

To our customers,

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## Old Company Name in Catalogs and Other Documents

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April 1<sup>st</sup>, 2010  
Renesas Electronics Corporation

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SH7125 Group and SH7124 Group  
Debugging MCU Board  
HS7125EDB03H, HS7124EDB02H  
User's Manual

Renesas Microcomputer  
Development Environment  
System

SuperH™ Family / SH/Tiny Series

HS7125EDB03HE



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# IMPORTANT INFORMATION

## READ FIRST

- **READ this user's manual before using this emulator product.**
- **KEEP the user's manual handy for future reference.**

**Do not attempt to use the emulator product until you fully understand its mechanism.**

### **Emulator Product:**

Throughout this document, the term "emulator product" shall be defined as the following products produced only by Renesas Technology Corp. and Renesas Solutions Corp. excluding all subsidiary products.

- E10A-USB emulator main unit
- Debugging MCU board

The user system or a host computer is not included in this definition.

### **Purpose of the Debugging MCU Board:**

This debugging MCU board is used to connect the E10A-USB emulator to the user system. This debugging MCU board must only be used for the above purpose.

### **Limited Applications:**

This emulator product is not authorized for use in transportation, vehicular, medical (where human life is potentially at stake), aerospace, nuclear, or undersea repeater applications. Buyers of this emulator product must notify Renesas Technology Corporation, Renesas Solutions Corporation or an authorized Renesas Technology product distributor before planning to use the product in such applications.

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## **Target User of the Emulator Product:**

This emulator product should only be used by those who have carefully read and thoroughly understood the information and restrictions contained in the user's manual. Do not attempt to use the emulator product until you fully understand its mechanism.

It is highly recommended that first-time users be instructed by users that are well versed in the operation of the emulator product.

Users are required to be familiar with the basic knowledge for the electric circuits, logic circuits, and microcomputers.

## **Precautions to be Taken when Using This Product:**

1. This emulator is a development supporting unit for use in your program development and evaluation stages. In mass-producing your program you have finished developing, be sure to make a judgment on your own risk that it can be put to practical use by performing integration test, evaluation, or some experiment else.
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4. This emulator has been developed by assuming its use for program development and evaluation in laboratories. Therefore, it does not fall under the application of Electrical Appliance and Material Safety Law and protection against electromagnetic interference when used in Japan.
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6. Renesas cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this user's manual and on the emulator product are therefore not all inclusive. Therefore, you must use the emulator product safely at your own risk.



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**Figures:**

Some figures in this user's manual may show items different from your actual system.

# SAFETY PAGE

## READ FIRST

- **READ** this user's manual before using this emulator product.
- **KEEP the user's manual handy for future reference.**

**Do not attempt to use the emulator product until you fully understand its mechanism.**

## DEFINITION OF SIGNAL WORDS

**Either in the user's manual or on the product, several icons are used to insure proper handling of this product and also to prevent injuries to you or other persons, or damage to your properties. Their graphic images and meanings are given in this safety page. Be sure to read this chapter before using the product.**



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



**CAUTION** used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

**NOTE** emphasizes essential information.

In addition to the four above, the following are also used as appropriate.



# WARNING

Observe the precautions listed below. Failure to do so will result in a **FIRE HAZARD** and will damage the user system and the emulator product or will result in **PERSONAL INJURY**. The **USER PROGRAM** will be **LOST**.

1. Do not repair or remodel the emulator product by yourself for electric shock prevention and quality assurance.
2. Always switch **OFF** the emulator and user system before connecting or disconnecting any **CABLES** or **PARTS**.
3. Always before connecting any **CABLES**, make sure that pin 1 on both sides are correctly aligned.
4. If cables are connected incorrectly in the case of the **SH7125**, the power-supply pins will be shorted as shown below:

90° rotation		270° rotation	
4 (Vcc)	— 52 (AVss)	6 (Vss)	— 22 (Vcc)
22 (Vcc)	— 6 (Vss)	8 (VCL)	— 24 (Vss)
24 (Vss)	— 8 (VCL)	52 (AVss)	— 4 (Vcc)

# User Registration

When you have purchased the emulator represented in this user's manual, be sure to register it. As the H/W Tool Customer Registration Sheet is included with this product, fill it in and send the same contents to the following address by an email. Your registered information is used for only after-sale services, and not for any other purposes. Without user registration, you will not be able to receive maintenance services such as a notification of field changes or trouble information. So be sure to carry out the user registration.

For more information about user registration, send an email to the following address.

[regist\\_tool@renesas.com](mailto:regist_tool@renesas.com)



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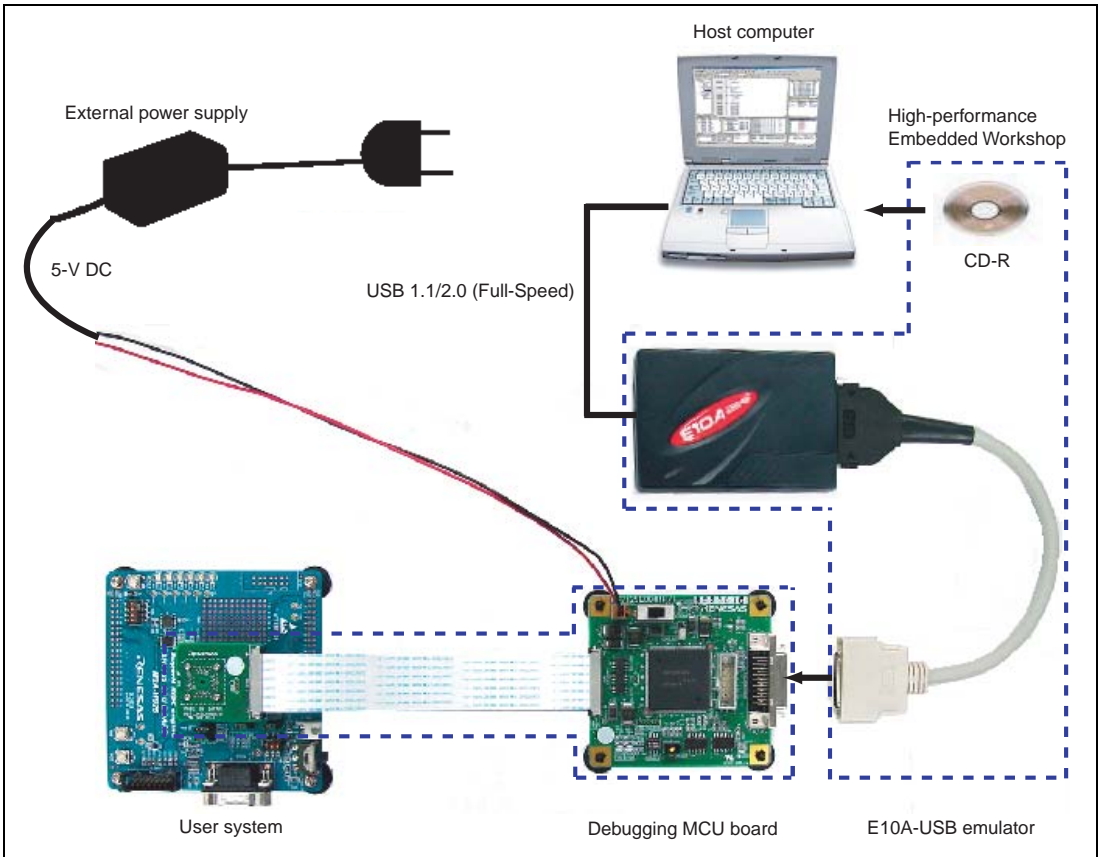
# Section 1 Product Overview

## 1.1 Introduction

The High-performance Embedded Workshop is a graphical user interface intended to ease the development and debugging of applications written in C/C++ programming language and assembly language for Renesas microcomputers. Its aim is to provide a powerful yet intuitive way of accessing, measuring, and modifying the debugging platform in which the application is running.

This system is a software and hardware development support tool for application systems using the Renesas original microcomputer.

The debugging MCU board is connected to the user system through the IC socket on the user system. The user system can be debugged under the conditions similar to the actual application conditions. The debugging MCU board enables debugging anywhere indoors or out with the E10A-USB emulator. The host computer for controlling the debugging MCU board must be an IBM PC compatible machine with USB 1.1/2.0 (Full-Speed).



**Figure 1.1 System Configuration with the Debugging MCU Board**

The debugging MCU board provides the following features:

1. Excellent cost-performance in-circuit emulator

Using the debugging MCU board with the E10A-USB emulator implements low-cost debugging of the user system without the user pins being occupied by the debugging interface (H-UDI).

When the AUD function on the debugging MCU board is used, the debugging MCU board supports the window trace function for trace acquisition of a large-capacity realtime trace or a memory access (memory access address or memory access data) within the specified ranges.

2. Realtime emulation

Realtime emulation of the user system is enabled at the maximum operating frequency of the CPU.

3. Excellent operability

Using the High-performance Embedded Workshop on the Microsoft® Windows® 2000, and Microsoft® Windows® XP operating systems enables user program debugging using a pointing device such as a mouse. The High-performance Embedded Workshop enables high-speed downloading of load module files.

4. Debugging of the user system in the final development stage

The user system can be debugged under conditions similar to the actual application conditions.

5. Compact debugging environment

When the emulator is used, a laptop computer can be used as a host computer, creating a debugging environment in any place.

## CAUTION

**READ the following warnings before using the debugging MCU board. Incorrect operation will damage the user system and the debugging MCU board. The USER PROGRAM will be LOST.**

1. Check all components against the component list after unpacking the emulator.
2. Never place heavy objects on the casing.
3. Protect the emulator from excessive impacts and stresses. For details, refer to section 1.5, Environmental Conditions.
4. Only supply the power of the specified voltages or power-supply frequencies to the debugging MCU board.
5. When moving the host computer or user system, take care not to vibrate or damage it.
6. After connecting the cable, check that it is connected correctly. For details, refer to section 2, Setting Up the Debugging MCU Board.
7. Supply power to the connected equipment after connecting all cables. Cables must not be connected or removed while the power is on.

## 1.2 Components





After removing the product from its packaging, confirm that you have all of the components. For details on the components of the debugging MCU board, refer to section 1.3, Components in the Package for the Debugging MCU Board. If any component is not present, contact your nearest Renesas sales office.

### 1.3 Components in the Package for the Debugging MCU Board

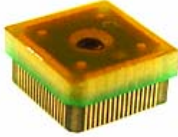

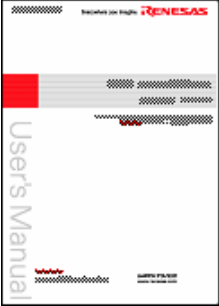
The debugging MCU board supports the SH7125 group (SH7125) and SH7124 group (SH7124). Table 1.1 lists the components supplied in the package for the debugging MCU board.

In the product as shipped, the main unit of the debugging MCU board is connected to the user system interface board with the flexible flat cable (FFC). Do not detach them from each other.

**Table 1.1 Components in the Package for the Debugging MCU Board**

Classification	Component	Appearance	Qty	Remarks
Hardware	Debugging MCU board main unit		1	Depth: 80.0 mm, width: 85.0 mm, height: 22.3 mm, mass: 55.2 g  * The main unit of the debugging MCU board is connected to the user system interface board with the FFC cable. Do not disconnect these components.
	FFC cables		2	Length: 150.0 mm, mass: 1.4 g
	User system interface board		1	Depth: 35.0 mm, width: 37.5 mm, height: 8.8 mm, mass: 6 g
	Power cable		1	Length: 0.5 m

**Table 1.1 Components in the Package for the Debugging MCU Board (cont.)**

Classification	Component	Appearance	Qty	Remarks
Hardware (cont.)	IC socket		1	NB SOCKET064SE-RE41N or NB SOCKET052SE-RE41N *The provided IC socket will differ according to the supported MCU.  Connect the IC socket to the user system.
			1	NW PLUG064SE-RE01 or NW PLUG052SE-RE01 *The provided socket cover will differ according to the supported MCU.
	User's manual		1	SH7125 Group and SH7124 Group Debugging MCU Board User's Manual (this manual)

## CAUTION

Use the following IC sockets to connect the user system with the debugging MCU board.

- IC sockets for the SH7125 (package code: PVQN0064LB-A:  
: NBSOCKET064SE-RE41N (manufactured by Tokyo Eletech Corporation)  
: NWPLUG064SE-RE01 (manufactured by Tokyo Eletech Corporation)

- IC sockets for the SH7124 (package code: PVQN0052LE-A:  
: NBSOCKET052SE-RE41N (manufactured by Tokyo Eletech Corporation)  
: NWPLUG052SE-RE01 (manufactured by Tokyo Eletech Corporation)

To mount the MCU without connecting the debugging MCU board to the user system, use one of the IC sockets listed below. These components (NLPACK and NSSOCKET) are not provided with the debugging MCU board, so must be separately purchased before use.

