

SE-17010
SYSTEM EVALUATION BOARD

SUPPORTED PRODUCTS:

μ PD17003A

μ PD17005

μ PD17010

μ PD17016

μ PD17017

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Major Changes

Page	Description
Throughout	The μ PD17016 and μ PD17017 have been added as evaluation products. The IE-17K-ET has been added as a compatible in-circuit emulator. HEX files have been replaced with ICE files.
p.1	Table 1-1 has been added.
p.17	The descriptions in (3) of Section 4.5 have been modified.
p.18	The descriptions in (4) of Section 4.5 have been modified.
pp.29 to pp.30	Tables 5-3 and 5-4 have been added.

Major changes in this revision are indicated by a star (*) in the margins.

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[MEMO]

CHAPTER 1 OVERVIEW

The SE-17010 is an SE board for evaluating the μ PD17003A, μ PD17005, μ PD17010, μ PD17016, and μ PD17017 4-bit single-chip microcontroller systems. *

The SE-17010 can be used alone. To maximize the efficiency of program debugging, however, use it with a 17K series common in-circuit emulator (either the IE-17K or IE-17K-ET^{Note 1}).

Actual μ PD17003A, μ PD17005, μ PD17010, μ PD17016, or μ PD17017 chips (called the chips hereafter) are used to interface with a target system^{Note 2}. The function of the SE-17010 is thus equivalent to that of a target system to be evaluated.

An emulation probe, the optional EP-17003GF^{Note 3}, and conversion socket (EV-9200G-80) are required to connect the SE-17010 to a target system.

- Notes**
1. Low-end model: An external power supply is required. *
 2. System to be evaluated (created by the user) *
 3. Can be used for 80-pin plastic QFPs (14 x 20 mm). *

Table 1-1. Development Tools for the SE-17010 *

SE board	Use	Assembler (AS17K) output file (host machine)	In-circuit emulator	Support software ^{Note 3}	Emulation probe	Target product
SE-17010	Used with an in-circuit emulator	ICE file ^{Note 1} [PC-9800 series] [IBM PC/AT TM]	IE-17K IE-17K-ET	<i>SIMPLEHOST</i> TM	EP-17003GF + EV-9200-G-80	μ PD17003A μ PD17005 μ PD17010
	Used alone	PRO file ^{Note 2} [PC-9800 series] [IBM PC/AT]	Not required	Not required	(Conversion socket)	μ PD17016 μ PD17017

- Notes**
1. ICE file : Automatically output after a source program is assembled.
 2. PRO file: Output when an assembler option (/PRO) is specified during assembly of a source program.
For details of the ICE and PRO files, refer to the AS17K user's manual.
 3. *SIMPLEHOST* is the software for the man-machine interface with the in-circuit emulator. The software runs under WindowsTM, enabling debugging by manipulating the source list, figures, and tables on the CRT display using a mouse.
For details, refer to the *SIMPLEHOST* user's manual.
It is also possible to interface with the in-circuit emulator by using commercially available RS-232C communications software other than *SIMPLEHOST*. When using other software systems, the users need to know the baud rate setting and the commands for an in-circuit emulator. For details, refer to the IE-17K or IE-17K-ET user's manual.

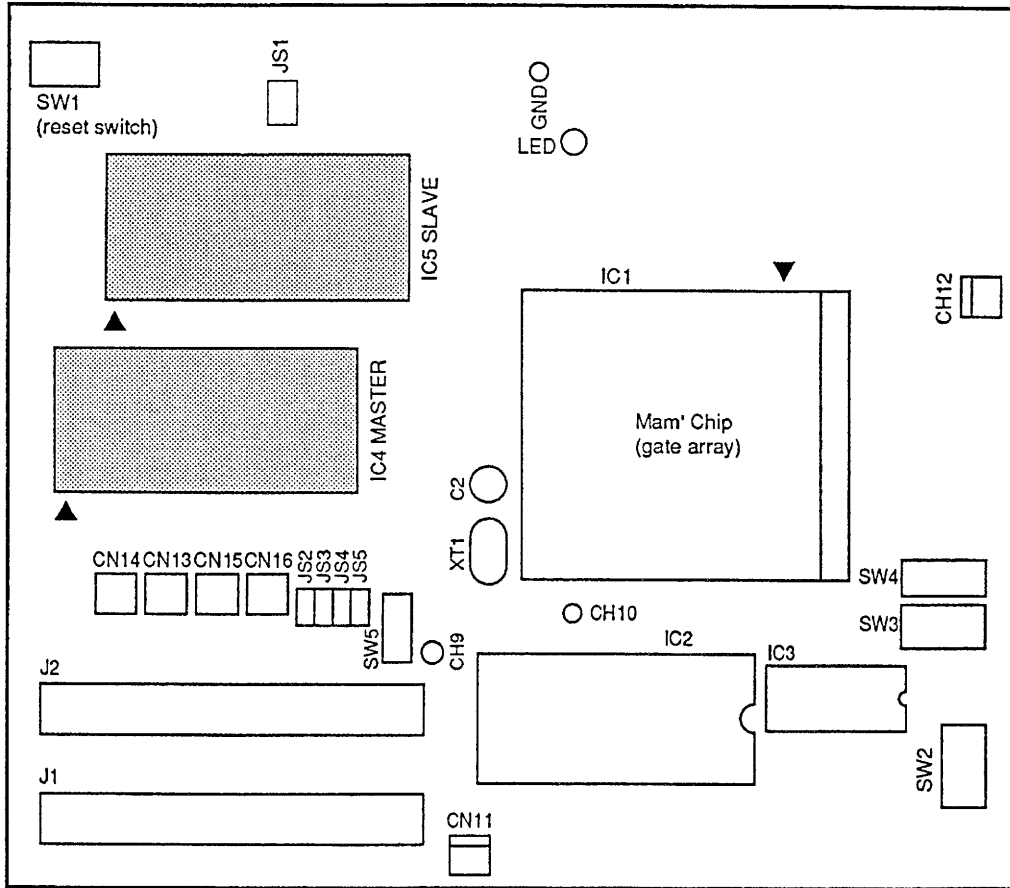
[MEMO]

CHAPTER 2 SPECIFICATIONS

The specifications of the SE-17010 are shown below:

Product name	: SE-17010
Program memory	: <ul style="list-style-type: none">• When the SE-17010 is used with an in-circuit emulator Use the μPD43256GU (RAM) mounted on the board.• When the SE-17010 is used alone Write the program in the μPD27C256, μPD27C512, or μPD27C1001 (PROM) and plug it into socket IC2 on the SE-17010.
Data memory	: Use the data memory in the chip.
Oscillator frequency	: 4.5 MHz
Instruction cycle	: 4.44 μ s (when a 4.5-MHz crystal is used)
Operating temperature	: +10 °C to +40 °C
Storage temperature	: -10 °C to +50 °C (no condensation)
Power	: +5 V \pm 5% <ul style="list-style-type: none">• When the SE-17010 is used with an in-circuit emulator, power is supplied from the in-circuit emulator.• When the SE-17010 is used alone, power must be supplied from an external power supply, via the CN11 or CN12 connector or a probe (EP-17003GF).
Current	: 150 mA (maximum) (When the μ PD27C512 is being used as program memory, with no load)
External dimensions	: 150 x 148 x 35 mm

