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April 1st, 2010
Renesas Electronics Corporation

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USER'S MANUAL

Phase-out/Discontinued

SE-17053

μPD17000 SERIES

USER'S MANUAL

NEC

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SE-17053

μPD17000 SERIES

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Phase-out/Discontinued

CHAPTER 1 INTRODUCTION

SE-17053 is a system evaluation board for 4-bit single chip microcomputer μ PD17053CW. SE-17053 can be used with the μ PD17000 series common in-circuit emulator IE-17K, and also SE-17053 can be used alone.

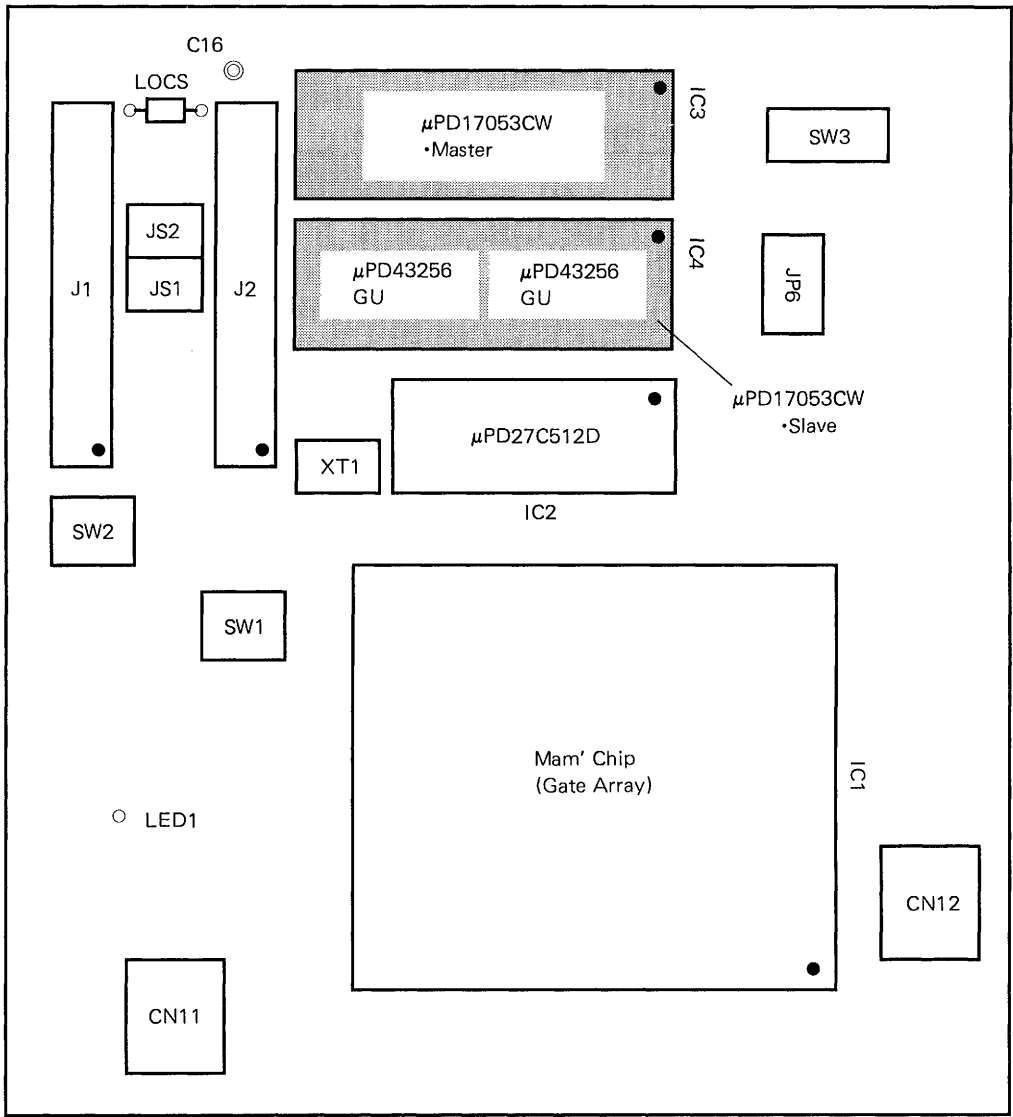
μ PD17053CW is used as an interface with the target system. Therefore, the function of SE-17053 is the same as μ PD17053CW.

In case of connecting SE-17053 to the target system, use the option EP-17052CW (80 pin SDIP probe for μ PD17053CW).

