ 80286	16	24	16M
80386SX	16	24	16M
→ 80386DX	32	32	4G
80386EX	16	26	64M
80486	32	32	4G
Pentium	64	32	4G
Pentium Over Drive	32	32	4G
Pentium Pro	64	32	4G
Pentium Pro	64	36	64G

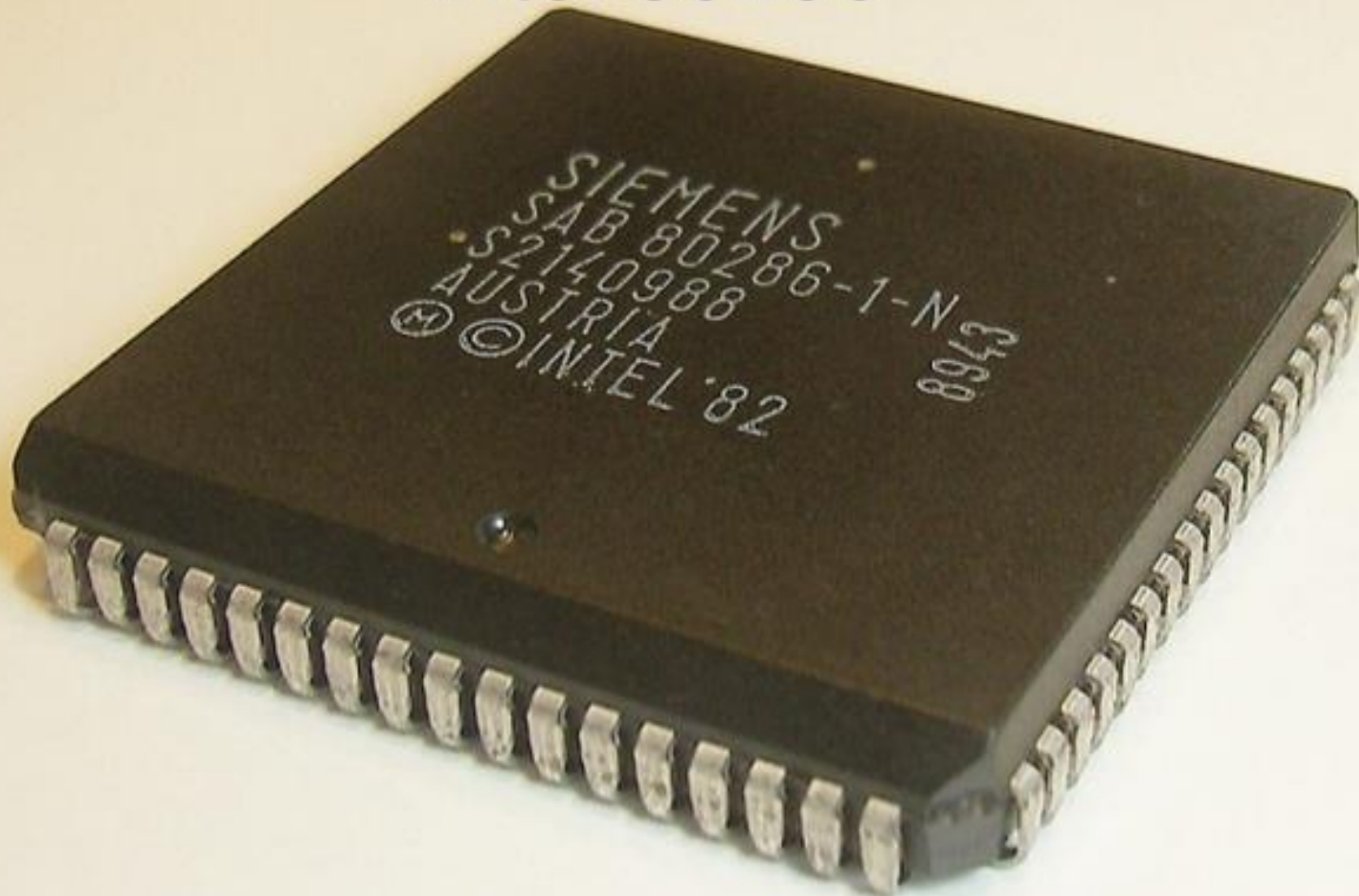
# microprocessors of Intel family

Microprocessor	Data bus width	Address bus width	Memory size
8086	16	20	1M
80186	16	20	1M
<b>80286</b>	<b>16</b>	<b>24</b>	<b>16M</b>
80386 DX	32	32	4G
80486	32	32	4G
Pentium 4 & core 2	64	40	1T

# 80186 Basic Features

- Date 1982
- The 80186 contains 16 – bit data bus.
- The internal register structure virtually identical to the 8086.
- It is an improved 8086 with several common support functions built in: clock generator, system controller, interrupt controller, DMA controller, and timer/counter.

