Date of Issue	September 6, 1990
Status	Product Specification
Application Specific Product	

80C851/83C851

T-49-19-03

CMOS single-chip 8-bit microcontroller with on-chip EEPROM

FOR DETAILED INFORMATION SEE THE LATEST ISSUE OF HANDBOOK IC20 OR DATASHEET

DESCRIPTION

The Philips 80C851/83C851 is a high-performance microcontroller fabricated with Philips high-density CMOS technology. The 80C851/83C851 has the same instruction set as the 80C51. The Philips CMOS technology combines the high speed and density characteristics of HMOS with the low power attributes of CMOS. The Philips epitaxial substrate minimizes latch-up sensitivity.

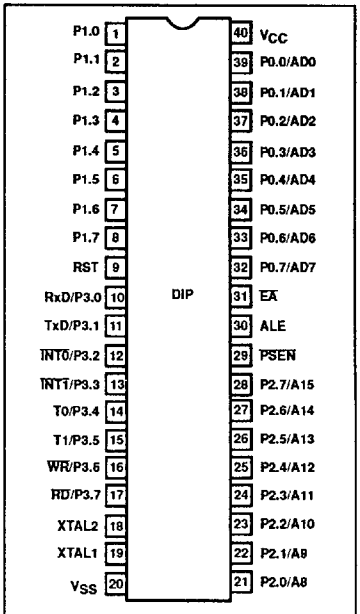
The 80C851/83C851 contains a 4k x 8 ROM with mask-programmable ROM code protection, a 128 x 8 RAM, 256 x 8 EEPROM, 32 I/O lines, two 16-bit counter/timers, a seven-source, five vector, two-priority level nested interrupt structure, a serial I/O port for either multi-processor communications, I/O expansion or full duplex UART, and on-chip oscillator and clock circuits.

In addition, the 80C851/83C851 has two software selectable modes of power reduction – idle mode and power-down mode. The idle mode freezes the CPU while allowing the RAM, timers, serial port, and interrupt system to continue functioning. The power-down mode saves the RAM and EEPROM contents but freezes the oscillator, causing all other chip functions to be inoperative.

FEATURES

- 80C51 based architecture
  - 4k x 8 ROM
  - 128 x 8 RAM
  - Two 16-bit counter/timers
  - Full duplex serial channel
  - Boolean processor
- Non-volatile 256 x 8-bit EEPROM (electrically erasable programmable read only memory)
  - On-chip voltage multiplier for erase/write
  - 10,000 erase/write cycles per byte
  - 10 years non-volatile data retention
  - Infinite number of read cycles
  - User selectable security mode
  - Block erase capability
- Mask-programmable ROM code protection
- Memory addressing capability
  - 64k ROM and 64k RAM
- Power control modes:
  - Idle mode
  - Power-down mode
- CMOS and TTL compatible
- 1.2 to 12MHz
- Two temperature ranges
- Three package styles

PIN CONFIGURATION



Pin	Function	Pin	Function	Pin	Function
1	NC	15	INT1/P3.3	30	P2.6/A14
2	P1.0	16	T0/P3.4	31	P2.7/A15
3	P1.1	17	T1/P3.5	32	PSEN
4	P1.2	18	WR/P3.6	33	ALE
5	P1.3	19	RD/P3.7	34	NC
6	P1.4	20	XTAL2	35	EA
7	P1.5	21	XTAL1	36	P0.7/AD7
8	P1.6	22	V_{SS}	37	P0.6/AD6
9	P1.7	23	NC	38	P0.5/AD5
10	RST	24	P2.0/A8	39	P0.4/AD4
11	RxD/P3.0	25	P2.1/A9	40	P0.3/AD3
12	NC	26	P2.2/A10	41	P0.2/AD2
13	TxD/P3.1	27	P2.3/A11	42	P0.1/AD1
14	INT0/P3.2	28	P2.4/A12	43	P0.0/AD0
		29	P2.5/A13	44	V_{CC}

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PART NUMBER SELECTION

PHILIPS		PHILIPS COMPONENTS-SIGNETICS		TEMPERATURE AND PACKAGE	FREQUENCY (MHz)
ROMless Version	ROM Version	ROMless Version	ROM Version		
PCB80C851P	PCB83C851P	S80C851-1N40	S83C851-1N40	0 to +70°C plastic DIP	1.2 to 12
PCB80C851WP	PCB83C851WP	S80C851-1A44	S83C851-1A44	0 to +70°C plastic LCC	1.2 to 12
PCB80C851H	PCB83C851H	S80C851-1B44	S83C851-1B44	0 to +70°C plastic QFP	1.2 to 12
PCF80C851P	PCF83C851P	S80C851-2N40	S83C851-2N40	–40 to +85°C plastic DIP	1.2 to 12
PCF80C851WP	PCF83C851WP	S80C851-2A44	S83C851-2A44	–40 to +85°C plastic LCC	1.2 to 12
PCF80C851H	PCF83C851H	S80C851-2B44	S83C851-2B44	–40 to +85°C plastic QFP	1.2 to 12

BLOCK DIAGRAM