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H8SX/1582 PLQP0120LA-A
User System Interface Cable

HS1582ECH61H User's Manual

Renesas Microcomputer Development Environment System

H8SX Family / H8SX/1500 Series

HS1582ECH61HE

User's Manual

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READ FIRST

• READ this user's manual before using this user system interface cable.

• KEEP the user's manual handy for future reference.

Do not attempt to use the user system interface cable until you fully understand its mechanism.

User System Interface Cable:

Throughout this document, the term "user system interface cable" shall be defined as the following product produced only by Renesas Technology Corp. excluding all subsidiary products.

- User system interface cable (HS1582ECH61H)

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

Purpose of the User System Interface Cable:

This user system interface cable is for connecting the emulator station and user system. This user system interface cable must only be used for the above purpose.

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This user system interface cable 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 user system interface cable until you fully understand its mechanism.

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SAFETY PAGE

READ FIRST

• READ this user's manual before using this user system interface cable.

• KEEP the user's manual handy for future reference.

Do not attempt to use the user system interface cable until you fully understand its mechanism.

DEFINITION OF SIGNAL WORDS

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

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

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

CAUTION **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.

⚠ 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 E6000H 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.**

Preface

The HS1582ECH61H is a user system interface cable that connects an H8SX/1582 E6000H emulator (HS1527KEPH60H; hereinafter referred to as the emulator) to the IC socket for an PLQP0120LA-A (former package: FP-120B) package for the H8SX/1582 MCU on the user system.

Contents

Section 1 Configuration

CAUTION

Use an NQPACK120SE-ND socket and an HQPACK120SE cover (manufactured by Tokyo Eletech Corporation) for the PLQP0120LA-A package IC socket on the user system.

Figure 1 and table 1 show the external appearance and components, respectively, of the HS1582ECH61H user system interface cable for the PLQP0120LA-A package.

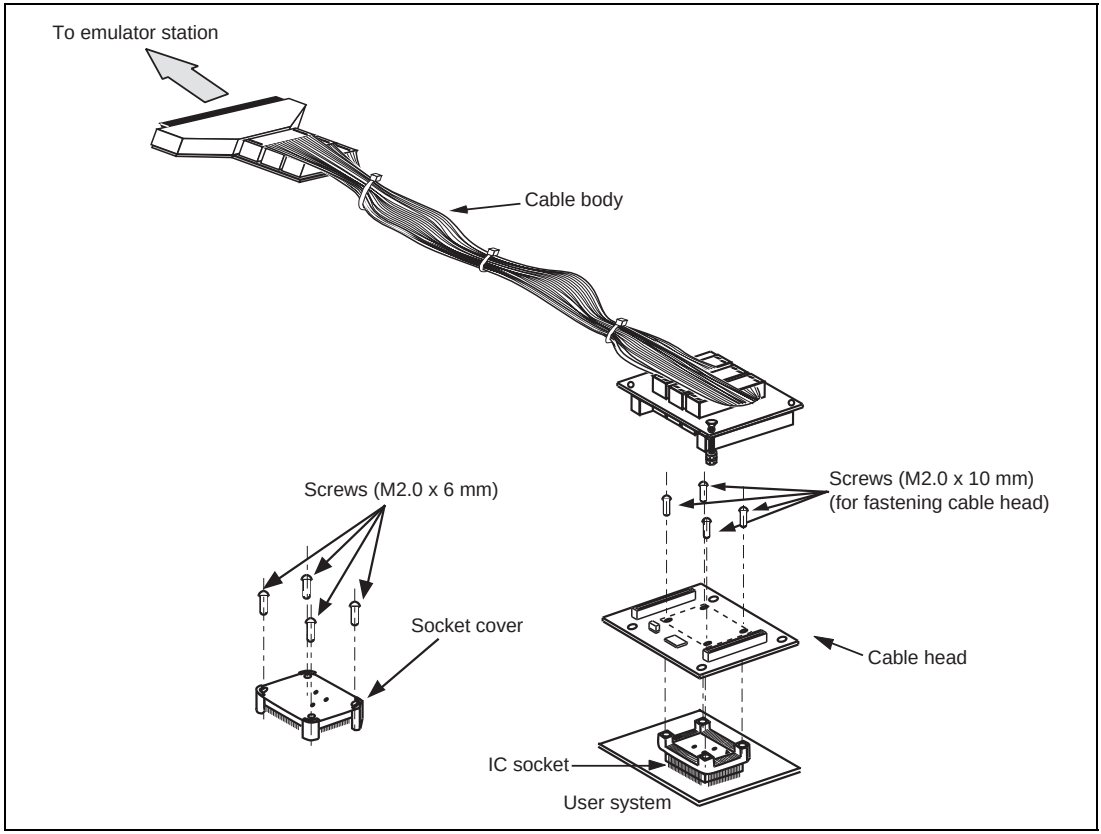

Figure 1 HS1582ECH61H User System Interface Cable

Table 1 lists the HS1582ECH61H components. Please make sure you have all of these components when unpacking.

Table 1 HS1582ECH61H Components

No.	Component	Quantity	Remarks
1	Cable body	1	Cable
2	Cable head	1	
3	IC socket	1	For the PLQP0120LA-A package
4	Socket cover	1	For installing an PLQP0120LA-A packaged MCU
5	Screws (M2.0 x 10 mm)	4	For fastening cable head
6	Screws (M2.0 x 6 mm)	4	For installing an PLQP0120LA-A packaged MCU
7	Guide pins (ϕ1 mm)	3	For determining the IC socket location
8	Screwdriver	1	For tightening screws
9	Documentation	1	User's manual for HS1582ECH61H (this manual)

Section 2 Connection Procedures

2.1 Connecting User System Interface Cable to Emulator Station

⚠ 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. **Always switch OFF the user system and the emulator product before the USER SYSTEM INTERFACE CABLE is connected to or removed from any part. Before connecting, make sure that pin 1 on both sides are correctly aligned.**
2. **The user system interface cable dedicated to the emulator must be used.**

To connect the cable body to the emulator station, follow the instructions below.

1. Make sure the user system and emulator station are turned off.

CAUTION

When connecting or removing the user system interface cable, apply force only in the direction suitable for connection or removal, while making sure not to bend or twist the cable or connectors. Otherwise, the connectors will be damaged.

2. After making sure the direction of the cable body connector is correct, firmly insert the cable body connector into the emulator station socket (figure 2).

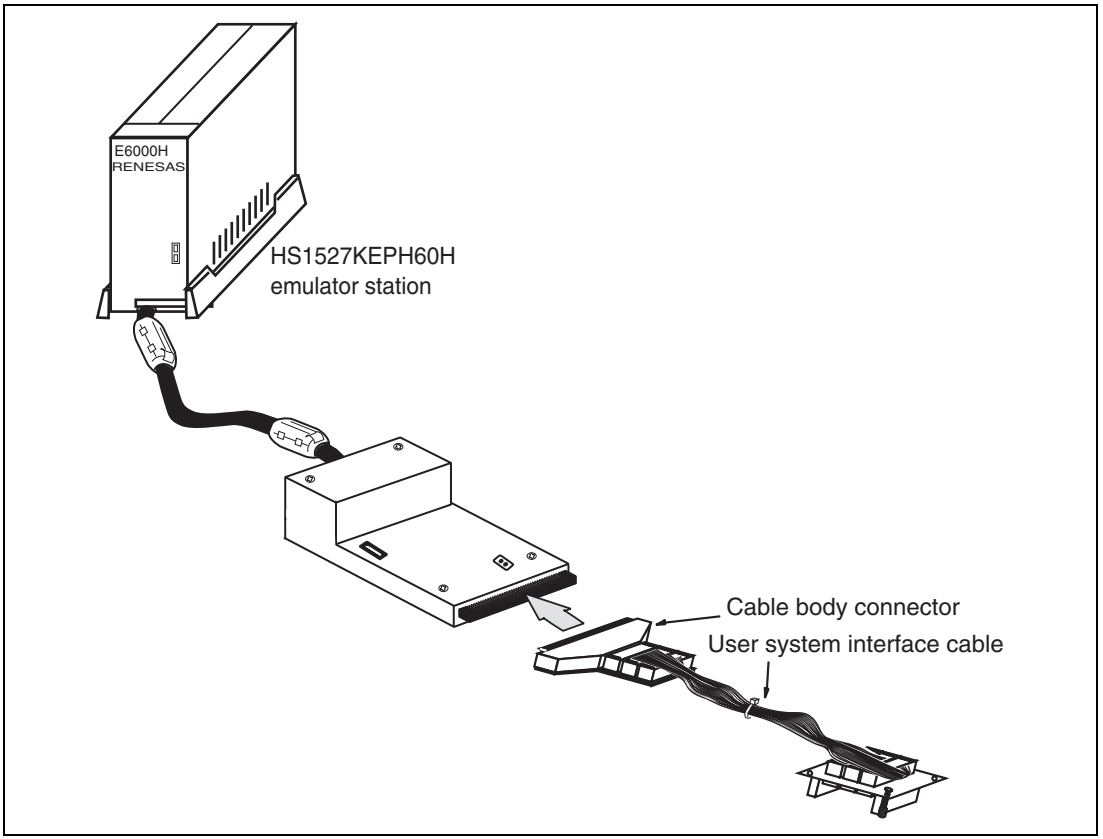

Figure 2 Example of the HS1527KEPH60H Emulator Station

2.2 Connecting User System Interface Cable to User System

⚠ WARNING

Always switch OFF the user system and the emulator product before the USER SYSTEM INTERFACE CABLE is connected to or removed from any part. Before connecting, make sure that pin 1 on both sides are correctly aligned. 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.

To connect the cable head to the user system, follow the instructions below.

2.2.1 Installing IC Socket

After checking the location of pin 1 on the IC socket fasten it to the user system before soldering.

CAUTION

After confirming the location of pin 1 on the IC socket, apply epoxy resin adhesive to the end of the four projections at the bottom of the IC socket, and fasten it to the user system.

Use the guide pins provided to determine where to install the IC socket, as shown in figure 3.

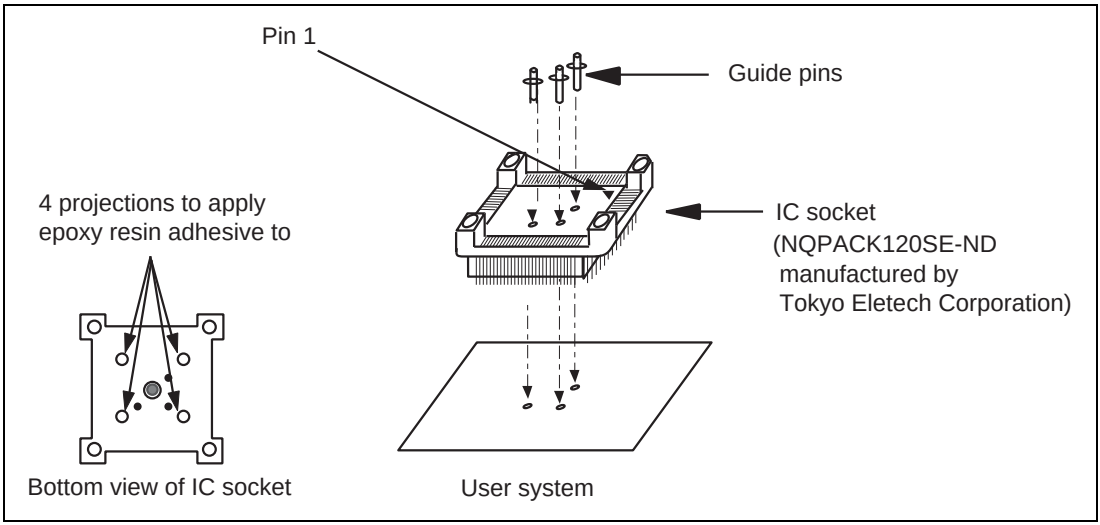

Figure 3 Location Setting of IC Socket

2.2.2 Soldering IC Socket

After fastening, solder the IC socket for an PLQP0120LA-A package to the user system.

CAUTION

Be sure to completely solder the leads so that the solder slops gently over the leads and forms solder fillets. (Use slightly more solder than the MCU.)

2.2.3 Inserting Cable Head

CAUTION

Check the location of pin 1 before inserting.

Align pin 1 on the IC socket for an PLQP0120LA-A package on the user system with pin 1 on the user system interface cable head, and insert the user system interface cable head into the IC socket on the user system, as shown in figure 4.

2.2.4 Fastening Cable Head

CAUTION

1. **Use a screwdriver whose head matches the screw head.**
2. **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.**
3. **If the emulator does not operate correctly, cracks might have occurred in the solder. Check conduction with a tester and re-solder the IC socket if necessary.**

Fasten the user system interface cable head to the IC socket for an PLQP0120LA-A package on the user system with the four screws (M2.0 x 10 mm) provided. Each screw should be tightened a little at a time, alternating between screws on opposing corners. Take special care, such as manually securing the IC socket soldered area, to prevent the soldered IC socket from being damaged by overtightening the screws or twisting the components.

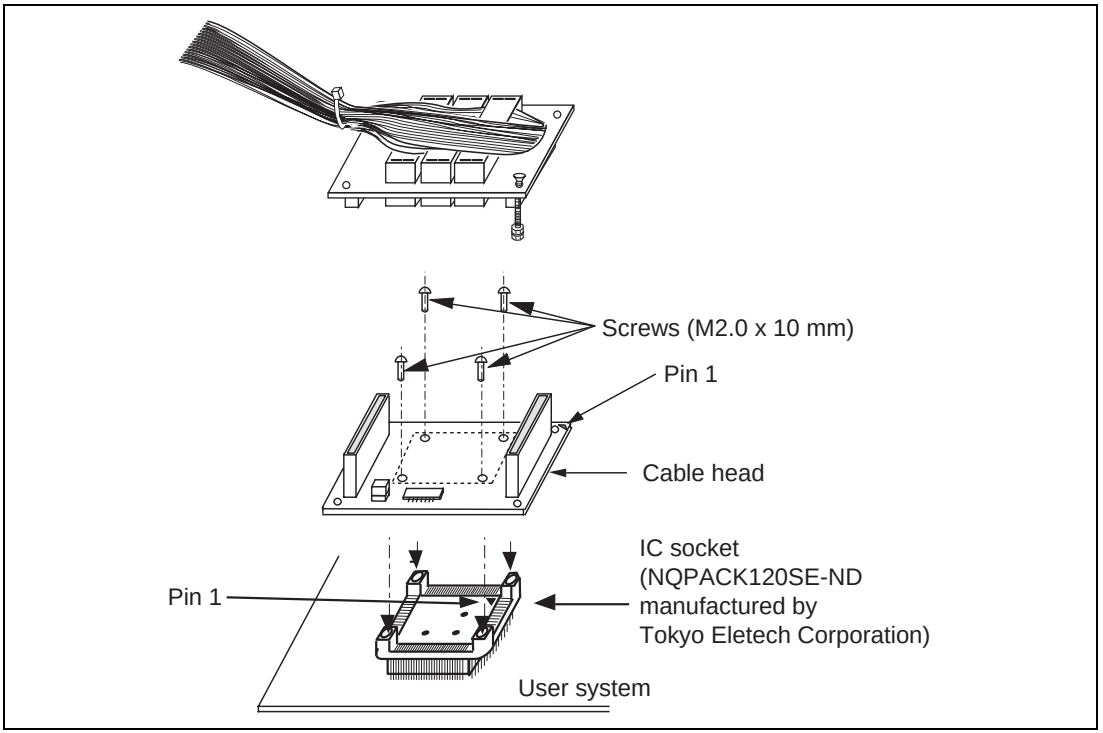

Figure 4 Connecting User System Interface Cable to User System

2.2.5 Fastening Cable Body

Connect the cable body to the cable head.

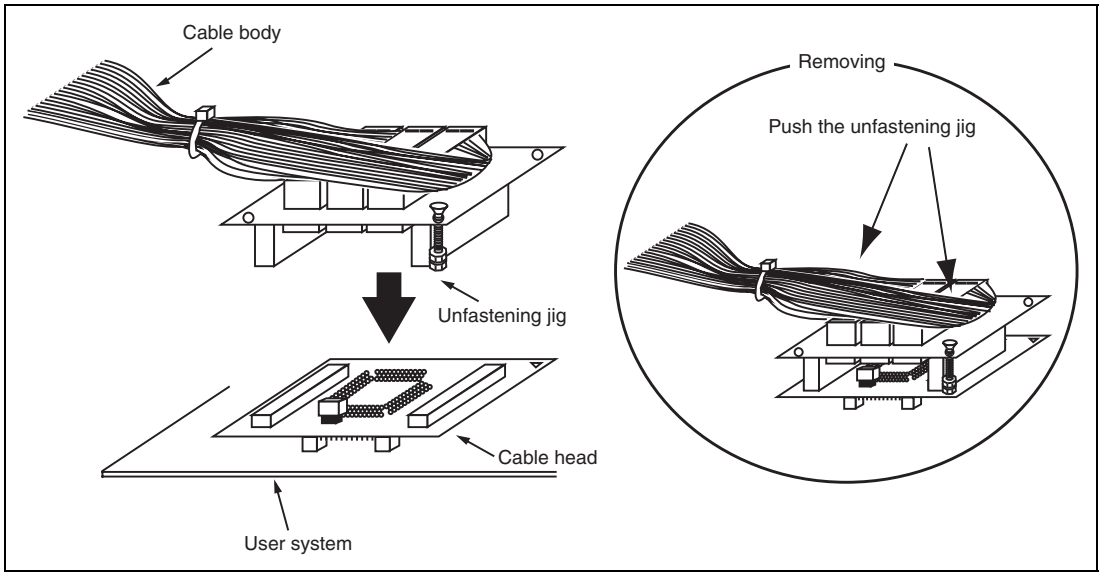

Figure 5 Fastening Cable Body

2.3 Recommended Dimensions for User System Mount Pad

Figure 6 shows the recommended dimensions for the mount pad (footprint) for the user system with an IC socket for an PLQP0120LA-A package (NQPACK120SE-ND: manufactured by Tokyo Eletech Corporation). The dimensions in figure 6 are somewhat different from those of the actual chip's mount pad. Also, note the user system can not be connected to the user system interface cable with inserting the guide pins in place.

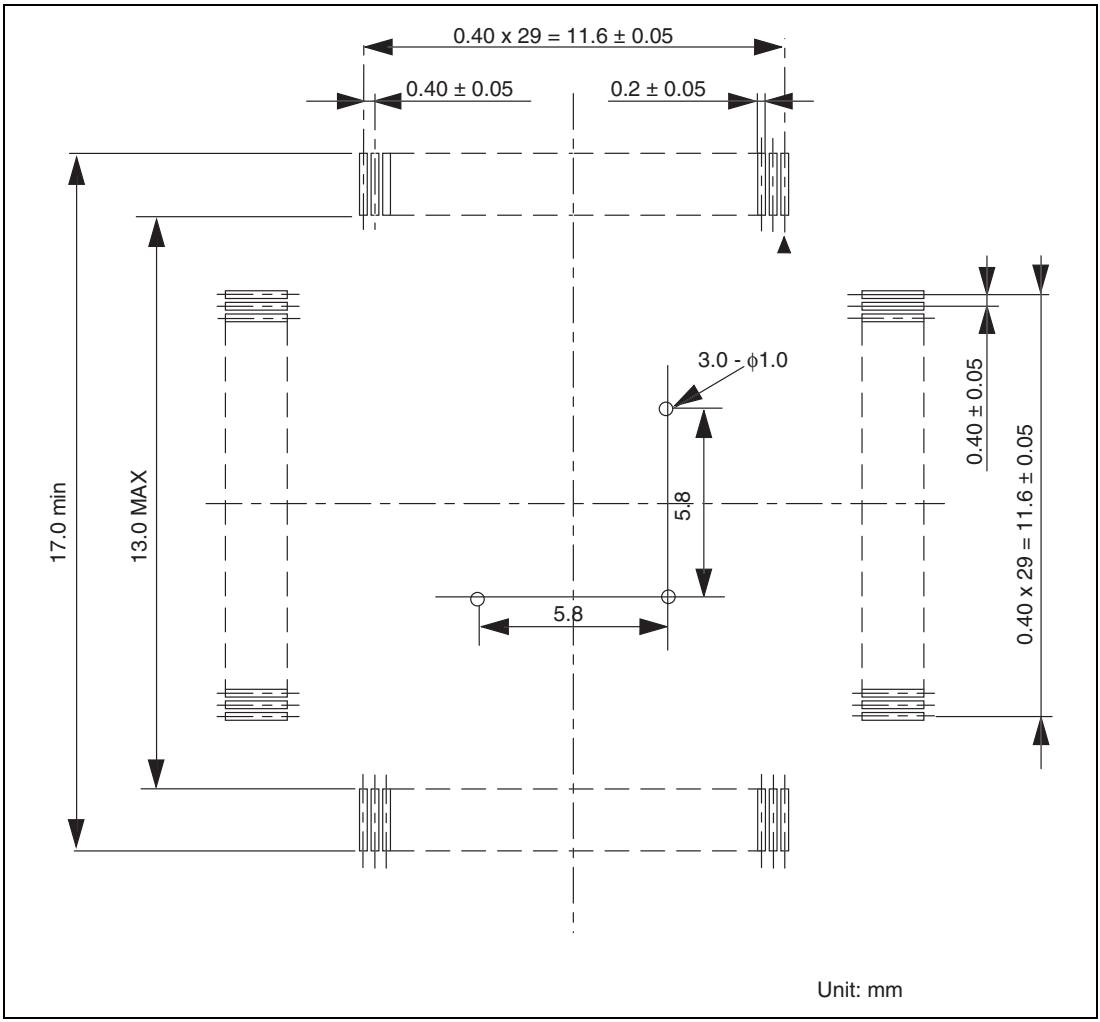

Figure 6 Recommended Dimensions for Mount Pad

2.4 Dimensions for User System Interface Cable Head

The dimensions for the user system interface cable head are shown in figure 7.

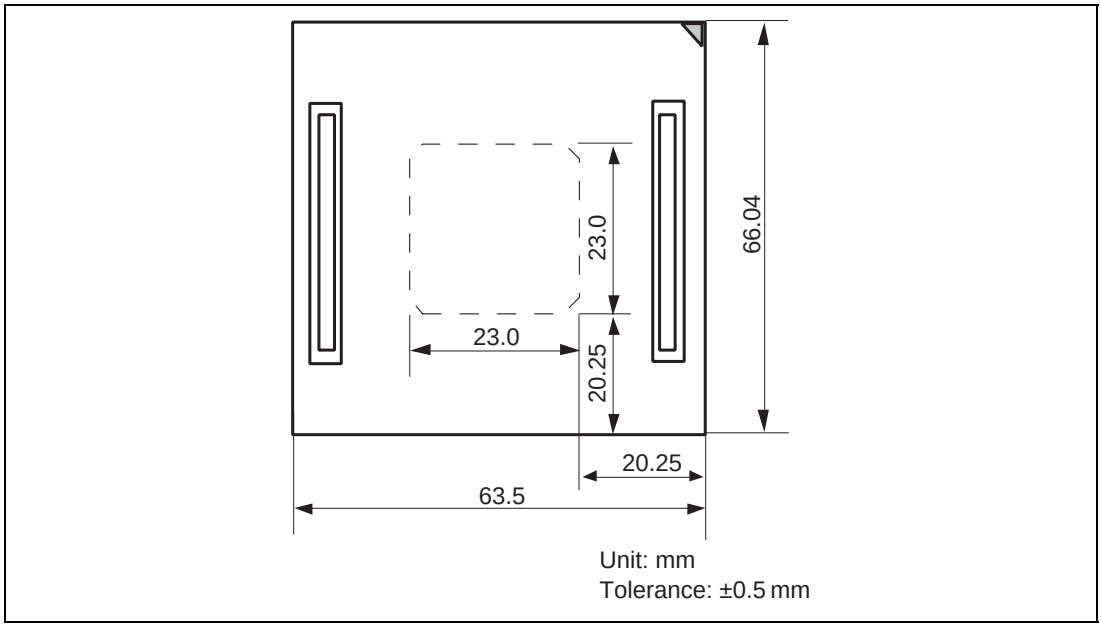

Figure 7 Dimensions for User System Interface Cable Head

2.5 Resulting Dimensions after Connecting User System Interface Cable

The resulting dimensions, after connecting the user system interface cable head to the user system, are shown in figure 8.

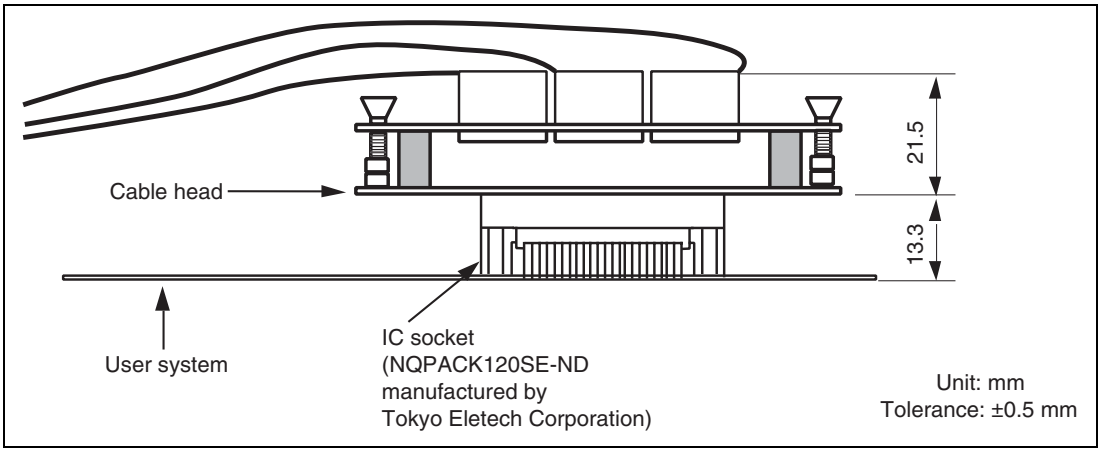

Figure 8 Resulting Dimensions after Connecting User System Interface Cable

Section 3 Installing the MCU to the User System

CAUTION

1. **Check the location of pin 1 before inserting.**
2. **Use a 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.**

Check the location of pin 1 before inserting the MCU into the IC socket on the user system, as shown in figure 9. After inserting the MCU, fasten the socket cover with the provided four screws (M2.0 x 6 mm). Take special care, such as manually securing the IC socket soldered area, to prevent the IC socket from being damaged by overtightening the screws or twisting the components.

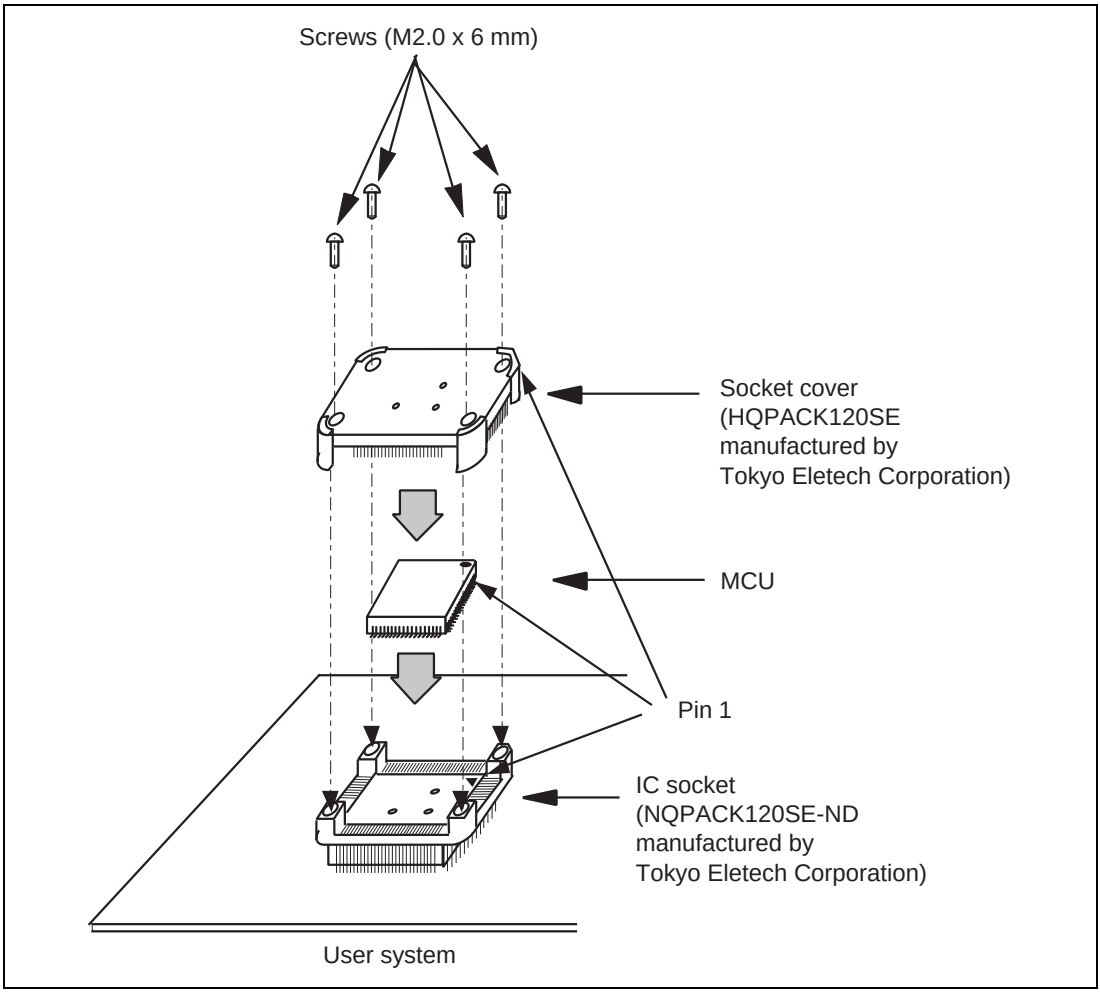

Figure 9 Installing MCU to User System

Section 4 Verifying Operation

1. Turn on the emulator according to the procedures described in the H8SX/1650 E6000H Emulator User's Manual (HS1650EPH60HE).
2. Verify the user system interface cable connections by checking the pin states with the CHECK command (emulator command). If an error is detected, recheck the soldered IC socket and the location of pin 1.
3. The emulator connected to this user system interface cable supports three kinds of clock sources as the MCU clock: an emulator internal clock, an external clock on the user system, and a crystal oscillator to be mounted on the EV-chip board. For details, refer to the H8SX/1650 E6000H Emulator User's Manual (HS1650EPH60HE).
   - To use the emulator internal clock
     Select the clock in the emulator by using the CLOCK command (emulator command).
   - To use the external clock on the user system
     Select the external clock with the CLOCK command (emulator command). Supply the external clock from the user system to the emulator by inputting the external clock from the EXTAL terminal on the cable head or connecting a crystal oscillator to the EXTAL and XTAL terminals. For details, refer to the H8SX/1520 Group Hardware Manual.
   - To use the crystal oscillator mounted on the EV-chip board
     Install a crystal oscillator into the crystal oscillator terminals on the EV-chip board.

   Figure 10 shows the oscillator circuit on the user system interface cable.

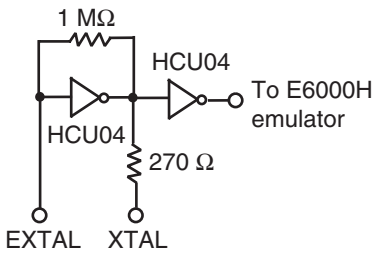

Figure 10 Oscillator Circuit

Section 5 Notice

1. Make sure that pin 1 on the user system IC socket is correctly aligned with pin 1 on the cable head before inserting the cable head into the user system IC socket.
2. This user system interface cable is specifically designed for the HS1527KEPH60H emulator. Do not use this cable with any other emulator station.
3. To prevent breaking of wires in the cable body, do not place heavy or sharp metal objects on the user system interface cable.
4. While the emulator station is connected to the user system with the user system interface cable, force must not be applied to the cable head. Place the emulator station, user system interface cable, and user system as shown in the example in figure 11.

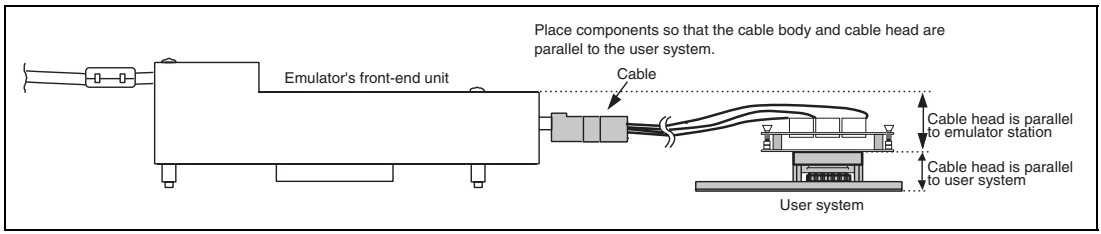

Figure 11 User System Interface Cable Location Example

5. The P1 short connector is used for testing. Do not remove the jumper pin that is inserted in the side of pins 1 and 2.

