

[Notes]

R20TS0636EJ0100

Rev.1.00

Dec. 01, 2020

RX Family

Memory Access Driver Interface Firmware Integration Technology,

RX Driver Package

## Overview

When using any of the products in the title, note the following point.

1. Caution regarding a problem in RSPI Data Transfer (when both IAR compiler and big endian are used)

1. Caution regarding a problem in RSPI Data Transfer (when both IAR compiler and big endian are used)

### 1.1 Applicable Product

- (1) Memory access driver interface module using Firmware Integration Technology (MEMDRV FIT module)

The applicable revision numbers and document numbers are as follows.

Table 1.1 MEMDRV FIT Module Applicable Products

| Revision of the MEMDRV FIT module | Document number |
|-----------------------------------|-----------------|
| Rev.1.02                          | R01AN4548EJ0102 |

- (2) RX Driver Package

The MEMDRV FIT module in (1) is also included in the RX Driver Package products.

The product names and revision numbers of the applicable RX Driver Package and the revision numbers and document of the included MEMDRV FIT module are as follows.

Table 1.2 Products Which Include the MEMDRV FIT Module

| Product name of the RX Driver Package     | Revision of the RX Driver Package | Document number | Revision of the included MEMDRV FIT module |
|-------------------------------------------|-----------------------------------|-----------------|--------------------------------------------|
| RX Driver Package for RX Family, Ver.1.26 | Rev.1.26                          | R01AN5401EJ0126 | Rev.1.02                                   |
| RX Driver Package for RX Family, Ver.1.25 | Rev.1.25                          | R01AN5371EJ0125 | Rev.1.02                                   |
| RX Driver Package for RX Family, Ver.1.24 | Rev.1.24                          | R01AN5267EJ0124 | Rev.1.02                                   |

### 1.2 Applicable MCUs

RX family

### 1.3 Description and Conditions

If all the following conditions apply, data is not transferred properly.

- (a) IAR compiler is used.
- (b) Big endian is used.
- (c) Either R\_MEMDRV\_TxData() or R\_MEMDRV\_RxData() is used as the RSPI software transfer mode.
- (d) Data of 4 or more bytes is transferred.

### 1.4 Detailed Description

When the transfer data size specified by the data length is 4 bytes or more, R\_MEMDRV\_TxData() and R\_MEMDRV\_RxData(), whose transfer data unit is 32-bit, convert and divide the data length into 4-byte units.

However, if the above (a) through (d) in 1.3 apply, data with transfer size of 4 bytes or more cannot be properly divided due to the faults in the following processing, causing this phenomenon.

- Data transfer command determination processing
- Data division processing

The following shows a source code for determining the data transfer command and dividing the transfer size inside the data transfer functions<sup>(Note)</sup>.

Note: The data transfer functions are as follows.

- r\_memdrv\_rspi\_write\_data() called by R\_MEMDRV\_TxData()
- r\_memdrv\_rspi\_read\_data() called by R\_MEMDRV\_RxData()

■ For r\_memdrv\_rspi\_write\_data() source code:

For r\_memdrv\_rspi\_read\_data(), replace the description as follows.

Read r\_memdrv\_rspi\_write\_data() as r\_memdrv\_rspi\_read\_data().

r\_memdrv\_rspi\_write\_data() (Lines 2667 to 2677 in r\_memdrv\_rspi.c)

```

#if RSPI_LITTLE_ENDIAN == 1
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[0])
    {
        count = count >> 2;
    }
#else
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[1])
    {
        count = count >> 2;
    }
#endif

```

## ■ Source Code Description

For `r_memdrv_rspi_read_data()`, replace the description as follows.

Read `r_memdrv_rspi_write_data()` as `r_memdrv_rspi_read_data()`.

Read `R_RSPI_Write()` as `R_RSPI_Read()`.

