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S3F8S19/15 Product Brief

PB024905-1013

Microcontrollers

From Zilog's New S3 Family of Microcontrollers: the S3F8S19/15 8-Bit MCUs

Overview

The S3F8S19 and S3F8S15 MCUs are 48-pin members of Zilog's S3 Family of MCUs, and offer a fast and efficient Z8 compatible CPU, 32 KB or 16 KB of Flash memory, and a wide range of integrated peripherals. The S3 Family CPU features an efficient register-oriented architecture and a sophisticated interrupt controller that allow for fast context switching. Flash memory is CPU-programmable and offers a 128-byte sector size. The internal oscillator is switchable between 8 MHz, 4 MHz, 1 MHz, and 0.5 MHz for low-power applications. Four 16-bit timers with PWM and pulse generation make these devices ideal for controlling load power in heating, motor control, and home appliance applications. The timers in these MCUs can also be configured for carrier generation in IR remote control applications, while the on-chip LCD controller provides low-power display control.

ADVANTAGES

- Multiple 16 PWM timers with pulse and carrier generation
- 2 UARTs, SPI and I^2C to cover all serial communication requirements
- LCD controller for low-power display capabilities
- 10 bit ADC for temperature, current or voltage measurement
- Small Flash sector size allows Flash to be used as EEPROM
- Programmable Low Voltage Reset ensure stable system operation

APPLICATIONS

- Vending Machines
- IR Remote Controls with LCD
- Home Appliances:
  - Induction Heaters
  - Air Conditioners
  - Washing Machines
  - Dryer Controller
  - Oven Controller

Features

- SAM88 Z8-Compatible CPU Core
- Flash Memory
  - 32 KB internal Flash program memory (S3F8S19)
  - 16 KB internal Flash program memory (S3F8S15)
    - Sector size: 128 bytes
    - CPU programmable with LDC instruction
    - Fast 25 µs byte programming time
    - Endurance: 10,000 erase/program cycles
    - 10 years data retention
- RAM
  - 2,086 bytes general-purpose register RAM area (including LCD)
- Instruction Set
  - 78 CISC instructions
  - Idle and Stop instructions for power-down modes
  - LDC for reading and writing Flash memory
- Interrupts
  - 26 interrupt sources with 8 programmable priorities
- General-Purpose I/O
  - 40 programmable GPIO pins
  - Bit-programmable ports
  - Programmable pull-up on ports 1 and 2
- LCD Controller
  - 6 common and 16 segment pins
  - LCD bias voltage generator
- Clock Sources
  - Internal oscillator: 8 MHz, 4 MHz, 1 MHz or 0.5 MHz
  - External RC oscillator: 4 MHz max. (capacitor is integrated on chip)
  - External crystal oscillator: 12 MHz max.
  - Low power ring oscillator: 32 kHz

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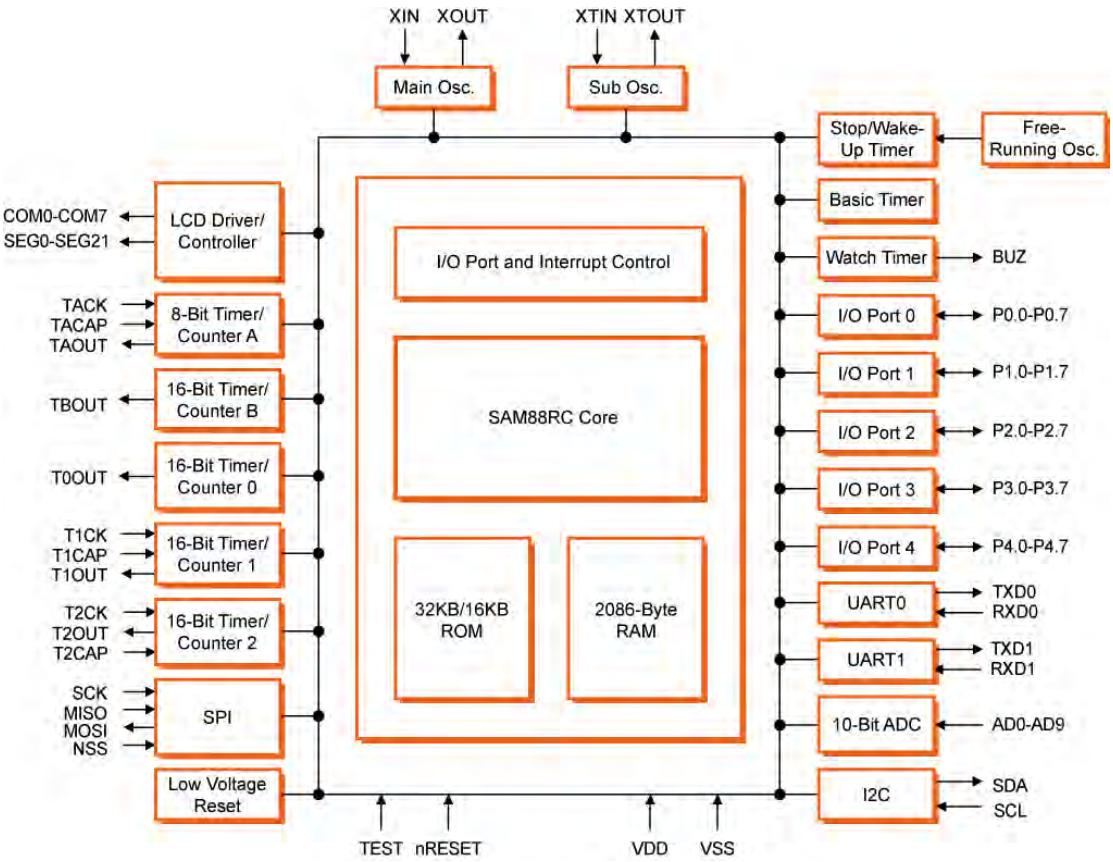
Features (continued)

- Timers
  - One 8-bit timer for watchdog or periodic interrupt generation
  - One 8-bit timer with input capture
  - Three 16-bit timers with PWM capability
  - One 16-bit timer with PWM, pulse, and carrier detect capability
  - Low-power wake-up timer
- Communications
  - Full-duplex SPI
  - Master/slave I²C
  - 2 full-duplex UARTs with independent BRGs
  - Programmable Low Voltage Reset controller (LVR)
    - 1.9V, 2.3 V, 3.0 V and 3.9V
  - Programmable Low Voltage Detector (LVD)
    - 2.1V, 2.5 V, 3.2 V and 4.1V
- Analog Peripherals
  - 10-bit SAR A/D converter
    - 10 analog inputs

Block Diagram



S3F8S19/15 Block Diagram

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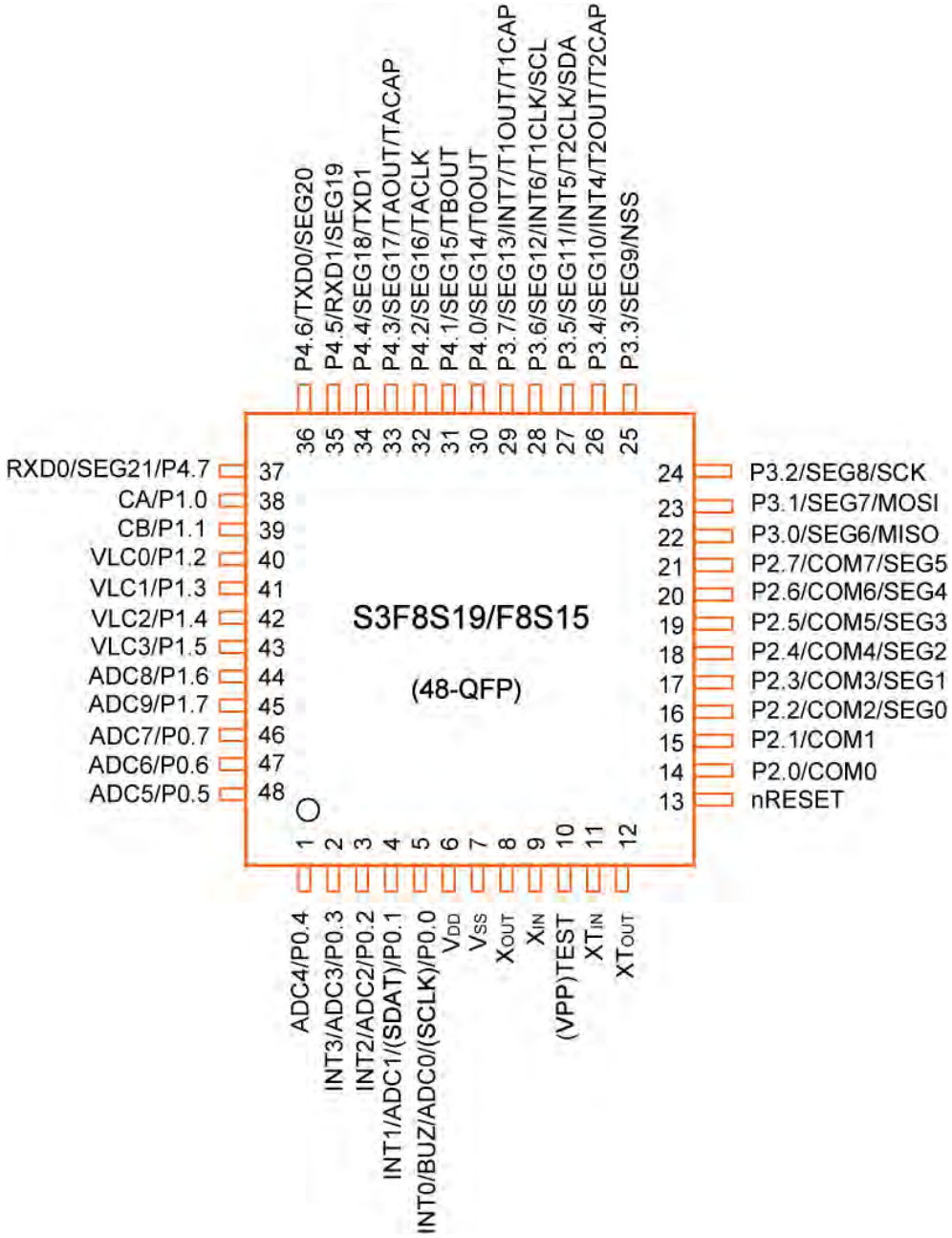
Pin Signals



S3F8S19/15 48-Pin QFP Packages

Operating Characteristics

- Operating Voltage Range
  - 1.8V to 5.5V up to 4 MHz (LVR disabled)
  - 2.7V to 5.5V up to 12 MHz
- Operating Temperature Range: –40°C to 85°C

Development Tools

A complete line of development tools are available for Zilog's S3 Microcontroller Family. The development environment is composed of your application board, a target board, an emulator, and a host PC running the IDE. Production programmers are also available from third party sources. Zilog's in-circuit emulator solution provides a wide range of capabilities and prices to suite most budgets and system complexities.

In-Circuit Emulators that support the S3 Family

- OpenICE-i500
- OpenICE-i2000
- SmartKit SK-1200

Target Boards for the S3F8S19 and S3F8S15 MCUs

- TB8S19, TB8S28 and TB8S39

Programmers

- SPW-uni: single-device programmer
- GW-uni: 8-device gang programmer
- AS-pro

Development Tools Suppliers

Please contact your local Zilog Sales Office, or contact your Third Party Tools supplier directly.

Ordering Information

Order your S3 Family parts from your local Zilog distributor using the part numbers listed below. For more information, or to download product collateral and software, please visit us at www.zilog.com.

Part Number	Package Type	Flash Program Memory	GPIO
S3F8S15XZZ-C0C5	48-Pin QFP	16 KB	40
S3F8S15XZZ-QR85	48-Pin QFP	16 KB	40
S3F8S19XZZ-C0C9	48-Pin QFP	32 KB	40
S3F8S19XZZ-LR89	48-Pin QFP	32 KB	40
S3F8S19XZZ-QR89	48-Pin QFP	32 KB	40
S3F8S19XZZ-TB89	48-Pin QFP	32 KB	40

Warning: DO NOT USE THIS PRODUCT IN LIFE SUPPORT SYSTEMS.

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As used herein

Life support devices or systems are devices which (a) are intended for surgical implant into the body, or (b) support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in a significant injury to the user. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

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ENGINEERING NOTES