

To our customers,

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## Old Company Name in Catalogs and Other Documents

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Renesas Electronics Corporation

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H8/36024, H8/36049 Group  
Expansion I/O Board for E6000  
Emulator

User's Manual

HS36024EIO61HE

Renesas Microcomputer  
Development Environment  
System

H8 Family / H8/300H Tiny Series

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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. excluding all subsidiary products.

- E6000 series emulator station
- Expansion I/O board
- User system interface cables
- PC interface board

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

### **Purpose of the Expansion I/O Board:**

This expansion I/O board is installed in the E6000 emulator, and enables the emulator station to be connected to the user system interface cable. This expansion I/O board must only be used for the above purpose.

### **Improvement Policy:**

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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.

## **LIMITED WARRANTY**

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## **Figures:**

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

## **Limited Anticipation of Danger:**

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.

# 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



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.

# **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 E6000 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. Supply power according to the power specifications and do not apply an incorrect power voltage. Use only the provided power cable.**

# Preface

Thank you for purchasing this H8/36024, H8/36049 group expansion I/O board (HS36024EIO61H; hereinafter referred to as the expansion I/O board) for the H8/36024, H8/36049 group E6000 emulator.

The expansion I/O board enables user systems for Renesas's original microcomputer H8/36024, H8/36049 group to be developed using an H8/36024, H8/36049 group E6000 emulator (HS3664EPI61H; hereinafter referred to as the emulator).

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# Section 1 Overview

The H8/36024, H8/36049 group E6000 expansion I/O board (hereinafter referred to as the expansion I/O board) is an efficient software and hardware development support tool for application systems using channel 3 of Renesas's original microcomputers H8/36024, H8/36049 group SCI3 (Serial Communication Interface 3).

The expansion I/O board should be used with H8/36024, H8/36049 group E6000 emulator station (HS3664EPI61H: hereinafter referred to as the emulator).

## 1.1 Environment Conditions

**Table 1.1 Environment Conditions**

<b>Item</b>	<b>Specifications</b>
Temperature	Operating: +10 to +35°C Storage: -10 to +50°C
Humidity	Operating: 35 to 80% RH; no condensation Storage: 35 to 80% RH; no condensation
Ambient gases	No corrosive gases
Power supply	Power supply from E6000 emulator station
User system voltage (UVcc)	Depends on the MCU within the range 3.0 V to 5.5 V

## 1.2 Supported MCUs and User System Interface Cables

Table 1.2 shows the correspondence between the MCUs and the user system interface cables supported by the E6000.

### H8/36024, H8/36049 group:

**Table 1.2 H8/36024, H8/36049 group MCUs and User System Interface Cable**

<b>No.</b>	<b>MCU Type Number</b>	<b>Package</b>	<b>E6000 User System Interface Cables</b>
1	HD64F36024	64-pin LQFP(FP-64E)	HS36014ECH61H
	HD64F36022	48-pin LQFP(FP-48F)	HS36014ECH63H
		48-pin LQFP(FP-48B)	HS36014ECH64H
2	HD64F36049	80-pin QFP(FP-80A)	HS36049ECH61H

### 1.3 Operating Voltage and Frequency Specifications

Table 1.3 shows the MCU operating voltage and frequency specifications supported by the E6000. If the E6000 is used in an environment that exceeds the operating voltage range and operating frequency range guaranteed for the MCU operation, normal emulator operation is not guaranteed.