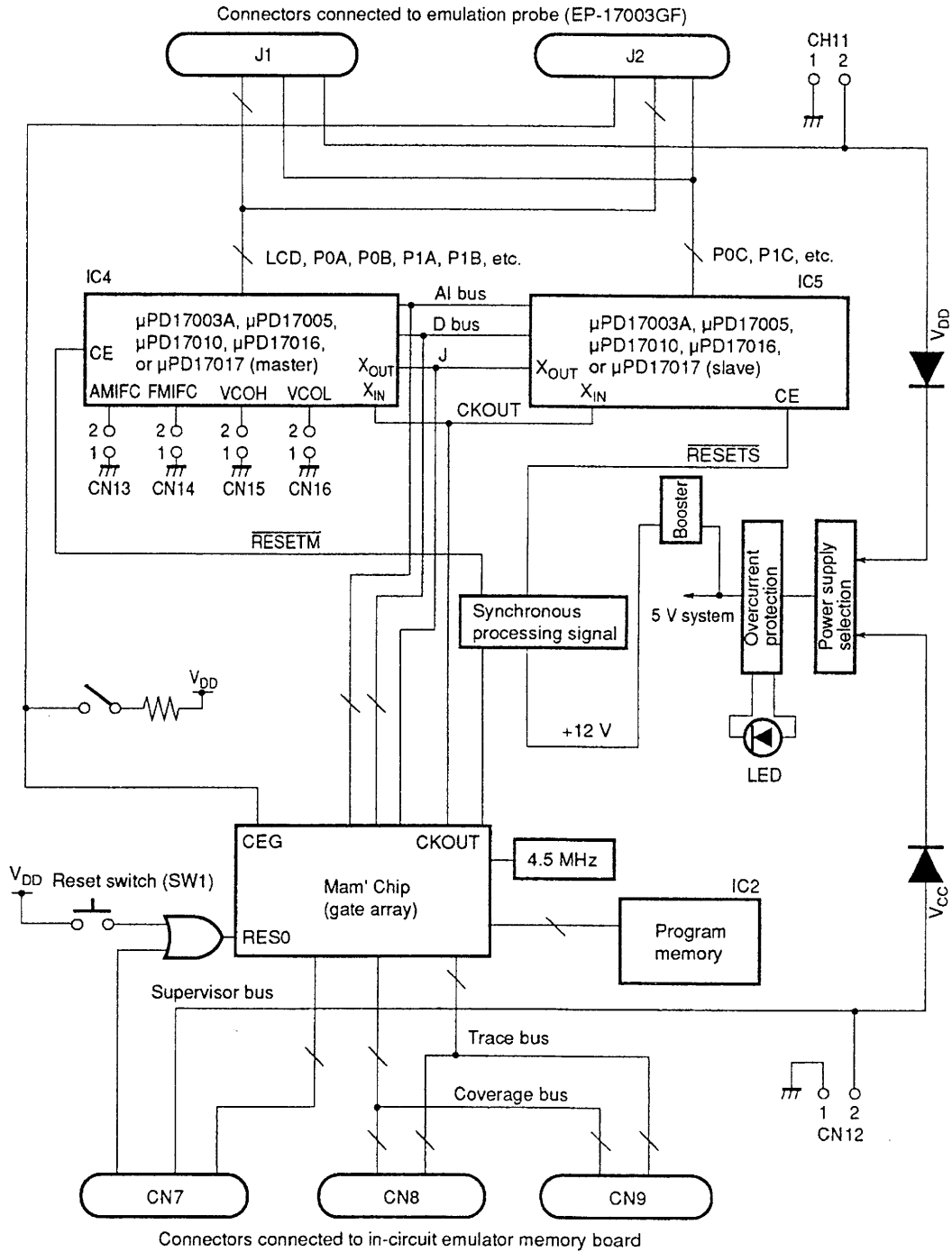
Figure 2-1. Configuration of SE-17010 Components



- * **Remark** The shaded portions in the above figure indicate the chips. Change the chips plugged into the IC4 (MASTER) and IC5 (SLAVE) sockets according to the product to be evaluated. For details, see **Section 4.1**.
When the SE-17010 is delivered from the factory, μ PD17010GF-xxx chips are mounted in these sockets.

CHAPTER 3 BLOCK DIAGRAM

Figure 3-1. Block Diagram of SE-17010



[MEMO]

CHAPTER 4 USAGE

4.1 SETTING THE SE BOARD ACCORDING TO THE PRODUCT (μ PD17003A, μ PD17005, μ PD17010, μ PD17016, or μ PD17017)

When a product is evaluated using the SE-17010, the chips corresponding to that product must be mounted in the IC4 (MASTER) and IC5 (SLAVE) sockets on the SE board (see **Figure 2-1**).

When the SE-17010 is delivered from the factory, μ PD17010GF-xxx chips are mounted in the IC4 and IC5 sockets. These must be replaced with the appropriate chips when a product other than the μ PD17010 is to be evaluated. Table 4-1 lists the correspondence between the products to be evaluated and the chips to be mounted in these sockets.

The position of the development environment selection switch (SW3) must also be set according to the product to be evaluated (see **Figure 4-1**). SW3 is factory-set to enable use of the μ PD17010. Table 4-2 lists the SE-17010 operating environments corresponding to each SW3 setting.

Table 4-1. Correspondence between Product to be Evaluated and Chips to be Mounted

Target product \ Chip	IC4	IC5
μ PD17003A	μ PD17003AGF-xxx	μ PD17003AGF-xxx
μ PD17005	μ PD17005GF-xxx	μ PD17005GF-xxx
μ PD17010	μ PD17010GF-xxx	μ PD17010GF-xxx
μ PD17016	μ PD17016GF-xxx	μ PD17016GF-xxx
μ PD17017	μ PD17017GF-xxx	μ PD17017GF-xxx

★

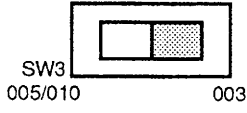
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Remark The shaded portion indicates the factory setting.

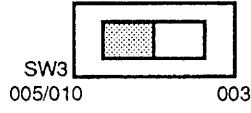
Caution Turn off the power before attempting to replace a chip. Note the orientation of pin 1 when inserting a chip. Pin 1 is indicated by ▲ on the socket.

Figure 4-1. Setting SW3

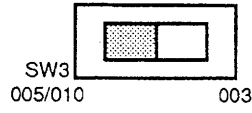
(1) For μ PD17003A



(2) For μ PD17005

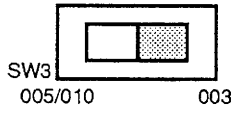


(3) For μ PD17010

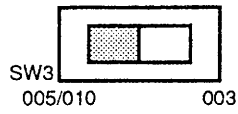


*

(4) For μ PD17016



(5) For μ PD17017



Remark The shaded portions indicate the switch settings.

Table 4-2 SE-17010 Operating Environment Corresponding to Each SW3 Setting

Item	SW3 setting	
	003	005/010
Program memory capacity	4K steps x 16 bits	8K steps x 16 bits

Remark The shaded portion indicates the factory setting.

4.2 SUPPLYING POWER TO THE SE BOARD

(1) Power supply pins

The SE-17010 has three terminals to which power is supplied.

- CN11
- CN12
- Emulation probe (V_{DD} and GND)

Remarks 1. For both the CN11 and CN12 connectors, pin 1 is a ground pin while, again in both cases, pin 2 is a power supply pin. The power cable supplied with the board can be used to supply power.

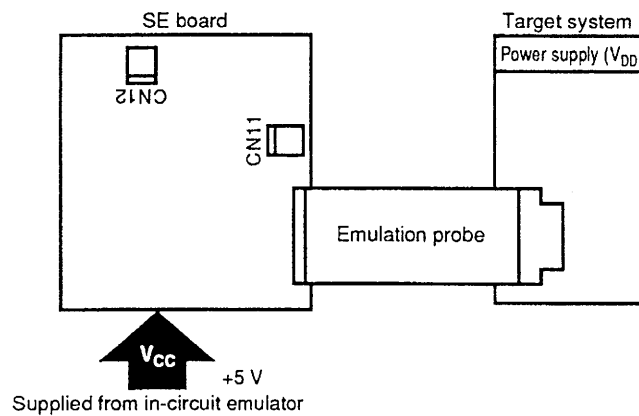
2. On the SE board, the power supply pin of CN11 is directly connected to that of the emulation probe. Power can, therefore, be supplied to either pin.

(2) Examples

<1> When the SE-17010 is used with an in-circuit emulator

Power is supplied from the in-circuit emulator. Power need not be supplied to CN11, CN12, or the emulation probe.

