

# S1C60N16

## 4-bit Single Chip Microcomputer

- S1C6200B Core CPU
- Low Voltage and Low Power
- Built-in LCD Driver
- Built-in SVD (Supply Voltage Detector)

### ■ DESCRIPTION

The S1C60N16 Series is a single-chip microcomputer made up of the 4-bit core CPU S1C6200C, ROM (4,096 words × 12 bits), RAM (256 words × 4 bits), LCD driver, analog comparator, event counter, watchdog timer, and two types of time base counter. Because of its low-voltage operation and low power consumption, this series is ideal for a wide range of battery-driven applications. It is especially suitable for various controller applications such as a clock, game and pager.

### ■ CONFIGURATION

The S1C60N16 Series is configured as follows, depending on supply voltage and oscillation circuits.

Model	S1C60N16	S1C60L16	S1C60A16
Supply voltage	3.0V	1.5V	3.0V
Oscillation circuit	OSC1 only (Single clock)		OSC1 and OSC3 (Twin clock)
LCD power supply	Supports 3.0 V LCD panels		

### ■ FEATURES

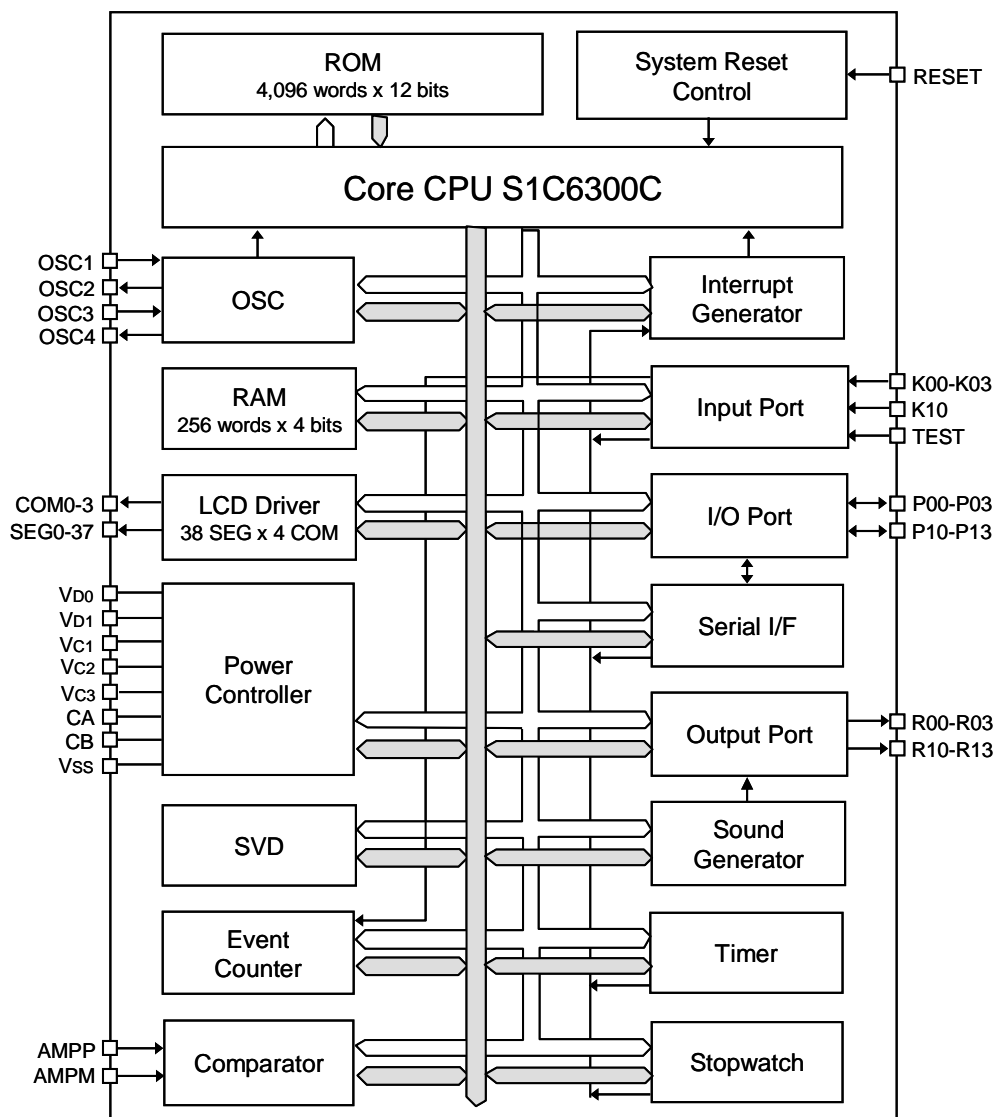
The main features of the S1C60N16/L16/A16 are listed below.

Model	S1C60N16	S1C60L16	S1C60A16
OSC1 oscillation circuit	Crystal oscillation circuit 32.768 kHz (Typ.)		
OSC3 oscillation circuit	-		CR or ceramic oscillation circuit (selected by mask option) 1 MHz (Typ.)
Instruction set	108 types		
Instruction execution time (differs depending on instruction) (CLK: CPU operation frequency)	153μsec, 214μsec, 366μsec (CLK=32.768kHz)		
ROM capacity	4,096 words × 12 bits		
RAM capacity	256 words × 4 bits		
Input ports	5 bits (pull-down resistor can be added by mask option)		
Output ports	8 bits (BZ, BZ, FOUT and SIOF outputs are available by mask option)		
I/O ports	8 bits (pull-down resistor is added during input data read-out) (3 bits can be configured as serial I/O ports by mask option)		
Serial interface	1 port (8-bit clock synchronous system)		
LCD driver	38 segments × 4, 3, or 2 commons (selected by mask option) V-3 V 1/4, 1/3 or 1/2 duty (voltage regulator and booster circuits built-in)		
Time base counter	Two types (timer and stopwatch)		
Watchdog timer	Built-in (can be disabled by mask option)		
Event counter	Two 8-bit inputs (dial input evaluation or independent)		
Sound generator	Programmable in 8 sounds (8 frequencies) Digital envelope built-in (can be disabled by mask option)		
Analog comparator	Inverted input × 1, non-inverted input × 1		
Supply voltage detection (SVD)	2.2V	1.2V	2.2V
Heavy load protection function	Not implemented		Implemented
External interrupt	Input interrupt: 2 systems		
Internal interrupt	Time base counter interrupt: 2 systems Serial interface interrupt: 1 system		
Supply voltage	3.0V(2.2~3.6V)	1.5V(1.2~1.8V)	3.0V(2.2~3.6V)
Current	CLK=32.768kHz 0.7μA	0.7μA	1.5μA

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consumption (Typ. value)	(when halted)			(Normal operation mode)
	CLK=32.768kHz (when executed)	1.4μA	1.4μA	2.4μA (Normal operation mode)
	CLK=1MHz (ceramic) (when executed)	–	–	50μA (Normal operation mode)
	CLK=1MHz(CR) (when executed)	–	–	85μA (Normal operation mode)
Form when shipped		QFP14-80pin or chip		

## ■ BLOCK DIAGRAM



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