SM8502★/SM8503★/ SM8504/SM8505★/ SM8506

8-Bit Single-Chip Microcomputer (Controllers For General Purpose)

★ Under development

DESCRIPTION

SM8500 series is a 1-chip microcomputer containing SM85CPU core and the required peripheral functions for system. SM85CPU is an 8-bit high performance CPU with various addressing modes and high-efficiency instructions set. SM85CPU is featured by allocating general registers on RAM to reduce overhead when calling subroutines.

The peripheral functions and memory of SM8500 series contain ROM, RAM, timer/event counter, serial interfaces (SIO, UART), A/D converter, and D/A converter and waveform generator.

The SM8500 series are offered by a variety of models with different capacity of memory. These are SM8502, SM8503, SM8504, SM8505, and SM8506.

FEATURES

- ROM capacity : 24 576 x 8 bits (SM8502)*
  32 768 x 8 bits (SM8503)*
  40 960 x 8 bits (SM8504)
  49 152 x 8 bits (SM8505)*
  61 440 x 8 bits (SM8506)
- RAM capacity : 1 024 x 8 bits (SM8502*/SM8503*/SM8504)
  2 048 x 8 bits (SM8505*/SM8506)
- A RAM area is used as subroutine stack
- I/O ports :

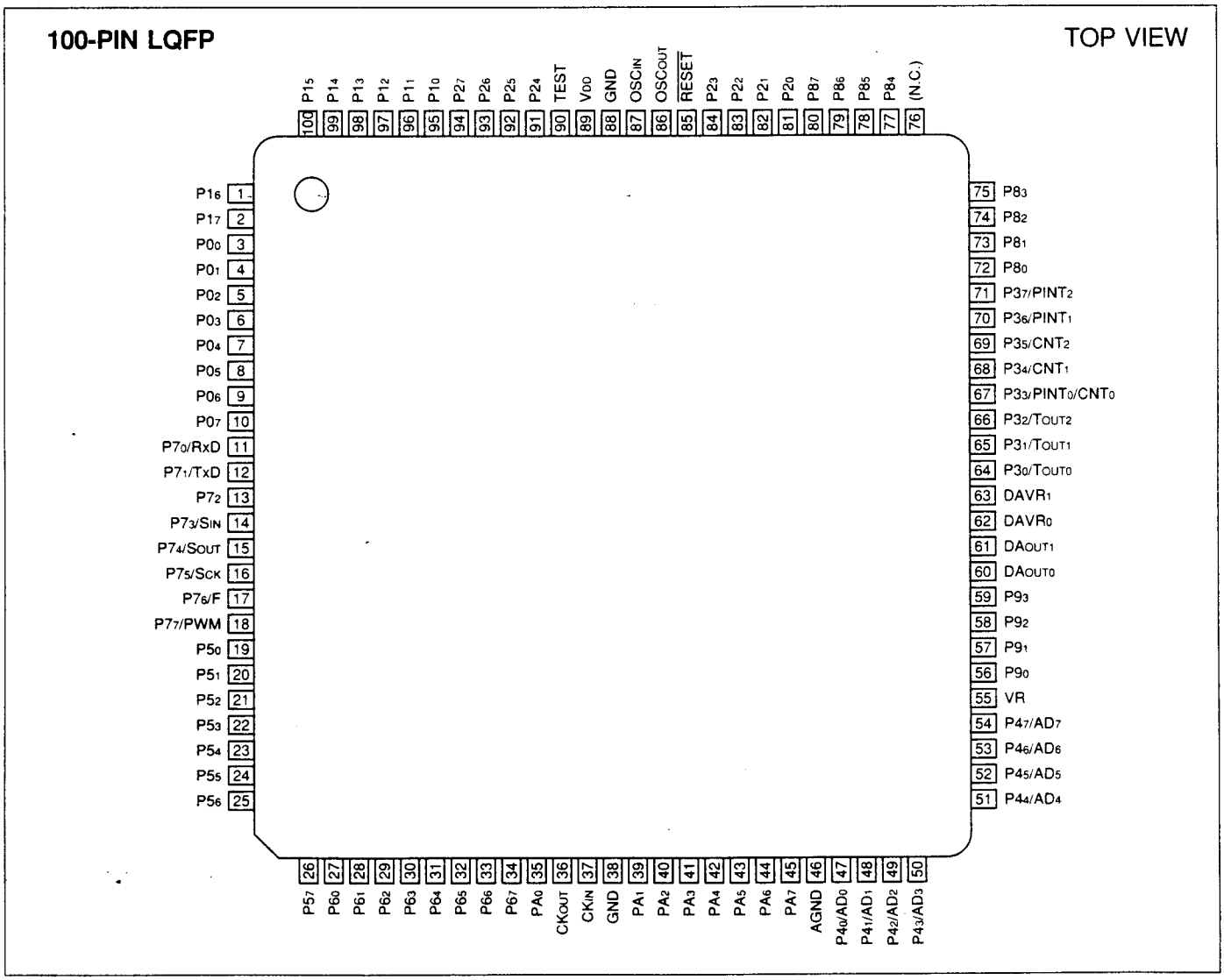
Input	16 (8 inputs also used as A/D input pins)
Output	16
Input / Output	52
D/A output	2

