

## 8-bit CMOS microcontroller families with FLASH program memory

89C52/54/58  
89C51RA+/RB+/RC+/RD+

### DESCRIPTION

Two different Single-Chip 8-Bit Microcontroller families are presented in this datasheet:

- 89C52/89C54/89C58
- 89C51RA+/89C51RB+/89C51RC+/89C51RD+

The 89C5X and 89C51RX+ families contain a non-volatile FLASH program memory (up to 64K bytes in the 89C51RD+) that is both parallel programmable and In-System Programmable. In-System Programming allows devices to alter their own program memory, in the actual end product, under software control. This opens up a range of applications that can include the ability to field update the application firmware.

Both families are Single-Chip 8-Bit Microcontrollers manufactured in advanced CMOS process and are derivatives of the 80C51 microcontroller family. All the devices have the same instruction set as the 80C51.

FLASH/ EPROM Memory Size (X by 8)	RAM Size (X by 8)	Programmable Timer Counter (PCA)	Hardware Watch Dog Timer
<b>89C52/54/58</b>			
8K/16K/32K	256	No	No
<b>89C51RA+/RB+/RC+</b>			
8K/16K/32K	512	Yes	Yes
<b>89C51RD+</b>			
64K	1024	Yes	Yes

The devices also have four 8-bit I/O ports, three 16-bit timer/event counters, a multi-source, four-priority-level, nested interrupt structure, an enhanced UART and on-chip oscillator and timing circuits. For systems that require extra memory capability up to 64k bytes, each can be expanded using standard TTL-compatible memories and logic.

The added features of the P89C51RX+ Family makes them even more powerful microcontrollers for applications that require pulse width modulation, high-speed I/O and up/down counting capabilities such as motor control.

### FEATURES

- 80C51 Central Processing Unit
- On-chip FLASH Program Memory
- Speed up to 33MHz
- Full static operation
- RAM expandable externally to 64K bytes
- 4 level priority interrupt
- 6 or 7 interrupt sources, depending on device
- Four 8-bit I/O ports
- Full-duplex enhanced UART
  - Framing error detection
  - Automatic address recognition
- Power control modes
  - Clock can be stopped and resumed
  - Idle mode
  - Power down mode
- Programmable clock out
- Second DPTR register
- Asynchronous port reset
- Low EMI (inhibit ALE)

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## 89C52/54/58 AND ORDERING INFORMATION

	MEMORY SIZE 8K × 8	MEMORY SIZE 16K × 8	MEMORY SIZE 32K × 8	TEMPERATURE RANGE °C AND PACKAGE	VOLTAGE RANGE	FREQ. (MHz)	DWG. #
FLASH	P89C52UBAA	P89C54UBAA	P89C58UBAA	0 to +70, Plastic Leaded Chip Carrier	5V	0 to 33	SOT187-2
FLASH	P89C52UBPN	P89C54UBPN	P89C58UBPN	0 to +70, Plastic Dual In-line Package	5V	0 to 33	SOT129-1
FLASH	P89C52UBBB	P89C54UBBB	P89C58UBBB	0 to +70, Plastic Quad Flat Pack	5V	0 to 33	SOT307-2
FLASH	P89C52UFAA	P89C54UFAA	P89C58UFAA	Plastic Leaded Chip Carrier	5V	0 to 33	SOT187-2
FLASH	P89C52UFPN	P89C54UFPN	P89C58UFPN	Plastic Dual In-line Package	5V	0 to 33	SOT129-1
FLASH	P89C52UFBB	P89C54UFBB	P89C58UFBB	Plastic Quad Flat Pack	5V	0 to 33	SOT307-2

