To our customers,

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April 1st, 2010
Renesas Electronics Corporation

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User's Manual

# E6000 SIMM Memory Module for SH7010, SH7040, SH7050
(HS6000EMS21H/HS6000EMS22H)

## User's Manual

Renesas Electronics
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Rev.1.0 2002.07

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**• 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 Hitachi, Ltd. excluding all subsidiary products.

- E6000 series emulator station
- PC interface board
- User system interface cables
- SIMM memory module
- Optional boards

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

### Purpose of the SIMM Memory Module:

This SIMM memory module is installed in the E6000 emulator, and is used in place of the user system memory. This module must only be used for this purpose.

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# 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** **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 E6000 emulator and user system before connecting or disconnecting any CABLES or PARTS.**
3. **Always switch OFF the E6000 emulator and user system before installing or removing the SIMM memory module.**
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 the SIMM memory module (HS6000EMS21H or HS6000EMS22H) for the E6000 emulator. The SIMM memory module can emulate a 2.5-Mbyte or 6.5-Mbyte area by installing it in the SH7010, SH7040, SH7050 series E6000 emulator (HS7010EPI60H, HS7040EPI60H or SH7050EPI60H).

# Contents

# Section 1 Components

Figure 1 shows the SIMM memory module, and table 1 lists its components.

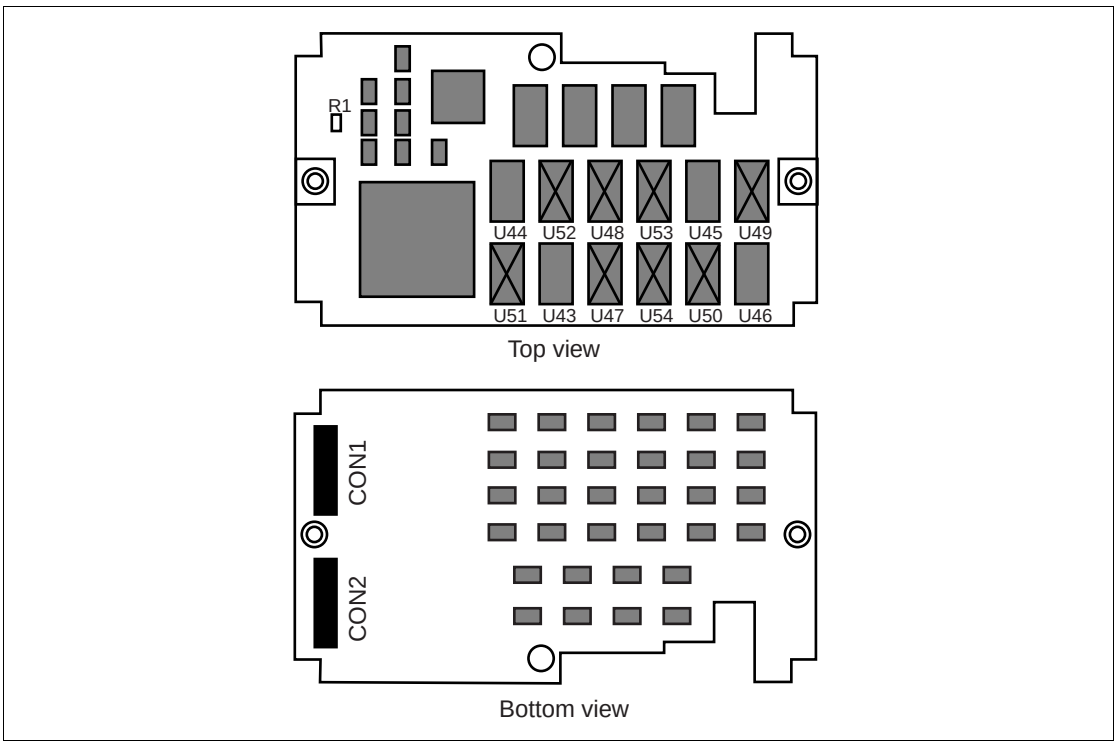


**Figure 1 E6000 SIMM Memory Module for the SH7010, SH7040, SH7050**

**Table 1 Components**

| Item | Quantity | Remarks |
|---|---|---|
| SIMM memory module | 1 | In HS6000EMS21H, R1 and U47 to U54 cannot be used. |
| Screw (M2.6 x 6 mm) | 2 | For fastening cable head (with flat washer) |
| User's Manual for HS6000EMS21H/HS6000EMS22H | 1 | This manual |

# Section 2 SIMM Memory Module Outline

## 2.1 SIMM Memory Module Functions

Tables 2 and 3 and list the SIMM memory module functions.

