Single-Chip 8-Bit Microcontroller

MAB84XX Family

DESCRIPTION

The MAB84XX family of microcontrollers is fabricated in NMOS. The instruction set is based on that of the 8048. The family consists of 8 devices:

- MAB/F 8400 – 128 RAM bytes, external program memory
- MAB/F 8401 – like 8400 but with 8-bit LED-driver (10mA), emulation of MAB/F 8422/42* possible
- MAB/F 8420 – 2K ROM/ 64 RAM bytes
- MAB/F 8440 – 4K ROM/128 RAM bytes
- MAB/F 8421 – 2K ROM/ 64 RAM bytes plus 8-bit LED-driver
- MAB/F 8441 – 4K ROM/128 RAM bytes plus 8-bit LED-driver
- MAB/F 8461 – 6K ROM/128 RAM bytes plus 8-bit LED-driver

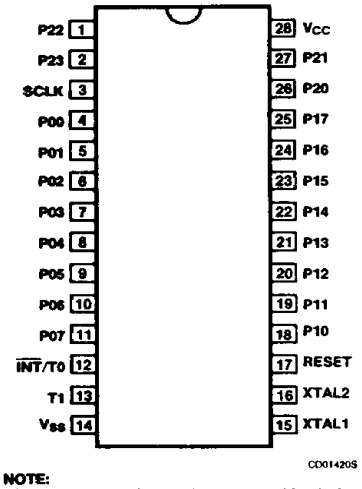
Each version has 20 quasi-bidirectional I/O port lines, one serial I/O line, one single-level vectored interrupt, an 8-bit timer event counter and on-board clock oscillator and clock circuits. Two 20-pin versions, MAB/F 8422 and MAB/F 8442 are also available.

This microcontroller family is designed to be an efficient controller as well as an arithmetic processor. The instruction set is based on that of the MAB8048. The microcontrollers have extensive bit handling abilities and facilities for both binary and BCD arithmetic.

FEATURES

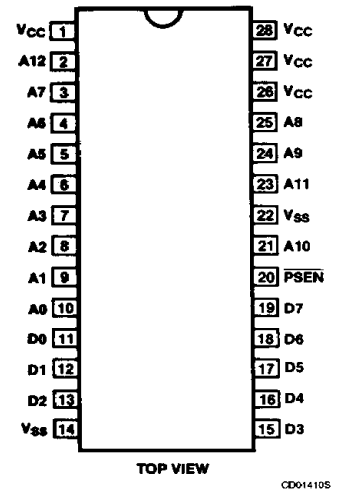
- **I^2C Compatible Serial I/O that can be used in single or multi-master systems (serial I/O data and clock via P23 and SCLK respectively)**
- **8-bit: CPU, ROM, RAM and I/O in a single 28-lead DIL package**
- **2K, 4K or 6K ROM bytes plus a ROM-less version**
- **64 or 128 RAM bytes**
- **20 quasi-bidirectional I/O port lines**
- **Two testable inputs: one of which can be used to detect zero cross-over; the other is also the external interrupt input**
- **Single level vectored interrupts: external, timer/event counter, serial I/O**
- **8-bit programmable timer/event counter**
- **Internal oscillator, generated with inductor, crystal, ceramic resonator or external source**
- **Over 80 instructions (based on SCN8048) all of 1 or 2 cycles**
- **Single 5V power supply (± 10%)**
- **Operating temperature range:**
  0 to +70°C MAB84XX family
  –40 to +85°C MAF84XX family
  –40 to +110°C MAF84AXX family

PIN CONFIGURATION



CD01420S

NOTE:
Pinning diagram for mask-programmable devices MAB8420, MAB8421, MAB8440, MAB8441, MAB8461 and for MAB8400 and MAB8401 'Piggy-back' version bottom pinning.



TOP VIEW

CD01410S

NOTE:
Pinning diagram for MAB8400/01B 'piggy-back' version top pinning to access a 2732 or 2764 EPROM. Access times for ROMS/EPROMS to be below 1μs.

5

ORDERING CODE

See SCN8400 series in Microprocessor Data Manual

PIN DESCRIPTION for Bottom Pinning

DESCRIPTION	PIN NUMBER	FUNCTION
V_{SS}	14	**Ground**
V_{CC}	28	**Power supply,** +5V
P00 – P07	4 – 11	**Port 0,** 8-bit quasi-bidirectional I/O port
P10 – P17	18 – 25	**Port 1,** 8-bit quasi-bidirectional I/O port
P20 – P23	26, 27, 1, 2	**Port 2,** 4-bit quasi-bidirectional I/O port; P23 is the serial data I/O in serial I/O mode
SCLK	3	Bidirectional clock for serial I/O
$\overline{INT}$/TO	12	External interrupt input (sensitive to a negative-going edge min LOW> > 7 clock pulse, min HIGH < 4 clock pulses), testable using the JTO or JNTO instructions.
T1	13	Input pin, testable using the JT1 or JNT1 instructions. It can be designated as event counter input using the STRT CNT instruction. It can also be used to detect zero cross-over of slowly moving A.C. inputs.
RESET	17	Input to initialize the processor (active HIGH).
XTAL1	15	Connection to timing component (crystal) that determines the frequency of the internal oscillator. It is also the input for an external clock source.
XTAL2	16	Connection to other side of the timing component.

