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April 1st, 2010
Renesas Electronics Corporation

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User's Manual

SH7058 Group BP-272 User System Interface Board

HS7058ECB61H User's Manual

Renesas Microcomputer Development Environment System

SuperH™ Family/SH7050 Series

Renesas Electronics
www.renesas.com

Rev.3.0 2004.03

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

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

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

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- User system interface board (HS7058ECB61H)

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

SAFETY PAGE

READ FIRST

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

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

Do not attempt to use the user system interface board 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 BOARDS, make sure that pin 1 on both sides are correctly aligned.**

Preface

The HS7058ECB61H is a user system interface board that connects a user system for the SH7058 BP-272 package to the SH7058 E6000H emulator (HS7058EPH60H).

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Section 1 Configuration

Figure 1 and table 1 show the configuration and components of the user system interface board for the BP-272 package. Please make sure you have all of these components when unpacking.

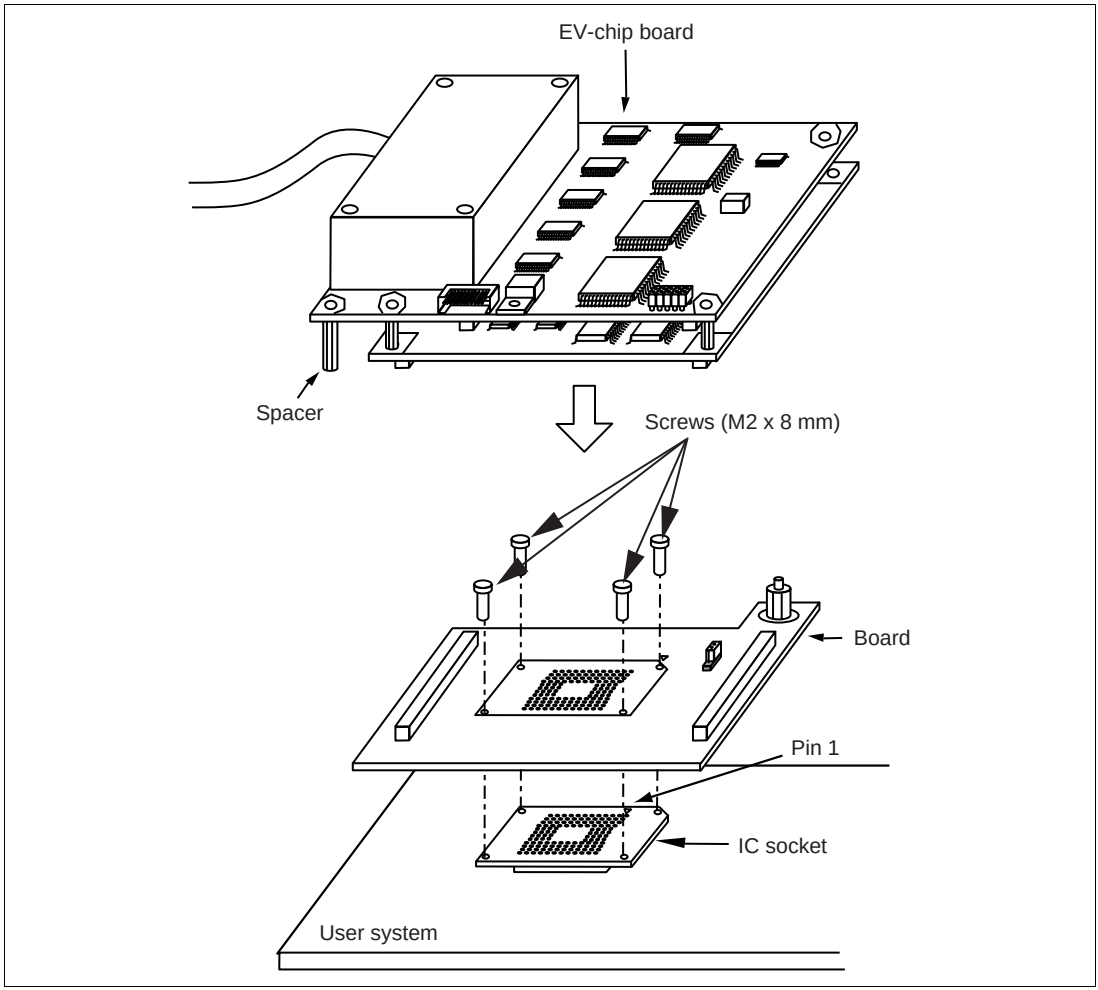


Figure 1 User System Interface Board for the SH7058 BP-272 Package

CAUTION

Use a TQPACK256RD socket and CSPACK256Z202H01 (manufactured by Tokyo Eletech Corporation) for the BP-272 package IC socket and IC socket connector on the user system.

Table 1 HS7058ECB61H Components

No.	Component	Quantity	Remarks
1	Board	1	
2	IC socket	1	For the BP-272 package (installed on the user system): CSPACK256Z2021H01
3	Spacer	1	For installing a BP-272 packaged MCU
4	Cover	1	For installing a BP-272 packaged MCU
5	Screws (M2 x 8 mm)	4	For installing a BP-272 packaged MCU
6	Driver	1	Dedicated screwdriver to fasten the screws.
7	Guide pins	4	
8	Spacers (2.6MP x 25 mm)	2	
9	User's manual	1	User's manual for HS7058ECB61H (this manual)

Section 2 Connection Procedures

2.1 Connecting User System Interface Board 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.

2.1.1 Installing IC Socket

Install the socket for BP-272 packaged ICs on the user system.

(1) Gently apply solder to the BGA pads of the user system. Be careful to keep the thickness of the solder within 100 to 150 μm. Too much solder will cause short-circuiting of the pins.

(2) The IC socket is vacuum-packed to avoid oxidization of the surfaces of the solder balls. It is thus recommended that the IC socket be installed on the user system immediately after the package is opened. After the package's seal has been broken, store the socket in a desiccator. Do not touch the solder balls. If they are touched, solder may not adhere to the solder surface.
