

# SM3511

## 4-Bit Single-Chip Microcomputer (For Data Bank Use)

### DESCRIPTION

The SM3511 is a CMOS 4-bit single-chip microcomputer for databank incorporating data memory RAM, LCD driver (the output is adjustable in 16 steps for various contrast), key/switch input circuit, 8-bit parallel I/O port, 3 output ports, external memory control circuit, buzzer output circuit and voltage detector circuit. One of three ports contains special output circuit for infrared(IR) communication. It is easy to realize timer function by timer signal interrupt since the oscillator circuit is built-in.

### FEATURES

- ROM capacity :
 

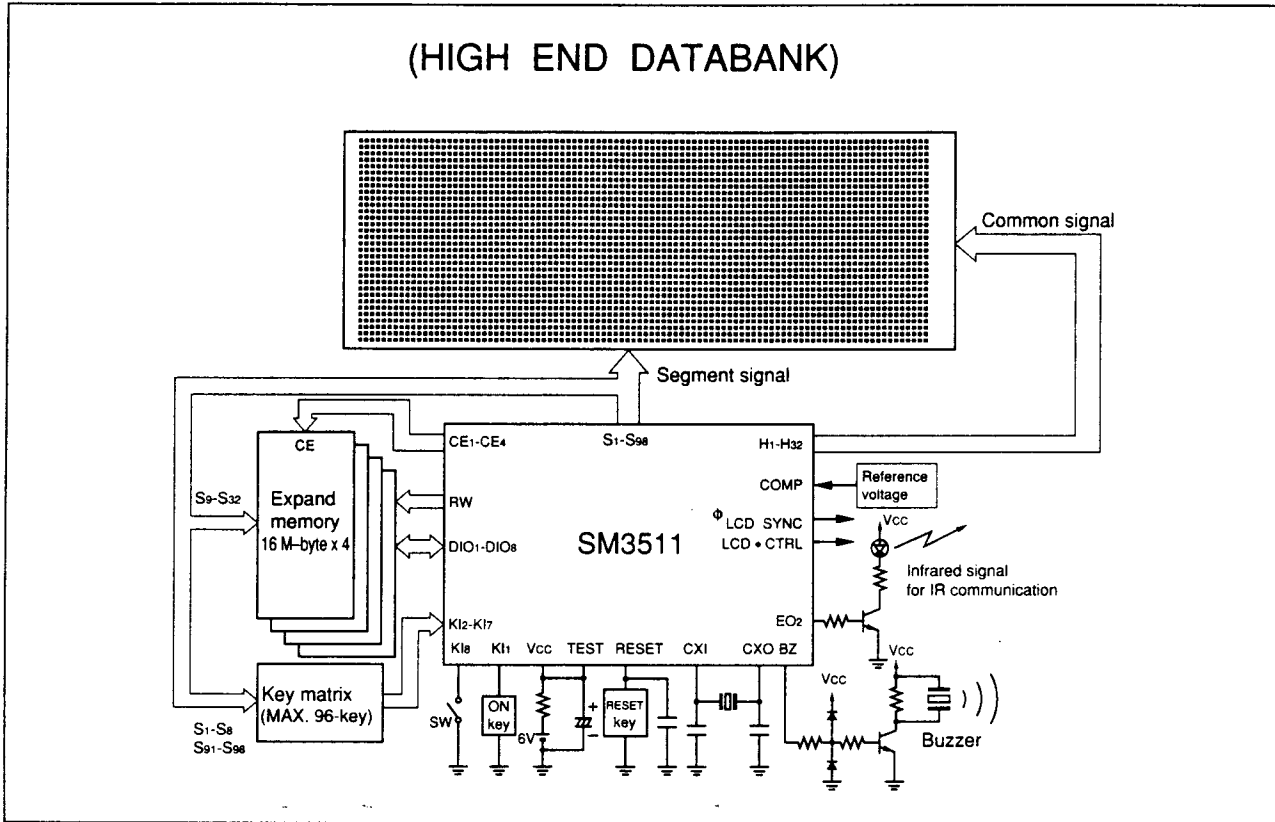
Program ROM	24 k x 23 bits
Character ROM	6 x 8 x 256 bits
- RAM capacity :
 

Working RAM	256 x 4 bits
Display RAM	98 x 32 bits
Data RAM	512 x 8 bits
- Memory expansion (external) : 16 M x 8 bits x 4
- Built-in battery detector
- LCD display : 98 segment x 32 common
- I/O ports :
 

Parallel I/O	8 bits
Input	2 bits
Output	3 bits
Buzzer output	1 bit (4 kHz)
Key input	6 bits
- Standby release : 2 events (Timer signal, key input)
- LCD contrast adjustable : 16 levels
- Built-in oscillator :
 

System clock (built-in CR oscillator)	1 MHz
(external ceramic resonator)	1 MHz
Timer (built-in CR oscillator)	32.8 kHz
(external crystal)	32.768 kHz
- Instruction cycle time : 3  $\mu$ s
- Operating temperature : -10 to +60 °C
- Supply voltage : 3.8 to 6.0 V
- Package : Chip (180-pad)

SYSTEM CONFIGURATION EXAMPLE



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