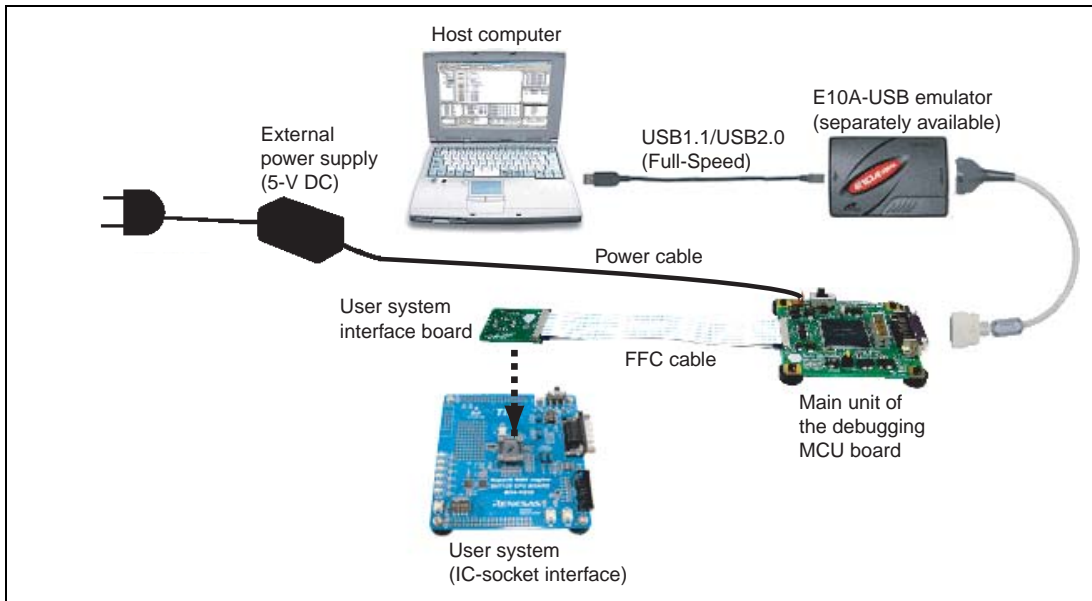
- IC sockets for the SH7125 (package code: PVQN0064LB-A:  
: NBSOCKET064SE-RE41N (manufactured by Tokyo Eletech Corporation)  
: NLPACK064SE-RE01 (manufactured by Tokyo Eletech Corporation)  
: NSSOCKET064SE-RE01 (manufactured by Tokyo Eletech Corporation)

- IC sockets for the SH7124 (package code: PVQN0052LE-A:  
: NBSOCKET052SE-RE41N (manufactured by Tokyo Eletech Corporation)  
: NLPACK052SE-RE01 (manufactured by Tokyo Eletech Corporation)  
: NSSOCKET052SE-RE01 (manufactured by Tokyo Eletech Corporation)

## 1.4 Hardware Configuration

As shown in figure 1.2, the usable configuration of the debugging MCU board consists of the main unit, FFC cable, user system interface board, and power cable. The debugging MCU board is connected, via the E10A-USB emulator, to the host computer over a USB 1.1/2.0 (Full-Speed) link.

The host computer, E10A-USB emulator, and external power supply must be separately obtained by the user.



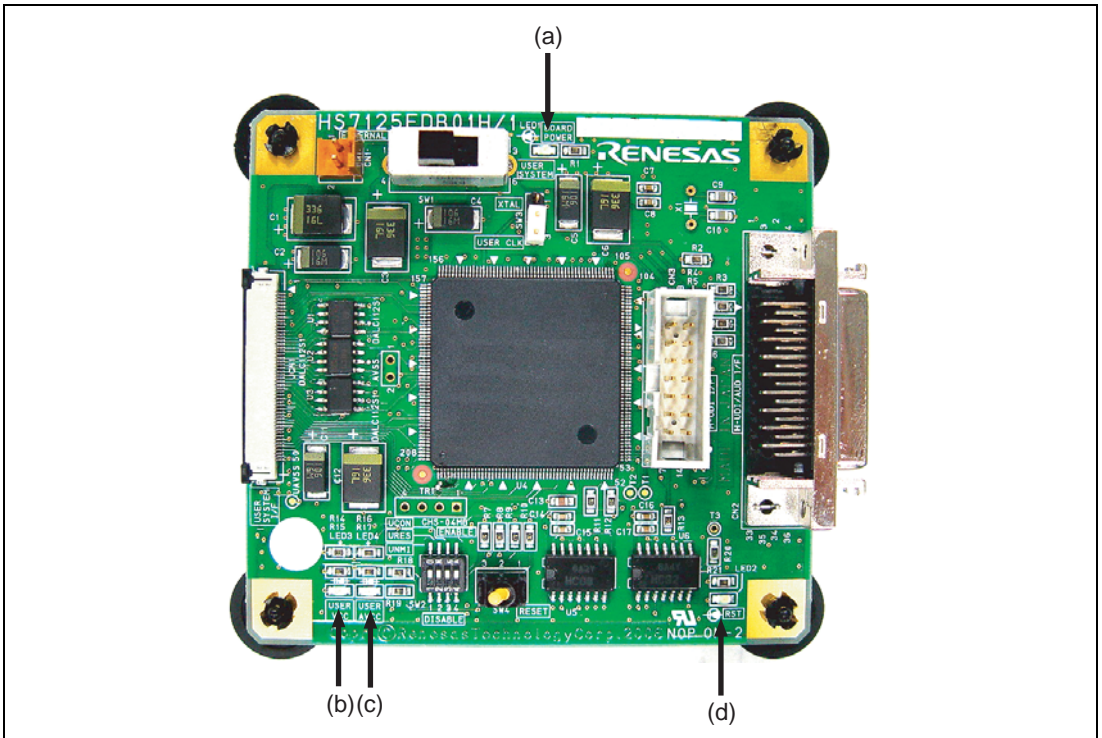
**Figure 1.2 Hardware Configuration of the Debugging MCU Board**



### 1.4.1 Configuration of the Main Unit of the Debugging MCU Board

The names of each section of the debugging MCU board are explained below.

#### Top of the Main Unit of the Debugging MCU Board (1)



**Figure 1.3 Top of the Main Unit of the Debugging MCU Board (1)**

- (a) External power LED: Marked 'BOARD POWER'. This LED is lit while external power is being supplied from the power cable.
- (b) User VCC LED: Marked 'USER VCC'. This LED is lit while power is being supplied from the user system to the VCC pin of the MCU.
- (c) User AVCC LED: Marked 'USER AVCC'. This LED is lit while power is being supplied from the user system to the AVCC pin of the MCU.
- (d) Reset LED: Marked 'RST'. This LED is lit while the reset signal is being input to the MCU.

## Top of the Main Unit of the Debugging MCU Board (2)

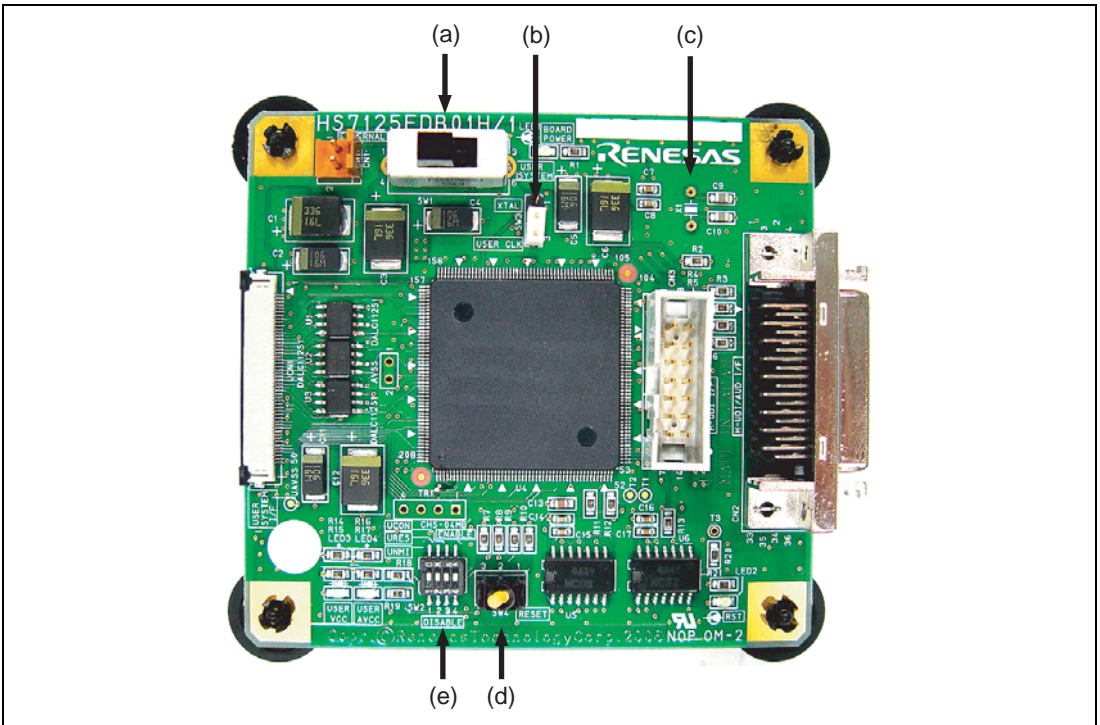
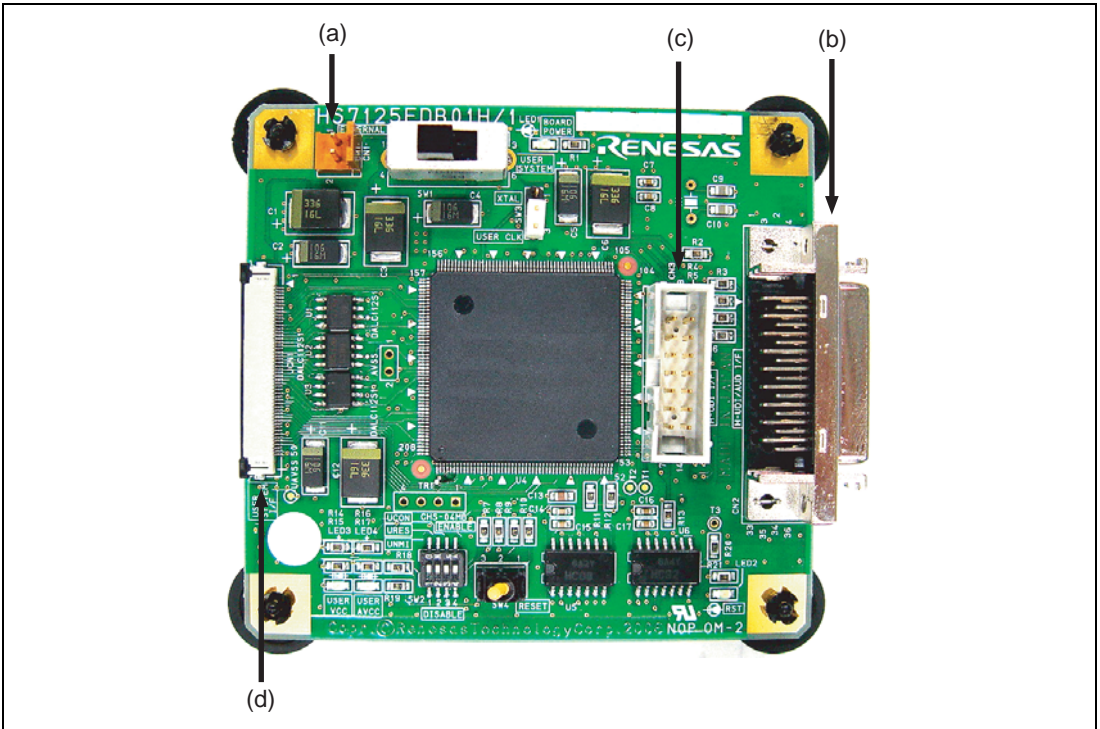


Figure 1.4 Top of the Main Unit of the Debugging MCU Board (2)

- (a) Power-selection switch: This switch is used to select the power source for the debugging MCU board.  
When 'EXTERNAL' is selected, an external power supply is the source for the debugging MCU board.  
When 'USER SYSTEM' is selected, the VCC power supply on the user system is the source for the debugging MCU board.
- (b) Clock-selection jumper: This jumper is used to select the clock signal for input to the MCU on the debugging MCU board.  
When 'XTAL' is selected, the input clock signal is from the crystal resonator on the debugging MCU board. When 'USER CLK' is selected, the input clock signal is from the EXTAL pin on the user system.
- (c) Crystal-resonator installation sockets: The crystal resonator for supplying the external clock signal is mounted here when 'XTAL' has been selected on the clock-selection jumper.
- (d) Reset switch: This switch is used to input reset signals manually to the debugging MCU board.
- (e) User-system input signal enabling/disabling switches: These switches are used to enable or disable the input of /RES and NMI signals from the user system and connect or disconnect the user system.

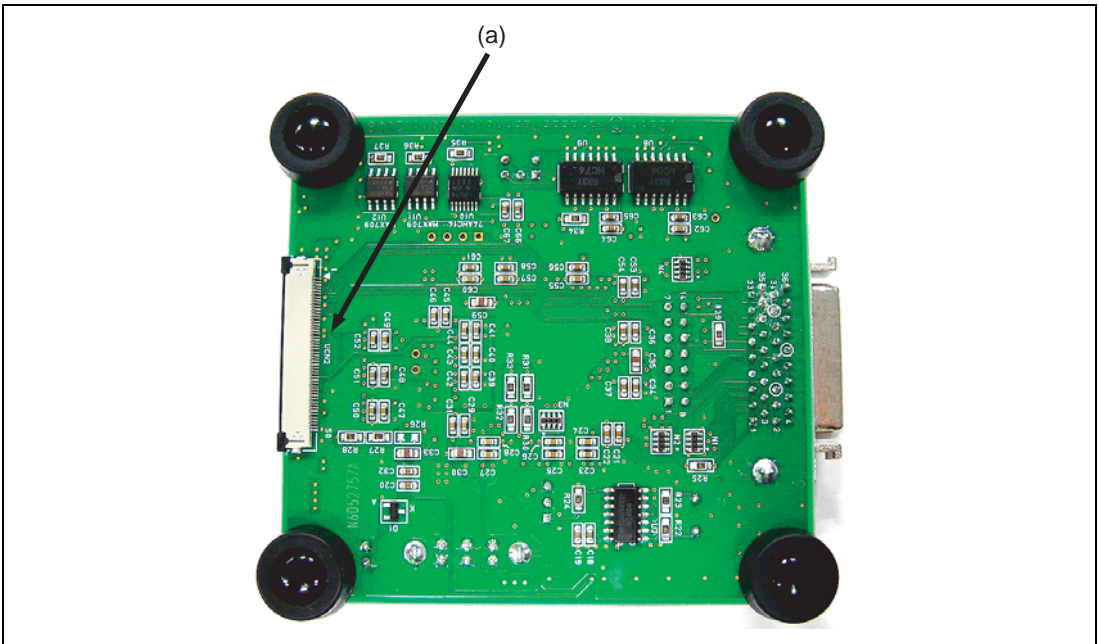
### Top of the Main Unit of the Debugging MCU Board (3)



**Figure 1.5 Top of the Main Unit of the Debugging MCU Board (3)**

- (a) Power-cable connector: This connector is used to connect the debugging MCU board to the power cable for the external power supply.
- (b) H-UDI interface connector (36 pins): This connector is used to connect the debugging MCU board to the 36-pin cable of the E10A-USB emulator.
- (c) H-UDI interface connector (14 pins): This connector is used to connect the debugging MCU board to the 14-pin cable of the E10A-USB emulator.
- (d) User system interface connector 1: This connector is used to connect the main unit of the debugging MCU board to the FFC cable.  
 Note: The FFC cable already occupies this connector in the product as shipped. Do not remove the cable from the connector.

