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April 1st, 2010
Renesas Electronics Corporation

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USER'S MANUAL

RENESAS

Phase-out/Discontinued

SE-17934

SYSTEM EVALUATION BOARD

(PRELIMINARY)

Target devices:
μPD17933
μPD17934

Document No. U11646EJ1V0UM00 (1st edition)
Date Published February 1997 N
Printed in Japan

M7A 96.10

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[MEMO]

CHAPTER 1 GENERAL

The SE-17934 is a system evaluation board (SE board) for the 4-bit single-chip microcontrollers μPD17933[Note 1] and 17934[Note 1].

This SE board is used for debugging mounted to a 17K series in-circuit emulator (IE-17K or IE-17K-ET). It can also be used in stand alone mode for system evaluation.

To interface with the target system[Note 2], the μPD17933GK-00x, or μPD17934GK-00x, (hereafter referred to as the "real chip") is used; therefore, the functions of the SE-17934 are equivalent to a device to be evaluated.

To connect the SE-17934 and the target system, an optional emulation probe (EP-17K80GK) and a conversion socket, the TGK-080SDP[Note 3], supplied as accessories, are necessary.

Notes 1. Under development.

2. System developed by the user to be evaluated.

3. Product of TOKYO ELETECH CORPORATION (Tokyo (03)5295-1661).
Contact an NEC dealer regarding the purchase of this product.

Table 1-1. Development Tools for SE-17934

SE Board	Usage	Assembler Output File (RA17K assembler package) (host machine)	In-Circuit Emulator	Support Software[Note 3]	Emulation Probe	Target Device to Be Evaluated
SE-17934	When used with in-circuit emulator	ICE file[Note 1] (PC-9800 series / IBM PC/AT™)	IE-17K IE-17K-ET	*SIMPLEHOST™*	EP-17K80GK + TGK-080SDP	μPD17933, 17934
	When SE-17934 alone is used	PRO file[Note 2] (PC-9800 series / IBM PC/AT™)	Unnecessary	Unnecessary		

Notes 1. ICE file : Output if -HOST option is specified on assembler and linker or -ICE option is specified on linker.

2. PRO file : Output if a linker option (-PROM) is specified when the source program is assembled.
For details on the ICE file and PRO file, refer to the **RA17K** and **LK17K User's Manuals**.

3. *SIMPLEHOST* is a software that serves a man-machine interface when the in-circuit emulator is used. This software runs on Windows™ and allows you to debug, by operating the source lists, figures, and tables displayed on the CRT with using a mouse.
For details, refer to the ***SIMPLEHOST* User's Manual**.
Although commercially available RS-232-C communication software other than *SIMPLEHOST* can also be used for interfacing, knowledge about baud rate setting and in-circuit emulator's commands is required. For details, refer to the **IE-17K** or **IE-17K-ET User's Manual**.

Caution When the SE-17934 alone is used, it does not operate with PROM files (.PRO) created by the AS17K.

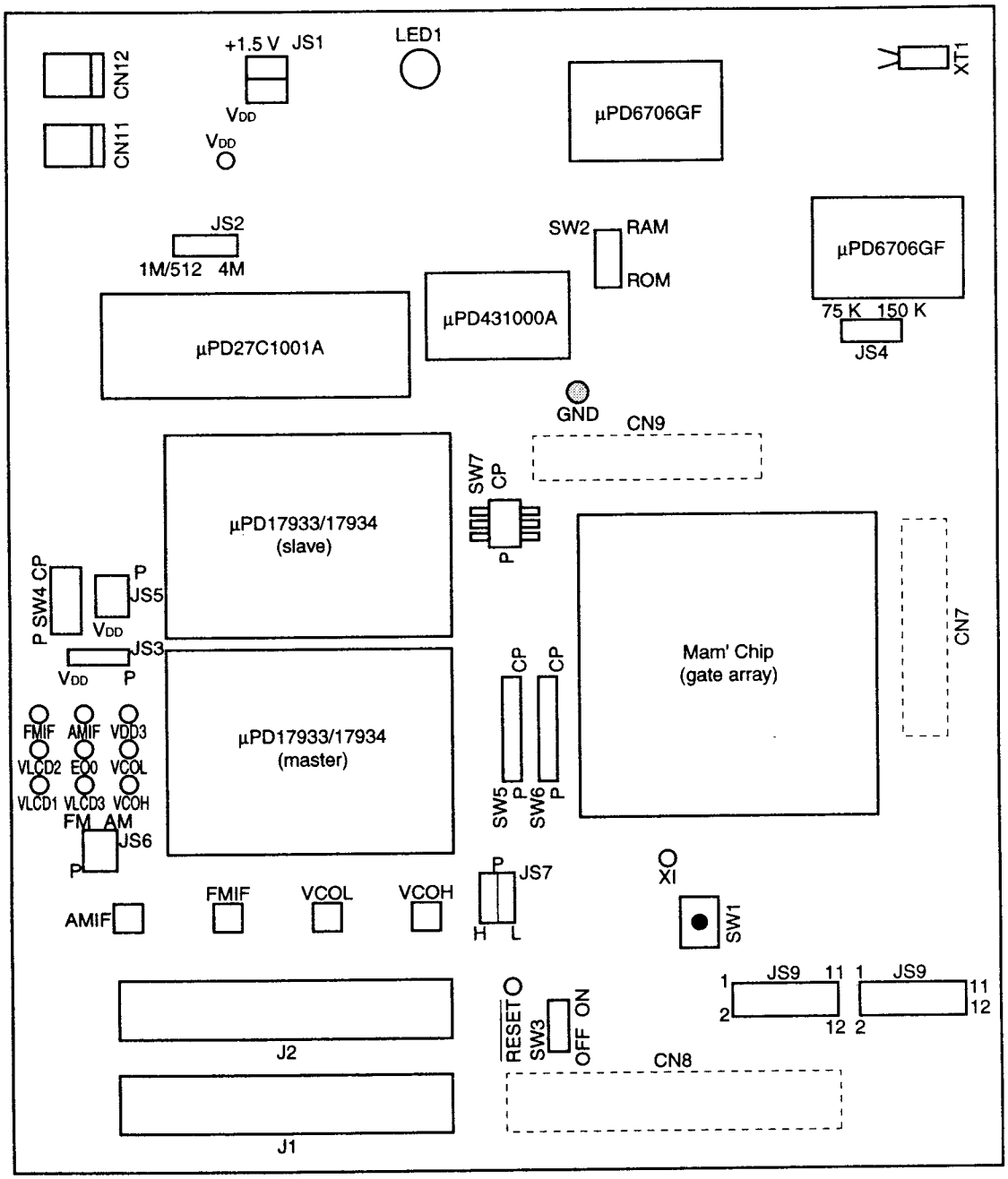
[MEMO]

CHAPTER 2 SPECIFICATIONS

Here are the specifications of the SE-17934:

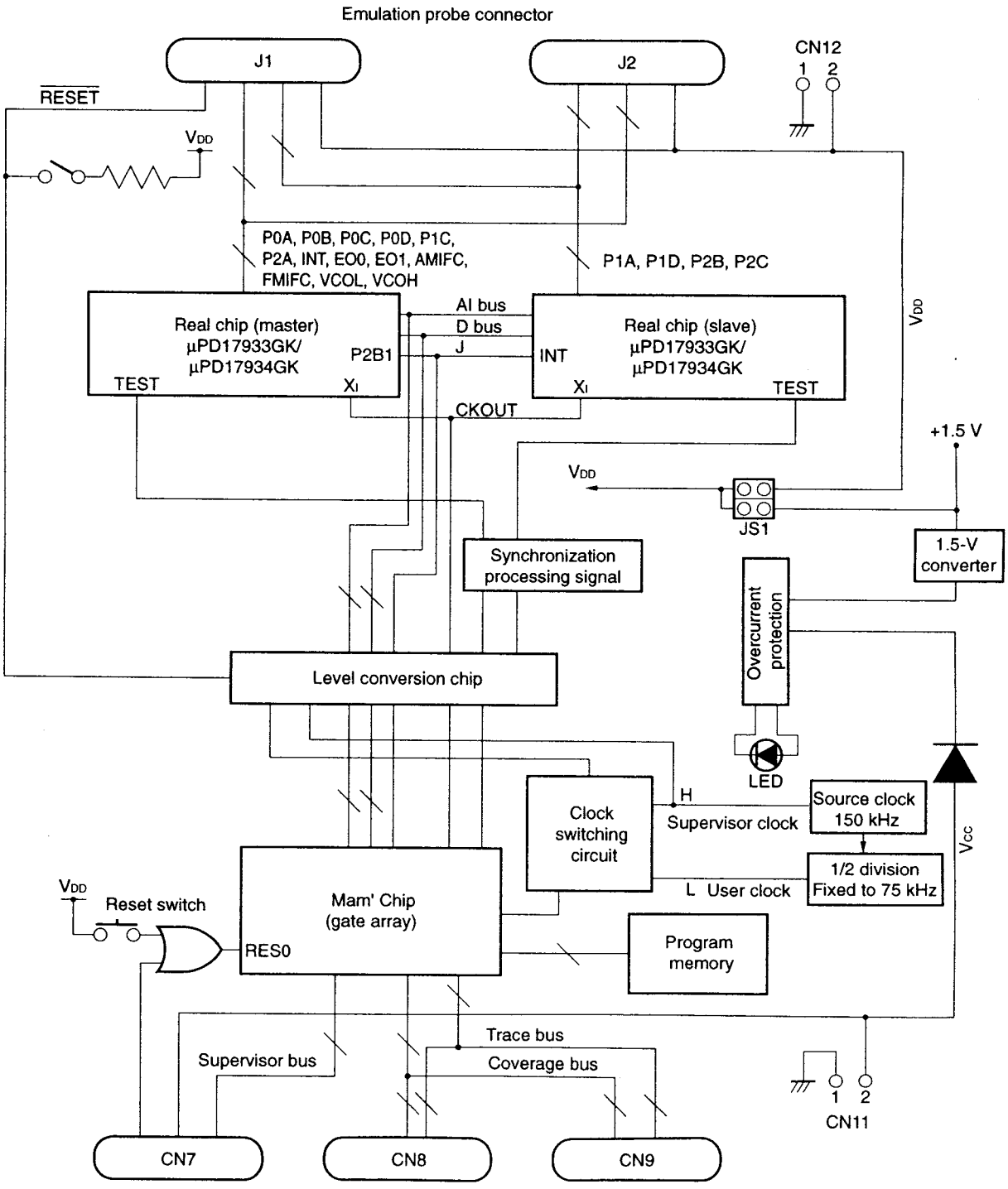
Product name	: SE-17934
Program memory	: • The μPD431000ACW mounted on board is used when the SE-17934 is used with an in-circuit emulator (IE-17K or IE-17K-ET). • When the SE-17934 alone is used, write program to the μPD27C1001GD and mount the memory onto a socket (IC2) on the board.
Data memory	: The on-chip memory of the real chip is used.
Operating frequency	: 75 kHz
Instruction cycle	: 53.3 μs (at 75 kHz oscillation)
Operating temperature	: +10 to +40°C
Storage temperature	: −10 to +50°C (without condensation)
Power supply	: • For real chip (V_{DD}) : +1.2 to +1.8 V Power is supplied from emulation probe (EP-17K80GK) or CN12 pin. • For SE-17934 (Vcc) : +5 V ± 5% Power is supplied from the in-circuit emulator when the SE-17934 is used with an in-circuit emulator. When the SE-17934 alone is used, supply power from the CN11 pin.
Current consumption	: 150 mA (MAX.) (without load and with the μPD27C1001AD used as the program memory)
Dimensions	: 150 x 175 x 33 mm

Figure 2-1. SE-17934 Component Layout



CHAPTER 3 BLOCK DIAGRAM

Figure 3-1. SE-17934 Block Diagram



Connector for memory board of in-circuit emulator

[MEMO]

CHAPTER 4 HOW TO USE

4.1 Using Level Conversion Chip (μPD6706GF)

(1) Outline of level conversion chip

The level conversion chip is an IC that converts a voltage level of the target system (or SE board) into the voltage at which the SE board (or target system) operates if the operating voltages of the target system and SE board are different ($V_{DD} \neq V_{CC}$, $V_{CC} = +5$ V). Therefore, this IC allows smooth signal transfer between the target system and SE board even when the operating voltages of the two are different.

(2) Using level conversion chip

The level conversion chip automatically operates when a voltage other than 5 V is applied between the V_{DD} and GND pins of the emulation probe (EP-17K80GK) or to the CN12 pin of the SE board with the jumper switch JS1, which selects a method of supplying power to the SE board, set to the V_{DD} side.

Remarks 1. V_{DD} is the supply voltage of the target system to be used. Power can be supplied from the target system to the real chip on the SE board from the CN12 pin or emulation probe. Consequently, debugging can be performed in an environment close to the actual environment.

2. V_{CC} is the voltage at which the SE board (except the real chip) operates. Always supply +5 V as V_{CC}. When the SE board is mounted to an in-circuit emulator, V_{CC} is automatically supplied from the in-circuit emulator. When the SE board alone is used, supply V_{CC} from the CN11 pin.

4.2 Supplying Voltage to SE Board

Two types of voltages must be supplied to the SE board: V_{CC} and V_{DD}. V_{CC} is the voltage at which the SE board (except the real chip) operates. The real chip operates at V_{DD}.
Always supply +5 V as V_{CC}. As V_{DD}, supply a voltage in the range of the operating voltage of the real chip (+1.2 to +1.8 V).

(1) Jumper switch selecting method of power supply to SE board (JS1)

Jumper switch JS1 selects whether the 1.5-V voltage supplied from the SE board (V_{CC} = +5 V), or the voltage supplied from the emulation probe or CN12 pin (V_{DD}) is supplied to the real chip.
Table 4-1 shows the function of JS1 when the SE board is mounted to an in-circuit emulator. **Table 4-2** shows the function of JS1 when the SE board alone is used.
If the supply voltage of the target system is +1.5 V, set JS1 to the +1.5 V side. When the SE board is mounted to an in-circuit emulator, +1.5 V is automatically supplied from the in-circuit emulator. When the SE board alone is used, +1.5 V is supplied from the CN11 pin. This has the advantage that supplying voltage is extremely easy.
If the supply voltage of the target system is other than +1.5 V while JS1 is set to the V_{DD} side, the voltage of the target system can be supplied to the real chip from the emulation probe or CN12 pin, so that evaluation can be performed in an environment close to the actual environment.

Caution Set the supply voltage to the real chip in the range of V_{DD} = +1.2 to +1.8 V.

Table 4-1. Function of JS1 When SE Board is Mounted to In-Circuit Emulator

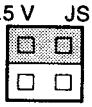
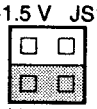
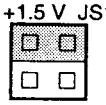
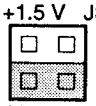
Type of Power / Setting of JS1	Power Supplied to Real Chip (V_{DD})	Power to Operate SE board (except real chip) (V_{CC})
+1.5 V JS1  V_{DD}	+1.5 V is supplied from in-circuit emulator.	+5 V is supplied from in-circuit emulator.
+1.5 V JS1  V_{DD}	Power must be supplied from emulation probe or CN12 pin.	

Table 4-2. Function of JS1 When SE Board Alone is Used

Type of Power / Setting of JS1	Power Supplied to Real Chip (V_{DD})	Power to Operate SE board (except real chip) (V_{CC})
+1.5 V JS1  V_{DD}	+1.5 V is supplied from CN11 pin.	+5 V is supplied from CN11 pin.
+1.5 V JS1  V_{DD}	Power must be supplied from emulation probe or CN12 pin.	

The shaded portions in the above figures indicate the selected switch positions.

(2) Power supply pins

The SE board has three pins through which power is supplied from external sources. Appropriate pin and power must be selected and used depending on the evaluation environment. **Table 4-3** shows the functions of these pins.

Table 4-3. Power Supply Pins and Their Functions

Pin Name	Type of Power (range of supplied voltage)	Function
CN11	Vcc (+5 V ± 5%)	This pin is used to supply power when SE board alone is used (except real chip). Always supply +5 V to this pin. Do not supply power through this pin when SE board is mounted to in-circuit emulator.
CN12	V_{DD} (+1.2 to 1.8 V)	This pin supplies +1.2 to 1.8 V to real chip.
Emulation probe (V_{DD} and GND pins)	V_{DD} (+1.2 to 1.8 V)	Function is equivalent to that of CN12 pin. CN12 pin of SE board is connected to power supply pin of emulation probe.

Remark Pin 1 of the CN11 pin is GND, and pin 2 is the power supply pin. To supply power, use the power supply cable supplied as an accessory.

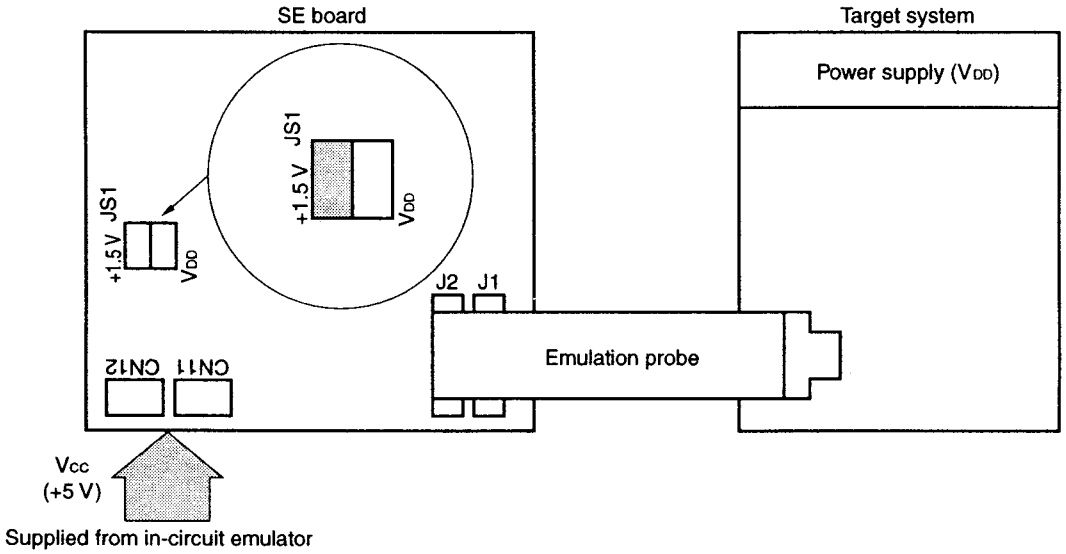
(3) Example of actual use

<1> When SE board is mounted to in-circuit emulator

(a) When SE board is mounted to in-circuit emulator with V_{DD} = +1.5 V, Vcc = +5 V

Set JS1 to the +1.5 V side. Vcc and V_{DD} are supplied from the in-circuit emulator.

Figure 4-1. When SE Board is Mounted to In-Circuit Emulator with V_{DD} = +1.5 V, Vcc = +5 V



(b) When SE board is mounted to in-circuit emulator with $V_{DD} \neq$ +1.5 V, Vcc = +5 V

Set JS1 to the V_{DD} side. Vcc is supplied from the in-circuit emulator, and V_{DD} is supplied from the CN12 pin or emulation probe.

Figure 4-2. When SE Board is Mounted to In-Circuit Emulator and V_{DD} (+1.2 to 1.8 V) is Supplied from CN12 Pin

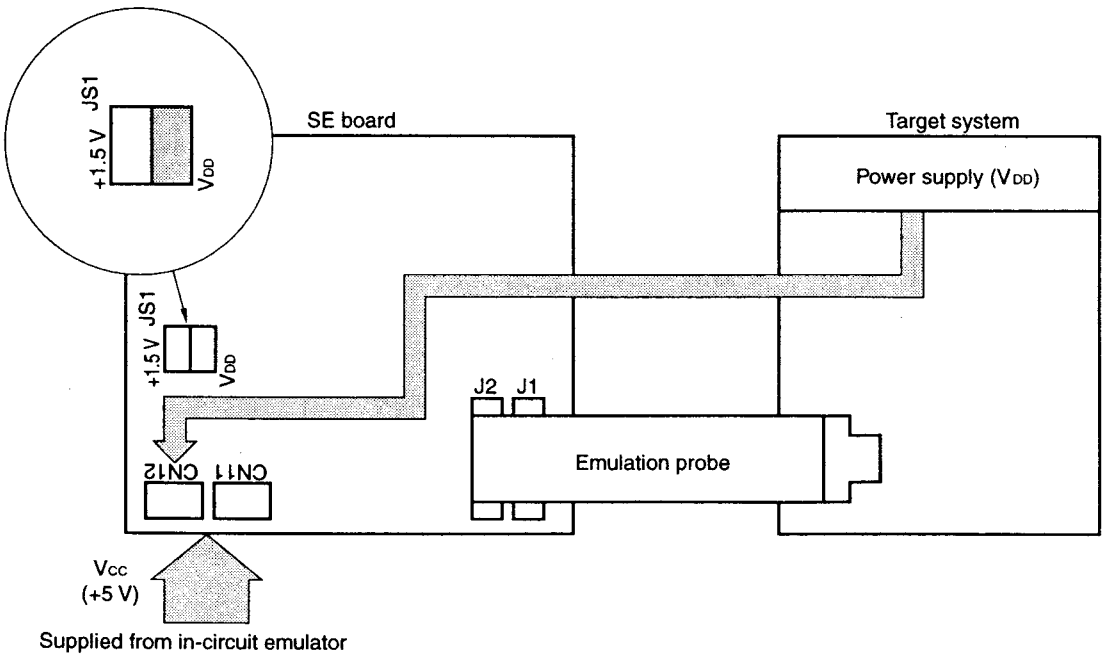
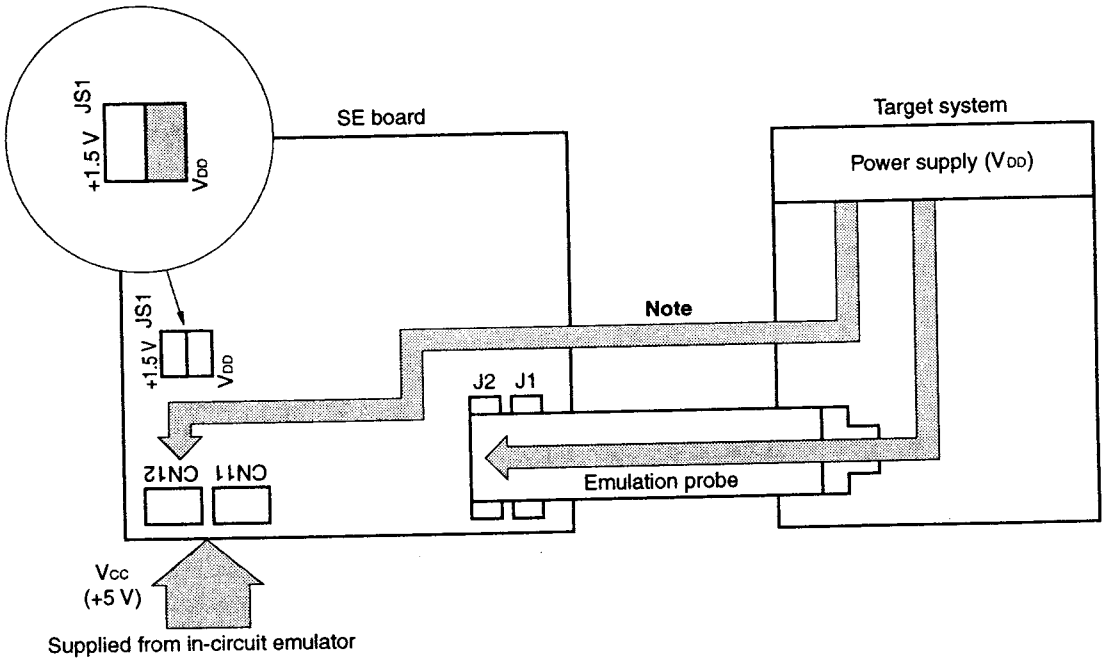


Figure 4-3. When SE Board is Mounted to In-Circuit Emulator and V_{DD} (+1.2 to 1.8 V) is Supplied from Emulation Probe



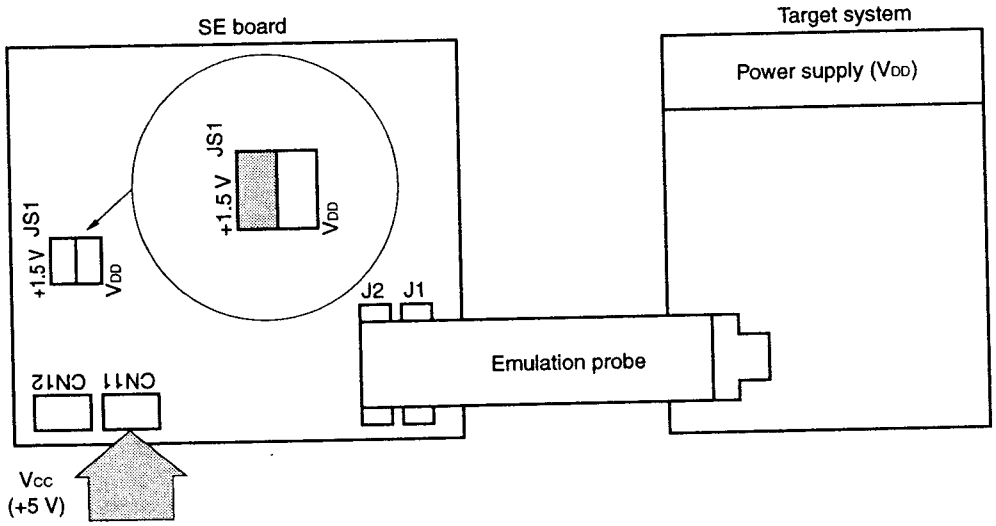
Note If additional voltage is supplied from the CN12 pin, make sure to supply the same voltage as supplied from the emulation probe.

<2> When SE board alone is used

(a) When SE board alone is used with V_{DD} = +1.5 V, Vcc = +5 V

Set JS1 to +1.5 V side. Vcc and V_{DD} are supplied from the CN11 pin.

Figure 4-4. When SE Board Alone is Used with V_{DD} = +1.5 V, Vcc = +5 V



(b) When SE board alone is used with $V_{DD} \neq +1.5$ V, Vcc = +5 V

Set JS1 to the V_{DD} side. Vcc is supplied from the CN11 pin, and V_{DD} is supplied from the CN12 pin or emulation probe.

Figure 4-5. When SE Board Alone is Used and V_{DD} is Supplied from CN12 Pin

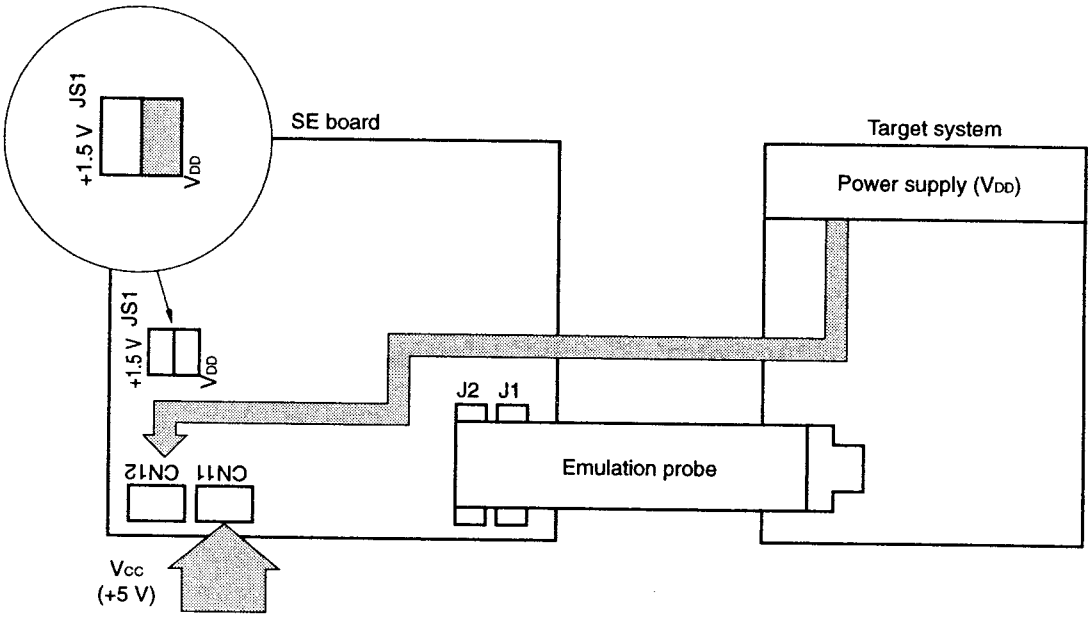
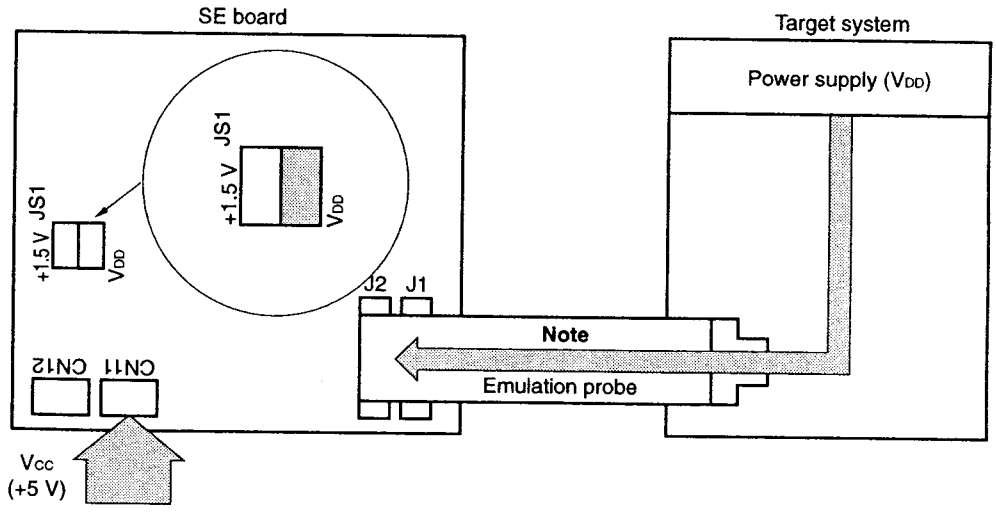


Figure 4-6. When SE Board Alone is Used and V_{DD} is Supplied from Emulation Probe



Note If the voltage supplied from the emulation probe is low (less than +1.5 V), additional voltage should be supplied from the CN12 pin.
In this case, make sure to supply the same voltage as supplied from the emulation probe.

4.3 Setting of Other Switches

(1) **SW1: Reset switch**

SW1 is the reset switch used when the SE board alone is used.

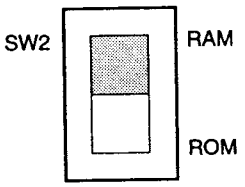
For details, refer to **4.5 Using SE Board Alone**.

(2) **SW2: Slide switch selecting ROM/RAM**

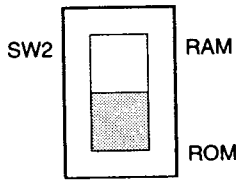
This switch selects the setting of the program memory to be used.

Figure 4-7. Setting of SW2

<1> When SE board is mounted to in-circuit emulator



<2> When SE board alone is used



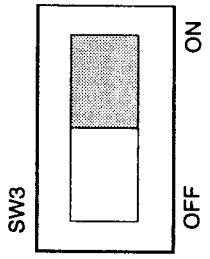
Remark The shaded portions in the above figures indicate the selected switch positions.

(3) SW3 pull-up select switch

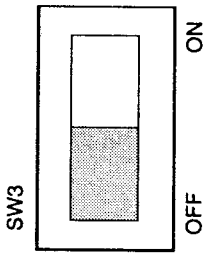
These switches specify whether the $\overline{\text{RESET}}$ pin of the real chip is pulled up or not.
When the SE-17934 is not connected to the target system, be sure to pull up the CE pin/$\overline{\text{RESET}}$ pin by setting these switches to the ON side.

Figure 4-8. Setting of SW3

<1> To pull up $\overline{\text{RESET}}$ pin



<2> To not pull up $\overline{\text{RESET}}$ pin

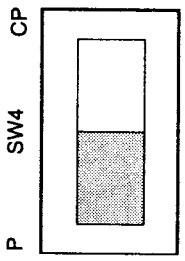


(4) SW4 PLL power supply select switch

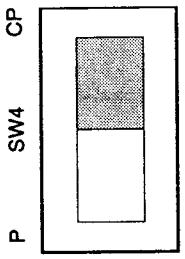
This switch sets the PLL power supply.

Figure 4-9. Setting of SW4

<1> To supply PLL power supply to external from PLL power supply pin of real chip



<2> To connect the PLL power supply pin (REG) of the real chip to the capacitor (0.22 μF) on the SE board, and not supply PLL power supply to external



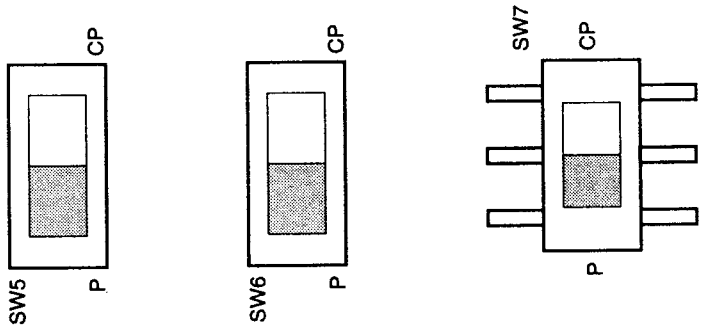
Remark The shaded portions in the above figures indicate the selected switch positions.

(5) SW5, SW6, SW7 LCD power supply selection slide switch

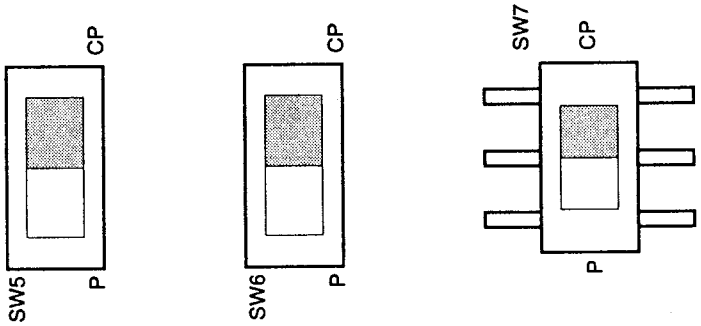
This switch selects whether to connect the LCD driving current supply pin to the capacitor (0.33 μF) or output it to external. At the same time, it also serves to select the driving current supply capacitor (internal or external).

Figure 4-10. Setting of SW5, SW6, SW7

<1> To supply LCD power supply from LCD power supply pins ($REG_{LCD}0$ to $REG_{LCD}2$) of real chip to external, and use LCD driving power supply pins ($CAP_{LCD}0$ to $CAP_{LCD}3$) for external capacitor



<2> To connect capacitor to be used for LCD power supply pins ($REG_{LCD}0$ to $REG_{LCD}2$) of real chip and LCD driving power supply pins ($CAP_{LCD}0$ to $CAP_{LCD}3$) to SE board, and not supply LCD power supply to external



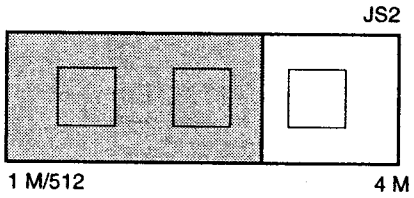
Remark The shaded portions in the above figures indicate the selected switch positions.

(6) JS2 ROM type switching jump switch

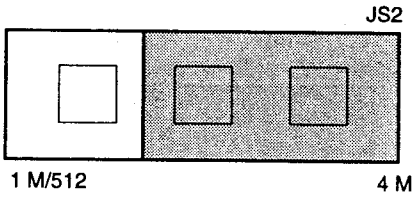
Perform switching according to the type of program memory to be used.

Figure 4-11. Setting of JS2

<1> If ROM is 512-K/1-M type



<2> If ROM is 4-M type



Remark The shaded portions in the above figures indicate the selected switch position.

(7) JS3 Real chip CPU power supply ($V_{DD}1$) switching jumper switch

This switch sets whether to connect the CPU power supply (V_{DD}) pin of the real chip to V_{DD} on the SE board, or connect it to the target system.

Figure 4-12. Peripheral Circuit of JS3

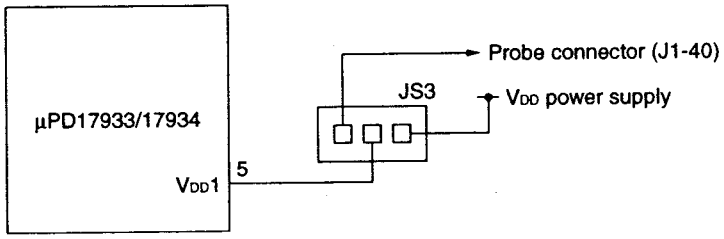
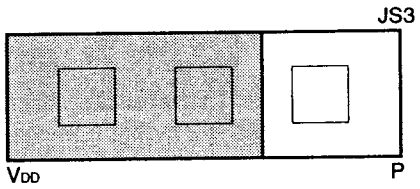
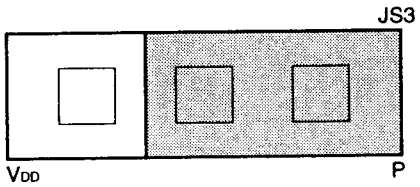


Figure 4-13. Setting of JS3

<1> To connect CPU power supply ($V_{DD}1$) of real chip to V_{DD} power supply on SE board



<2> To supply power from external through probe to CPU power supply ($V_{DD}1$) of real chip



Remark The shaded portions in the above figures indicate the selected switch positions.

(8) JS5 Real chip CPU power supply ($V_{DD}2$) select jump switch

This switch sets whether to connect the real chip CPU power supply ($V_{DD}2$) to V_{DD} on the SE board or to the target system.

Figure 4-14. Peripheral Circuit of JS5

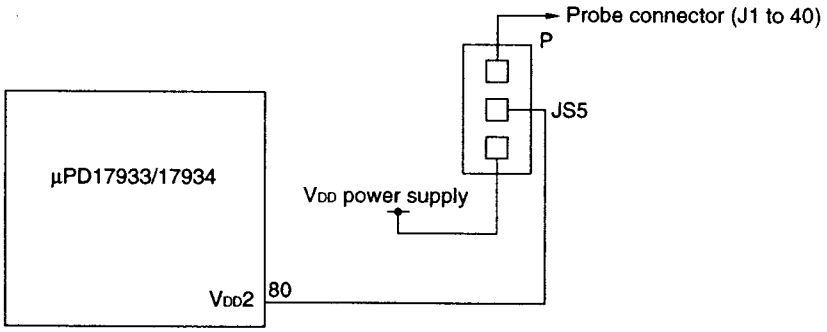
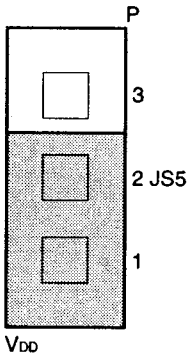
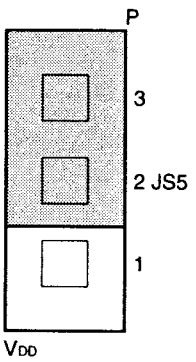


Figure 4-15. Setting of JS5

<1> To connect real chip CPU supply power pins ($V_{DD}2$) to V_{DD} on SE board



<2> To supply power from outside through probe to real chip CPU power supply pins ($V_{DD}2$)



Remark The shaded portions in the above figures indicate the selected switch positions.

(9) AMIFC/P1C2, FMIFC/P1C3 and VCOH, VCOL pin input select jumper switch

This switch sets whether to perform AMIFC/P1C2, FMIFC/P1C3, and VCOH, VCOL pin input through a probe or a coaxial cable.

The AMIFC/P1C2 and FMIFC/P1C3 pins are IF counter/input port duplex pins.

Figure 4-16. Peripheral Circuit of JS6, JS7

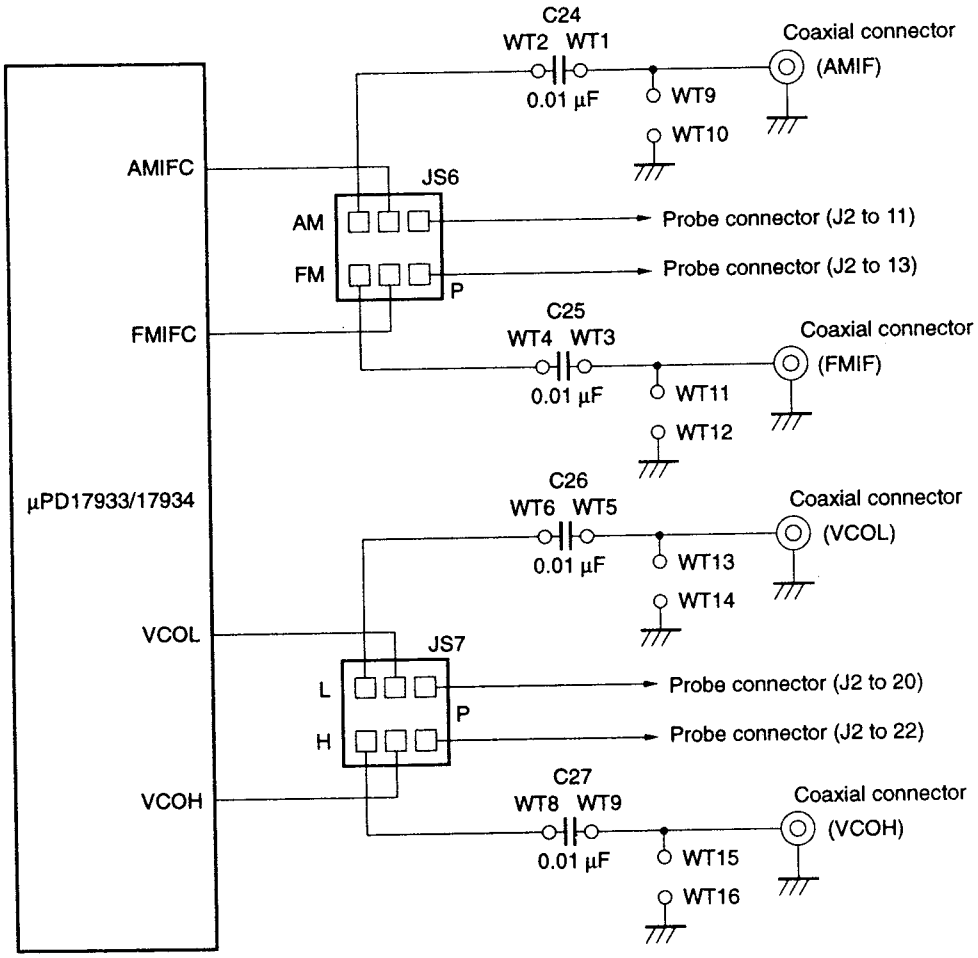
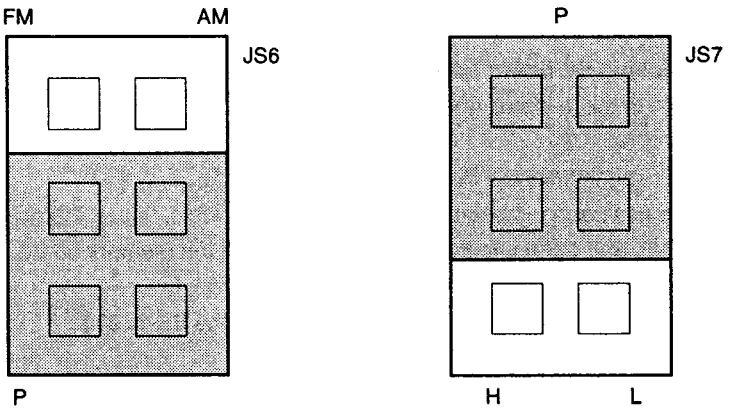
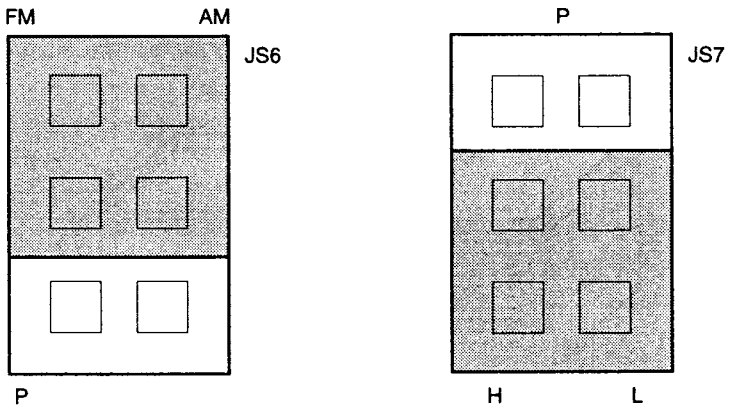


Figure 4-17. Setting of JS6, JS7

<1> If using probe



<2> If using coaxial cable



Remark The shaded portion in the above figures indicates the selected switch positions.

4.4 When SE Board is Mounted to In-Circuit Emulator

The in-circuit emulator is connected to a host machine such as the PC-9800 series to debug the target system. For details on the operations of the in-circuit emulator, refer to the **IE-17K** or **IE-17K-ET User's Manual**.

(1) Mounting and removing SE board to/from in-circuit emulator

Mount the SE-17934 to the in-circuit emulator as follows:

<1> Remove the exterior and interior lids from the in-circuit emulator.

<2> When the interior lid has been removed, a memory board is visible. Insert the connectors on the bottom of the SE-17934 (CN7, CN8, and CN9) into the three connectors on the memory board.

To remove the SE-17934 from the in-circuit emulator, lift out the SE-17934.

Figure 4-18. Appearance of IE-17K (with exterior lid removed)

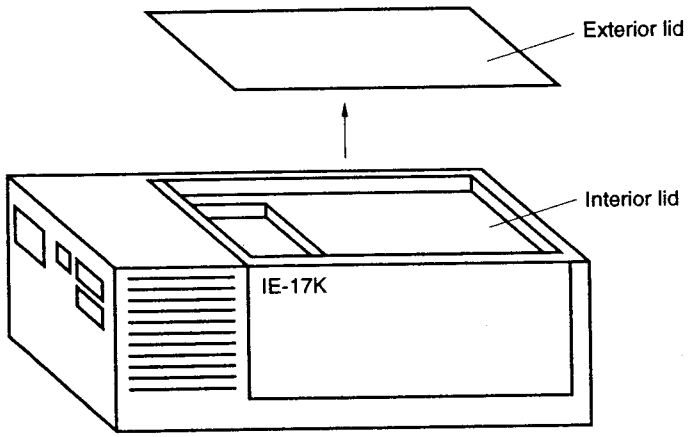
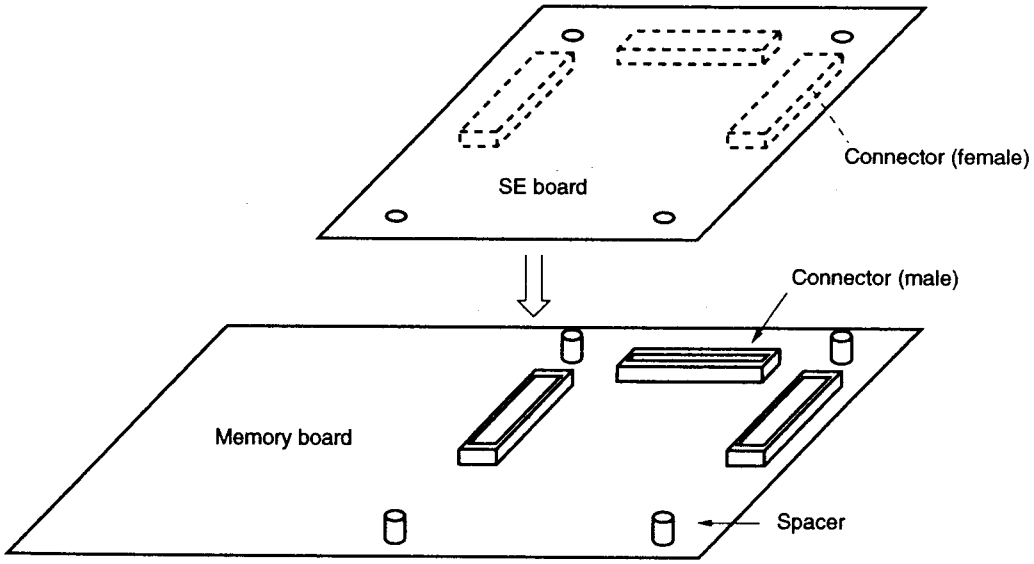


Figure 4-19. Mounting and Removing SE-17934



Next, connect the emulation probe (EP-17K80GK) to the connectors J1 and J2 on the SE-17934, to connect the target system.
Then attach the interior and exterior lids to the in-circuit emulator.

(2) Supplying power

After the SE-17934 has been mounted to the in-circuit emulator and before attaching the exterior and interior lids of the in-circuit emulator, turn on power to the in-circuit emulator and confirm that LED1 on the SE-17934 lights. If LED1 does not light, the possible causes are as follows:

- The power cable of the in-circuit emulator is not connected.
- An overcurrent flows to the SE-17934 (about 500 mA or higher).
- The SE-17934 is not correctly mounted to the in-circuit emulator.

If LED1 does not light, turn off the power to the in-circuit emulator, and check to see if the SE-17934 is correctly mounted. If LED1 still does not light, the SE-17934 may be malfunctioning.

(3) Transferring ICE file to in-circuit emulator

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

When using the *SIMPLEHOST*, refer to the ***SIMPLEHOST* User's Manual**.

The procedure to confirm that the SE-17934 has been correctly mounted to the in-circuit emulator when commercially available RS-232-C communication software is used is described below.

When the *SIMPLEHOST* is used, and if the SE-17934 has been correctly mounted, the message "LISTING" is displayed on the screen.

<1> Turn on the power to the in-circuit emulator. If the power is already supplied, press the reset switch for restart. The prompt (@@@>) will then be displayed.

<2> Next, load the ICE file of the program created with the assembler (RA17K assembler package) or the ICE file output by using the ,.SP0 or ,.SP1 command to the in-circuit emulator by using the ,.LP0 or ,.LP1 command.

The in-circuit emulator will not operate until this ICE file has been loaded to it.

If the SE board is correctly connected to the in-circuit emulator at this time, a prompt (BRK>) will be displayed as shown in the following example.

Example When ICE file for the μPD17934 is loaded

```
OK
D17934
BRK>
```

If the above messages are not displayed, the possible causes are as follows:

- The real chip mounted to the SE-17934 does not correspond to the loaded ICE file.
- An SE board other than the SE-17934 is mounted to the in-circuit emulator.
- An ICE file other than that for the μPD17934 has been loaded.
- The SE-17934 is not completely connected to the in-circuit emulator.
- The $\overline{\text{RESET}}$ pin (SW3) is not pulled-up.

If the in-circuit emulator makes no response, take the following measures:

<1> The SE board may not be connected correctly to the in-circuit emulator. Correctly connect the SE board.

<2> The target system and SE board may not be connected correctly with the emulation probe (EP-17K80GK). Check the connections again.

<3> If JS1 is set to the V_{DD} side, power may not be supplied to the real chip from the emulation probe or CN12 pin. Supply power from the emulation probe or CN12 pin to the real chip, or set JS1 to the +1.5 V side.
If JS1 is set to the +1.5 V side, the in-circuit emulator supplies +1.5 V (refer to **4.2 Supplying Voltage to SE Board**).

<4> The reset circuit of the target system may not operate correctly. If this happens, the reset status of the SE board is not stable, and the in-circuit emulator cannot return a response.
In this case, turn ON SW3 that selects pull up of the $\overline{\text{RESET}}$ pin, to start the in-circuit emulator again.

<5> Check the set baud rates of the in-circuit emulator and host machine. For the baud rate setting of the in-circuit emulator, refer to the **IE-17K** or **IE-17K-ET User's Manual**.

(4) Error message and remedial action

An error message is displayed if the correspondence between the real chip mounted to the in-circuit emulator and SE board, and the loaded ICE file is wrong.
Moreover, an SE board number is registered to the SE-17934 and a device number is registered to the real chip, so that debugging can be correctly executed.
Error messages that may be displayed and remedial actions to be taken if an error message is displayed are described next.

Table 4-4. Device Number and SE Board Number

Evaluation Device	Device Number	SE Board Number
μPD17933	5A	59
μPD17934	59	59

Remarks 1. A device number is the registration number of each real chip.

2. An SE board number is the registration number of the SE board.

3. A device number and an SE board number are contained in the data in the ICE file to be loaded and are used by the in-circuit emulator to check the development environment when the ICE file is loaded.
For example, an ICE file assembled by using the device file for the μPD17934 contains device number = 59 and SE board number = 59.

(a) Error message to be displayed and remedial action when real chip mounted to SE-17934 does not correspond to loaded ICE file

[Error message]

?IDI INVALID DEVICE ID NUMBER [XX-**]

Remark XX indicates the device number of the real chip actually mounted, and ** indicates the device number contained in the loaded ICE file.

If this message has been output, check to see if the correct real chip is mounted on the SE board. If the real chip is wrong, turn off power to the in-circuit emulator, replace the real chip, and load the ICE file again. If a wrong device file was selected at assembly time, assemble the source file again by using the correct device file, and load the ICE file again.

(b) Error message to be displayed and remedial action when SE board other than SE-17934 is mounted

[Error message]

?ISE INVALID SE BOARD NUMBER [##-VV]

Remark ## indicates the SE board number of the SE board actually mounted, and VV indicates the SE board number contained in the loaded ICE file.

(5) Cautions

<1> Turn on power to the in-circuit emulator and then to the target system.

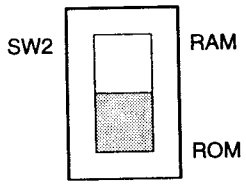
<2> Do not use the reset switch (SW1) on the SE board.
To reset the in-circuit emulator, use the reset switch of the in-circuit emulator.

4.5 Using SE Board Alone

(1) Setting of slide switch selecting ROM/RAM

Set the slide switch selecting ROM/RAM (SW2) to the ROM side as shown in **Figure 4-20.**

Figure 4-20. Setting of Slide Switch Selecting ROM/RAM



Remark The shaded portion in the above figure indicates the selected switch position.

(2) Mounting PROM

To use the SE-17934 alone, mount a PROM (μPD27C1001AD) as a program memory.

Use the PROM that satisfies the following conditions:

- ROM size

  1 Mbits : μPD27C1001AD-12, -15, -20, or equivalent

Either of the following output files must be written to the PROM as a program:

- PROM file (.PRO) for the μPD17933, 17934 output by the 17K series assembler (RA17K assembler package)

Cautions 1. Do not write the ICE file (.ICE) that RA17K assembler package outputs to the in-circuit emulator. When the SE-17934 alone is used, the SE board does not operate with the ICE file.

2. The SE board does not operate with PROM files (.PRO) created by the AS17K.

3. The last address of the program memory of the μPD17933, 17934 is as follows:

μPD17933 : 2FFFH

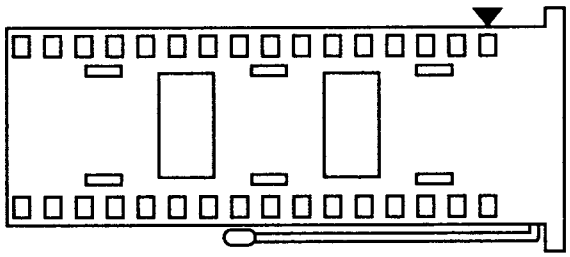
μPD17934 : 3FFFH

Mount the PROM to a socket (IC2) on the SE board.

Notes on mounting PROM

- Mount the μPD27C1001AD (32-pin) so that pin 1 aligns with the up-side-down triangle below it.

Figure 4-21. PROM (IC2) Mounting Socket



(3) Supplying power

Be sure to supply +5 V ± 5% (Vcc) to the CN11 pin of the SE-17934 from an external power source. For details, refer to **4.1 Using Level Conversion Chip (μPD6706GF)** and **4.2 Supplying Voltage to SE Board**.

When Vcc is correctly supplied, LED1 on the SE-17934 lights.

If LED1 does not light, the possible causes are as follows:

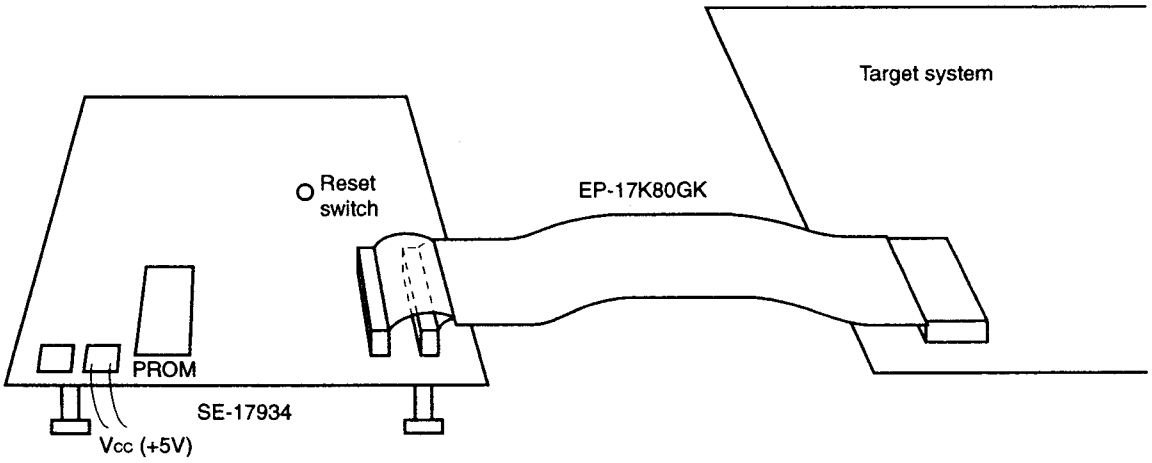
- Power is not supplied.
- Overcurrent flows (about 500 mA or higher).

(4) Executing program

Connect the SE-17934 and the target system as illustrated in **Figure 4-22**. When the power to the target system is turned on, power is also supplied to the SE-17934, power-ON reset is effected, and the program written to the PROM is executed starting from address 0H.

When the reset switch on the SE-17934 is pressed, the SE board is forcibly reset, and the program written to the PROM is executed starting from address 0H, in the same manner as when power-ON reset is effected.

Figure 4-22. Example of Connection When SE-17934 Alone is Used



4.6 Monitor Pins and LEDs

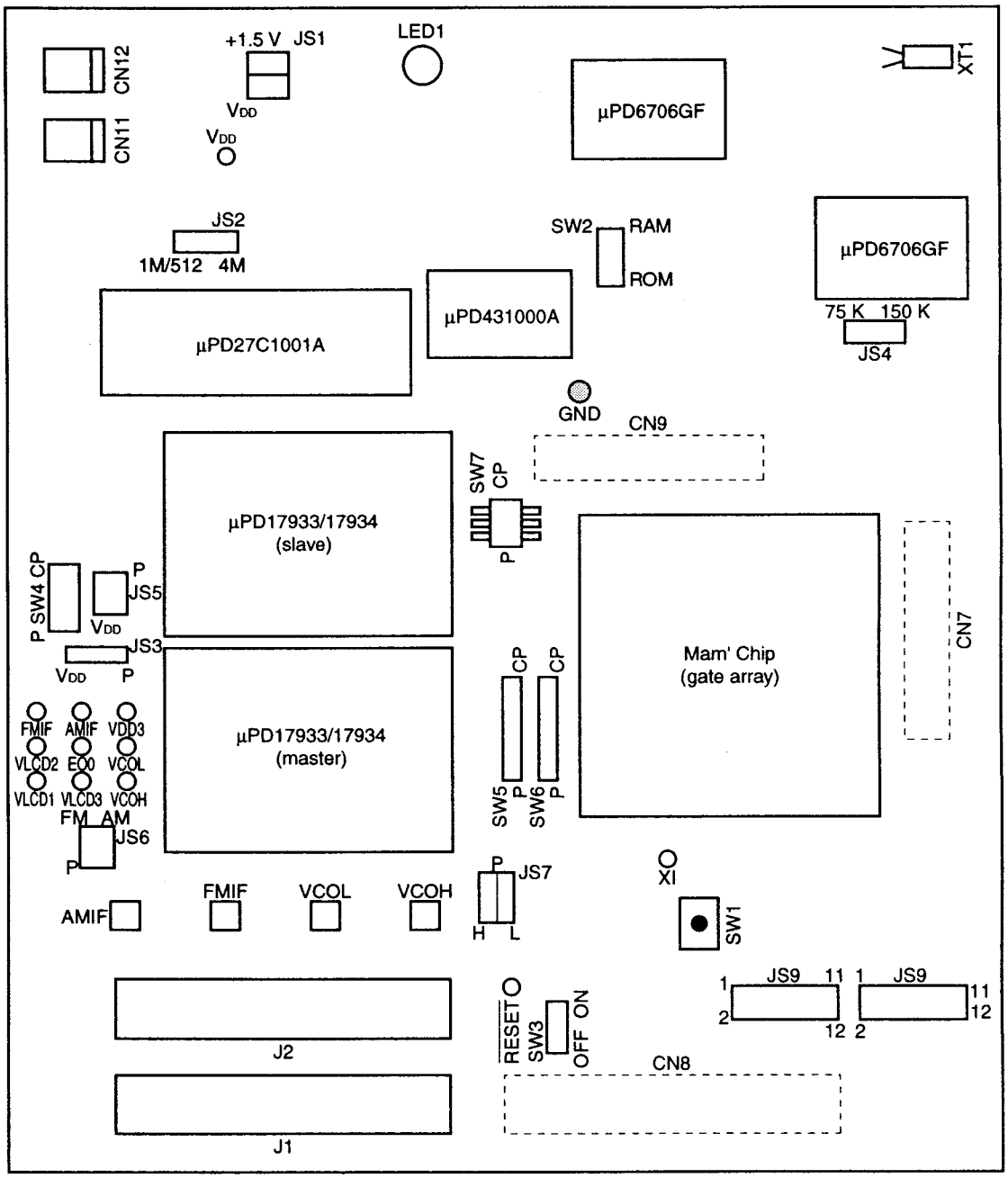
The SE-17934 is provided with monitor pins that check the pin status of the real chip, and LEDs that indicate the operation status of the board. **Table 4-5** lists the monitor pins and LEDs and their functions. **Figure 4-22** shows the layout of the monitor pins and LEDs.

Table 4-5. Monitor Pins and LEDs, and Their Functions

Monitor Pin, LED		Function
Monitor pin	XI	To CKOUT monitor
	$\overline{\text{RESET}}$	To $\overline{\text{RESET}}$ monitor
	GND	GND
	V_{DD}	To monitor power supply V_{DD}
	AMIF	To AMIFC monitor
	FMIF	To FMIFC monitor
	VCOL	To VCOL monitor
	VCOH	To VCOH monitor
	EO0	To EO0 monitor
	$V_{LCD}1$	To $REG_{LCD}0$ monitor
	$V_{LCD}2$	To $REG_{LCD}1$ monitor
	$V_{LCD}3$	To $REG_{LCD}2$ monitor
	$V_{DD}3$	To $V_{DD}2$ monitor
LED1		Light : Power ON Dark : Power OFF

Remark Pin names in this function list are those of real chip.