Figure 4-2. When the SE Board Is Used with an In-Circuit Emulator



<2> When the SE board is used alone

Figures 4-3 to 4-5 show how to supply +5 V to CN11, CN12, or the emulation probe when the SE board is used alone.

Figure 4-3. Supplying +5 V from CN11 When the SE Board Is Used Alone

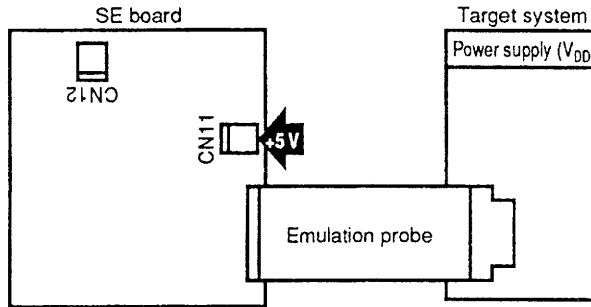


Figure 4-4. Supplying +5 V from CN12 When the SE Board Is Used Alone

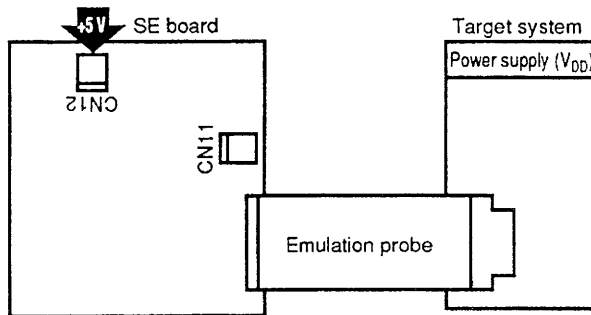
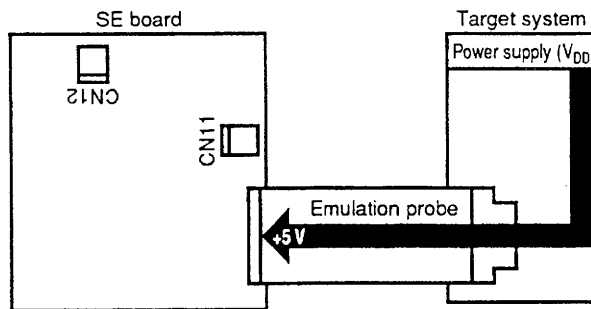


Figure 4-5. Supplying +5 V from the Emulation Probe When the SE Board Is Used Alone



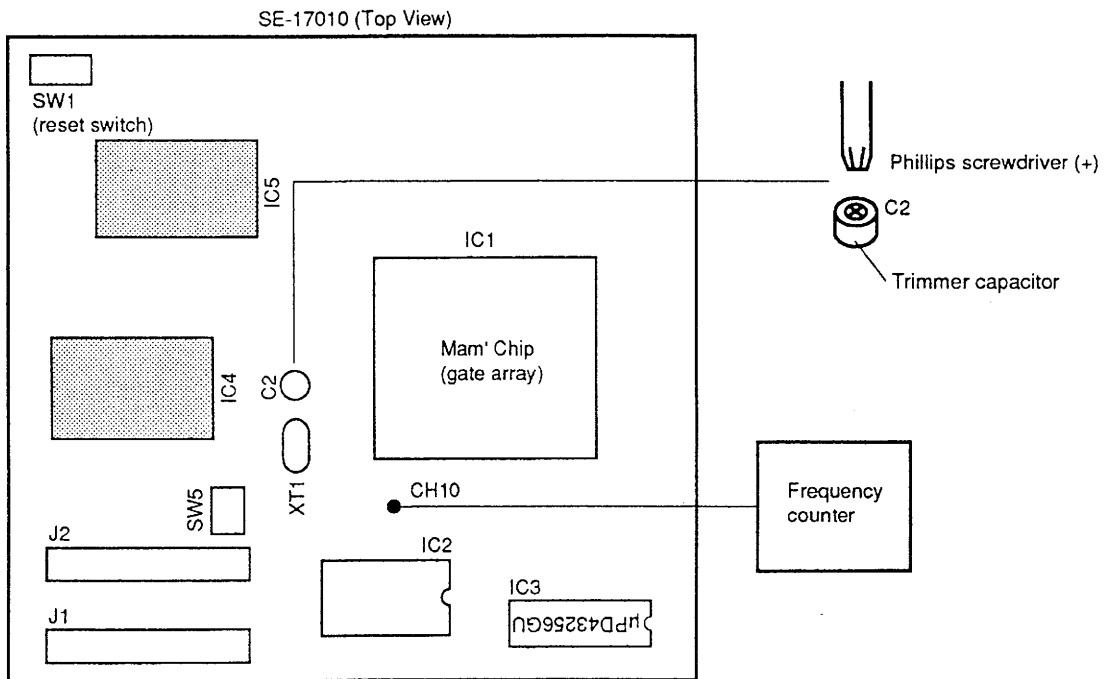
Remark Do not supply +5 V from CN11.

4.3 FINE-TUNING THE OSCILLATOR FREQUENCY

The oscillator frequency is factory-set to $4.5 \text{ MHz} \pm 20 \text{ ppm}$. To fine-tune the oscillator frequency, adjust the trimmer capacitor (C2) as shown in Figure 4-6.

To monitor the oscillation waveform or measure the oscillator frequency, use the monitor pin CH10 (CKOUT pin of the Mam' chip).

Figure 4-6. Fine-Tuning the Oscillator Frequency



Remark The shaded portions indicate the chips.

4.4 SETTING OTHER SWITCHES

(1) **Reset switch (SW1)**

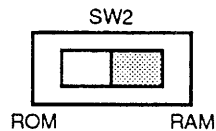
This switch is used to reset the system when the SE-17010 is being used alone. Do not press this switch when the SE-17010 is being used with an in-circuit emulator.

(2) **ROM/RAM selection switch (SW2)**

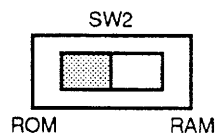
This switch is used to select the program memory to be used. When the SE-17010 is being used with an in-circuit emulator, set the switch to RAM. When the SE-17010 is being used alone, however, mount a PROM (μ PD27C256, μ PD27C512, or μ PD27C1001), then set the switch to ROM.

Figure 4-7. Setting SW2

<1> When the SE board is used with an in-circuit emulator



<2> When the SE board is used alone



Remark The shaded portions indicate the switch settings.

(3) **μ PD27C256/ μ PD27C512/ μ PD27C1001 selection switch (SW4)**

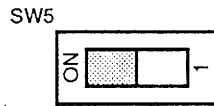
This switch is used to set the use of ROM when the SE-17010 is being used alone. For details, see (4) of **Section 4.6**. When the SE-17010 is being used with an in-circuit emulator and accordingly, RAM is being used, this switch can be set to either position.

(4) **CE pin pull-up selection switch (SW5)**

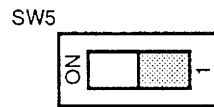
This switch is used to specify whether the chip CE pins are to be pulled up. When the SE-17010 is not connected to the target system, set SW5 to ON to pull up the CE pins.

Figure 4-8. Setting SW5

<1> When the CE pins are to be pulled up



<2> When the CE pins are not to be pulled up



Remark The shaded portions indicate the switch settings.

