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Renesas Electronics Corporation

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**H8S/2276R, H8S/2276 Series TFP-100G
User System Interface Cable (HS2276ECN61H)
for E6000 Emulator
User's Manual**

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Preface

Thank you for purchasing this user system interface cable (HS2276ECN61H) for the Renesas's original microcomputer H8S/2276R, H8S/2276 series.

The HS2276ECN61H is a user system interface cable that connects an H8S/2214 series E6000 emulator (HS2214EPI61H; hereinafter referred to as the emulator) through the expansion board to the IC socket for a TFP-100G package for the H8S/2276R, H8S/2276 series MCU (HS2276REIO61H, HS2276EIO61H) on the user system.

Contents

Section 1	Configuration.....	1
Section 2	Connection Procedures.....	3
2.1	Connecting User System Interface Cable to Expansion Board.....	3
2.2	Connecting User System Interface Cable to User System.....	5
2.2.1	Installing IC Socket.....	6
2.2.2	Soldering IC Socket.....	7
2.2.3	Inserting Cable Head.....	7
2.2.4	Fastening Cable Head.....	8
2.2.5	Fastening Cable Body.....	10
2.3	Recommended Dimensions for User System Mount Pad.....	11
2.4	Dimensions for User System Interface Cable Head.....	12
2.5	Resulting Dimensions after Connecting User System Interface Cable.....	13
Section 3	Installing the MCU to the User System.....	14
Section 4	Verifying Operation.....	16
Section 5	Notice.....	19

Section 1 Configuration

CAUTION

Use an NQPACK100SE socket (manufactured by Tokyo Eletech Corporation) for the TFP-100G package IC socket on the user system.

Figure 1 shows the configuration of the HS2276ECN61H user system interface cable for the TFP-100G package.