## Bottom of the Main Unit of the Debugging MCU Board (4)



**Figure 1.6 Bottom of the Main Unit of the Debugging MCU Board (4)**

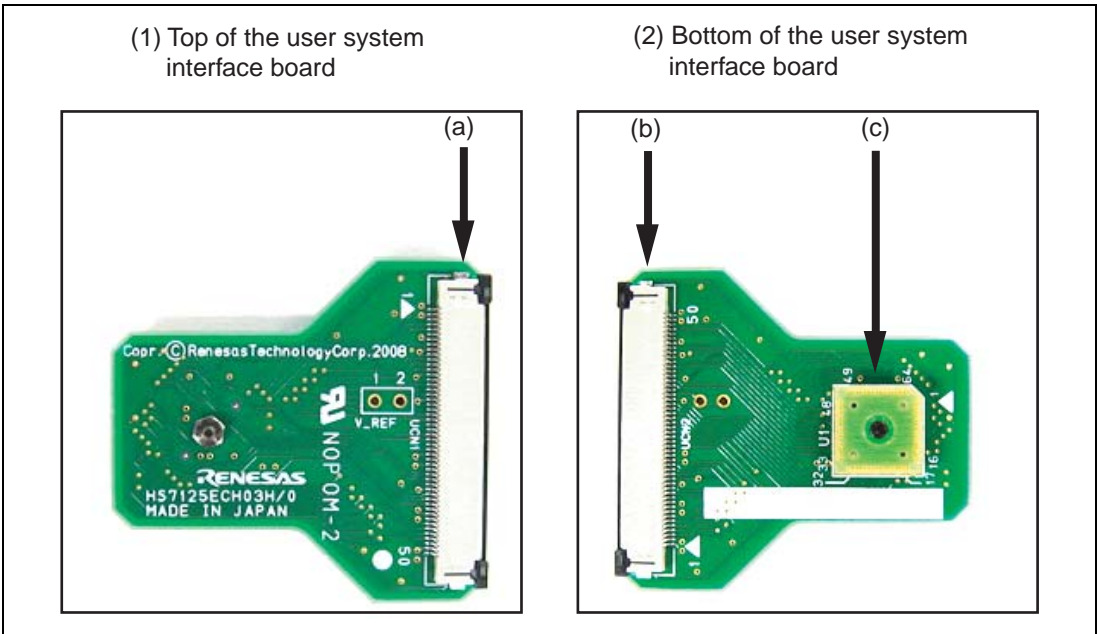
(a) User system interface connector 2:

This connector is used to connect the main unit of the debugging MCU board to the FFC cable.

Note: The FFC cable already occupies this connector in the product as shipped. Do not remove the cable from the connector.

## 1.4.2 Configuration of the User System Interface Board

The names of each section of the user system interface board are explained below.



**Figure 1.7 User System Interface Board**

(a) User system interface connector 1:

This connector is used to connect the user system interface board to the FFC cable.

Note: The FFC cable already occupies this connector in the product as shipped. Do not remove the cable from the connector.

(b) User system interface connector 2:

This connector is used to connect the user system interface board to the FFC cable.

Note: The FFC cable already occupies this connector in the product as shipped. Do not remove the cable from the connector.

(c) User system connector:

This connector is for connection to the user system.

## 1.5 Environmental Conditions

### CAUTION

**Observe the conditions listed in tables 1.6 and 1.7 when using the debugging MCU board. Failure to do so can lead to abnormal operation of the user system, the debugging MCU board, and the user program.**

**Table 1.6 Environmental Conditions**

Item	Specifications
Temperature	Operating: +10°C to +35°C Storage: -10°C to +50°C
Humidity	Operating: 35% RH to 80% RH, no condensation Storage: 35% RH to 80% RH, no condensation
Vibration	Operating: 2.45 m/s <sup>2</sup> max. Storage: 4.9 m/s <sup>2</sup> max. Transportation: 14.7 m/s <sup>2</sup> max.
Ambient gases	No corrosive gases may be present

**Table 1.7 Operating Environment**

Item	Description
Host computer	IBM PC or compatible machine that satisfies the operating-environment conditions of the E10A-USB emulator
Emulator	Renesas microcomputer development tool: E10A-USB emulator (HS0005KCU01H or HS0005KCU02H)
Power supply	DC 5 V ± 10%
Supply current	300 mA (max.)





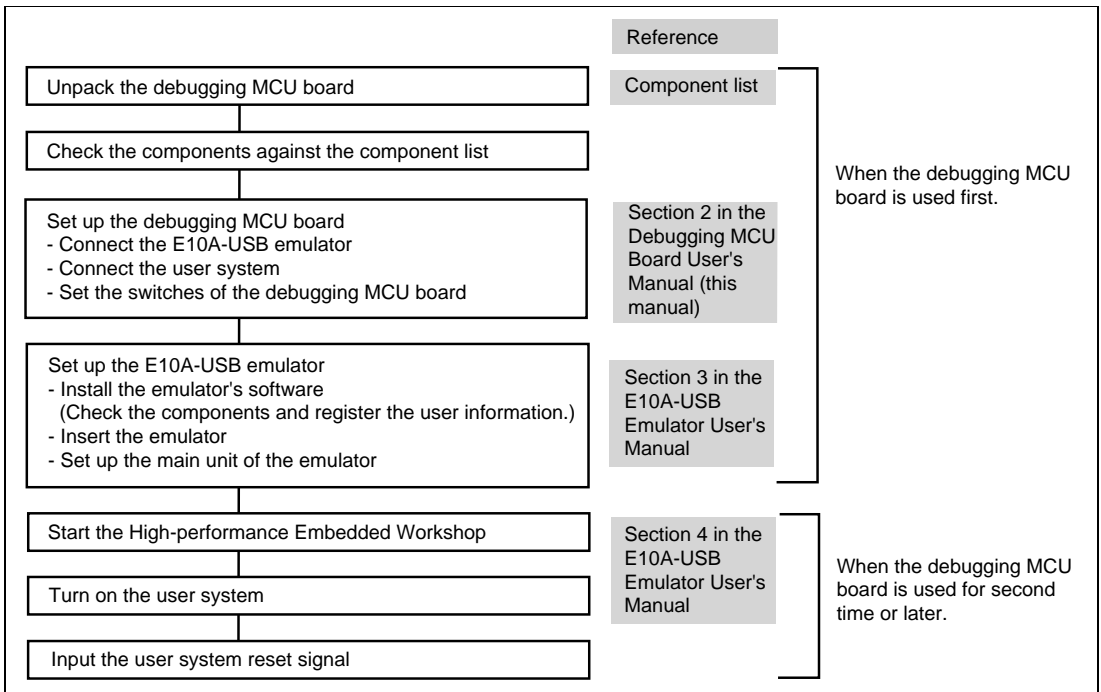
## Section 2 Setting Up the Debugging MCU Board

### 2.1 Flow Chart before Using the Debugging MCU Board

Unpack the debugging MCU board and prepare it for use as follows:

# WARNING

**READ the reference sections shaded in figure 2.1 before using the debugging MCU board. Incorrect operation will damage the user system and the debugging MCU board. The USER PROGRAM will be LOST.**



**Figure 2.1 Preparation Flow Chart for the Debugging MCU Board**

## 2.2 Setting Up the Debugging MCU Board

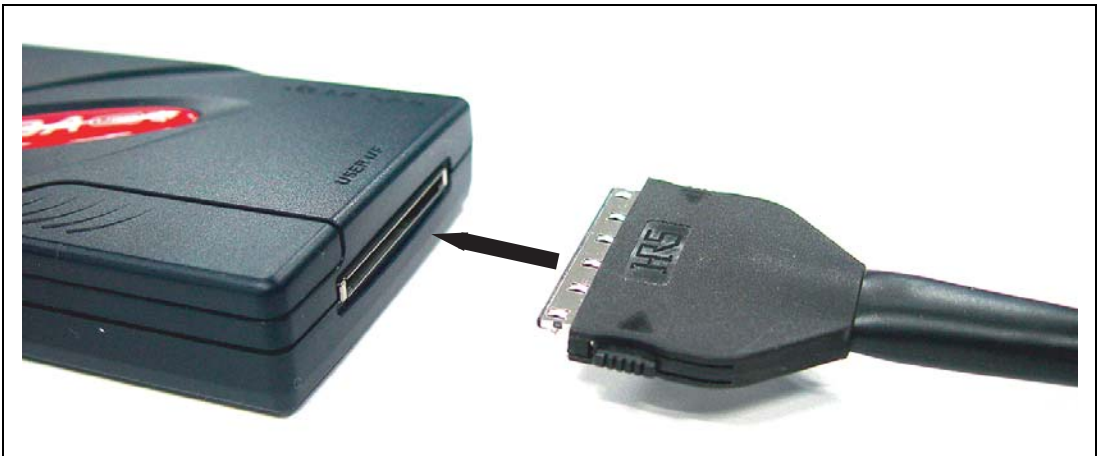
To apply the debugging MCU board, you must obtain an E10A-USB emulator. This section describes how to connect the debugging MCU board, the E10A-USB emulator, and the user system interface board.

Before making the connections, check that the host computer is turned off, the E10A-USB emulator is not connected to the host computer via the USB cable, and power is being supplied to neither the debugging MCU board nor the user system.

### 2.2.1 Connecting the Debugging MCU Board to the E10A-USB Emulator

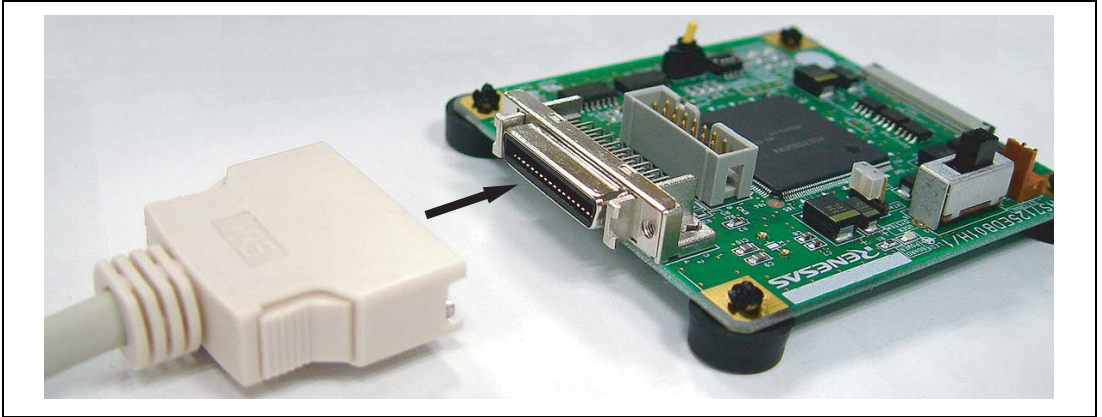
Follow the below procedure to connect the debugging MCU board to the E10A-USB emulator.

1. Connect the user system interface cable (14 or 36 pins) provided with the E10A-USB emulator to the side connector of the E10A-USB emulator as shown in figure 2.2.

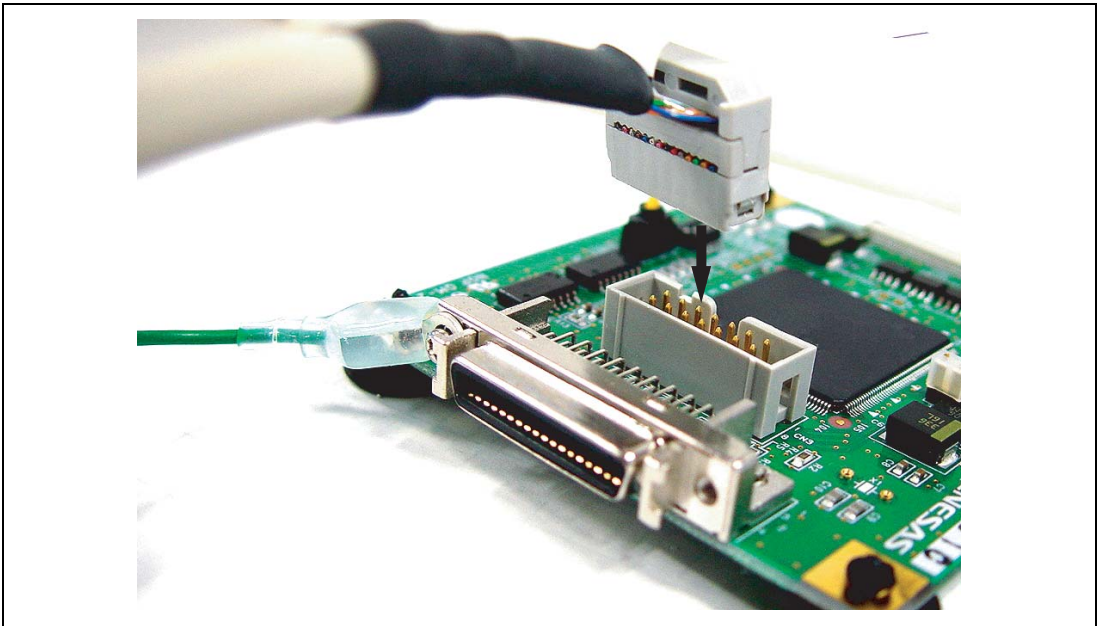


**Figure 2.2 Connecting the E10A-USB Emulator to the User System Interface Cable**

2. Connect the 14-pin or 36-pin connector of the user system interface cable to the H-UDI interface connector on the debugging MCU board as shown in figures 2.3 and 2.4. Connect the 36-pin or 14-pin connector to CN2 or CN3, respectively.