- Interrupts :
  Non-maskable interrupts x 2
  (watch dog timer / illegal instruction trap)
  Maskable interrupts x 14
  (internal interrupts x 10 / external interrupts x 4)
- A/D converter :
  Resolution 8 bits
  Channel 8 channels
- D/A converter :
  Resolution 8 bits
  (4 bits for waveform generator)
  Channel 2 channels
- Waveform generator :
  Channel 2 channels
  16 level tone, 32 step / 1 period waveform output.
  Combined with external circuit, DTMF waveform can be output.
  * Waveform generator can be used by combining with D/A converter.
- Timer/counter : 16 bits x 1, 8 bits x 5
  PWM output available
  Watch dog timer : 8 bits x 1
  Clock timer : 8 bits x 1
- Input capture function
- Clock output (also used as buzzer output)
- Serial interface :
  SIO 8 bits clock synchronous x 1
  UART 8 bits clock asynchronous x 1
- External memory expansion
- Memory configuration (SM8505/SM8506) :
  Setting of external memory accessing address range.

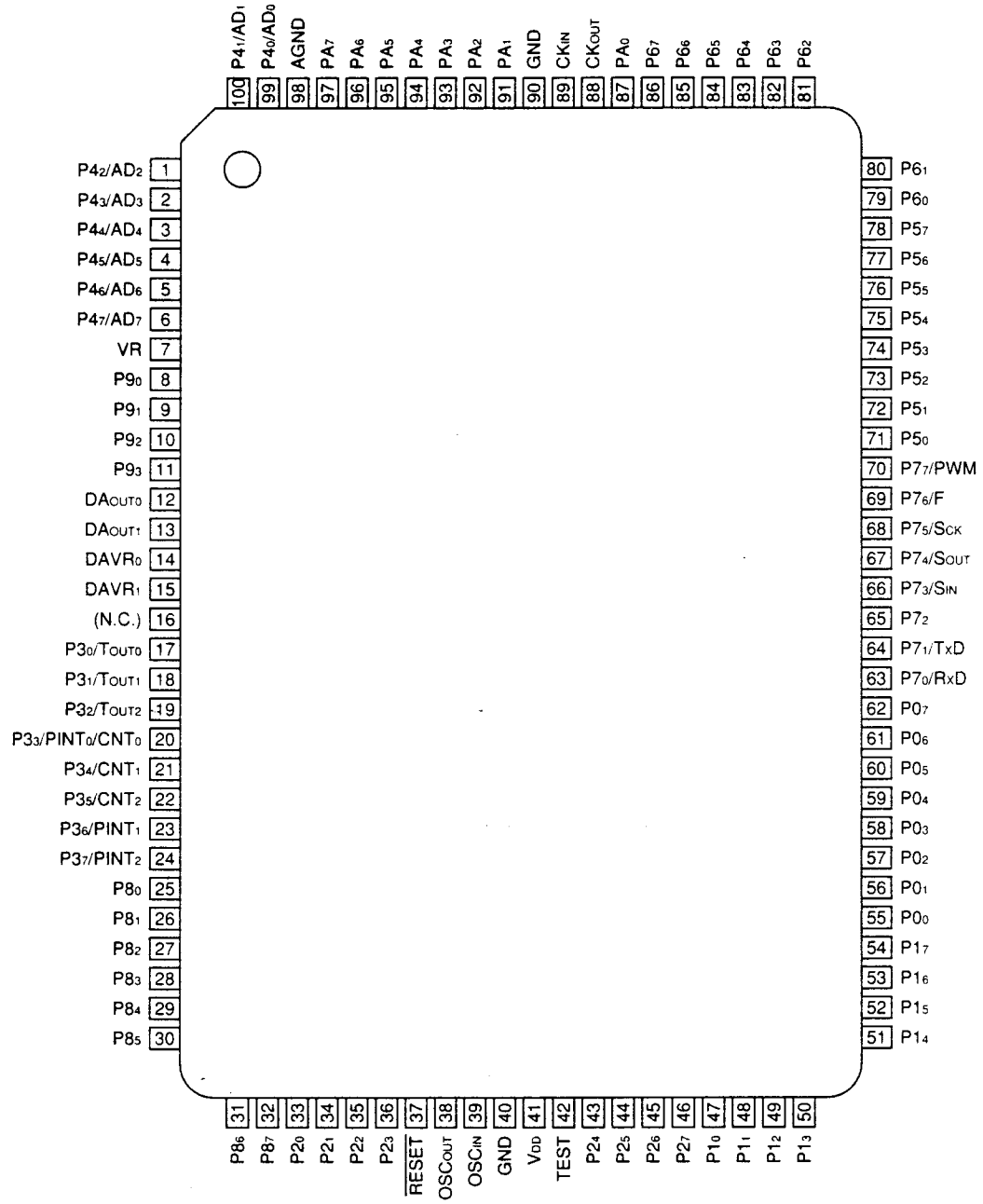
- CPU core :
  8 bits x 8 ports (or 16 bits x 4 ports) and 16 bits x 4 ports general purpose register are used as accumulator, register pointer, and register index.
  Instruction sets 67
  (multiplication / division / bit manipulation instruction)
  Addressing mode 23 types
  System clock cycle 0.17 µs (MIN.) at 12 MHz main clock cycle
  System clock is variable by software (system clock can be optioned to 1/2, 1/4, 1/8, 1/16, 1/32 of main-clock and 1/2 of sub-clock.)
- Built-in main clock oscillator for system clock
- Built-in sub clock oscillator for real time clock
- Standby modes : halt mode / stop mode
- Supply voltage :
  4.5 to 5.5 V ;
  system clock frequency 6 MHz(MAX.)
  2.7 to 3.6 V ;
  system clock frequency 3 MHz(MAX.)
  1.8 to 2.7 V ;
  system clock frequency 750 kHz(MAX.)
  * The system clock frequency must be switched to above given ratings by program.
- Packages :
  100-pin LQFP (LQFP100-P-1414)
  100-pin QFP (QFP100-P-1420)