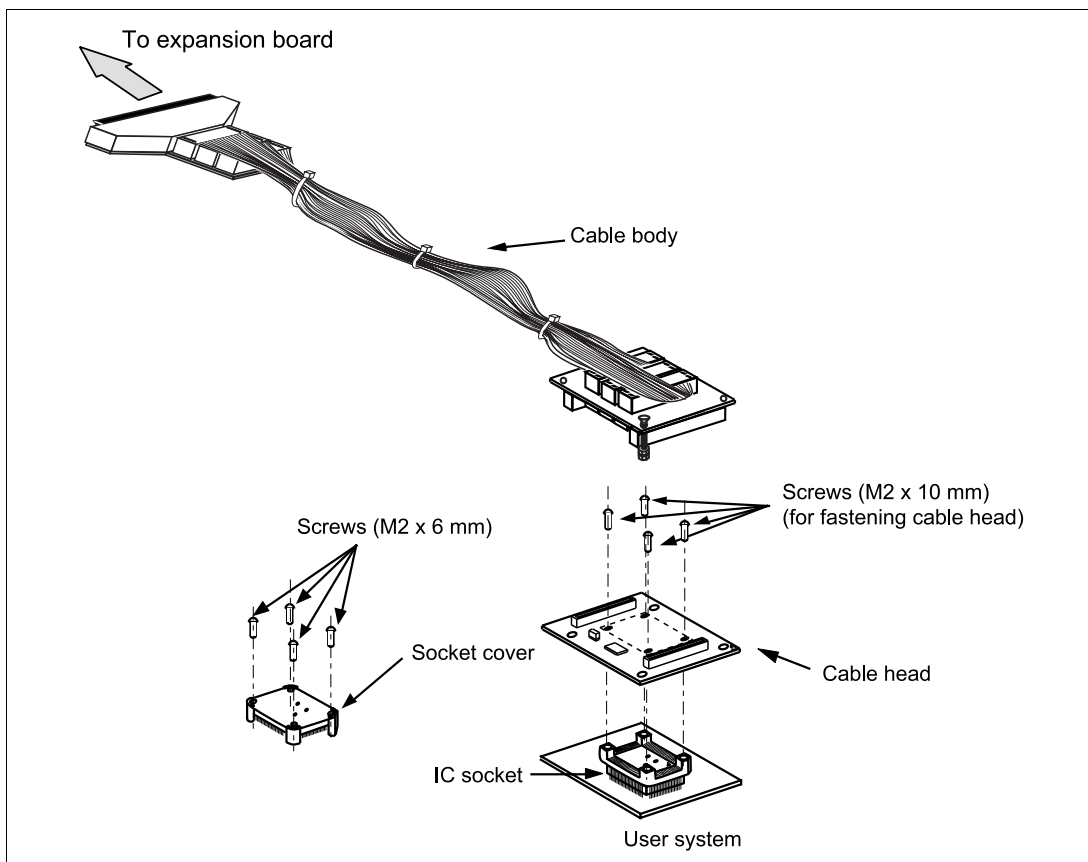


Figure 1 HS2276ECN61H User System Interface Cable

Table 1 lists the HS2276ECN61H components. Please make sure you have all of these components when unpacking.

Table 1 HS2276ECN61H Components

No.	Component	Quantity	Remarks
1	Cable body	1	Flat cable
2	Cable head	1	
3	IC socket	1	For the TFP-100G package
4	Socket cover	1	For installing a TFP-100G packaged MCU
5	Screws (M2.0 x 10 mm)	4	For fastening cable head
6	Screws (M2.0 x 6 mm)	4	For installing a TFP-100G packaged MCU
7	Guide pins (ϕ 1 mm)	3	For determining the IC socket location
8	Screwdriver	1	For tightening screws
9	Documentation	1	User's manual for HS2276ECN61H (this manual)

Section 2 Connection Procedures

2.1 Connecting User System Interface Cable to Expansion Board

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. The user system interface cable must be connected to an H8S/2214 Series E6000 emulator through the H8S/2276R, H8S/2276 Series expansion board. Do not connect the user system interface cable directly to the E6000 emulator.

2. [1] After making sure the direction of the expansion board connector labeled E6000 EMULATOR is correct, firmly insert the expansion board connector into the emulator station connector labeled USER INTERFACE ([1] in figure 2).
- [2] Connect the expansion board labeled USER INTERFACE CABLE and the user system interface cable body.

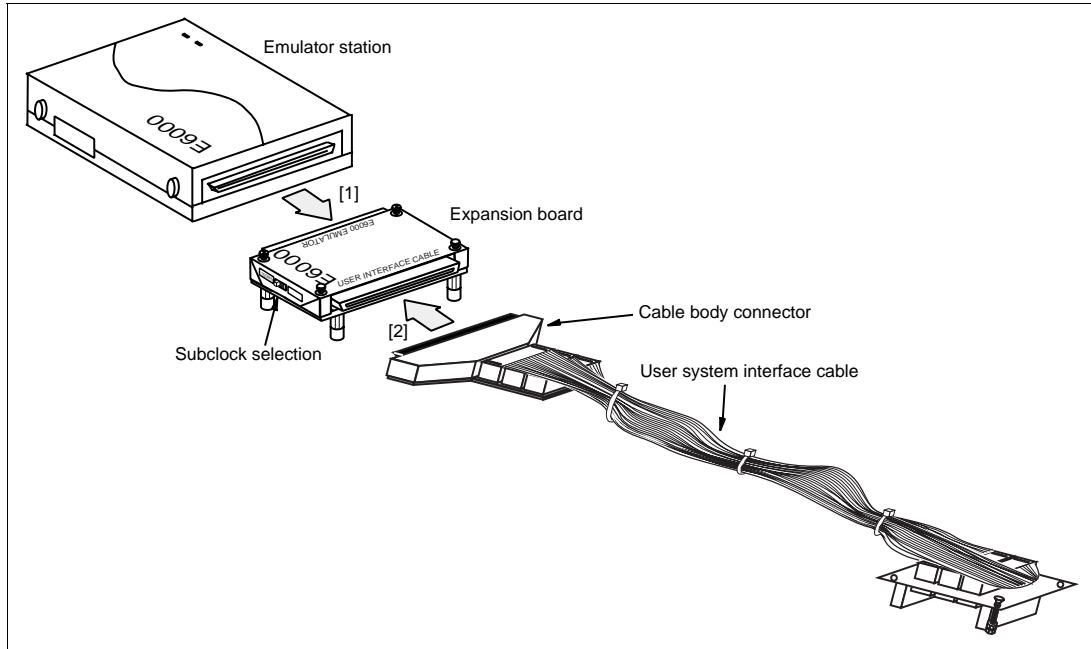


Figure 2 Connecting User System Interface Cable to Expansion Board

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, the emulator product, and the expansion board 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.