**Table 1.3 Operating Voltage and Frequency Specifications**

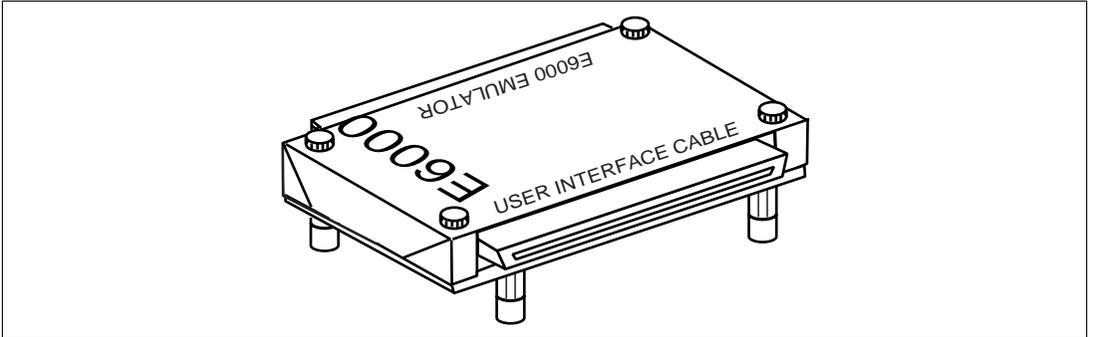
No.	MCU Types	Operating Voltage (V)	Operating Frequency (ϕ) (MHz)
1	H8/36024 Group	3.0-5.5	2-10
	H8/36049 Group	4.0-5.5	2-20

## NOTE

For details on the operating voltage and frequency specifications, refer to the MCU hardware manual.

## 1.4 Components

Figure 1.1 shows the HS36024EIO61H expansion I/O board appearance, and table 1.4 lists the components of the expansion I/O board. Please make sure you have all of these components when unpacking.



**Figure 1.1 HS36024EIO61H Expansion I/O Board**

**Table 1.4 HS36024EIO61H Components**

No.	Component	Quantity	Remarks
1	HS36024EIO61H	1	Expansion I/O board
2	Documentation	1	User's manual for HS36024EIO61H (this manual)

## Section 2 Connection Procedures

### **WARNING**

**Always switch OFF the user system and the emulator product before the EXPANSION I/O BOARD or USER SYSTEM INTERFACE CABLE is connected to or removed from any part. Before connecting, make sure that pin 1 on each side is correctly aligned. Failure to do so will result in a FIRE HAZARD and will damage the user system, the emulator product, the user system interface cable, and the expansion board, or will result in PERSONAL INJURY. The USER PROGRAM will be LOST.**

#### **2.1 Using Emulator without Connecting User System**

1. Make sure the emulator is turned off.
2. After making sure the direction of the expansion I/O board connector labeled E6000 EMULATOR is correct, firmly insert the expansion I/O board connector into the emulator station connector. When the emulator is operated while connected to only the expansion I/O board (without connecting the user system), disconnect the cable body from the expansion I/O board.

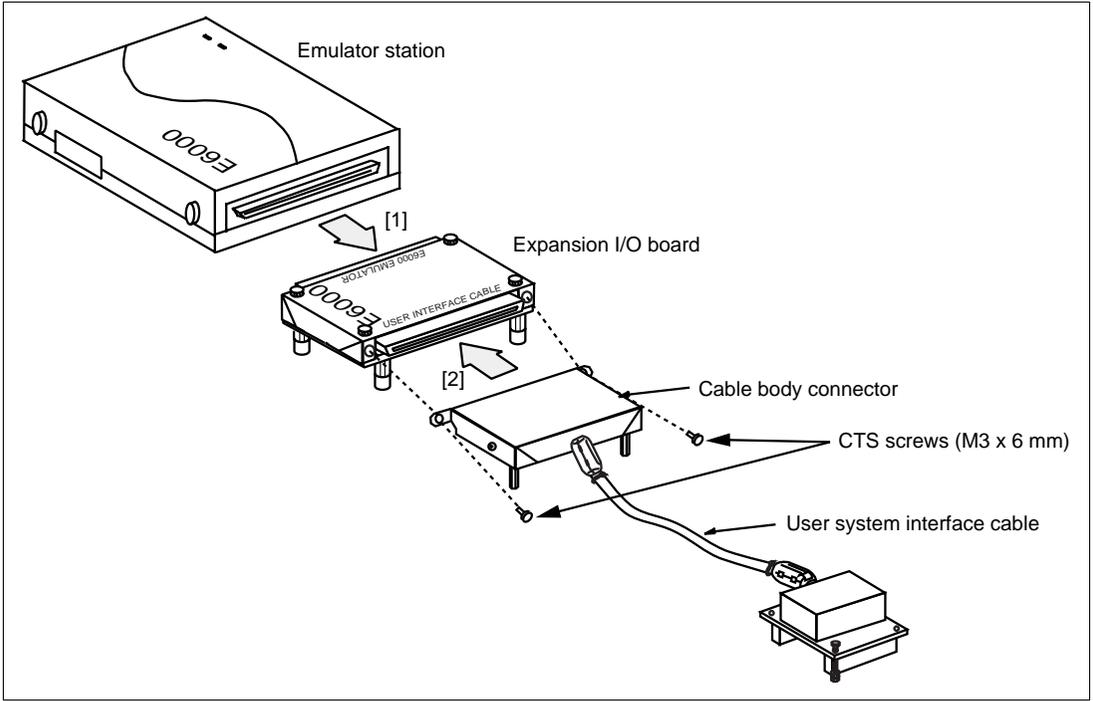
## 2.2 Using Emulator with Connecting User System through User System Interface Cable

