[Notes]

Renesas Starter Kit for RX231,

Renesas Starter Kit for RX231 (B Mask),

Renesas Starter Kit for RX113

Outline

When using the sample project of the Renesas Starter Kit for RX231, Renesas Starter Kit for RX231 (B Mask), or Renesas Starter Kit for RX113, note the following point.

1. Interrupts during programming or erasure of flash memory

1. Interrupts during Programming or Erasure of Flash Memory

1.1 Applicable Products and List of Sample Codes

Product name	Renesas Starter Kit for RX231 (Mounted MCU: R5F52318ADFP)	Renesas Starter Kit for RX231 (B Mask) (Mounted MCU: R5F52318BDFP)	Renesas Starter Kit for RX113 (Mounted MCU: R5F51138ADFP)
Applicable item	・Sample project in installers attached to the product ・Sample project as attachments to the following application notes posted on the Web - R01AN3138EG0100 (CS+) - R01AN3137EG0100 (e^2 studio)		・Sample project in installers attached to the product ・Sample project as attachments to the following application notes posted on the Web - R01AN2510EG0100 (CS+) - R01AN2509EG0100 (e^2 studio)
Applicable sample project	・System_BootLoader		

1.2 Details

In the System_BootLoader sample project, a compare match timer 3 (referred to as CMT3 hereafter) interrupt is used to count the timeout timer for flash memory transfer processing. Because the CMT3 interrupt vector is located in ROM, if a CMT3 interrupt occurs during programming or erasure in flash memory, the vector is fetched from ROM, causing a jump to an invalid address. As a result, programming or erasure is placed in error state, and transfer processing to flash memory cannot be completed normally.

1.3   Workaround

To avoid this problem, change the fetch target of the interrupt vector from ROM to RAM.

To change the fetch target, add the processing codes in red to the files shown in "Source file to add processing" of the following table.

Sample project	Source file to add processing
・System_BootLoader	・r_cg_main.c
	・r_cg_cmt_user.c

■   r_cg_main.c file (1/2): Common to applicable products

```
/* function pointer for sending a message to the terminal device */
void (*R_SCI5_SerialTxString_Ptr) (const char *);


/* Used for storing and calling the user's application initial function */
void (*start_address) (void) = NULL;


static uint32_t ram_vector_table[400];  /* RAM space to hold the vector table */
static void flash_copy_vector_table(void);


#pragma section
...................Omitted...................


void main(void)
{
    R_MAIN_UserInit();
    /* Start user code. Do not edit comment generated here */
    ...................Omitted...................


    /* if SW1 not being pressed and application CRC is verified, then jump to application code */
    if ((!switch_pressed) && appvalid)
    {
        /* Jump to Application */
        jump_to_application(IMMEDIATE_JUMP);
    }
    /* Copy vector table to RAM if interrupts possible while erasing/writing ROM */
    flash_copy_vector_table();


    /* User requested application code update or application area is invalid */
    /* so get update from UART */
    while (1U)
    {
    ...................Omitted...................
}
```

■ r_cg_main.c file (2/2): Common to applicable products

```
/*****************************************************************************
 * End of function prep_for_user_jmp
 *****************************************************************************/
/*****************************************************************************
 * Function Name: flash_copy_vector_table();
 * Description  : Moves the relocatable vector table to RAM. This is only needed if ROM
 *                operations are performed. ROM cannot be accessed during operations.
 *                The vector table is located in ROM and will be accessed if an interrupt
 *                occurs.
 * Arguments    : none
 * Return Value : none
 *****************************************************************************/
static void flash_copy_vector_table(void)
{
    uint32_t *pvect_table;
    unsigned short i;

    pvect_table = (uint32_t *)__sectop("C$VECT");
    for(i=0;i<400;i++){
        ram_vector_table[i] = pvect_table[i];
    }
    set_intb((void *)ram_vector_table);
}


/*****************************************************************************
 * End of function flash_copy_vector_table
 *****************************************************************************/
/* End user code. Do not edit comment generated here */
```

■ r_cg_cmt_user.c file: Renesas Starter Kit for RX231, Renesas Starter Kit for RX231 (B Mask)

```
/* Start user code for global. Do not edit comment generated here */


uint32_t g_onesec_counter = 0;


#pragma section FRAM


/* End user code. Do not edit comment generated here */
```

■ r_cg_cmt_user.c file: Renesas Starter Kit for RX113

```
/* Start user code for global. Do not edit comment generated here */
uint32_t g_1s_counter = 0;


#pragma section FRAM


/* End user code. Do not edit comment generated here */
```

1.4   Schedule for Fixing the Problem

We will rectify the problem with the sample code (as attachments to application notes on the Web) in the next version.

We do not plan to fix the sample projects in installers attached to the product. If the sample code is updated (as attachments to application notes on the Web), download the latest sample code from the Web.

Revision History

Rev.	Date	Description	
		Page	**Summary**
1.00	Apr. 1, 2017	-	First edition issued

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