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USER'S MANUAL

RENESAS

Phase-out/Discontinued

SE-17015

SYSTEM EVALUATION BOARD

Applicable model:
μPD17015

Document No. EEU-1539
(O.D. No. EEU-927A)
Date Published April 1995 P
Printed in Japan

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[MEMO]

CHAPTER 1 GENERAL

The SE-17015 is a system evaluation (SE) board for the μPD17015 4-bit single-chip microcontroller.

This board is either mounted in an in-circuit emulator (IE-17K or IE-17K-ET) that is commonly used with the microcontrollers in the 17K series for debugging, or used alone.

For the interface with the target system**Note 1**, the actual chip, the μPD17015GS-00x (hereafter referred to the "actual chip") is used; therefore, the function of the SE-17015 is equivalent to the product to be evaluated.

To connect the SE-17015 and the target system, an emulation probe (EP-17K38GT**Note 2** (option)) and conversion flexible printed circuit board (EV-9500GT-38) are necessary.

The SE-17015 is provided with a level conversion chip, so that evaluation can be performed even if the supply voltage of the μPD17015GS is not +3 V. (It can be in the range of +1.8 to +3.6 V.)

Notes 1. System to be evaluated (created by user)

2. Can be used for 38-pin shrink SOP (300 mil)

Table 1-1. Development Tools for the SE-17015

SE Board	Usage	Output File of Assembler (AS17K) (Host Machine)	In-Circuit Emulator	Support Software**Note 5**	Emulation Probe	Product to Be Evaluated
SE-17015	When used with in-circuit emulator	ICE file**Note 3** (PC-9800 series, IBM PC/AT™)	IE-17K IE-17K-ET	SIMPLEHOST™	EP-17K38GT + EV-9500GT-38	μPD17015
	When SE-17015 alone is used	PRO file**Note 4** (PC-9800 series, IBM PC/AT)	Not needed	Not needed		

Notes 3. ICE file: automatically output after the source program has been assembled.

4. PRO file: Output if the assembler option (/PRO) is specified when the source program is assembled. For details of the ICE and PRO files, refer to the AS17K User's Manual.

5. SIMPLEHOST is software for man-machine interfacing to the in-circuit emulator.
This software runs on Windows™ and allows you to debug your program by manipulating the source listing and figures displayed on the CRT with a mouse.
For details, refer to the SIMPLEHOST User's Manual.
Interfacing can be also performed by using commercially available RS-232-C communications software other than SIMPLEHOST. In this case, however, knowledge of how to set the baud rate and of the commands of the in-circuit emulator is necessary. For details, refer to the User's Manual for the IE-17K or IE-17K-ET.

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CHAPTER 2 SPECIFICATIONS

The following are the specifications of the SE-17015:

Product name : SE-17015

Program memory :
- When used with an in-circuit emulator (IE-17K or IE-17K-ET), the μPD43256AGU mounted on the board is used.
- When the SE-17015 is used alone, write the program to the μPD27C512D or μPD27C1001AD and mount the program memory in the socket (U15) on the SE-17015.

Data memory : The internal memory of the actual chip is used.

Operating frequency : 75 kHz

Instruction cycle : 53.3 μs (at 75 kHz)

Operating temperature : +10 to +40 °C

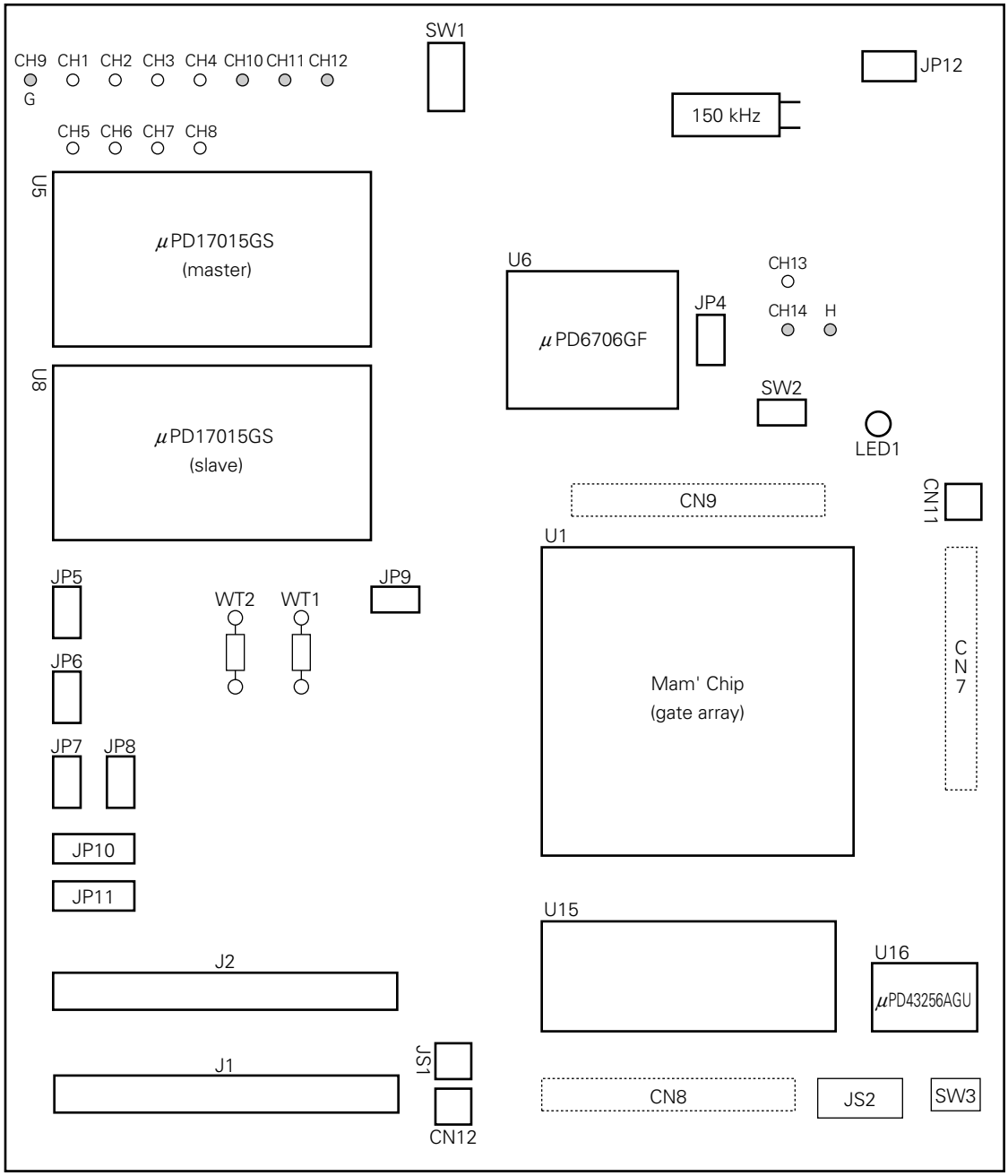
Storage temperature : –10 to +50 °C (without condensation)

Power requirements :
- Power to actual chip (V_{DD1}): +1.8 V to +3.6 V
  Supplied from an emulation probe (EP-17K38GT) or CN12 pin.
- Power to SE-17015 (V_{CC}): +5 V ± 5%
  When the SE-17015 is used with an in-circuit emulator, the power is supplied from the in-circuit emulator. When the SE-17015 is used alone, supply power from the CN11 pin.

Current dissipation : 110 mA (MAX.) (no load, when the μPD27C1001AD is used as program memory)

