S1C8F626

8-bit Single Chip Microcomputer

- Original Architecture Core CPU
- Built-in Flash EEPROM (48K + 192K bytes)
  with Self-Programming Function
- LCD Driver (96 SEG × 32 COM)
- Serial Interface with IrDA1.0

■ DESCRIPTION

The S1C8F626 is a microcomputer which has a built-in 8-bit CPU S1C88 (MODEL3) as the core CPU, 48K-byte and 192K-byte Flash EEPROMs, 8K byte RAM, 16-bit programmable timers (PWM), serial interface, watchdog timer, stopwatch timer, an LCD driver that can drive a maximum 96 segments x 32 commons and a supply voltage detection circuit.

This microcomputer features low-voltage (1.8V) and high-speed (8.2 MHz) operations as well as low-current consumption (2.5 µA in HALT mode).

Furthermore, the S1C8F626 allows the user to program (erase, program, verify) the internal ROM even if it is mounted on the target board. The S1C8F626 Flash EEPROM can be used for storing a 11 x 12-dot kanji font data that contains JIS level-1 and level-2 kanji sets, other characters and user defined characters, this makes it possible to display kanji characters without any external kanji font ROM.

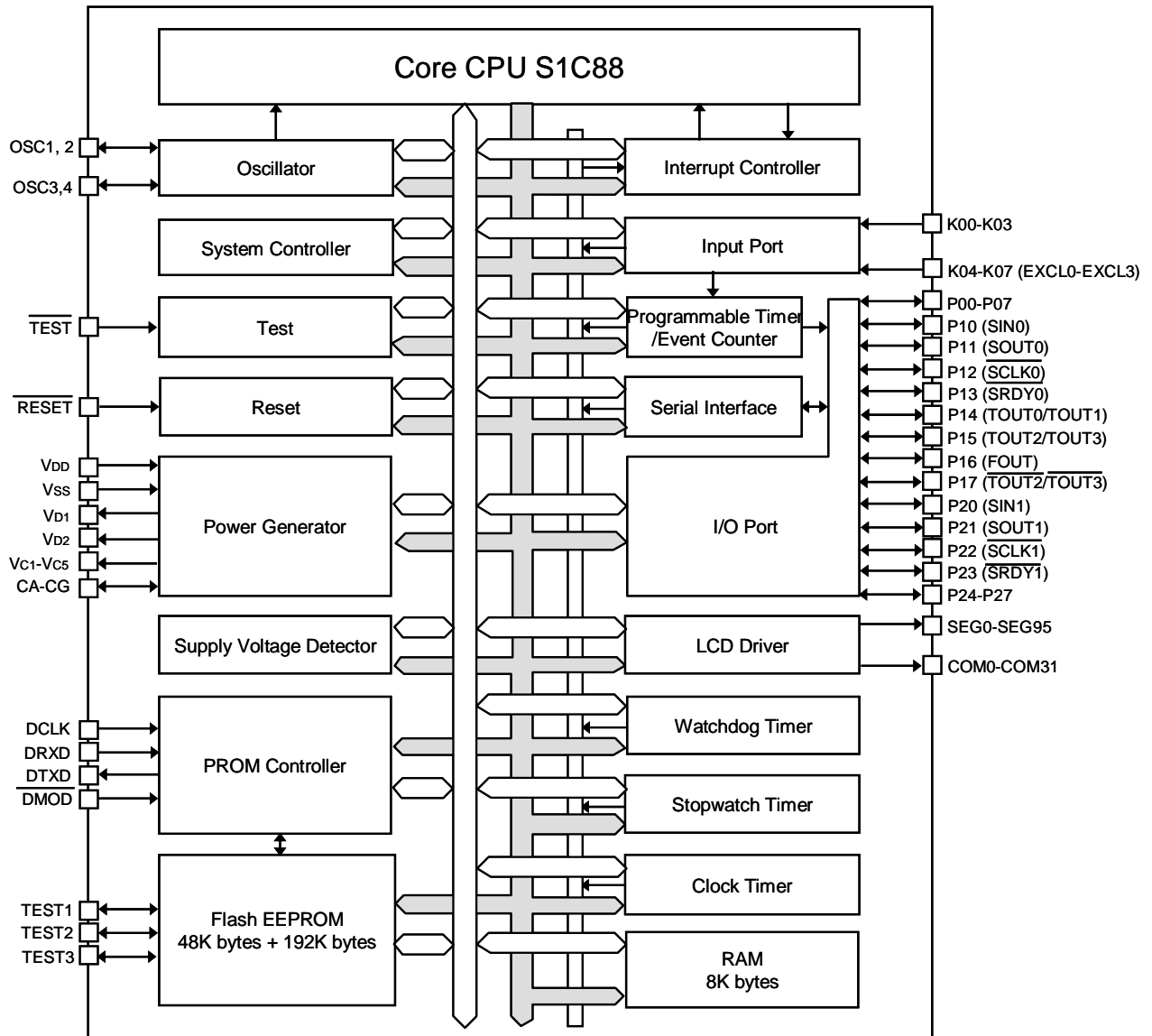The S1C8F626 is suitable for various battery driven controllers.