**Figure 2.3** Connecting the User System Interface Cable (36 Pins) to the Debugging MCU Board



**Figure 2.4** Connecting the User System Interface Cable (14 Pins) to the Debugging MCU Board

### 2.2.2 Connecting the Debugging MCU Board to the User System

To connect the debugging MCU board to the user system, follow the instructions below.

## WARNING

**Always switch OFF the emulator product, the debugging MCU board, and the user system before any connection or removal of the USER SYSTEM INTERFACE BOARD. Furthermore, make sure that the pin 1 positions on both sides are correctly aligned. Failure to do so will create a FIRE HAZARD that can damage the emulator product, the debugging MCU board, the user system interface board, or the user system, or produce PERSONAL INJURY.**

1. Solder the NBSOCKET to the user system after checking the location of pin 1. The socket is notched to indicate the corner corresponding to this location.

## CAUTION

**Before applying solder, use epoxy resin adhesive to affix the guide points on the IC socket to the user system.**

**Ensure full wetting of the leads so that the solder flows over the leads and forms good fillets (use slightly more solder than you normally would).**

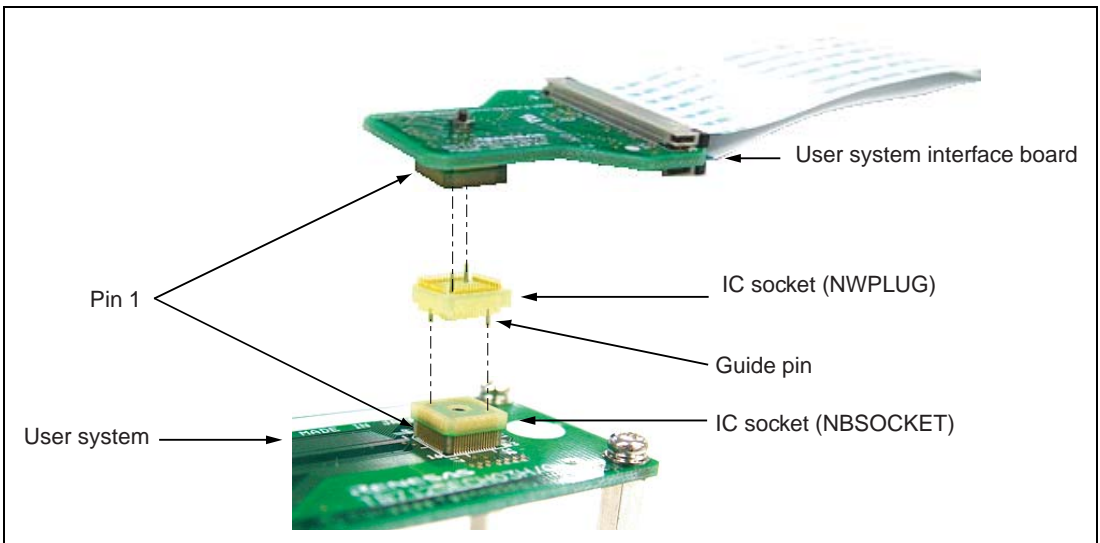
- Insert the NWPLUG in the NBSOCKET on the user system. The NWPLUG has guide pins for the four corners of the socket. When connecting to the user system, plug the user system connector of the interface board into the NBSOCKET on the user system after matching up the pin 1 positions and the holes and guide pins in the corners (see figure 2.5).

## CAUTION

**Ensure that the locations of pin 1 on the socket and connector are aligned before inserting the connector. If this is not done in the case of the SH7125, power-supply pins will be shorted as shown below.**

90° rotation		270° rotation	
4 (Vcc)	— 52 (AVss)	6 (Vss)	— 22 (Vcc)
22 (Vcc)	— 6 (Vss)	8 (VCL)	— 24 (Vss)
24 (Vss)	— 8 (VCL)	52 (AVss)	— 4 (Vcc)

- Insert the user system interface board in the NWPLUG after checking the location of pin 1. The corner of the NBSOCKET which is mounted on the user interface board is notched to indicate the position of pin 1. (see figure 2.5)



**Figure 2.5 Connecting the User System Interface Board to the User System**

### 2.2.3 Setting the Power-Selection Switch

The external power supply (DC5V) or the VCC power supply on the user system can be selected as the source of power for the debugging MCU board. Refer to table 2.1 when selecting the power supply to be used.



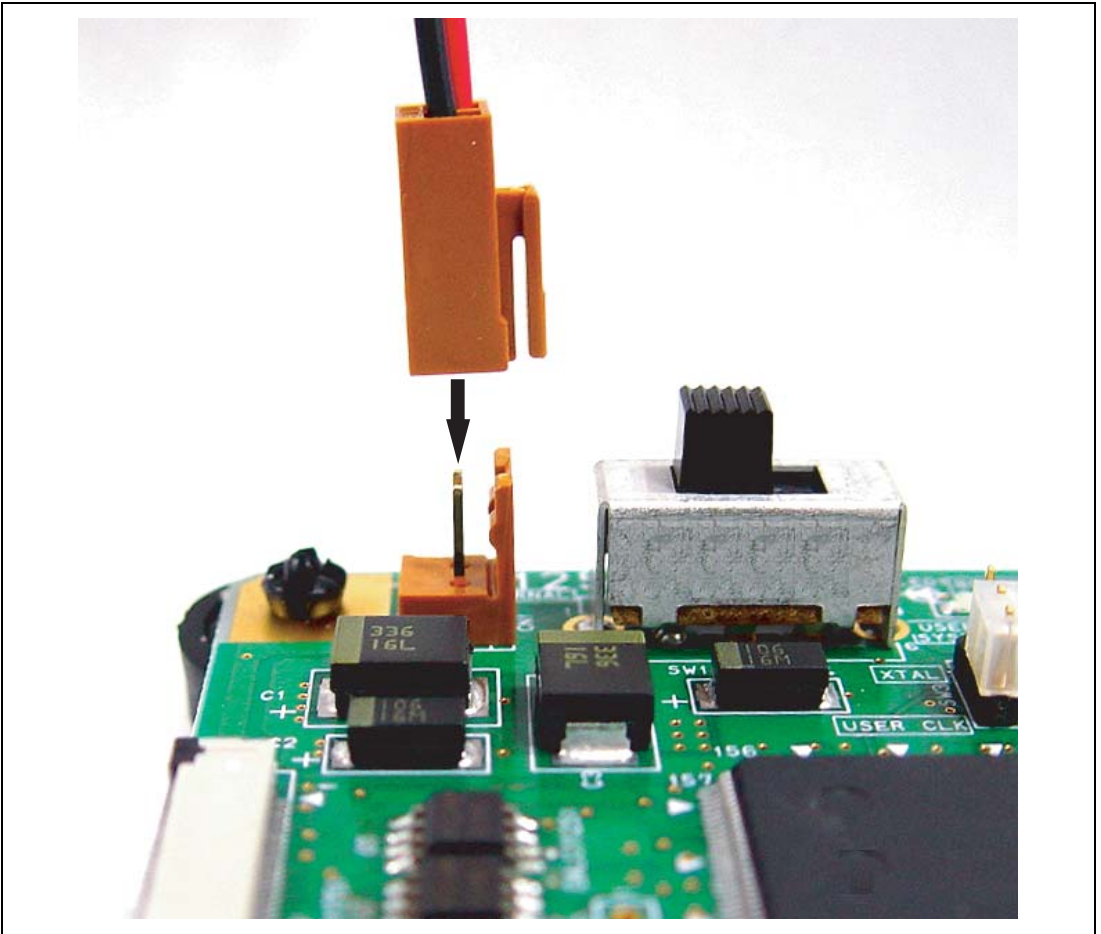
Figure 2.6 Power-Selection Switch

Table 2.1 Correspondence of Power-Selection Switch Settings

Silk-Screened Label	Power Supply to be Used
EXTERNAL	External power supply connected to the power cable (factory setting)
USER SYSTEM	VCC on the user system

## 2.2.4 Connecting the Power Cable

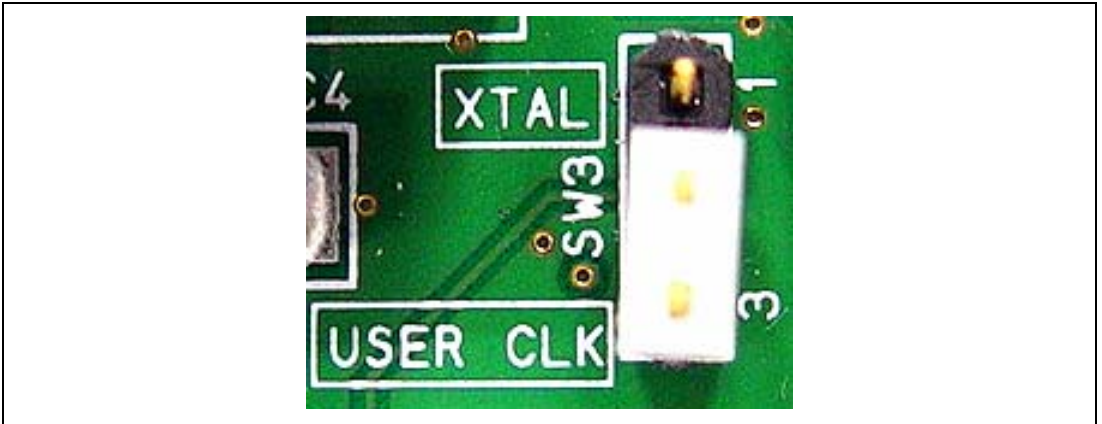
When the power-selection switch is set to 'EXTERNAL', the power cable must be connected to the debugging MCU board so that power can be supplied from beyond the board. Connect the power cable to the power-cable connector on the debugging MCU board as shown in figure 2.7. Since the debugging MCU board operates with the VCC power supply when the power-selection switch is set to the 'USER SYSTEM' position, the power cable need not be connected in this case.



**Figure 2.7 Connecting the Power Cable to the Debugging MCU Board**

### 2.2.5 Setting the Clock-Selection Jumper

The EXTAL input from the user system or the crystal resonator installed on the debugging MCU board can be selected as the source of the clock signal for the MCU. Refer to table 2.2 when selecting the clock.



**Figure 2.8** Clock-Selection Jumper

**Table 2.2** Correspondence of Clock-Selection Jumper Settings

Silk-Screened Label	Jumper Pin (SW3)	Clock to be Used
XTAL	Pins 1-2 closed	Crystal resonator installed on the debugging MCU board
USER CLK	Pins 2-3 closed	EXTAL input from the user system (factory setting)

Note: 'XTAL' should only be selected if a crystal resonator has been mounted across the crystal-resonator installation sockets (X1) of the debugging MCU board. Users must provide the crystal resonator.



### 2.2.6 Installing a Crystal Resonator

'XTAL' should only be selected if a crystal resonator has been mounted on the debugging MCU board. Install the crystal resonator across the crystal-resonator installation sockets of the debugging MCU board.

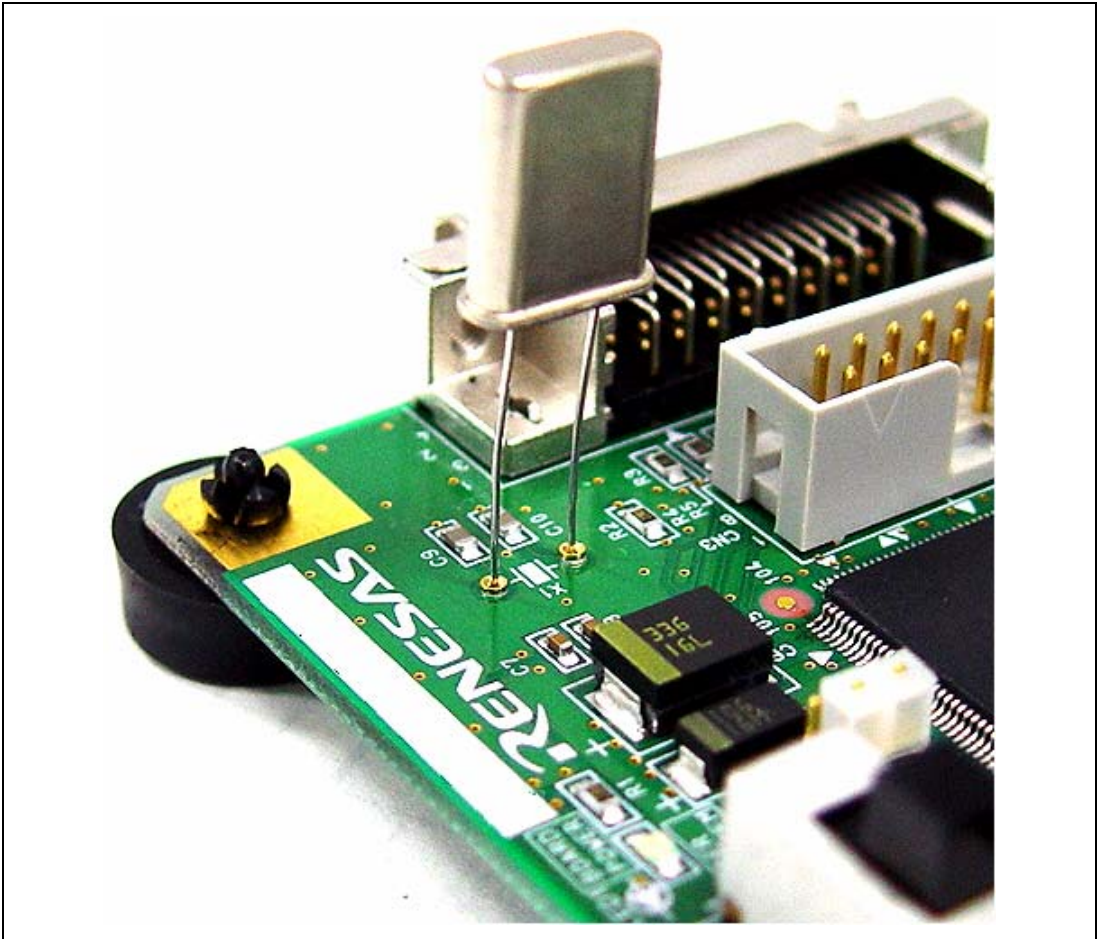
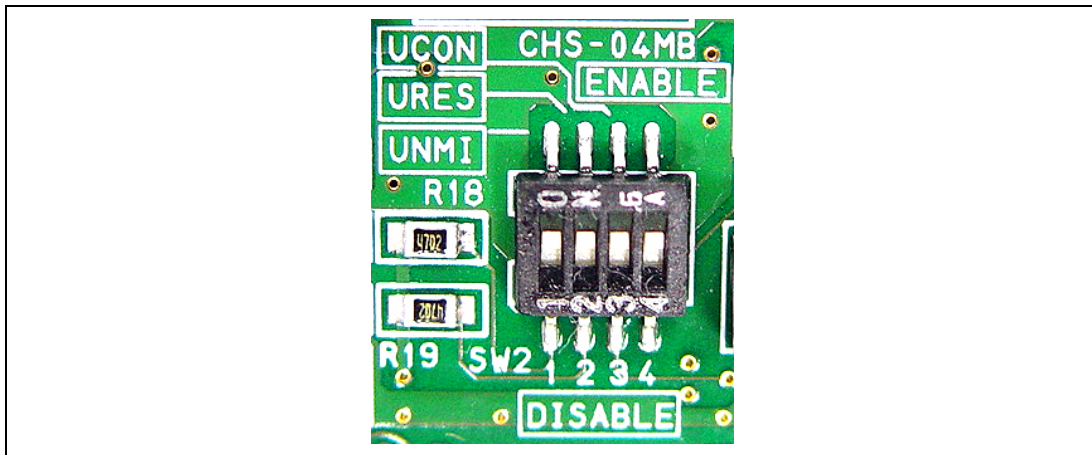


Figure 2.9 Installing a Crystal Resonator

## 2.2.7 Setting the User-System Input Signal Enabling/Disabling Switches

Enabling or disabling of particular input signals from the user system can be set on the debugging MCU board. In addition, connecting or disconnecting the user system must be set with these switches. Table 2.3 lists the signals and settings.



**Figure 2.10** User-System Input Signal Enabling/Disabling Switches

**Table 2.3** Correspondence of User-System Input Signal Enabling/Disabling Switch Settings

Silk-Screened Label	Number on SW2	ENABLE	DISABLE
UNMI	1	Enables the NMI input. (factory setting)	Disables the NMI input.
URES	2	Enables the /RES input. (factory setting)	Disables the /RES input.
UCON	3	Set this switch when the user system is connected for operation. (factory setting)	Set this switch for single operation of the debugging MCU board.
—	4	Do not change this switch. (factory setting)	Do not change this switch.

**Note:** When 'UCON' is set as 'DISABLE', the debugging MCU board can be initiated even if the user system has not been connected. Set the debugging MCU board, referring to section 2.4, Setting Up the Debugging MCU Board for Single Operation, for the use of simple evaluation before designing the user system.

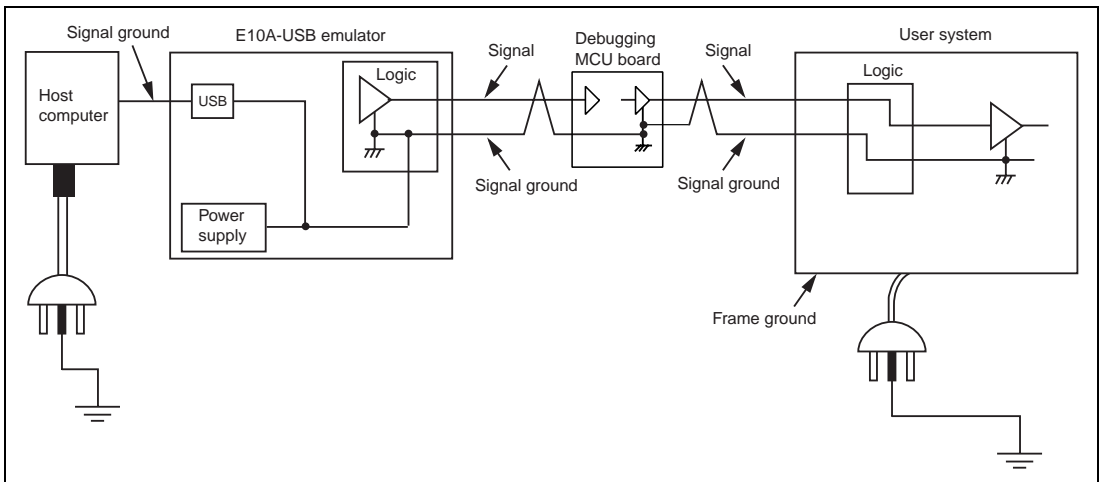
### 2.2.8 Connecting the System Ground

## ! WARNING

**Separate the frame ground and signal ground of the user system. Failure to do so will create a FIRE HAZARD that can damage the user system and emulator product, or produce PERSONAL INJURY.**

The signal grounds of the E10A-USB emulator and the debugging MCU board are connected to the user system's signal ground. In the emulator, the signal ground and frame ground are connected. In the user system, only connect the frame ground to earth; do not connect the signal ground to the frame ground (figure 2.11).

If it is difficult to separate the frame ground from the signal ground in the user system, tie the frame ground of the user system to the same potential as the GND level of the DC power input (AC adapter) of the host computer. This is because differences in GND potential between the host computer and target system will lead to excessive flows of current in the low-impedance GND lines, and thin lines might burn out.



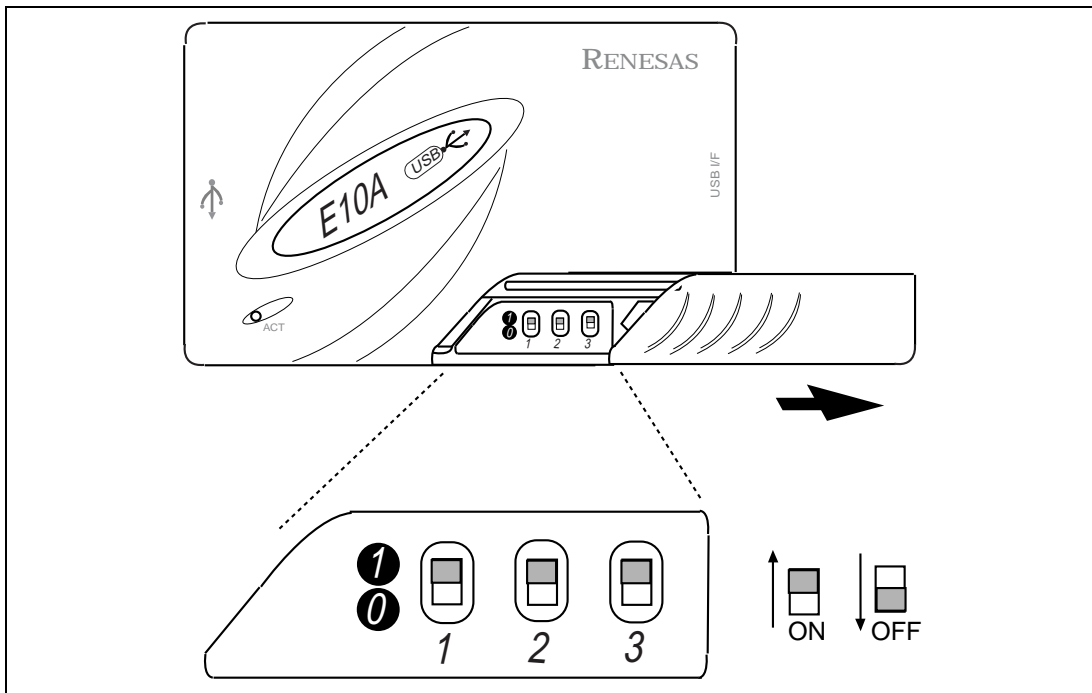
**Figure 2.11 Connecting System Ground**

## 2.3 Setting the E10A-USB Emulator

### 2.3.1 Setting the DIP Switches of the E10A-USB Emulator

Set the DIP switches of the E10A-USB emulator as follows.

1. Open the sliding switch cover in the lower right portion of the upper side of the E10A-USB emulator by sliding it to the right as shown in figure 2.12.
2. Turn all of the DIP switches (SW1, SW2, and SW3) on ('1' side).



**Figure 2.12** Setting the DIP Switches of the E10A-USB Emulator

### 2.3.2 CD-R

The emulator's software for the debugging MCU board is included in the CD-R provided with the E10A-USB emulator.

The root directory of the CD-R contains a setup program for installing the emulator's software for the debugging MCU board. The folders contain the files and programs listed below.

**Table 2.4 Contents of the CD-R Directories**

Directory Name	Contents	Description
Dlls	Microsoft® runtime library	A runtime library for the High-performance Embedded Workshop. The version is checked at installation and this library is copied to the hard disk as part of the installation process.
Drivers	E10A-USB emulator driver	USB drivers for the E10A-USB emulator.
Help	Online help for the E10A-USB emulator	An online help file. This is copied to the hard disk as part of the installation process.
Manual	E10A-USB emulator manuals	E10A-USB emulator user's manuals. They are provided as PDF files.

Execute HewInstMan.exe from the root directory of the CD-R to start the installation wizard.

Follow the cues given by the installation wizard to install the software. Select the SH-2 device group in the wizard for selecting the device group to be installed.

Follow the cues given by the installation wizard to install the software.

Note: When a driver is installed in Windows® XP, a warning message on the Windows® logo test may be displayed, but it is not a problem. Select [Continue Anyway] to proceed with driver installation.

### 2.3.3 Connecting the E10A-USB Emulator to the Host Computer

This section describes how to connect the E10A-USB emulator to the host computer. For the position of each connector of the emulator, refer to the SuperH™ Family E10A-USB Emulator User's Manual.

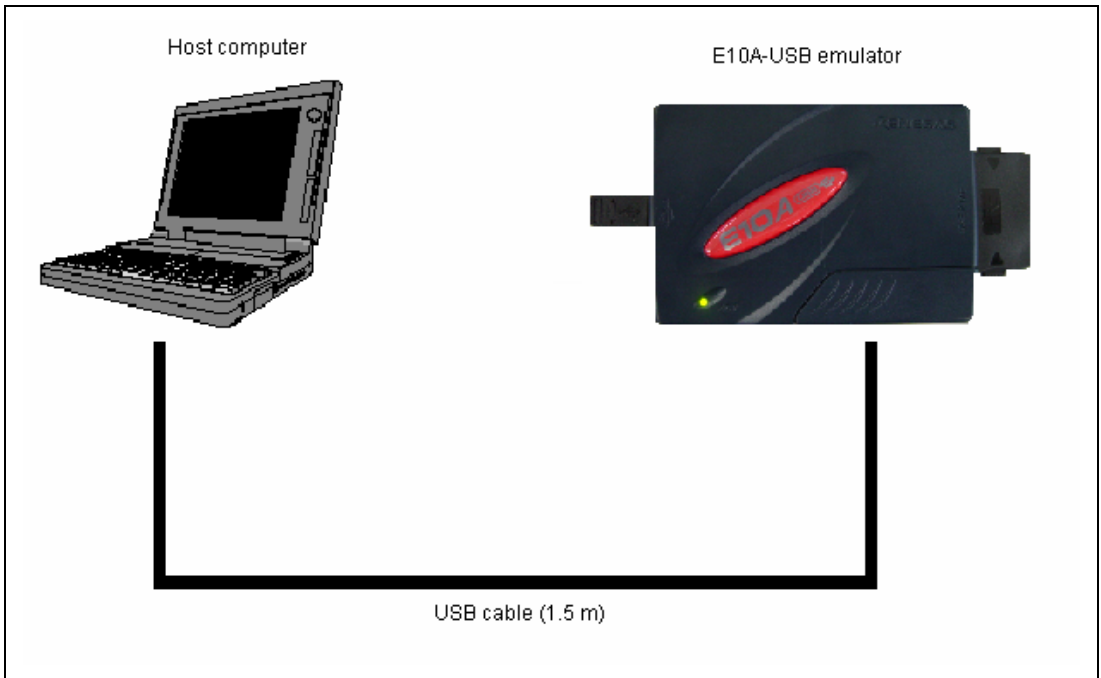
- Notes:
1. When [Add New Hardware Wizard] is displayed, select the [Search for the best driver for your device. (Recommended)] radio button and then the [Specify a location] check box to select the path to be searched for drivers. The location must be specified as <Drive>:\DRIVERS. (<Drive> is the CD drive letter.)
  2. When a driver is installed in Windows® XP, a warning message on the Windows® logo test may be displayed, but it is not a problem. Select [Continue Anyway] to proceed with driver installation.
  3. Be sure to install the software for the E10A-USB emulator before putting the emulator in place.



## WARNING

**Always switch OFF the emulator product and the user system before connecting or disconnecting any CABLES except for the USB interface cable. Failure to do so will result in a FIRE HAZARD and will damage the user system and the emulator product or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.**

The E10A-USB emulator is connected to the host computer via the USB 1.1, and also to the USB port conforming to USB 2.0. Figure 2.13 shows the system configuration.



**Figure 2.13 System Configuration when Connecting the E10A-USB Emulator to the Host Computer**

### 2.3.4 Setting Up the E10A-USB Emulator

Set up the E10A-USB emulator's firmware referring to section 3.10, Setting Up the Emulator, and section 3.11, System Check, in the SuperH™ Family E10A-USB Emulator User's Manual.

