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Renesas Electronics Corporation

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Customer Support Dept.
April 1, 2003

User's Manual

SH7055 QFP-256 User System Interface Cable (HS7055ECF81H) for E8000 Emulator

User's Manual

Renesas Electronics
www.renesas-electoronics.com

Rev.0.1 2000.09

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• 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 Hitachi, Ltd. excluding all subsidiary products.

- User system interface cable (HS7055ECF81H)

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Figures:

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

Limited Anticipation of Danger:

Hitachi cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this user's manual and on the user system interface cable are therefore not all inclusive. Therefore, you must use the user system interface cable safely at your own risk.

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

DANGER indicates an **imminently** hazardous situation which, **if not avoided,** will result in **DEATH** or **SERIOUS INJURY** to you or other people.

WARNING indicates a **potentially** hazardous situation which, **if not avoided,** could result in **DEATH** or **SERIOUS INJURY** to you or other people.

CAUTION indicates a hazardous situation which, **if not avoided**, may result in **minor or moderate injury** to you or other people, or may result in **damage to the machine** or **loss of the user program**. It may also be used to alert against unsafe usage.

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, emulator, and user system interface cable or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.

1. **Always switch OFF the emulator and the user system before connecting or disconnecting any CABLES, the user system interface cable connector, or the user system IC socket.**
2. **When connecting the user system interface cable connector to the user system IC socket, ensure that pin 1 on both sides are correctly aligned.**

Preface

Thank you for purchasing this user system interface cable (HS7055ECF81H) for the Hitachi's original microcomputer SH7055.

The HS7055ECF81H is a user system interface cable that connects an SH7055 E8000 evaluation chip board (HS7055EBK81H; hereinafter referred to as the EV-chip board) to the IC socket for a QFP-256 package (package code: FP-256) for the SH7055 MCU on the user system.

Contents

Section 1 Configuration

CAUTION

Use a TQPACK256RD socket and a TQSOCKET256RDP (manufactured by Tokyo Eletech Corporation) for the FP-256 package IC socket and IC socket connector on the user system.

Figure 1 shows the configuration of the HS7055ECF81H user system interface cable for the FP-256 package.

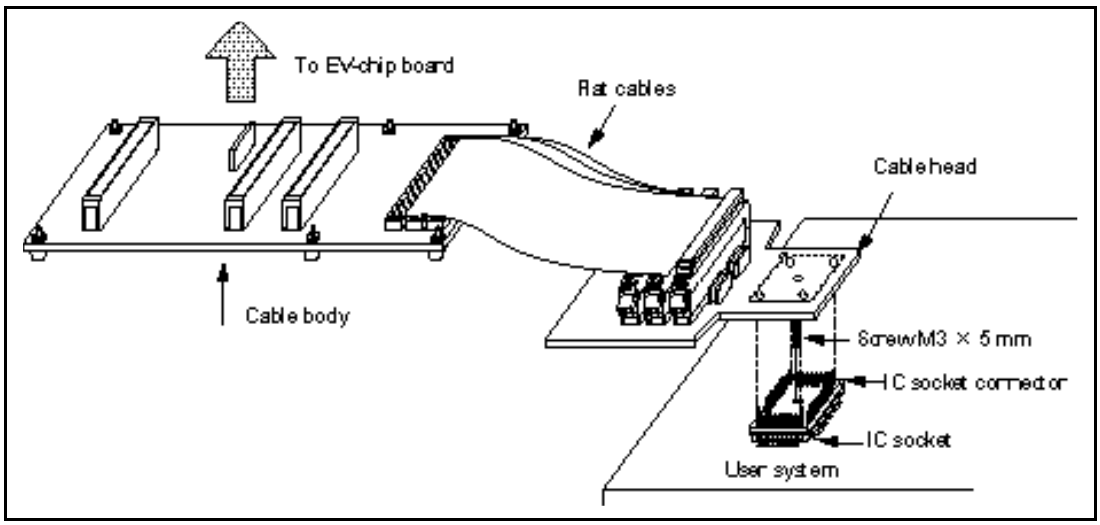

Figure 1 HS7055ECF81H User System Interface Cable

Table 1 lists the HS7055ECF81H components. Please make sure you have all of these components when unpacking.