CHAPTER 2 SPECIFICATIONS

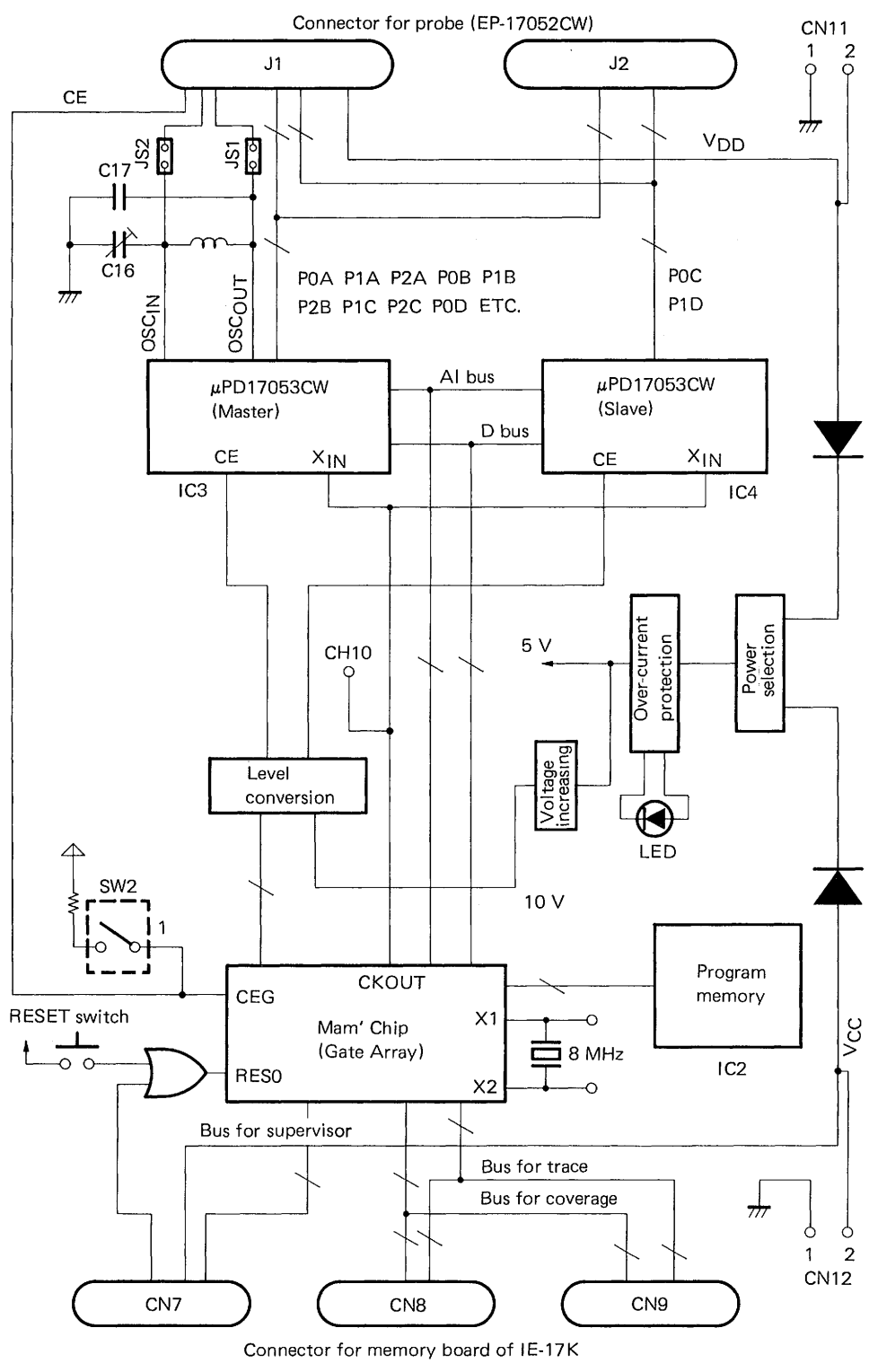
Model name	: SE-17053
Program memory	: • using SE-17053 with IE-17K μ PD43256GU • using SE-17053 alone μ PD27C512D Two pieces of μ PD43256GU are mounted as shipped.
Data memory	: built-in RAM of μ PD17053CW (4 bits x 672)
Oscillating frequency	: 8 MHz (using crystal oscillator) 8 MHz crystal oscillator is installed as shipped
Instruction cycle	: 2 μ s
Operating temperature	: +10 to +40 °C
Storage temperature	: -10 to +50 °C (but without condensation)
Power supply	: 5 V \pm 5 % • When using SE-17053 with IE-17k, the power is supplied from IE-17k. • When using SE-17053 alone, the power is supplied from the probe (EP-17052CW) or the connector CN11 or CN12 on SE-17053.
Current consumption	: 180 mA (MAX.) (no load, using μ PD27C512D as a program memory)
Board dimensions	: 150 mm x 114 mm x 30 mm

Fig. 2-1 SE-17053 Component Layout



CHAPTER 3 BLOCK DIAGRAM

Fig. 3-1 Block Diagram of SE-17053



CHAPTER 4 OPERATING PROCEDURES

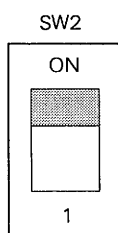
4.1 HOW TO USE SE-17053 WITH IE-17K

(1) DIP SWITCH(SW2) SETTING

The DIP switch(SW2) selects that the CE signal of μ PD17053CW is pulled up or not. When pulled up, it is set as shown in Fig. 4-1. When not pulled up, it is set as shown in Fig. 4-2.

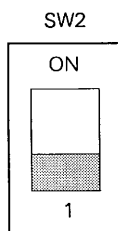
Pull up the CE signal when using SE-17053 without the target system or when the CE signal is not supplied from the target system. The CE signal need not be pulled up when the CE signal is supplied from the target system.