The IC socket is covered by a protective cover. Socket and cover are fastened together by four screws before the whole is vacuum packed to prevent bending of the IC socket's pins. To avoid the scattering (dispersal) of flux from other components to the IC socket, keep the protective cover on the IC socket until solder reflow has been completed.

(3) Install the provided guide pins into the holes for the guide pins on the user system. Check that the pads are correctly aligned with the IC socket.

(4) Notes on soldering the IC socket

a) The IC socket is larger than the actual IC package; therefore, refer to figure 4 for the installation of other components.

b) Do not install components that occupy large volume close to the IC socket. Such components will prevent the convective flow of heat during reflow.

c) Since the IC socket has a greater volume than the IC package, it is recommended that the temperature profile under the conditions used in installation be measured by attaching a temperature sensor to the back side of the IC socket.

d) Actual heating of the reflow conditions for the IC socket must be more than 210°C for 30 to 60 seconds.

Recommended Reflow Conditions
Surface temperature of IC-socket connector Preheating: 150 to 180°C for 180 seconds Actual heating: To more than 210°C, for 30 to 60 seconds

CAUTION

1. **Never dip the IC socket in flux or use wash to clean the IC socket. This is because flux may remain inside the IC socket due to the IC socket's structure. When using the IC socket with other DIP products, never clean the other DIP products with flux because the flux may enter the connector through the guide pins of the IC socket.**
2. **When an IC socket with guide pins is soldered to the user system, about 1.3 mm of the guide pins will stick out (when the user-system board is 1.6 mm thick). When a load is applied to the guide pins from the back of the user-system board, stress will be applied to the soldered part of the IC socket, and this may destroy the connectors. Do not apply any load to the guide pins after the IC socket has been soldered on the user system.**
3. **When an IC socket with no guide pins is soldered to the user system, the soldered part will crack if stress is applied to the IC socket. Therefore, always apply adhesive to the connector and the user system so that there is a firm connection between them.**
4. **When the IC socket has guide pins, it is recommended that epoxy resin adhesive or solder be applied to the guide pins at the back of the user system to make sure that no stress is applied to the soldered part.**

2.1.2 Fastening IC Socket Connector

CAUTION

1. **Check the location of pin 1 before inserting.**
2. **Use a provided screwdriver.**
3. **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 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 board to the IC socket and the IC socket connector on the user system with four screws (M2 x 8 mm) provided.
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.