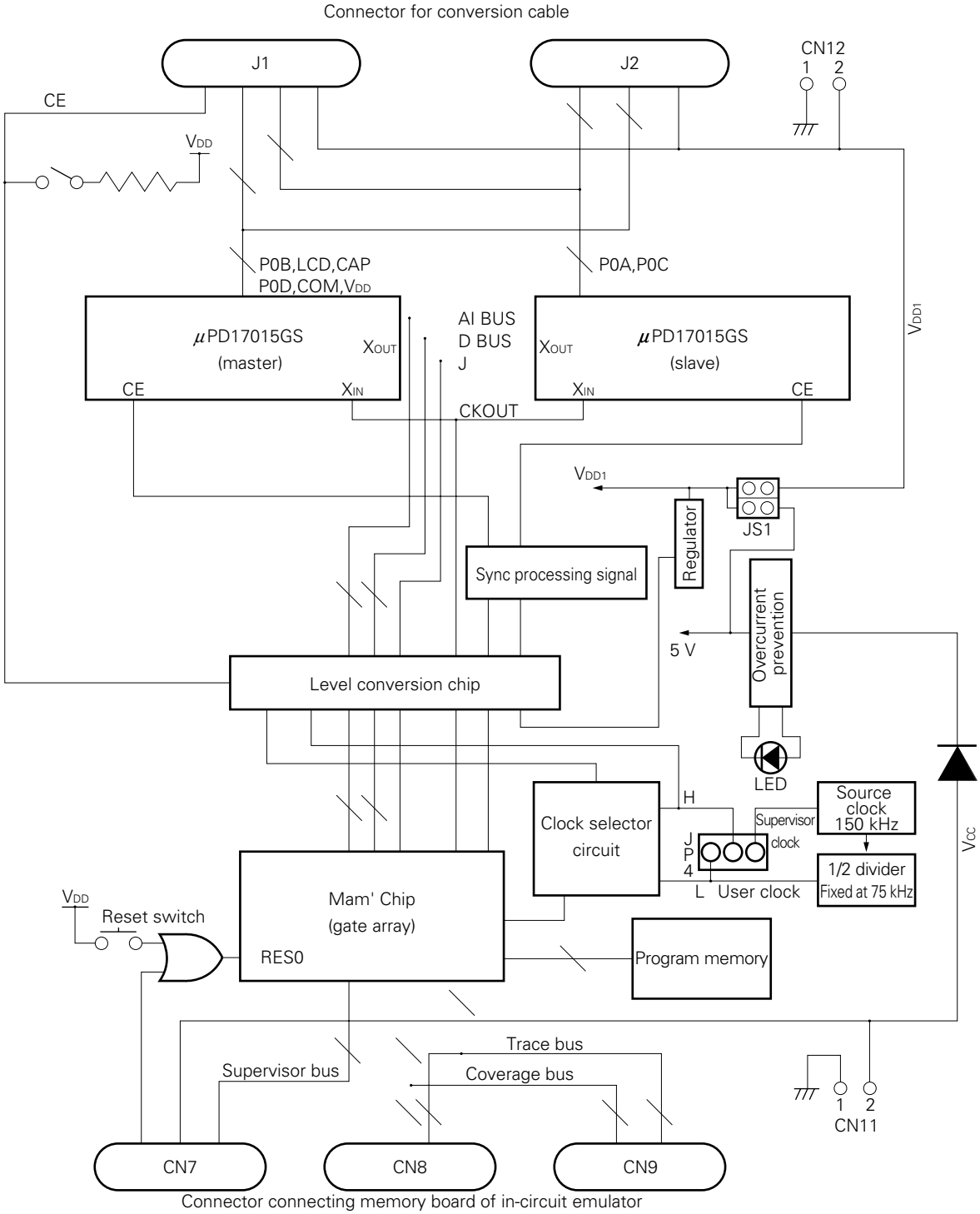
Dimensions : 150 x 175 x 33 mm

Figure 2-1. Component Layout of the SE-17015



CHAPTER 3 BLOCK DIAGRAM

Figure 3-1. SE-17015 Block Diagram



[MEMO]

CHAPTER 4 USAGE

4.1 Using the Level Converter Chip (μPD6706GF)

(1) Overview of level converter chips

If the operating voltage of the target system used is different from the voltage level of the SE board ($V_{DD1} \neq V_{CC}$, V_{CC} = +5 V), a level converter chip can convert the voltage level of the one to the voltage level of the other. Therefore, even if the operating voltages of the target system and the SE board differ, the target system and SE board can smoothly transfer signals back and forth.

(2) Using the level converter chip

The level converter chip automatically operates when a voltage other than 5 V is applied between the V_{DD1} and GND pins of the emulation probe (EP-17K38GT) or to the CN12 pin of the SE board, when the jumper switch for selecting the method of supplying power to the SE board (JS1) is set to the V_{DD1} position.

Remarks 1. V_{DD1} is the supply voltage of the target system. The power of the target system can be supplied from the CN12 pin or emulation probe to the actual chip mounted on the SE board. Therefore, debugging can be performed in an environment close to the actual environment.

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

4.2 Supplying Power to SE Board

Two types of power must be supplied to the SE board: V_{CC} and V_{DD1}. V_{CC} is for operating the SE board (except the actual chip), and V_{DD1} is for operating the actual chip.

Always supply +5 V as V_{CC}. Supply a voltage in the operating voltage range (+1.8 to +3.6 V) of the actual chip as V_{DD1}.

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

Jumper switch JS1 selects whether the power supplied to the SE board (V_{CC} = +5 V) is converted to +3 V and supplied to the actual chip, or the voltage from the emulation probe or CN12 pin (V_{DD1}) is supplied to the actual chip.

Tables 4-1. and 4-2. show the functions of JS1 when the SE board is mounted in the in-circuit emulator and when the SE board alone is used.

If the supply voltage of the target system is +3 V, set JS1 to the +3-V position. When the SE board is mounted in the in-circuit emulator, a voltage of +5 V supplied from the in-circuit emulator is automatically converted to +3 V and supplied to the SE board. When the SE board alone is used, +5 V supplied from the CN11 pin is converted to +3 V; therefore, power can be easily supplied.

If the supply voltage of the target system is +3 V, and JS1 is set to the V_{DD1} position, then the voltage of the target system can be supplied to the actual chip from the emulation probe or CN12 pin, so that evaluation can be performed in an environment close to the actual environment.

Table 4-1. Function of JS1 When SE Board Is Mounted in In-Circuit Emulator

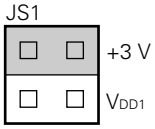
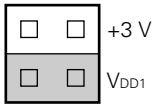
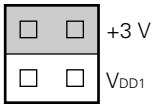
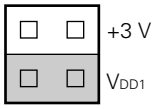
Type of Power / Setting of JS1	Power Supplied to Actual Chip (V_{DD1})	Power to Operate SE Board (Except Actual Chip) (V_{CC})
JS1 	+5 V from in-circuit emulator is converted to +3 V and supplied	+5 V is supplied from in-circuit emulator
JS1 	Power must be supplied from emulation probe or CN12 pin	

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

Type of Power / Setting of JS1	Power Supplied to Actual Chip (V_{DD1})	Power to Operate SE Board (Except Actual Chip) (V_{CC})
JS1 	+5 V from CN11 pin is converted to +3 V and supplied	Supply +5 V from CN11 pin
JS1 	Power must be supplied from emulation probe or CN12 pin	

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

(2) Power supply pins

The SE board has three pins from which external power is supplied. These pins must be selected depending on the evaluation environment. Table 4-3. shows the pins and their functions.

Table 4-3. Power Supply Pins and Functions

Pin Name	Type of Power (Range of Voltage That Can Be Supplied)	Function
CN11	V_{CC} (+5 V ± 5 %)	This pin supplies power to the SE board (except the actual chip) when the SE board alone is used. Always supply +5 V to this pin. Do not supply power to the CN11 pin when the SE board is mounted in the in-circuit emulator.
CN12	V_{DD1} (+1.8 to 3.6 V)	This pin supplies +1.8 to +3.6 V to the actual chip when the supply voltage of the target system (V_{CC}) is not +3 V (JS1 is set to the V_{DD1} position).
Emulation probe (V_{DD1} and GND pins)	V_{DD1} (+1.8 to 3.6 V)	The function is equivalent to the CN12 pin. The CN12 pin and the power supply pin of the emulation probe are connected on the SE board.

Remark Pin 1 of the CN11 pin is GND and pin 2 is the power supply pin. Use of the power cable (supplied as an accessory) is recommended.

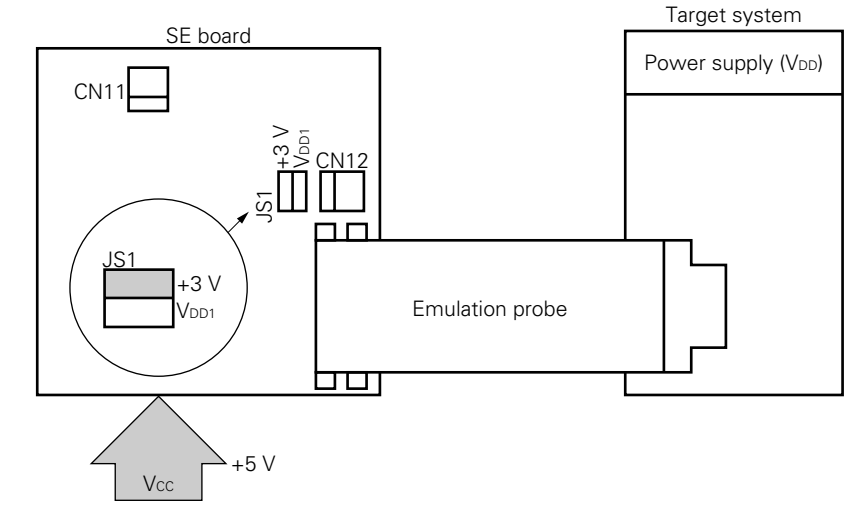
(3) Actual example of usage

<1> To mount SE board in in-circuit emulator

(a) To Mount the SE board in the in-circuit emulator when V_{DD1} = +3 V, VCC = +5 V

Set JS1 to the +3-V position. V_{CC} and V_{DD1} are supplied from the in-circuit emulator.