Fig. 4-1 SW2 Setting (when pulled up)



NOTE:  is the setting side.

Fig. 4-2 SW2 Setting (when not pulled up)



NOTE:  is the setting side.

When SE-17053 is shipped, the DIP switch(SW2) is set as shown in Fig. 4-2.

(2) RAM mounting

Two pieces of RAM (μ PD43256GU) are mounted as program memory for SE-17053 as shipped.

When using the RAM other than μ PD43256GU, mount the RAM that accepts the following condition.

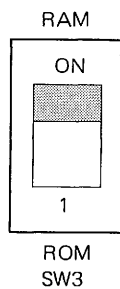
$$t_{ACC} < 0.5 \mu s$$

(t_{ACC} : Address setting \rightarrow Data output delay time)

μ PD43256GU-10, 12 and 15 are available.

(3) ROM/RAM change slide switch settings

Set the ROM/RAM change slide switch(SW3) to the RAM side as shown in Fig. 4-3.

Fig. 4-3 ROM/RAM Change Slide Switch Setting

NOTE:  is the setting side.

(4) Installation and removal of SE-17053 into and from IE-17K

To install SE-17053 into IE-17K, firstly remove the external cover and the inside cover. Fig. 4-4 shows the external view of IE-17K after removing the external cover.

Removing the inside cover, the memory board can be seen. Three connectors are located on the memory board. SE-17053 can be installed into IE-17K by putting three connectors (CN7, 8, and 9) on SE-17053 into three connectors on IE-17K. (See Fig. 4-5)

When installing SE-17053, push it down vertically and check if three connectors are connected firmly.

SE-17053 can be removed from IE-17K by lifting it up vertically. (See Fig. 4-5)

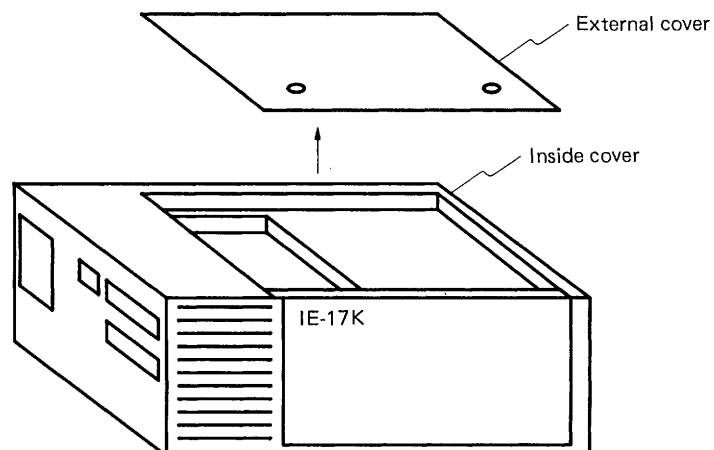
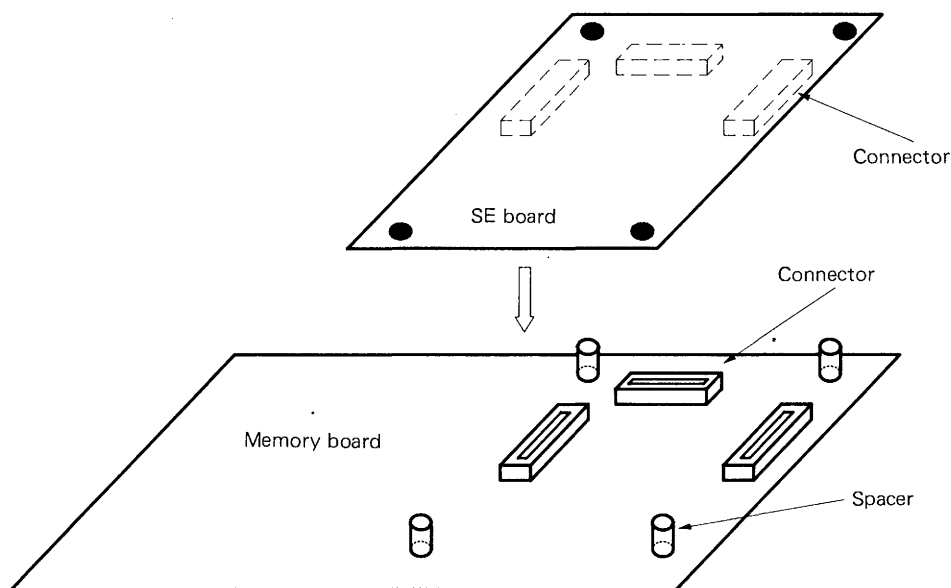
Fig. 4-4 External View of IE-17K (after removing the external cover)

Fig. 4-5 Installation and Removal of SE-17053



After installing SE-17053, turn on the power of IE-17K before installing the inside cover and the external cover. And check if the LED on SE-17053 lights.

The LED does not light in the following cases.

- No connection of the IE-17K power cord
- Over-current in SE-17053 (about 500 mA and more)
- Incorrect installing of SE-17053

If the LED does not light, turn off the power of IE-17K and take out SE-17053 and then reinstall it. If it does not light yet, the trouble may exist.

