



January 23, 2003

Application Note 001

Programming Characteristics of QP SEMI Intel/Philips Compatible Microcontrollers based on 87C51 Architecture

QP SEMI manufactures a line of 87C51 based microcontroller devices that are functionally compatible and fully compliant to their associated slash sheets. These devices are compatible with devices made previously by Intel and Philips.

However, since QP SEMI is a small manufacturer, most EPROM programmer manufacturers have not listed our parts in their menus for setting up their EPROM programmers.

We have tested our devices on the following programmers:

Data I/O Unisite

EETools TopMax Universal Programmer (both single and 4-Gang Versions)

Advin Systems Pilot-MVP Universal Programmer (both single and 4-Gang Versions)

We are working directly with Data I/O and EETools to add our devices to their standard menus. But, until this is completed, there is an easy work around for our devices. See table I for Programming Instructions by device type.

If your programmer does not have PLCC/JLCC fixtures (programming sockets), one may be easily constructed using a 40 Pin DIP wire wrap socket and a 44 Pin PLCC Socket. Connect the pins from the PLCC Socket to the DIP wire wrap socket per Table III. Table II shows the relative locations of each pin for the two package types. Then select the programming instructions for the DIP Version of your product per Table I.

TABLE I

Select on EPROM Programmer Menu:

Military Part Number	Commercial Part Number	EPROM Array	Package Type	Device Manufacturer	Device Type	EPROM Programmer Package Type	Electronic ID	Continuity Check
5962-8768401MMA	87C51/BMA	4K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51	PLCC or JLCC	Off	Off
5962-8768401MQA	87C51/BQA	4K	40 Pin Dual Inline Package	Philips	87C51		Off	Off
5962-8768401MUA	87C51/BUA	4K	44 Pin Leadless Ceramic Chip Carrier	Philips	87C51	PLCC or JLCC	Off	Off
5962-8768402MMA	87C51-16/BMA	4K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51	PLCC or JLCC	Off	Off
5962-8768402MQA	87C51-16/BQA	4K	40 Pin Dual Inline Package	Philips	87C51		Off	Off
5962-8768402MUA	87C51-16/BUA	4K	44 Pin Leadless Ceramic Chip Carrier	Philips	87C51	PLCC or JLCC	Off	Off
5962-9056401MA	87C51RB/BMA	16K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9056401XA	87C51RB/BQA	16K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off
5962-9056402MA	87C51RB-16/BMA	16K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9056402XA	87C51RB-16/BQA	16K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off
5962-9157601MMA	87C52/BMA	8K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9157601MQA	87C52/BQA	8K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off
5962-9157602MMA	87C52-16/BMA	8K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9157602MQA	87C52-16/BQA	8K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off
5962-9157603MMA	87C52/BMA OTP	8K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9157603MQA	87C52/BQA OTP	8K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off
5962-9157604MMA	87C52-16/BMA OTP	8K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9157604MQA	87C52-16/BQA OTP	8K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off
5962-9169701MMA	87C51RC/BMA	32K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9169701MXA	87C51RC/BQA	32K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off
5962-9169702MMA	87C51RC-16/BMA	32K	44 Pin Leaded Ceramic Chip Carrier	Philips	87C51RC+	PLCC or JLCC	Off	Off
5962-9169702MXA	87C51RC-16/BQA	32K	40 Pin Dual Inline Package	Philips	87C51RC+		Off	Off

TABLE II

Package Configuration:

40 Lead Ceramic DIP & Sidebrazed DIP (Quartz window on erasable devices)	44 Lead JLCC (Quartz window on erasable devices)

TABLE III

40 Pin DIP		Fixture Wiring	44 Pin JLCC/PLCC	
Pin	Function		Pin	Function
				1 NC
1	P1.0	1 <-->	2	2 P1.0
2	P1.1	2 <-->	3	3 P1.1
3	P1.2	3 <-->	4	4 P1.2
4	P1.3	4 <-->	5	5 P1.3
5	P1.4	5 <-->	6	6 P1.4
6	P1.5	6 <-->	7	7 P1.5
7	P1.6	7 <-->	8	8 P1.6
8	P1.7	8 <-->	9	9 P1.7
9	RESET	9 <-->	10	10 RESET
10	(RXD)P3.0	10 <-->	11	11 (RXD)P3.0
				12 NC
11	(TXD)P3.1	11 <-->	13	13 (TXD)P3.1
12	(INT0)P3.2	12 <-->	14	14 (INT0)P3.2
13	(INT1)P3.3	13 <-->	15	15 (INT1)P3.3
14	(TO)P3.4	14 <-->	16	16 (TO)P3.4
15	(TI)P3.5	15 <-->	17	17 (T1)P3.5
16	(WR)P3.6	16 <-->	18	18 (WR)P3.6
17	(RD)P3.7	17 <-->	19	19 (RD)P3.7
18	XTAL2	18 <-->	20	20 XTAL2
19	XTAL1	19 <-->	21	21 XTAL1
20	Vss	20 <-->	22	22 Vss
				23 NC
21	P2.0(A8)	21 <-->	24	24 P2.0(A8)
22	P2.1(A9)	22 <-->	25	25 P2.1(A10)
23	P2.2(A10)	23 <-->	26	26 P2.2(A10)
24	P2.3(A11)	24 <-->	27	27 P2.3(A11)
25	P2.4(A12)	25 <-->	28	28 P2.4(A12)
26	P2.5(A13)	26 <-->	29	29 P2.5(A13)
27	P2.6(A14)	27 <-->	30	30 P2.6(A14)
28	P2.7(A15)	28 <-->	31	31 P2.7(A15)
29	PSEN	29 <-->	32	32 PSEN
30	ALS/PROG	30 <-->	33	33 AL/PRO
				34 NC
31	EA/Vpp	31 <-->	35	35 EA/Vpp
32	P0.7(AD7)	32 <-->	36	36 P0.7(AD7)
33	P0.6(AD6)	33 <-->	37	37 P0.6(AD6)
34	P0.5(AD5)	34 <-->	38	38 P0.5(AD5)
35	P0.4(AD4)	35 <-->	39	39 P0.4(AD4)
36	P0.3(AD3)	36 <-->	40	40 P0.3(AD3)
37	P0.2(AD2)	37 <-->	41	41 P0.2(AD2)
38	P0.1(AD1)	38 <-->	42	42 P0.1(AD1)
39	P0.0(AD0)	39 <-->	43	43 P0.0(AD0)
40	Vcc	40 <-->	44	44 Vcc