SHARP®

APPLICATIONS:
- PDA
- Digital Camera

Integrated Circuits Group

SM6004/SM6006 16-Bit Single-Chip Microcomputers

FEATURES

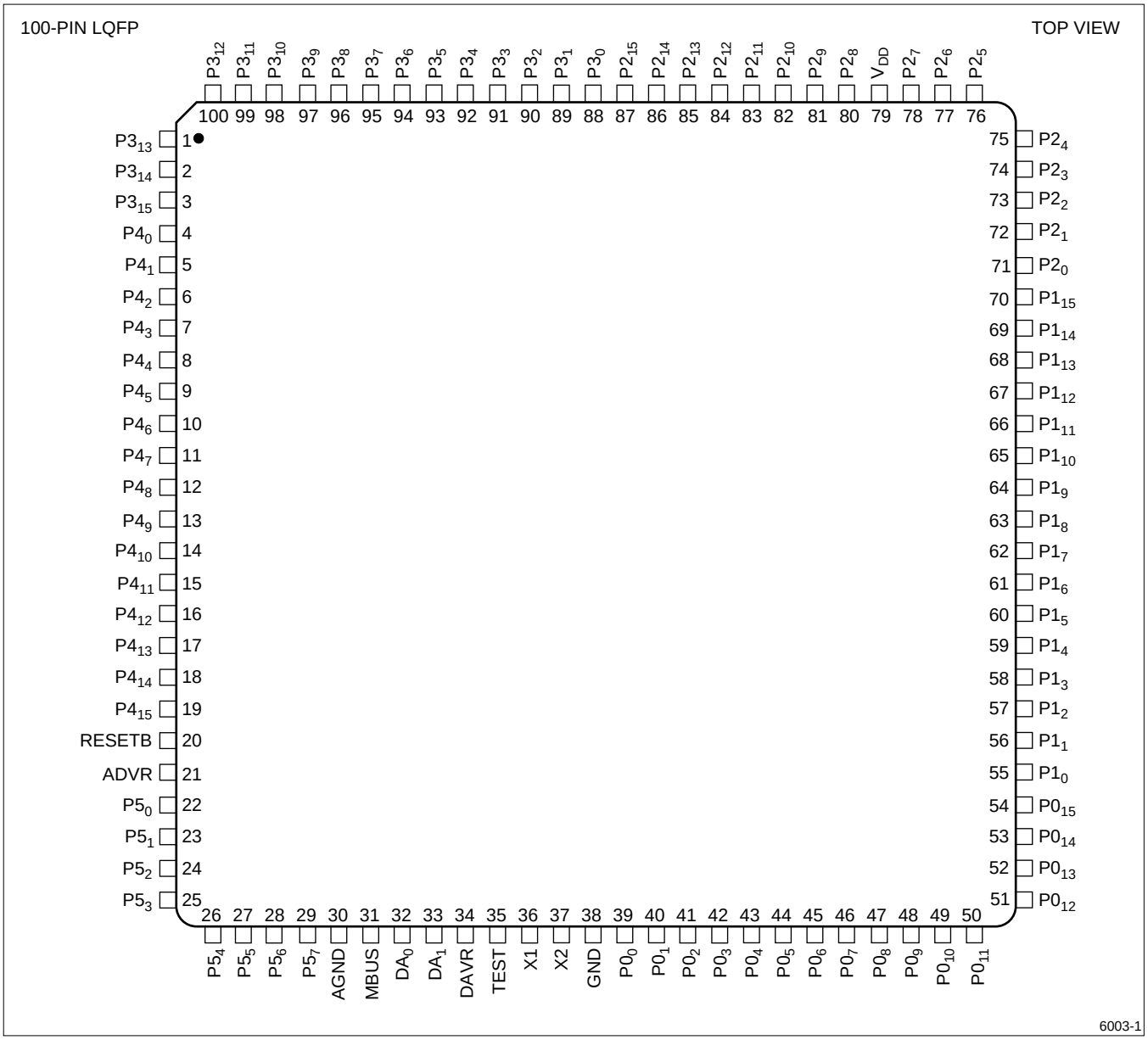
- ROM capacity:
  - 61,440 × 8-bits (SM6004)
  - 126,976 × 8-bits (SM6006)
- RAM capacity:
  - 2,048 × 8-bits (SM6004)
  - 3,584 × 8-bits (SM6006)
- External memory expansion function
  - On chip bus controller for external memory
  - Bus multiplexing/nonmultiplexing selection
  - Bus width selection
  - Auto wait control
- CPU
  - General purpose registers 16-bit × 16
  - 62 basic instructions (bit manipulation instructions Suitable for controlling, bit transfer instructions, bit branch instructions, high speed multiplication and division instructions (16-bits × 16-bits, 16-bits ÷ 16-bits, 32-bits ÷ 16-bits))
- 10 addressing modes
  - 16M of address space
  - An interrupt request starts a high performance automatic data transfer (DTS). Appropriate settings of interrupts and registers enable hardware automatic data transfer. Various functions can be operated successively and the resultant data can also successively be stored.
  - System clock cycle 0.133 µs (MIN.) (V_{DD} = 4.5 V to 5.5 V at 30 MHz main clock cycle)
  - 0.2 µs (MIN.) (V_{DD} = 2.5 V to 5.5 V at 20 MHz main clock cycle)
  - Selectable system clocks divided by 2 up to 16 main clocks for low power operation.
- 27 total software interrupts
  - 24 maskable interrupts (external 4, internal 20)
  - 3 nonmaskable interrupts
  - A nonmaskable interrupt, when used in conjunction with BST instruction, can trigger the software reset
- Built-in main clock oscillator for system clock
- Standby function: Halt mode/stop mode
- I/O ports × 88/specific purpose function pin × 3
  - Input ports × 8 (also serve as A/D input)
  - I/O ports × 80 (also serve as function pins)
  - Specific purpose function pins × 3 (D/A output pin × 2, bus mode selection pin × 1)
- Timer
  - 16-bit multifunction timers × 6
  - 5-stage capture and 2-stage compare type × 1
  - 1-stage compare type × 2
  - 2-stage capture type (or capture and compare) × 2
  - 2-stage compare, PWM output type × 1
- Watchdog timer (overrun detect timer): 8-bit × 1
- Serial interface
  - Selectable universal asynchronous receiver transmitter (UART)/serial I/O interface (SIO) × 2
  - Serial I/O interface (SIO) × 1
- A/D converter
  - Resolution 10-bits
  - 8 channels
  - Auto start by triggering with timer output
- D/A converter 8-bit × 2
- High precision PWM outputs
  - 14-bit × 2
  - Bit modulated PWM
- Real time outputs 4-bit × 2
- Supply voltages
  - 4.5 V to 5.5 V (main clock at 30 MHz)
  - 2.5 V to 5.5 V (main clock at 20 MHz)
- Packages
  - 100-pin LQFP (LQFP100-P-1414)
  - 100-pin QFP (QFP100-P-1420)