Next, connect the probe (EP-17052CW) to the connectors J1 and J2 on SE-17053 in order to connect to the target system.

Finally, install the inside cover and the external cover.

(5) Use of IE-17K

Connecting IE-17K to the host machine of PC-9800 series and so on. IE-17K can be used to debug the hardware and the software of the target system. With regard to the operation of IE-17K, refer to "IE-17K USER'S MANUAL".

The procedure to check if SE-17053 is correctly installed is described below.

By turning on the power or pressing the RESET switch of IE-17K when the power is already supplied, IE-17K is activated and displays a prompter (@@@>) which indicates the command is acceptable. Next, by .LP command load the HEX file (.HEX) of the μ PD17053CW program made by the assembler (AS17K) or the HEX file output by .SP command. IE-17K does not operate till the HEX file is loaded. If SE-17053 is correctly installed to IE-17K, the following messages are displayed and a prompter is "BRK>".

And then IE-17K becomes the in-circuit emulator for μ PD17053CW.

```
OK
D17053
```

```
BRK>
```

When the above messages are not displayed, the causes seem as follows.

- If the device other than μ PD17053CW is mounted on SE-17053, the following error message is displayed.

? IDI INVALID DEVICE ID NUMBER [XX-14]

“14” indicates the device number of μ PD17053CW and “XX” indicates the actually mounted device number.

- If the SE board other than SE-17053 is installed, the following error message is displayed.

? ISE INVALID SE BOARD NUMBER [XX-14]

“14” indicates the SE board of SE-17053 and “XX” indicates the actually installed SE board number.

- If the HEX file other than the μ PD17053CW is loaded, the following error message is displayed.

? IDI INVALID SE BOARD NUMBER [14-XX]

“14” indicates the SE board of SE-17053 and “XX” indicates the SE board number of SE board that corresponds to the loaded HEX file.

- In case that SE-17053 is not installed to IE-17K correctly. When loading the HEX file by .LP command, after for a while, without the response from IE-17K, there is a possibility of the incorrect installing of SE-17053. In case of the incorrect installing of SE-17053, reinstall it correctly. And also when loading the HEX file other than the μ PD17053CW, load the HEX file of the μ PD17053CW again.

(6) NOTE

- When turning on the power, turn on the power to IE-17K and then the target system.
- Never use the RESET switch on SE-17053. When resetting IE-17K, use the RESET switch on IE-17K.

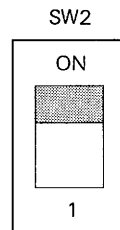
4.2 HOW TO USE SE-17053 ALONE

(1) DIP SWITCH(SW2) SETTING

The DIP switch(SW2) selects that the CE signal of μ PD17053CW is pulled up or not. When pulled up, it is set as shown in Fig. 4-6. When not pulled up, it is set as shown in Fig. 4-7.

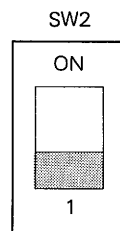
Pull up the CE signal when the CE signal is not supplied from the target system. The CE signal need not be pulled up when the CE signal is supplied from the target system.

Fig. 4-6 SW2 Setting (when pulled up)



NOTE:  is the setting side.

Fig. 4-7 SW2 Setting (when not pulled up)



NOTE:  is the setting side.

When SE-17053 is shipped, the DIP switch(SW2) is set as shown in Fig. 4-7.

(2) PROM mounting

When using SE-17053 alone, mount the PROM (μ PD27C512D) as a program memory. Mount the PROM that accepts the following condition.

$$t_{ACC} < 0.5 \mu s$$

(t_{ACC} : Address setting \rightarrow Data output delay time)

μ PD27C512D-12, 15 and 20 are available.

It is required to write whichever output file as below into the PROM as a program.

- PROM file (.PRO) for μ PD17053CW made by the assembler (AS17K) for μ PD17000 series.
Never write the HEX file (.HEX) made by AS17K into the PROM.
- File for the PROM made by .XS command of IE-17K.

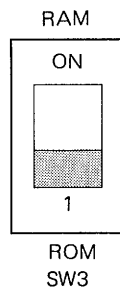
[Note for PROM writing]

The last program memory address of the μ PD17053CW is 2FFFH.

(3) ROM/RAM change slide switch settings

Set the ROM/RAM change slide switch(SW3) to the ROM side as shown in Fig. 4-8.

Fig. 4-8 ROM/RAM Change Slide Switch Setting



NOTE:  is the setting side.

(4) Power supply

SE-17053 has two ways to be supplied with the power, i.e., via V_{DD} or via V_{CC} . Supply the power in one of the following ways.

- Via V_{DD} ($5\text{ V} \pm 5\%$) power from the target system
 - ① Supply the power from CN11 (CN11-1 . . . GND, CN11-2 . . . V_{DD}).
 - ② Supply the power via the probe.
- Via V_{CC} ($5\text{ V} \pm 5\%$) power separate from the target system
 - ① Supply the power from CN12 (CN12-1 . . . GND, CN12-2 . . . V_{CC}).

