

Notes on Connecting the H8/38024F and H8/38004F

Separate Document for Tiny/SLP E7 Emulator User's
Manual



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Renesas Technology Corp.

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Contents

Section 1	Connecting the E7 Emulator with the User System.....	1
Section 2	Pin Arrangement of the E7 Connector.....	3
Section 3	Example of Emulator Connection.....	5
Section 4	Differences between the MCUs and the Emulator.....	9

Section 1 Connecting the E7 Emulator with the User System

Before connecting an E7 emulator (hereafter referred to as emulator) with the user system, a connector must be installed in the user system so that an user system interface cable can be connected. When designing the user system, refer to the connector and recommended circuits shown in this manual.

Before designing the user system, be sure to read the E7 emulator user's manual and the hardware manual for related MCUs.

Connect pins 2, 4, 6, 10, 12, and 14 of the user system connector to GND firmly on the PCB. These pins are used as electrical GND and to monitor the connection of the user system connector. Note the pin arrangement of the user system connector.

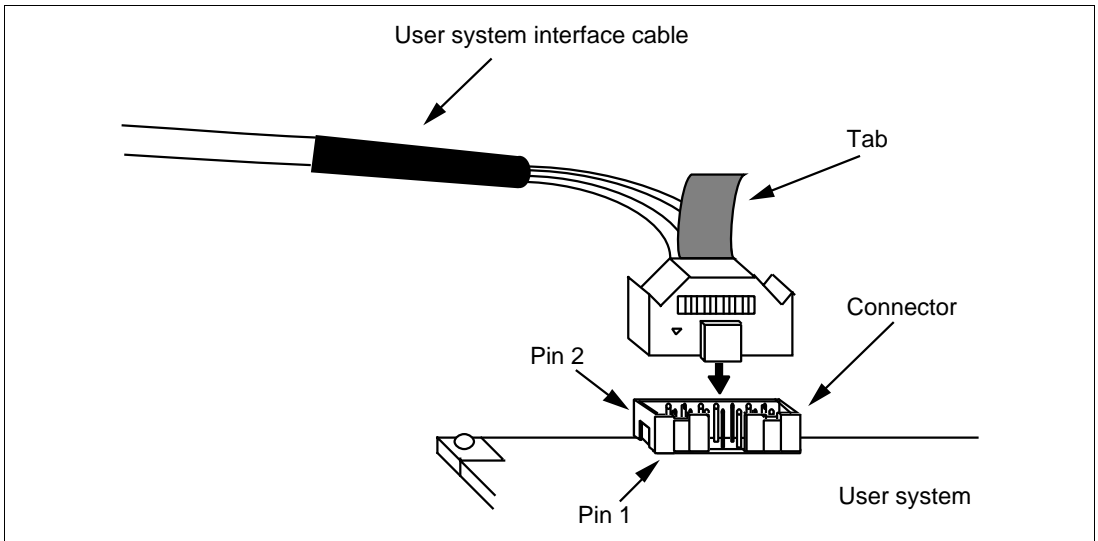


Figure 1.1 Connecting the User System Interface Cable to the User System

- Notes:
1. The pin number assignment of the 14-pin connector differs from that of the E10A emulator; however, the physical location is the same.
 2. When the connector is used, do not install any components within 3 mm of the connector.

Section 2 Pin Arrangement of the E7 Connector

Figure 2.1 shows the pin arrangement of the connector.

