S1C63016

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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.
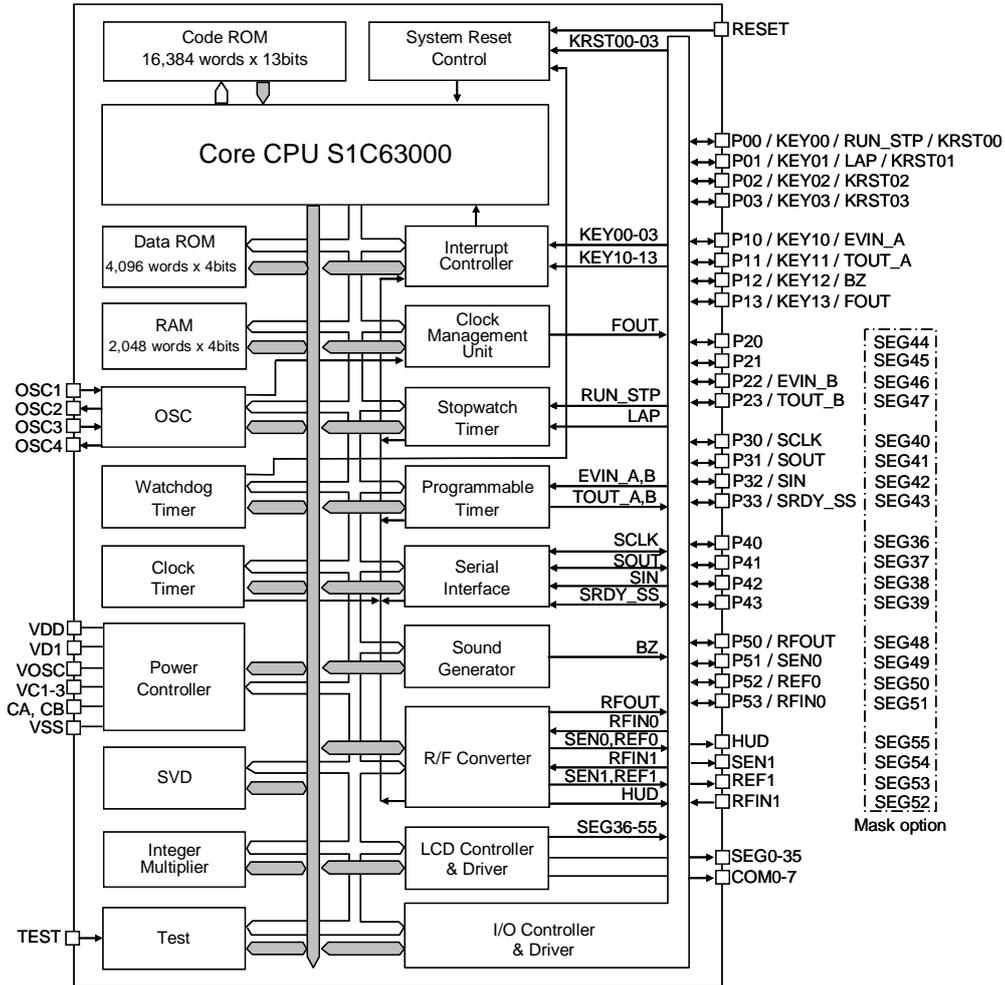
■ FEATURES

● 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 (extenal 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.

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■ BLOCK DIAGRAM

NOTICE: