



# FlashFlex<sup>®</sup> Microcontrollers

SST89x RD Series

SST89x RC Series

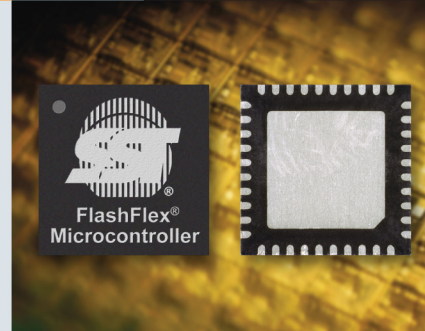
Product Brief

February 2008

## Product Description

The FlashFlex family of 8-bit microcontroller products is designed and manufactured with SST's patented and proprietary SuperFlash<sup>®</sup> CMOS semiconductor process technology. The products use the 8051 instruction set and are pin-to-pin compatible with standard 8051 microcontroller devices.

The devices are designed to be programmable with in-system and in-application on the printed circuit board for maximum flexibility. The devices are pre-programmed with a basic bootstrap loader in the memory, demonstrating the initial user program code loading or subsequent user code updating via the In-Application Programming (IAP) operation.



## Key Features

- 8-bit 8051-compatible microcontrollers with embedded SuperFlash memory
- 512 Byte/1024 Byte RAM
- 9/17/24/34/40/72 KByte embedded SuperFlash
- Individual block/page security lock
- In-System Programming (ISP)
- In-Application Programming (IAP)
- Dual-block SuperFlash for RD Series
- Single-block SuperFlash for RC Series
- Small sector architecture: 128-byte sector size
- Low power modes
  - Idle mode
  - Power-down mode with external wake-up
- Eight to ten interrupt sources with four levels of priority
- 6-clock mode option
- Three high-current drive pins for LEDs
- Serial interfaces: enhanced UART, enhanced SMBus, and SPI

- 36 I/O pins\*
- Three 16-bit timer/counters
- Watchdog Timer (WDT)
- Programmable Counter Array (PCA)\*\*
- Temperature ranges: 0° C to +70° C and -40° C to +85° C
- Reduced EMI mode
- Brown-out detection\*\*\*
- 3V, 5V or wide voltage (3-5V) operations
- PDIP-40, WQFN-40, PLCC-44 and TQFP-44 packages
- Provided example Bootstrap Loader (BSL)\*\*\*

\* For RD Series, PDIP and WQFN packages have 32 I/O pins

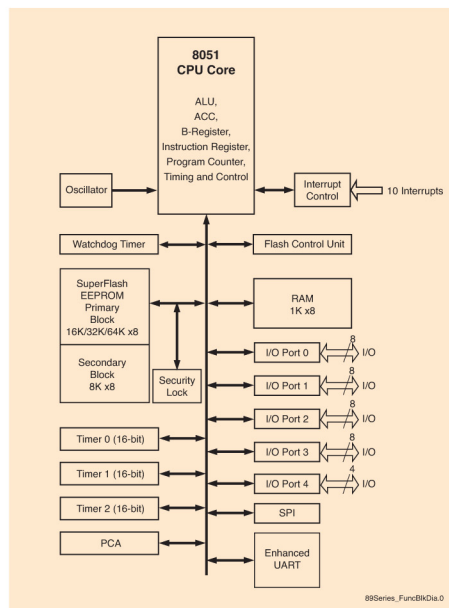
\*\* For RD Series only

\*\*\* An example BSL is pre-programmed in the memory for demonstrating initial user program code loading or subsequent user code updating via the IAP operation.



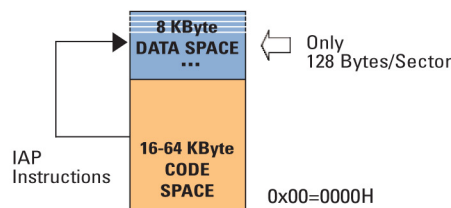
The in-system and in-application programmable Series 89 FlashFlex microcontroller provides maximum flexibility for applications like HDTVs and other electrical instruments.

## Functional Block Diagram (RD Series)

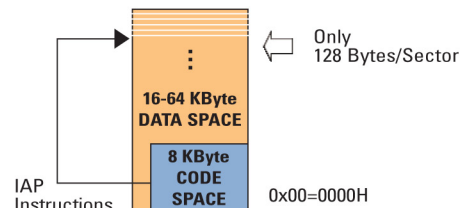


## Application Examples using Dual-Block Architecture

Application 1: Using 8 KByte as Data Space



Application 2: Using 8-64 KByte as Data Space



## Applications

- HDMI (High Definition Multimedia Interface)
- POS/cash registers
- Financial devices
- TVs, HDTVs
- Audio/video amplifiers
- Home appliances
- Industrial instruments
- Communication devices
- Networking equipment

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[www.SuperFlash.com](http://www.SuperFlash.com)

### RC Series: Single-Block SuperFlash

Device	Operating Voltage	Max Clock Speed (MHz)	Flash Memory		RAM	Serial Interface		WDT	ISP & IAP	DPTR	Interrupt Sources (Levels)	Security		Reduced EMI	I/O Pins <sup>3</sup>	Packages
			Main Partition	2nd Partition		UART <sup>1</sup>	SMBus <sup>2</sup>					Chip Lock	Page Lock			
SST89E52RC	4.5-5.5V	33	8 KB	1 KB	512 B	1ch+	-	√	√	2	8(4)	√	√	√	32	PDIP-40, PLCC-44
SST89E54RC	4.5-5.5V	33	16 KB	1 KB	512 B	1ch+	-	√	√	2	8(4)	√	√	√	32	PDIP-40, PLCC-44
SST89C58RC	2.7-5.5V	40	32 KB	2 KB	1 KB	1ch+	2ch+	√	√	2	9(4)	√	√	√	32	WQFN-40, PLCC-44, TQFP-44

