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Integrated Circuits Group

APPLICATIONS:
- PDA
- Digital Camera

SM8504/SM8506 8-Bit Single-Chip Microcomputers

FEATURES

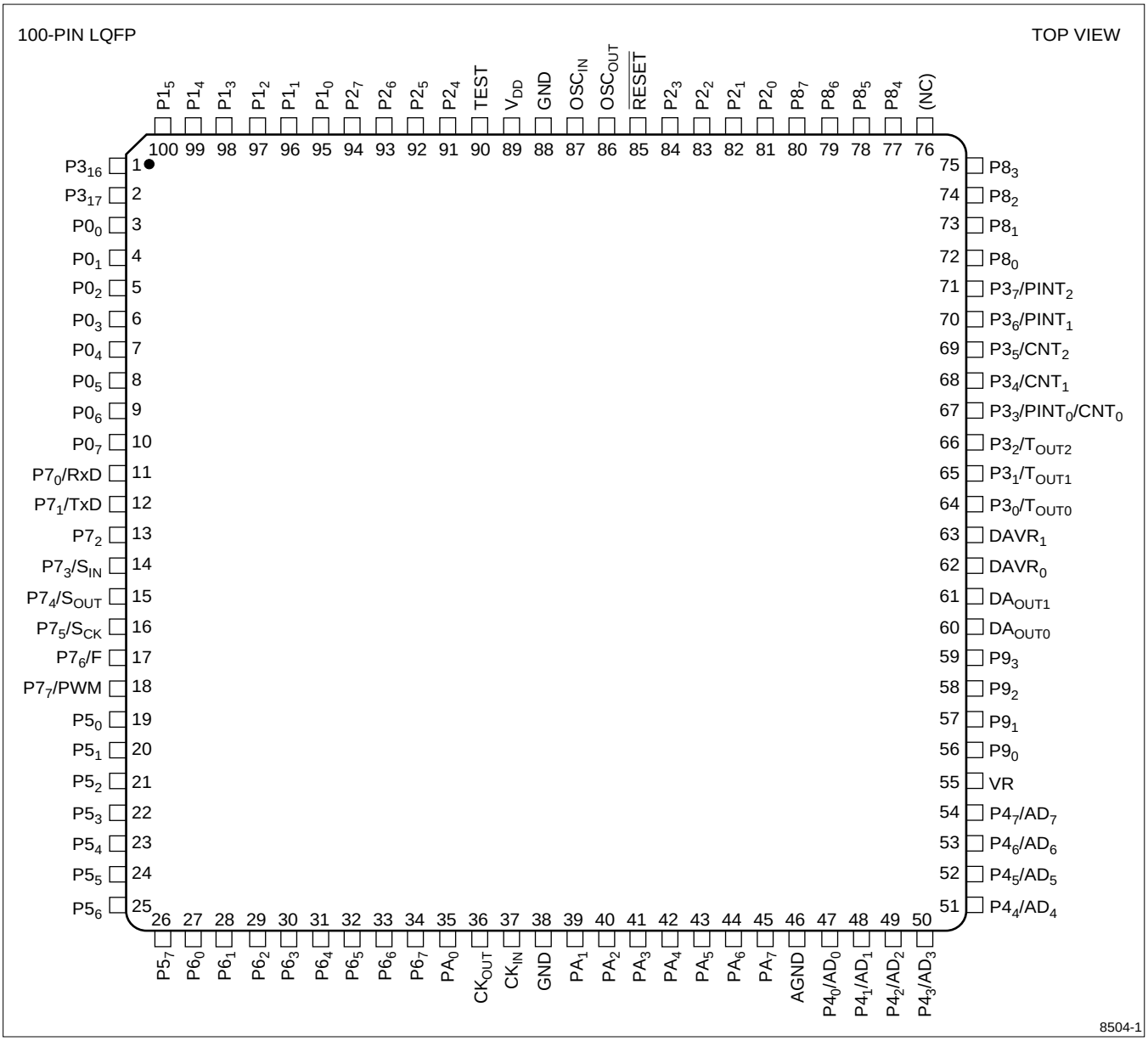
- ROM capacity
  - 40,960 × 8-bits (SM8504)
  - 61,440 × 8-bits (SM8506)
- RAM capacity
  - 1,024 × 8-bits (SM8504)
  - 2,048 × 8-bits (SM8506)
- Memory organization, it is possible to set the range of accessible address of the external memory in unit of 4K (4K to 60K) by the user program.
- External memory expansion, the SM8500 series can access external memory by program setting.
- A RAM area is used as subroutine stack
- CPU core
  - 8-bits × 8 ports (or 16-bits × 4 ports) and 16-bits × 4 ports general purpose register are used as accumulator, register pointer and index register
  - 67 instruction sets (multiplication, division and bit manipulation instructions)
  - 23 types of addressing mode
  - System clock cycle 0.17 µs MIN. At (12 MHz main clock cycle)
  - System clock cycle can be varied by program. System clock can be derived from the main clock (divided by 1/2, 1/4, 1/8, 1/16 or 1/32) or sub-clock (divided-by-2 32.768 kHz)
- Built-in main-clock oscillator for system clock
- Built-in sub-clock oscillator for real time clock
- Interrupts
  - 14 maskable interrupts
  - 4 external interrupts and 10 internal interrupts from peripheral functions can be set enable/disable independently and masked by 14-level priority
  - 2 nonmaskable interrupts
  - Watchdog timer interrupt, illegal instruction trap
- Standby modes: Halt mode/Stop mode
- I/O ports
  - 16 Input (8 inputs also used as A/D input pins). The pull-up resistor of one port (8-bits) can be turned on/off by software
  - 16 Output (large current output pins)
  - 52 Input/Output. The pull-up resistors can be turned on/off by software.
  - 2 D/A output
- Timer counter
  - Timer/counter (16-bit × 1, 8-bit × 5)
  - PWM output available
  - 1-channel period and duty cycle variable
  - 3-channel duty cycle variable
  - Watchdog timer (8-bit × 1)
  - Clock timer (8-bit × 1)
- Serial interface
  - SIO 8-bit clock synchronous × 1
  - UART 8-bit clock asynchronous × 1
- A/D converter
  - 10-bits resolution
  - 8 channels
- D/A converters
  - 8-bits resolution (4 bits for waveform generator)
  - 2 channels
- Waveform generator
  - 2 channels internal waveform RAM
  - User programmable 16-level waveforms, 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.
- Clock output
  - $P7_6$/F pin can be used to drive a buzzer (timer 5 output)
- Input capture function
- Supply voltages
  - 1.8 V to 2.7 V (system clock frequency; at 750 kHz MAX.)
  - 2.7 V to 3.6 V (system clock frequency; at 3 MHz MAX.)
  - 4.5 V to 5.5 V (system clock frequency; at 6 MHz MAX.)
  - The SM8500 series can operate at the MAX. 12 MHz main clock if the operating voltage is in the range (2.7 to 5.5 V). However, the main clock frequency must be divided to the system clock according to the operating voltage range.
- Packages
  - 100-pin LQFP (LQFP100-P-1414)
  - 100-pin QFP (QFP100-P-1420)

DESCRIPTION

SM8504/SM8506 (SM8500) are CMOS 8-bit single-chip microcomputers 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/counter, serial interfaces (SIO, UART), A/D converter, D/A converter and waveform generator.

The information for this document is from the Microcomputer Databook, issued in March 1997.

100-PIN LQFP PINOUT



100-PIN QFP PINOUT