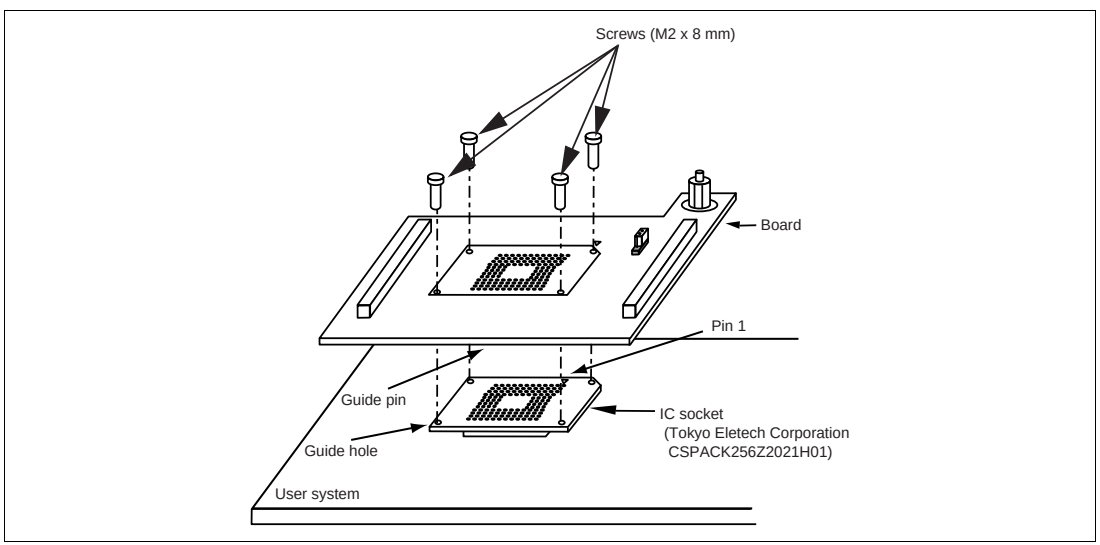


Figure 2 Connecting User System Interface Board to User System

2.2 Exchanging the Spacer of the EV-Chip Board

While the user system interface board is connected to the user system, force must not applied to the user system.

Exchange the spacer (2.6MP x 10 mm) of the EV-chip board with another spacer (2.6MP x 25 mm) provided for the user system interface board.

