

8-bit microcontrollers

P89C738; P89C739

1 FEATURES

- 80C51 CPU
- 64 kbytes on-chip Multiple Programming ROM (MTP-ROM), expandable externally to 64 kbytes program memory address space
- 512 bytes on-chip RAM, expandable externally to 64 kbytes data memory address space
- P89C738 pin outs fully compatible to the standard 8051/8052
- 8-bit I/O ports for P89C738: 4 and P89C739: 6
- Full-duplex UART compatible with the standard 80C51 and the 8052
- Two standard 16-bit timers/event counters
- An additional 16-bit timer (functionally equivalent to the Timer 2 of the 8052)
- On-chip Watchdog Timer (T3)
- 6-source and 6-vector interrupt structure with 2 priority levels
- Up to 3 external interrupt request inputs
- Two programmable power reduction modes: Idle and Power-down
- Termination of Idle mode by any interrupt, external or Watchdog Timer reset
- Wake-up from Power-down by external interrupt, external or Watchdog Timer reset
- Packages,
 - P89C738: DIP40, PLCC44 and QFP44
 - P89C739: PLCC68 and QFP64
- Improved Electromagnetic Compatibility (EMC)

- Frequency range: 3.5 to 40 MHz
- ROM code protection

2 GENERAL DESCRIPTION

The P89C738 and P89C739 (hereafter generally referred to as P89C738 unless the P89C739 is specifically mentioned) are 8-bit microcontrollers manufactured in an advanced CMOS process and is a derivative of the PCB80C51 microcontroller family. This device provides architectural enhancements that make it applicable in a variety of applications in general control systems, especially in those systems which need a large on-chip ROM and RAM capacity.

The P89C738 contains a non-volatile 64 kbytes Multiple Programming ROM (MTP-ROM) program memory, a volatile 512 bytes read/write data memory, four 8-bit I/O ports (six for the P89C739), two 16-bit timer/event counters (identical to the timers of the 80C51), a 16-bit timer (identical to the Timer 2 of the 8052), a multi-source two-priority-level nested interrupt structure, one serial interface (UART), a Watchdog Timer (T3), an on-chip oscillator and timing circuits. For systems that require extra capability, the P89C738 can be expanded using standard TTL compatible memories and logic.

The device also functions as an arithmetic processor having facilities for both binary and BCD arithmetic plus bit-handling capabilities. The P89C738 has the same instruction set as the PCB80C51 which consists of over 100 instructions: 49 one-byte, 46 two-byte and 16 three-byte. With a 16 MHz crystal, 58% of the instructions are executed in 750 ns and 40% in 1.5 μ s. Multiply and divide instructions require 3 μ s.

3 ORDERING INFORMATION

TYPE NUMBER ⁽¹⁾	PACKAGE		
	NAME	DESCRIPTION	VERSION
P89C738ABA	PLCC44	plastic leaded chip carrier; 44 leads	note 2
P89C738ABP	DIP40	plastic dual in-line package; 40 leads (600 mil)	SOT129-1
P89C738BBB	QFP44	plastic quad flat package; 44 leads	note 2
P89C739ABA	PLCC68	plastic leaded chip carrier; 68 leads	note 2
P89C739ABB	QFP64	plastic quad flat package; 64 leads (lead length 1.95 mm); body 14 × 20 × 2.7 mm; high stand-off height	SOT319-1

Note

1. Temperature and frequency range for all types: 0 to 70 °C and 3.5 to 40 MHz.
2. For more information on the package outline of this version, please contact the Philips Semiconductors Sales office.

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4 BLOCK DIAGRAM

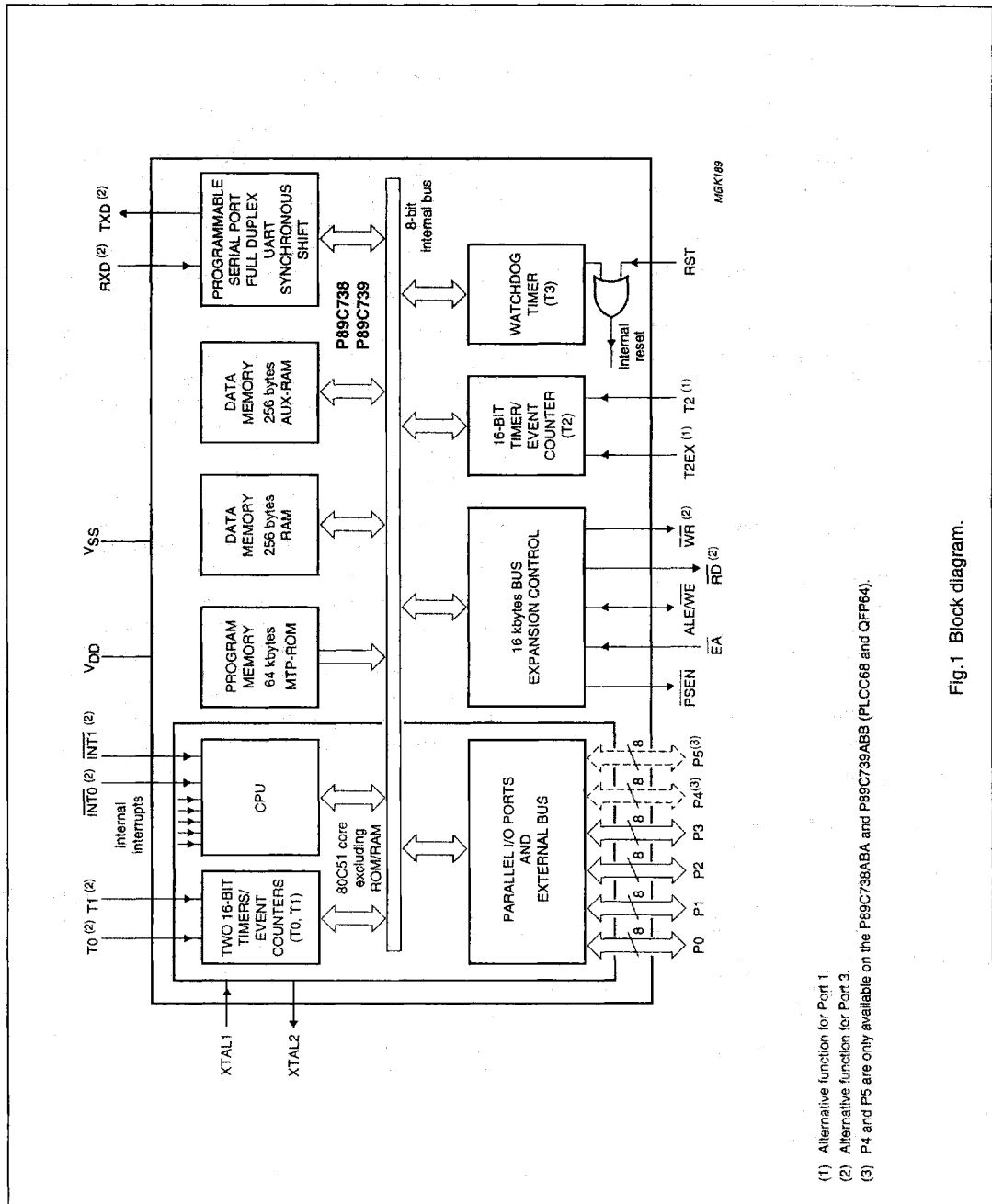


Fig. 1 Block diagram.

(1) Alternative function for Port 1.

(2) Alternative function for Port 3.

(3) P4 and P5 are only available on the P89C738ABA and P89C739ABB (PLCC68 and QFP64).