### \*RD Series: Dual-Block SuperFlash

Device	Operating Voltage	Max Clock Speed (MHz)	Flash Memory		RAM	Serial Interfaces		PCA	WDT	BOD	ISP & IAP	DPTR	Interrupt Sources (Levels)	Security		Reduced EMI	I/O Pins <sup>3</sup>	Packages
			Main Block	2nd Block		UART <sup>1</sup>	SPI							Hard	Soft			
SST89E54RDA	4.5-5.5V	40	16 KB	8 KB	1 KB	1ch+	√	5ch	√	√	√	2	10(4)	√	√	√	32+4	PDIP-40, PLCC-44, TQFP-44
SST89E58RDA	4.5-5.5V	40	32 KB	8 KB	1 KB	1ch+	√	5ch	√	√	√	2	10(4)	√	√	√	32+4	PDIP-40, PLCC-44, TQFP-44
SST89E516RD	4.5-5.5V	40	64 KB	8 KB	1 KB	1ch+	√	5ch	√	√	√	2	10(4)	√	√	√	32+4	WQFN-40, PDIP-40, PLCC-44, TQFP-44
SST89V54RD	2.7-3.6V	33	16 KB	8 KB	1 KB	1ch+	√	5ch	√	√	√	2	10(4)	√	√	√	32+4	PDIP-40, PLCC-44, TQFP-44
SST89V58RD	2.7-3.6V	33	32 KB	8 KB	1 KB	1ch+	√	5ch	√	√	√	2	10(4)	√	√	√	32+4	PDIP-40, PLCC-44, TQFP-44
SST89V516RD	2.7-3.6V	33	64 KB	8 KB	1 KB	1ch+	√	5ch	√	√	√	2	10(4)	√	√	√	32+4	PDIP-40, PLCC-44, TQFP-44

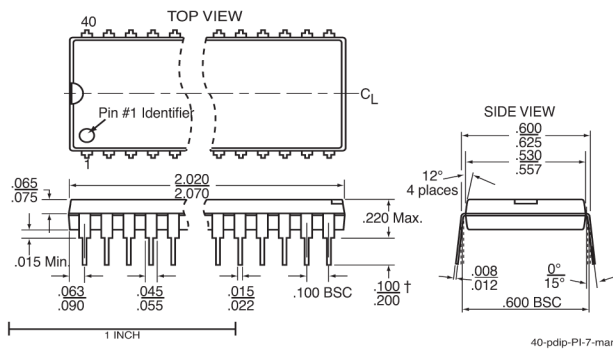
**Note 1:** Enhanced UART with Automatic Address Recognition (AAR) and Framing Error Detection Features

**Note 2:** Enhanced SMBus with high speed (up to 400Kbit per second)

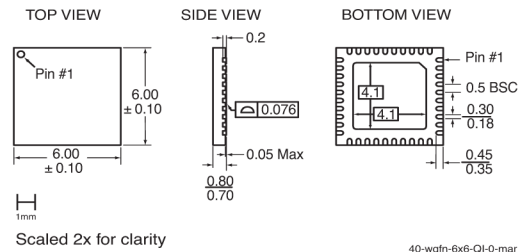
**Note 3:** Besides for four 8-bit I/O ports, an additional 4-bit port is provided in PLCC-44 and TQFP-44 packages only.

For PLCC-44 and TQFP-44 packages the part number suffix is RD2, it has Port 4 function and provides a total of ten interrupt sources, and the A in the part number designates the device as an enhanced version.

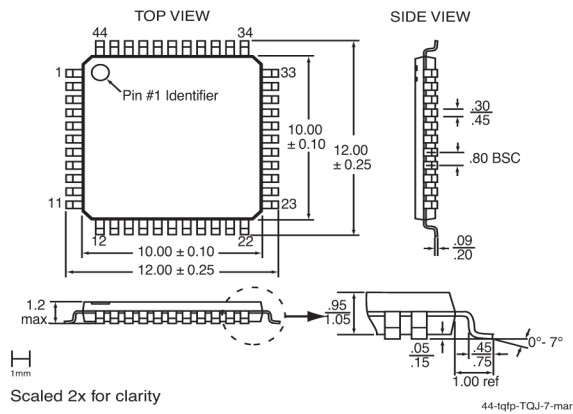
### PDIP-40 Package Diagram



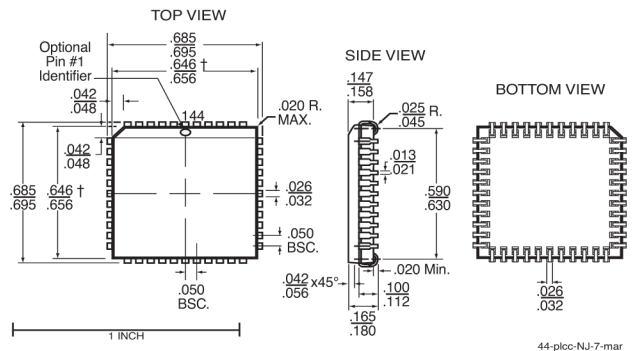
### WQFN-40 Package Diagram



### TQFP-44 Package Diagram



### PLCC-44 Package Diagram



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