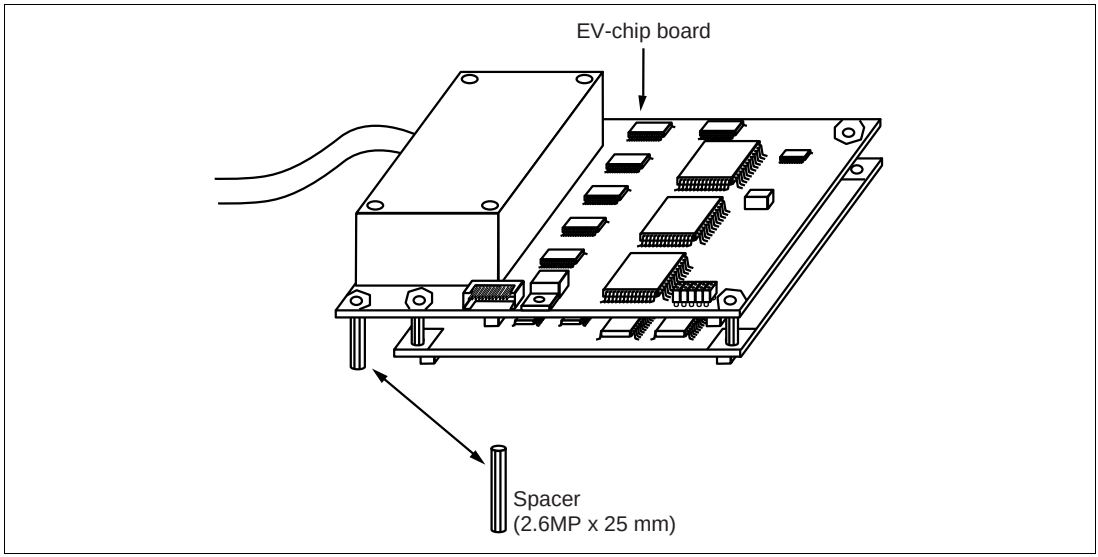


Figure 3 Exchanging the Spacer

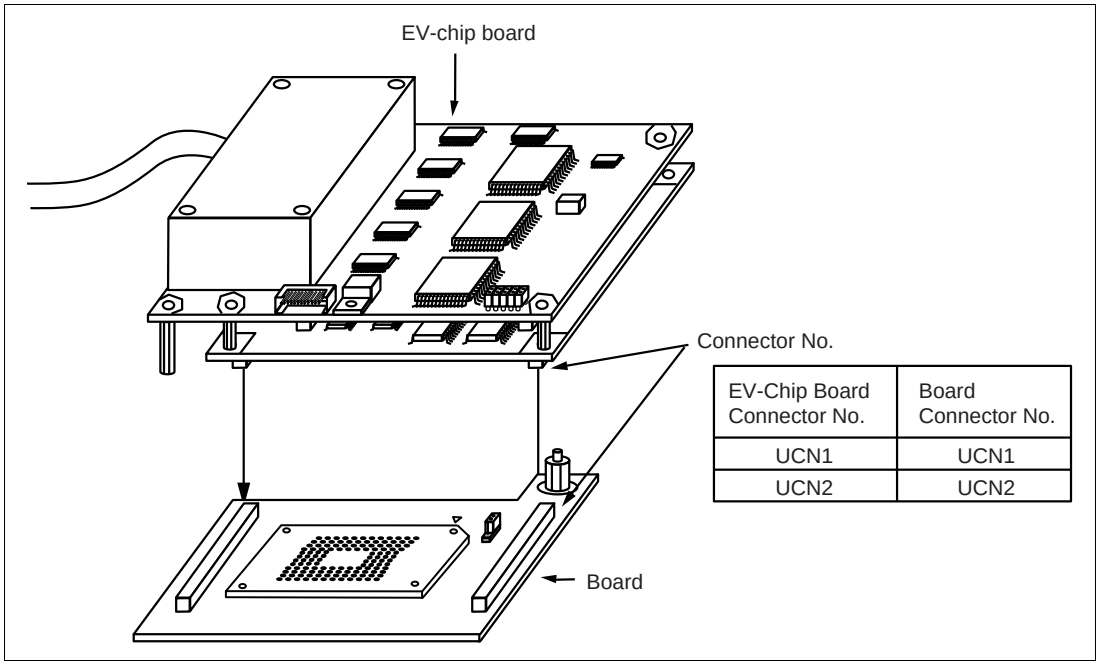
2.3 Connecting User System Interface Board to EV-Chip Board

⚠ 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 BOARD 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 board dedicated to the emulator must be used.**

1. Make sure the user system and emulator are turned off.
2. Align the connectors on the board with those on the EV-chip board according to their numbers (figure 4).
3. Adjust the height of the spacer of the EV-chip board with the user system.



EV-Chip Board Connector No.	Board Connector No.
UCN1	UCN1
UCN2	UCN2

Figure 4 Connecting User System Interface Board to EV-Chip Board

2.4 Recommended Dimensions for User System Mount Pad (Footprint)

Figure 5 shows the recommended dimensions for the mount pad (footprint) for the user system with an IC socket for an BP-272 package (CSPACK256Z2021H01: manufactured by Tokyo Eletech Corporation). Note that the dimensions in figure 6 are somewhat different from those of the actual chip's mount pad.