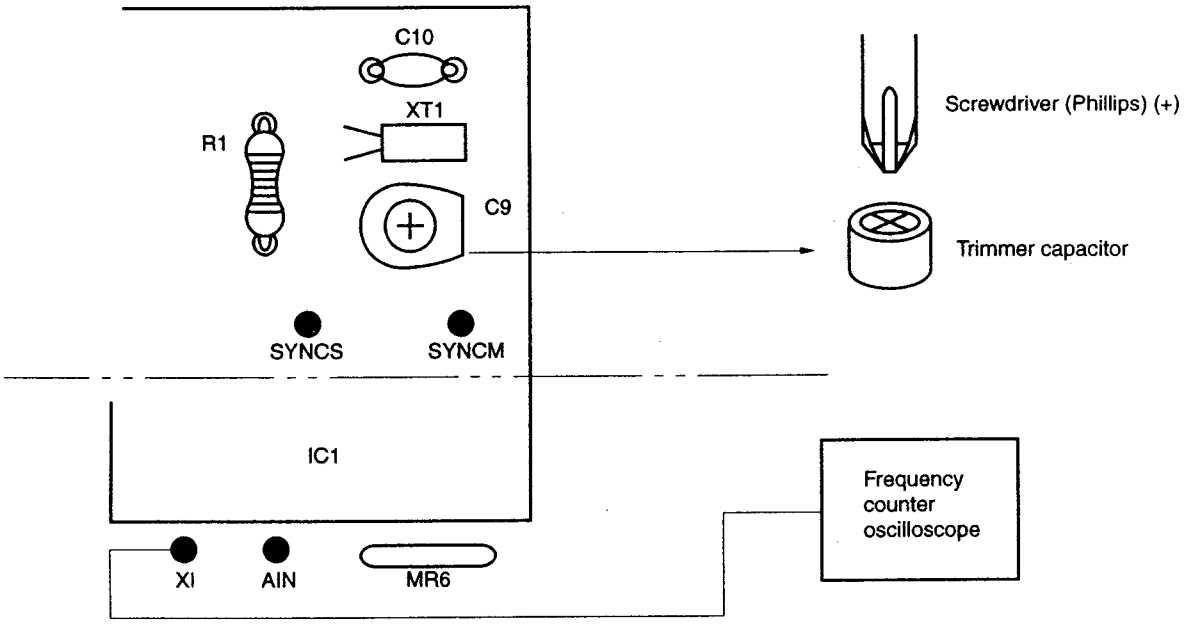
Figure 4-23. Layout of Monitor Pins and LEDs



4.7 Fine-Tuning of Source Clock Oscillation Frequency (150 kHz)

The frequency of the source clock for the supervisor operation[Note] of the SE board is 150 kHz.
The clock (75 kHz) supplied to the real chip uses the source clock as it is.
To fine-tune the source clock frequency, use a trimmer capacitor (C9) as shown in **Figure 4-24**. To monitor the oscillated waveform and measure oscillation, use monitor pin "XI".

Figure 4-24. Fine-Tuning of Source Clock

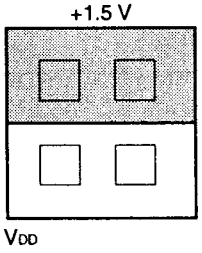
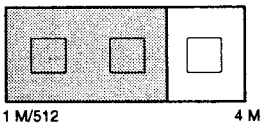
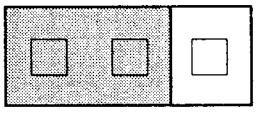
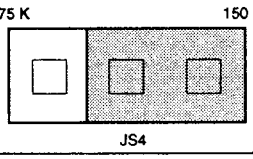
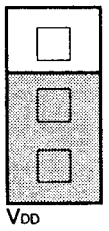


Note An operation to be executed on the in-circuit emulator when CLICE is used.

4.8 Setting of Jumper Switches and Slide Switches

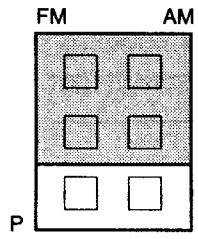
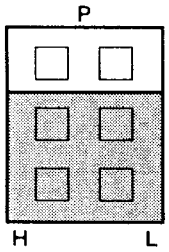
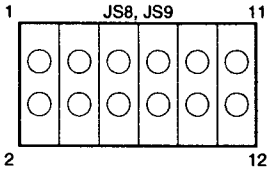
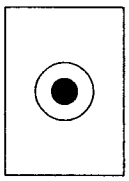
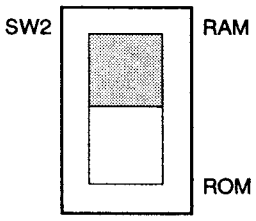
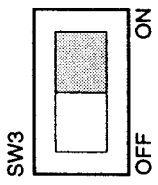
The jumper switches and slide switches of the SE-17934 are factory-set as indicated in **Table 4-6** for shipment. Confirm the setting of these switches before using them.

Table 4-6. Setting of Jumper Switches and Slide Switches (1/3)

Switch Number	Jumper Switch, Slide Switch	Set Conditions	Set Position
JS1		Refer to **4.1 Using Level Conversion Chip (μPD6706GF)** and **4.2 Supplying Voltage to SE Board.**	
JS2		If 1-M/512-Kbit ROM is used.	1 M/512 side
		If 4-Mbit ROM is used.	4 M side
JS3		If real chip VDD2 power supply pin is connected to internal power supply (VDD) inside SE board	VDD side
		If real chip VDD2 power supply pin is connected to external power supply via probe	P side
JS4		Set at factory shipping	Do not change the setting of this jumper switch.
JS5		If the real chip VDD3, VADREF power supply pins are connected to the internal power supply	VDD side
		If the real chip VDD3, VADREF power supply pins are connected to an external power supply via a probe	P side

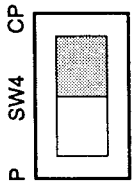
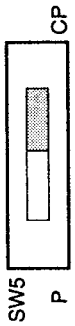
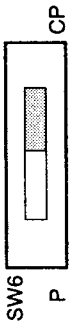
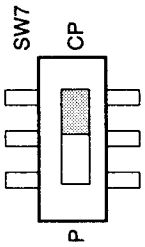
Remark The shaded portions in the above figures indicate the factory settings at shipment.

Table 4-6. Setting of Jumper Switches and Slide Switches (2/3)

Switch Number	Jumper Switch, Slide Switch	Set Conditions	Set Position
JS6		If AMIFC/PIC2, FMIFC/P1C3 are input/output through coaxial cable	FM, AM side
		If AMIFC/PIC2, FMIFC/P1C3 are input/output through probe	P side
JS7		If VCOH, VCOL are input through coaxial cable	H, L side
		If VCOH, VCOL are input through probe	P side
JS8, JS9		At factory shipping, set according to delay of real chip.	Do not change the setting of this switch.
SW1		Used if reset signal is input when using SE board on stand-alone basis. Cannot be used when in-circuit emulator (IE-17K) is mounted.	—
SW2		If incorporated in in-circuit emulator (IE-17K) for evaluation.	RAM side
		To perform evaluations with SE-17934 only.	ROM side
SW3		If $\overline{\text{RESET}}$ pin on target side is pulled up	ON side
		If $\overline{\text{RESET}}$ pin on target side is not pulled up	OFF side

Remark The shaded portions in the figures above indicate the factory settings at shipment.

Table 4-6. Setting of Jumper Switches and Slide Switches (3/3)

Switch Number	Jumper Switch, Slide Switch	Set Conditions	Set Position
SW4		If real chip REG power supply pin is connected to external through probe	P side
		If real chip REG power supply pin is connected to capacitor (0.22 μF) inside SE board	CP side
SW5		If real chip power supply pins $CAP_{LCD}0$ to $CAP_{LCD}3$ are connected to external through probe	P side
		If real chip power supply pins $CAP_{LCD}0$ to $CAP_{LCD}3$ are connected to capacitor (0.33 μF) inside SE board	CP side
SW6		If real chip power supply pins $REG_{LCD}0$ to $REG_{LCD}2$ are connected to external through probe	P side
		If real chip power supply pins $REG_{LCD}0$ to $REG_{LCD}2$ are connected to capacitor (0.33 μF) inside SE board	CP side
SW7		If real chip power supply pin $CAP_{LCD}0$ is connected to external through probe	P side
		If real chip power supply pin $CAP_{LCD}0$ is connected to capacitor (0.33 μF) inside SE board	CP side

Remark The shaded portions in the above figures indicate the factory settings at shipment.

[MEMO]

CHAPTER 5 CONNECTOR PIN LIST

Table 5-1. Connector Pins of J1

J1 Pin Number	Pin Name (pin number of IC)	J1 Pin Number	Pin Name (pin number of IC)	J1 Pin Number	Pin Name (pin number of IC)
1	P2B1 (15)	21	GND	41	LCD0 (44)
2	INT (68)	22	P0C2 (66)	42	IC
3	GND	23	X_{OUT} (69)	43	LCD2 (46)
4	$REG_{LCD}1$ (36)	24	NC	44	LCD3 (47)
5	LCD11 (55)	25	X_{IN} (70)	45	IC
6	GND	26	P2C0 (71)	46	LCD4 (48)
7	LCD12 (56)	27	NC	47	LCD5 (49)
8	LCD13 (57)	28	P2C1 (72)	48	GND
9	GND	29	P2C2 (73)	49	LCD6 (50)
10	LCD14 (58)	30	GND	50	LCD7 (51)
11	LCD15 (59)	31	P2C3 (74)	51	GND
12	IC	32	P0D0 (75)	52	LCD10 (64)
13	LCD16 (60)	33	GND	53	P0C3 (67)
14	LCD17/P2A0 (61)	34	P0D1/AD0 (76)	54	GND
15	GND	35	P0D2/AD1 (77)	55	LCD8 (52)
16	LCD18/P2A1 (62)	36	GND	56	COM3 (43)
17	LCD19/P2A2 (63)	37	P0D3/AD2 (78)	57	LCD9 (53)
18	GND	38	GND	58	$CAP_{LCD}2$ (37)
19	P0C0 (64)	39	GND	59	$CAP_{LCD}3$ (38)
20	P0C1 (65)	40	$V_{DD}2$ (80)	60	IC