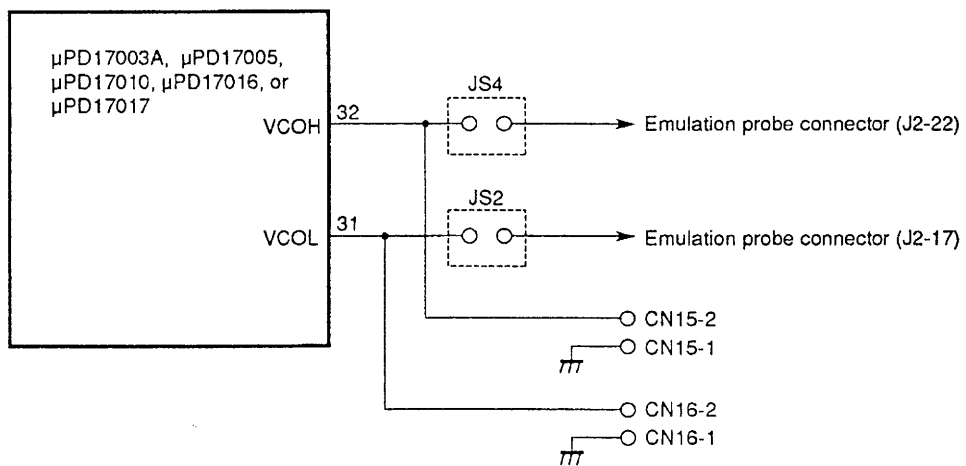
(5) Jumper switch (JS1)

Use the jumper switch in the factory-set position.

(6) VCOL/VCOH input selection jumper switches (JS2 and JS4)

These switches are used to specify whether to input signals to the VCOL and VCOH pins (PLL local oscillation frequency) via the emulation probe or connectors (CN15 and CN16). Pin 2 of CN15 is VCOH, while pin 2 of CN16 is VCOL. GND is pin 1 of both CN15 and CN16.

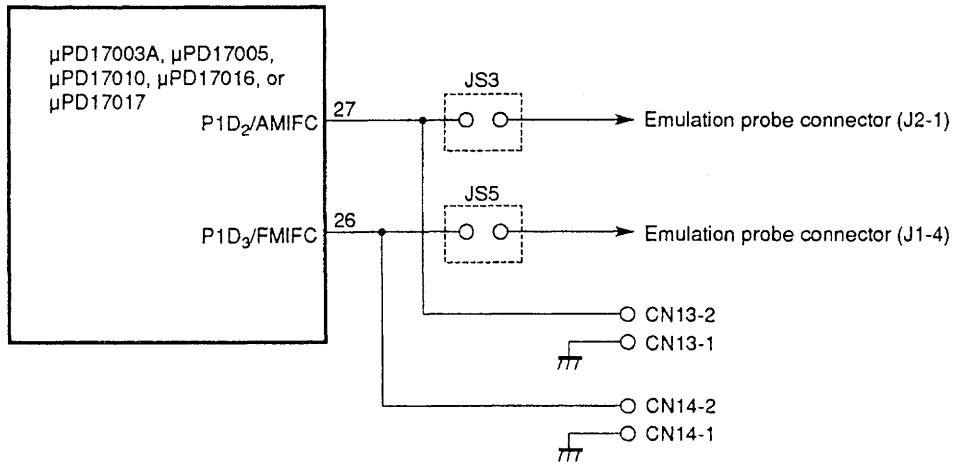
Figure 4-9. JS2 and JS4 Peripheral Circuits



(7) P1D₃/FMIFC and P1D₂/AMIFC port selection jumper switches (JS3 and JS5)

These switches are used to specify whether to input/output signals to/from the P1D₃/FMIFC and P1D₂/AMIFC ports of the chips via the emulation probe or through the connectors (CN13 and CN14). Pin 2 of CN13 is P1D₂/AMIFC, while pin 2 of CN14 is P1D₃/FMIFC. GND is pin 1 of both CN13 and CN14.

Figure 4-10. JS3 and JS5 Peripheral Circuits



4.5 USING THE SE-17010 WITH AN IN-CIRCUIT EMULATOR

The in-circuit emulator is connected to the host machine such as a PC-9800 series and used to debug a target system. For details of operation, refer to the IE-17K or IE-17K-ET user's manual.

(1) Mounting the SE-17010 on the in-circuit emulator and dismantling it from the emulator

Mount the SE-17010 on the in-circuit emulator according to the following procedure:

- <1> Open the outside and inside covers of the in-circuit emulator.
- <2> A memory board is under the inside cover. Connect connectors CN7, CN8, and CN9 on the bottom of the SE-17010 to three connectors on the memory board.

Raise the SE-17010 vertically when dismantling it from the in-circuit emulator.

Figure 4-11. IE-17K with the Outside Cover Opened

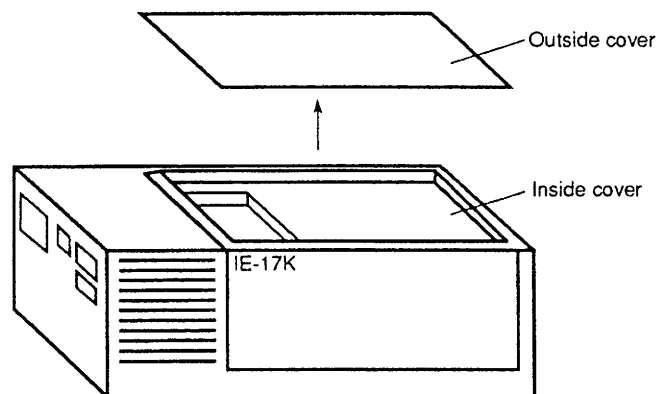
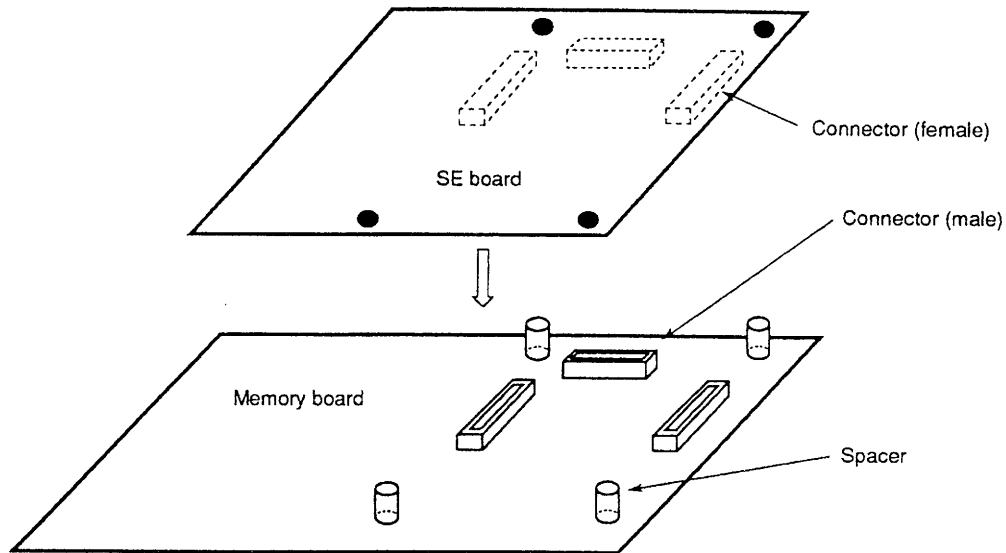


Figure 4-12. Mounting and Dismounting the SE-17010



Next connect emulation probe EP-17003GF to connectors J1 and J2 of the SE-17010, to connect the SE-17010 to the target system.

Then mount the inside and outside covers.

(2) Supplying power

After mounting the SE-17010 on the in-circuit emulator, turn on the in-circuit emulator power and check that the LED on the SE-17010 lights. Do this before mounting the inside and outside covers of the in-circuit emulator.

In the following cases, the LED will not light:

- Power cord of the in-circuit emulator is not connected.
- An overcurrent (about 500 mA or above) passes through the SE-17010.
- The SE-17010 is mounted incorrectly.

If the LED does not light, turn off the in-circuit emulator power, then remount the SE-17010 on the in-circuit emulator. If the LED still does not light, the SE-17010 may be faulty. In such a case, contact your NEC sales representative or agency.

(3) Transferring ICE file to the in-circuit emulator

*

The in-circuit emulator (IE-17K or IE-17K-ET) is connected to the host machine such as a PC-9800 series and used to debug software and hardware of a target system. For details, refer to the IE-17K or IE-17K-ET user's manual.