Table 1 HS7055ECF81H Components

No.	Component	Quantity	Remarks
1	Cable body	1	Includes two three cables
2	Cable head	1	
3	IC socket	1	For the FP-256 package (to be mounted on the user system)
4	IC socket connector	1	For the FP-256 package (for connecting the IC socket and the user system interface cable)
5	Screw (M3 x 5 mm)	1	For fastening cable head
6	Documentation	1	User's manual for HS7055ECF81H (this manual)

Section 2 Connection Procedures

2.1 Connecting User System Interface Cable to EV-Chip Board

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 body to the EV-chip board, follow the instructions below.

1. Make sure the user system and emulator 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. Align the connectors on the cable body with those on the EV-chip board according to their numbers (figure 2), insert the cable body connectors to those on the EV-chip board until they are locked.

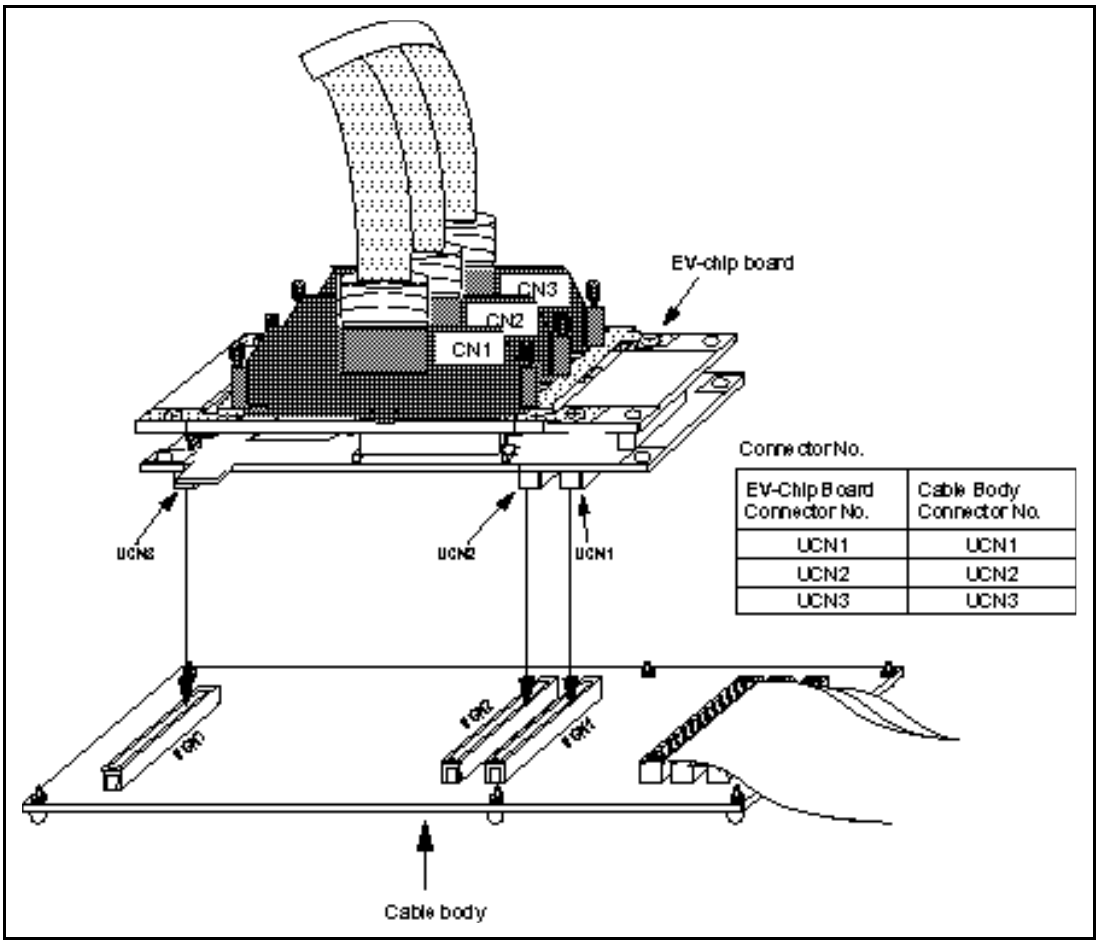

Figure 2 Connecting User System Interface Cable to EV-Chip Board

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 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, as shown in figure 3.