PIN DESCRIPTION for Top Pinning

DESCRIPTION	PIN NUMBER	FUNCTION
V_{SS}	14, 22	**Ground**
V_{CC}	1, 26 – 28	**Power supply,** +5V
A0 – A12	10 – 3, 25, 24, 21, 23, 2	Address outputs
D0 – D7	11 – 13, 15 – 19	Data inputs
$\overline{PSEN}$	20	Program store enable

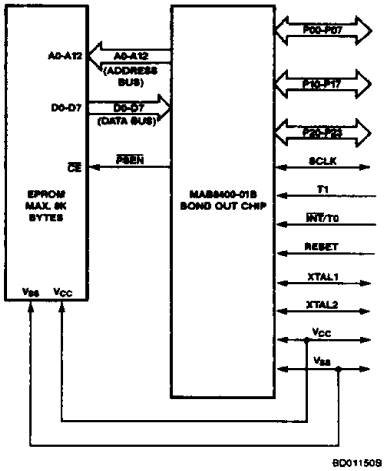
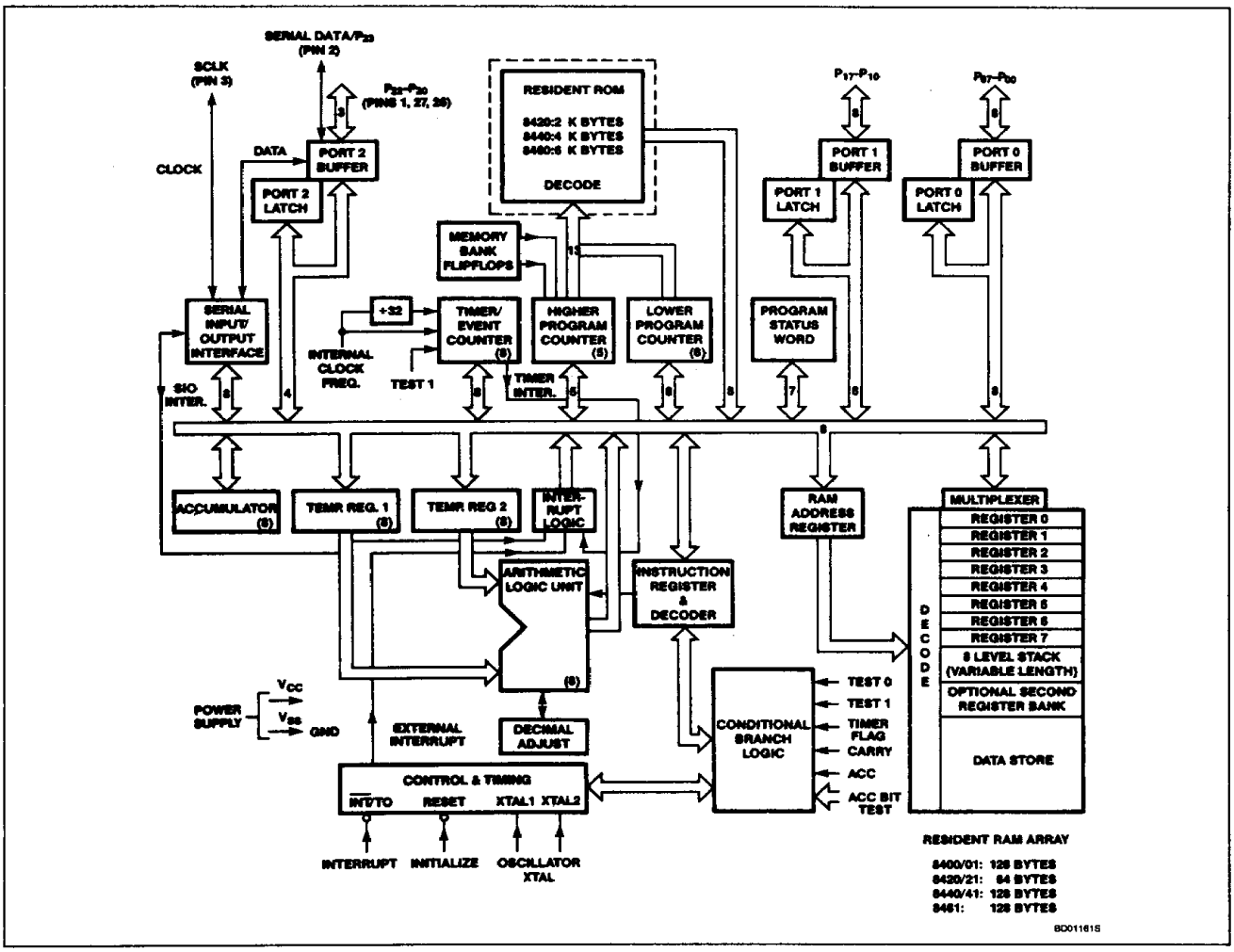


Figure 1. Connection of EPROM to 'Piggy-back' Package MAB8400/01B

BLOCK DIAGRAM



For additional information, consult the Applications Section and Signetics Microprocessor Data Manual