For how to use *SIMPLEHOST*, refer to the *SIMPLEHOST* user's manual.

The following describes the procedure to check whether the SE-17010 is connected normally when commercially available RS-232C communications software is used.

When *SIMPLEHOST* is used, the SE-17010 is connected normally if the LISTING screen is displayed.

- <1> Turn on the power to the in-circuit emulator, or press the reset switch to start the software when the power is already turned on. Then the prompt @@@> is displayed.
- <2> Execute the .LP0 or .LP1 command to load the ICE file containing the program coded by the AS17K assembler, or the ICE file output with the .SP0 or .SP1 command.

The in-circuit emulator does not operate until the ICE file is loaded.

When the SE-17010 is correctly mounted on the in-circuit emulator, the in-circuit emulator displays the following messages and prompt BRK>.

Example Loading the ICE file for the μ PD17010

```
OK
D17010
BRK>
```

In the following cases, the above messages will not be displayed:

- The device number of the chips mounted on the SE-17010 does not correspond to that of the loaded ICE file.
- An SE board other than the SE-17010 is mounted on the in-circuit emulator.
- An ICE file other than that for the μ PD17010, programs is loaded.
- Mounting the SE-17010 on the in-circuit emulator is incomplete.

When no response is received from the in-circuit emulator, perform the following:

- <1> The SE board may not be mounted correctly on the in-circuit emulator. Check the mounting of the SE board.
- <2> The connection between the target system and SE board, made using the emulation probe (EP-17003GF), may be unsatisfactory. Check the state of all the connections.
- <3> The reset circuit in the target system may be malfunctioning. If the reset circuit malfunctions, the reset status of the SE board will become unstable, preventing the in-circuit emulator from responding. The above state can be checked by setting the CE pin pull-up selection switch (SW5) to ON, then turning the in-circuit emulator off then back on again.
- <4> Recheck the baud rate set for the in-circuit emulator and host machine. For details of how to set the baud rate for the in-circuit emulator, refer to the IE-17K or IE-17K-ET user's manual.

* (4) **Error messages and action to take**

The in-circuit emulator and SE-17010 both have a function to display an error message when the combination of the mounted chips and the loaded ICE file is incorrect.

To ensure accurate debugging, the SE board number is registered in the SE-17010 and the device number registered in each chip.

The following explains the registered SE board numbers and device numbers and the action to take corresponding the error messages.

Table 4-3. Device Numbers and SE Board Numbers

Evaluation device	Device number	SE board number
μPD17003A	07	1F
μPD17005	0A	
μPD17010	1F	
μPD17016	07	
μPD17017	0A	

*
*

- Remarks**
1. The device number means the registration number assigned to each chip.
 2. The SE board number means the registration number assigned to the SE board.
 3. The device number and SE board number are also included in the data in the ICE file to be loaded. These numbers are used by the IE-17K to check the development environment. The ICE file assembled by device file AS17010, for example, contains device number 1F and SE board number 1F.

(a) **Error message, displayed when the device number of the chips mounted on the SE-17010 does not correspond to that in the loaded ICE file, and action to take**

[Error message]

? IDI INVALID DEVICE ID NUMBER [xx- ΔΔ]

Remark In this error message, xx indicates the device number of the chips mounted on the SE-17010 and ΔΔ indicates the device number in the loaded ICE file.

If the error message is displayed, recheck whether correct chips are mounted on the SE board or whether the development environment selection switch (SW3) is correctly adjusted. When the chips on the SE board are incorrect, turn off the power to the in-circuit emulator, replace the incorrect chips and adjust SW3 again, then reload the ICE file.

If the device file selected during assembling is incorrect, use a correct device file to reassemble the source file, then reload the ICE file.

- (b) Error message, displayed when an SE board other than the SE-17010 is mounted or an ICE file other than that for the μ PD17003A, μ PD17005, μ PD17010, μ PD17016, and μ PD17017 programs is loaded, and action to take

[Error message]

? ISE INVALID SE BOARD NUMBER [$\square\square$ - $\nabla\nabla$]

Remark In this error message, $\square\square$ indicates the SE board number of the mounted SE board and $\nabla\nabla$ indicates the SE board number in the loaded ICE file. For the SE-17010, $\square\square$ indicates 1F. When the ICE file for the μ PD17003A, μ PD17005, μ PD17010, μ PD17016, and μ PD17017 programs is loaded, $\nabla\nabla$ indicates 1F.

When this error message is displayed, recheck the SE board and loaded ICE file.

(5) Caution

- Turn on the in-circuit emulator before turning on the target system.
- When the SE-17010 is used with an in-circuit emulator, do not use the reset switch (SW1) on the SE-17010. Instead, to reset the SE-17010, use the reset switch of the in-circuit emulator.

4.6 USING THE SE-17010 ALONE

(1) Installing PROM

When using the SE-17010 alone, install PROM (μ PD27C256, μ PD27C512, or μ PD27C1001), as program memory, in the IC2 socket on the SE board.

Install PROM satisfying the following conditions:

- ROM size 256K bits : μ PD27C256-12, μ PD27C256-15, μ PD27C256-20, or the equivalent
 512K bits : μ PD27C512-12, μ PD27C512-15, μ PD27C512-20, or the equivalent
 1M bit : μ PD27C1001-12, μ PD27C1001-15, μ PD27C1001-20, or the equivalent

The following output files must be written in PROM as the program in advance:

- μ PD17003A, μ PD17005, μ PD17010, μ PD17016, and μ PD17017 PROM files (.PRO) output by the 17K series assembler (AS17K)

Cautions 1. Do not write an ICE file (.ICE) AS17K outputs to the in-circuit emulator

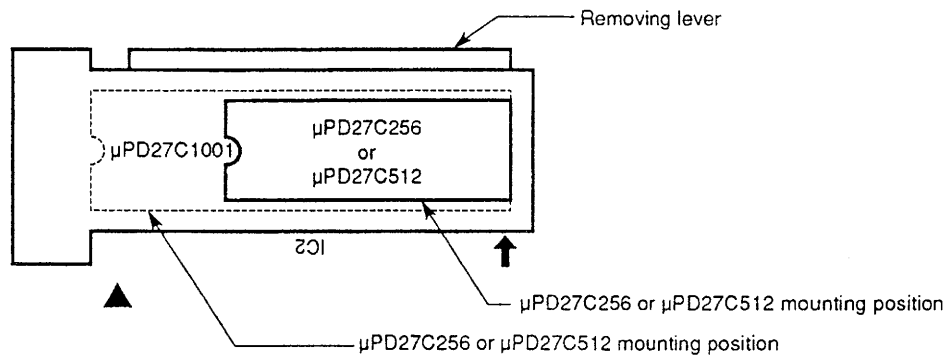
2. The last address of program memory is as follows:

μ PD17003A and μ PD17016 : 0EFBH

μ PD17005, μ PD17010 and μ PD17017 : 1EFBH

3. The number of pins of the μ PD27C256 and μ PD27C512 differs from that of the μ PD27C1001. When installing these devices, therefore, align the end of the device with the arrow, as shown in Figure 4-13.

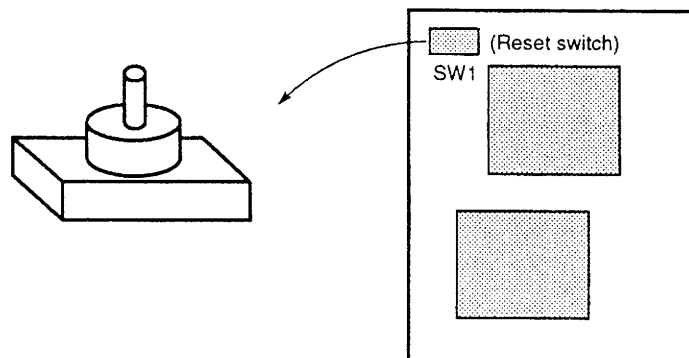
Figure 4-13. Installing PROM



(2) **Function of the reset switch (SW1)**

This switch is used to reset the system when the SE-17010 is being used alone. Do not use this switch to reset the system when the SE-17010 is being used with an in-circuit emulator.