CAUTION

Apply epoxy resin adhesive to the four projections at the bottom of the IC socket for an FP-256 package before fastening the IC socket.

2.2.2 Soldering IC Socket

After fastening, solder the IC socket for an FP-256 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 Installing IC Socket Connector

CAUTION

Check the location of pin 1 before inserting.

After checking the location of pin 1 on the IC socket on the user system and pin 1 on the IC socket connector, align the guide pins on the IC socket connector with the guide holes on the IC socket, and insert the IC socket connector into the IC socket, as shown in figure 3.

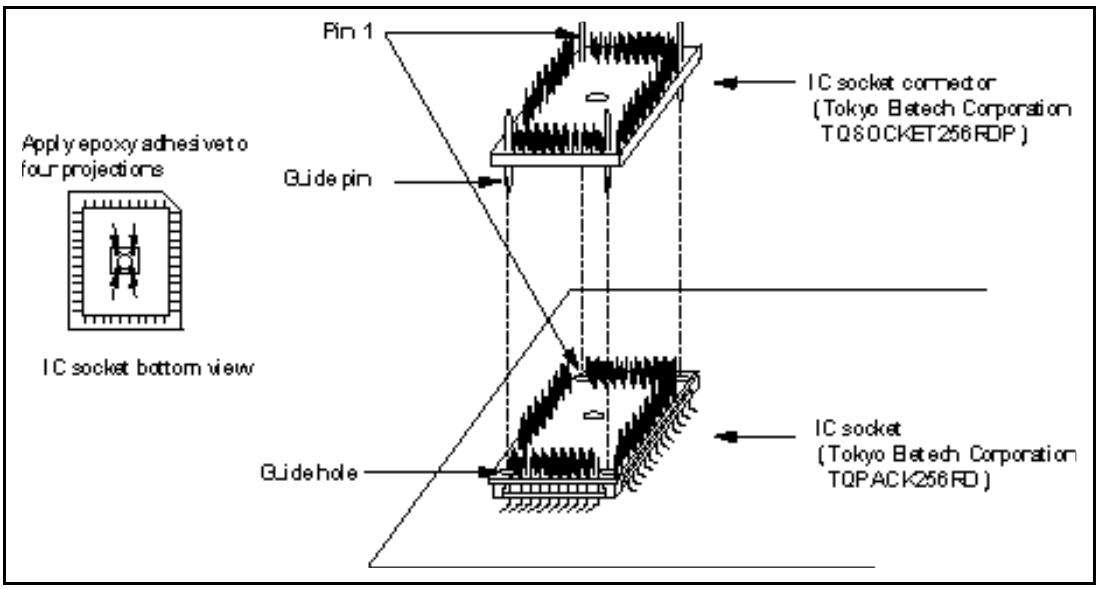

Figure 3 Installing IC Socket to User System

2.2.4 Fastening IC Socket Connector

Fasten the IC socket connector to the IC socket with the screw (M3 x 5 mm) provided (figure 4). Take special care, such as manually securing the IC socket soldered area, to prevent the soldered IC socket from being damaged by twisting the components.

CAUTION

1. **Use a hexagonal wrench (f 1.5 mm).**
2. **Stop tightening when the top of the screw reaches the top surface (point A in the cross-sectional view in figure 4) of the metal section around the screw hole. If a screw is tightened too much, the screw head may break or the user system may be damaged.**
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.**