Table 5-2. Connector Pins of J2

J2 Pin Number	Pin Name (pin number of IC)	J2 Pin Number	Pin Name (pin number of IC)	J2 Pin Number	Pin Name (pin number of IC)
1	$REG_{LCD}2$ (39)	21	GND	41	P1A3 (23)
2	IC	22	VCOH (10)	42	GND
3	IC	23	GND	43	P1D0 (24)
4	$REG_{LCD}0$ (35)	24	GND	44	P1D1 (25)
5	$CAP_{LCD}1$ (34)	25	TEST (12)	45	GND
6	$CAP_{LCD}0$ (33)	26	$\overline{RESET}$ (13)	46	P1D2 (26)
7	BEEP/P0B3 (31)	27	GND	47	P1D3 (27)
8	TM0/P1C0 (1)	28	P2B0 (14)	48	GND
9	GND	29	P2B2 (16)	49	$\overline{SCK}$/P0B0 (28)
10	TM2/PIC1 (2)	30	GND	50	SI1/SO2/P0B1 (29)
11	FCG/AMIFC/PIC2 (3)	31	P2B3 (17)	51	IC
12	GND	32	P0A0 (18)	52	SO1/P0B2(30)
13	AMIFC/FMIFC/PIC3 (4)	33	GND	53	$V_{DD}0$ (32)
14	$V_{DD}1$ (5)	34	LCD1 (45)	54	IC
15	GND	35	P0A1 (19)	55	COM0 (40)
16	REG (6)	36	GND	56	GND
17	EO0 (7)	37	P1A0 (20)	57	GND
18	GND	38	P1A1 (21)	58	COM1 (41)
19	EO1 (8)	39	GND	59	COM2 (42)
20	VCOL (9)	40	P1A2 (22)	60	GND

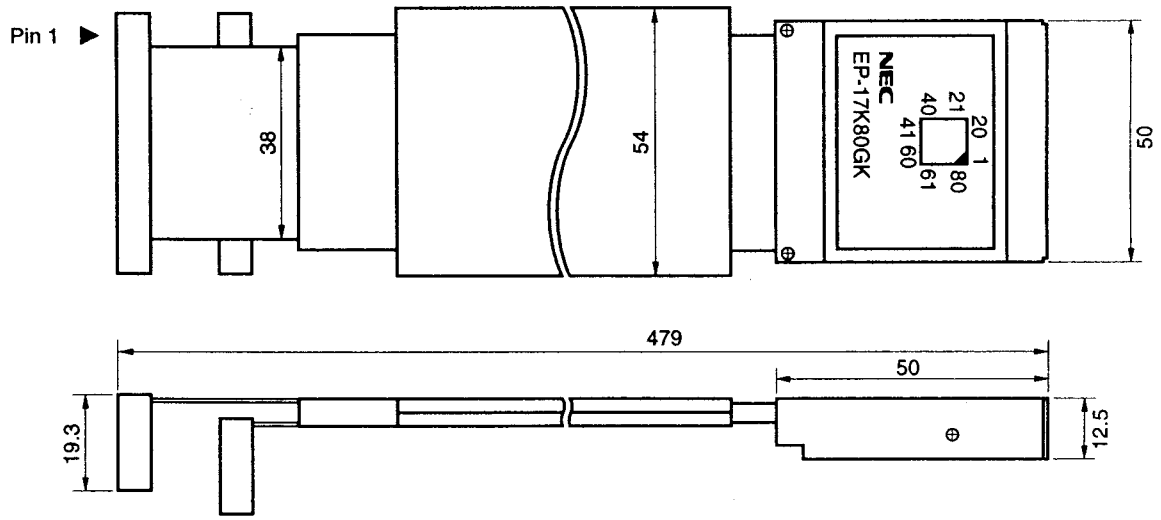
CHAPTER 6 DRAWINGS OF PROBE, CONVERSION SOCKET AND SOCKET CONVERSION ADAPTER

6.1 Drawing of Probe

Product Name EP-17K80GK

Figure 6-1. Drawing of Probe

EP-17K80GK (Product supporting forward bend packages)



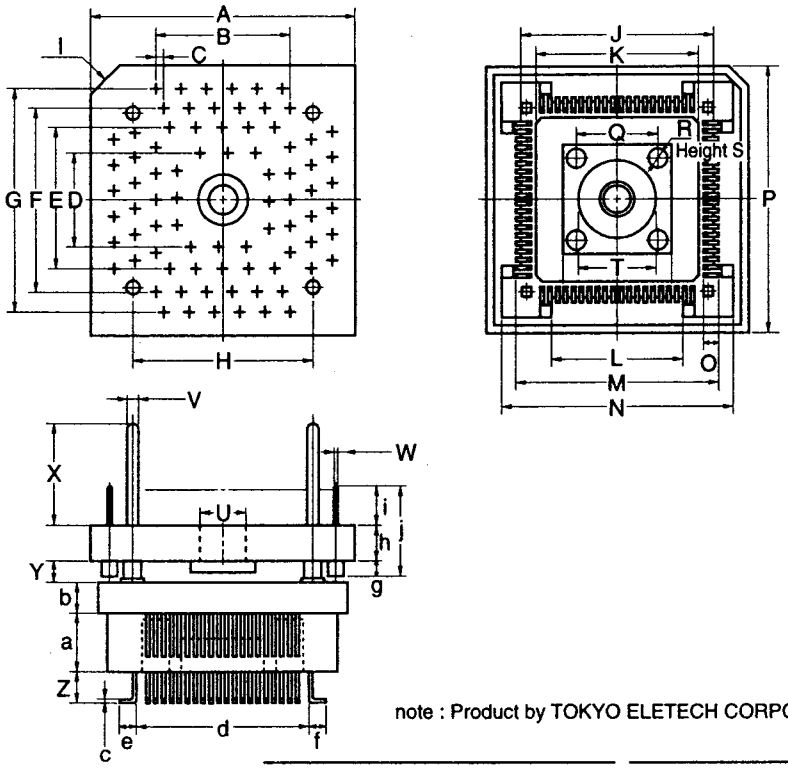
(Unit: mm)

6.2 Drawings of Conversion Socket (TGK-080SDP[Note]) and Socket Conversion Adapter

Note Product made by TOKYO ELETECH CORPORATION (Tokyo (03)5295-1661).
Contact an NEC dealer regarding the purchase of this product.

Remark The TGK-080SDP is a set that combines the conversion socket and socket conversion adapter.

TGK-080SDP
Package dimension



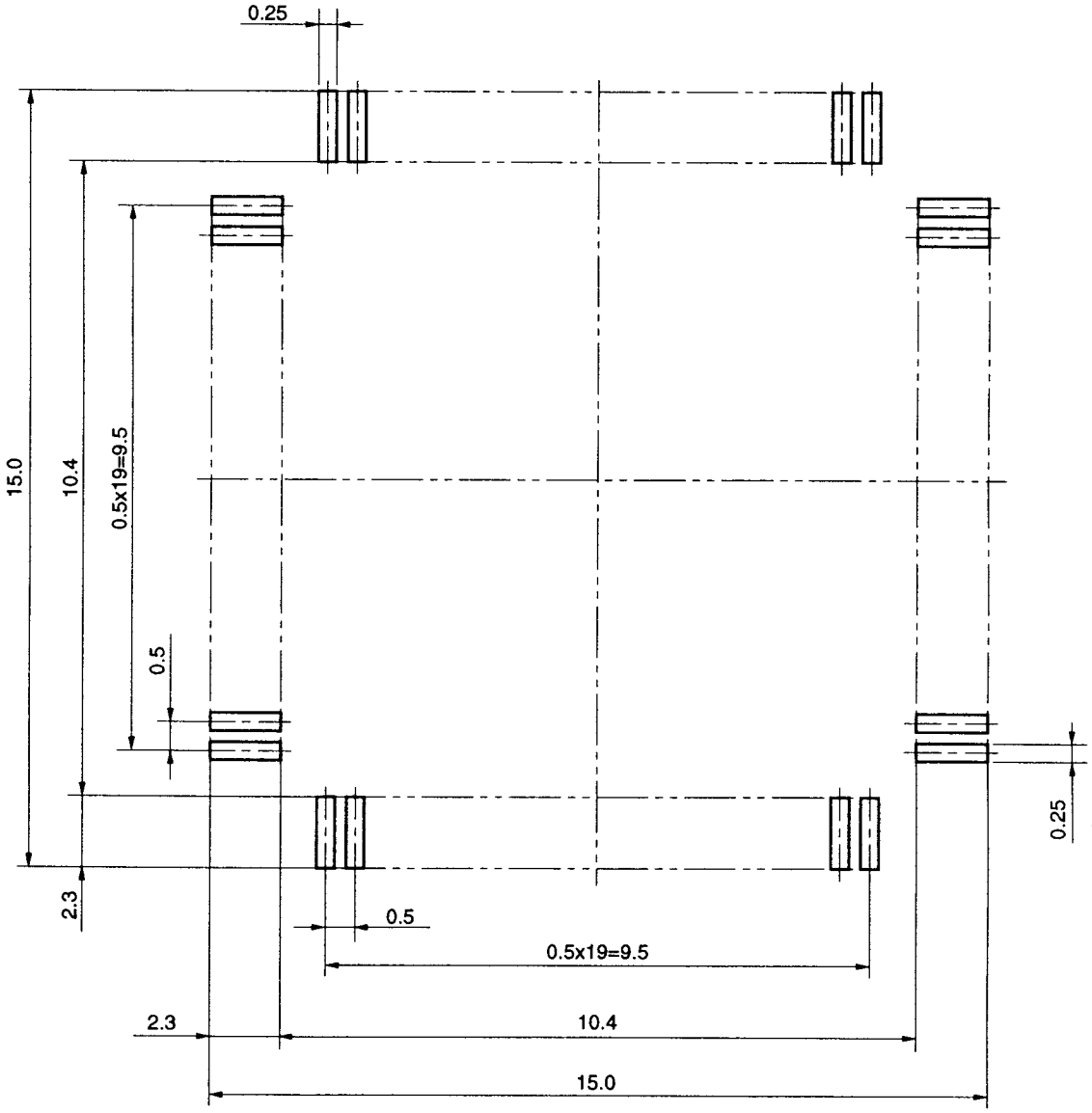
note : Product by TOKYO ELETECH CORPORATION

ITEM	MILLIMETERS	INCHES
A	18.0	0.709
B	0.5×19=9.5	0.020×0.748=0.374
C	0.5	0.020
D	7.64	0.301
E	10.04	0.395
F	12.44	0.490
G	14.84	0.584
H	11.77	0.463
I	C 2.0	C 0.079
J	12.17	0.479
K	10.17	0.400
L	8.24	0.324
M	14.0	0.551
N	14.8	0.583
O	1.505	0.059
P	18.0	0.709
Q	5.0	0.197
R	4- ϕ1.3	4- ϕ0.051
S	1.8	0.071
T	ϕ5.0	ϕ0.197
U	ϕ3.55	ϕ0.140
V	ϕ0.9	ϕ0.035
W	ϕ0.3	ϕ0.012
X	6.0	0.236
Y	1.2	0.047
Z	1.85	0.073

ITEM	MILLIMETERS	INCHES
a	3.5	0.138
b	2.0	0.079
c	0.25	0.010
d	11.24	0.443
e	1.38	0.054
f	1.38	0.054
g	0.8	0.031
h	2.4	0.094
i	2.7	0.106
j	5.9	0.232

TGK-080SDP-G0E

6.3 Recommended Footprint



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