# Intel 80286



Clock frequencies 16 Mhz

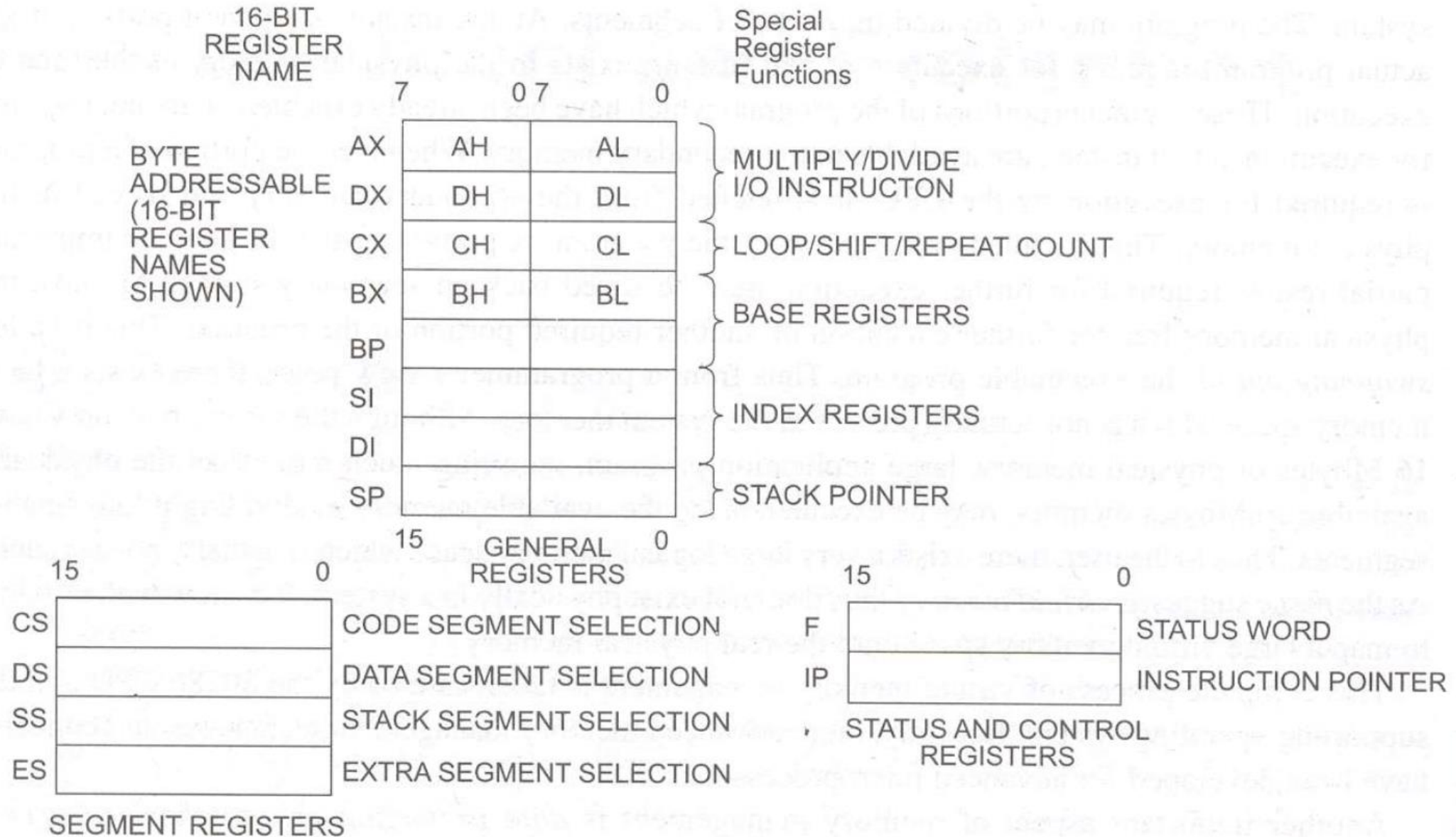


The 80286 CPU contains almost the same set of registers, as in 8086.