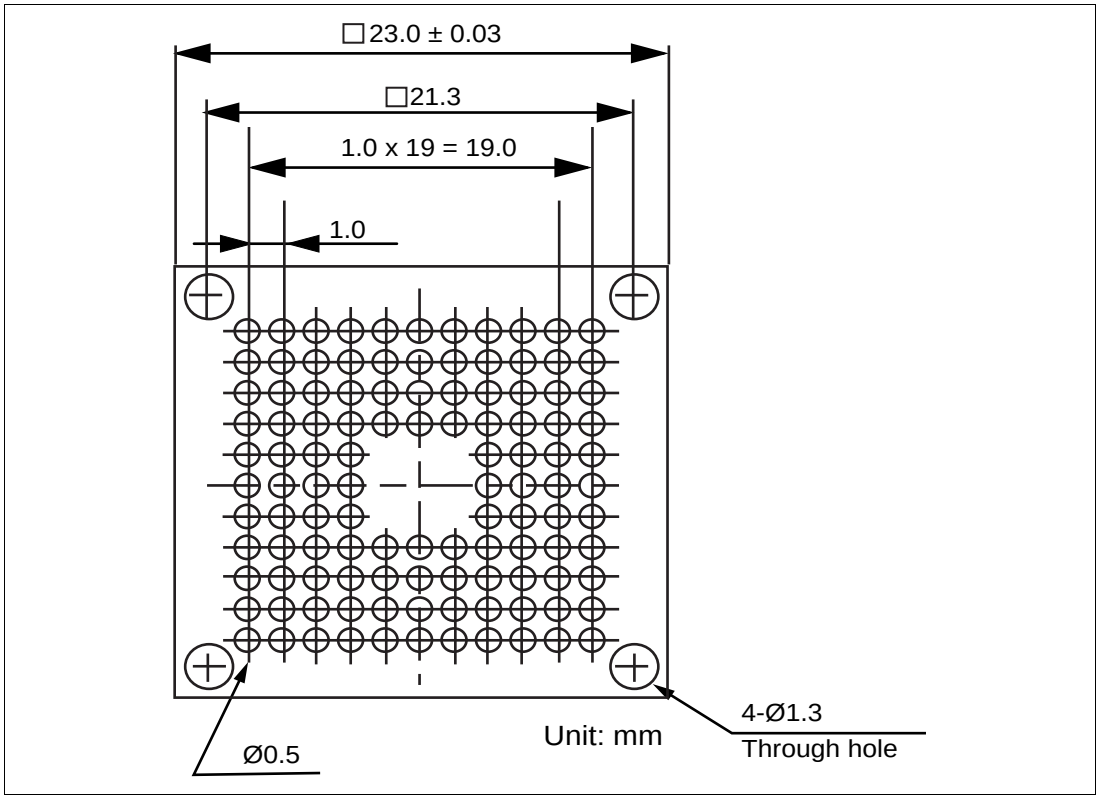


Figure 5 Recommended Dimensions for Mount Pad

2.5 Dimensions for EV-Chip Board and User System Interface Board

The dimensions for the EV-chip board and the user system interface board are shown in figure 6.