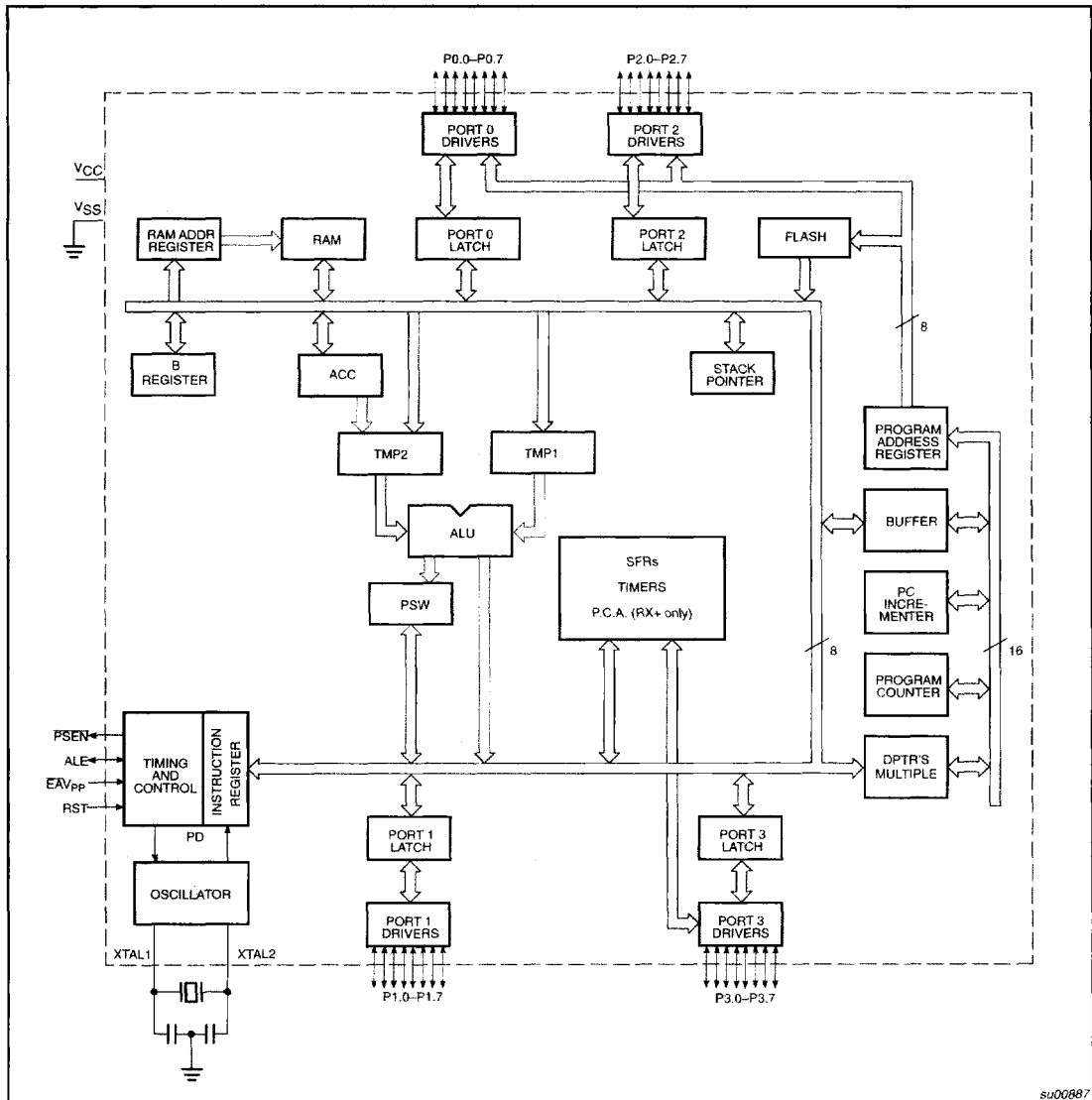
## 87C51RA+/RB+/RC+/RD+ ORDERING INFORMATION

	MEMORY SIZE 8K × 8	MEMORY SIZE 16K × 8	MEMORY SIZE 32K × 8	MEMORY SIZE 64K × 8	TEMPERATURE RANGE °C AND PACKAGE	VOLTAGE RANGE	FREQ. (MHz)	DWG. #
FLASH	P89C51RA+IN	P89C51RB+IN	P89C51RC+IN	P89C51RD+IN	0 to +70, 40-Pin Plastic Dual In-line Pkg.	5V	0 to 33	SOT129-1
FLASH	P89C51RA+IA	P89C51RB+IA	P89C51RC+IA	P89C51RD+IA	0 to +70, 44-Pin Plastic Leaded Chip Carrier	5V	0 to 33	SOT187-2
FLASH	P89C51RA+IB	P89C51RB+IB	P89C51RC+IB	P89C51RD+IB	0 to +70, 44-Pin Plastic Quad Flat Pack	5V	0 to 33	SOT307-2
FLASH	P89C51RA+JN	P89C51RB+JN	P89C51RC+JN	P89C51RD+JN	40-Pin Plastic Dual In-line Pkg.	5V	0 to 33	SOT129-1
FLASH	P89C51RA+JA	P89C51RB+JA	P89C51RC+JA	P89C51RD+JA	44-Pin Plastic Leaded Chip Carrier	5V	0 to 33	SOT187-2
FLASH	P89C51RA+JB	P89C51RB+JB	P89C51RC+JB	P89C51RD+JB	44-Pin Plastic Quad Flat Pack	5V	0 to 33	SOT307-2

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## BLOCK DIAGRAM



su00887