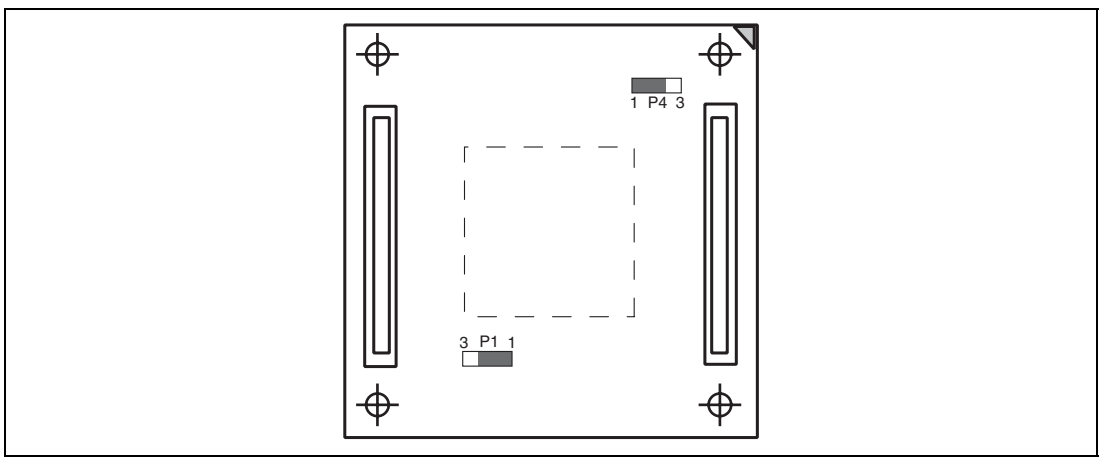

Figure 12 P1 and P4 Short Connectors

6. A level-shift circuit with AVcc0 and AVcc1 is mounted on the user system interface cable, as shown in figure 13. At shipment, the jumper pin is inserted in the side of pins 1 and 2 of the

P4 short connector. For details on the differences between the target MCU and the emulator, refer to the H8SX/1650 E6000H Emulator User's Manual (HS1650EPH60HE). For the ranges of input voltages of AVcc0 and AVcc1, refer to the H8SX/1520 Group Hardware Manual.

CAUTION

Insert the jumper pin in the P4 short connector so that the higher voltage between AVcc0 and AVcc1 is selected. Select either AVcc0 or AVcc1 when their potentials are the same. Do not use the emulator without jumper pins.

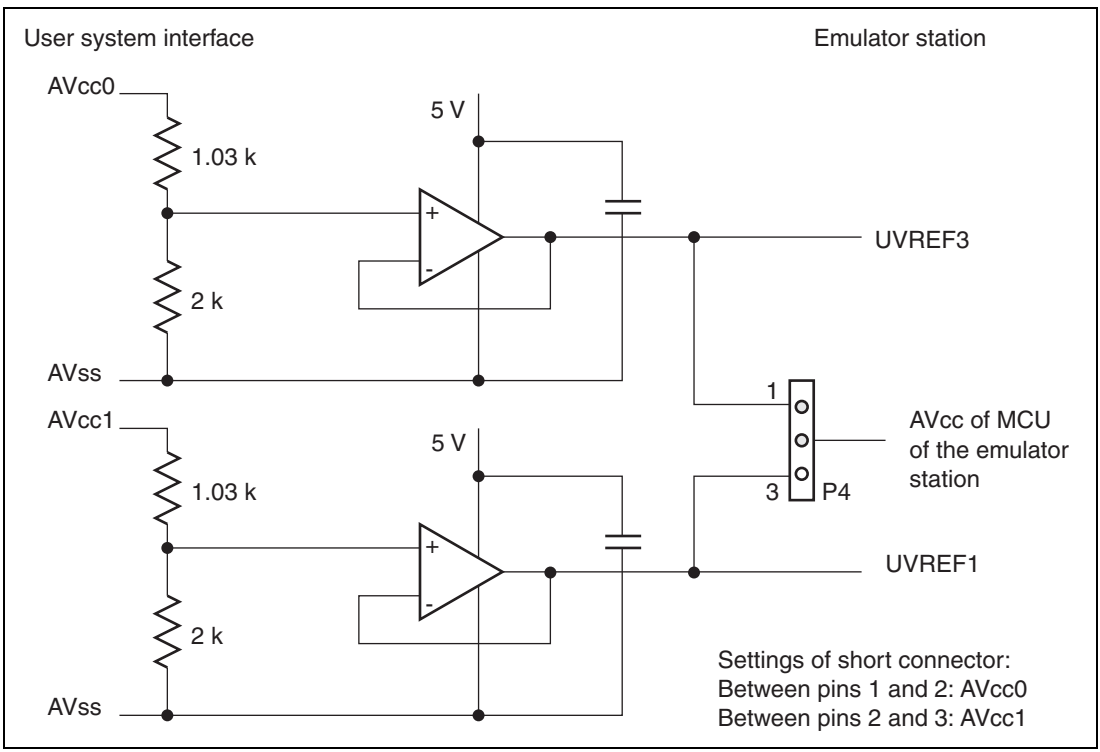

Figure 13 Level-shift Circuit with AVcc0 and AVcc1

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