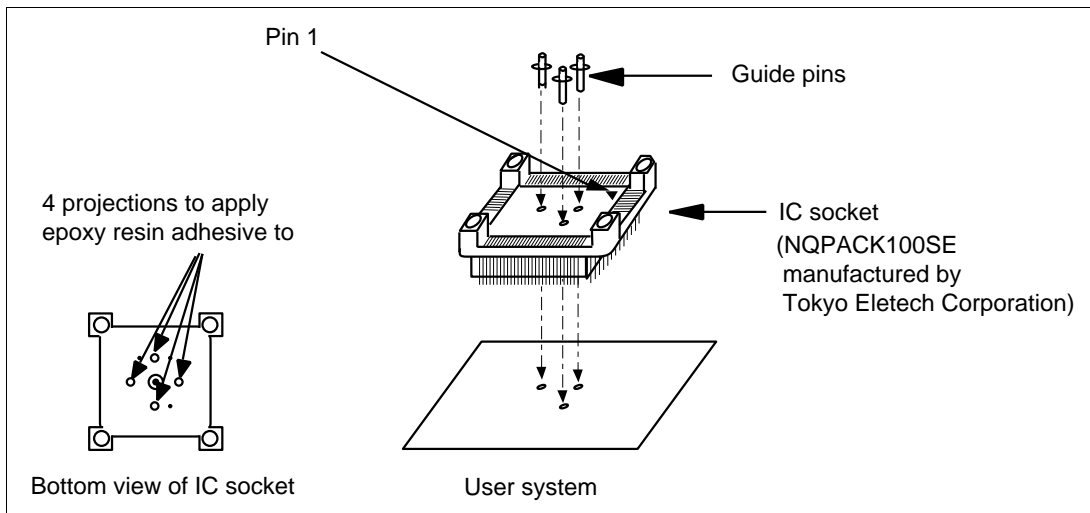


Figure 3 Location Setting of IC Socket

2.2.2 Soldering IC Socket

After fastening, solder the IC socket for a TFP-100G 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 a TFP-100G 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 a TFP-100G 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.