Supply the power via either V_{DD} or V_{CC} . When the power is supplied via both V_{DD} and V_{CC} , one of them would be selected to be the power of 5 V in SE board.

The power supply voltage must be $5\text{ V} \pm 5\%$.

When the power is supplied normally, the LED on SE-17053 lights.

The LED does not light in the following cases.

- No supplying power to SE-17053
- Over-current in SE-17053 (about 500 mA and more)

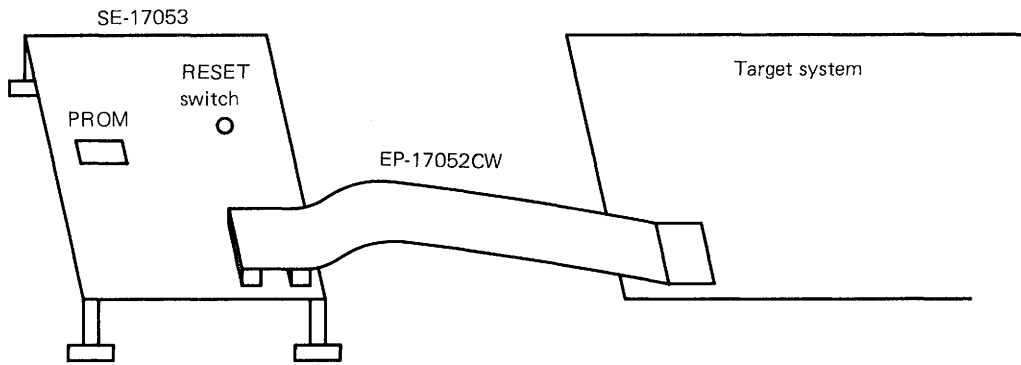
(5) Program executing

Connect the target system to SE-17053 as shown in Fig. 4-9.

Starting to supply the power to target system, the power is supplied to SE-17053 and the POWER-ON-RESET procedure is activated and the program written in the PROM is executed from the location 0.

By pressing the RESET switch on SE-17053, SE-17053 is reset forcibly. As same as the POWER-ON-RESET procedure, the program written in the PROM is executed from the location 0.

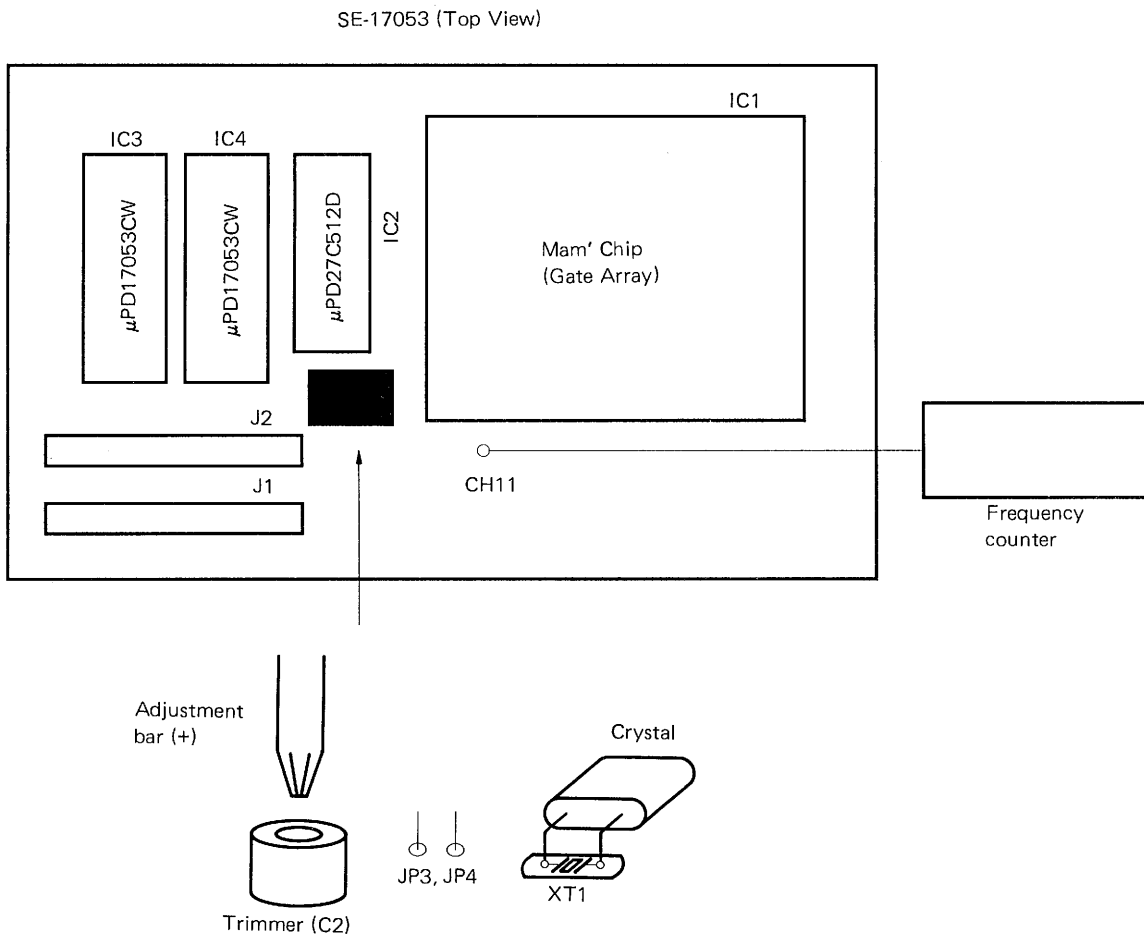
Fig. 4-9 Example of Connection of SE-17053 to the Target System