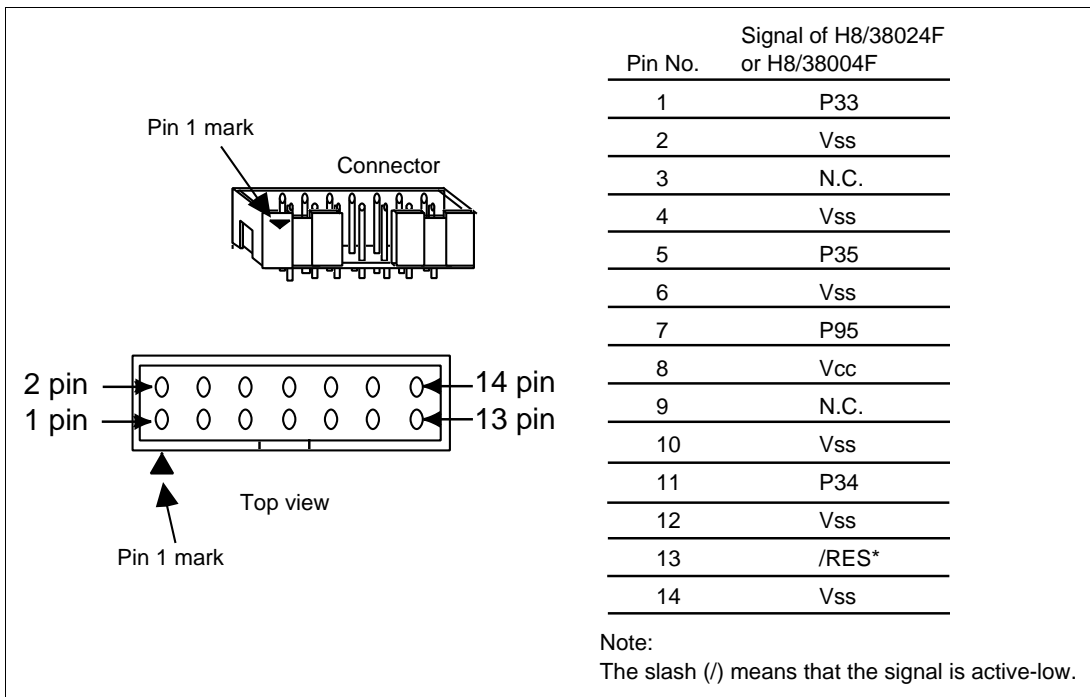


Figure 2.1 Pin Arrangement of the Connector

Section 3 Example of Emulator Connection

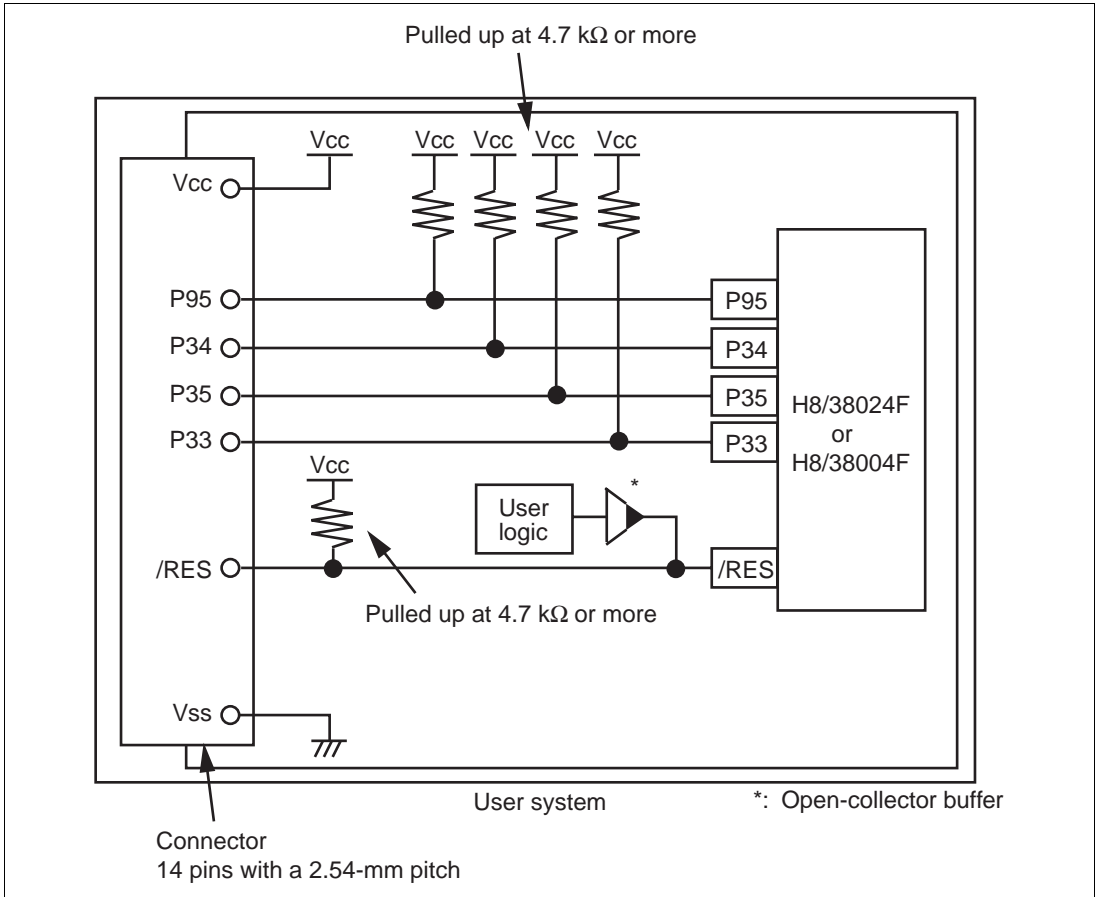


Figure 3.1 Example of Emulator Connection

Notes: 1. P33 to P35 pins are used by the emulator. Pull up and connect the emulator and MCU pins.