■ FEATURES

Core CPU	S1C88 (MODEL3) CMOS 8-bit core CPU
Main (OSC3) oscillation circuit	Crystal oscillation circuit/ceramic oscillation circuit 8.2 MHz (Max.), or CR oscillation circuit 2.2 MHz (Max.)
Sub (OSC1) oscillation circuit	Crystal oscillation circuit 32.768 kHz (Typ.)
Instruction set	608 types (usable for multiplication and division instructions)
Min. instruction execution time	0.244 µsec/8.2 MHz (2 clock)
Internal ROM capacity (Flash EEPROM)	48K bytes: Program ROM 192K bytes: Program and data (font) ROM Can be programmed using the On Board Writer. (Supports various security settings.) Supports self-programming by the user program.
Internal RAM capacity	8K bytes: RAM 576 bytes: Display memory (4608 bits/display area x 2)
Input port	8 bits (4 bits can be used as the source clock inputs for PWM timers.)
I/O port	24 bits (Shared with serial interface, FOUT and TOUT terminals.)
Serial interface	2ch (Supports clock synchronous system, asynchronous system and IrDA 1.0 interface.)
Timer	Programmable timer: 16 bits (8 bits x 2) 4 ch (with PWM function) Clock timer: 1ch Stopwatch timer: 1ch
LCD driver	Dot matrix type (supports 16 x 16/5x8 or 12 x 12 dot font) 96 segments x 32, 16 or 8 commons (1/5 bias) Built-in LCD power supply circuit (booster type, 5 potentials)
Watchdog timer	Built-in
Supply voltage detection (SVD) circuit	13 value programmable (1.8-2.7 V)
Interrupt	External interrupt: Input interrupt 1 systems (8 types) Internal interrupt: Timer interrupt 6 systems (23 types) Serial interface interrupt 2 system (6 types)
Supply voltage	1.8-3.6 V (for running, internal operating voltage V_{D1}=1.8V) 2.7-3.6 V (for Flash programming, internal operating voltage V_{D1}=2.5V)

Current consumption	SLEEP mode: 1 µA (Typ.)
	HALT mode: 2.5 µA (Typ.) 32 kHz crystal, LCD OFF
	    7.5 µA (Typ.) 32k Hz crystal, LCD ON*, V_{DD}=2.5-3.6V
	Run state: 10 µA (Typ.) 32kHz crystal, LCD OFF
	    1.8 mA (Typ.) 8MHz ceramic, LCD OFF
	    700 µA (Typ.) 2MHz CR, LCD OFF
	    15 µA (Typ.) 32 kHz crystal, LCD ON*, V_{DD}=2.5-3.6V

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	28 μA (Typ.) 32 kHz crystal, LCD ON*, V_{DD}=1.8-2.5V, Power voltage booster ON 15 μA (Typ.) 32 kHz crystal, SVD ON
Supply form	Chip, VFBGA10H-240pin or QFP21-216pin package

* The current consumption with LCD ON listed above is the value under the conditions of LCDCx = "11 (all on)", LCx = "0FH" and "No panel load". Current consumption increases according to the display contents and panel load.

Seiko Epson Corporation

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■ BLOCK DIAGRAM

Core CPU S1C88

OSC1, 2 — Oscillator
OSC3,4

System Controller

$\overline{TEST}$ — Test

$\overline{RESET}$ — Reset

VDD, VSS, VD1, VD2, VC1-VC5, CA-CG — Power Generator

Supply Voltage Detector

DCLK, DRXD, DTXD, DMOD — PROM Controller

TEST1, TEST2, TEST3 — Flash EEPROM 48K bytes + 192K bytes

Interrupt Controller

Input Port — K00-K03, K04-K07 (EXCL0-EXCL3)

Programmable Timer /Event Counter

Serial Interface

I/O Port:
- P00-P07
- P10 (SIN0)
- P11 (SOUT0)
- P12 ($\overline{SCLK0}$)
- P13 ($\overline{SRDY0}$)
- P14 (TOUT0/TOUT1)
- P15 (TOUT2/TOUT3)
- P16 ($\overline{FOUT}$)
- P17 ($\overline{TOUT2/TOUT3}$)
- P20 (SIN1)
- P21 (SOUT1)
- P22 ($\overline{SCLK1}$)
- P23 ($\overline{SRDY1}$)
- P24-P27

LCD Driver — SEG0-SEG95, COM0-COM31

Watchdog Timer

Stopwatch Timer

Clock Timer

RAM 8K bytes