CMOS SINGLE-CHIP 8-BIT MICROCONTROLLER WITH 4K BYTES OF EPROM MEMORY

The 87C51 is the EPROM version of the 80C51. Microcontroller fabricated with high-density CMOS technology. It contains 4K bytes of on chip Program memory that can be electrically programmed The 80C51 contains a 4k x 8 ROM , a 128 x 8 RAM , 32 I/O lines, two 16-bit counter/timers, a five-source, 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.

The device 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 contents but freezes the oscillator, causing all other chip functions to be inoperative.

FEATURES

8031/8051 compatible (MCS-51 family)

— 4K EPROM

— 128 x 8 RAM

— Two 16-bit counter/timers

— Full duplex serial channel

— Boolean processor

— Memory addressing capability

— 64k ROM and 64k RAM

— Power control modes:

— Idle mode

— Power-down mode

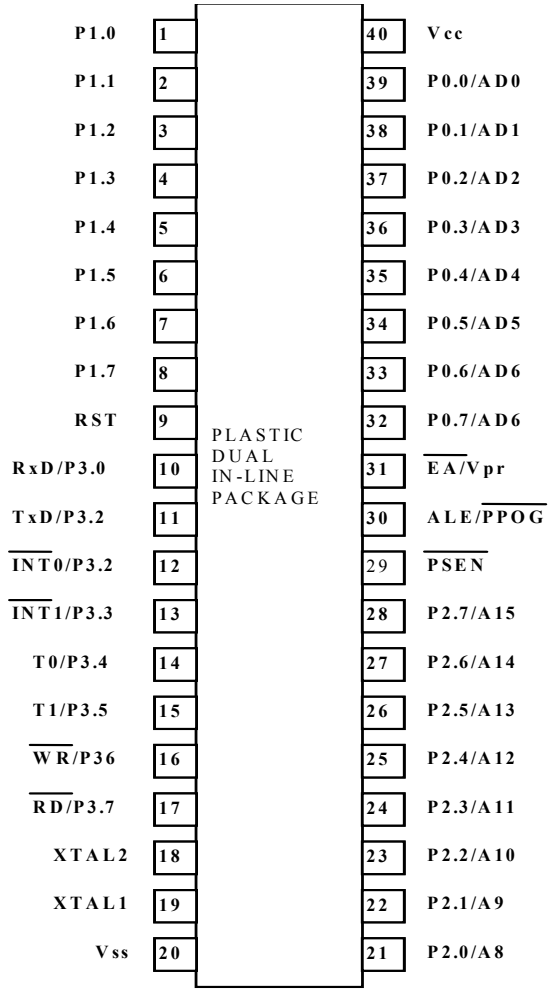
— CMOS and TTL compatible

— Two speed ranges at V_{CC}=5V

— 12 MHz

— 16 MHz

PIN CONFIGURATIONS



INTEGRAL

CMOS single-chip 8-bit microcontroller 87C51

DC ELECTRICAL CHARACTERISTICS FOR INTEGRAL DEVICES

T=-10 °C to + 70°C; Vcc= 5V ± 10%

	Parameter Symbol	Test conditions	Limits	
			Min	Max
Vcc			4,5	5,5
Icc	Supply current operating, mA	Vcc = 5,5 V Fclc = 12MHz	-	25
Icc1	Idle mode current, mA	Vcc = 5,5 V Fclc = 12MHz	-	4,0
Ipd	Pover-down current, mkA	2V≤Vpd≤Vcc max	-	50
	INPUTS:			
Vil	LOW level input voltage, V (exept EA)		-0,5	0.2Vcc-0,1
Vili	LOW level input voltage, V (for EA)		0	0.2Vcc-0,3
Vih	HIGH level input voltage, V (exept XTAL1, RST)		0,2Vcc +0,9	Vcc+0,5
Vih1	HIGH level input voltage, V (for XTAL1, RST)		0,7Vcc	Vcc+0,5
-Iil	Input current logic 1, mkA (Ports 1, 2 and 3)	Vi=0,45 V	-	-50
±Itl	Input current logic 1 to 0, mkA (Ports 1, 2 and 3)	Vi=2 V	-	-650
±Ili	Input leacage current, mkA (Port 0, EA)	0,45V≤Vi≤Vcc	-	10
	OUTPUTS:			
Vol	LOW level output voltage, V (Ports 1, 2 and 3)	Iol = 1,6 mA	-	0,45
Vol1	LOW level output voltage, V (Ports 0, ALE, PSEN)	Iol = 3,2 mA	-	0,45
Voh	HIGH level output voltage, V (Ports 1, 2 and 3)	-Ioh=60 mkA	2,4	-
		-Ioh=25 mkA	0,75Vcc	
		-Ioh=10 mkA	0,9Vcc	
Voh1	HIGH level output voltage, V (Ports 0, ALE, PSEN)	-Ioh=800 mkA	2,4	-
		-Ioh=300 mkA	0,75Vcc	
		-Ioh=80 mkA	0,9Vcc	
Rrst	RST pull-down resistor, kOm		50	300
Ci/0	I/O pin capasitance, pF	test frecuency=1MHz	-	10

AC ELECTRICAL CHARACTERISTICS FOR INTEGRAL DEVICES

T=-10 °C to + 70°C; Vcc= 5V ± 10%

Symbol	Parameter	Variable Oscillator		Unit
Fclc		Min	Max	
	Oscillator Frequency:			
	IN87C51N - 12	3,5	12	MHz
	IN87C51N - 16	3,5	16	MHz