Figure 4-14. SW1

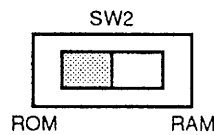


Remark The shaded portions indicate the chips.

(3) **Setting the ROM/RAM selection switch (SW2)**

This switch is used to select the program memory to be used. Set the switch to ROM, as shown in Figure 4-15.

Figure 4-15. Setting SW2



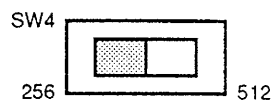
Remark The shaded portion indicates the switch setting.

(4) **Setting the μ PD27C256/ μ PD27C512/ μ PD27C1001 selection switch (SW4)**

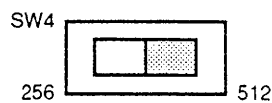
This switch is used to set the ROM being used when the SE-17010 is used alone. Set the switch as shown in Figure 4-16.

Figure 4-16. Setting SW4

<1> For the μ PD27C256



<2> For the μ PD27C512 or μ PD27C1001



Remark The shaded portions indicate the switch settings.

(5) Supplying power

For the SE-17010, be sure to supply +5 V \pm 5% (V_{CC}) from the external power supply to the CN12 pin. When the power is supplied normally, the LED on the SE-17010 lights.

In the following cases, the LED will not light:

- The power is not supplied.
- An overcurrent (about 500 mA or above) is flowing.

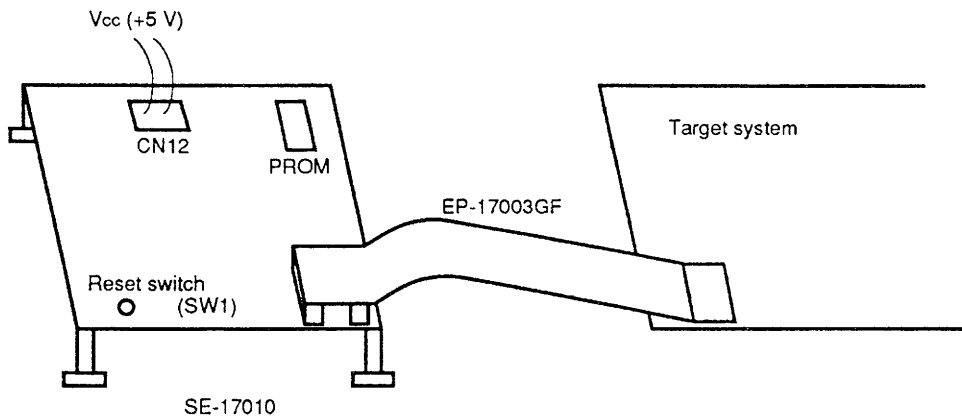
If the LED does not light, check that the external power supply (+ side) is connected to GND. Check the current to ensure that an overcurrent is not flowing. Normally, the value of the current will be up to 150 mA, when the μ PD27C512 is being used as program memory, with no load.

(6) Executing the program

The SE-17010 and target system are connected as shown in Figure 4-17. When the target system power is turned on, the power is supplied to the SE-17010, causing power-on reset to be activated. When power-on reset is activated, the program written in PROM is executed, starting at address 0.

When reset switch SW1 on the SE-17010 is pressed, the SE-17010 is forcibly reset and the program in PROM is executed, starting at address 0, as in power-on reset.

Figure 4-17. Example of Connection When SE-17010 Is Used Alone



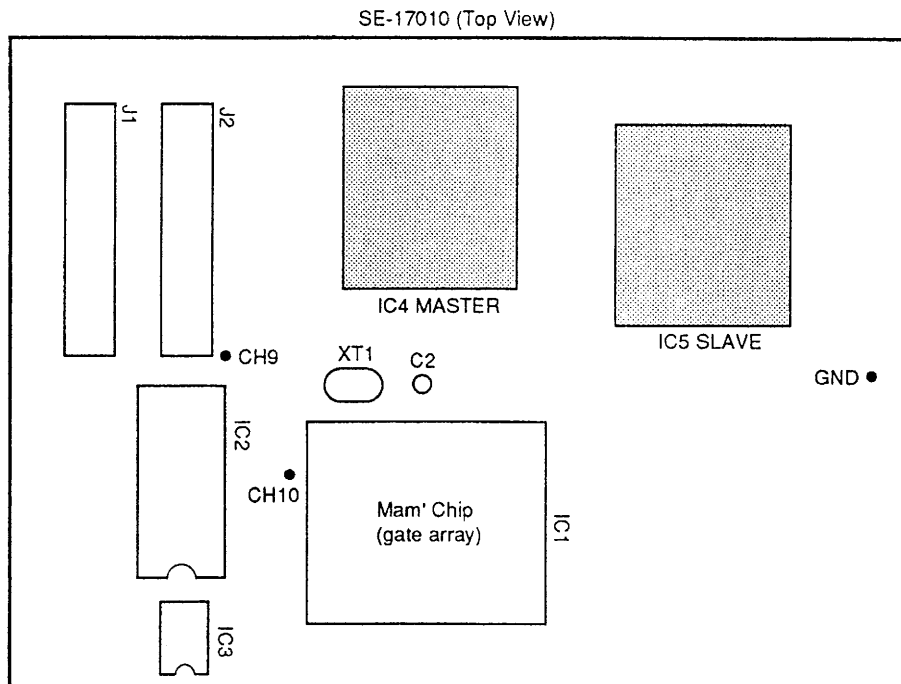
4.7 MONITOR PINS

The monitor pins for checking the pin status of the chips are provided on the SE-17010. Table 4-4 lists the monitor pins and their functions. Figure 4-18 shows the monitor pin layout.

Table 4-4. Monitor Pins and Their Function

Monitor pin name	Function
CH9	For CEG pin monitor
CH10	For chip oscillator frequency monitor
G	GND

Figure 4-18. Monitor Pin Layout



Remark The shaded portions indicate the chips.

4.8 SETTING JUMPER SWITCHES, SLIDE SWITCHES, AND OTHER COMPONENTS

The factory settings for program memory (IC2), the crystal, jumper switches, and slide switches of the SE-17010 are as follows:

(1) Program memory (IC2)

RAM (μ PD43256GU) is installed. No ROM is installed.

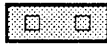
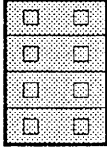




(2) Crystal

A 4.5-MHz crystal is mounted in XT1.

(3) Jumper and slide switches

The jumper and slide switches are factory-set as indicated in Table 4-5. Modify these switch settings only after checking the corresponding conditions.

Table 4-5 Setting the Jumper and Slide Switches

Switch No.	Jumper and slide switches	Condition	Setting	
JS1	 JS1	JS1 is factory-mounted.	Do not remove.	
JS2 JS3 JS4 JS5	 JS2 JS3 JS4 JS5	See Section 4.4.		
SW2	 SW2 ROM RAM	When the SE-17010 is used with an in-circuit emulator	RAM	
		When the SE-17010 is used alone (Also set SW4.)	ROM	
SW3	 SW3 005/010 003	When evaluating the μ PD17003A	003	
		When evaluating the μ PD17005	005/010	
		When evaluating the μ PD17010	003	
		When evaluating the μ PD17016	003	
		When evaluating the μ PD17017	005/010	
SW4	 SW4 256 512	When the SE-17010 is used with an in-circuit emulator	Either 256 or 512	
		When the SE-17010 is used alone	For the μ PD27C256	256
			For the μ PD27C512 or μ PD27C1001	512
SW5	 SW5	When the chip CE pins are to be pulled up	ON	
		When the chip CE pins are not to be pulled up	1	

*
*

Remark The shaded portions indicate the factory settings.