Figure 4-1. Supplying Power with SE Board Mounted in In-Circuit Emulator and V_{DD1} = +3 V, V_{CC} = +5 V



(b) To Mount SE Board in In-Circuit Emulator When $V_{DD1} \neq$ +3 V, V_{CC} = +5 V

Set JS1 to the V_{DD1} position. V_{CC} is supplied from the in-circuit emulator, and V_{DD1} is supplied from the CN12 pin or emulation probe.

Figure 4-2. Supplying V_{DD1} from CN12 Pin with SE Board Mounted in In-Circuit Emulator

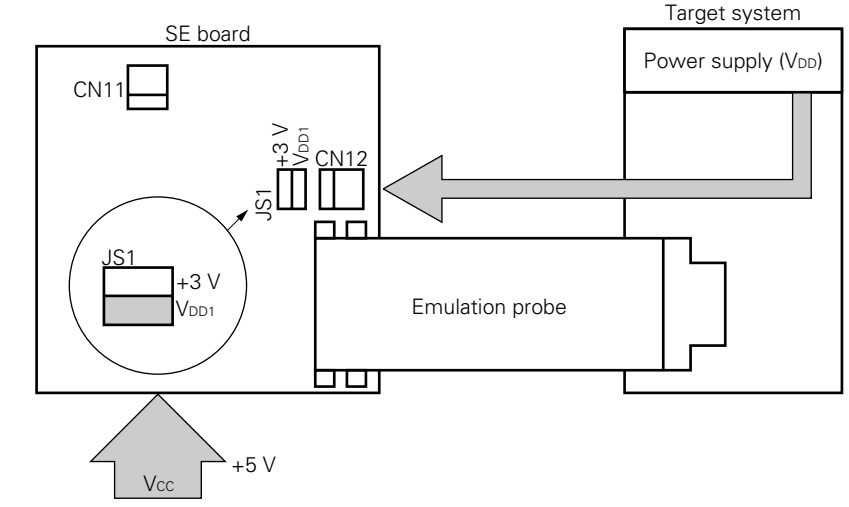
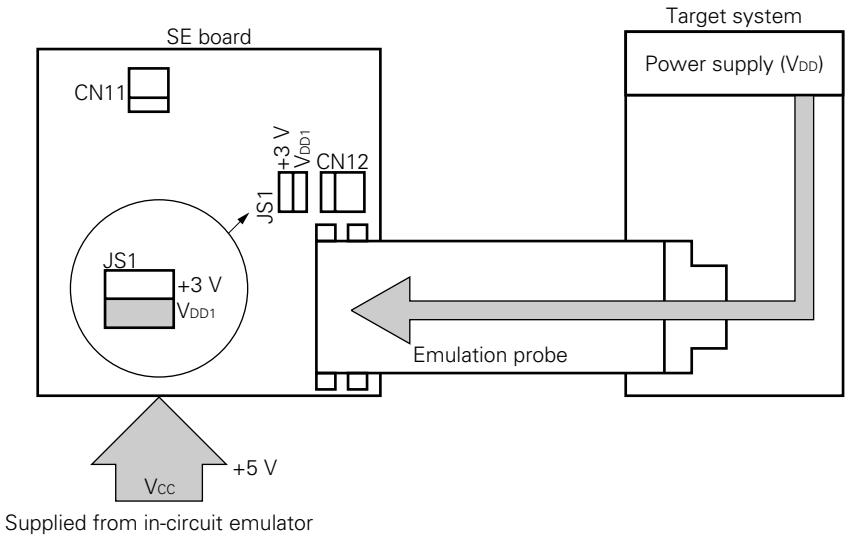


Figure 4-3. Supplying V_{DD1} from Emulation Probe with SE Board Mounted in In-Circuit Emulator

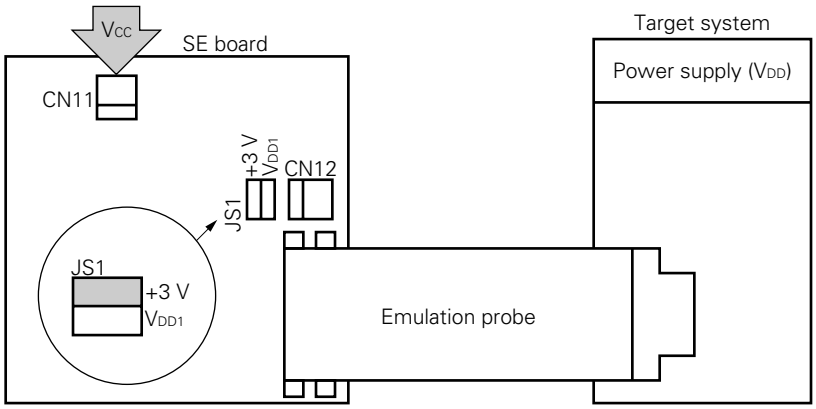


<2> To use SE board alone

(a) To use SE board alone with V_{DD1} = +3 V, V_{CC} = +5 V

Set JS1 to the +3-V position. Supply V_{CC} and V_{DD1} from the CN11 pin.

Figure 4-4. Supplying Power When SE Board Is Used Alone with V_{DD1} = +3 V, V_{CC} = +5 V



(b) To use SE board alone with $V_{DD} \neq$ +3 V, V_{CC} = +5 V

Set JS1 to the V_{DD1} position. V_{CC} is supplied from the CN11 pin, and V_{DD1} is supplied from the CN12 pin or emulation probe.

Figure 4-5. Supplying V_{DD1} from CN12 Pin When SE Board Is Used Alone

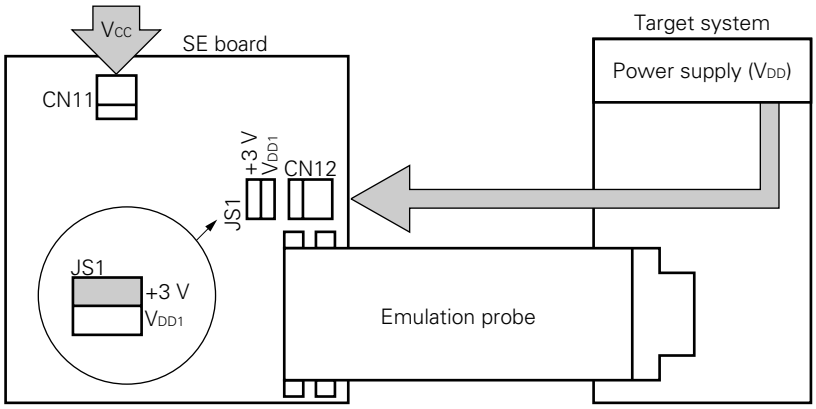
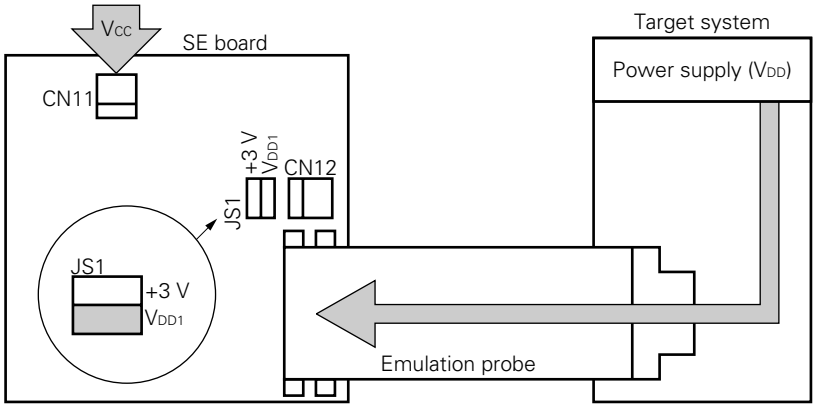


Figure 4-6. Supplying V_{DD1} from Emulation Probe When SE Board Is Used Alone



4.3 Setting of Other Switches

(1) SW1: Reset switch

This switch is used when the SE board alone is used. For details, refer to **4.5 Using SE Board Alone**.

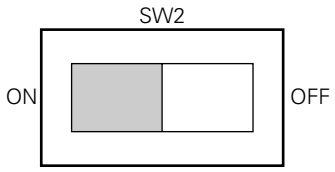
(2) SW2: CE pin pull-up selector switch

This switch is used to pull up the CE pin of the actual chip.