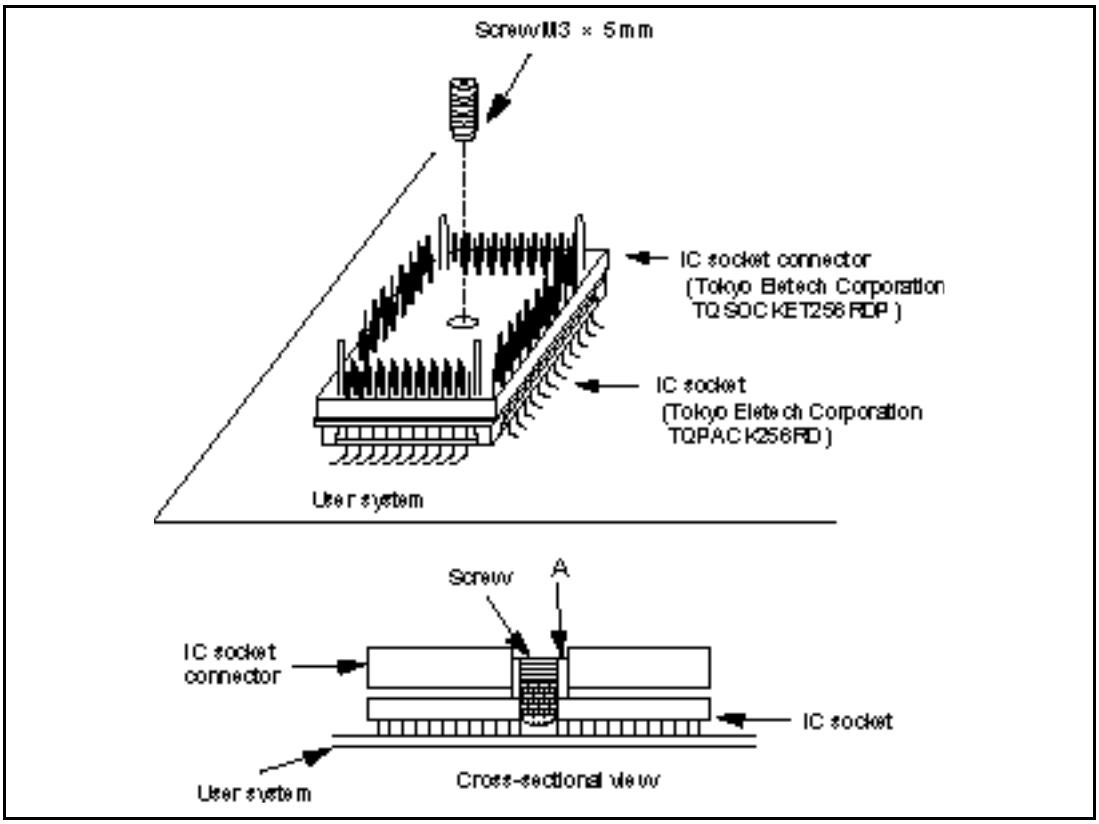

Figure 4 Fastening IC Socket Connector

2.2.5 Inserting Cable Head

CAUTION

Check the location of pin 1 before inserting.

After checking the location of pin 1 on the IC socket connector on the user system and pin 1 on the user system interface cable head, align the guide pins on the IC socket connector with the guide holes on the user system interface cable head, and insert the user system interface cable head into the IC socket connector, as shown in figure 5.