[MEMO]

CHAPTER 5 CONNECTOR PINS

(1) μ PD17003A, μ PD17005, and μ PD17010

Table 5-1. J1 Connector Pins

J1 pin No.	Pin name (IC pin No.)	J1 pin No.	Pin name (IC pin No.)
1	GND	31	LCD ₀ /P0Y ₀ /KS ₀ (74)
2	V _{DD}	32	LCD ₁ /P0Y ₁ /KS ₁ (73)
3	GND	33	GND
4	P1D ₃ /FMIFC (26)	34	LCD ₂ /P0Y ₂ /KS ₂ (72)
5	P1C ₁ (24)	35	LCD ₃ /P0Y ₃ /KS ₃ (71)
6	GND	36	GND
7	P0B ₀ /SI ₂ (SI ₁) ^{Note} (10)	37	LCD ₄ /P0Y ₄ /KS ₄ (70)
8	P0B ₂ / $\overline{\text{SCK}}_2$ ($\overline{\text{SCK}}_1$) ^{Note(8)}	38	LCD ₅ /P0Y ₅ /KS ₅ (69)
9	GND	39	GND
10	P1B ₁ /PWM ₀ (20)	40	LCD ₆ /P0Y ₆ /KS ₆ (68)
11	P1B ₃ /PWM ₂ (18)	41	LCD ₇ /P0Y ₇ /KS ₇ (67)
12	GND	42	GND
13	P1A ₁ (16)	43	LCD ₉ /P0Y ₉ /KS ₉ (65)
14	P1A ₃ (14)	44	LCD ₈ /P0Y ₈ /KS ₈ (66)
15	GND	45	GND
16	INT ₀	46	LCD ₁₀ /P0Y ₁₀ /KS ₁₀ (64)
17	P1C ₃	47	LCD ₁₃ /P0Y ₁₃ /KS ₁₃ (61)
18	GND	48	GND
19	P1C ₀ (25)	49	LCD ₁₄ /P0Y ₁₄ /KS ₁₄ (60)
20	P0A ₀ /SO ₁ (SO ₀) ^{Note} (6)	50	LCD ₁₅ /P0Y ₁₅ /KS ₁₅ (59)
21	GND	51	GND
22	P0A ₂ /SCL (4)	52	LCD ₁₆ /P0X ₀ (58)
23	P0C ₀ (2)	53	LCD ₁₇ /P0X ₁ (57)
24	GND	54	GND
25	P0A ₃ /SDA (3)	55	LCD ₁₉ /P0X ₃ (55)
26	P0C ₂ (80)	56	LCD ₁₈ /P0X ₂ (56)
27	GND	57	GND
28	P0C ₁ (1)	58	LCD ₂₀ /P0X ₄ (54)
29	P0D ₁ /ADC ₃ (77)	59	LCD ₁₂ /P0Y ₁₂ /KS ₁₂ (62)
30	GND	60	GND

Note The pin names for the μ PD17010 are enclosed in parentheses.

Table 5-2. J2 Connector Pins

J2 pin No.	Pin name (IC pin No.)	J2 pin No.	Pin name (IC pin No.)
1	P1D ₂ /AMIFC (27)	31	LCD ₂₁ /P0X5 (53)
2	P1C ₂ (23)	32	LCD ₂₂ /P0E0 (52)
3	GND	33	GND
4	P1B ₀ /CGP (21)	34	X _{IN} (35)
5	P1D ₁ /ADC ₁ (28)	35	LCD ₂₃ /P0E ₁ (51)
6	GND	36	GND
7	P1B ₂ /PWM ₁ (19)	37	LCD ₂₄ /P0E ₂ (50)
8	P1A ₀ /FCG (17)	38	EO ₀ (36)
9	GND	39	GND
10	P1D ₀ /ADC ₀ (29)	40	LCD ₂₅ /P0E ₃ (49)
11	P1A ₂ (15)	41	LCD ₂₆ /P0F ₀ (48)
12	GND	42	GND
13	CE (13)	43	EO ₁ (37)
14	INT ₁ (11)	44	LCD ₂₇ /P0F ₁ (47)
15	GND	45	GND
16	P0B ₁ /SO ₂ (SO ₁) Note (9)	46	LCD ₂₉ /P0F ₃ (45)
17	VCOL (31)	47	LPF _{IN} (NC) Note (38)
18	GND	48	GND
19	P0B ₃ /SI ₁ (SI ₀) Note (7)	49	COM ₁ (43)
20	P0A ₁ / $\overline{\text{SCK}}_1$ ($\overline{\text{SCK}}_0$) Note (5)	50	GND
21	GND	51	GND
22	VCOH (32)	52	LPF _{OUT} (NC) Note (39)
23	P0C ₃ (79)	53	COM ₀ (44)
24	GND	54	GND
25	P0D ₀ /ADC ₂ (78)	55	P2A ₀ (42)
26	P0D ₂ /ADC ₄ (76)	56	V _{LPF} (NC) Note (40)
27	GND	57	GND
28	P0D ₃ /ADC ₅ (75)	58	LCD ₂₈ /P0F ₂ (46)
29	X _{OUT} (34)	59	LCD ₁₁ /P0Y ₁₁ /KS ₁₁ (63)
30	GND	60	GND

Note The pin names for the μ PD17010 are enclosed in parentheses.

(2) μ PD17016 and μ PD17017

*

Table 5-3. J1 Connector Pins

J1 pin No.	Pin name (IC pin No.)	J1 pin No.	Pin name (IC pin No.)
1	GND	31	LCD ₀ /KS ₀ (74)
2	V _{DD}	32	LCD ₁ /KS ₁ (73)
3	GND	33	GND
4	P1D ₃ /FMIFC (26)	34	LCD ₂ /KS ₂ (72)
5	P1C ₁ (24)	35	LCD ₃ /KS ₃ (71)
6	GND	36	GND
7	P0B ₀ (10)	37	LCD ₄ /KS ₄ (70)
8	P0B ₂ /SCK (8)	38	LCD ₅ /KS ₅ (69)
9	GND	39	GND
10	P1B ₁ /PWM ₀ (20)	40	LCD ₆ /KS ₆ (68)
11	P1B ₃ (18)	41	LCD ₇ /KS ₇ (67)
12	GND	42	GND
13	P1A ₁ (16)	43	LCD ₉ /KS ₉ (65)
14	P1A ₃ (14)	44	LCD ₈ /KS ₈ (66)
15	GND	45	GND
16	INT ₀ (12)	46	LCD ₁₀ /KS ₁₀ (64)
17	P1C ₃ (22)	47	LCD ₁₃ /KS ₁₃ (61)
18	GND	48	GND
19	P1C ₀ (25)	49	LCD ₁₄ /KS ₁₄ (60)
20	P0A ₀ (6)	50	LCD ₁₅ /KS ₁₅ (59)
21	GND	51	GND
22	P0A ₂ (4)	52	LCD ₁₆ (58)
23	P0C ₀ (2)	53	LCD ₁₇ (57)
24	GND	54	GND
25	P0A ₃ (3)	55	LCD ₁₉ (55)
26	P0C ₂ (80)	56	LCD ₁₈ (56)
27	GND	57	GND
28	P0C ₁ (1)	58	LCD ₂₀ (54)
29	P0D ₁ /ADC ₃ (77)	59	LCD ₁₂ /KS ₁₂ (62)
30	GND	60	GND