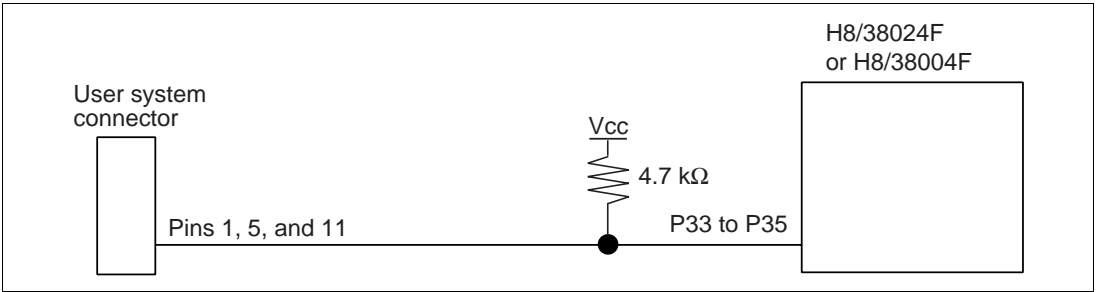


Figure 3.2 Connection of Emulator and P33 to P35 Pins

2. The P95 pin is used for forced break control by the emulator. Connect the emulator and MCU pins directly.

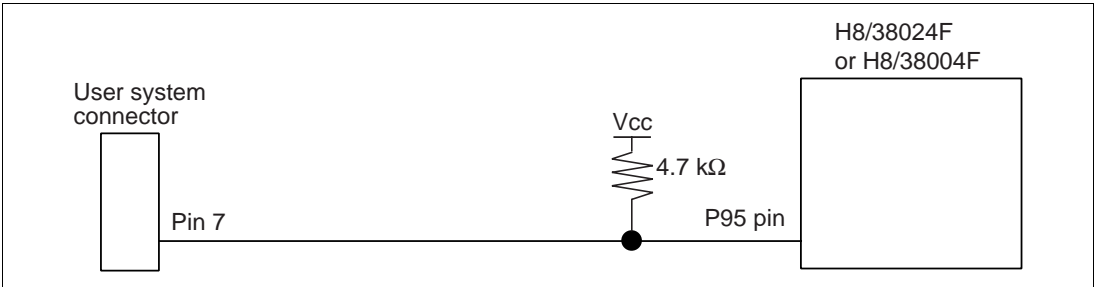


Figure 3.3 Connection of Emulator and P95 Pin

3. The /RES pin is used by the emulator. Create the following circuit by connecting the open-collector output buffer so that reset input can be accepted from the emulator:

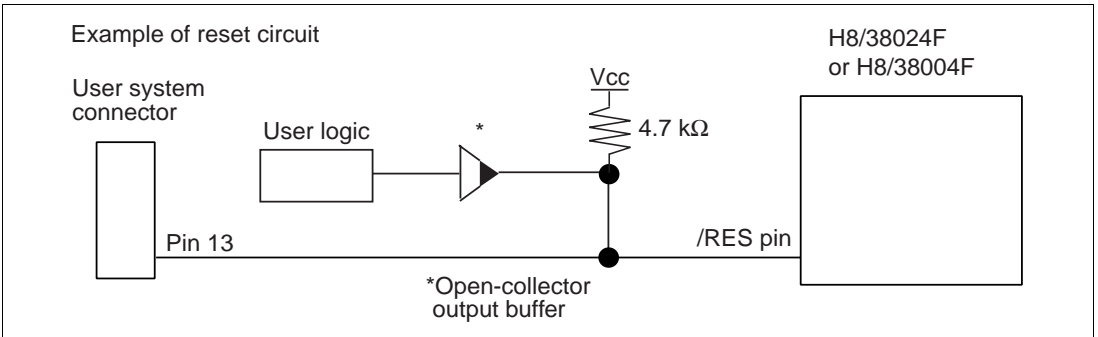


Figure 3.4 Example of a Reset Circuit

4. Connect Vss and Vcc with the Vss and Vcc of the MCU, respectively.
 5. Connect nothing with N.C.

6. The input voltage, V_{cc} , must be connected to the user system V_{cc} (power supply). The amount of voltage permitted to input to V_{cc} must be within the guaranteed range of the microcomputer.
7. Figure 3.5 shows the interface circuit in the emulator. Use this figure as a reference when determining the pull-up resistance value.

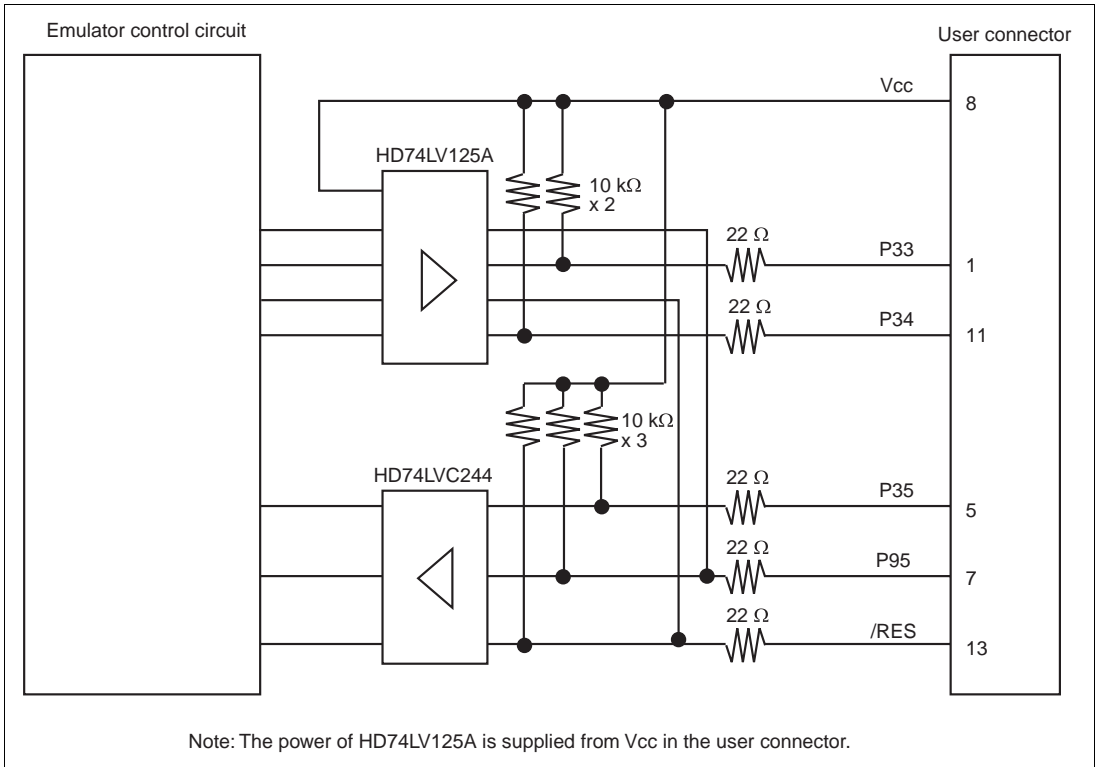


Figure 3.5 Interface Circuit in the Emulator (Reference)

Section 4 Differences between the MCUs and the Emulator

1. When the emulator system is initiated, it initializes the general registers and part of the control registers as shown in table 4.1.

Table 4.1 Register Initial Values at Emulator Power-On

Register	Initial Value
PC	Reset vector value in the vector address table
R0 to R6	H'0000
R7	H'0010
CCR	H'80

2. Low-Power Mode

During a user program break, the CPU operating frequency is forced to a system clock (ϕ) for high-speed operation.

3. RES Signal

The MCU signals are only valid during user program execution started with clicking the GO or STEP-type button. During a user program break, the RES signal is not sent to the MCUs.

Note: Do not start user program execution or access the memory while control input signal (RES) is being low. A TIMEOUT error will occur.

4. System Control Register

In the emulator, the internal I/O registers can be accessed from the [I/O] window. However, be careful when accessing the system control register. The emulator saves the register value of the system control register at a break and returns the value when the user program is executed. Since this is done during a break, do not rewrite the system control register in the [I/O] window.

5. Memory Access during Emulation

If the memory contents are referenced or modified during emulation, realtime emulation cannot be performed because the user program is temporarily halted.

6. The emulator communicates with the MCUs by using the RES, P33 to P35, and P95 pins. These pins except for RES cannot be used.

7. The power consumed by the MCU can reach several mA. This is because the user power supply drives one HD74LV125A to make the communication signal level match the user-system power-supply voltage. The power consumed rises little during user program execution since the emulator does not perform communication; it rises more during a break.

8. Program Area for the Emulator

Do not access a part of areas in the flash memory or the internal RAM since the emulator program uses these areas. If the contents of the program area for the emulator are changed, the emulator will not operate normally. In this case, restart the emulator with the Download emulator firmware mode.

Table 4.2 Program Area for the E7 Emulator

Mode	Program Area
H8/38024F	Flash memory: H'7000 to H'7FFF
H8/38004F	Internal RAM: H'F780 to H'FB7F Vector, etc.: H'0002 to H'0007, H'0014 to H'0015, H'7FF8 to H'7FF9

9. The emulator uses a two-word stack pointer for values stored on a user program break. Therefore, the stack area must accept two-word addresses.

10. Do not use an MCU that has been used for debugging.

If the flash memory is rewritten many times, data may be lost due to retention problems after the emulator has been left for a few days and the data will be erased. If an error message is displayed, exchange the MCU for a new one.