1. Eight 16-bit general purpose registers.
2. Four 16 bit segment registers.
3. Status and control register.
4. Instruction pointer.



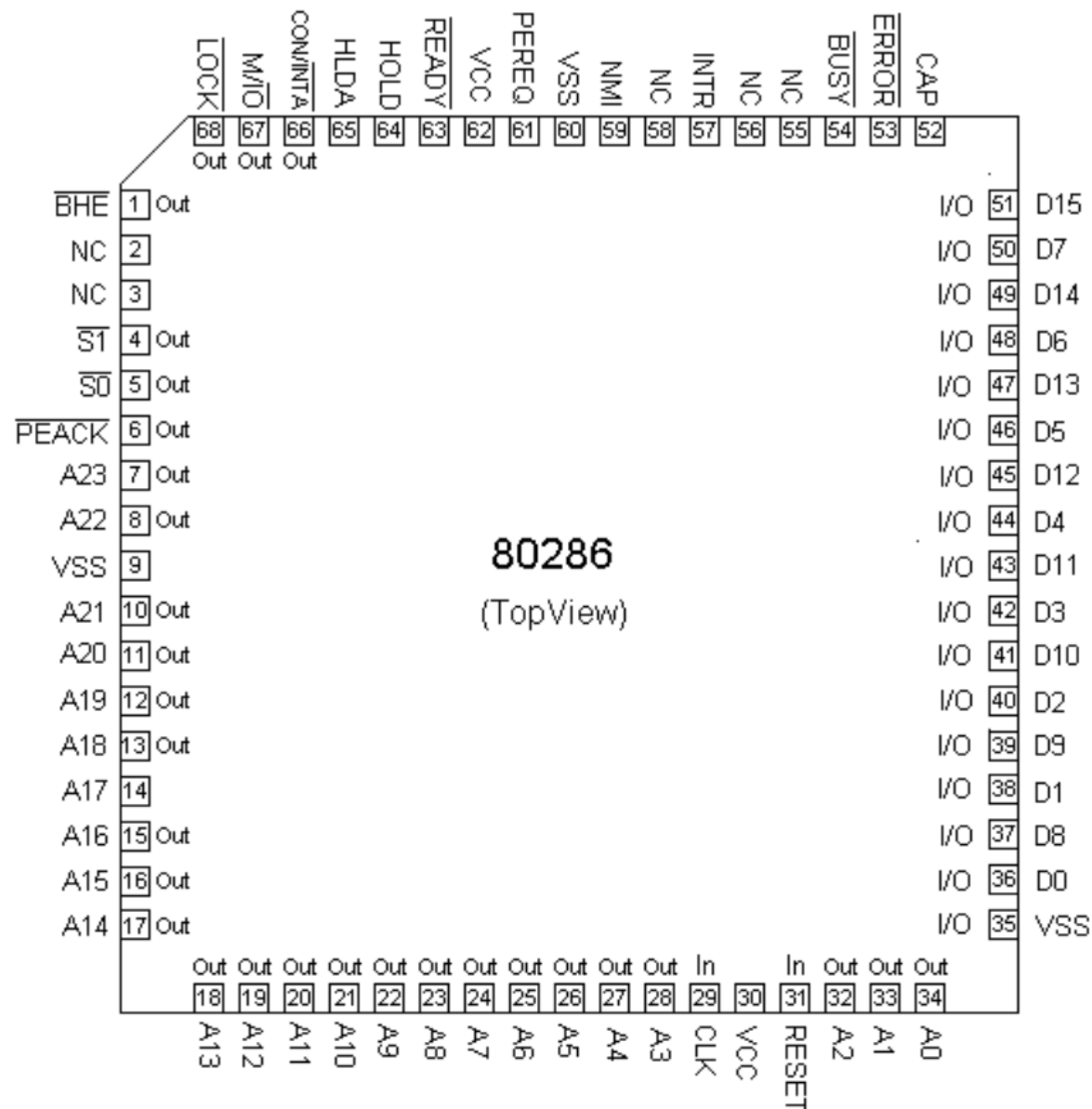
The register set of 80286 is shown in Fig. 9.1.