### **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 cables or connectors will be damaged.**

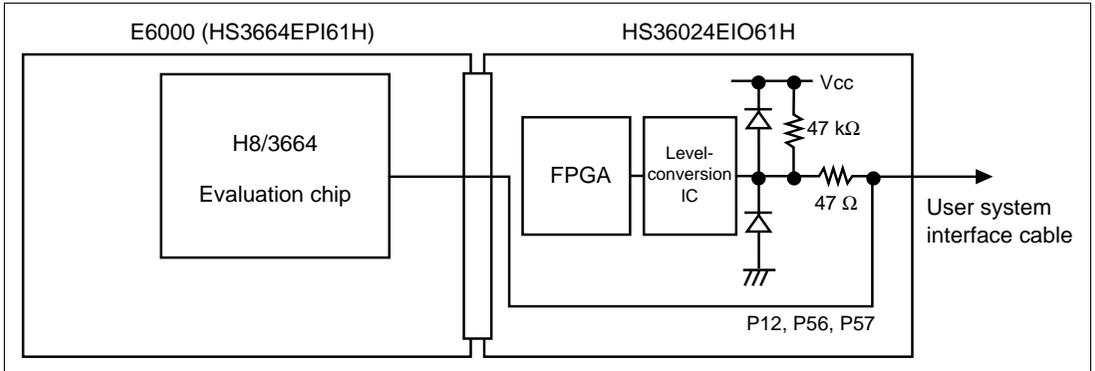
1. Make sure the emulator and the user system are turned off.
2. [1] After making sure the direction of the expansion I/O board connector labeled E6000 EMULATOR is correct, firmly insert the expansion I/O board connector into the emulator station connector ([1] in figure 2.1).  
[2] To connect the expansion I/O board labeled USER INTERFACE CABLE and the user system interface cable body.



**Figure 2.1 Connecting Expansion I/O Board to Emulator Station and User System Interface Cable**

## Section 3 User System Interface

Switches, protection circuits, and termination circuits are provided for the H8/36024, H8/36049 SCI3\_3 of the expansion I/O board. Signals are connected to the user system interface cable with the protection circuit. Figure 3.1 shows user system interface circuit.



**Figure 3.1 User System Interface Circuit (Port 12, 56, 57)**

## Section 4 Notice

# **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. This expansion I/O board is specifically designed for the HS3664EPI61H. Do not use this expansion I/O board with any other emulator station.**
- 2. Use the H8/36014 and H8/36024 group user system interface cable (HS36014ECH61H for FP-64E, HS36014ECH63H for FP-48F, or HS36014ECH64H for FP-48B) and H8/36049 group user system interface cable (HS36049ECH61H for FP-80A). Do not use any otherseries of user system interface cable.**

1. Do not place heavy objects on the expansion I/O board.
2. Power is supplied from the emulator station to the expansion I/O board.

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## **H8/36024, H8/36049 Group Expansion I/O Board for E6000 Emulator User's Manual**

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# H8/36024, H8/36049 Group Expansion I/O Board for E6000 Emulator User's Manual



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