**Table 2 SIMM Memory Module Functions of HS6000EMS21H**

| Item | Specifications |
|---|---|
| Memory size | • 2.5 Mbytes<br>(128 kbytes × 4 areas and 512 kbytes × 4 areas) |
| Operating frequency | • 128 kbytes × 4 areas<br>4 MHz ≤ ϕ (operating frequency) ≤ 33 MHz: 2-cycle access |
| | • 512 kbytes × 4 areas<br>4 MHz ≤ ϕ (operating frequency) ≤ 20 MHz: 3-cycle access<br>20 MHz < ϕ (operating frequency) ≤ 33 MHz: 4-cycle access |
| Access restrictions<br>(E.g.: Read-only or guarded (no access)) | • Access restrictions can be specified in 128-kbyte, 1-Mbyte, 2-Mbyte, and 4-Mbyte units (see figures 2 and 3).<br>• Specifies access restriction for the emulation memory. |
| Bus width | • 8 bits/16 bits/32 bits (Depends on the MCU used.) |

**Table 3 SIMM Memory Module Functions of HS6000EMS22H**

| Item | Specifications |
|---|---|
| Memory size | • 6.5 Mbytes<br>(128 kbytes × 4 areas and 512 kbytes × 12 areas) |
| Operating frequency | • 128 kbytes × 4 areas<br>4 MHz ≤ ϕ (operating frequency) ≤ 33 MHz: 2-cycle access |
| | • 512 kbytes × 12 areas<br>4 MHz ≤ ϕ (operating frequency) ≤ 20 MHz: 3-cycle access<br>20 MHz < ϕ (operating frequency) ≤ 33 MHz: 4-cycle access |
| Number of cycles | • 2-cycle access: 128 kbytes × 4 areas at operation frequency of 33 MHz<br>• 4-cycle access: 512 kbytes × 12 areas at operation frequency of 33 MHz |
| Access restrictions<br>(E.g.: Read-only or guarded (no access)) | • Access restrictions can be specified in 128-kbyte, 1-Mbyte, 2-Mbyte, and 4-Mbyte units (see figures 2 and 3).<br>• Specifies access restriction for the emulation memory. |
| Bus width | • 8 bits/16 bits/32 bits (Depends on the MCU used.) |

Notes: 1 When specifying the CS3 area for the emulation memory in the SIMM memory module, set bus control register 1 (BCR1) in the bus state controller so that the CS3 area becomes the usual emulation memory for the emulator. The SH7011 has no BCR1.

2 When using the SIMM memory module, set the wait state control register (WCR) according to the device frequency.

E.g.: When accessing a 512 x 4 byte area at 28.7 MHz, set the WCR so that the area is accessed in 4 cycles.

## 2.2 Access Restrictions

Access Restrictions for emulation memory within the SIMM memory module can be specified in 128-kbyte or 512-kbyte units. However, to avoid competition for access between the emulation memory and user memory, the MCU inhibits the output of strobe signals (/WRHH, /WRHL, /WRH, /WRL, /CASHH, /CASHL, /CAH, /CASL, /CS0 to /CS3, and RD/_WR) to the user system in units of the memory blocks shown in figures 2 and 3, instead of using the boundaries of the emulation memory.

For example, when the address range H’000C0000 to H’000DFFFF (SB6) is specified as the emulation memory, and that address range is accessed, the strobe signals listed above will not be output to the user system.

Note: Even if less memory than the size of the memory block is specified for use as emulation memory, the MCU inhibits the output of strobe signals by memory block unit. For example,

when a 128-kbyte emulation memory requires restriction of access to the address range H’00C00000 to H’00DFFFFF (LB10), the access restriction is applied to LB10 (2 Mbytes), and output of the strobe signals is inhibited.

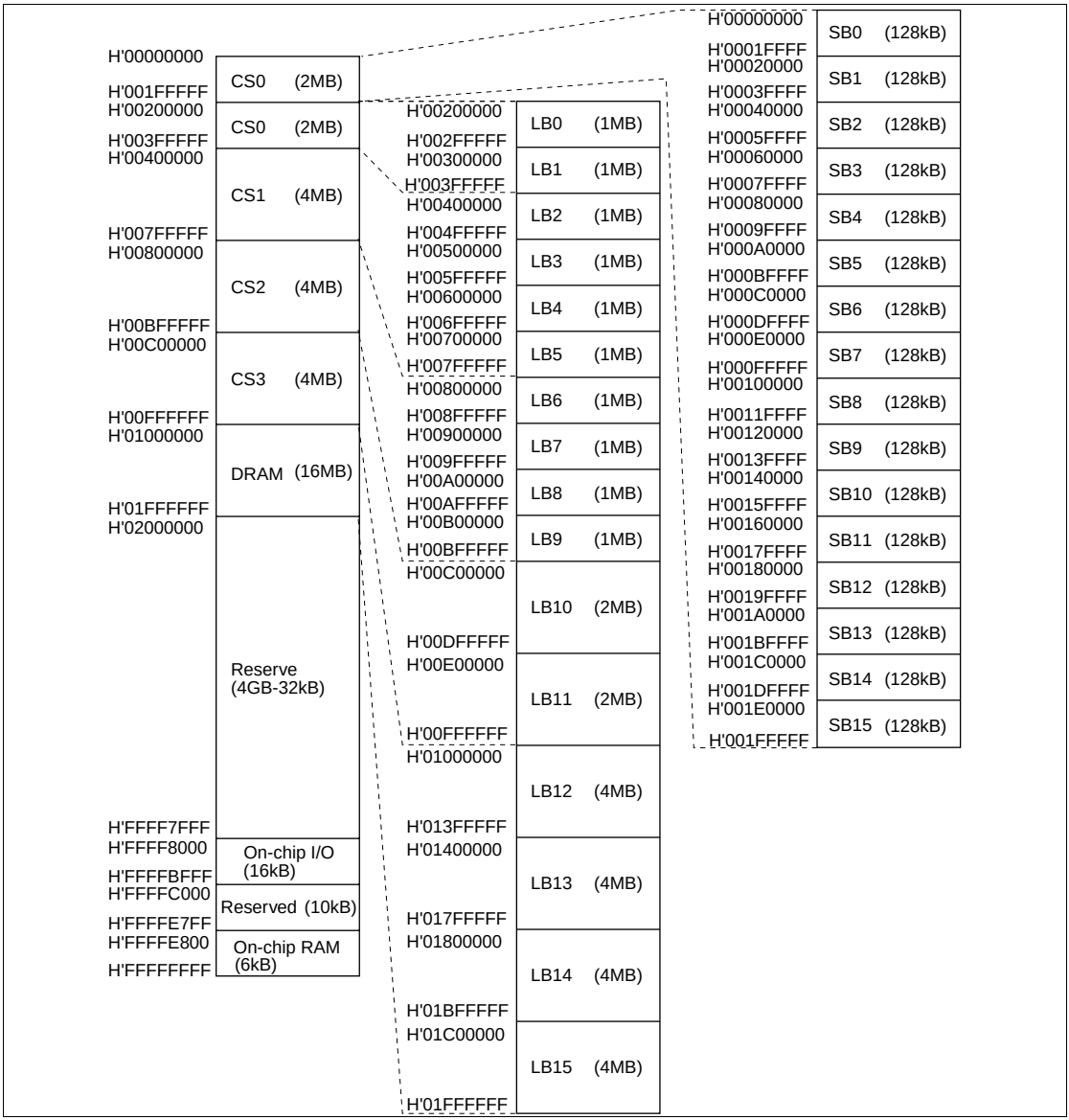


**Figure 2 Memory Blocks in Extended Mode without ROM**

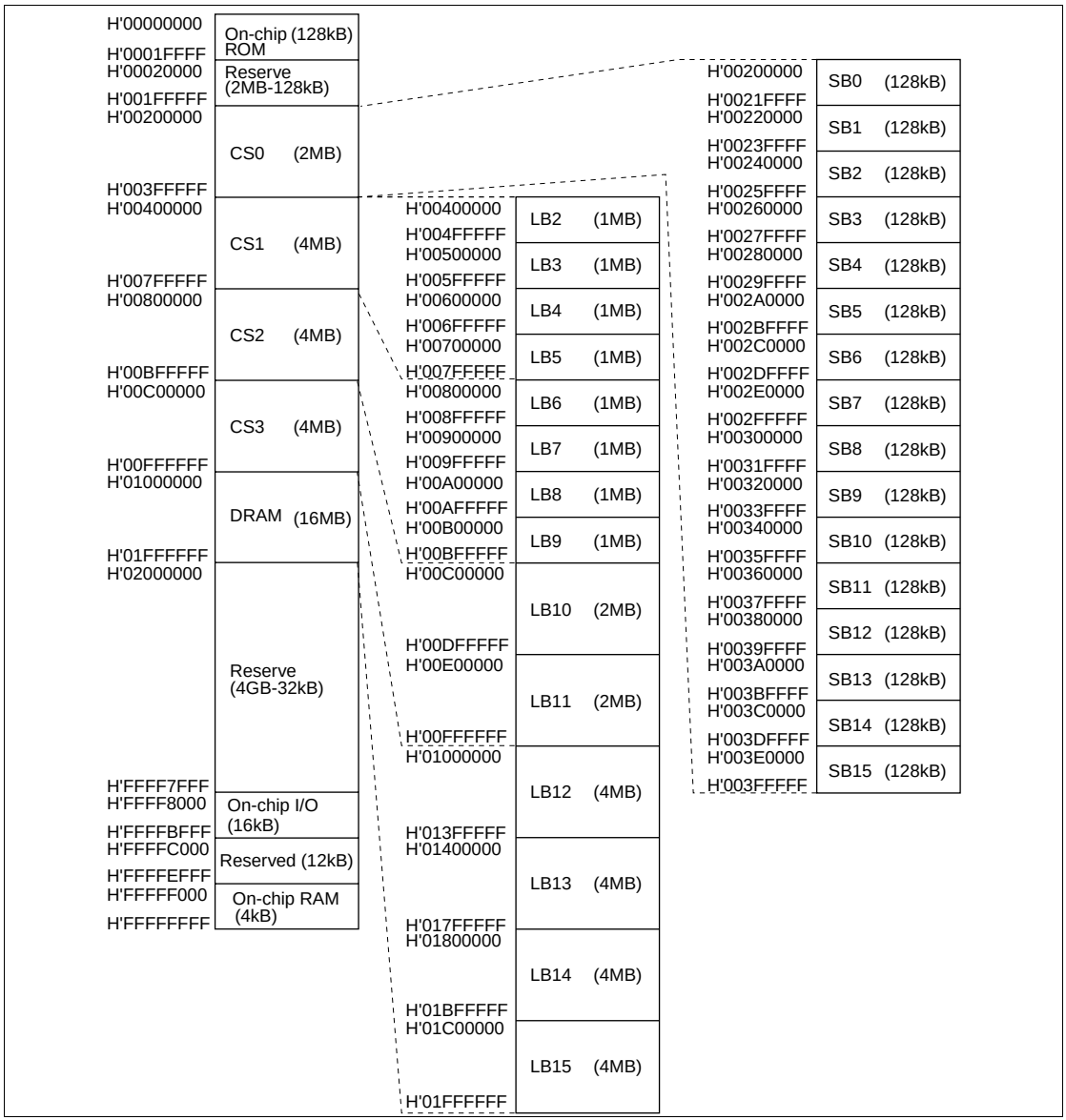


**Figure 3 Memory Blocks in Extended Mode with ROM**

Note: The memory map of internal ROM, internal RAM, internal I/O, and reserved area will differ according to the target MCU. For details, refer to the relevant hardware manual.

# Section 3 SIMM Memory Module

The HS6000EMS21H SIMM memory module has 4 areas of 128-kbyte and 512-kbyte units. The HS6000EMS22H SIMM memory module has 4 areas of 128-kbyte units and 12 areas of 512-kbyte units. Each area can be allocated to a 128-kbyte or 512-kbyte boundary address space, and one area can have a continuous 128-kbyte or 512-kbyte memory. Figure 4 shows an example of address allocation.

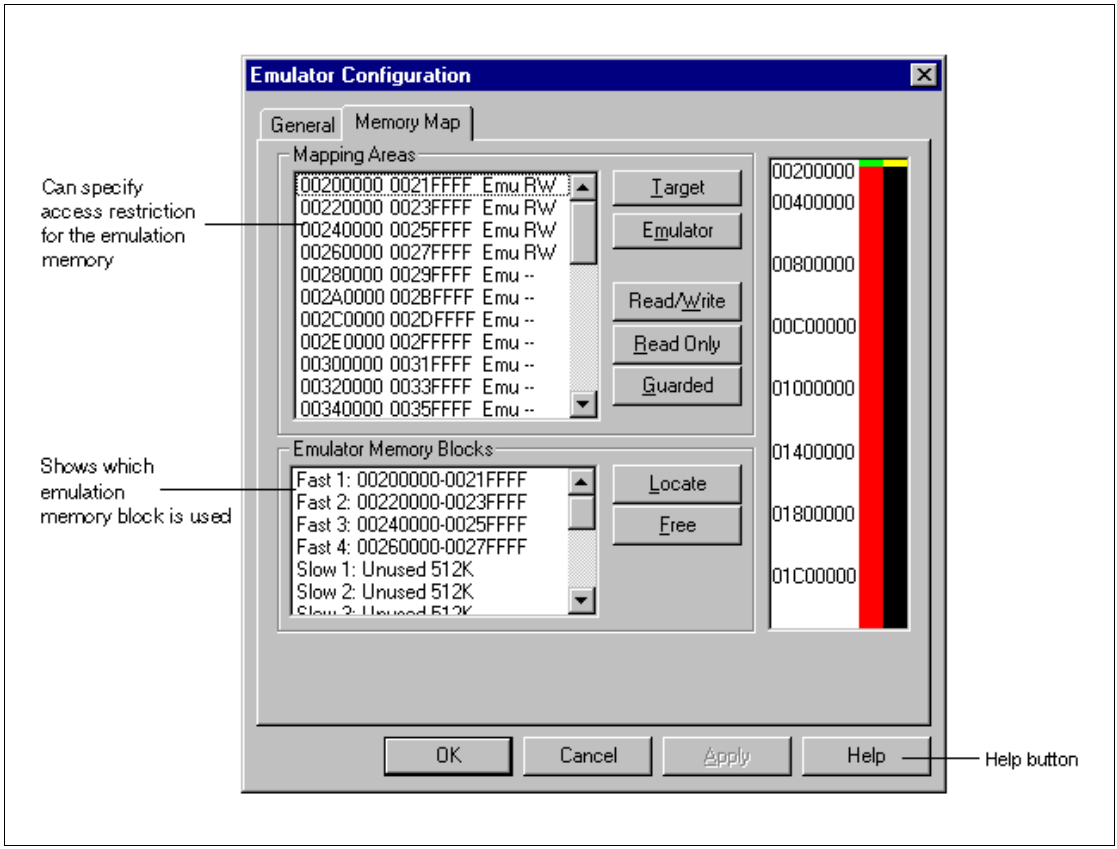


**Figure 4 Memory Map Dialog Box**

In the HDI Setup menu, open the Configure Platform dialog box, and allocate emulation memory (Emulator Read-write or Emulator Read-only) to the designated address space through the Memory Map dialog box. In this tag, Emulator Guarded memory can also be set.

The following dialog boxes show how to allocate emulation memory to memory range H'00400000-H'004FFFFF. In this example, a R/W memory is selected for the emulation memory.

1. Select memory range 00400000-004FFFFF from the Mapping Area list box.
2. Click the Emulator button.

3. Click the Read/Write button.

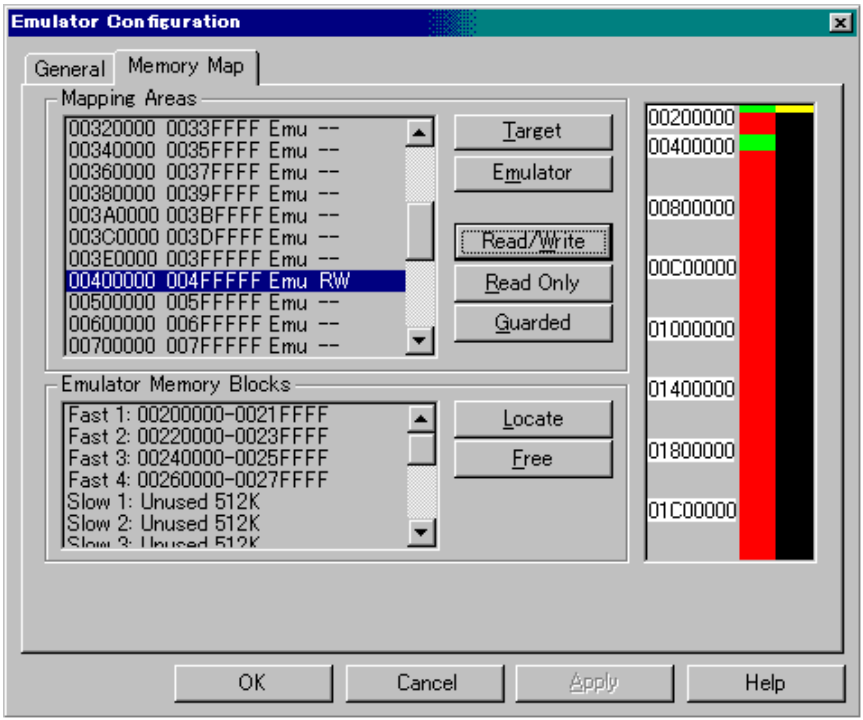


**Figure 5 Memory Allocation 1**

4. Select an area of unused memory from the Emulator Memory Blocks list box.
   In this example, Slow 1 and Slow 2 are selected. Then click the Locate button.

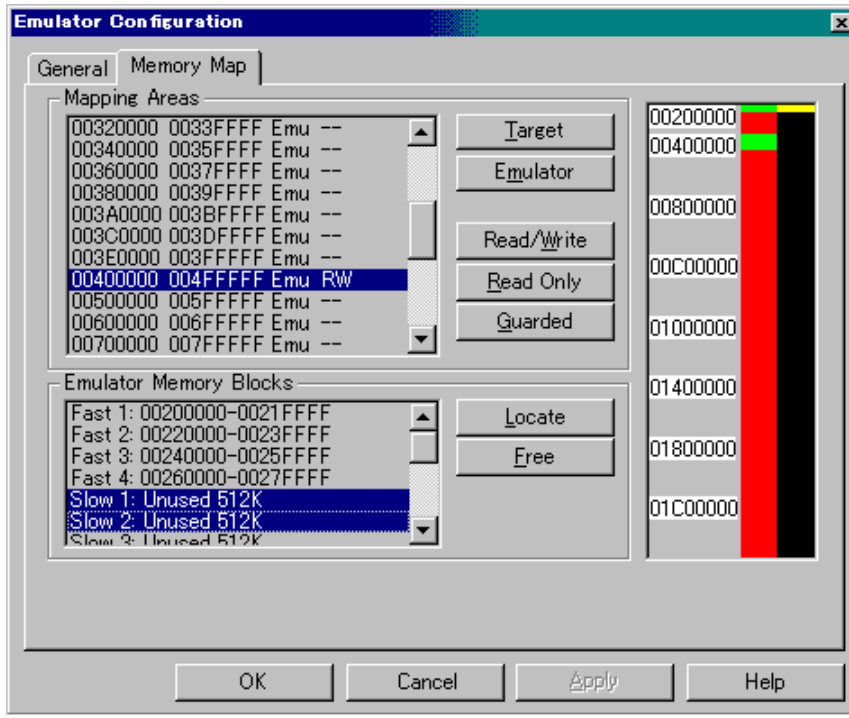


**Figure 6 Memory Allocation 2**

5. The Locate Emulator Memory Blocks dialog box is displays an available base address. Click OK.

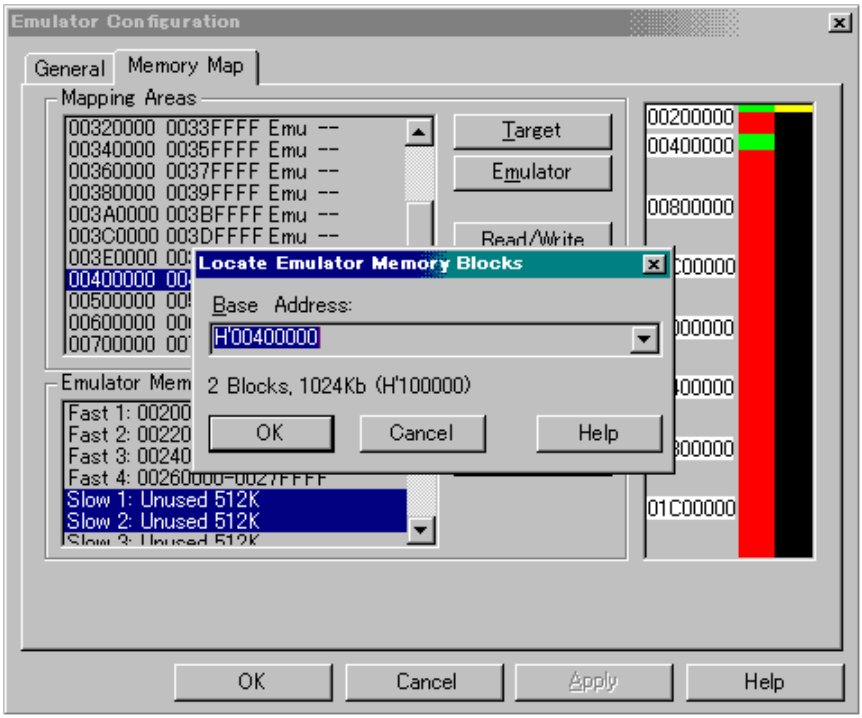


**Figure 7 Memory Allocation 3**

6. Emulation memory has been set successfully.

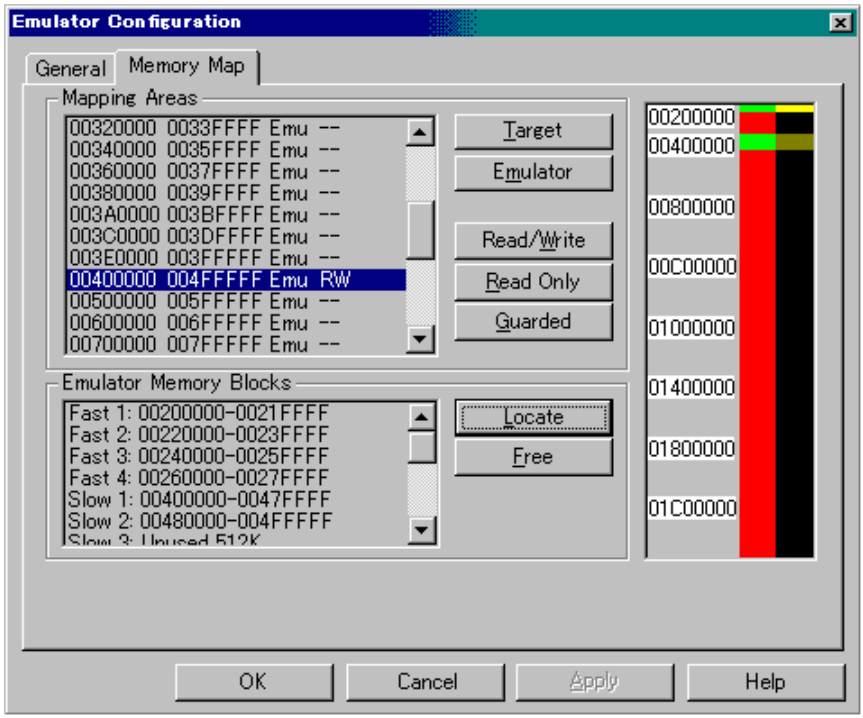


**Figure 8 Memory Allocation 4**

For details, refer to the HDI online help.

# Section 4 Installation

Be sure to switch off the emulator and user system before installation.

## ⚠ WARNING

**1. Always switch OFF the emulator product and user system, before connecting or disconnecting the SIMM memory module.**

**Failure to do so will result in a FIRE HAZARD and will damage the user system and emulator product or will result in PERSONAL INJURY.**

**2. Before closing the cover of the emulator, be sure to check that no foreign objects such as metal fractions are left inside the emulator station.**

**Failure to do so will result in a FIRE HAZARD and will damage the user system and emulator product or will result in PERSONAL INJURY.**

To install the SIMM memory module in the E6000 emulator station,

1. Remove the four screws from the sides of the emulator station.
2. Pull the emulator cover upward and remove it.
3. Insert the CON1 and CON2 connectors of the SIMM memory module into the CON8 and CON9 connectors in the E6000 emulator station.
4. Fasten the SIMM memory module to the E6000 emulator by attaching the SIMM memory board to the spacer and then a screw and a washer.
5. Close the emulator cover and fasten it with the four screws.
6. Connect the emulator station to the host computer and turn on the E6000 emulator station.
7. Start the HDI. Open the Configure Platform dialog box from the Setup menu and check that the emulation memory can be displayed and selected through the Memory Map dialog box.

Note: The HS7040EPI60H has a cooling fan. Do not pull or apply excessive strength to the cable of the evaluation chip cooling fan.

