

HD81810(DSP-W)

Digital Signal Processor Wide Temperature Range

The HD81810, HD81A810 is member of the DSP family of single-chip general-purpose digital signal processors which can be used in the wide-range temperature. High-speed floating-point ALU and MULT are provided internally to perform addition/subtraction and multiplication simultaneously in only one cycle,

HD81810 : 250 ns / instruction

HD81A810 : 200 ns / instruction

Its instruction set and the hardware are completely compatible with the HD61810 (DSP). Moreover, the lower power consumption is realized by employing a high-density CMOS process. It can support a wide range of applications; telecommunication, speech processing, image processing and control which need a high-speed Multiply and accumulate operation.

Features

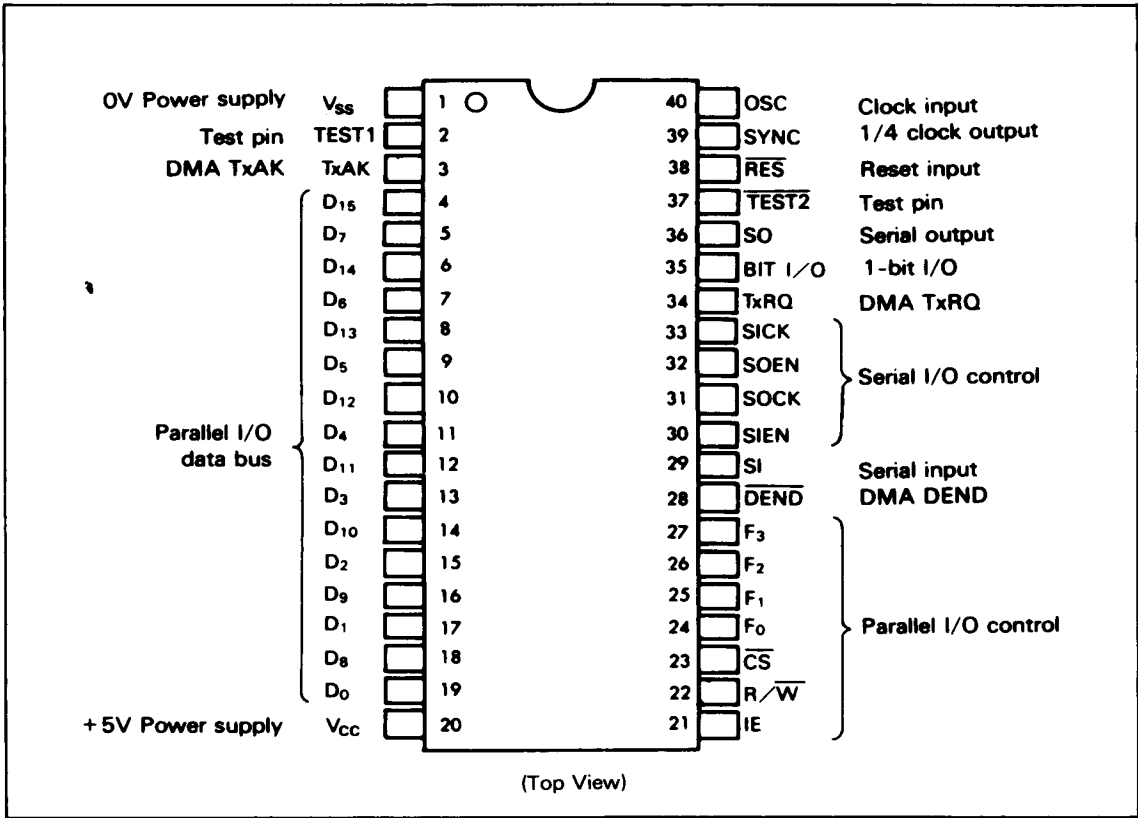
Hardware

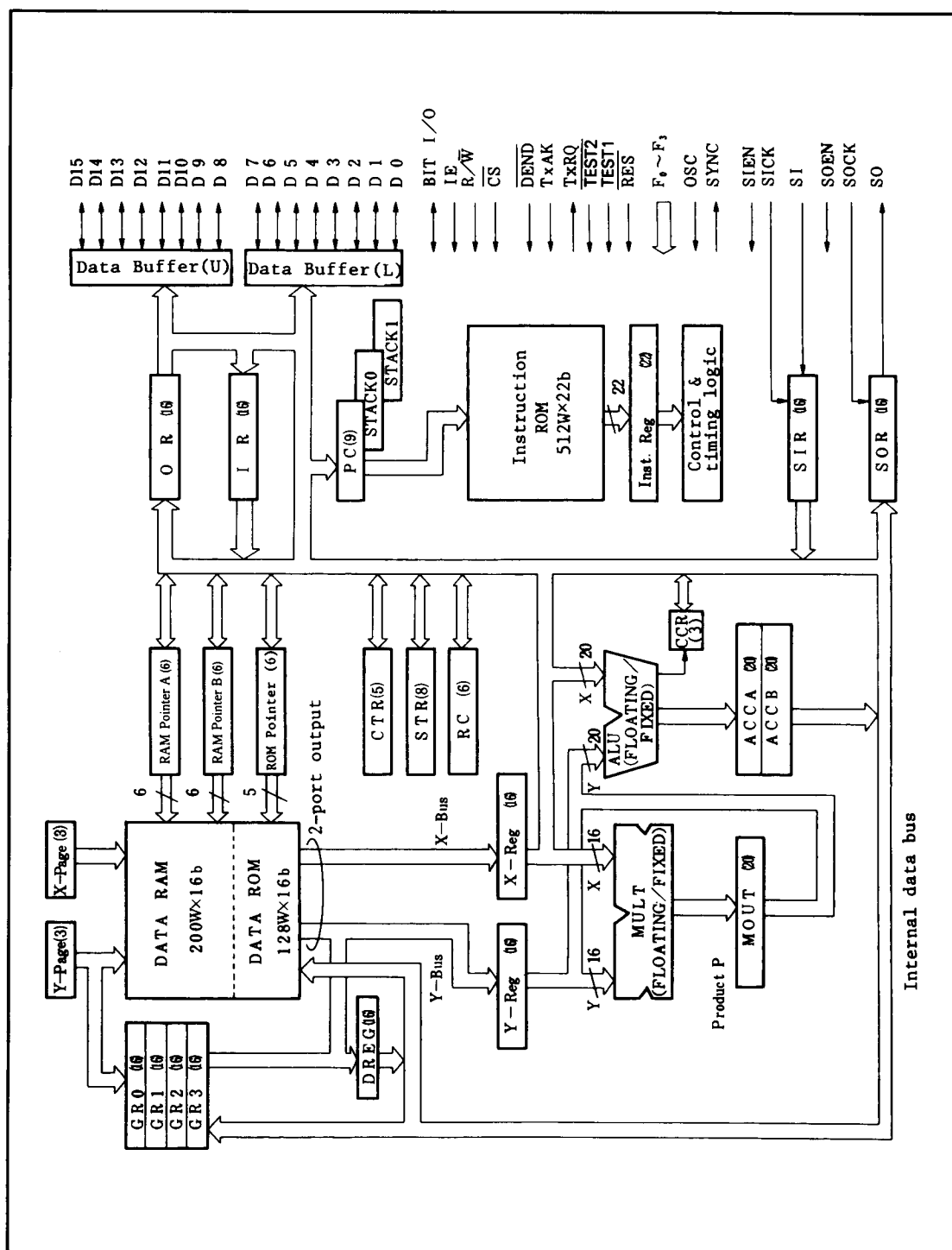
- Fixed-point arithmetic (16 bits)
- Floating-point arithmetic (mantissa: 16 bits, exponent: 4 bits)
- Includes high-speed floating-point ALU and multiplier
- High throughput by pipeline control and horizontal microinstructions
- 32-bit dynamic range of floating-point arithmetic
- Internal large capacity memories
 - Instruction ROM : 512 × 22 bits
 - Data RAM : 200 × 16 bits
(2-port accessible)
 - Data ROM : 128 × 16 bits