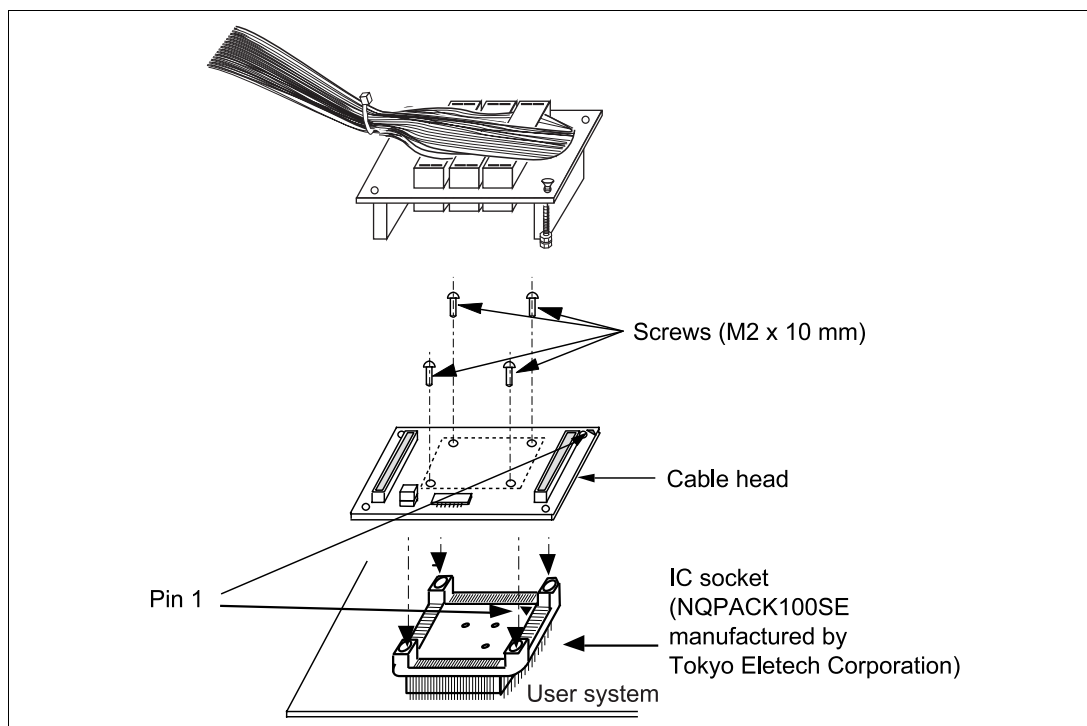


Figure 4 Connecting User System Interface Cable to User System

2.2.5 Fastening Cable Body

Connect the cable body to the cable head.

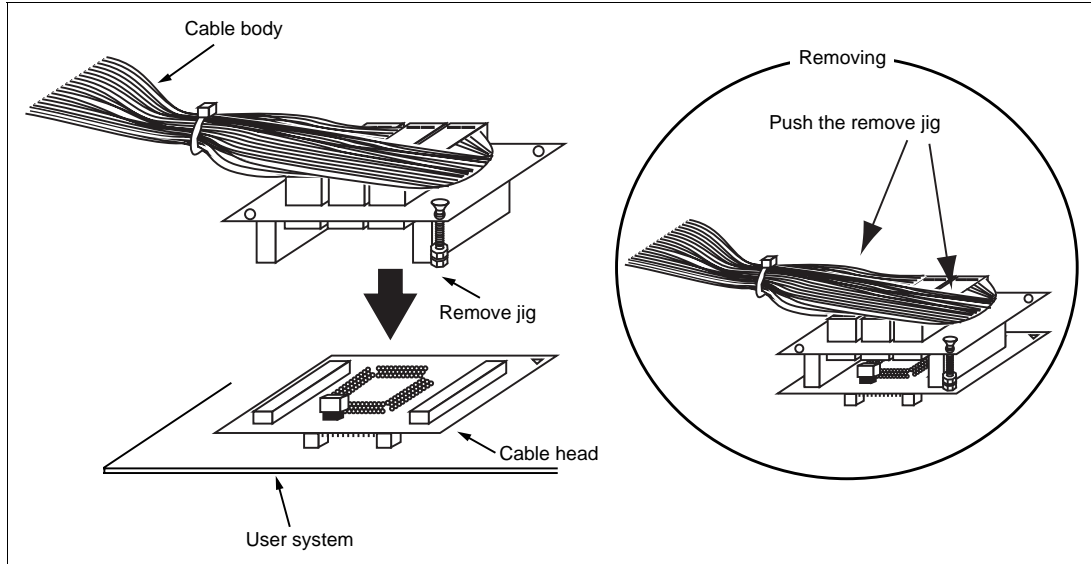


Figure 5 Fastening Cable Body

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 a TFP-100G package (NQPACK100SE: manufactured by Tokyo Eletech Corporation). Note that the dimensions in figure 6 are somewhat different from those of the actual chip's mount pad.

