S1C63656

4-bit Single Chip Microcomputer

- ● Original Architecture Core CPU
- ● Low Current Consumption
- ● High Speed Operation in Low Voltage

■ DESCRIPTION

The S1C63656 is a microcomputer which has a high-performance 4-bit CPU S1C63000 as the core CPU, ROM (6,144 words × 13 bits), RAM (1,024 words × 4 bits), multiply-divide circuit, serial interface, watchdog timer, programmable timer, time base counters (2 systems), an LCD driver that can drive a maximum 38 segments × 4 commons, sound generator, R/f converter and stepping motor driver built-in. The S1C63656 features low current consumption, this makes it suitable for battery driven clocks and watches with temperature and humidity measurement functions.
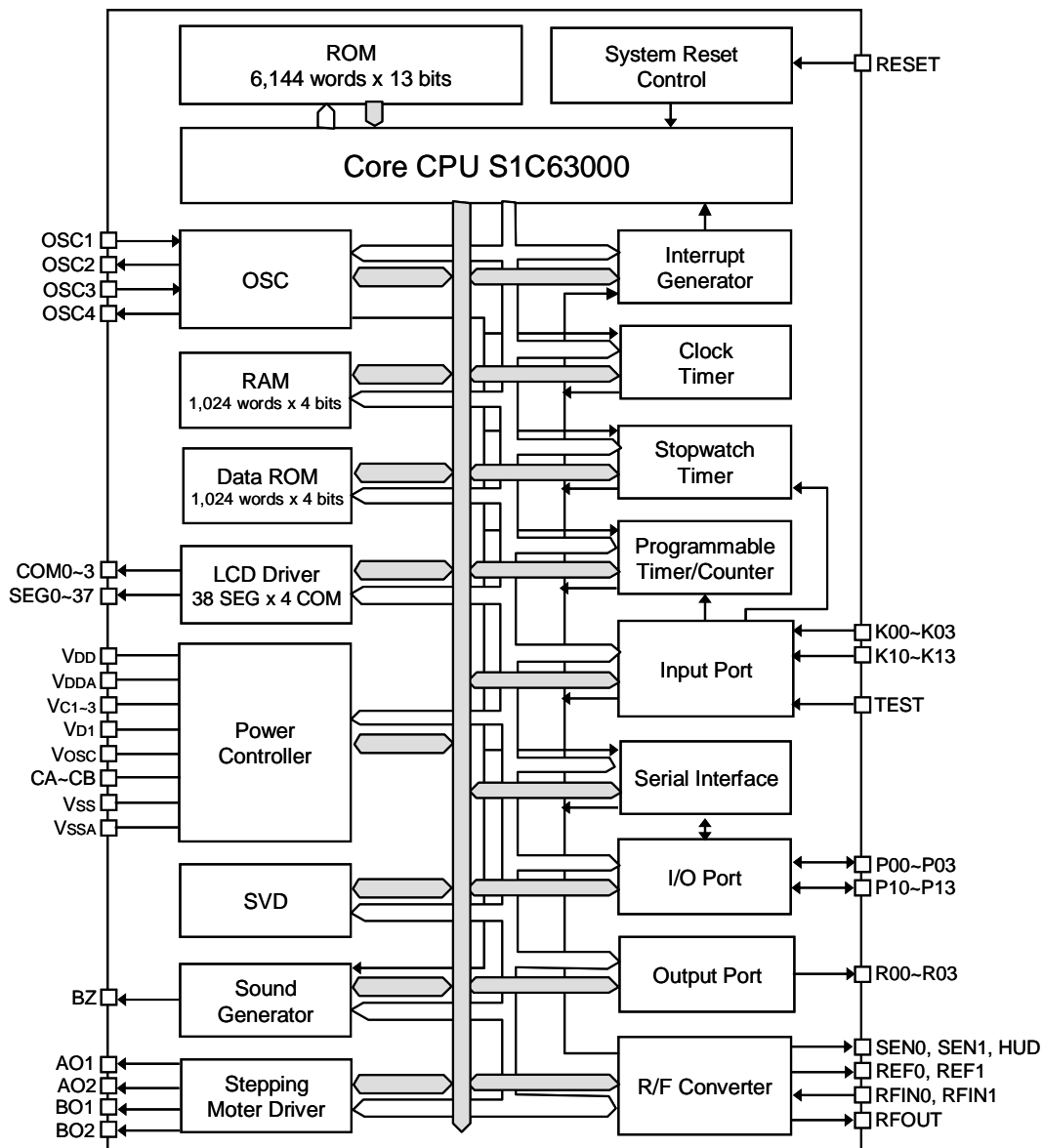
■ FEATURES

OSC1 oscillation circuit	32.768 kHz (Typ.) crystal oscillation circuit
OSC3 oscillation circuit	4 MHz (Max.) ceramic
	(2 MHz Max. when OSC3 is used as the R/f converter operating clock),
	1.1 MHz (Typ.) CR oscillation circuit or not used (*1)
Instruction set	Basic instruction: 46 types (411 instructions with all)
	Addressing mode: 8 types
Instruction execution time	During operation at 32.768 kHz: 61 μsec 122 μsec 183 μsec
	During operation at 4 MHz: 0.5 μsec 1 μsec 1.5 μsec
ROM capacity	Code ROM: 6,144 words × 13 bits
	Data ROM: 1,024 words × 4 bits
RAM capacity	Data memory: 1,024 words × 4 bits
	Display memory: 48 words × 4 bits
Input port	8 bits (Pull-down resistors may be supplemented *1)
Output port	4 bits (It is possible to switch the 2 bits to special output *2)
I/O port	8 bits (It is possible to switch the 4 bits to serial I/F input/output *2)
Serial interface	1 port (8-bit clock synchronous system)
LCD driver	38 segments × 4 or 3 commons (*2)
Time base counter	Clock timer
	Stopwatch timer (1/1000 sec, with direct key input function)
Programmable timer	8-bit PWM × 2 ch. or 16-bit PWM × 1 ch. (*2)
Watchdog timer	Built-in
Sound generator	With envelope and 1-shot output functions
R/f converter	2 ch., CR oscillation type, 20-bit counter
	Supports resistive humidity sensors
Multiply-divide circuit	8-bit accumulator × 1 ch.
	Multiplication: 8 bits × 8 bits -> 16-bit product
	Division: 16 bits ÷ 8 bits -> 8-bit quotient and 8-bit remainder
Stepping motor driver	2 ch., a clock or watch controller can be implemented
Supply voltage detection (SVD)	Criteria voltages:
	1.85–2.90 V (1.13–1.64 V when OSC3 is not used) are selectable (*2)
External interrupt	Input port interrupt: 2 systems
Internal interrupt	Clock timer interrupt: 5 systems
	Stopwatch timer interrupt: 4 systems
	Programmable timer interrupt: 4 systems
	Serial interface interrupt: 1 system
	R/f converter interrupt: 2 systems
	Motor driver interrupt: 2 systems
Power supply voltage	2.4 to 3.6 V: Max. 4 MHz operation (when OSC3 is used)
	1.1 to 3.6 V: 32 kHz operation (when OSC3 is not used)
Operating temperature range	-20 to 70°C

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Current consumption (Typ.)	Low-speed operation (OSC1 = 32 kHz crystal oscillation):
	During HALT 3.0 V (LCD ON) 0.60 µA
	During operation 3.0 V (LCD ON) 2.50 µA
	High-speed operation (OSC3 ceramic oscillation):
	During operation 3.0 V (LCD ON) 1.0 mA
Shipment form	QFP20-144pin (plastic) or chip

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

■ BLOCK DIAGRAM

NOTICE: