# [Notes] RX Family Flash Module Using Firmware Integration Technology, RX Driver Package

R20TS0772EJ0100
Rev.1.00
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## Outline

When using the product in the title, note the following points.

1. Note on the callback after "R_FLASH_Erase" (flash type 3 and 4, non-blocking mode)
2. Note on the response time after "R_FLASH_Erase", "R_FLASH_BlankCheck", and "R_FLASH_Write" (flash type 1, non-blocking mode)
3. Note on "R_FLASH_Write" (flash type 1, non-blocking mode)

## 1. Note on the Callback After "R_FLASH_Erase" (Flash Type 3 and 4, Non-Blocking Mode)

### 1.1 Applicable Products

(1) RX Family Flash Module Using Firmware Integration Technology

(Hereafter referred to as the Flash Module)

The applicable revisions and documents are as follows.

Table 1.1 Flash Module applicable products

| Revision | Document number |
|---|---|
| Rev.2.10 | R01AN2184EU0210 |
| Rev.3.00 | R01AN2184EU0300 |
| Rev.3.10 | R01AN2184EU0310 |
| Rev.3.20 | R01AN2184EU0320 |
| Rev.3.30 | R01AN2184EU0330 |
| Rev.3.40 | R01AN2184EU0340 |
| Rev.3.41 | R01AN2184EU0341 |
| Rev.3.42 | R01AN2184EU0342 |
| Rev.3.50 | R01AN2184EU0350 |
| Rev.4.00 | R01AN2184EJ0400 |
| Rev.4.10 | R01AN2184EJ0410 |
| Rev.4.20 | R01AN2184EJ0420 |
| Rev.4.30 | R01AN2184EJ0430 |
| Rev.4.40 | R01AN2184EJ0440 |
| Rev.4.50 | R01AN2184EJ0450 |
| Rev.4.60 | R01AN2184EJ0460 |
| Rev.4.70 | R01AN2184EJ0470 |
| Rev.4.80 | R01AN2184EJ0480 |

(2) RX Driver Package

The Flash Module in (1) is also included in the RX Driver Packages.

The product names, revisions, documents of the RX Driver Packages, and the revisions of the Flash Module are as follows.

Table 1.2 Products that include the Flash Module

| RX Driver Package product name | RX Driver Package revision | Document number | Flash Module revision |
|---|---|---|---|
| RX Family RX Driver Package Ver.1.12 | Rev.1.12 | R01AN3651EJ0112 | Rev.2.10 |
| RX Family RX Driver Package Ver.1.13 | Rev.1.13 | R01AN3859EJ0113 | Rev.3.20 |
| RX Family RX Driver Package Ver.1.14 | Rev.1.14 | R01AN4191EJ0114 | Rev.3.30 |
| RX Family RX Driver Package Ver.1.15 | Rev.1.15 | R01AN4372EJ0115 | Rev.3.30 |
| RX Family RX Driver Package Ver.1.16 | Rev.1.16 | R01AN4471EJ0116 | Rev.3.40 |
| RX Family RX Driver Package Ver.1.17 | Rev.1.17 | R01AN4572EJ0117 | Rev.3.41 |
| RX Family RX Driver Package Ver.1.18 | Rev.1.18 | R01AN4659EJ0118 | Rev.3.42 |
| RX Family RX Driver Package Ver.1.19 | Rev.1.19 | R01AN4677EJ0119 | Rev.3.50 |
| RX Family RX Driver Package Ver.1.20 | Rev.1.20 | R01AN4794EJ0120 | Rev.4.00 |
| RX Family RX Driver Package Ver.1.21 | Rev.1.21 | R01AN4843EJ0121 | Rev.4.10 |
| RX Family RX Driver Package Ver.1.22 | Rev.1.22 | R01AN4873EJ0122 | Rev.4.20 |
| RX Family RX Driver Package Ver.1.23 | Rev.1.23 | R01AN4976EJ0123 | Rev.4.40 |
| RX Family RX Driver Package Ver.1.24 | Rev.1.24 | R01AN5267EJ0124 | Rev.4.40 |
| RX Family RX Driver Package Ver.1.25 | Rev.1.25 | R01AN5371EJ0125 | Rev.4.50 |
| RX Family RX Driver Package Ver.1.26 | Rev.1.26 | R01AN5401EJ0126 | Rev.4.50 |
| RX Family RX Driver Package Ver.1.27 | Rev.1.27 | R01AN5600EJ0127 | Rev.4.60 |
| RX Family RX Driver Package Ver.1.29 | Rev.1.29 | R01AN5826EJ0129 | Rev.4.60 |
| RX Family RX Driver Package Ver.1.30 | Rev.1.30 | R01AN5882EJ0130 | Rev.4.60 |
| RX Family RX Driver Package Ver.1.31 | Rev.1.31 | R01AN5975EJ0131 | Rev.4.70 |
| RX Family RX Driver Package Ver.1.32 | Rev.1.32 | R01AN6013EJ0132 | Rev.4.80 |

(3) FIT Modules used in combination with Flash Module and their application notes

The problem may occur when certain FIT Modules are used with the Flash Module in (1).

Examples

- RX Family Flash Memory Data Management Module Using Firmware Integration Technology (R20AN0507EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-flash-memory-data-management-module-using-firmware-integration-technology
- RX Family Firmware Update Module Using Firmware Integration Technology (R01AN5824EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-firmware-update-module-using-firmware-integration-technology-application-notes
- RX Family TSIP (Trusted Secure IP) Module Firmware Integration Technology (R20AN0548EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-tsip-trusted-secure-ip-module-firmware-integration-technology-binary-version

## 1.2 Applicable Devices

RX64M, RX651, RX65N, RX66N, RX66T, and RX671 groups

RX71M, RX72M, RX72N, and RX72T groups

## 1.3 Details

If a flash memory error occurs after "R_FLASH_Erase" is executed, the callback function sends the error message to the user application. The size of the message may become the number of the blocks specified as the parameter for "R_FLASH_Erase".

## 1.4 Conditions

The problem occurs when the following conditions are met.

Condition 1: The flash module is set to the non-blocking mode.

Condition 2: Refer to the code snippets in (1). Interval A takes longer than the erasure time.

Condition 3: A flash memory error has occurred.

The following shows an example of Condition 2, in which an interrupt has occurred during the interval.

(1) The main routine process and the problem

The code snippets show "r_flash_fcu.c", in which the final erase command is written (FLASH_FACI_CMD_FINAL) and the current operation variable is judged (g_current_parameters.current_operation). If the interval between the two events takes longer than the erasure time, and if a flash memory error occurs meanwhile, an FIFERR interrupt is requested before the judgement.

The current operation variable is changed during the FIFERR interrupt. The judgement of the variable does not match after the interrupt. Therefore, “break” does not occur, but the erasure process continues.

```
flash_err_t flash_erase(uint32_t block_address, uint32_t num_blocks)
{
(Omitted)                                   Write the final erase command
       *g_pfcu_cmd_area = (uint8_t) FLASH_FACI_CMD_BLOCK_ERASE;
       *g_pfcu_cmd_area = (uint8_t) FLASH_FACI_CMD_FINAL;
  Interval A
       /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
       if ((g_current_parameters.current_operation == FLASH_CUR_CF_BGO_ERASE)
        || (g_current_parameters.current_operation ==
FLASH_CUR_DF_BGO_ERASE))
       {                                                 Judge the current operation variable
          break;
                  It does not break
       }
(Omitted)
```

The codes are expanded by the assembler as follows.

The final erase commend is written in (2).

If an interrupt request occurs during (2) when the one-cycle instruction is executed, and if the processing of the interrupt takes longer than the erasure time, and if a flash memory error occurs meanwhile, an FIFERR interrupt is requested before the current operation variable is judged.

```
(*g_pfcu_cmd_area = (uint8_t) FLASH_FACI_CMD_FINAL;)
(1) mov.l   [r8], r14
(2) mov.b   #208, [r14]
(if ((g_current_parameters.current_operation == FLASH_CUR_CF_BGO_ERASE))
(3) mov.l   16[r7], r2
```

## 1.5 Workaround

Refer to the following "r_flash_fcu.c" and change the functions written in red.

Before modification

```
flash_err_t flash_erase(uint32_t block_address, uint32_t num_blocks)
{
(Omitted)
       *g_pfcu_cmd_area = (uint8_t) FLASH_FACI_CMD_BLOCK_ERASE;
       *g_pfcu_cmd_area = (uint8_t) FLASH_FACI_CMD_FINAL;

       /* Return if in BGO mode. Processing will finish in FRDYI interrupt
*/
       if ((g_current_parameters.current_operation ==
FLASH_CUR_CF_BGO_ERASE)
        || (g_current_parameters.current_operation ==
FLASH_CUR_DF_BGO_ERASE))
       {
          break;
       }
(Omitted)
```

After modification

```
flash_err_t flash_erase(uint32_t block_address, uint32_t num_blocks)
{
(Omitted)
       *g_pfcu_cmd_area = (uint8_t) FLASH_FACI_CMD_BLOCK_ERASE;
       *g_pfcu_cmd_area = (uint8_t) FLASH_FACI_CMD_FINAL;

       /* Return if in BGO mode. Processing will finish in FRDYI interrupt
*/
       if ((g_current_parameters.bgo_enabled_cf == true)
        || (g_current_parameters.bgo_enabled_df == true))
       {
          break;
       }
(Omitted)
```

## 1.6 Schedule for Fixing the Problem

The problem will be fixed in the next version.

## 2. Note on the Response Time After "R_FLASH_Erase", "R_FLASH_BlankCheck", and "R_FLASH_Write" (Flash Type 1, Non-Blocking Mode)

### 2.1 Applicable Products

(1) RX Family Flash Module Using Firmware Integration Technology

The applicable revision and document are as follows.

Table 2.1 Flash Module applicable product

| Revision | Document number |
|---|---|
| Rev.4.80 | R01AN2184EJ0480 |

(2) RX Driver Package

The Flash Module in (1) is also included in the RX Driver Package.

The product name, revision, document of the RX Driver Package, and the revision of the flash module are as follows.

Table 2.2 Product that includes the Flash Module

| RX Driver Package product name | RX Driver Package revision | Document number | Flash Module revision |
|---|---|---|---|
| RX Family RX Driver Package Ver.1.32 | Rev.1.32 | R01AN6013EJ0132 | Rev.4.80 |

(3) FIT Modules used in combination with Flash Module and their application notes

The problem may occur when certain FIT Modules are used with the Flash Module in (1).

Examples

- RX Family Flash Memory Data Management Module Using Firmware Integration Technology (R20AN0507EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-flash-memory-data-management-module-using-firmware-integration-technology
- RX Family Firmware Update Module Using Firmware Integration Technology (R01AN5824EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-firmware-update-module-using-firmware-integration-technology-application-notes
- RX Family TSIP (Trusted Secure IP) Module Firmware Integration Technology (R20AN0548EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-tsip-trusted-secure-ip-module-firmware-integration-technology-binary-version

### 2.2 Applicable Devices

RX110, RX111, RX113, RX130, RX13T, and RX140 groups

RX230, RX231, RX23E-A, RX23T, RX23W, RX24T, and RX24U groups

## 2.3 Details

It may take long to respond to the user application after "R_FLASH_Erase", "R_FLASH_BlankCheck", and "R_FLASH_Write" are executed.

## 2.4 Conditions

The problem occurs when Condition 1 and any of the three conditions are met.

Condition 1: The flash module is set to the non-blocking mode.

Condition 2: Interval A or B* takes longer than the erasure time.

Condition 3: Interval A or B* takes longer than the blank check.

Condition 4: Interval A or B* takes longer than the programming time.

*Refer to the code snippets in (1).

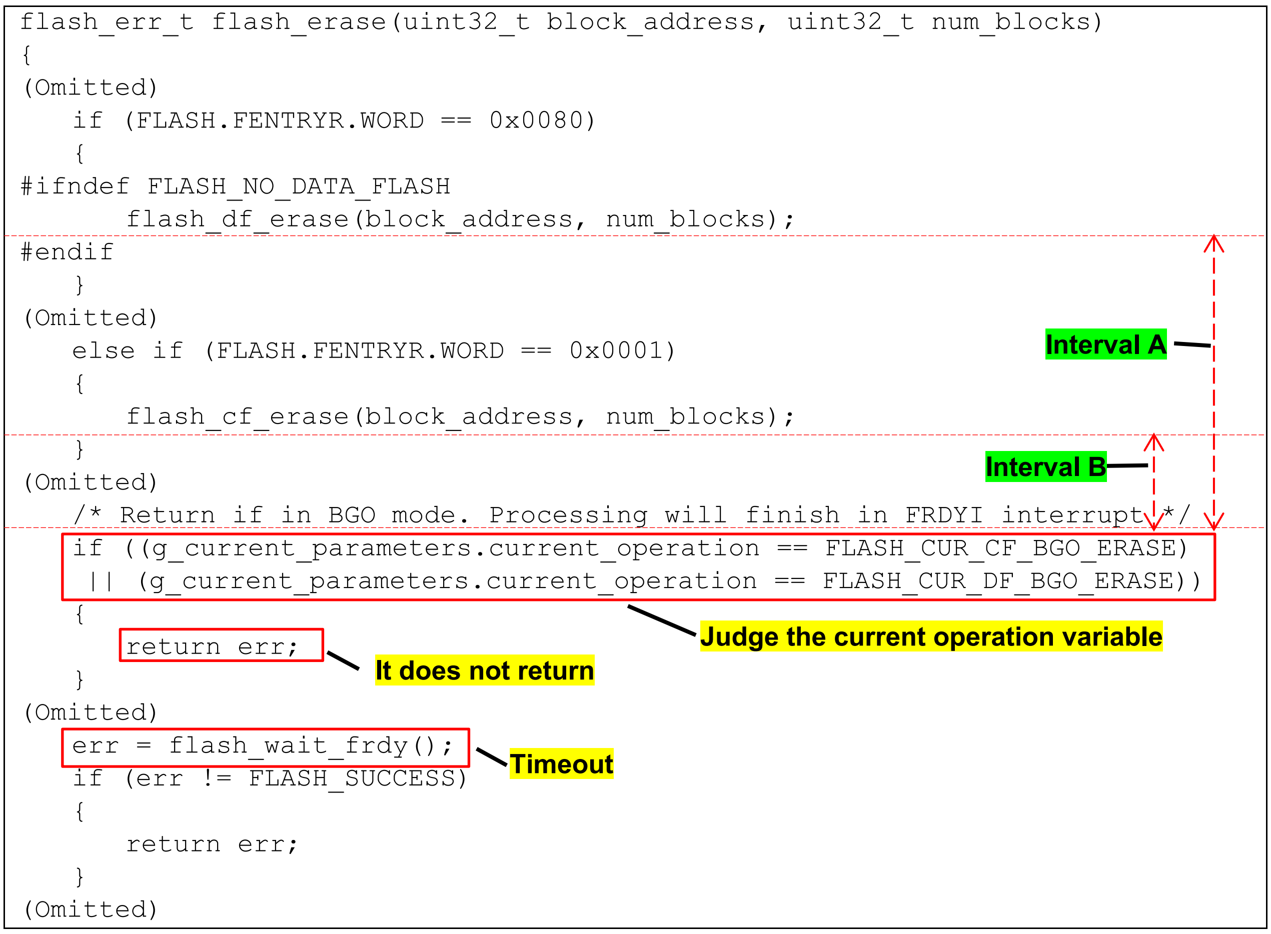
The following shows an example of Condition 2 to 4, in which an interrupt has occurred during the interval.

(1) The main routine process and the problem

Condition 2

The code snippets show "r_flash_nofcu.c", in which ”flash_df_erase” or ”flash_cf_erase” is executed and the current operation variable is judged (g_current_parameters.current_operation). If the interval between the two events takes longer than the erasure time, an FRDYI interrupt is requested before the judgement.

During the FRDYI interrupt, the current operation variable is changed and FRDY is set to 0. The judgement of the variable does not match after the interrupt. Therefore, “return” does not occur, but ”flash_wait_frdy” is executed. However, since FRDY is 0, a timeout occurs in "flash_wait_frdy", causing the delay in response.

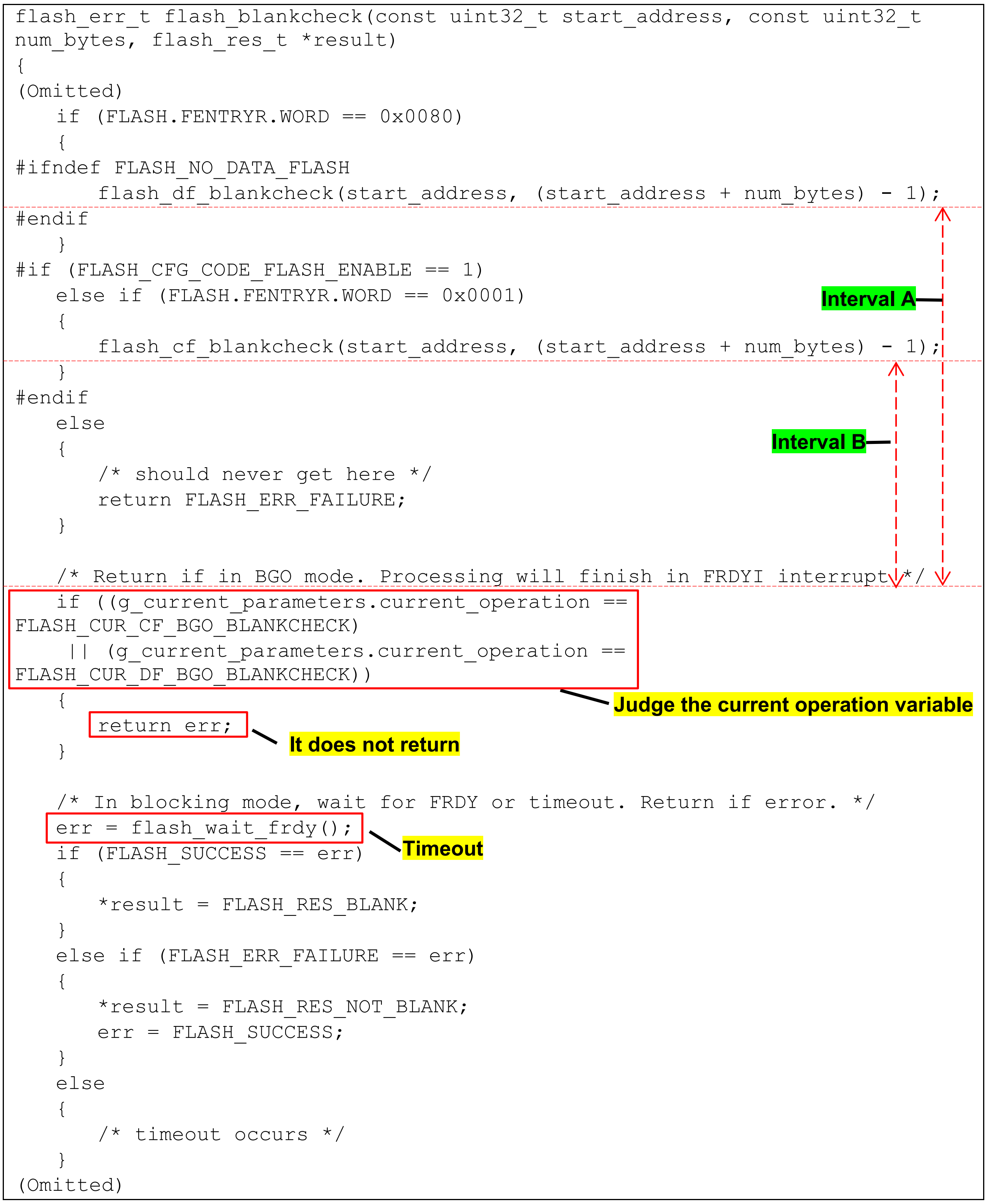


```
flash_err_t flash_erase(uint32_t block_address, uint32_t num_blocks)
{
(Omitted)
    if (FLASH.FENTRYR.WORD == 0x0080)
    {
#ifndef FLASH_NO_DATA_FLASH
        flash_df_erase(block_address, num_blocks);
#endif
    }
(Omitted)
    else if (FLASH.FENTRYR.WORD == 0x0001)
    {
        flash_cf_erase(block_address, num_blocks);
    }
(Omitted)
    /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
    if ((g_current_parameters.current_operation == FLASH_CUR_CF_BGO_ERASE)
     || (g_current_parameters.current_operation == FLASH_CUR_DF_BGO_ERASE))
    {
        return err;
    }
(Omitted)
    err = flash_wait_frdy();
    if (err != FLASH_SUCCESS)
    {
        return err;
    }
(Omitted)
```

Condition 3

The code snippets show "r_flash_nofcu.c", in which ”flash_df_blankcheck” or ”flash_cf_blankcheck” is executed and the current operation variable is judged. If the interval between the two events takes longer than the blank check, an FRDYI interrupt is requested before the judgement.

During the FRDYI interrupt, the current operation variable is changed and FRDY is set to 0. The judgement of the variable does not match after the interrupt. Therefore, “return” does not occur, but ”flash_wait_frdy” is executed. However, since FRDY is 0, a timeout occurs in "flash_wait_frdy", causing the delay in response.

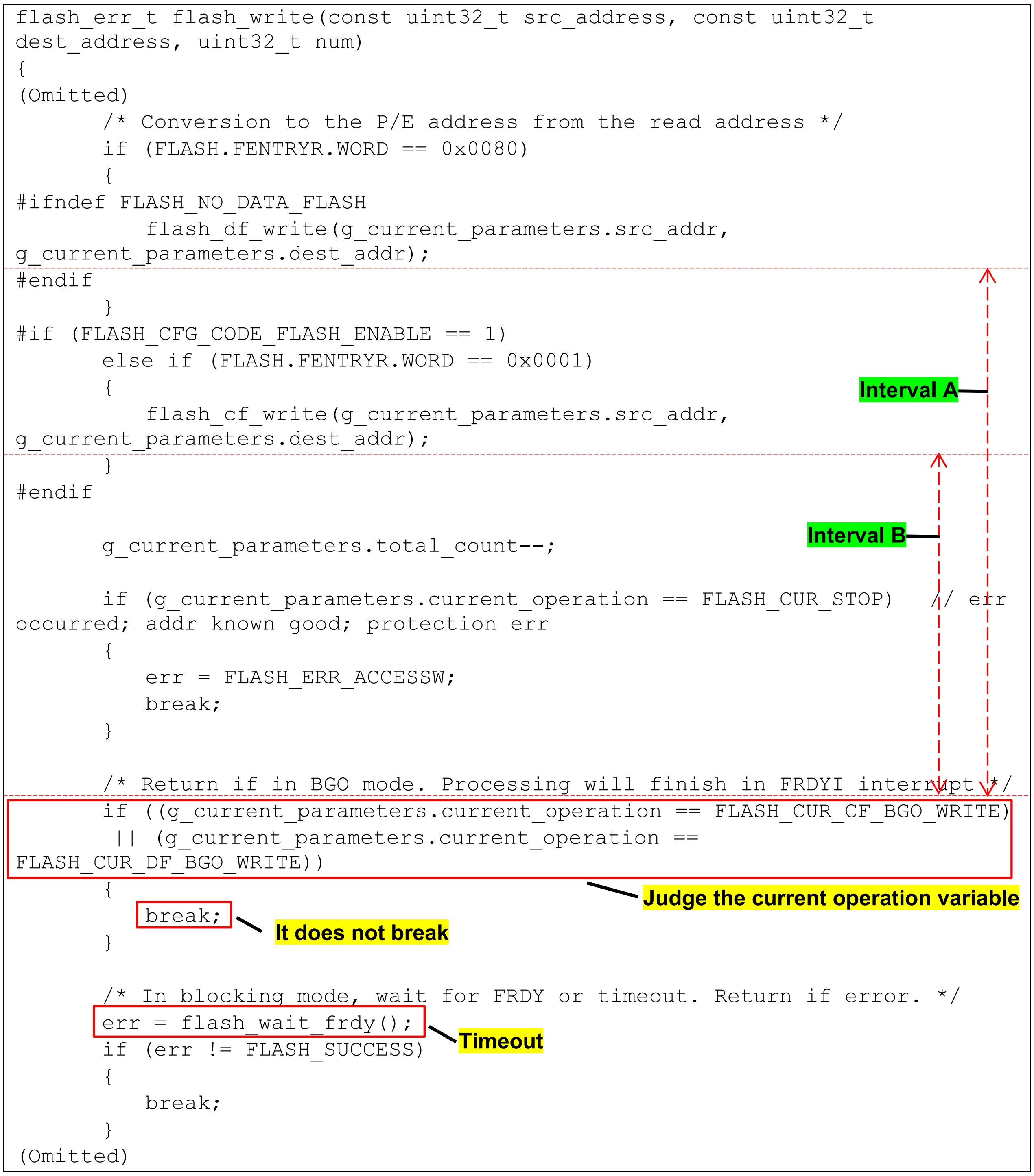


```
flash_err_t flash_blankcheck(const uint32_t start_address, const uint32_t
num_bytes, flash_res_t *result)
{
(Omitted)
    if (FLASH.FENTRYR.WORD == 0x0080)
    {
#ifndef FLASH_NO_DATA_FLASH
        flash_df_blankcheck(start_address, (start_address + num_bytes) - 1);
#endif
    }
#if (FLASH_CFG_CODE_FLASH_ENABLE == 1)
    else if (FLASH.FENTRYR.WORD == 0x0001)
    {
        flash_cf_blankcheck(start_address, (start_address + num_bytes) - 1);
    }
#endif
    else
    {
        /* should never get here */
        return FLASH_ERR_FAILURE;
    }

    /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
    if ((g_current_parameters.current_operation ==
FLASH_CUR_CF_BGO_BLANKCHECK)
     || (g_current_parameters.current_operation ==
FLASH_CUR_DF_BGO_BLANKCHECK))
    {
        return err;
    }

    /* In blocking mode, wait for FRDY or timeout. Return if error. */
    err = flash_wait_frdy();
    if (FLASH_SUCCESS == err)
    {
        *result = FLASH_RES_BLANK;
    }
    else if (FLASH_ERR_FAILURE == err)
    {
        *result = FLASH_RES_NOT_BLANK;
        err = FLASH_SUCCESS;
    }
    else
    {
        /* timeout occurs */
    }
(Omitted)
```

Condition 4

The code snippets show "r_flash_nofcu.c", in which ”flash_df_write” or ”flash_cf_write” is executed and the current operation variable is judged. If the interval between the two events takes longer than the programming time, an FRDYI interrupt is requested before the judgement.

During the FRDYI interrupt, the current operation variable is changed and FRDY is set to 0. The judgement of the variable does not match after the interrupt. Therefore, “break” does not occur, but ”flash_wait_frdy” is executed. However, since FRDY is 0, a timeout occurs in "flash_wait_frdy", causing the delay in response.



```
flash_err_t flash_write(const uint32_t src_address, const uint32_t
dest_address, uint32_t num)
{
(Omitted)
       /* Conversion to the P/E address from the read address */
       if (FLASH.FENTRYR.WORD == 0x0080)
       {
#ifndef FLASH_NO_DATA_FLASH
           flash_df_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
#endif
       }
#if (FLASH_CFG_CODE_FLASH_ENABLE == 1)
       else if (FLASH.FENTRYR.WORD == 0x0001)
       {
           flash_cf_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
       }
#endif

       g_current_parameters.total_count--;

       if (g_current_parameters.current_operation == FLASH_CUR_STOP)   // err
occurred; addr known good; protection err
       {
           err = FLASH_ERR_ACCESSW;
           break;
       }

       /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
       if ((g_current_parameters.current_operation == FLASH_CUR_CF_BGO_WRITE)
        || (g_current_parameters.current_operation ==
FLASH_CUR_DF_BGO_WRITE))
       {
           break;
       }

       /* In blocking mode, wait for FRDY or timeout. Return if error. */
       err = flash_wait_frdy();
       if (err != FLASH_SUCCESS)
       {
           break;
       }
(Omitted)
```

## 2.5 Workaround

Refer to the following "r_flash_nofcu.c " and change the functions written in red.

Before modification

```
flash_err_t flash_erase(uint32_t block_address, uint32_t num_blocks)
{
(Omitted)
    /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
    if ((g_current_parameters.current_operation == FLASH_CUR_CF_BGO_ERASE)
     || (g_current_parameters.current_operation == FLASH_CUR_DF_BGO_ERASE))
    {
        return err;
    }
(Omitted)
```

```
flash_err_t flash_blankcheck(const uint32_t start_address, const uint32_t
num_bytes, flash_res_t *result)
{
(Omitted)
    /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
    if ((g_current_parameters.current_operation ==
FLASH_CUR_CF_BGO_BLANKCHECK)
     || (g_current_parameters.current_operation ==
FLASH_CUR_DF_BGO_BLANKCHECK))
    {
        return err;
    }
(Omitted)
```

```
flash_err_t flash_write(const uint32_t src_address, const uint32_t
dest_address, uint32_t num)
{
(Omitted)
        /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
        if ((g_current_parameters.current_operation == FLASH_CUR_CF_BGO_WRITE)
         || (g_current_parameters.current_operation ==
FLASH_CUR_DF_BGO_WRITE))
        {
            break;
        }
(Omitted)
```

After modification

```
flash_err_t flash_erase(uint32_t block_address, uint32_t num_blocks)
{
(Omitted)
    /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
    if ((g_current_parameters.bgo_enabled_cf == true)
     || (g_current_parameters.bgo_enabled_df == true))
    {
        return err;
    }
(Omitted)
```

```
flash_err_t flash_blankcheck(const uint32_t start_address, const uint32_t
num_bytes, flash_res_t *result)
{
(Omitted)
    /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
    if ((g_current_parameters.bgo_enabled_cf == true)
     || (g_current_parameters.bgo_enabled_df == true))
    {
        return err;
    }
(Omitted)
```

```
flash_err_t flash_write(const uint32_t src_address, const uint32_t
dest_address, uint32_t num)
{
(Omitted)
        /* Return if in BGO mode. Processing will finish in FRDYI interrupt */
        if ((g_current_parameters.bgo_enabled_cf == true)
         || (g_current_parameters.bgo_enabled_df == true))
        {
            break;
        }
(Omitted)
```

## 2.6 Schedule for Fixing the Problem

The problem will be fixed in the next version.

## 3. Note on "R_FLASH_Write" (Flash Type 1, Non-Blocking Mode)

### 3.1 Applicable Products

(1) RX Family Flash Module Using Firmware Integration Technology

The applicable revision and document are as follows.

Table 3.1 Flash Module applicable product

| Revision | Document number |
|---|---|
| Rev.4.80 | R01AN2184EJ0480 |

(2) RX Driver Package

The Flash Module in (1) is also included in the RX Driver Package.
The product name, revision, document of the RX Driver Package, and the revision of the Flash Module are as follows.

Table 3.2 Product that includes the Flash Module

| RX Driver Package product name | RX Driver Package revision | Document number | Flash Module revision |
|---|---|---|---|
| RX Family RX Driver Package Ver.1.32 | Rev.1.32 | R01AN6013EJ0132 | Rev.4.80 |

(3) FIT Modules used in combination with Flash Module and their application notes

The problem may occur when certain FIT Modules are used with the Flash Module in (1).

Examples

- RX Family Flash Memory Data Management Module Using Firmware Integration Technology (R20AN0507EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-flash-memory-data-management-module-using-firmware-integration-technology
- RX Family Firmware Update Module Using Firmware Integration Technology (R01AN5824EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-firmware-update-module-using-firmware-integration-technology-application-notes
- RX Family TSIP (Trusted Secure IP) Module Firmware Integration Technology (R20AN0548EJ)
  https://www.renesas.com/jp/en/document/apn/rx-family-tsip-trusted-secure-ip-module-firmware-integration-technology-binary-version

### 3.2 Applicable Devices

RX110, RX111, RX113, RX130, RX13T, and RX140 groups

RX230, RX231, RX23E-A, RX23T, RX23W, RX24T, and RX24U groups

## 3.3 Details

"R_FLASH_Write" may write excessive data (the minimum program size x 1).

## 3.4 Conditions

The problem occurs when the following conditions are met.

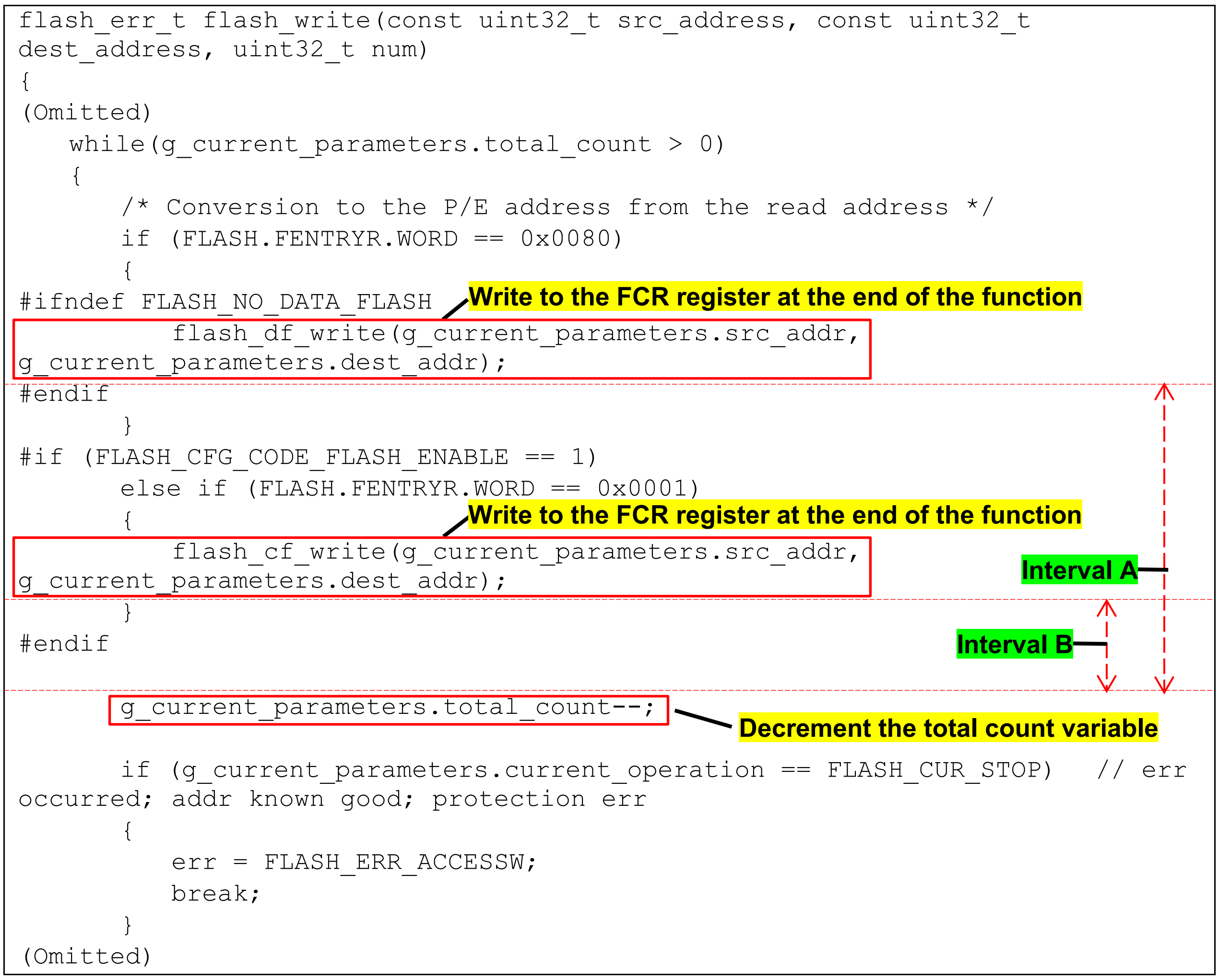
Condition 1: The flash module is set to the non-blocking mode.

Condition 2: Refer to the code snippets in (1). Interval A or B takes longer than the programming time.

The following shows an example of Condition 2, in which an interrupt has occurred during the interval.