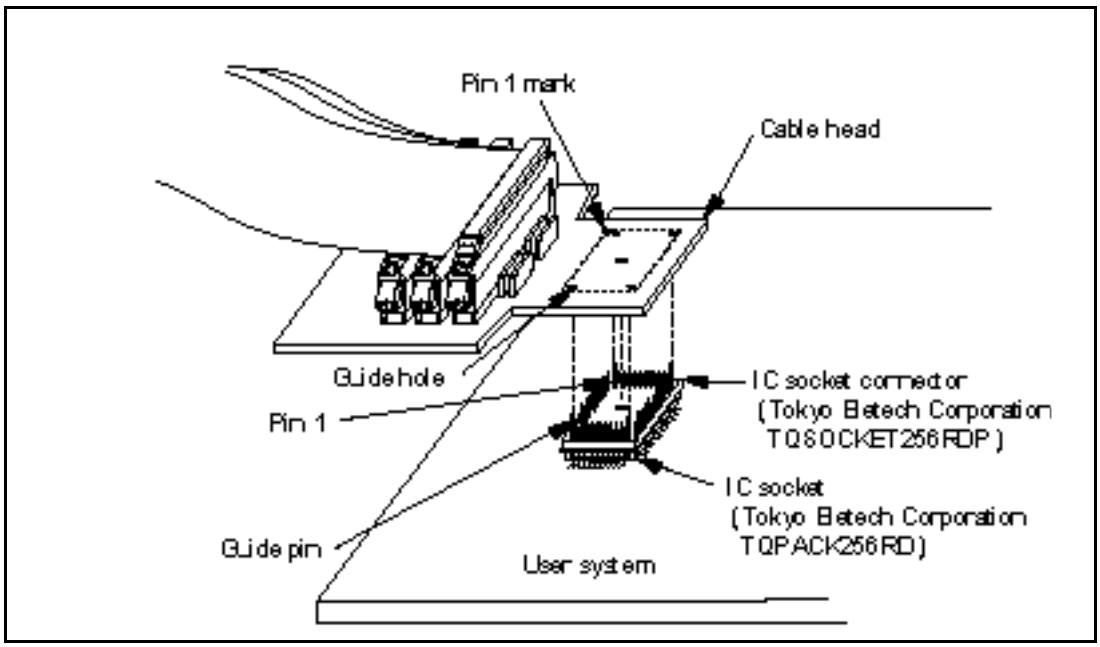

Figure 5 Connecting User System Interface Cable to User System

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 FP-256 package (TQPACK256RD: manufactured by Tokyo Eletech Corporation). Note that the dimensions in figure 6 are somewhat different from those of the actual chip's mount pad.