- Parallel I/O compatible with 8/16 bit microcomputer interface

- 16-bit serial input/output
- Parallel I/O allows the forcible change of contents of the internal registers (program counter and control register).
- DMA operation between the HD81810, HD81A810 and the external memory
- Interrupt by parallel I/O, serial input and serial output
- Up to 2 levels of nesting of subroutine and interrupt
- A single power supply of +5V
- Low power dissipation 150 mW typ
- Operating temperature : $-20 \sim +75^{\circ}\text{C}$
Wide temperature version : $-40 \sim +85^{\circ}\text{C}$

Software

- Fixed-point/floating-point arithmetic instruction set
 - All instructions are executed in only one cycle.
 - Floating-point arithmetic needs no scaling function during the operation and realizes a high-precision arithmetic.
(Representable value of ACC: $0, \pm 2^{-23}$ to $\pm 2^7$)
 - One instruction executes addition/subtraction, multiplication, memory read (2-port), memory write, RAM/ROM pointer increment and repeat counter decrement in parallel.
 - Two kinds of addressing mode (direct-and-pointer-addressing mode)
 - Repeat instruction allows an efficient programming of repetitive Multiply and accumulate operation.
- * For the processor of higher speed (200 ns), and wide temperature version refer to the HITACHI sales office.





HD81810, HD81A810 Block Diagram