(1) The main routine process and the problem

The code snippets show "r_flash_nofcu.c", in which "flash_df_write" or "flash_cf_write" is executed and the total count variable is decremented (g_current_parameters.total_count). If the interval between the two events takes longer than the programming time, an FRDYI interrupt is requested before the decrement.



```
flash_err_t flash_write(const uint32_t src_address, const uint32_t
dest_address, uint32_t num)
{
(Omitted)
    while(g_current_parameters.total_count > 0)
    {
        /* Conversion to the P/E address from the read address */
        if (FLASH.FENTRYR.WORD == 0x0080)
        {
#ifndef FLASH_NO_DATA_FLASH
            flash_df_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
#endif
        }
#if (FLASH_CFG_CODE_FLASH_ENABLE == 1)
        else if (FLASH.FENTRYR.WORD == 0x0001)
        {
            flash_cf_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
        }
#endif

        g_current_parameters.total_count--;

        if (g_current_parameters.current_operation == FLASH_CUR_STOP)   // err
occurred; addr known good; protection err
        {
            err = FLASH_ERR_ACCESSW;
            break;
        }
(Omitted)
```

Write to the FCR register at the end of the function
Write to the FCR register at the end of the function
Interval A
Interval B
Decrement the total count variable

(2) An FRDYI interrupt and the problem

In "flash_write" in "r_flash_nofcu.c", if an FRDYI interrupt is requested while the total count variable is not decremented, the if statement in the following FRDYI interrupt process is fulfilled. As the result, Process C or D is executed, causing excessive data (the minimum program size x 1) to be written.

```
R_BSP_ATTRIB_STATIC_INTERRUPT void Excep_FCU_FIFERR(void)
{
(Omitted)
   else if (FLASH_CUR_CF_BGO_WRITE  ==
g_current_parameters.current_operation)
   {
       err = flash_wait_frdy();
       if (FLASH_SUCCESS == err)
       {
           if (g_current_parameters.total_count > 0)
           {
               g_current_parameters.src_addr  += FLASH_CF_MIN_PGM_SIZE;
               g_current_parameters.dest_addr += FLASH_CF_MIN_PGM_SIZE;
               g_current_parameters.wait_cnt  =  WAIT_MAX_ROM_WRITE;
               g_current_parameters.total_count--;

               flash_cf_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);

               return;
           }
(Omitted)
   else if (FLASH_CUR_DF_BGO_WRITE  ==
g_current_parameters.current_operation)
   {
       err = flash_wait_frdy();
       if (FLASH_SUCCESS == err)
       {
           if (g_current_parameters.total_count > 0)
           {
               g_current_parameters.src_addr  += FLASH_DF_MIN_PGM_SIZE;
               g_current_parameters.dest_addr += FLASH_DF_MIN_PGM_SIZE;
               g_current_parameters.wait_cnt  =  WAIT_MAX_DF_WRITE;
               g_current_parameters.total_count--;

               flash_df_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);

               return;
           }
(Omitted)
```

**Applied if Condition 2 is met in Interval B and the total count variable is not decremented** (first `if (g_current_parameters.total_count > 0)`)

**Process C**: the block following the first `if (g_current_parameters.total_count > 0)`, from `{` to `}`

**Applied if Condition 2 is met in Interval A and the total count variable is not decremented** (second `if (g_current_parameters.total_count > 0)`)

**Process D**: the block following the second `if (g_current_parameters.total_count > 0)`, from `{` to `}`

## 3.5 Workaround

Refer to the following "r_flash_nofcu.c" and change the functions written in red.

Before modification

```
flash_err_t flash_write(const uint32_t src_address, const uint32_t
dest_address, uint32_t num)
{
(Omitted)
    while(g_current_parameters.total_count > 0)
    {
        /* Conversion to the P/E address from the read address */
        if (FLASH.FENTRYR.WORD == 0x0080)
        {
#ifndef FLASH_NO_DATA_FLASH
            flash_df_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
#endif
        }
#if (FLASH_CFG_CODE_FLASH_ENABLE == 1)
        else if (FLASH.FENTRYR.WORD == 0x0001)
        {
            flash_cf_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
        }
#endif

        g_current_parameters.total_count--;

        if (g_current_parameters.current_operation == FLASH_CUR_STOP)   // err
occurred; addr known good; protection err
        {
            err = FLASH_ERR_ACCESSW;
            break;
        }
(Omitted)
```

After modification

```
flash_err_t flash_write(const uint32_t src_address, const uint32_t
dest_address, uint32_t num)
{
(Omitted)
    while(g_current_parameters.total_count > 0)
    {
        g_current_parameters.total_count--;

        /* Conversion to the P/E address from the read address */
        if (FLASH.FENTRYR.WORD == 0x0080)
        {
#ifndef FLASH_NO_DATA_FLASH
            flash_df_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
#endif
        }
#if (FLASH_CFG_CODE_FLASH_ENABLE == 1)
        else if (FLASH.FENTRYR.WORD == 0x0001)
        {
            flash_cf_write(g_current_parameters.src_addr,
g_current_parameters.dest_addr);
        }
#endif

        if (g_current_parameters.current_operation == FLASH_CUR_STOP)   // err
occurred; addr known good; protection err
        {
            err = FLASH_ERR_ACCESSW;
            break;
        }
(Omitted)
```

## 3.6 Schedule for Fixing the Problem

The problem will be fixed in the next version.

## Revision History

| Rev. | Date | Description | |
|---|---|---|---|
| | | Page | Summary |
| 1.00 | Dec.01.21 | - | First edition issued |
| | | | |