

## CMOS 4-bit Single Chip Microcontroller

- High Performance 4-bit Core CPU S1C63000
- Segment LCD Driver (Max:50SEG x 8COM)
- R/F Converter to Measure Temperature and Humidity
- Low Current Consumption
- Low Voltage Operation

### ■ DESCRIPTIONS

The S1C63008 is a microcontroller features low voltage operations and low current consumption. It consists of a 4-bit core CPU S1C63000 as the core CPU, ROM (8K words x 13 bits), RAM (1K words x 4 bits), supply voltage detection (SVD) circuit, serial interface, timers, sound generator, and integer multiplier. It also incorporates a segment LCD controller/driver that can drive a maximum 50-segment x 8-common LCD panel, and an R/F converter that can measure temperature and humidity using sensors such as a thermistor.

The S1C63008 is suitable for battery driven clocks and watches with temperature and humidity measurement functions.

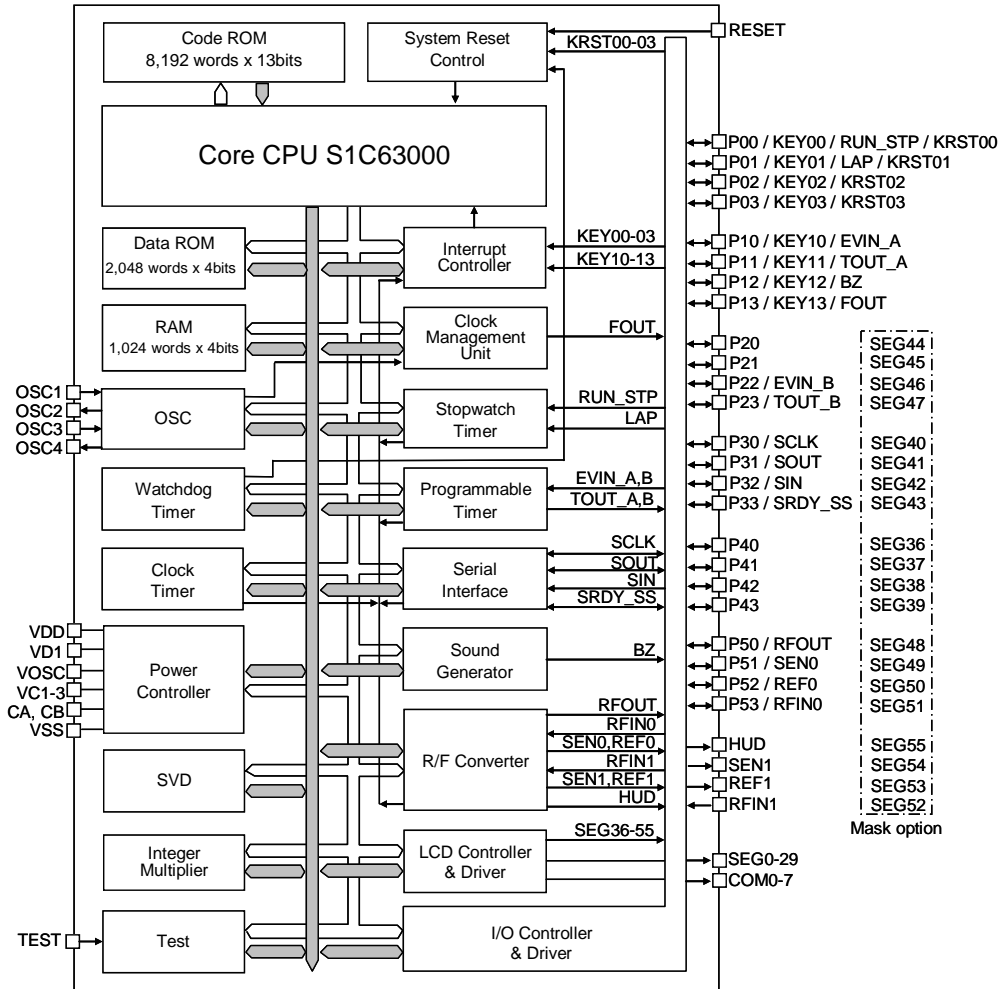
### ■ FEATURES

- |  |   |
|--|---|
| ● CPU                                    | 4-bit CMOS core CPU S1C63000  |
| ● OSC1 oscillation circuit               | 32.768kHz (Typ.) crystal oscillation circuit  |
| ● OSC3 oscillation circuit               | 4.0MHz (Typ., 3V model) / 1.0MHz (Typ., 1.5V model) ceramic oscillation circuit<br>1.8MHz (Typ., 3V model) / 500kHz (Typ., 1.5V model) CR oscillation circuit (external R), or<br>500kHz (Typ., 3V model / 1.5V model) CR oscillation circuit (built-in R) (*1) |
| ● Instruction set                        | 47 types of basic instructions (411 instructions with all),<br>8 types of addressing modes  |
| ● Instruction execution time             | During operation at 32.768kHz: 61μsec    122μsec    183μsec<br>During operation at 4MHz:    0.5μsec    1μsec    1.3μsec   |
| ● ROM capacity                           | Code ROM: 8,192 words x 13 bits<br>Data ROM: 2,048 words x 4 bits   |
| ● RAM capacity                           | Data memory: 1,024 words x 4 bits<br>Display memory: 400 bits   |
| ● LCD driver                             | 50 segments (Max., *1) x 3 to 8 commons (*2)  |
| ● I/O ports                              | 24 bits   |
| ● Serial interface                       | 1 port (8-bit clock synchronous system with SPI supported)  |
| ● Time base counters                     | Clock timer<br>1/1000-second stopwatch timer with direct key input function   |
| ● Programmable timer                     | 8-bit timer x 3 channels<br>(Can be used as 16-bit timer x 1 + 8-bit timer x 1) (*2)  |
| ● Watchdog timer                         | Built-in  |
| ● Sound generator                        | With envelope and 1-shot output functions   |
| ● R/F converter                          | 2 channels, CR oscillation type R/F converter with 20-bit counters,<br>supports resistive humidity sensors  |
| ● Integer Multiplier                     | 8-bit accumulator x 1 channel<br>Multiplication: 8 bits x 8 bits → 16-bit product<br>Division:    16 bits ÷ 8 bits → 8-bit quotient and 8-bit remainder   |
| ● Supply voltage detection (SVD) circuit | Programmable 29 detection voltage levels (*2)   |
| ● External interrupt                     | Key input    8 systems  |
| ● Internal interrupt                     | Watchdog timer (NMI)    1 systems<br>Clock timer    8 systems<br>Stopwatch timer    4 systems<br>Programmable timer    6 systems<br>Serial interface    1 systems<br>R/F converter    3 systems   |
| ● Power supply voltage                   | 1.8 to 5.5V (3V normal type) or 1.1 to 1.7V (1.5V low-voltage type) (*1)  |
| ● Operation temperature range            | -40 to 85°C   |
| ● Current consumption (Typ.)             | SLEEP (32kHz)    0.1μA (3V model) / 0.1μA (1.5V model)<br>HALT (32kHz)    0.5μA (3V model) / 0.5μA (1.5V model)<br>RUN (32kHz)    2.3μA (3V model) / 2.0μA (1.5V model)<br>RUN (4M/1MHz)    220μA (4MHz, 3V model) / 60μA (1MHz, 1.5V model)                    |
| ● Shipment form                          | QFP15-100pin, TQFP14-100pin, or die form  |

\*1: Can be selected with mask option.    \*2: Can be selected with software.

# S1C63008

## ■ BLOCK DIAGRAM



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