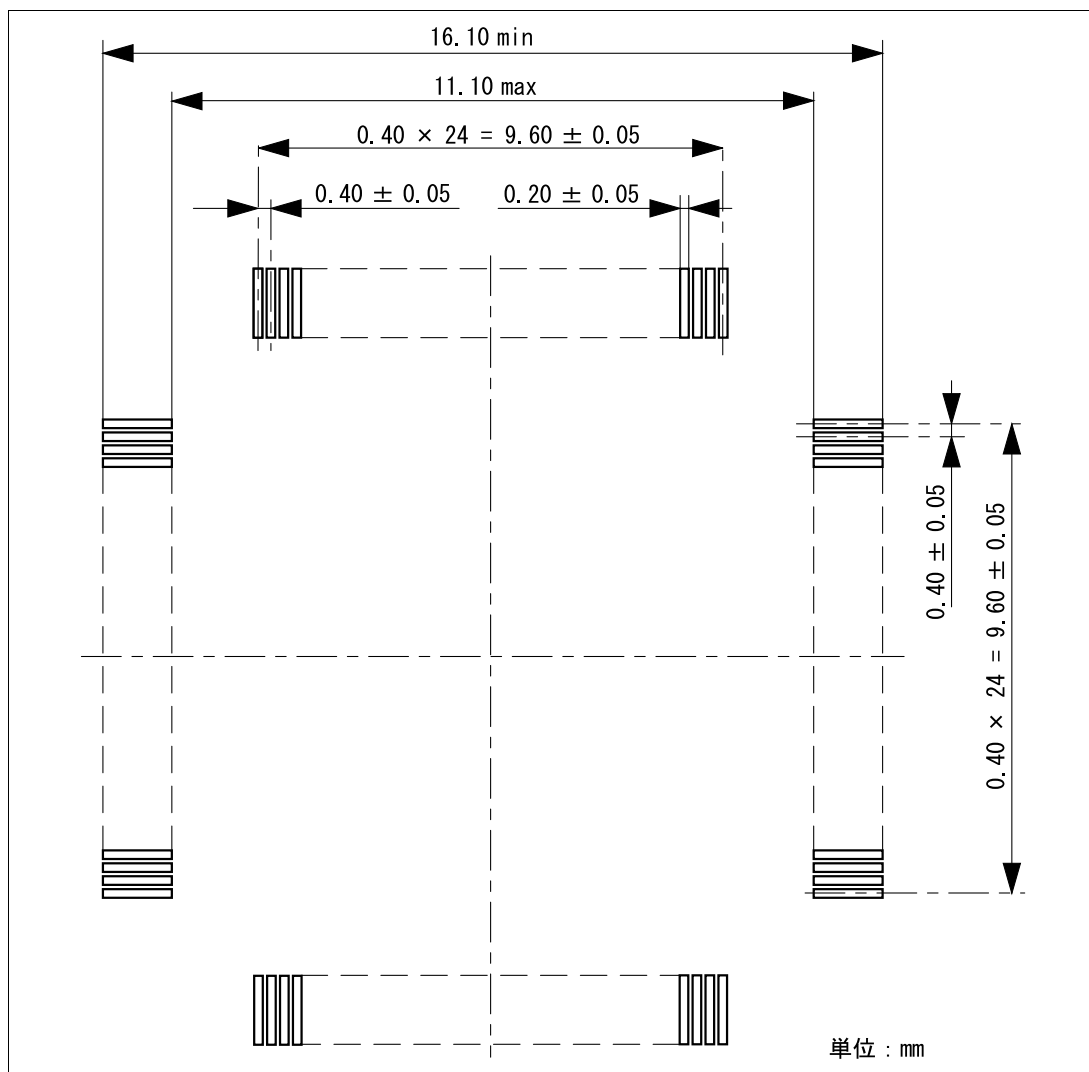


Figure 6 Recommended Dimensions for Mount Pad

2.4 Dimensions for User System Interface Cable Head

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

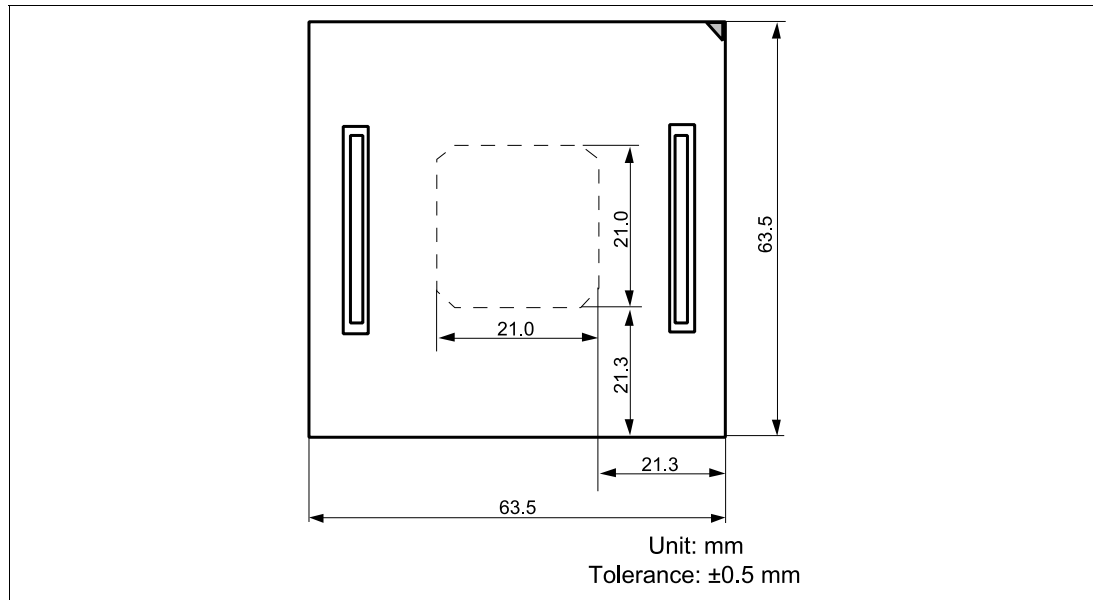