### 2.3.5 Activating the High-performance Embedded Workshop

Activate the High-performance Embedded Workshop referring to section 4, Preparations for Debugging, in the SuperH™ Family E10A-USB Emulator User's Manual, which describes the activation procedure.

## 2.4 Setting Up the Debugging MCU Board for Single Operation

Since the debugging MCU board can be initiated even if the user system has not been connected, it is available for simple evaluation before designing the user system.

### **WARNING**

- 1. Always disconnect the E10A-USB emulator from the host computer and switch OFF the debugging MCU board before setting switches on the debugging MCU board. Failure to do so will create a FIRE HAZARD that can damage the E10A-USB emulator product, the debugging MCU board, or the user system interface board.**
- 2. For the single operation of the debugging MCU board, connector pins on the bottom of the user system interface board, which are used for connecting the user system, are disconnected. To prevent connector pins from being shorted, be sure to put an insulator under the user system interface board.**

### 2.4.1 Setting Switches on the Debugging MCU Board

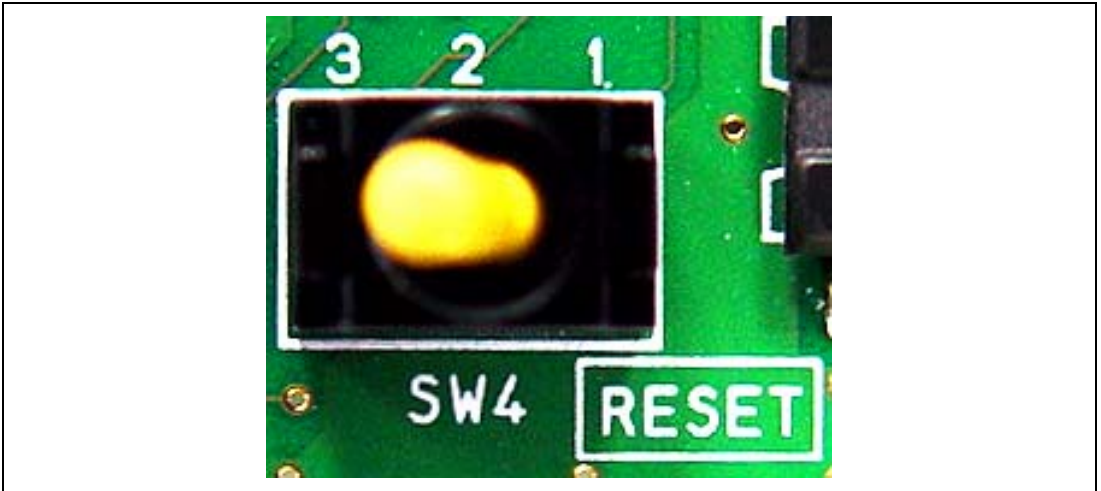
For the single operation of the debugging MCU board, set the switches on the debugging MCU board as described below and activate the High-performance Embedded Workshop.

- Only the external power supply is supported. Set the power-selection switch to 'EXTERNAL' and supply external power (5 Vdc) from the power-cable connector.
- Only the crystal resonator installed on the debugging MCU board is supported as the source of the clock signal.  
Set the clock-selection jumper to 'XTAL' to install the crystal resonator across the crystal-resonator installation sockets.
- The user-system input signal enabling/disabling switches must be set on the debugging MCU board. Of these switches, set 'UCON' 'URES', and 'UNMI' to the 'DISABLE' position.



## 2.4.2 Inputting Reset Signals to the Debugging MCU Board

When reset signals must be input, such as the case when activating the High-performance Embedded Workshop or debugging, they can be manually input from the reset switch on the debugging MCU board. For details on inputting reset signals, see table 2.5.



**Figure 2.14 Reset Switch**

**Table 2.5 Correspondence of Reset Switch Settings**

Setting of SW4	Reset Signal Input to the Debugging MCU Board
Turned to '3' of silk-screened label	Reset signal input from the reset switch is canceled. (factory setting)
Turned to '1' of silk-screened label	Reset signal is input from the reset switch.

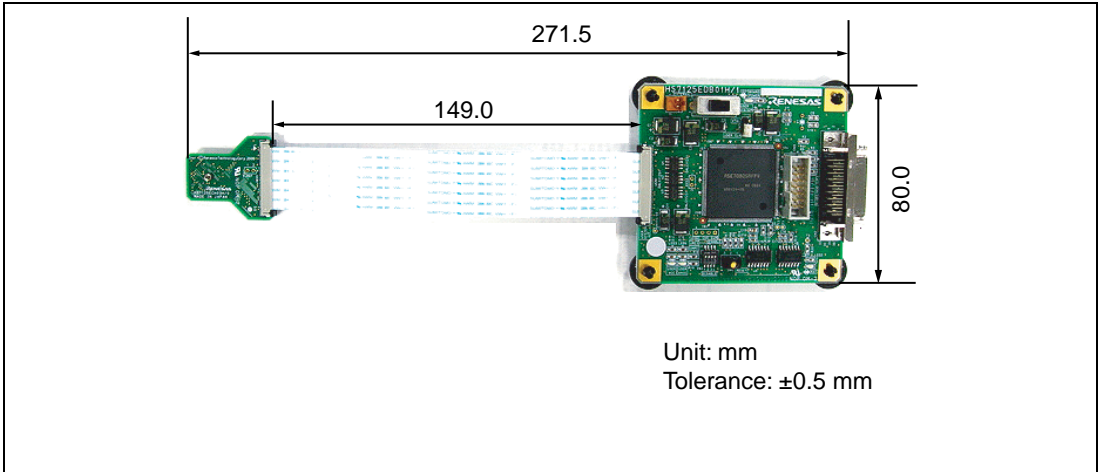
Note: This reset switch is used to manually input reset signals to the debugging MCU board. When the user system is connected, this reset switch is also available for inputting reset signals to the debugging MCU board, however, note that no reset signal is output to the user system.



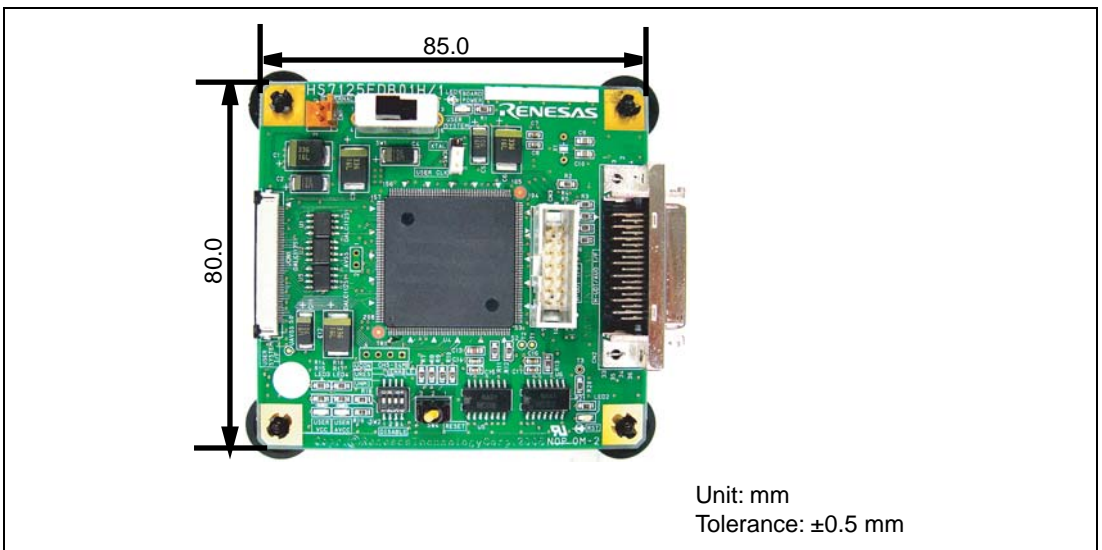
## Section 3 Hardware Specifications

### 3.1 External Dimensions of the Debugging MCU Board

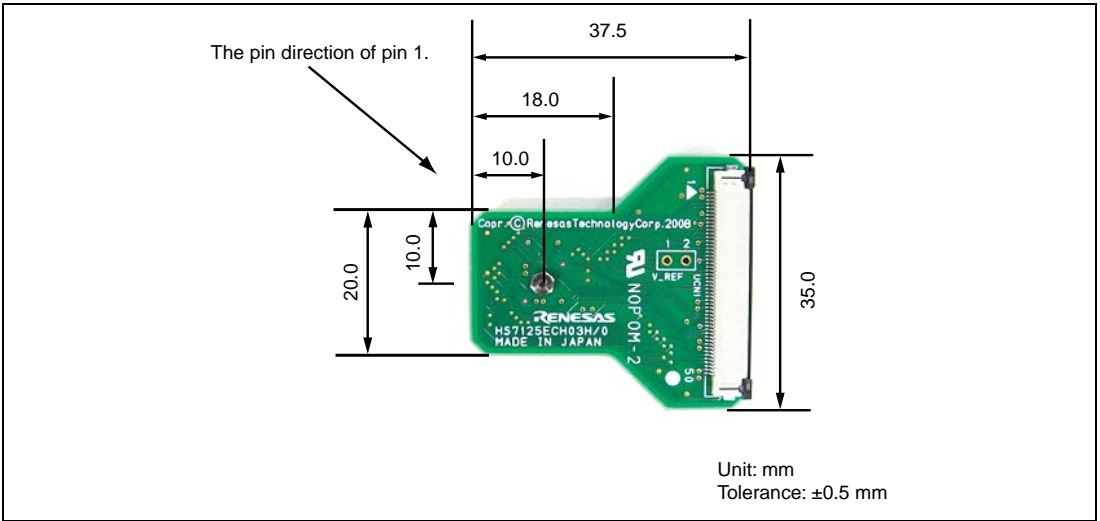
Figures 3.1 through 3.3 show the external dimensions of the debugging MCU board.



**Figure 3.1** External Dimensions of the Debugging MCU Board



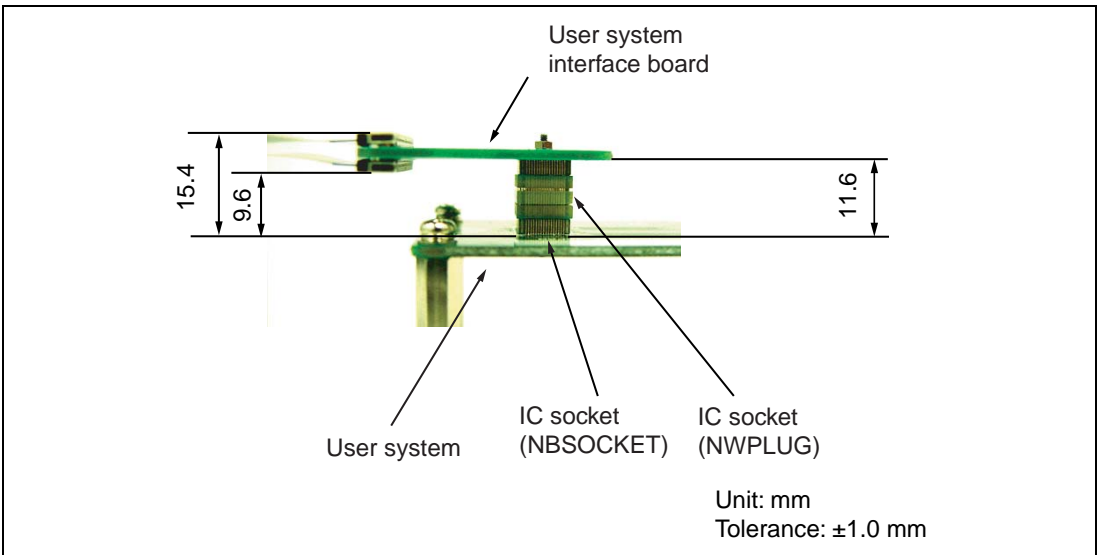
**Figure 3.2** External Dimensions of the Main Unit of the Debugging MCU Board



**Figure 3.3 External Dimensions of the User System Interface Board**

### 3.2 Resulting Dimensions after Connecting User System Interface Board

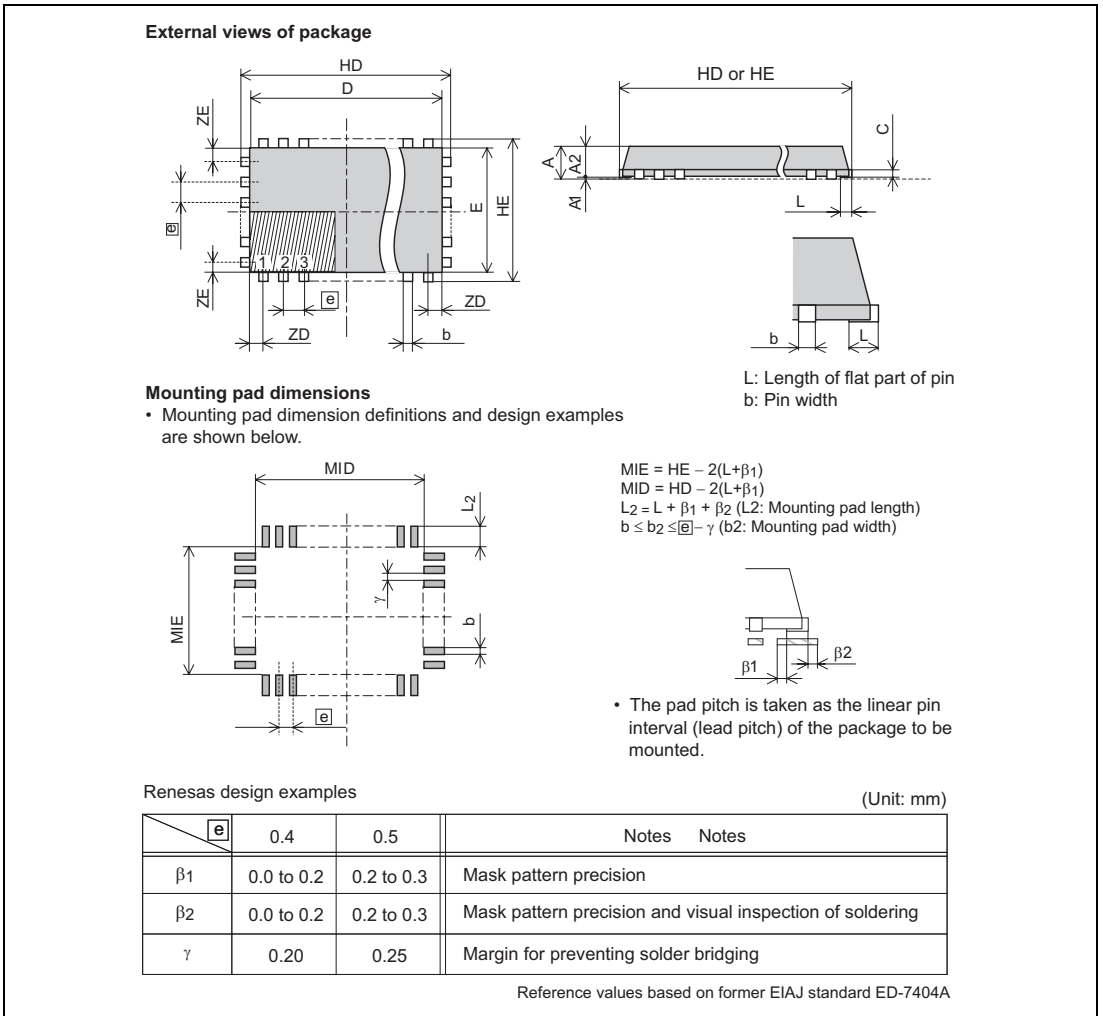
Figure 3.4 shows the resulting dimensions, after connecting the user system interface board to the user system.