DESCRIPTION

The SM6004/SM6006 are single-bit single-chip microcomputers incorporating a 16-bit CPU core, ROM, RAM, timer unit, watchdog timer, serial interface (UART, SIO), PWM output, real time output, A/D converter, D/A converter and bus controller.

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

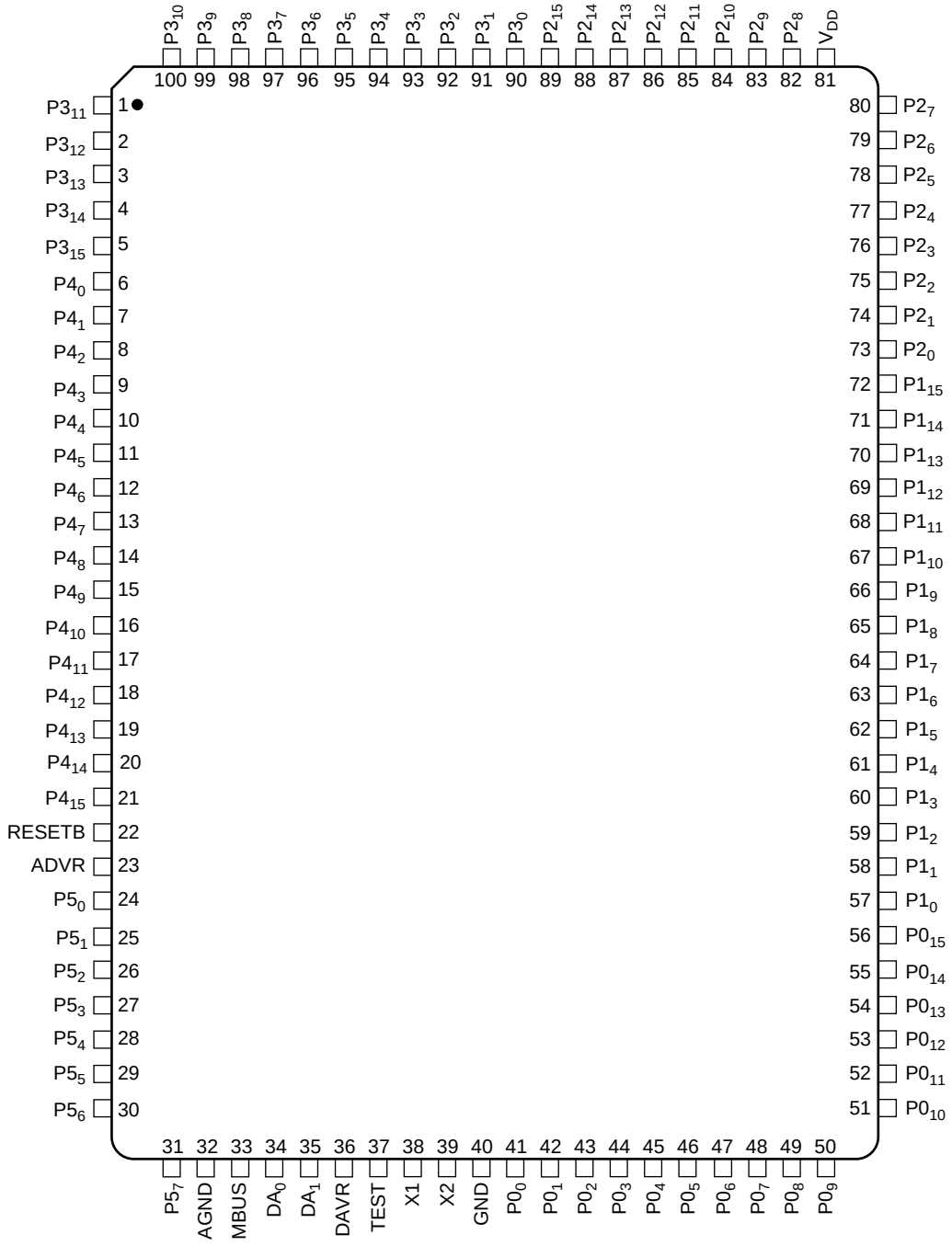
100-PIN LQFP PINOUT



100-PIN QFP PINOUT

100-PIN QFP

TOP VIEW



6003-2