Figure 7 Dimensions for User System Interface Cable Head

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.

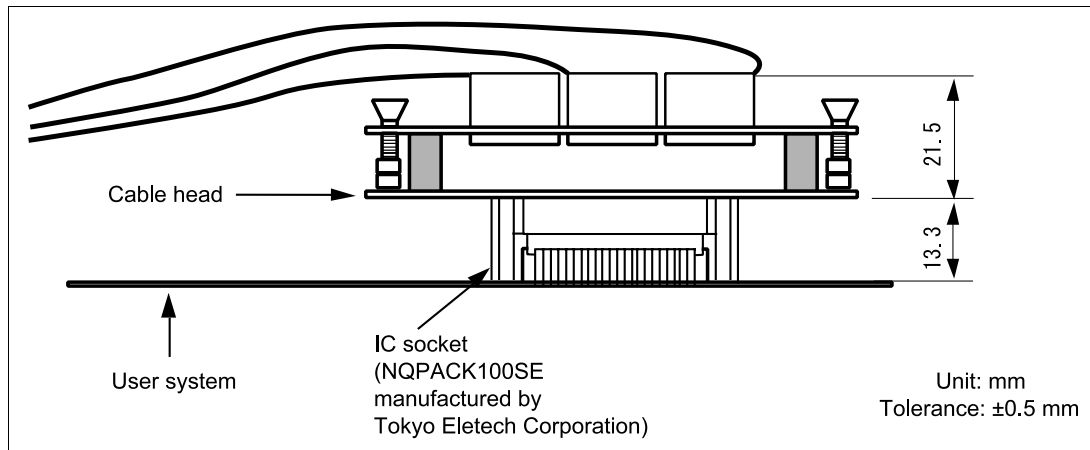


Figure 8 Resulting Dimensions after Connecting User System Interface Cable

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.

