

# SM6004

## Low-Voltage High-Speed 16-Bit Single-Chip Microcomputer

### DESCRIPTION

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

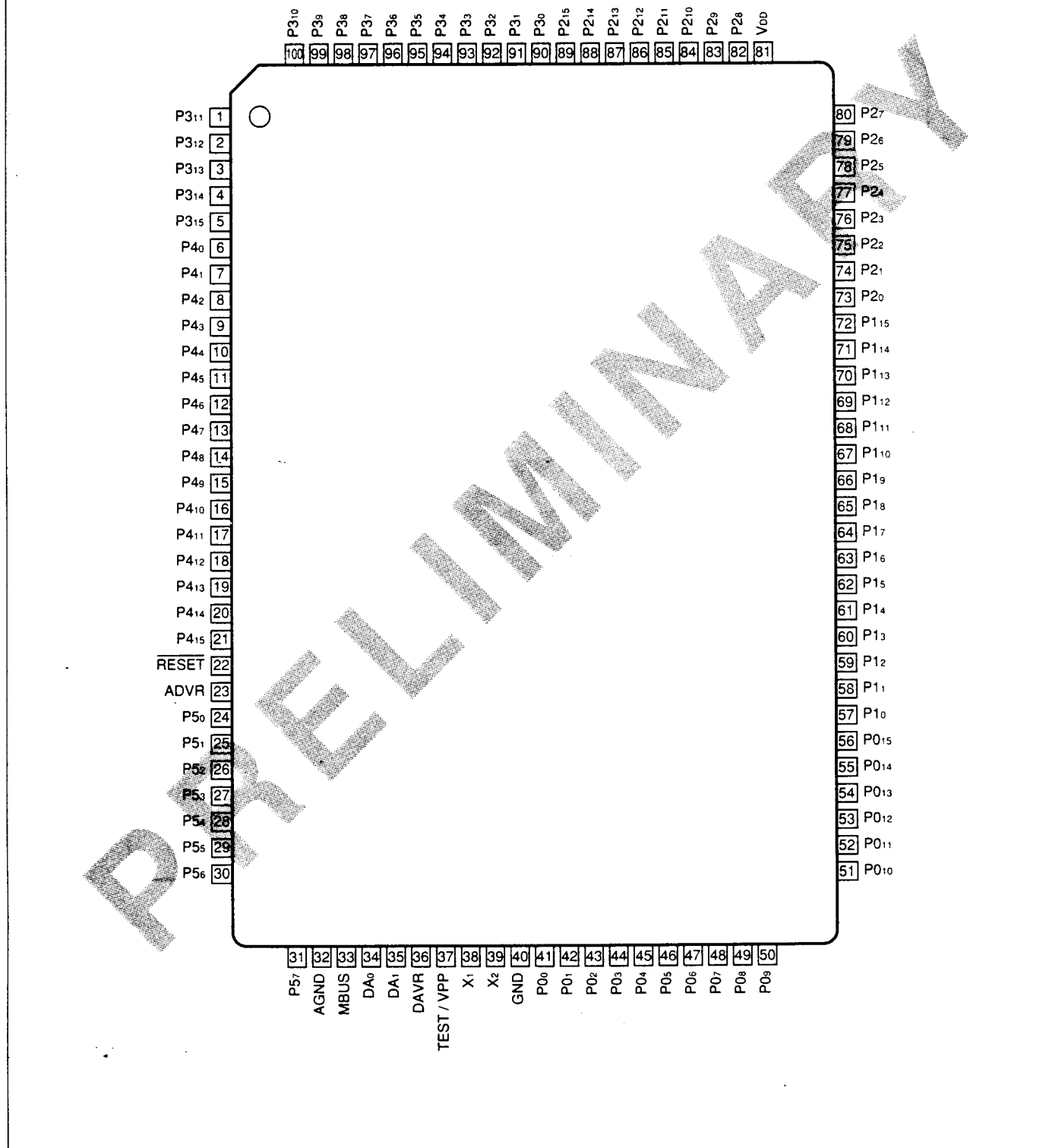
### FEATURES

- ROM capacity : 61 440 x 8 bits
- RAM capacity : 2 048 x 8 bits
- Versatile timer units : 16 bits counter x 6
  - Timer 0      16 bits counter x 1  
                Capture register x 5  
                Compare register x 2
  - Timer 1      16 bits counter x 1  
                Capture register x 1  
                Capture/compare register x 1
  - Timer 2      16 bits counter x 1  
                Capture register x 1  
                Capture/compare register x 1
  - Timer 3      16 bits counter x 1  
                Compare register x 1
  - Timer 4      16 bits counter x 1  
                Compare register x 1
  - Timer 5      16 bits counter x 1  
                Compare register x 2  