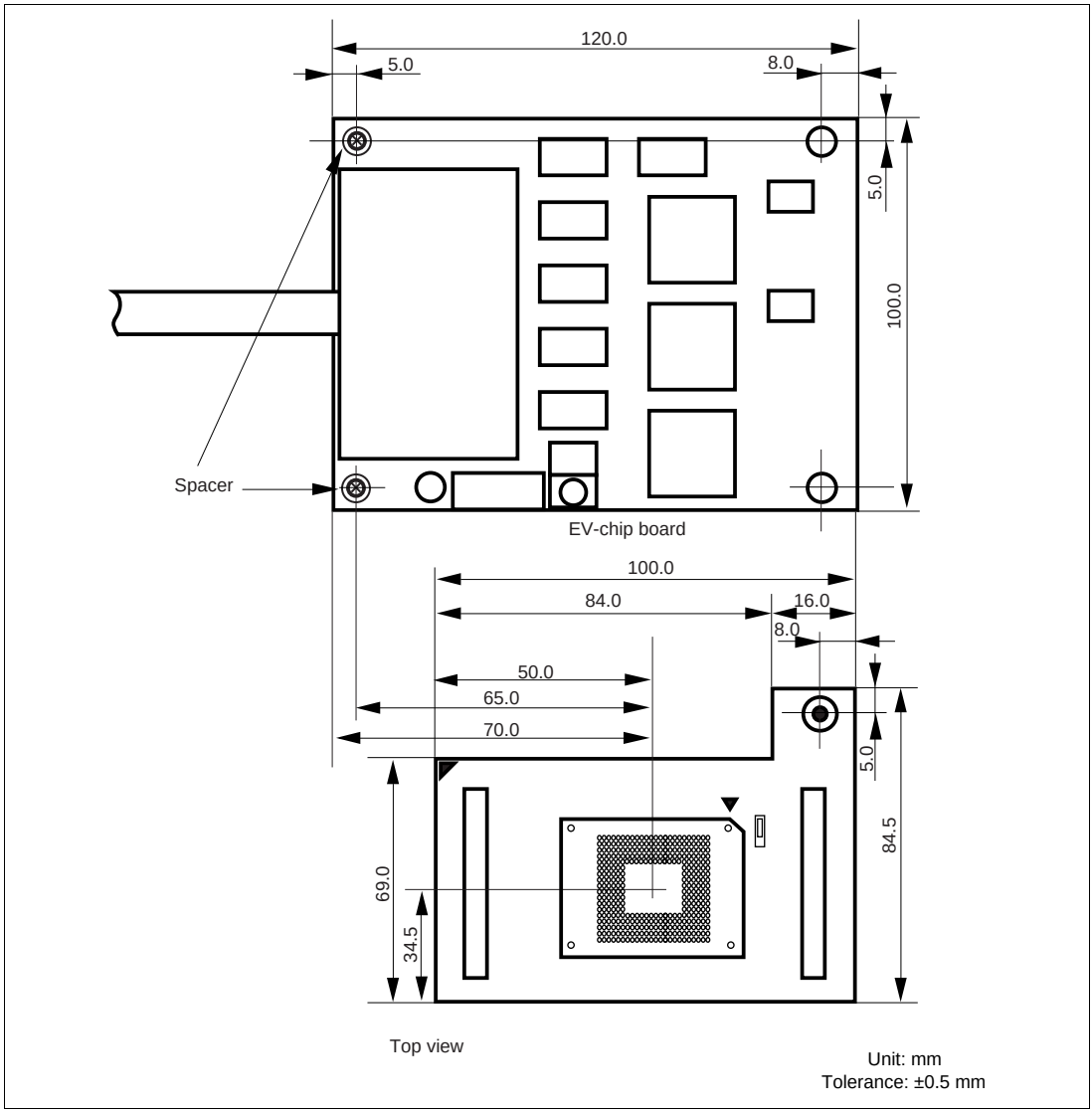


Figure 6 Dimensions for EV-Chip Board and User System Interface Board

2.6 Resulting Dimensions after Connecting User System Interface Board

The resulting dimensions, after connecting the user system interface board to the user system, are shown in figure 7.