Table 5-4. J2 Connector Pins

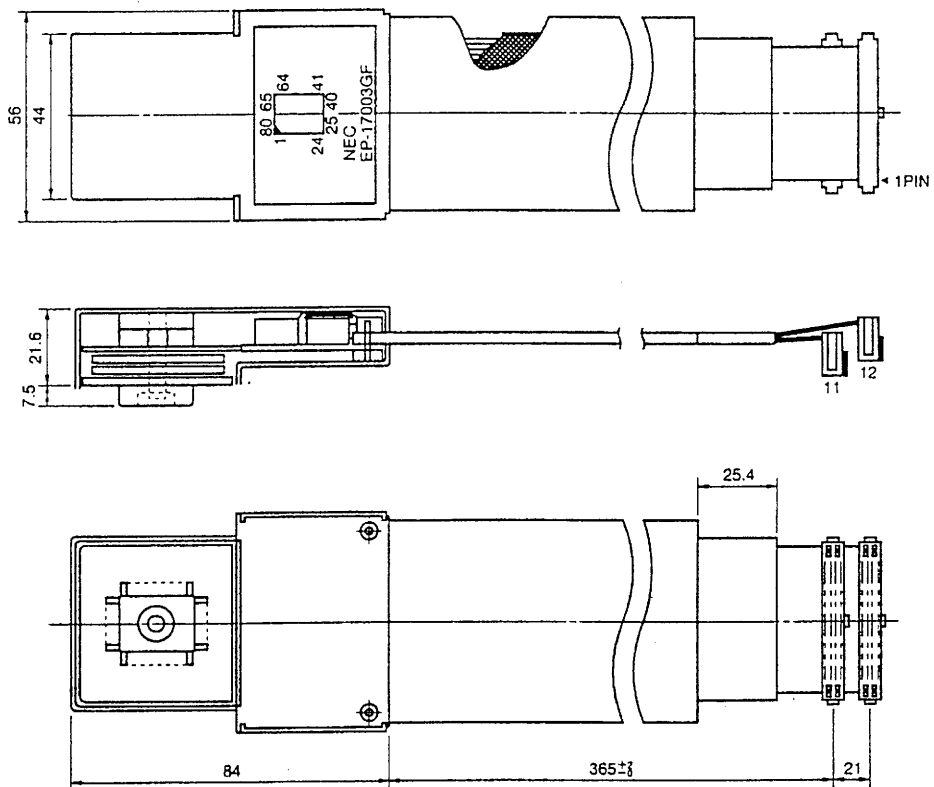
J2 pin No.	Pin name (IC pin No.)	J2 pin No.	Pin name (IC pin No.)
1	P1D ₂ /AMIFC (27)	31	LCD ₂₁ (53)
2	P1C ₂ (23)	32	LCD ₂₂ /P0E ₀ (52)
3	GND	33	GND
4	P1B ₀ /BEEP (21)	34	X _{IN} (35)
5	P1D ₁ /ADC ₁ (28)	35	LCD ₂₃ /P0E ₁ (51)
6	GND	36	GND
7	P1B ₂ /PWM ₁ (19)	37	LCD ₂₄ /P0E ₂ (50)
8	P1A ₀ (17)	38	EO ₀ (36)
9	GND	39	GND
10	P1D ₀ /ADC ₀ (29)	40	LCD ₂₅ /P0E ₃ (49)
11	P1A ₂ (15)	41	LCD ₂₆ /P0F ₀ (48)
12	GND	42	GND
13	CE (13)	43	EO ₁ (37)
14	IC (11)	44	LCD ₂₇ /P0F ₁ (47)
15	GND	45	GND
16	P0B ₁ /SO (9)	46	LCD ₂₉ /P0F ₃ (45)
17	VCOL (31)	47	IC (38)
18	GND	48	GND
19	P0B ₃ (7)	49	COM ₁ (43)
20	P0A ₁ (5)	50	GND
21	GND	51	GND
22	VCOH (32)	52	IC (39)
23	P0C ₃ (79)	53	COM ₀ (44)
24	GND	54	GND
25	P0D ₀ /ADC ₂ (78)	55	P2A ₀ (42)
26	P0D ₂ /ADC ₄ (76)	56	IC (40)
27	GND	57	GND
28	P0D ₃ /ADC ₅ (75)	58	LCD ₂₈ /P0F ₂ (46)
29	X _{OUT} (34)	59	LCD ₁₁ /KS ₁₁ (63)
30	GND	60	GND

CHAPTER 6 OUTLINE DRAWINGS OF EMULATION PROBE AND CONVERSION SOCKET

6.1 EMULATION PROBE

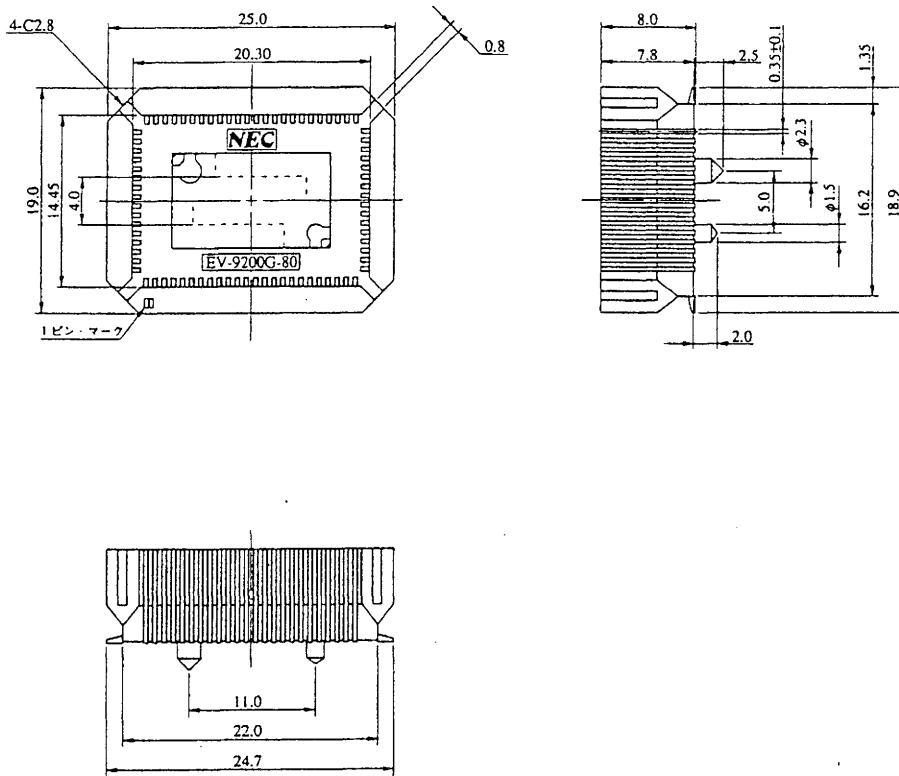
Part number: EP-17003GF

Figure 6-1. Emulation Probe (Units: mm)



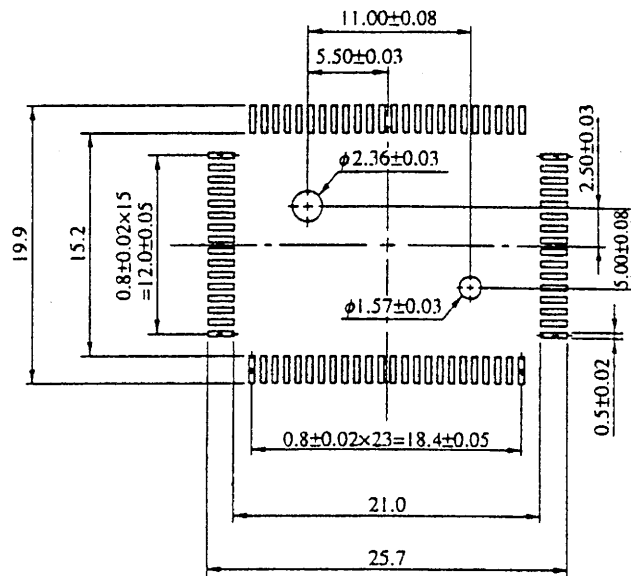
6.2 CONVERSION SOCKET (EV-9200G-80) AND RECOMMENDED BOARD MOUNTING PATTERN

Figure 6-2. EV-9200-80 (Units: mm)



EV-9200G-80-G0

Figure 6-3. Recommended EV-9200-80 Board Mounting Pattern (Units: mm)



EV-9200G-80-P0

Caution The mounting pad dimensions for the EV-9200 may differ from those for the target product (QFP). Refer to the *SMD Surface Mount Technology Manual (IEI-1207)* for details of the recommended mounting pad dimensions for QFPs.

[MEMO]

