

# SM3513

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

### DESCRIPTION

The SM3513 is a CMOS 4-bit single-chip micro-computer 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 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.

- Instruction cycle time : 3  $\mu$ s
- Operating temperature : -10 to +60°C
- Supply voltage : 3.8 to 6.0 V
- Package : 160-pin QFP (QFP160-P-2828)  
[Test Sample only]

### FEATURES

- ROM capacity :
 

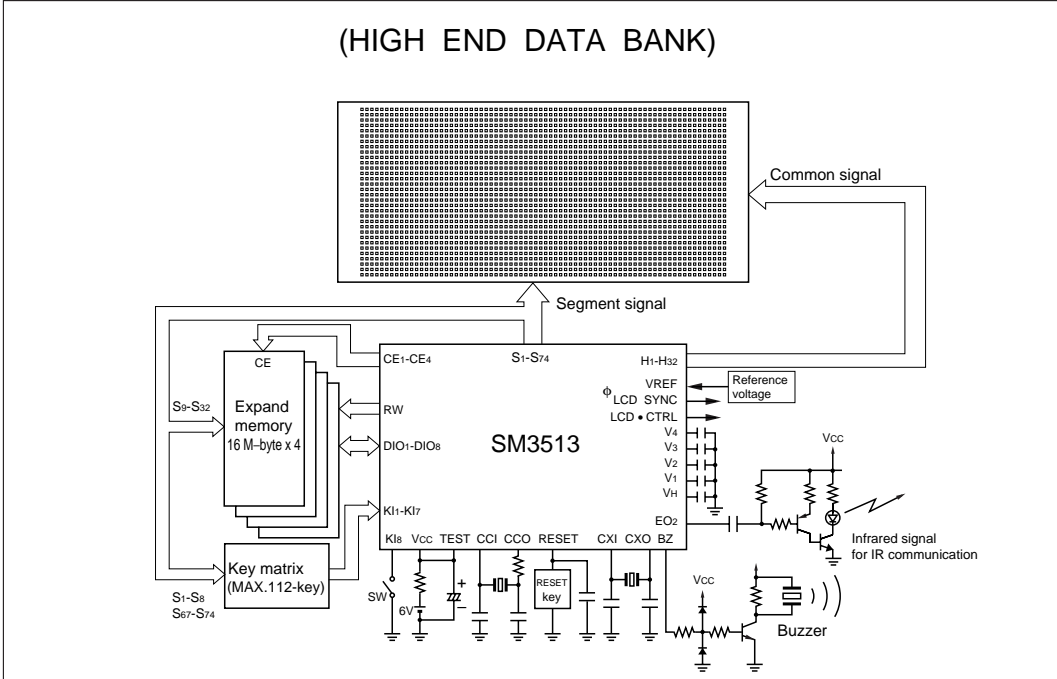
Program ROM	24 k x 23 bits
Character ROM	6 x 8 x 256 bits
Constant ROM	1 k x 4 bits
- RAM capacity :
 

Working RAM	256 x 4 bits
Display RAM	74 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 : 74-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

SYSTEM CONFIGURATION EXAMPLE



160 QFP (QFP160-P-2828)