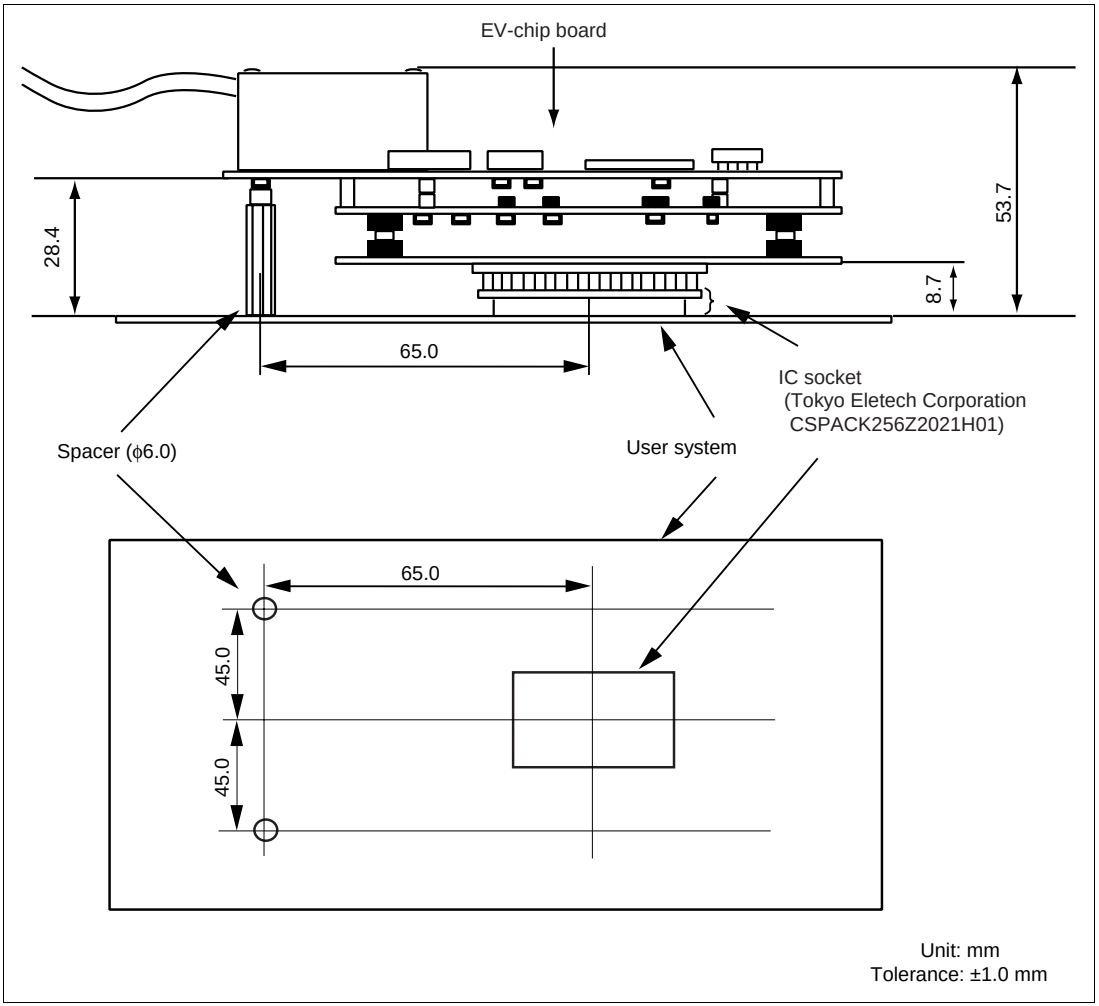


Figure 7 Resulting Dimensions after Connecting User System Interface Board

Section 3 Verifying Operation

1. Turn on the emulator according to the procedures described in the SH7058 E6000H Emulator User's Manual (HS7058EPH60HE).
2. Verify the user system interface cable connections by checking the pin states with the extended monitor 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 board supports three kinds of clock sources as the MCU clock. For details, refer to the SH7058 E6000H Emulator User's Manual (HS7058EPH60HE).
   - 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 by inputting the EXTAL pin (pin A14) on the user system interface board or connecting the crystal oscillator to the XTAL (pin A15) and EXTAL pins. For details, refer to section 5, Clock Pulse Generator (CPG), in the SH7058 Hardware Manual.
     Figure 8 shows the clock oscillator on the user system interface board.