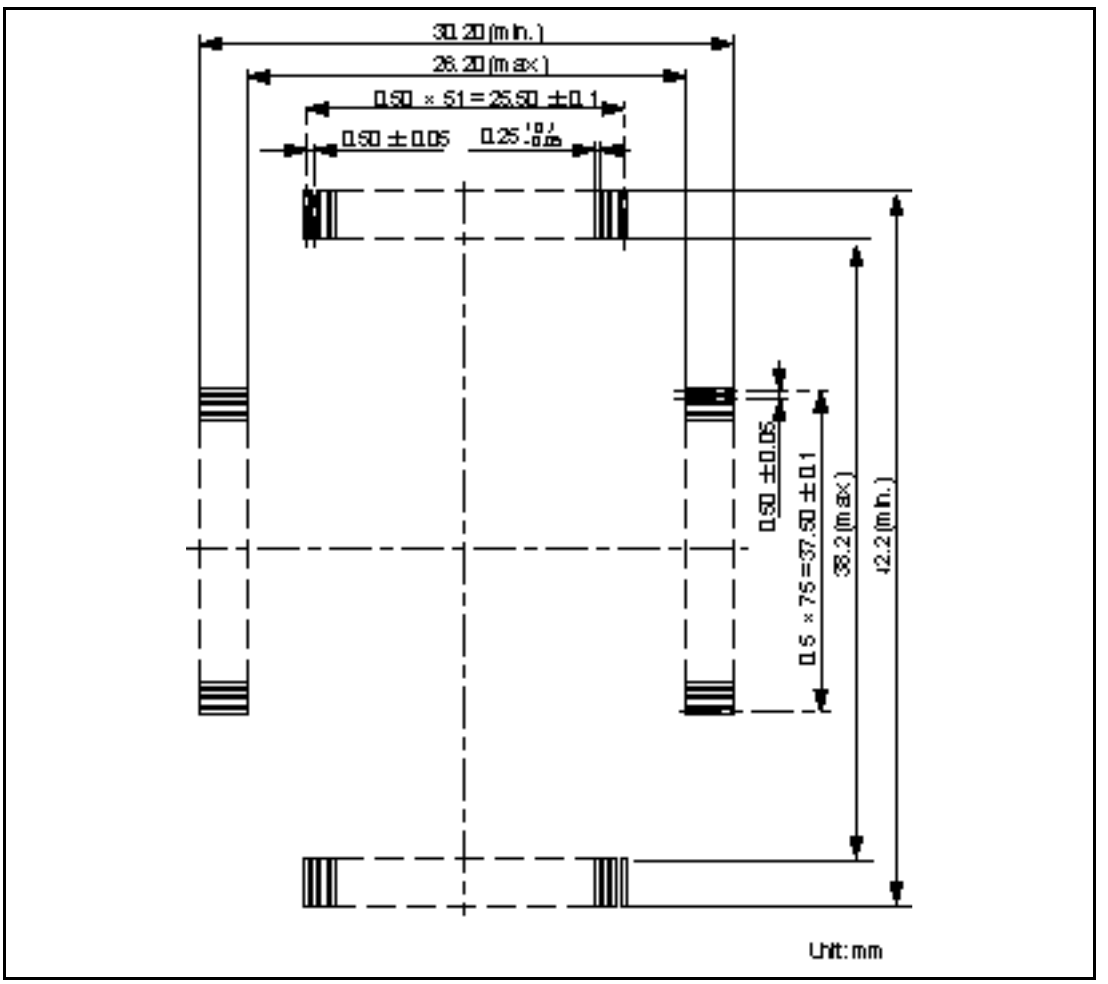

Figure 6 Recommended Dimensions for Mount Pad

2.4 Dimensions for User System Interface Cable Head

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

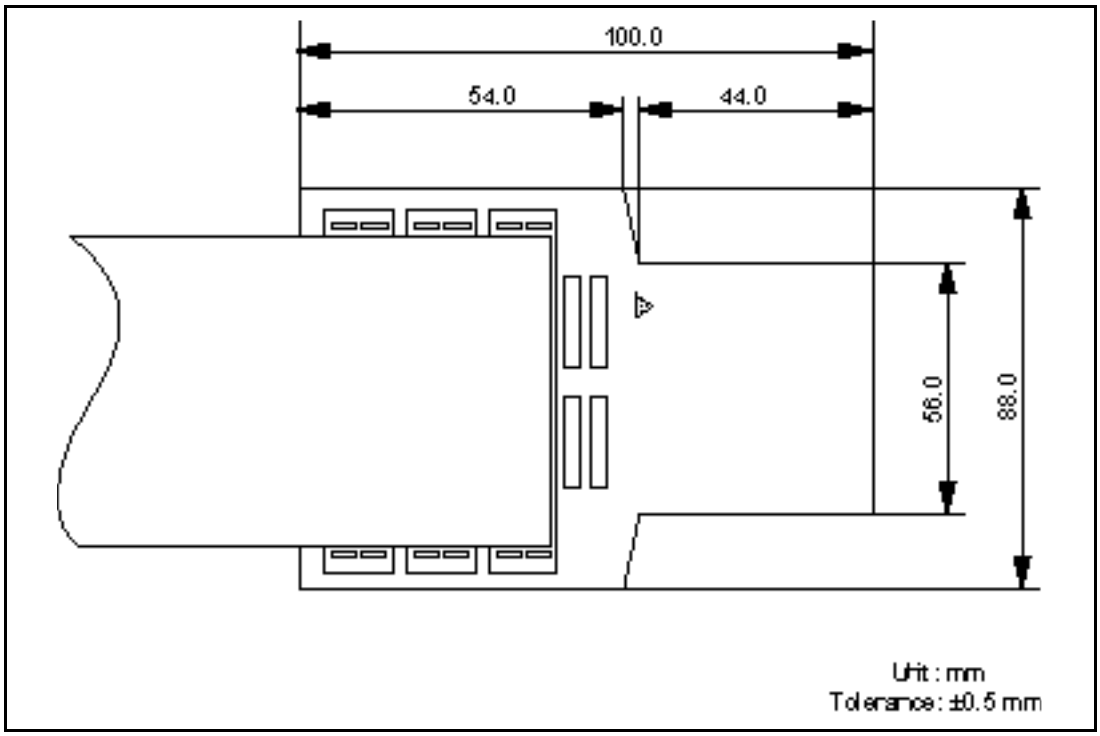

Figure 7 Dimensions for User System Interface Cable Head

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.

