

CMOS 4-bit Single Chip Microcontroller

- High Performance 4-bit Core CPU S1C63000
- Segment LCD Driver (Max:56SEG x 8COM)
- R/F Converter to Measure Temperature and Humidity
- Low Current Consumption
- Low Voltage Operation

■ DESCRIPTIONS

The S1C63016 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 (16K words x 13 bits), RAM (2K 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 56-segment x 8-common LCD panel, and an R/F converter that can measure temperature and humidity using sensors such as a thermistor.

The S1C63016 is suitable for battery driven clocks and watches with temperature and humidity measurement functions.

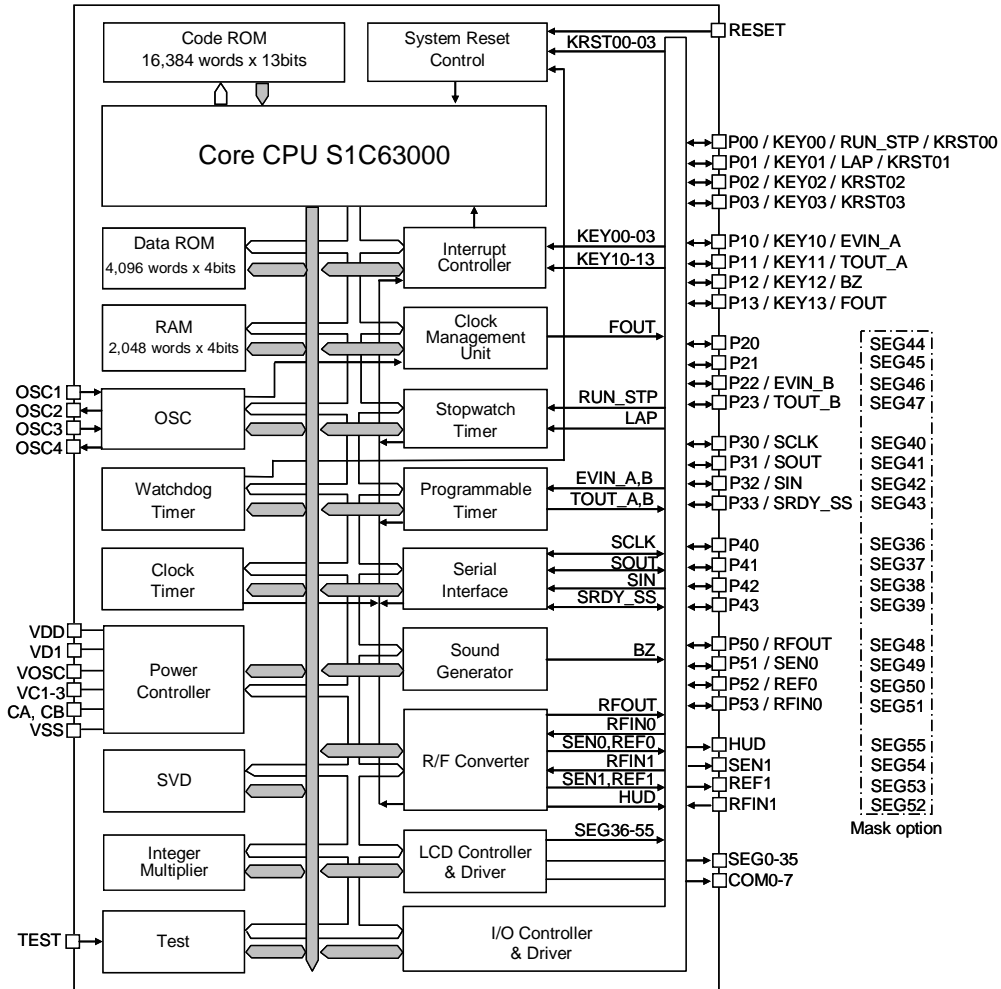
■ FEATURES

- | | |
|--|---|
| ● 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
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: 16,384 words x 13 bits
Data ROM: 4,096 words x 4 bits |
| ● RAM capacity | Data memory: 2,048 words x 4 bits
Display memory: 448 bits |
| ● LCD driver | 56 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
1/1000-second stopwatch timer with direct key input function |
| ● Programmable timer | 8-bit timer x 4 channels
(Can be used as 16-bit timer x 1 + 8-bit timer x 2) (*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 |
| ● Integer Multiplier | 8-bit accumulator x 1 channel
Multiplication: 8 bits x 8 bits → 16-bit product
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
Clock timer 8 systems
Stopwatch timer 4 systems
Programmable timer 8 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 | QFP15-100pin, TQFP14-100pin, or die form |

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

S1C63016

■ BLOCK DIAGRAM



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SEMICONDUCTOR OPERATIONS DIVISION

EPSON semiconductor website

http://www.epson.jp/device/semicon_e/

IC Sales Department

IC International Sales Group

421-8 Hino, Hino-shi, Tokyo 191-8501, JAPAN

Phone: +81-42-587-5814 FAX: +81-42-587-5117

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