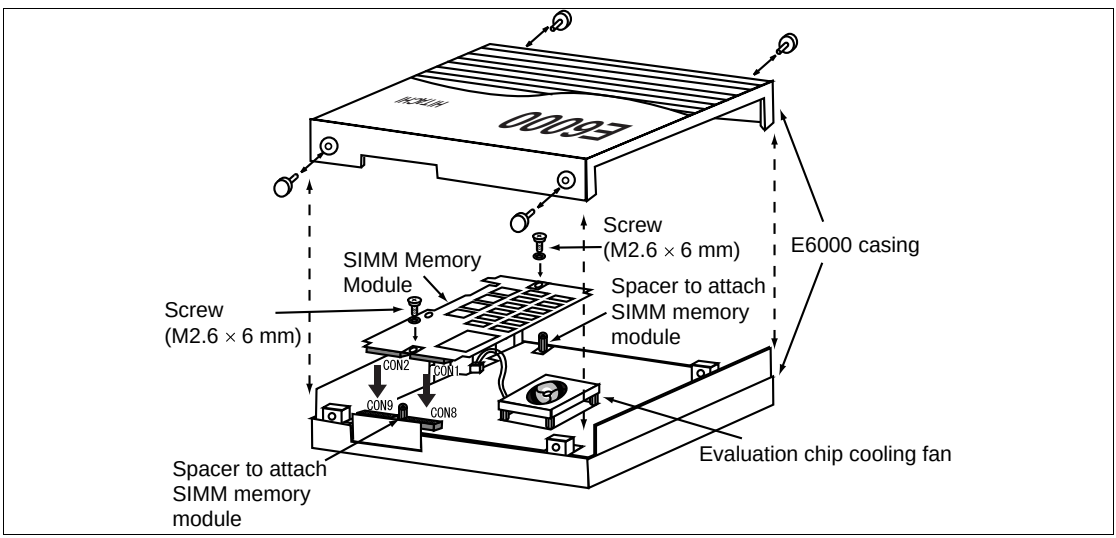


**Figure 9 Installing SIMM Memory Module**

To remove the SIMM memory module from the E6000 emulator station,

1. Remove the four screws from the sides of the emulator station.
2. Pull the emulator cover upward and remove it.
3. Remove the screw for fastening the SIMM memory module.
4. Remove the CON1 and CON2 connectors of the SIMM memory module from the CON8 and CON9 connectors.
5. Close the emulator cover and fasten it with the four screws.

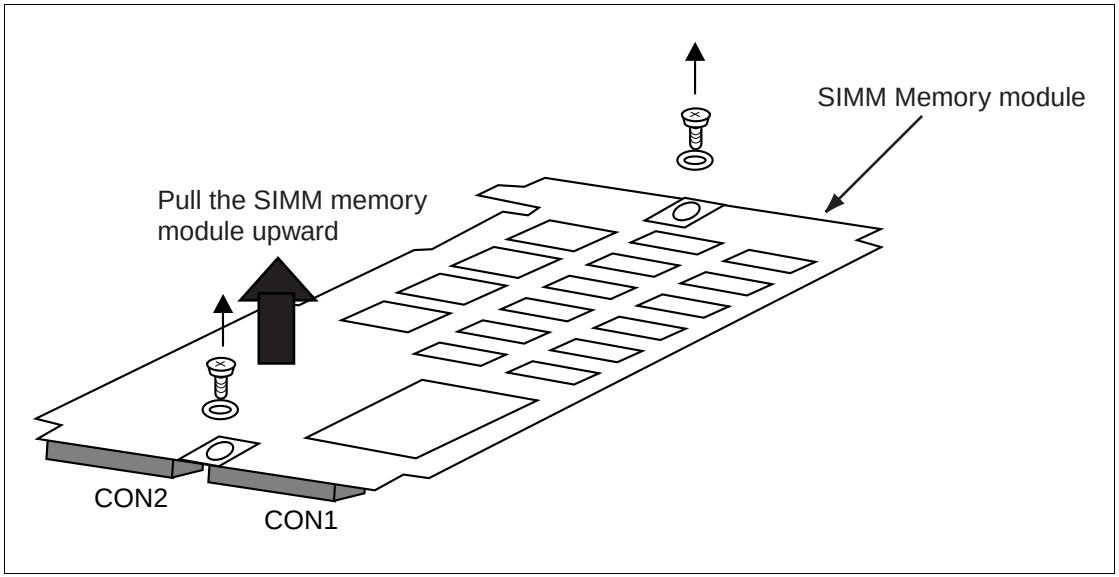


**Figure 10 Removing SIMM Memory Module**