**Figure 3.4 Resulting Dimensions after Connecting User System Interface Board**

### 3.3 Recommended Dimensions for User System Mount Pad (Footprint)

Figure 3.5 shows the recommended dimensions for the pads (footprint) for mounting the IC socket on the user system. Note that the dimensions in this figure are the same as those given for the design of mounting pads for the actual MCU. Refer to section 2.2, Printed Wiring Board Design, in Renesas Surface Mount Packages.



**Figure 3.5 Recommended Dimensions for User System Mounting Pads (Footprint)**

### 3.4 Installing the MCU to the User System

## CAUTION

1. Check the location of pin 1 before inserting.
2. Use a Philips-type screwdriver whose head matches the screw head.
3. The tightening torque must be 0.054 N•m or less.  
If the applied torque cannot be accurately measured, stop tightening when the force required to turn the screw becomes significantly greater than that needed when first tightening. If a screw is tightened too much, the screw head may break or an IC socket contact error may be caused by a crack in the IC socket solder.
4. If the MCU does not operate correctly, cracks might have occurred in the solder. Check conduction with a tester and re-solder the IC socket if necessary.

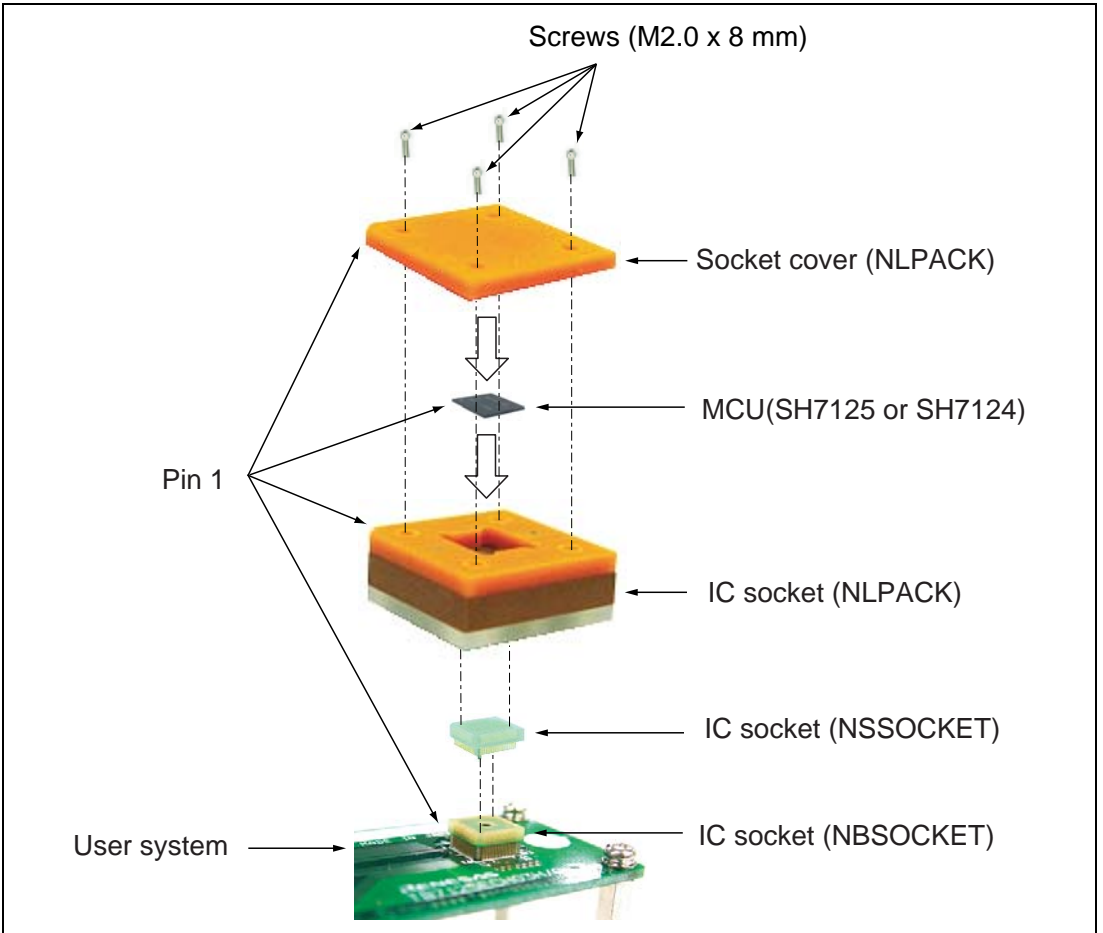
To mount the MCU on the user system, follow the procedure given below.

1. Mount the NBSOCKET on the user system after checking the location of pin 1. A notch in the corner of the socket indicates the position of pin 1.
2. Check the location of pin 1 of the MCU and mount it on the NLPACK, and then affix the top cover with four screws (M2.0 × 8 mm).
3. Insert the NLPACK on which the NSSOCKET and MCU are mounted in the NBSOCKET on the user system after checking the location of pin 1. (see figure 3.6).

## CAUTION

If the debugging MCU board is not to be connected with the user system, use the following IC socket. The NLPACK and NSSOCKET are not included with the debugging MCU board, so have to be separately purchased before use.

- IC sockets for the SH7125(package code: PVQN0064LB-A:  
NBSOCKET064SE-RE41N (manufactured by Tokyo Eletech Corporation)  
NLPACK064SE-RE01 (manufactured by Tokyo Eletech Corporation)  
NSSOCKET064SE-RE01 (manufactured by Tokyo Eletech Corporation)
- IC sockets for the SH7124(package code: PVQN0052LE-A:  
NBSOCKET052SE-RE41N (manufactured by Tokyo Eletech Corporation)  
NLPACK052SE-RE01 (manufactured by Tokyo Eletech Corporation)  
NSSOCKET052SE-RE01 (manufactured by Tokyo Eletech Corporation)



**Figure 3.6 Installing MCU to User System**



### 3.5 User System Interface Circuits

Figures 3.7 through 3.12 show user system interface circuits. Use them as a reference to determine the value of the pull-up resistance.

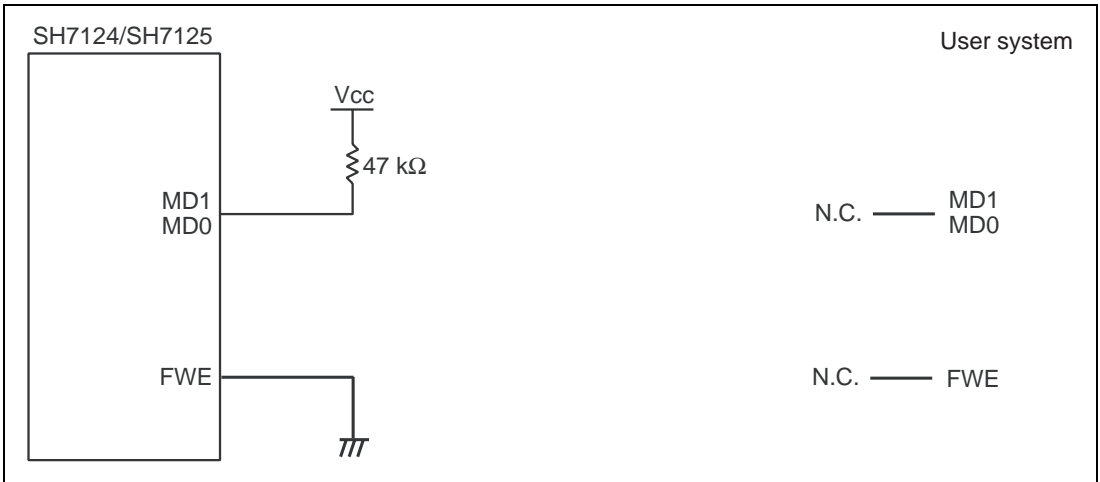


Figure 3.7 User System Interface Circuits

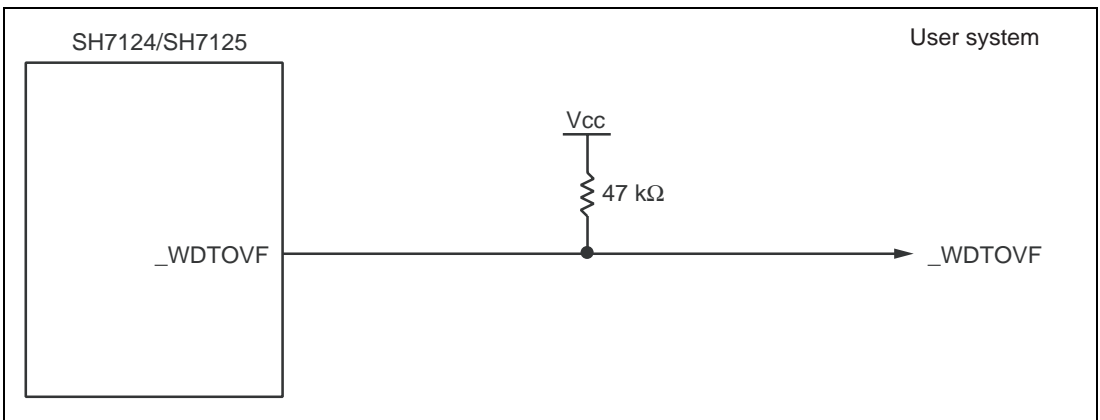
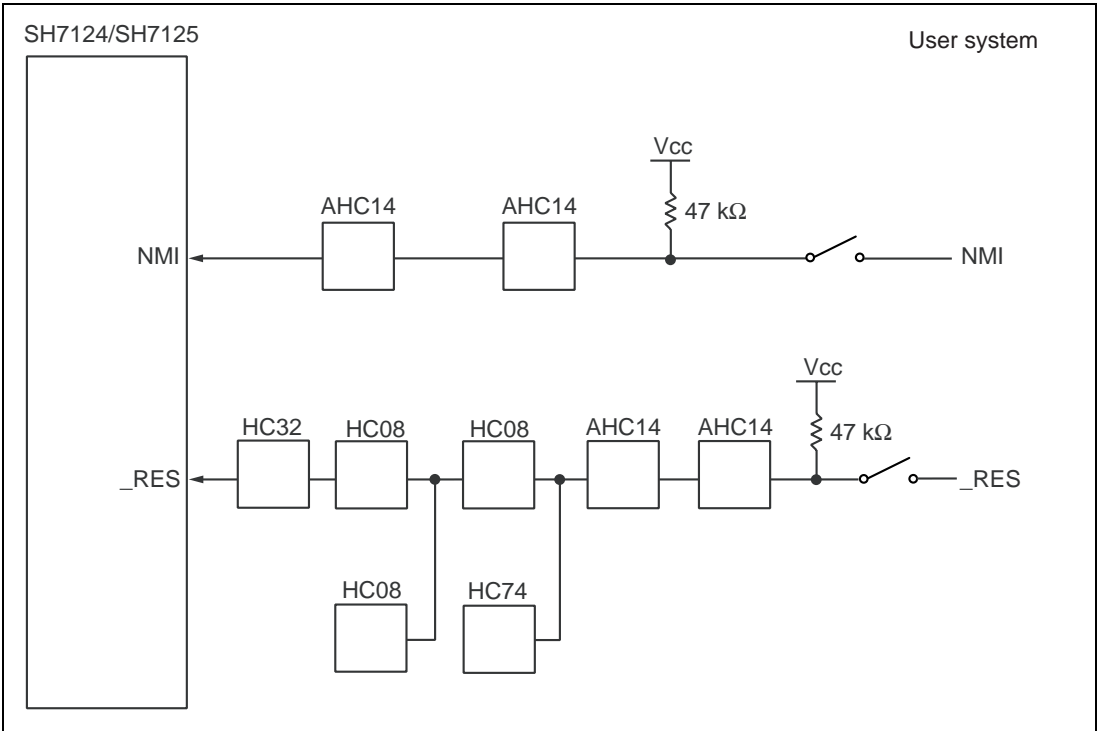