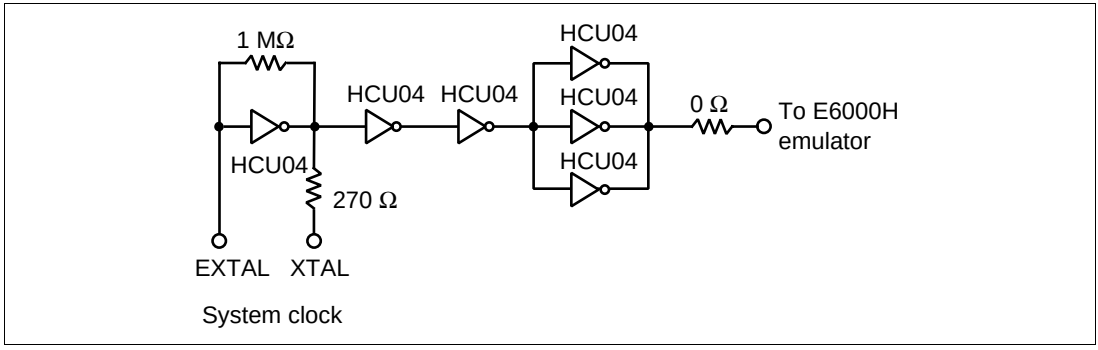


Figure 8 Clock Oscillator

— 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.

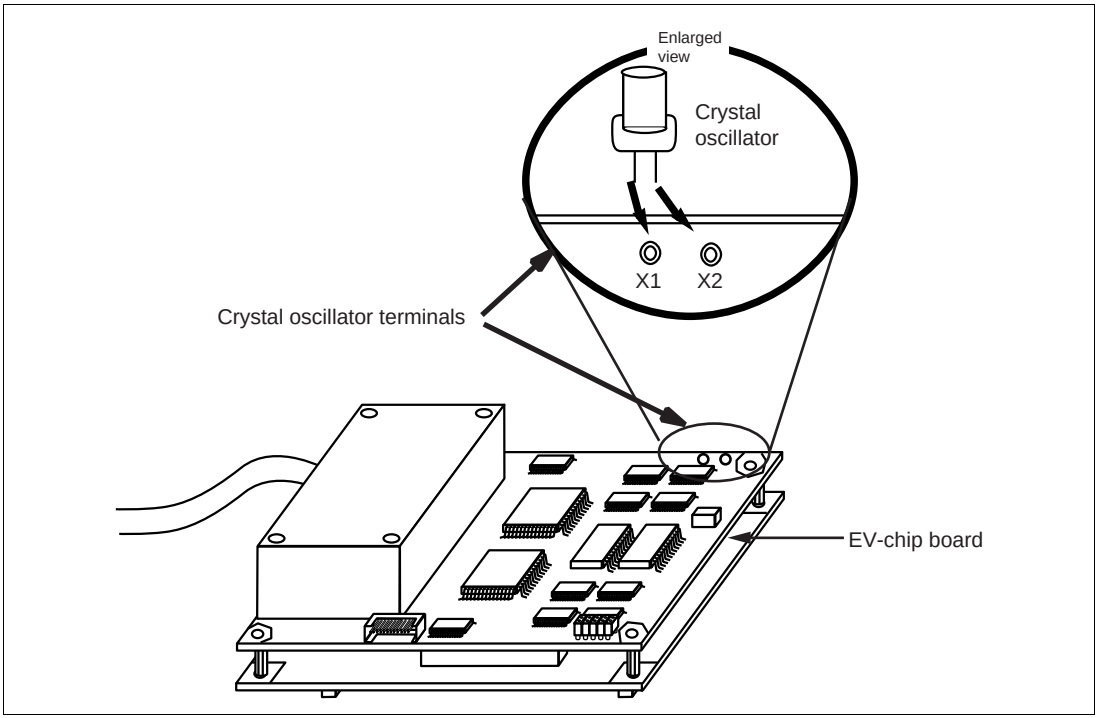


Figure 9 Installing the Clock Oscillator

Section 4 Notice

1. The MCU cannot be installed directly into the IC socket provided for connecting this user system interface board.
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 board 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 board are different from those of the MCU.
5. This user system interface board is specifically designed for the HS7058EPH60H emulator. Do not use this board with any other emulator.
6. When power is not supplied to the Vcc pin on the user system interface board, the emulator displays ** VCC DOWN. The emulator will not operate correctly.

SH7058 Group BP-272
User System Interface board
HS7058ECB61H User's Manual

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