4.3 ADJUSTING OF OSCILLATING FREQUENCY

The oscillating frequency is set to 8 MHz \pm 20 ppm as shipped. When the adjusting of oscillating frequency would be performed, adjust it by using the trimmer capacitor (C2) on SE-17053. With regard to the measurement of oscillating frequency, use the CH11 pin on SE-17053.

Fig. 4-10 Adjusting of Oscillating Frequency



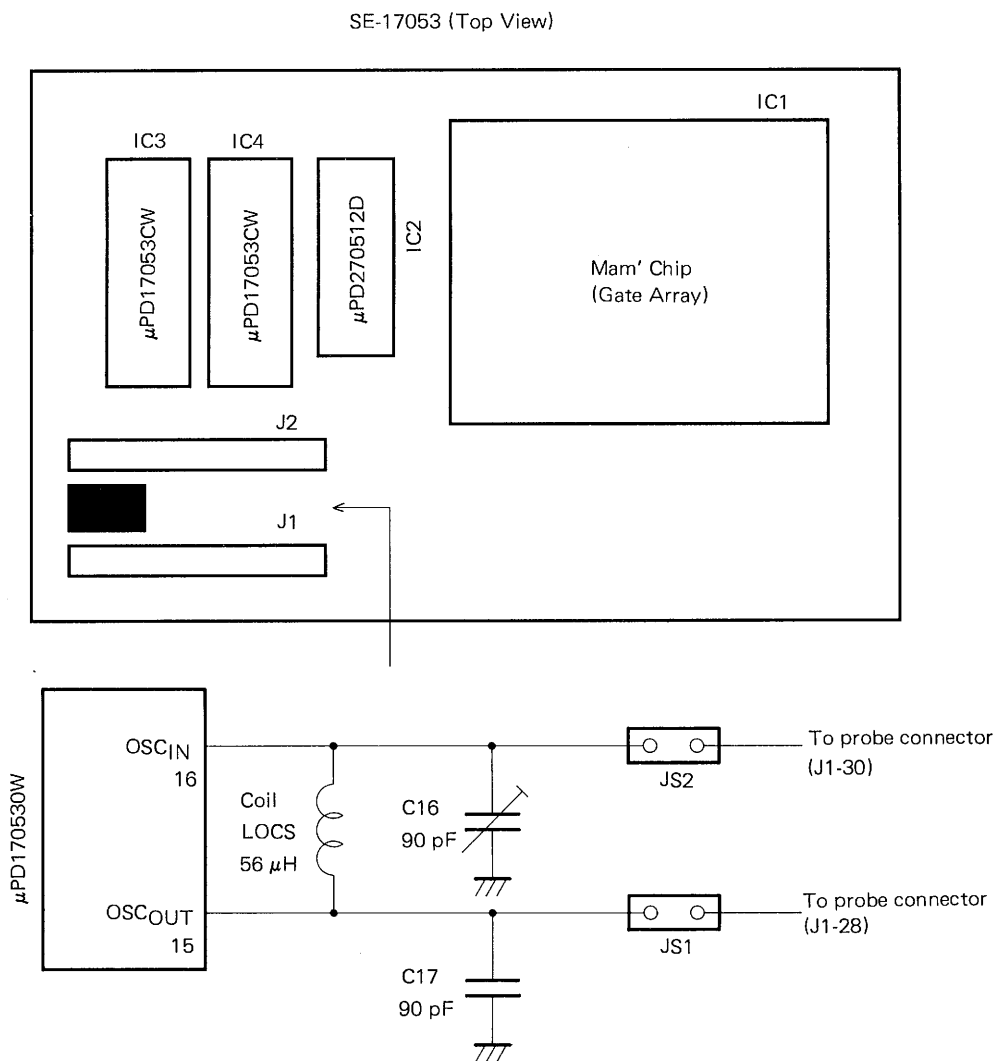
4.4 ADJUSTING OF OSCILLATING FREQUENCY FOR IDC

On SE-17053, the LC oscillating circuit (OSC) for IDC (Image Display Controller) is implemented. When using this circuit, disconnect the jumper switches JS1 and JS2 that connect the OSC_{IN} and OSC_{OUT} pins of μ PD17053CW to the target system. The jumper switches JS1 and JS2 are not connected as shipped.

When the adjusting of oscillating frequency for IDC would be performed, adjust it by using the trimmer capacitor (C16) on SE-17053 as shown in Fig. 4-11.

When the OSC_{IN} AND OSC_{OUT} pins of μ PD17053CW would be connected to the target system, connect the jumper switches JS1 and JS2 and remove the coil (LOCS).

