

## CMOS 4-bit Single Chip Microcontroller

- High Performance 4-bit Core CPU S1C63000
- Flash EEPROM 16K x 13bit / 4K x bit
- Segment LCD Driver (Max:56SEG x 8COM)
- R/F Converter to Measure Temperature and Humidity
- Low Current Consumption
- Low Voltage Operation

### ■ DESCRIPTIONS

The S1C6F016 is a microcontroller features low voltage operations and low current consumption. It consists of a 4-bit core CPU S1C63000 as the core CPU, Flash EEPROM (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 S1C6F016 is suitable for battery driven clocks and watches with temperature and humidity measurement functions.

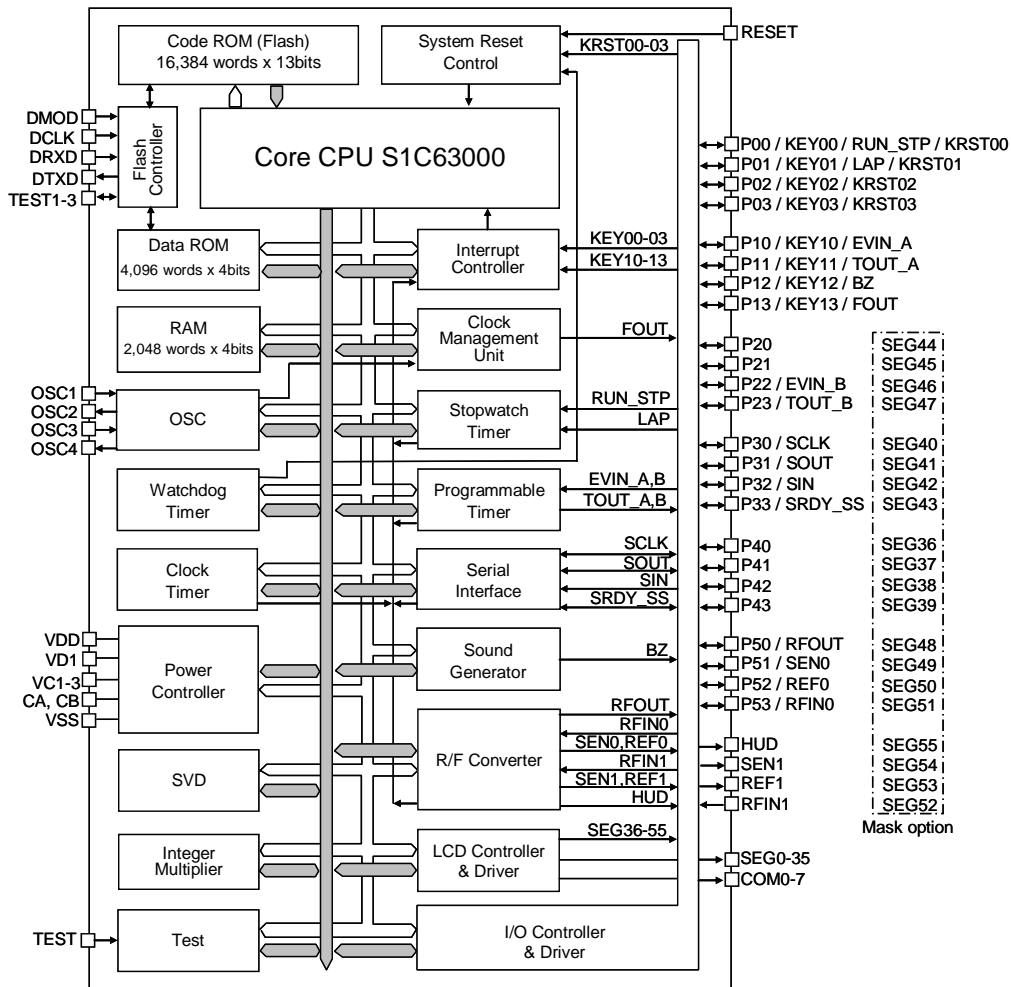
### ■ FEATURES

● CPU	4-bit CMOS core CPU S1C63000
● OSC1 oscillation circuit	32.768kHz (Typ.) crystal oscillation circuit
● OSC3 oscillation circuit	4.2MHz (Max.) ceramic oscillation circuit
	1.8MHz (Typ.) CR oscillation circuit (external R), or
	500kHz (Typ.) 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
● Flash EEPROM 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	16-bit timer x 2 channels
	Each 16-bit timer is configurable to two 8-bit timer channels (*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 16 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 3.6V (for normal operation),    2.7 to 3.6V (for Flash programming) (*1)
● Operation temperature range	-20 to 70°C
● Current consumption (Typ.)	During SLEEP (32kHz)    0.7μA
	During HALT (32kHz)    2μA
	During running (32kHz)    9μA
	During running (4MHz)    950μA
● Shipment form	QFP15-100pin or die form

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

# S1C6F016

## ■ BLOCK DIAGRAM



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Document code: 411904700  
 First issue Mar, 2010 in Japan