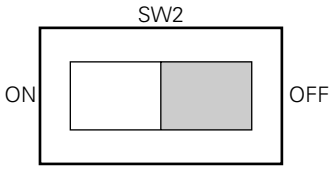
When the SE-17015 is not connected to the target system, be sure to pull up the CE pin by setting this switch to the ON position.

Figure 4-7. Setting CE Pin Pull-up Switch (SW2)

<1> To pull up CE pin



<2> To not pull up CE pin



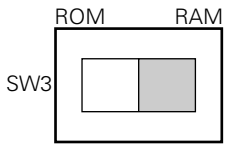
Remark The shaded portion indicates the selected switch position.

(3) SW3: ROM/RAM selector slide switch

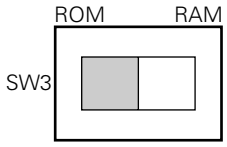
This switch sets the program memory to be used.

Figure 4-8. Setting of ROM/RAM Selector Slide Switch

<1> To mount SE board in in-circuit emulator



<2> To use SE board alone



Remark The shaded portion indicates the selected switch position.

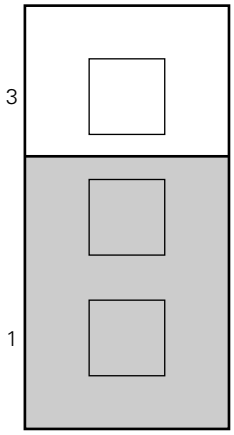
(4) JP4: SV (supervisor) clock selector jumper switch

This switch selects whether the source clock (150 kHz) or user clock (75 kHz) is supplied as the SV clock.

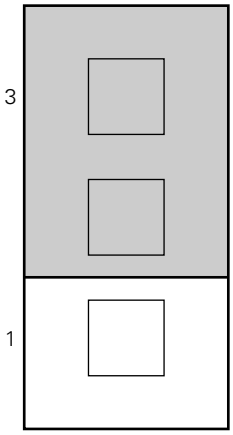
When the PLL synthesizer function is used and the source clock (150 kHz) is supplied as the SV clock, the operating frequency of the actual chip changes in the SV mode. As a result, the frequency locked up to that point changes. To lock a specific frequency even in the SV mode, supply the user clock (75 kHz) as the SV clock.

Figure 4-9. Setting of SV Clock Selector Jumper Switch

<1> To supply user clock (75 kHz)



<2> To supply source clock (150 kHz)



Remark The shaded portion indicates the selected switch position.

(5) JP5-JP7: Capacitor selector jumper switches for LCD driving power

These switches select whether the capacitors on the SE board or the capacitors on the target system are connected to the V_{DD3}, V_{DD4}, CAP1, and CAP2 pins of the actual chip.

CAP1 and CAP2 connect a double capacitor to generate LCD driving power.

Figure 4-10. Peripheral Circuit of JP5-JP7

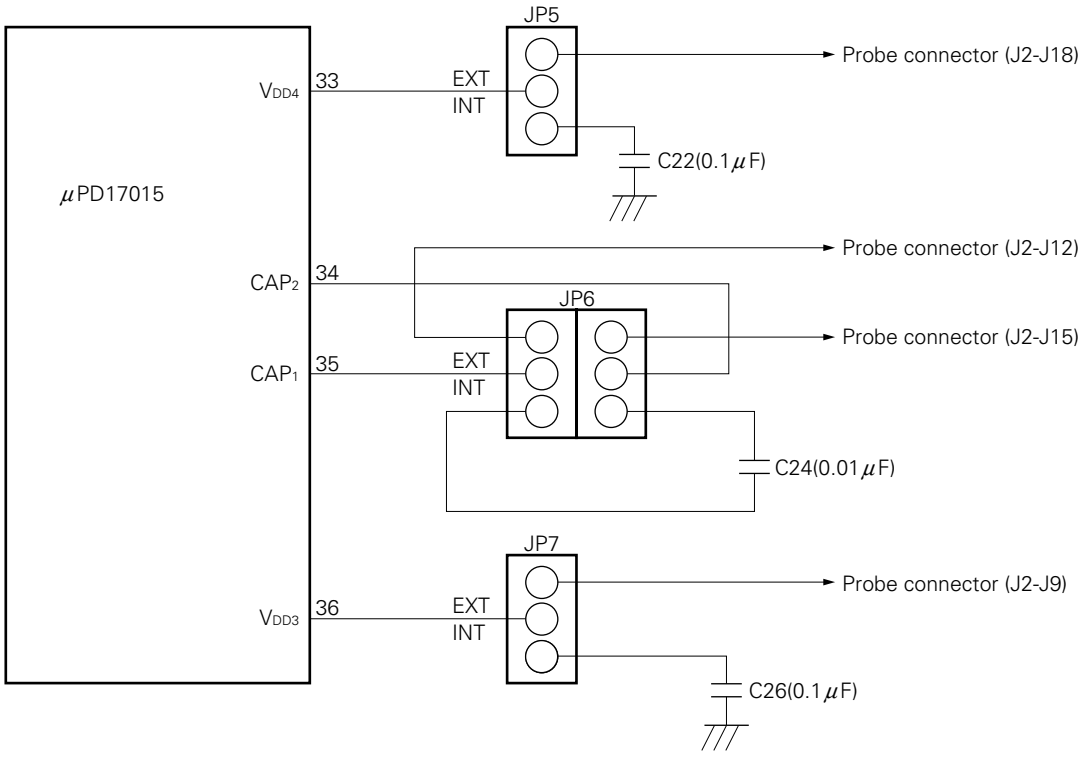
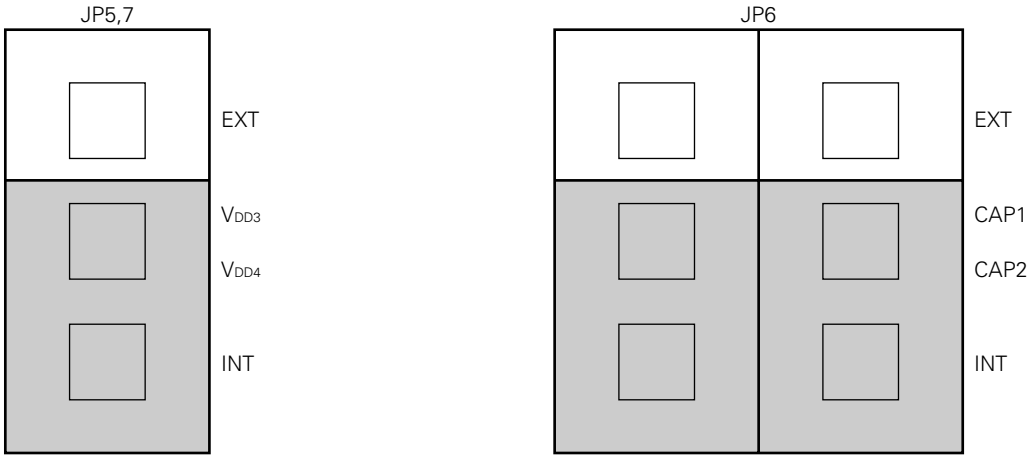
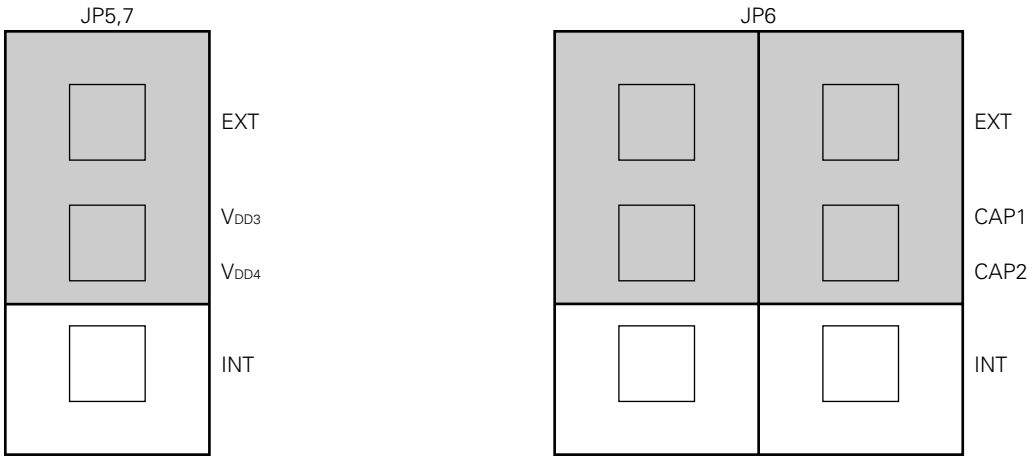


Figure 4-11. Setting of JP5-JP7

<1> To connect capacitors on SE board



<2> To connect capacitors on target system



Remark The shaded portion indicates the selected switch position.