Fig. 4-11 Adjusting of Oscillating Frequency for IDC



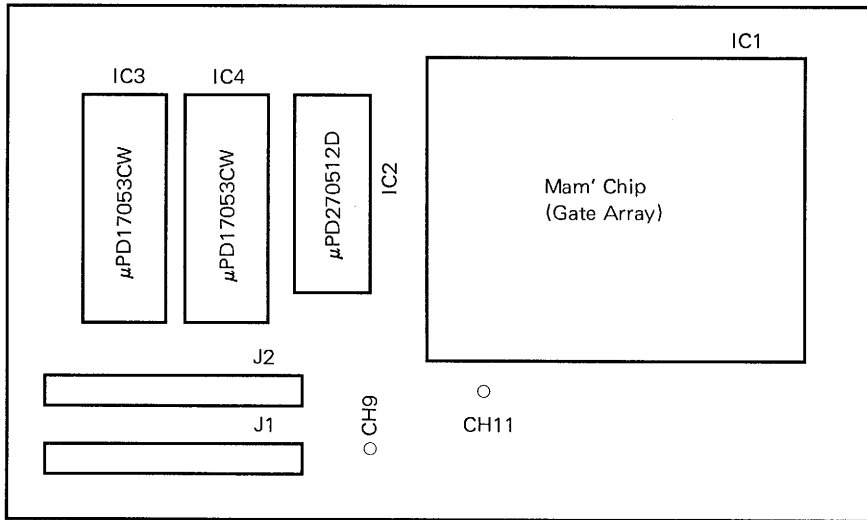
4.5 MONITOR PINS

On SE-17053 the monitor pins are provided in order to examine the status of the following pins of μ PD17053CW. The monitor pin layout shows in Fig. 4-12.

Monitor Pin Name	Pin Name of IC (Pin No.)
CH9	CE (13)
CH11	CKOUT (μ PD65200)

Fig. 4-12 Monitor Pin Layout

SE-17053 (Top View)



4.6 SETTINGS AS SHIPPED

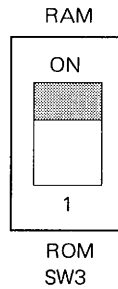
When SE-17053 is shipped, the settings of IC5, IC6 (the program memory), the ROM/RAM change slide switch (SW3), SW2 and the crystal oscillator are as below.

- IC5, IC6 (Program memory)

Two pieces of RAM (μ PD43256GU-10L) are mounted.

- ROM/RAM change slide switch (SW3)

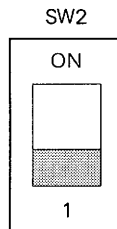
They are set so as to use the RAM as a program memory.



NOTE:  is the setting side.

- SW2

It is set so that the CE signal is not pulled up.



NOTE:  is the setting side.

- Crystal oscillator

It is adjusted to 8 MHz \pm 20 ppm.

CHAPTER 5 CONNECTOR PIN TABLES

5.1 CONNECTOR (J1) FOR PROBE

J1 Pin No.	Pin Name (Pin No. of IC)	J1 Pin No.	Pin Name (Pin No. of IC)	J1 Pin No.	Pin Name (Pin No. of IC)
1	GND	21	GND	41	GND
2	V _{DD} (14)	22	P1B ₁ (11)	42	PWM ₃ (23)
3	GND	23	GND	43	GND
4	P1D ₃ (1)	24	P1B ₀ (12)	44	PWM ₂ (24)
5	P1D ₂ (2)	25	GND	45	GND
6	P1D ₁ (3)	26	CE (13)	46	PWM ₁ (25)
7	GND	27	GND	47	GND
8	P1D ₀ (4)	28	OSC _{OUT} (15)	48	PWM ₀ (26)
9	GND	29	GND	49	GND
10	P2A ₃ (5)	30	OSC _{IN} (16)	50	X _{OUT} (27)
11	GND	31	GND	51	GND
12	P2A ₂ (6)	32	P1A ₃ (18)	52	X _{IN} (28)
13	GND	33	GND	53	GND
14	P2A ₁ (7)	34	P1A ₂ (19)	54	RED (29)
15	GND	35	GND	55	GND
16	P2A ₀ (8)	36	P1A ₁ (20)	56	GREEN (30)
17	GND	37	GND	57	GND
18	P1B ₀ /TMIN (9)	38	P1A ₀ (21)	58	BLUE (31)
19	GND	39	GND	59	GND
20	P1B ₂ (10)	40	PWM _{RMP} (22)	60	BLANK (32)