PIN CONNECTIONS

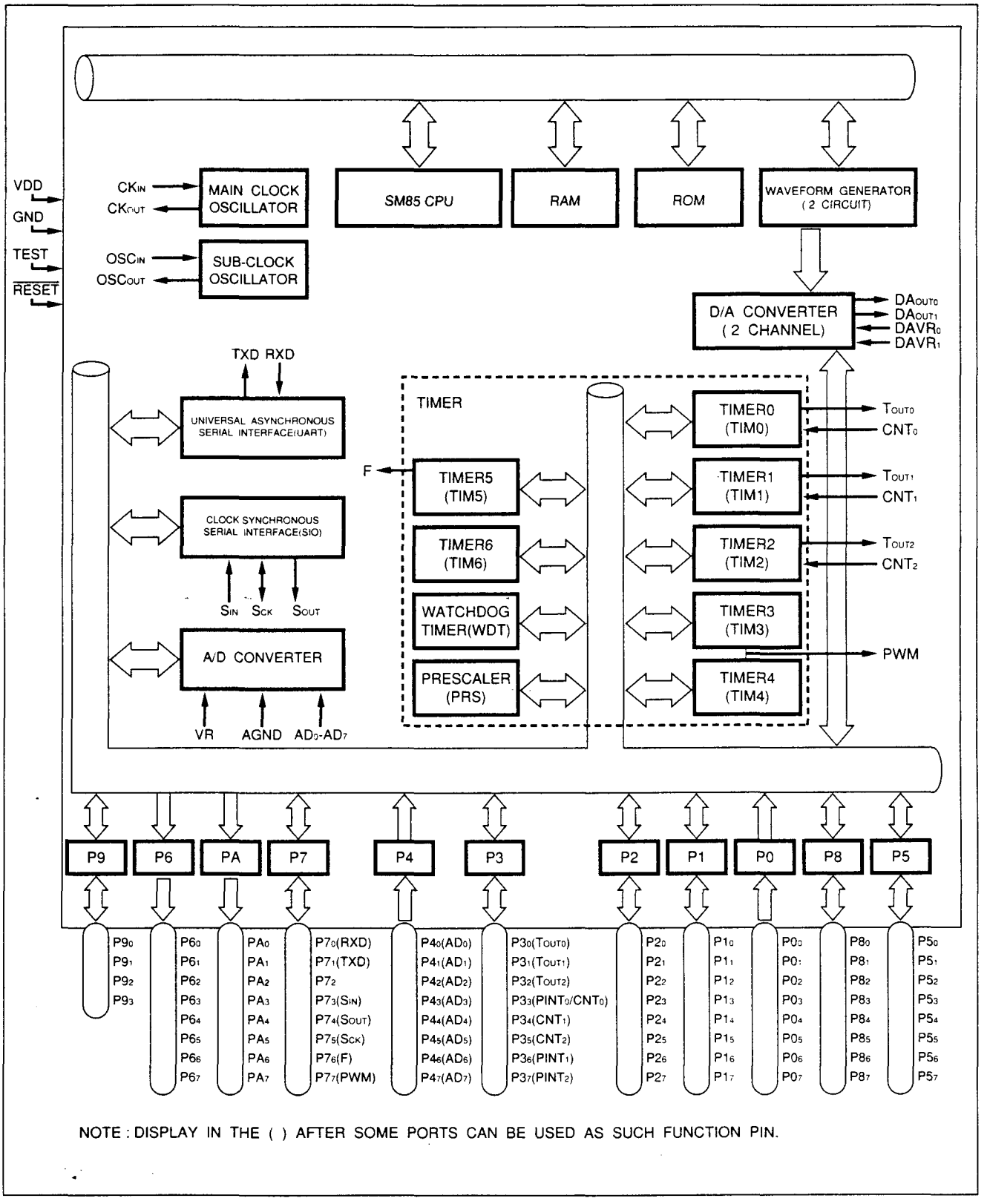
100-PIN LQFP TOP VIEW



100-PIN QFP TOP VIEW



BLOCK DIAGRAM



NOTE : DISPLAY IN THE ( ) AFTER SOME PORTS CAN BE USED AS SUCH FUNCTION PIN.

Singlechip LH7xxxx ‘790 ‘789 ‘791 SMxxxx ‘K series MCU Microcontroller MPU Microprocessor ARM Advanced RISC Machines Databank LCD Controller LCD Driver Controllers Processors Portable Low Power Low Voltage High Performance Power curve MIPS MIPS/Watt Execution Cycle Multiplier High Speed Compact Handheld System on Chip System Integration Chip Integration Integration Superchip Standard Cell Core Core based IC VHDL Verilog Synthesis Chip on Board COB Chip on Flex COF Device on Board DOB Power Supply Controller Handy Products Development Tools Board Support Software Tools Tools 2.10 Software Support Emulators Evaluation Boards ICE In-Circuit Emulators ROM ICE SME Series Programmable User Configurable RTOS Real Time Operating Systems Third Party Support Software Hardware Yokogawa Digital Cosmic Compiler C Language C Like Assembler Linker Debugger Debug A/D D/A DAC Analog Digital 10-bit 4-bit 8-bit 16-bit 32-bit Address bus Data Bus