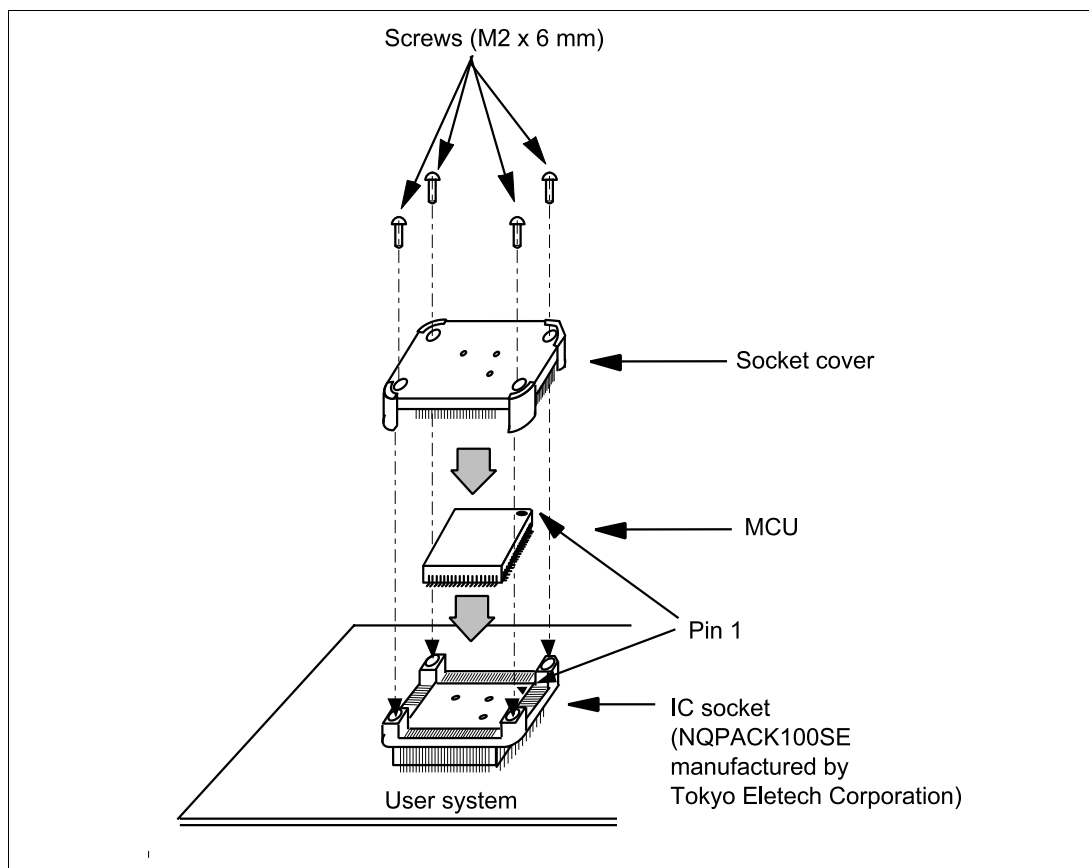


Figure 9 Installing MCU to User System

4. Subclock (OSC2, 1)

When the switch is set on the expansion I/O board (Subclock selection) and jumper P4 is set on the user system interface cable, subclocks in table 2 can be selected. Select target subclock in the Configuration window (see figures 11 and 12).

Table 2 Setting Subclock

Expansion I/O Board (Subclock selection)	User System Interface Cable (P4)	Subclock (\varnothing_{SUB})
160 kHz	1-2 connected	160 kHz
76.8 kHz		76.8 kHz
The setting of the subclock selection switch can be either 160 kHz or 76.8 kHz.	2-3 connected	Target subclock

Figure 11 shows the Expansion I/O board Subclock Selection, and figure 12 shows the location of jumper P4.

Figure 13 shows the system clock oscillator on the subclock oscillator.

