

## 4-bit Single Chip Microcomputer

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

### ■ DESCRIPTION

The S1C63616 is a microcomputer which has a 4-bit CPU S1C63000 as the core CPU, ROM (16,384 words × 13 bits), RAM (2,048 words × 4 bits), multiply-divide circuit, serial interface, watchdog timer, programmable timer, time base counters (2 systems), a dot matrix LCD driver that can drive a maximum 1,280 dots of LCD panel, and an R/f converter that can measure temperature and humidity using sensors such as a thermistor. The S1C63616 features low current consumption, this makes it suitable for battery driven clocks and watches with temperature and humidity measurement functions.

### ■ FEATURES

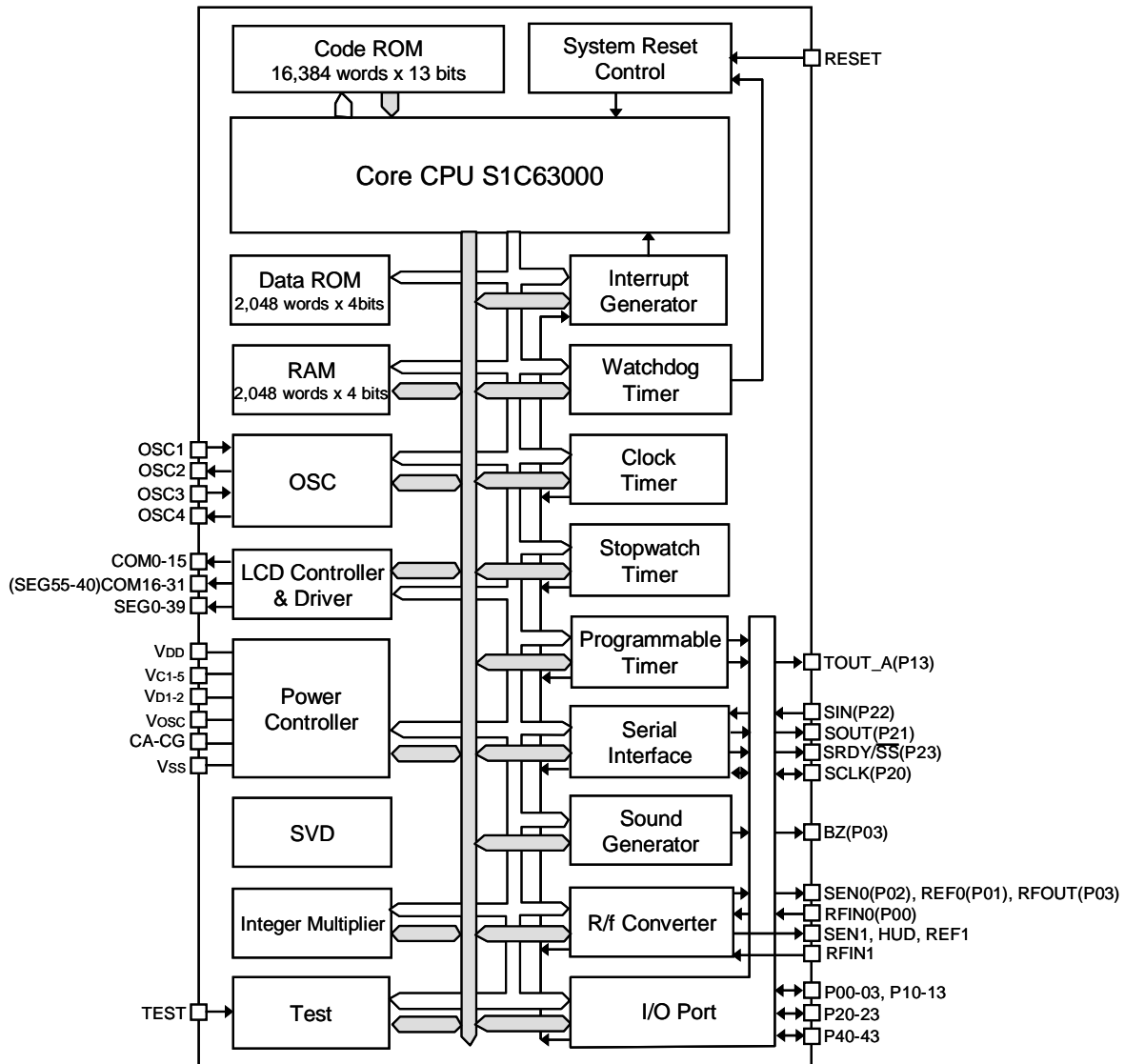
OSC1 oscillation circuit	32.768 kHz (Typ.) crystal oscillation circuit
OSC3 oscillation circuit	4.2 MHz (Max.) ceramic or 1.8 MHz (Typ.) CR oscillation circuit (*1)
Instruction set	Basic instruction: 47 types (411 instructions with all) Addressing mode: 8 types
Instruction execution time	During operation 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: 16,384 words × 13 bits Data ROM: 2,048 words × 4 bits
RAM capacity	Data memory: 2,048 words × 4 bits Display memory: 2,048 bits
I/O port	16 bits (pull-down resistors may be incorporated*1 Shared with 4 serial I/F I/O pins, 4 R/f converter I/O pins, and 3 special output pins *2)
Serial interface	1 port (8-bit clock synchronous system)
LCD driver	40 segments × 32 commons, 48 segments × 24 commons, or 56 segments × 16 commons (*2)
Time base counter	Clock timer Stopwatch timer (1/1000 sec, with direct key input function)
Programmable timer	16-bit timer × 4 ch. (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 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
Supply voltage detection (SVD) circuit	Programmable 16 detection voltage levels (*2)
External interrupt	Key input interrupt: 8 systems
Internal interrupt	Clock timer interrupt: 8 systems Stopwatch timer interrupt: 4 systems Programmable timer interrupt: 16 systems Serial interface interrupt: 1 system R/f converter interrupt: 3 systems
Power supply voltage	1.6 to 5.5 V
Operating temperature range	-40 to 85°C
Current consumption (Typ.)	During SLEEP (32 kHz) 0.08 μA During HALT (32 kHz) 0.6 μA During running (32 kHz) 2.5 μA During running (4 MHz) 320 μA
Shipment form	TQFP15-128pin or die form