                PWM output available
- Watch dog timer : 8 bits x 1
- Serial interface :
  - UART/SIO x 2 (built-in baud rate generator)
  - SIO x 1
- PWM outputs :
  - 14 bits x 2  
(14, 12, 10, 8 bits selectable)
- Real time outputs : 4 bits x 2
- A/D converter :
  - Resolution    10 bits
  - Channels      8
- D/A converter : 8 bits x 2
- Bus controller
  - External bus access function
  - Multi-/nonmulti- address and data selectable
  - Selectable bus width, 8 and 16 bits
  - Auto-wait function
- I/O ports :
  - Input          8 bits x 1 (also used as A/D input)
  - Input/output 16 bits x 5
- Supply voltage :
  - 2.5 to 5.5 V (at 20 MHz main clock)
  - 4.5 to 5.5 V (at 30 MHz main clock)
- Package :
  - 100-pin QFP (QFP100-P-1420)
  - 100-pin LQFP (LQFP100-P-1414)

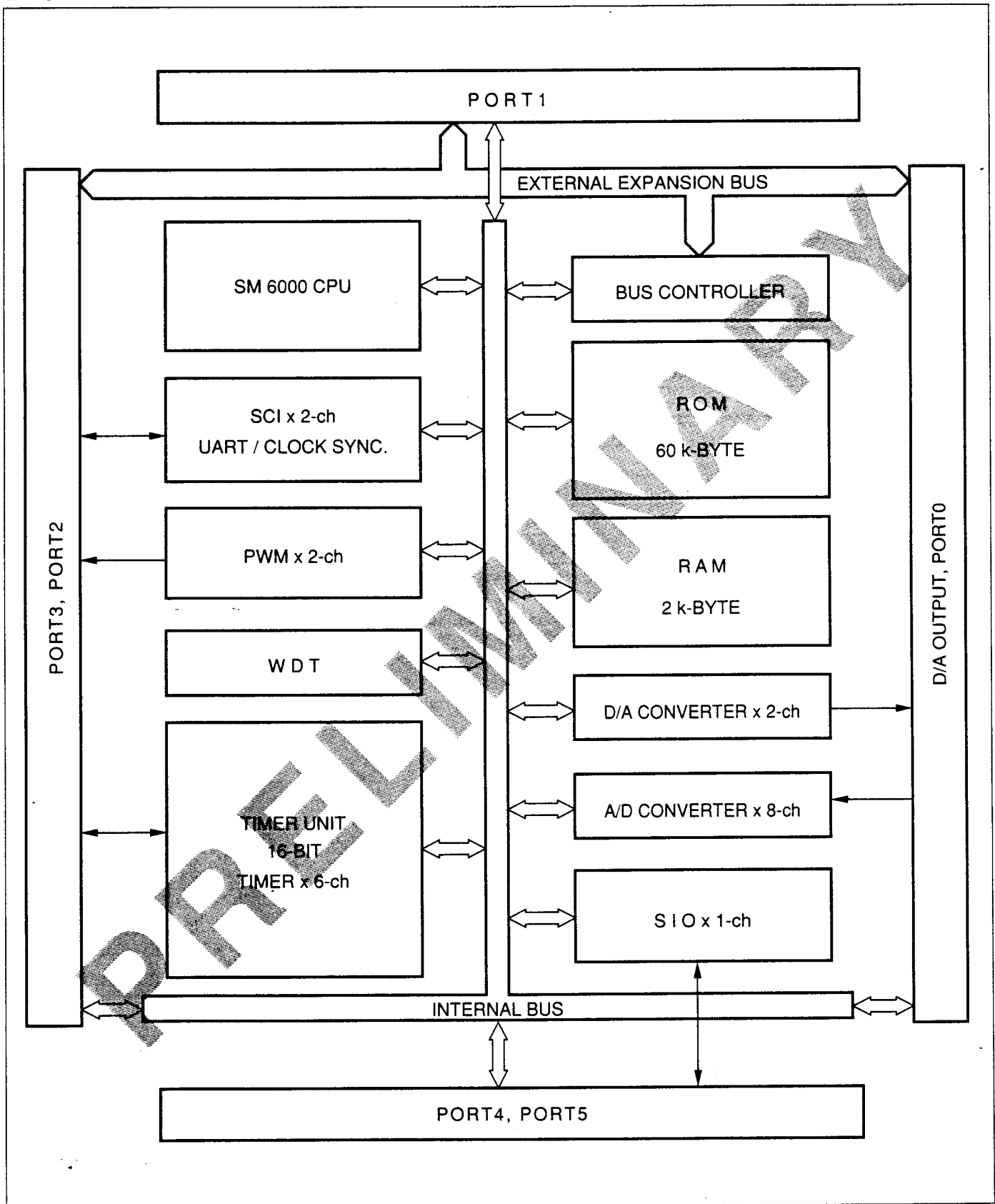
# PIN CONNECTIONS

100-PIN QFP

TOP VIEW



BLOCK DIAGRAM



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