Figure 3.8 User System Interface Circuits



**Figure 3.9 User System Interface Circuits**

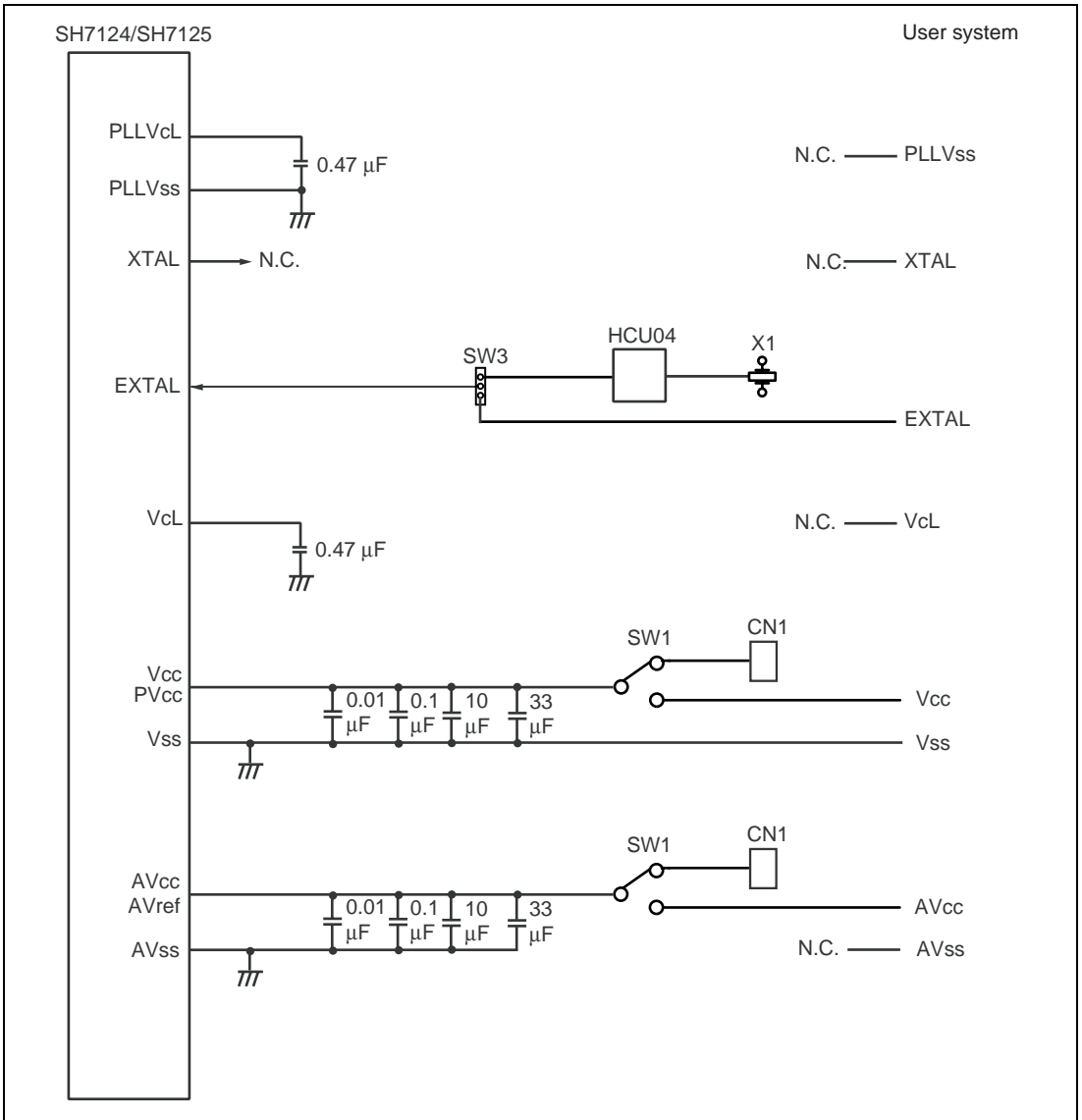
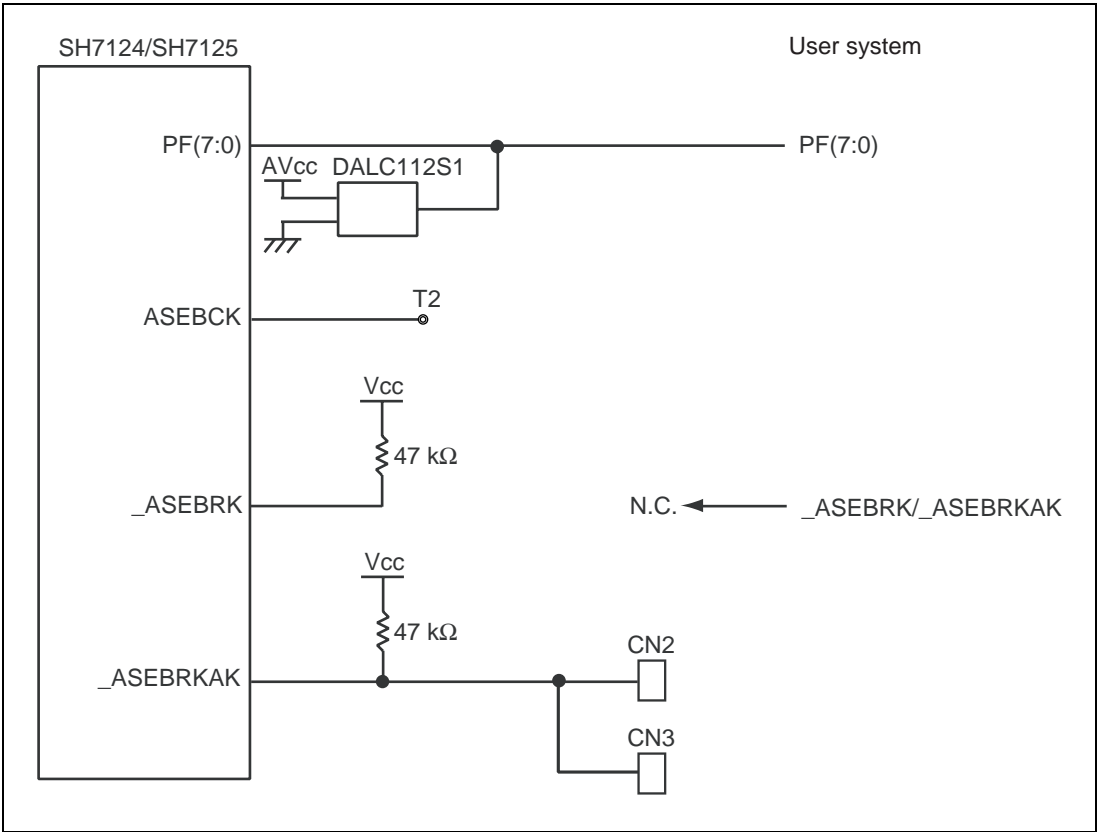
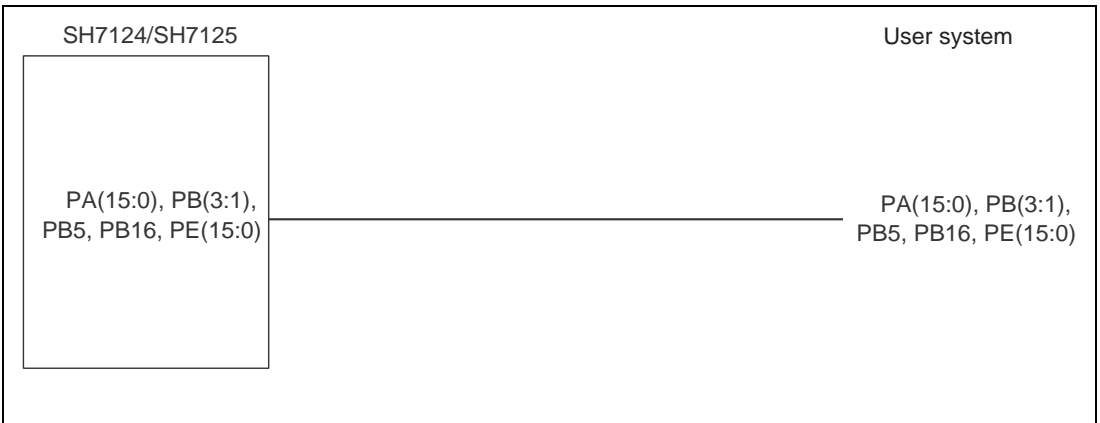


Figure 3.10 User System Interface Circuits



**Figure 3.11 User System Interface Circuits**



**Figure 3.12 User System Interface Circuits**

### 3.6 Delay Time for the User System Interface

Since the \_RES and NMI signals are connected to the user system via the logic on the EV-chip unit, a delay time shown in table 3.1 will be generated until the signal is input from the user system to the MCU.

**Table 3.1 Delay Time for Signals via the EV-chip Unit**

No.	Signal Name	Delay Time (ns)
1	_RES	20
2	NMI	10



## Section 4 Maintenance and Guarantee

This section describes maintenance, guarantee, repair provisions, and how to request for repair of the emulator.

### 4.1 User Registration

When you purchase our product, be sure to register as a user. For user registration, refer to the section of 'User Registration' (p. i) of this user's manual.

### 4.2 Maintenance

1. If dust or dirt collects on any equipment of this product, wipe the board dry with a soft cloth. Do not use thinner or other solvents because these chemicals can cause the equipment's surface coating to separate.

When you do not use this product for a long period, for safety purposes, disconnect the power cable from the power supply.

### 4.3 Guarantee

If your product becomes faulty within one year after its purchase while being used under good conditions by observing 'IMPORTANT INFORMATION' described in this user's manual, we will repair or replace your faulty product free of charge. Note, however, that if your product's fault is raised by any one of the following causes, we will repair it or replace it with new one with extra-charge:

- Misuse, abuse, or use under extraordinary conditions
- Unauthorized repair, remodeling, maintenance, and so on
- Inadequate user's system or misuse of it
- Fires, earthquakes, and other unexpected disasters

In the above cases, contact your local distributor. If your product is being leased, consult the leasing company or the owner.

## 4.4 Repair Provisions

### 1. Repair with Extra-Charge

The products elapsed more than one year after purchase can be repaired with extra-charge.

### 2. Replacement with Extra-Charge

If your product's fault falls in any of the following categories, the fault will be corrected by replacing the entire product instead of repair, or you will be advised to purchase new one, depending on the severity of the fault.

- Faulty or broken mechanical parts
- Flaw, separation, or rust in coated or plated parts
- Flaw or cracks in plastic parts
- Faults or breakage caused by improper use or unauthorized repair or modification
- Heavily damaged electric circuits due to overvoltage, overcurrent or shorting of power supply
- Cracks in the printed circuit board or burnt-down patterns
- Wide range of faults that makes replacement less expensive than repair
- Unlocatable or unidentified faults

### 3. Expiration of the Repair Period

When a period of one year elapses after the model was dropped from production, repairing products of the model may become impossible.

### 4. Transportation Fees at Sending Your Product for Repair

Send your product to us for repair at your expense.



## 4.5 How to Make a Request for Repair

If your product is found faulty, follow the procedure below to send your product for repair.

Fill in the Repair Request Sheet included with this product, then send it along with this product for repair to your local distributor. Make sure that information in the Repair Request Sheet is written in as much detail as possible to facilitate repair.

### CAUTION

#### **Note on Transporting the Product:**

**When sending your product for repair, use the packing box and cushion material supplied with this product when delivered to you and specify handling caution for it to be handled as precision equipment. If packing of your product is not complete, it may be damaged during transportation. When you pack your product in a bag, make sure to use conductive polyvinyl supplied with this product (usually a blue bag). When you use other bags, they may cause a trouble on your product because of static electricity.**



## Appendix A Repair Request Sheet

Thank you for purchasing the SH7125 group and SH7124 group debugging MCU board (HS7125EDB03H or HS7124EDB02H).

In the event of a malfunction, fill in the repair request sheet on the following pages and send it to your distributor.

## Repair Request Sheet

To Distributor

Your company name:

Person in charge:

Tel.:

Item	Symptom
1. Date and time when the malfunction occurred	Month/Day/Year {at system initiation, in system operation} *Circle either of items in the braces { }.
2. Frequency of generation of the malfunction	( ) times in ( ) {day(s), week(s), or month(s)} *Enter the appropriate numbers in the parentheses ( ) and circle one of the three items in the braces { }.
3. System configuration when the malfunction occurred	<p>Enter the system configuration in use when the malfunction occurred.</p> <ul style="list-style-type: none"> <li>• E10A-USB emulator (HS0005KCU01H or HS0005KCU02H): Serial No.: Revision: The above items are written on the label for product management at the bottom of the emulator unit; the serial no. is the five-digit number and the revision is the string of letters following the number.</li> <li>• Provided CD-R (HS0005KCU01SR): Version: V. Shown as 'V.x.xx release' on the CD-R (x: numeral).</li> <li>• SH7125 group and SH7124 group debugging MCU board (HS7125EDB03H or HS7124EDB02H): Serial No.: Revision: These are impressed on the circuit board.</li> <li>• Host computer in use: Manufacturer: Type number: OS:</li> </ul>

Item	Symptom
4. Settings when the malfunction occurred	Enter the operational settings of the debugging MCU board. (1) Power-selection switch: EXTERNAL or USER SYSTEM (circle either item). (2) Clock-selection jumper: XTAL or USER CLK (circle either item). Input clock:    MHz (3) User-system input signal enabling/disabling switches: UNMI: ENABLE or DISABLE (circle either item). URES: ENABLE or DISABLE (circle either item). UCON: ENABLE or DISABLE (circle either item). (4) Operating frequency:    MHz
5. Failure phenomenon	
6. Error in debugging	
7. The High-performance Embedded Workshop does not link-up with the debugging MCU board.	Content of the error message

For errors other than the above, fill in the box below.



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## **SH7125 Group and SH7124 Group Debugging MCU Board HS7125EDB03H, HS7124EDB02H User's Manual**

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**SH7125 Group and SH7124 Group  
Debugging MCU Board  
HS7125EDB03H, HS7124EDB02H  
User's Manual**



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