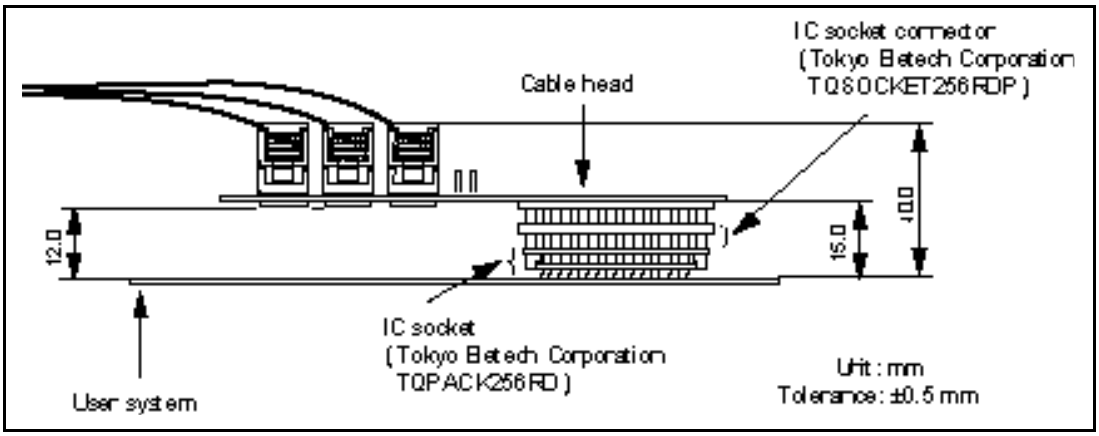

Figure 8 Resulting Dimensions after Connecting User System Interface Cable

Section 3 Verifying Operation

1. When using the E8000 emulator for the SH7055, turn on the emulator according to the procedures described in the SH7055 E8000 Emulator User's Manual (HS7055EDD81HE).
2. Verify the user system interface cable connections by checking the pin states with the CHECK command (emulator command) and checking the bus states with the FILL 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. For details, refer to the SH7055 E8000 Emulator User's Manual (HS7055EDD81HE).
   - To use the emulator internal clock
     Select the clock in the emulator by the CLOCK command (emulator command).
   - To use the external clock on the user system
     Supply the external clock from the user system to the emulator through the EXTAL pin (pin 51) on the cable head.
   - 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.

Section 4 Notice

1. The MCU cannot be installed directly into the IC socket provided for connecting this user system interface cable.
2. Before connecting any parts or cables, make sure that pin 1 on the both sides are correctly aligned.
3. Do not apply excessive force to the user system interface cable while it is connected to the user system.
4. The dimensions of the recommended mount pad for the IC socket for this user system interface cable are different from those of the MCU.
5. This user system interface cable is specifically designed for the HS7055EBK81H EV-chip board. Do not use this cable with any other EV-chip board.
6. This user system interface cable cannot be operated with a crystal oscillator mounted on the user system. To use a crystal oscillator, mount it on the crystal oscillator terminals on the EV-chip board.
7. When power is not supplied to the Vcc pin at the user system interface cable head, the emulator displays ** VCC DOWN. The emulator will not operate correctly.
7. While the EV-chip board is connected to the user system interface cable, force must not applied to the cable head. Place the EV-chip board, user system interface cable, and user system as shown in figure 9.

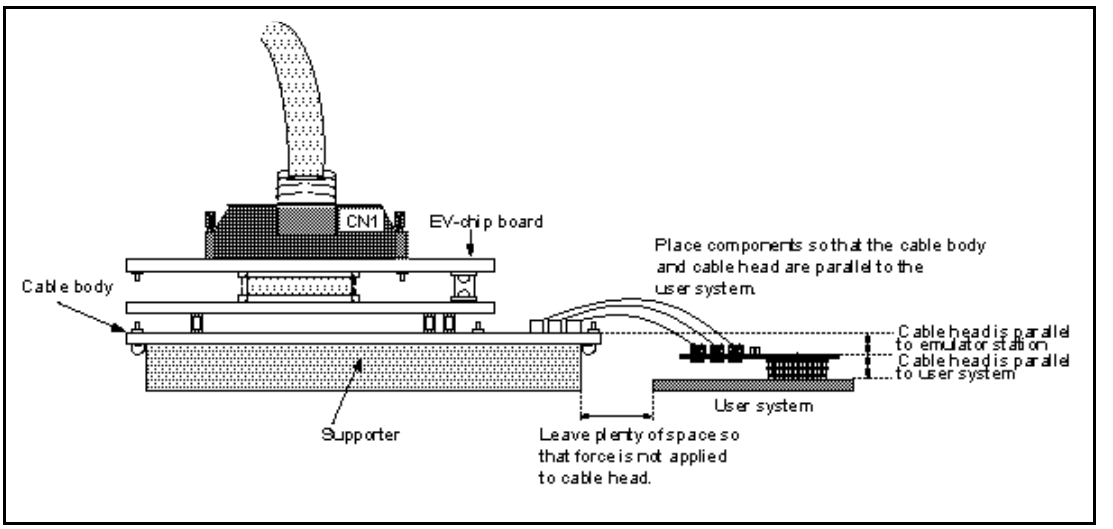

Figure 9 User System Interface Cable Location Example