# RENESAS TECHNICAL UPDATE

| Product Category | MPU / MCU | | Document No. | TN-SH7-A876A/E | | Rev. | 1.00 |
|---|---|---|---|---|---|---|---|
| Title | Notes on User's Manual of SH7250 Series | | | Information Category | Technical Notification | | |
| Applicable Product | See below (p.4). | | Lot No. | References | See below. | | |
| | | | All Lots | | | | |

This document describes modifications in ROM and EEPROM sections in each SH725x user's manual.  The parts described in **quotation mark** should be added.

This document is described based on SH72531/SH72533 user's manual.  If section numbers differ in other user's manuals, the product name and the section number are indicated in brackets.

## 23. ROM (25.ROM for SH7254R,SH72546R / 26.ROM for SH7256)

### 23.5.2 State Transition in Boot Mode (25.5.2 for SH7254R,SH72546R / 26.5.2 for SH7256)

(4) Waiting for Host Command for Programming or Erasure

In this state, this LSI performs programming or erasure according to the command sent from the host.  The LSI enters programming data wait state, erasure block specification wait state, or command (read or check) processing state depending on the received command.

Upon reception of a programming selection command, the LSI waits for programming data.  After the programming selection command, send the programming start address and programming data from the host.  Specifying H'FFFFFFFF as the programming start address terminates programming processing and the LSI makes a transition from the programming data wait state to programming/ erasure command wait state.

Upon reception of an erasure selection command, the LSI waits for erasure block specification.  After the erasure selection command, send the erasure block number from the host.  Specifying H'FF as the erasure block number terminates erasure processing and the LSI makes a transition from the erasure block specification wait state to programming/erasure command wait state.  As the entire area of each of the user MAT, user boot MAT, and EEPROM data MAT is erased before the LSI enters programming/erasure command wait state after it is started in boot mode, erasure processing is not needed except for the case when the data programmed in boot mode should be erased without resetting the LSI.

In addition to programming and erasing commands, many other host commands are provided for use in programming/erasure command wait state; these include commands for checksum, blank check (erasure check)**"*NOTE"**, memory read, and status inquiry.  For details on these host commands, see section 23.5.5, Programming/Erasing Host Command Wait State (25.5.5 for SH7254R,SH72546R / 26.5.5 for SH7256).

**"*NOTE**

**Blank check function checks the erase state of the area where erase has ended.**

**The function is disabled when programming/ erasing was suspended (ex: reset input, power-supply interruption)."**

### 23.5.5 Programming/Erasing Host Command Wait State (25.5.5 for SH7254R,SH72546R / 26.5.5 for 26.5.5)

(9) User Boot MAT Blank Check

In response to a user boot MAT blank check command sent from the host, this LSI checks whether the user boot MAT is completely erased.  When the user MAT is completely erased, this LSI returns a response (H'06). If the user boot MAT has an unerased area, this LSI returns an error response (sends H'CC and H'52 in that order).

| | |
|---|---|
| Command | H'4C |
| Response | H'06 |

| | | |
|---|---|---|
| Error response | H'CC | H'52 |

**"No verification function is provided to check program/erase state of the area where the data is undefined by suspend of program/erase (ex: reset input, power-supply interruption).  Therefore, if the undefined area should be used again, make sure to completely erase data before usage."**

(10) User MAT Blank Check

In response to a user MAT blank check command sent from the host, this LSI checks whether the user MAT is completely erased.  When the user MAT is completely erased, this LSI returns a response (H'06).  If the user MAT has an unerased area, this LSI returns an error response (sends H'CD and H'52 in that order).

| | |
|---|---|
| Command | H'4D |
| Response | H'06 |

| | | |
|---|---|---|
| Error response | H'CD | H'52 |

**"No verification function is provided to check program/erase state of the area where the data is undefined by suspend of program/erase (ex: reset input, power-supply interruption).  Therefore, if the undefined area should be used again, make sure to completely erase data before usage.**"

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# 24.  EEPROM (26.EEPROM for SH7254R,SH72546R / 28.EEPROM for SH7256)

## 24.1 Features (26.1 for SH7254R,SH72546R / 28.1 for SH7256)

● Blank check function

If data is read from erased EEPROM by the CPU, undefined values are read.   Using blank check command of the FCU allows checking of whether the EEPROM is erased (in a blank state).   Either an 8Kbytes (1 erasure block) or 8 bytes of area can be checked by a single execution of the blank check command.

**"Blank check function checks the erase state of the area where erase has ended.**

**The function is disabled when programming/ erasing was suspended (ex: reset input, power-supply interruption)."**

## 24.9 Usage Notes (26.9 for SH7254R,SH72546R / 28.9 for SH7256)

(5) Reset during Programming or Erasure

To reset the FCU by setting the FRESET bit in the FRESETR register during programming or erasure, hold the FCU in the reset state for a period of $t_{RESW2}$ (see section 30, Electrical Characteristics (section 32 for SH7254R,SH72546R / section 34 for SH7256)).   Since a high voltage is applied to the EEPROM during programming and erasure, the FCU has to be held in the reset state long enough to ensure that the voltage applied to the memory unit has dropped.   Do not read from the EEPROM while the FCU is in the reset state.

When a power-on reset is generated by asserting the /RES pin during programming or erasure of the flash memory, hold the reset state for a period of $t_{RESW2}$ (see section 30, Electrical Characteristics (section 32 for SH7254R,SH72546R / section 34 for SH7256)).   In a power-on reset, not only does the voltage applied to the memory unit have to drop, but the power supply for the EEPROM and its internal circuitry also have to be initialized.   Thus, the reset state must be maintained over a longer period than the case of resetting the FCU.

While programming or erasure is performed, do not generate an internal reset caused by WDT counter overflow. A reset caused by WDT cannot ensure a sufficient time required for voltage drop for the memory unit, initialization of the power supply for the EEPROM, or initialization of its internal circuit.

When either a power-on reset by asserting the /RES pin, or an FCU reset by setting the FRESET bit in the FRESETR register, is executed during programming or erasure, the whole data in the programming or erasure area becomes undefined.

**"No verification function is provided to check program/erase state of the area where the data is undefined by suspend of program/erase (ex: reset input, power-supply interruption).   Therefore, if the undefined area should be used again, make sure to completely erase data before usage."**

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[Applicable Products and References]

| Series | Group | Reference | Rev. | Document No. |
|---|---|---|---|---|
| SH7250 | SH72531 | SH72531 User's Manual: Hardware | 2.00 | R01UH0267EJ0200 |
| | SH72533 | SH72533 User's Manual: Hardware | 1.00 | R01UH0304EJ0100 |
| | SH7254R | SH7254R Group User's Manual: Hardware | 3.00 | R01UH0306EJ0300 |
| | SH7256 | SH7256 Group User's Manual: Hardware | 2.00 | R01UH0344EJ0200 |
| | SH72546R | SH72546R User's Manual: Hardware | 1.00 | R01UH0235EJ0100 |

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