\*1: Can be selected with mask option

\*2: Can be selected with software

# S1C63616

## ■ BLOCK DIAGRAM



### NOTICE:

No part of this material may be reproduced or duplicated in any form or by any means without the written permission of Seiko Epson. Seiko Epson reserves the right to make changes to this material without notice. Seiko Epson does not assume any liability of any kind arising out of any inaccuracies contained in this material or due to its application or use in any product or circuit and, further, there is no representation that this material is applicable to products requiring high level reliability, such as, medical products. Moreover, no license to any intellectual property rights is granted by implication or otherwise, and there is no representation or warranty that anything made in accordance with this material will be free from any patent or copyright infringement of a third party. This material or portions thereof may contain technology or the subject relating to strategic products under the control of the Foreign Exchange and Foreign Trade Law of Japan and may require an export license from the Ministry of Economy, Trade and Industry or other approval from another government agency.

All brands or product names mentioned herein are trademarks and/or registered trademarks of their respective companies.

©Seiko Epson Corporation 2012, All rights reserved

**SEIKO EPSON CORPORATION**

EPSON semiconductor website

**MICRODEVICES OPERATIONS DIVISION**

[http://www.epson.jp/device/semicon\\_e/](http://www.epson.jp/device/semicon_e/)

**Device Sales & Marketing Department**

421-8 Hino, Hino-shi, Tokyo 191-8501, JAPAN  
Phone: +81-42-587-5814 FAX: +81-42-587-5117

Document code: 412299000

First issue February, 2012 in Japan