**Fig. 9.1** Register Set of 80286 (Intel Corp.)



# 80286 pin diagram



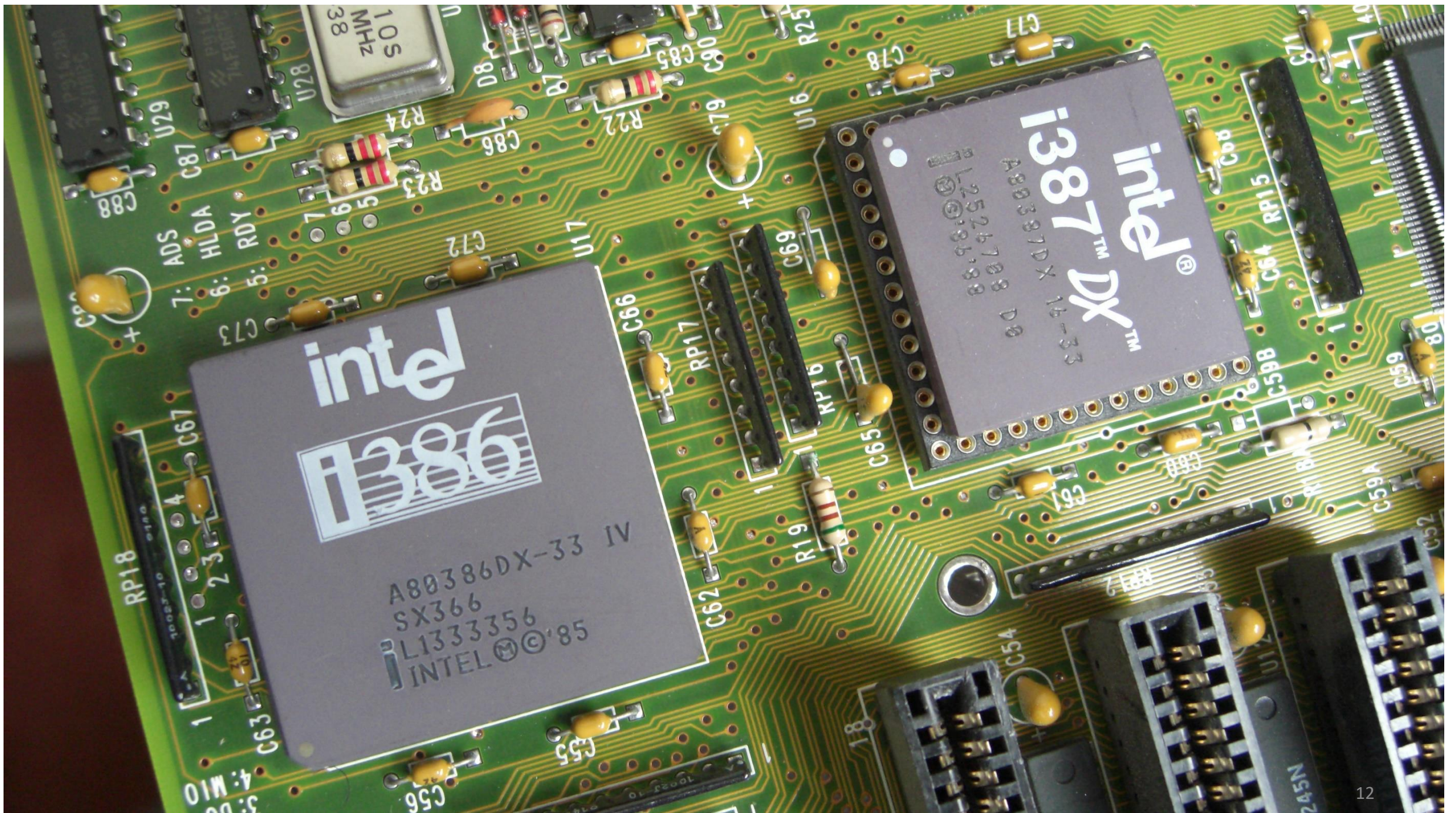
# 80286 Basic Features

- Date 1982
- The 80286 microprocessor is an advanced version of the 8086 microprocessor that is designed for multitasking environments.
- The 80286 has 24-bit address and 16-bit data bus
- The 80286 addresses 16 M Byte of physical memory and 1G Bytes of virtual memory by using its Management Unit (MMU).
- The 80286 is basically an 8086 that is optimized to execute instructions in fewer clocking periods than the 8086.