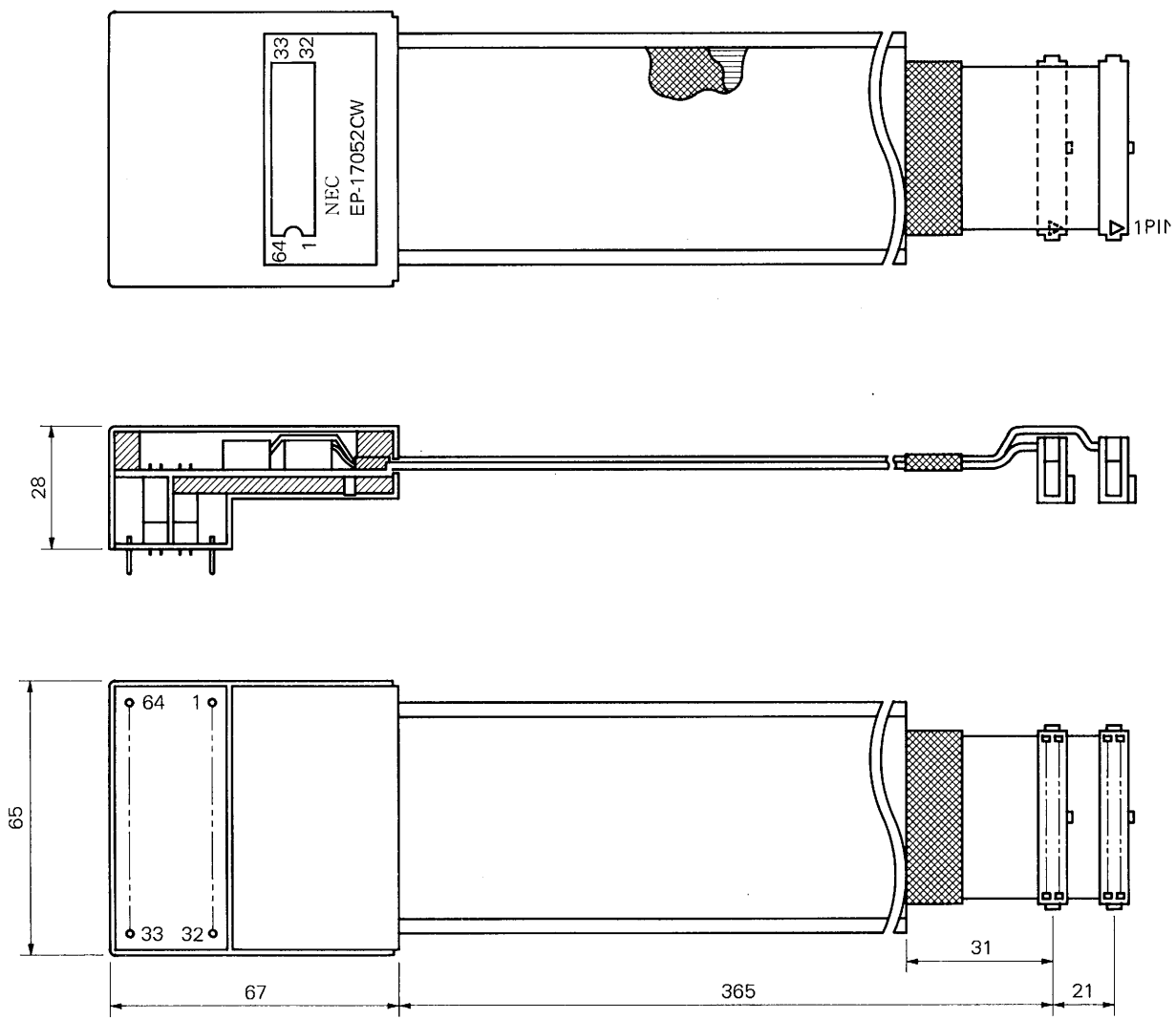
5.2 CONNECTOR (J2) FOR PROBE

J2 Pin No.	Pin Name (Pin No. of IC)	J2 Pin No.	Pin Name (Pin No. of IC)	J2 Pin No.	Pin Name (Pin No. of IC)
1	GND	21	GND	41	GND
2	RMC (64)	22	POC ₂ (52)	42	POA ₀ /SDA (42)
3	ADC ₀ (63)	23	GND	43	GND
4	POD ₀ /ADC ₁ (62)	24	POC ₃ (51)	44	POA ₁ /SCL (41)
5	GND	25	GND	45	GND
6	POD ₁ /ADC ₂ (61)	26	P2C ₀ (50)	46	POA ₂ /SCK (40)
7	POD ₂ /ADC ₃ (60)	27	GND	47	GND
8	POD ₃ /ADC ₄ (59)	28	P2C ₁ (49)	48	POA ₃ /SO (39)
9	GND	29	GND	49	GND
10	P1C ₀ /ADC ₅ (58)	30	P2C ₂ (48)	50	POB ₀ /SI (38)
11	GND	31	GND	51	GND
12	P1C ₁ /ADC ₆ (57)	32	P2C ₃ (47)	52	POB ₁ (37)
13	GND	33	GND	53	GND
14	P1C ₂ /ADC ₇ (56)	34	P2B ₀ (46)	54	POB ₂ (36)
15	GND	35	GND	55	GND
16	P1C ₃ (55)	36	P2B ₁ (45)	56	POB ₃ /HSCNT (35)
17	GND	37	GND	57	GND
18	POC ₀ (54)	38	P2B ₂ (44)	58	H _{SYNC} (34)
19	GND	39	GND	59	GND
20	POC ₁ (53)	40	P2B ₃ (43)	60	V _{SYNC} (33)

CHAPTER 6 EXTERNAL FORM OF PROBE

Model name EP-17052CW

Fig. 6-1 External form of Probe



Phase-out/Discontinued

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