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RENESAS TECHNICAL UPDATE

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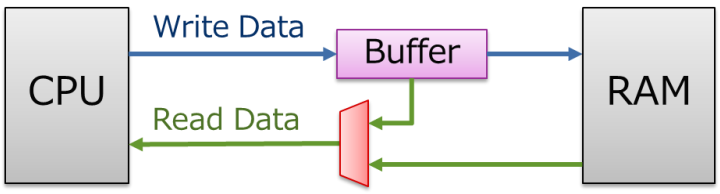
Product Category	MPU/MCU		Document No.	TN-RX*-A173A/E	Rev.	1.00
Title	Supplementary explanation on RAM self-test		Information Category	Technical Notification		
Applicable Product	RX64M Group, RX71M Group, RX65N Group, RX651 Group, RX230 Group, RX231 Group, RX23T Group, RX24T Group, RX24U Group	Lot No. All lots	Reference Document	See below.		

This is a supplementary explanation for customers who perform RAM self-tests to achieve functional safety or for any other purposes while a MCU is operating.

<Supplementary explanation>

With the above-mentioned applicable products, a buffer for high speed access is allocated between RAM and a CPU as illustrated below. When a value is written to RAM and then execute a read access to the same address, the value may be read from the buffer, not from the RAM.
The structure having a buffer will not functionally affect write/read operation. However, with a program in which a written value is to be read from RAM, the assumed (expected) operation may not be achieved. (In some cases, the written value is read from a buffer.)



Perform the following operation to ensure that a value will be read from RAM.
To read RAM data at an address of 4-aligned bytes (*) after writing a value to the RAM address of the same 4-aligned bytes:
Write a value to any other RAM address which is out of the 4-aligned bytes, and then execute a read access to the RAM address where you want to read.

(*) With 4-aligne bytes, the lower two bits of the address are a range of 00b to 11b.

Note that values read from a buffer and RAM are the same even if the value is read from the buffer, not from the RAM. Thus, the behavior of your program will not be affected even if this supplementary note is ignored.
However, please be aware that this (an unintentional read operation from a buffer) may happen when a value needs to be read directly from RAM (e.g. when performing a self-test for an internal RAM).

[Target RAM address]

Group	RAM address
RX64M Group	0000 0000h～0007 FFFFh
RX71M Group	0000 0000h～0007 FFFFh
RX65N Group RX651 Group	0000 0000h～0003 FFFFh
RX230 Group RX231 Group	0000 0000h～0000 FFFFh
RX23T Group	0000 0000h～0000 27FFh、0000 4000h～0000 4A7Fh
RX24T Group	0000 0000h～0000 7FFFh
RX24U Group	0000 0000h～0000 7FFFh

[Reference Documents]

Group	Document	Rev.	Document Number
RX64M Group	RX64M Group User's Manual: Hardware	1.10	R01UH0377EJ0110
RX71M Group	RX71M Group User's Manual: Hardware	1.00	R01UH0493EJ0100
RX65N Group RX651 Group	RX65N Group, RX651 Group User's Manual: Hardware	1.00	R01UH0590EJ0100
RX230 Group RX231 Group	RX230 Group, RX231 Group User's Manual: Hardware	1.10	R01UH0496EJ0110
RX23T Group	RX23T Group User's Manual: Hardware	1.10	R01UH0520EJ0110
RX24T Group	RX24T Group User's Manual: Hardware	2.00	R01UH0576EJ0200
RX24U Group	RX24U Group User's Manual: Hardware	1.00	R01UH0658EJ0100

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