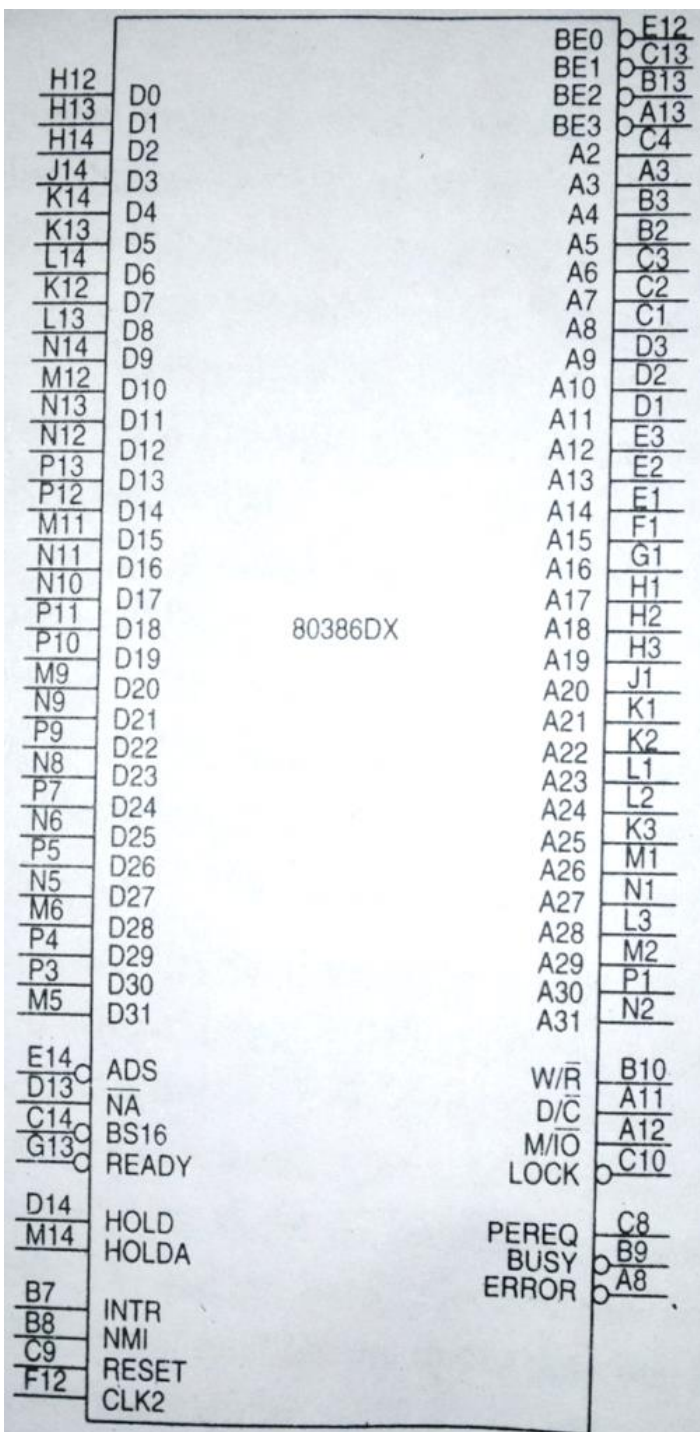
# 80286 Basic Features

- The 80286 operates in both the **real modes** and **protected modes**.
- In the real mode, the 80286 addresses a 1MByte memory address space and is virtually identical to 8086.
- In the protected mode, the 80286 addresses a 16MByte memory space.









# 80386 Basic Features

- Date 1985
- The 80386 operates in both the **real modes** and **protected modes**.
- The 80386 microprocessor is an enhanced version of the 80286 microprocessor and includes a memory-management unit is enhanced to provide memory **paging**.
- The 80386 also includes 32-bit extended registers and a 32-bit address and data bus
- The 80386 has a **physical memory** size of 4GBytes that can be addressed as a **virtual memory** with up to 64TBytes



# 80386 Basic Features

- The 80386 is operated in the pipelined mode, it sends the address of the next instruction prior to completing the execution of current instruction.
- The 80386 memory manager is similar to the 80286, except the physical addresses generated by the MMU are 32 bits wide instead of 24-bits