(6) JP8: PLL capacitor selector jumper switch

This switch selects whether the capacitor on the SE board or the capacitor on the target system is connected to the V_{DD2} pin (PLL regulator output) of the actual chip.

Figure 4-12. Peripheral Circuit of JP8

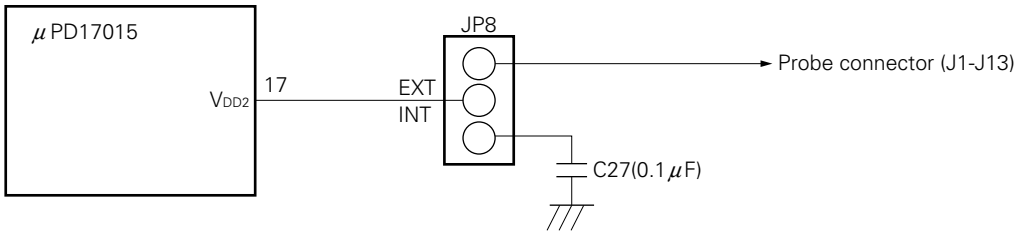
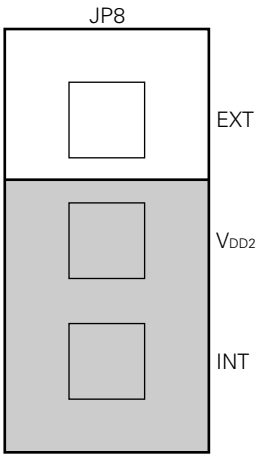
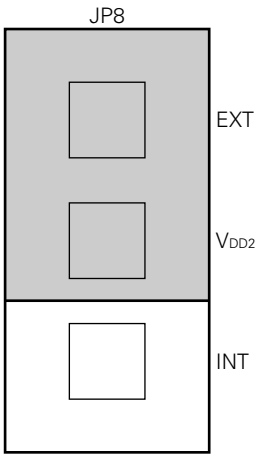


Figure 4-13. Setting of JP8

<1> To connect capacitor on SE board



<2> To connect capacitor on target system



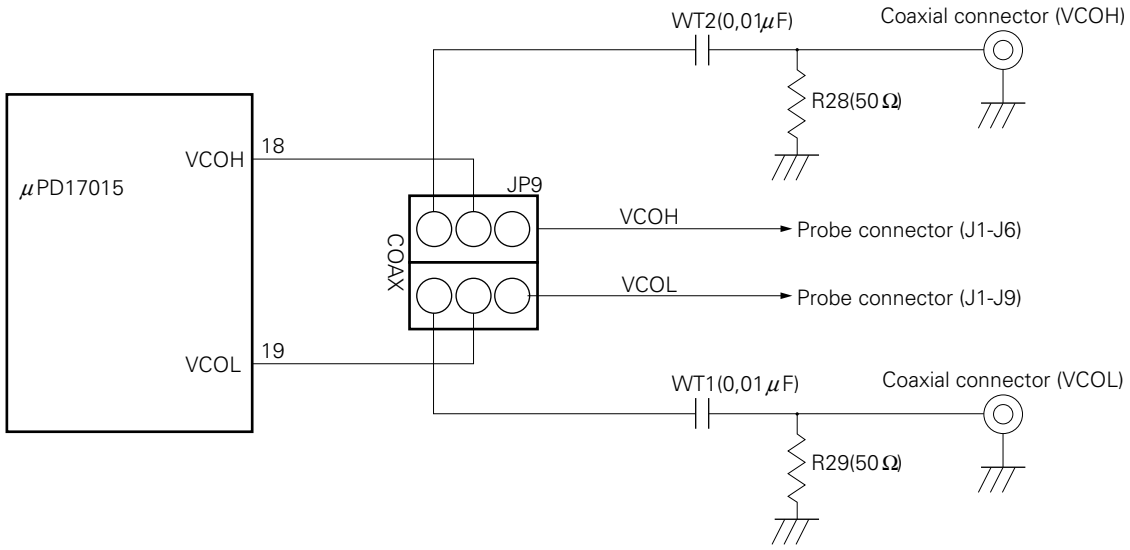
Remark The shaded portion indicates the selected switch position.

(7) JP9: VCOL and VCOH pin input selector jumper switch

This switch selects whether signals are input to the VCOL and VCOH pins of the actual chip via probe or coaxial cable.

The VCOL and VCOH pins input PLL local oscillation signals.

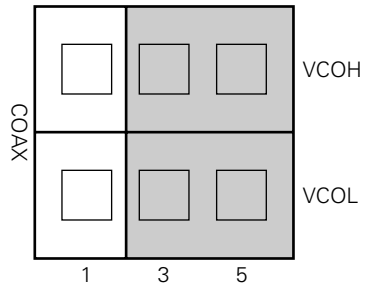
Figure 4-14. Perpheral Circuit of JP9



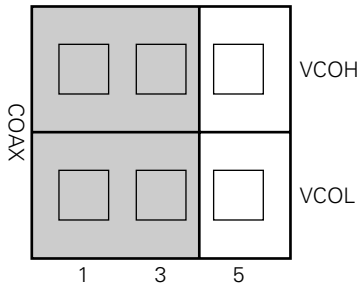
Remark When VCO input is from the probe, it may not be correctly input due to the influence of the wiring capacitance of the probe. It is recommended that VCOL and VCOH be input from coaxial cable to evaluate the PLL.

Figure 4-15. Setting of JP9

<1> Via probe



<2> Via coaxial cable



Remark The shaded portion indicates the selected switch position.

4.4 Mounting the SE Board in the 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 operational details, refer to the User's Manual for the IE-17K or IE-17K-ET.

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

Mount the SE-17015 in the in-circuit emulator as follows:

<1> Open the exterior and interior lids of the in-circuit emulator.

<2> When the interior lid is opened, a memory board is visible. Insert the three connectors (CN7, CN8, and CN9) at the bottom of the SE-17015 into the three connectors on the memory board.

To remove the SE-17015 from the in-circuit emulator, lift the SE board perpendicularly.

Figure 4-16. Appearance of IE-17K (with exterior lid open)

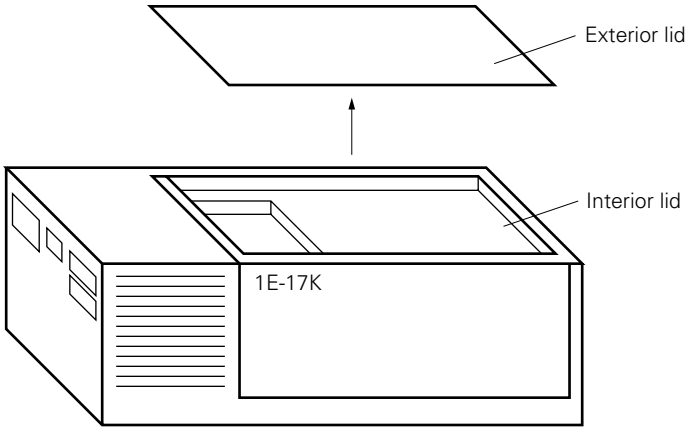
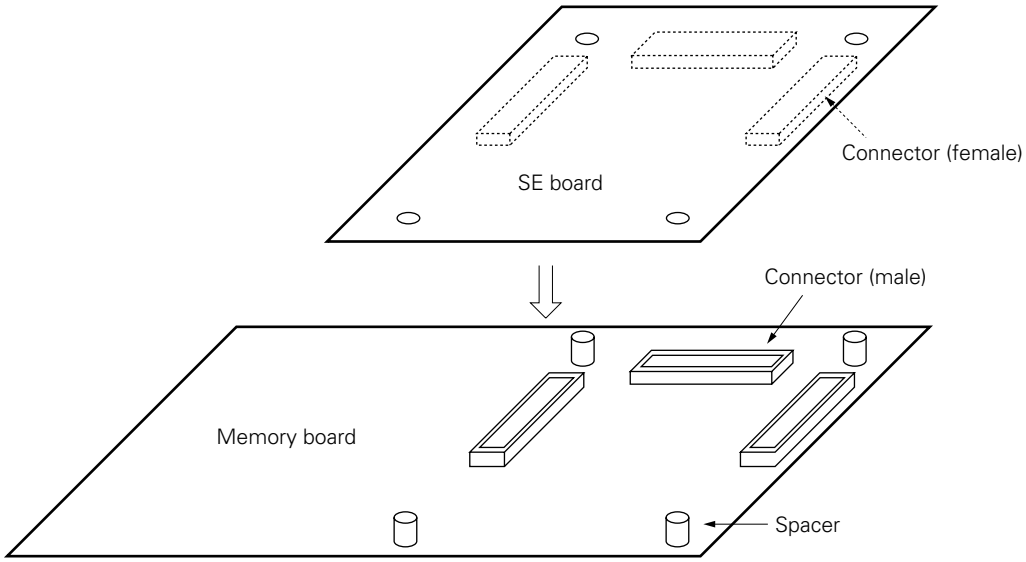


Figure 4-17. Mounting/Removing SE-17015



Next, connect the emulation probe (EP-17K38GT) to connectors J1 and J2 of the SE-17015 to connect the target system.