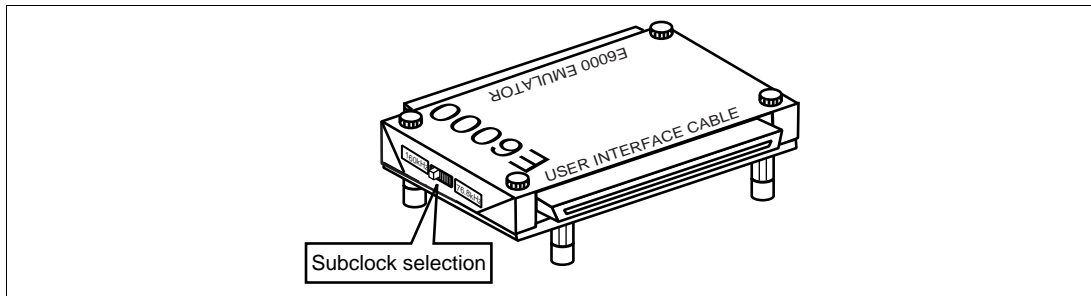


Figure 11 Expansion I/O Board Subclock Selection

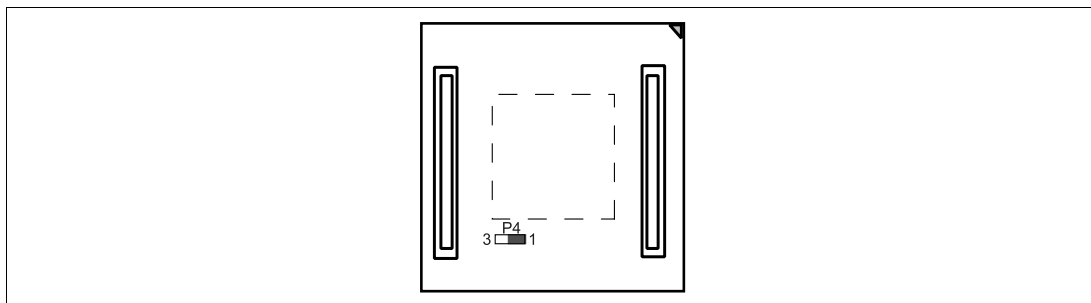


Figure 12 P4 Jumper

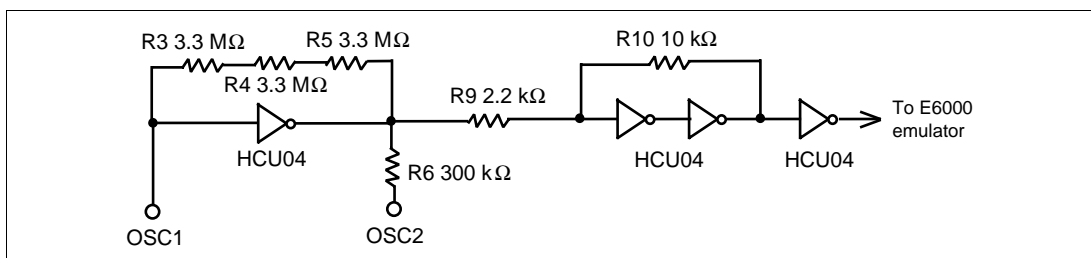


Figure 13 Subclock Oscillator

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. The dimensions of the recommended mount pad for the user system IC socket are different from those of the MCU.
3. To avoid breaking 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. Position the emulator station, user system interface cable, and user system as shown in figure 14.

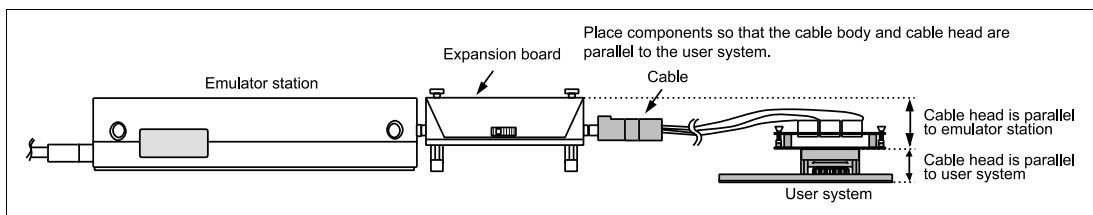


Figure 14 User System Interface Cable Location Example

5. The P1 jumper is used for testing. Do not remove the inserted jumper pin.

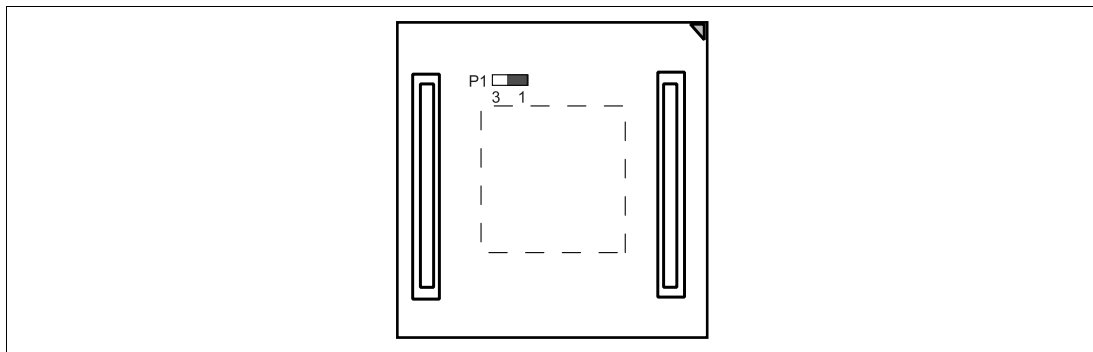


Figure 15 P1 Jumper