

CMOS 4-bit Single Chip Microcontroller

- High Performance 4-bit Core CPU S1C63000
- Segment LCD Driver (Max:36SEG x 8COM)
- R/F Converter to Measure Temperature and Humidity
- Low Current Consumption
- Low Voltage Operation

■ DESCRIPTIONS

The S1C63004 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 (4K words x 13 bits), RAM (512 words x 4 bits), supply voltage detection (SVD) circuit, serial interface, timers, and sound generator. It also incorporates a segment LCD controller/driver that can drive a maximum 36-segment x 8-common LCD panel, and an R/F converter that can measure temperature and humidity using sensors such as a thermistor.

The S1C63004 is suitable for battery driven clocks and watches with temperature and humidity measurement functions.

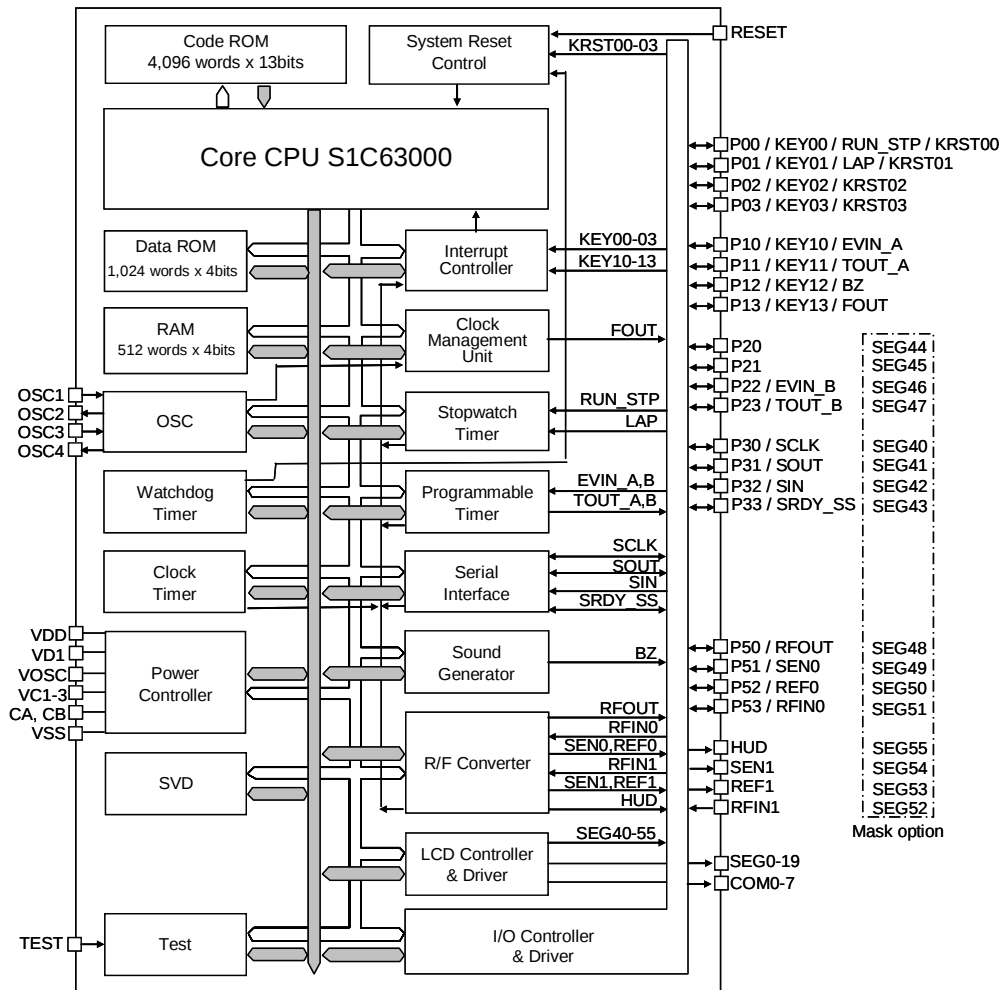
■ FEATURES

- | | |
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| • 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 |
| | 1.8MHz (Typ., 3V model) / 500kHz (Typ., 1.5V model) CR oscillation circuit (external R), or |
| | 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),
8 types of addressing modes |
| • Instruction execution time | During operation at 32.768kHz: 61μsec 122μsec 183μsec
During operation at 4MHz: 0.5μsec 1μsec 1.3μsec |
| • ROM capacity | Code ROM: 4,096 words x 13 bits
Data ROM: 1,024 words x 4 bits |
| • RAM capacity | Data memory: 512 words x 4 bits
Display memory: 288 bits |
| • LCD driver | 36 segments (Max., *1) x 3 to 8 commons (*2) |
| • I/O ports | 20 bits |
| • Serial interface | 1 port (8-bit clock synchronous system with SPI supported) |
| • Time base counters | Clock timer
1/1000-second stopwatch timer with direct key input function |
| • Programmable timer | 8-bit timer x 3 channels
(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,
supports resistive humidity sensors |
| • Supply voltage detection (SVD) circuit | Programmable 29 detection voltage levels (*2) |
| • External interrupt | Key input 8 systems |
| • Internal interrupt | Watchdog timer (NMI) 1 systems
Clock timer 8 systems
Stopwatch timer 4 systems
Programmable timer 6 systems
Serial interface 1 systems
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)
HALT (32kHz) 0.5μA (3V model) / 0.5μA (1.5V model)
RUN (32kHz) 2.3μA (3V model) / 2.0μA (1.5V model)
RUN (4M/1MHz) 220μA (4MHz, 3V model) / 60μA (1MHz, 1.5V model) |
| • Shipment form | QFP14-80pin, TQFP14-100pin, or die form |

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

S1C63004

■ BLOCK DIAGRAM



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