Then attach the interior and exterior lids to the in-circuit emulator.

(2) Supplying power

After mounting the SE-17015 in the in-circuit emulator and before attaching the interior and exterior lids, turn on power to the in-circuit emulator and confirm that LED1 on the SE-17015 lights.

If the supply voltage of your target system is not +3 V, the voltage of the target system can be supplied to the actual chip on the SE board from the CN12 pin or emulation probe. For details, refer to **4.1 Using Level Converter Chip (μPD6706GF)** and **4.2 Supplying Power to SE Board**.

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

- The power cable of the in-circuit emulator is not connected.
- An overcurrent (about 500 mA or higher) flows into the SE-17015.
- The SE-17015 is not mounted correctly.

If LED1 does not light, turn off power to the in-circuit emulator, and correctly mount the SE-17015. If LED1 still does not light, the SE-17015 may be malfunctioning.

(3) Transferring the ICE file to the 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 User's Manual for the IE-17K or IE-17K-ET.

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

The procedure to confirm that the SE-17015 has been correctly mounted when commercially available RS-232C communication software is used is described below.

When SIMPLEHOST is used, the message "LISTING" is displayed if the SE board has been correctly mounted.

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

<2> Next, load the ICE file of the program created with the assembler (AS17K) or the ICE file output by the .SP0 or .SP1 command to the in-circuit emulator by using the .LP0 or .LP1 command.

The in-circuit emulator does not operate until this ICE file has been loaded.

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

Example When the ICE file for the μPD17015 has been loaded

```
OK
D17015
BRK>
```

If the above message is not displayed, the possible causes are:

- The actual chip mounted on the SE-17015 does not match the loaded ICE file.
- An SE board other than the SE-17015 is mounted.
- An ICE file other than that for the μPD17015 has been loaded.
- The SE-17015 is not completely mounted to the in-circuit emulator.

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

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

<2> The target system and the SE board may not be correctly connected through the emulation probe (EP-17K38GT). Check the connection.

<3> If JS1 is set to the V_{DD1} position, power may not be supplied to the actual chip from the emulation probe or CN12 pin. Supply power to the actual chip from the emulation probe or CN12 pin, or set JS1 to the +3-V position.

If JS1 is set to the +3-V position, +5 V supplied from the in-circuit emulator is automatically converted into +3 V and supplied to the actual chip (refer to **4.2 Supplying Power to SE Board**).

<4> The reset circuit of the target system may not be operating correctly. If this is the case, the reset status of the SE board is undefined, and the in-circuit emulator cannot return a response.

To verify whether this has happened, set the CE pin pull-up selector switch (SW2) to the ON position, and restart the in-circuit emulator.

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

(4) Error message and corrective actions

An error message may be displayed if the actual chip mounted on the in-circuit emulator or SE board does not match the loaded ICE file.

So that accurate debugging can be performed, an SE board number is registered in the SE-17015 and a device number is registered in the actual chip.

The error messages that may be displayed and corrective actions to be taken are described below.

Table 4-4. Device Number and SE Board Number

Evaluated Device	Device Number	SE Board Number
μPD17015	3E	3E

Remarks 1. The device number is the registration number of the actual chip.

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

3. A device number and an SE board number are also 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 of the μPD17015 contains a device number = 3E and an SE board number = 3E.

(a) Error message and corrective action when the actual chip mounted on the SE-17015 does not match the loaded ICE file

[Error message]

?IDI INVALID DEVICE ID NUMBER [xx-△△]

Remark xx indicates the device number of the actual chip mounted on the SE-17015, and △△ indicates the device number contained in the loaded ICE file.

If this message is output, make sure that the actual chip on the SE board is correct. If a wrong chip is mounted, turn off power to the in-circuit emulator, replace the chip with the correct one, and load the ICE file again.
If a wrong device file was selected for assembly, assemble the source file again using the correct device file, and load the file again.

(b) Error message and corrective action when an SE board other than the SE-17015 is mounted

[Error message]

?ISE INVALID SE BOARD NUMBER [□□-▽▽]

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

(5) Caution

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

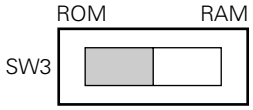
<2> Do not use the reset switch on the SE board.
To reset the in-circuit emulator, use the reset switch of the in-circuit emulator.

4.5 Using SE Board Alone

(1) ROM/RAM selector slide switch

Set the ROM/RAM selector slide switch (SW3) to the ROM position as shown in Figure 4-18.

Figure 4-18. Setting of ROM/RAM Selector Slide Switch



Remark The shaded portion indicates the selected switch position.

(2) Mounting a PROM

To use the SE-17015 alone, mount a PROM (μPD27C512D or μPD27C1001AD) as program memory on the SE board.

Use a PROM that satisfies the following conditions:

- ROM size
  512K bits : μPD27C512D-12, -15, -20, or equivalent
  1M bits : μPD27C1001AD-12, -15, -20, or equivalent

The following files must be written to the PROM as a program:

- PROM file for μPD17015 (.PRO) output by the 17K series assembler (AS17K)

Cautions 1. Do not write the ICE file (.ICE) output by the AS17K to the in-circuit emulator, to the SE-17015. When the SE-17015 is used alone, the SE board does not operate with the ICE file.

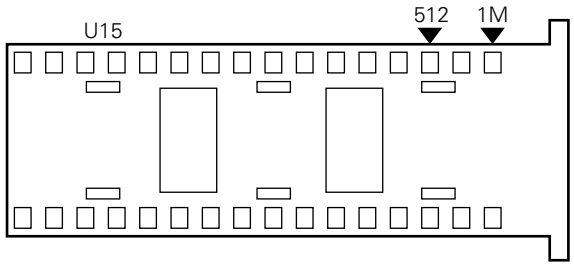
2. The end address of the program memory of the μPD17015 is 05F7H.

Mount the PROM on the socket (U15) on the SE board. Note that the mounting position differs depending on the number of pins of the PROM.

Note on mounting a PROM

- To use the μPD27C512D (28 pins), make sure that pin 1 of the PROM is at the position of the marking "▼512" on the socket.
- To use the μPD27C1001AD (32 pins), pin 1 must be at the position of the marking "▼1M" on the socket.

Figure 4-19. Socket for Mounting PROM (U15)



(3) Supplying power

Be sure to supply +5 V ± 5% (V_{CC}) to the CN11 pin of the SE-17015 from an external power source. If the supply voltage of your target system is not +3 V, the voltage of the target system can be supplied to the actual chip on the SE board from the CN12 pin or emulation probe. For details, refer to **4.1 Using Level Converter Chip (μPD6706GF)** and **4.2 Supplying Power to SE Board**.

If V_{CC} is supplied normally, LED1 on the SE-17015 lights.

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

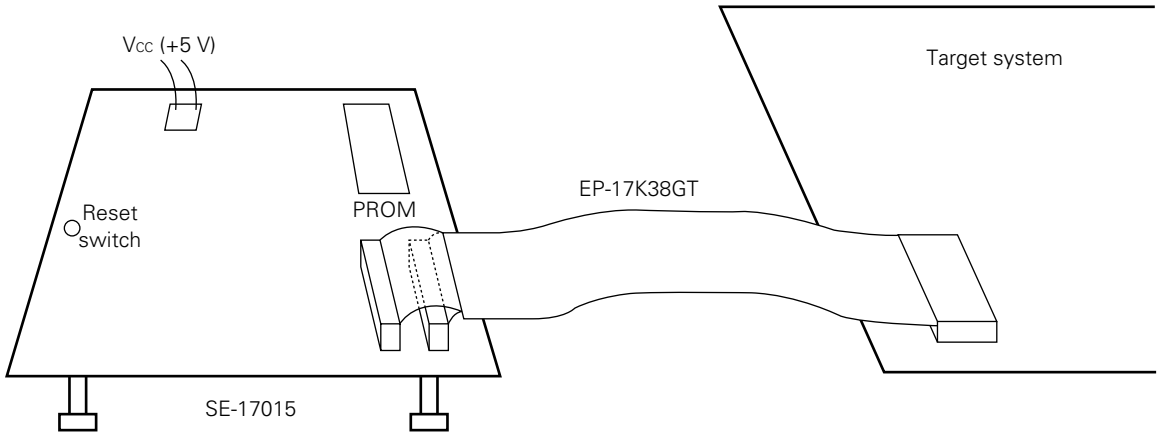
- Power is not supplied.
- An overcurrent is flowing (about 500 mA or higher).

(4) Executing the program

Connect the SE-17015 and target system as illustrated in Figure 4-20. When power is supplied to the target system, power is supplied to the SE-17015, a power-ON reset is effected, and the program written in the PROM is executed starting from address 0H.

When the reset switch on the SE-17015 is pressed, a forced reset is effected, and the program written in the PROM is executed starting from address 0H in the same manner as when a power-ON reset is effected.

Figure 4-20. Example of Connection When SE-17015 Alone Is Used



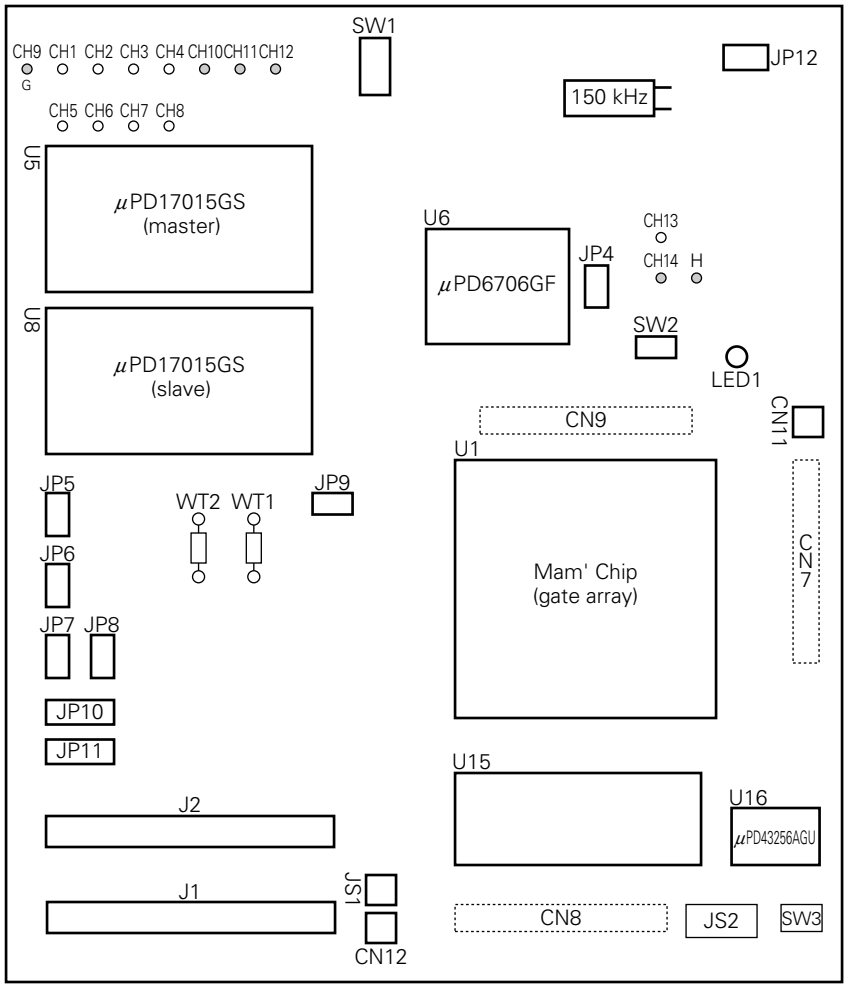
4.6 Monitor Pins

The SE-17015 is provided with monitor pins to check the status of the following pins. Table 4-5. shows the names and functions of the monitor pins, and Figure 4-21. shows the locations of the monitor pins.

Table 4-5. Monitor Pins and Functions

Monitor Pin Name	Function
CH9	GND
CH10	For monitoring V_{DD3}
CH11	For monitoring V_{DD4}
CH12	For monitoring V_{DD2}
CH14	For monitoring user clock
H	For monitoring source clock

Figure 4-21. Locations of Monitor Pins



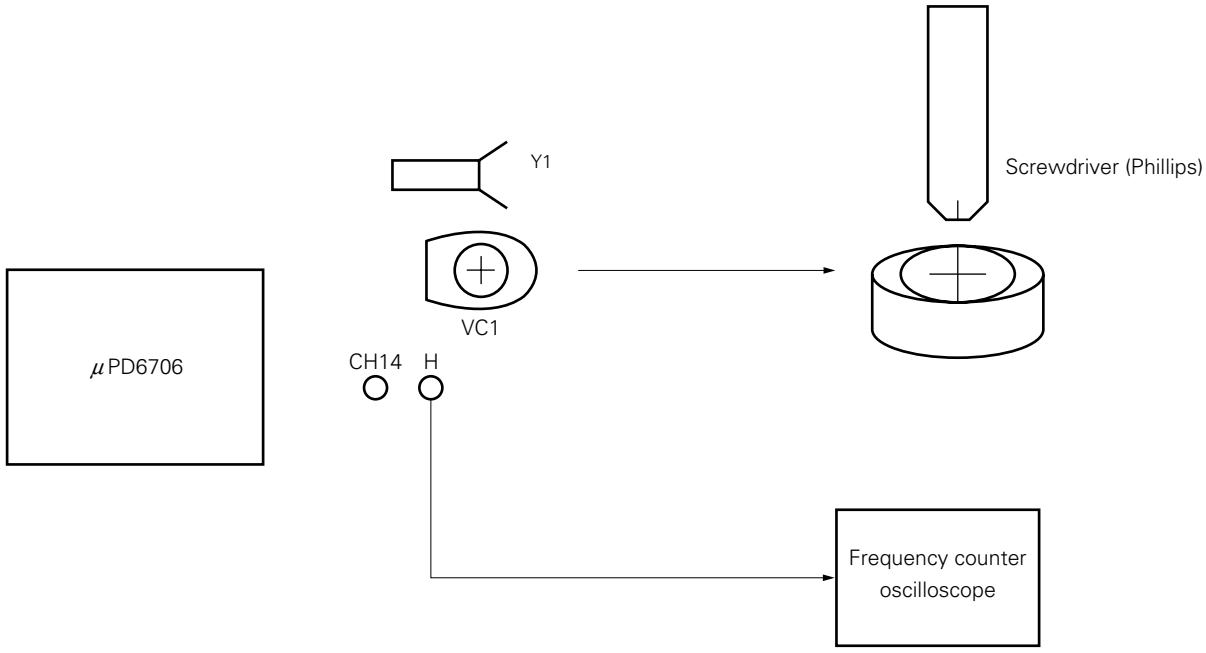
4.7 Fine-Tuning of Source Clock Oscillation Frequency (150 kHz)

The source clock frequency of the supervisor clock**Note** of the SE board is 150 kHz.

The user clock (75 kHz) is generated by dividing the source clock by two.

To fine-tune the source clock frequency, use the trimmer capacitor (VC1) as shown in Figure 4-22. To monitor and measure the oscillation waveform, use the monitor pin "H".

Figure 4-22. Fine-Tuning of Source Clock



Note Operation performed when CLICE is used on the in-circuit emulator.

4.8 Setting of Jumper Switches and Slide Switches

The jumper switches, slide switches, and oscillator of the SE-17015 are factory-set as follows:

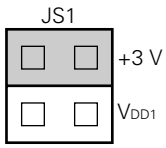
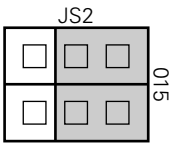
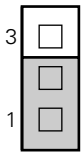
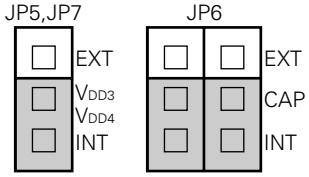
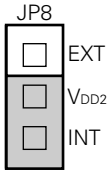
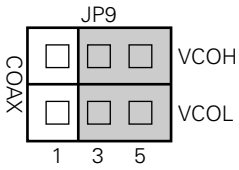
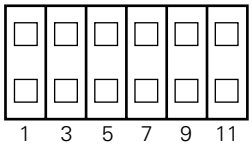
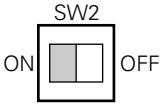
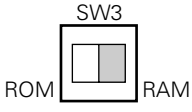
(1) Oscillator

The oscillation frequency of the clock supplied to the actual chip is factory-set to 75 kHz. To use an oscillation frequency of 150 kHz, set JP4 to position 3.

(2) Jumper switches and slide switches

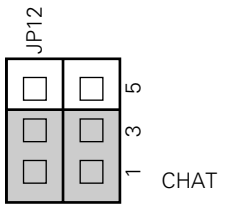
The jumper switches and slide switches of the SE-17015 are factory-set as shown in Table 4-6. Confirm these switches' setting status.

Table 4-6. Settings of Jumper and Slide Switches (1/2)

Switch Number	Jumper/Slide Switch	Effect of Setting	Setting
JS1		Refer to **4.1 Using Level Converter Chip (μPD6706GF)** and **4.2 Supplying Power to SE Board**	
JS2 JS3		Sets number of steps of program memory. Use factory setting (015).	Do not change setting of this switch.
JP4		To supply SV clock from source clock (150 kHz)	3
		To supply SV clock from user clock (75 kHz)	1
JP5 JP6 JP7		To connect capacitors on SE board to LCD power capacitor connecting pins (V_{DD3}, V_{DD4}, CAP1, and CAP2)	INT
		To connect capacitors on target system to LCD power capacitor connecting pins (V_{DD3}, V_{DD4}, CAP1, and CAP2)	EXT
JP8		To connect capacitor on SE board to PLL regulator output pin (V_{DD2})	INT
		To connect capacitor on target system to PLL regulator output pin (V_{DD2})	EXT
JP9		To input VCOL and VCOH signals from coaxial cable	1-3 (COAX)
		To input VCOL and VCOH signals from probe	3-5
JP10 JP11		Factory-set before shipment according to delay of actual chip	Do not change setting of this switch.
SW2		To pull up CE pin	ON
		To not pull up CE pin	OFF
SW3		To evaluate with SE board mounted in in-circuit emulator	RAM
		To use SE-17015 alone	ROM

Remark The shaded portions indicate the factory-set conditions for shipment.

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

Switch Number	Jumper/Slide Switch	Effect of Setting	Setting
JP12		If chattering occurs on CE pin	CHAT
		If chattering does not occur on CE pin	Opposite to CHAT

Remark The shaded portions indicate the factory-set conditions for shipment.

CHAPTER 5 CONNECTOR PIN LIST

Table 5-1. J1 Connector Pins

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	NC	21	NC (13)	41	GND
2	GND	22	GND	42	$P0D_0$/BEEP (6)
3	V_{DD2} (17)	23	GND	43	GND
4	GND	24	NC (12)	44	GND
5	GND	25	GND	45	$P0C_3$ (5)
6	VCOH**Note** (18)	26	GND	46	GND
7	GND	27	CE (11)	47	GND
8	GND	28	GND	48	$P0C_2$ (4)
9	VCOL**Note** (19)	29	GND	49	GND
10	GND	30	$P0A_3$ (10)	50	GND
11	GND	31	GND	51	$P0C_1$ (3)
12	EO (16)	32	GND	52	GND
13	GND	33	$P0A_2$ (9)	53	GND
14	GND	34	GND	54	$P0C_0$ (2)
15	GND (15)	35	GND	55	GND
16	GND	36	$P0A_1$ (8)	56	GND
17	GND	37	GND	57	$P0B_2$ (1)
18	V_{DD1} (14)	38	GND	58	GND
19	GND	39	$P0A_0$ (7)	59	GND
20	GND	40	GND	60	GND

Note VCOL and VCOH signals can also be input from the coaxial connector.

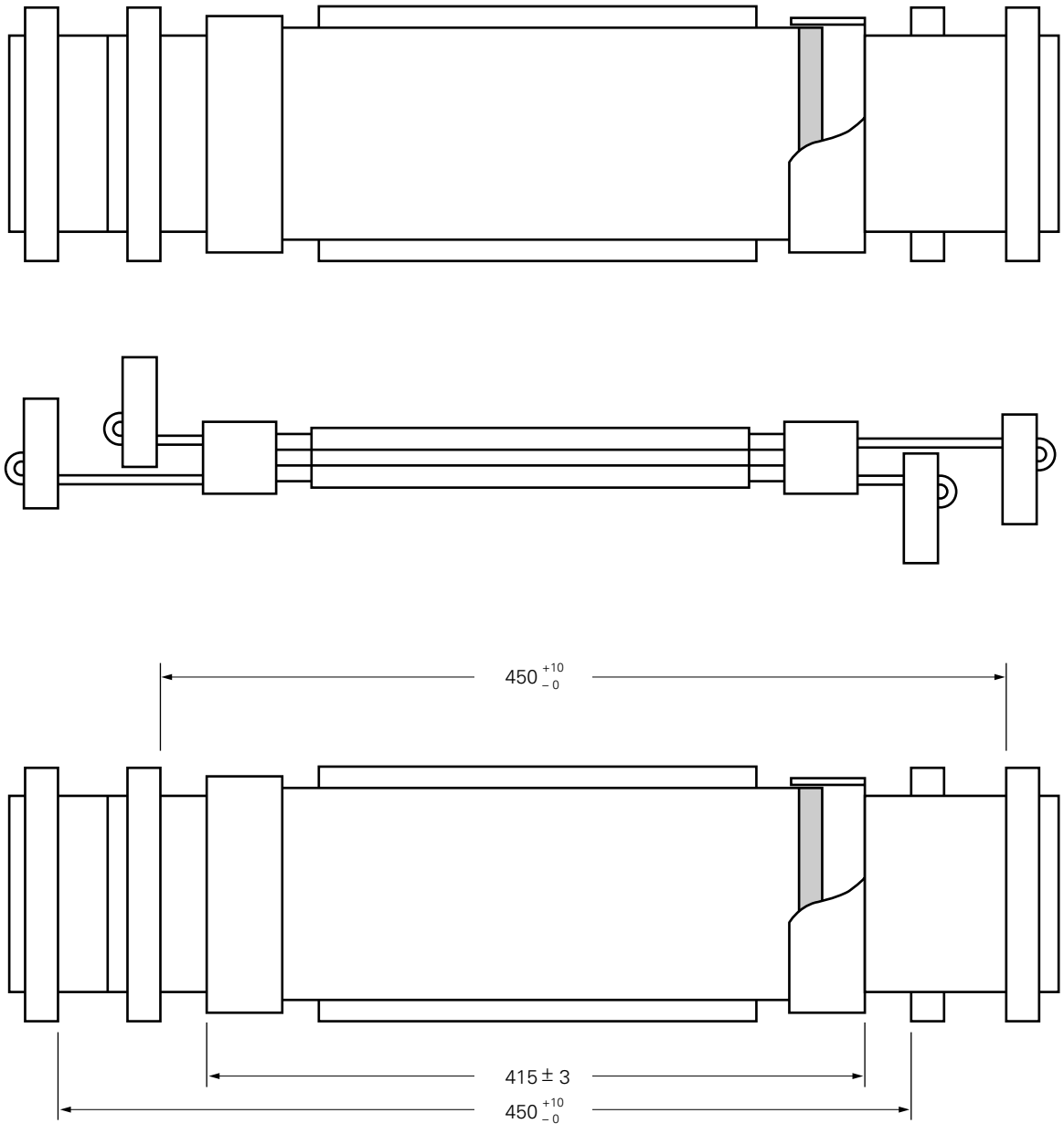
Table 5-2. J2 Connector Pins

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	GND	21	COM_0 (32)	41	GND
2	GND	22	GND	42	LCD_3 (25)
3	$P0B_1$ (38)	23	GND	43	GND
4	GND	24	COM_1 (31)	44	GND
5	GND	25	GND	45	LCD_4 (24)
6	$P0B_0$ (37)	26	GND	46	GND
7	GND	27	COM_2 (30)	47	GND
8	GND	28	GND	48	LCD_5 (23)
9	V_{DD3} (36)	29	GND	49	GND
10	GND	30	COM_3 (29)	50	GND
11	GND	31	GND	51	LCD_8 (20)
12	CAP_1 (35)	32	GND	52	GND
13	GND	33	LCD_0 (28)	53	GND
14	GND	34	GND	54	LCD_7 (21)
15	CAP_2 (34)	35	GND	55	GND
16	GND	36	LCD_1 (27)	56	GND
17	GND	37	GND	57	LCD_6 (22)
18	V_{DD4} (33)	38	GND	58	GND
19	GND	39	LCD_2 (26)	59	GND
20	GND	40	GND	60	NC

CHAPTER 6 DIMENSIONS OF PROBE AND CONVERSION FLEXIBLE PRINTED CIRCUIT BOARD

6.1 Dimensions of Probe

Figure 6-1. Dimensions of EP-17K38GT (cable)



(Unit : mm)

6.2 Dimensions of Conversion Flexible Printed Circuit Board

Product name: EV-9500GT-38

Figure 6-2. Dimensions of Conversion Flexible Printed Circuit Board