To perform RSPI 32-bit software transfer (`R_RSPI_Write()`), the program divides the transfer data into 4-byte units. Here, the following equation holds:

$$\text{Len} = \text{Len1} * 4 + \text{Len2} \quad (\text{Len2} \geq 0 \text{ and } \text{Len2} < 32)$$

Len (bits): Transfer data length

Len1: Data frame length during 32-bit data transfer

Len2: Data length when data of less than 32 bits (including the divided data at the end) is transferred

The variable "count" indicated in red has the following two meanings in `r_memdrv_rspi_write_data()` and performs conversions accordingly in `r_memdrv_rspi_write_data()`.

-Before conversion: The variable indicates the data length during data transfer.

(The second argument of `r_memdrv_rspi_write_data()`. Corresponds to  $(\text{Len1} * 4)$  or

Len2.)

-After conversion: The variable indicates the number of transfer data frames.

(The fourth argument of `R_RSPI_Write()` that is called inside

`r_memdrv_rspi_write_data()`)

When the transfer data is four bytes or more (which corresponds to  $\text{Len1} * 4$ ), because data is transferred in 32-bit units, the "count" variable, which indicates the data length, is divided by 4 (shifted right by 2 bits), and the result is reassigned to the "count" variable as the number of transfer data frames.

If the transfer data is 3 bytes or less (corresponding to Len2), data is properly transferred (without the need to divide the data).

## 1.5 Workaround

Modify the code as shown in red in `r_memdrv_rspi_write_data()` and `r_memdrv_rspi_read_data()`.

–Before modification

`memdrv_rspi_write_data()` (Lines 2667 to 2677 in `r_memdrv_rspi.c`)

```
#if RSPI_LITTLE_ENDIAN == 1
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[0])
    {
        count = count >> 2;
    }
#else
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[1])
    {
        count = count >> 2;
    }
#endif
```

`r_memdrv_rspi_read_data()` (Lines 2727 to 2737 in `r_memdrv_rspi.c`)

```
#if RSPI_LITTLE_ENDIAN == 1
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[0])
    {
        count = count >> 2;
    }
#else
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[1])
    {
        count = count >> 2;
    }
#endif
```

–After modification

memdrv\_rspi\_write\_data() (Lines 2667 to 2677 in r\_memdrv\_rspi.c)

```
#if RSPI_LITTLE_ENDIAN == 1
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[0])
    {
        count = count >> 2;
    }
#else
    #if defined (__ICCRX__)
    uint16_t cmd_big_endian = 0;
    cmd_big_endian = (MEMDRV_TRNS_DATA_CMD >> 8);
    cmd_big_endian |= (MEMDRV_TRNS_DATA_CMD << 8);
    if (cmd_big_endian == cmd.word[0])
    {
        count = count >> 2;
    }
    #else
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[1])
    {
        count = count >> 2;
    }
    #endif
#endif
```

r\_memdrv\_rspi\_read\_data() (Lines 2727 to 2737 in r\_memdrv\_rspi.c)

```
#if RSPI_LITTLE_ENDIAN == 1
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[0])
    {
        count = count >> 2;
    }
#else
    #if defined (__ICCRX__)
    uint16_t cmd_big_endian = 0;
    cmd_big_endian = (MEMDRV_TRNS_DATA_CMD >> 8);
    cmd_big_endian |= (MEMDRV_TRNS_DATA_CMD << 8);
    if (cmd_big_endian == cmd.word[0])
    {
        count = count >> 2;
    }
    #else
    if (MEMDRV_TRNS_DATA_CMD == cmd.word[1])
    {
        count = count >> 2;
    }
    #endif
#endif
#endif
```

## 1.6 Schedule for fixing the problem

The problem has already been rectified in MEMDRV FIT Rev.1.03.

## Revision History

| Rev. | Date      | Description |                      |
|------|-----------|-------------|----------------------|
|      |           | Page        | Summary              |
| 1.00 | Dec.01.20 | -           | First edition issued |
|      |           |             |                      |

Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.

The past news contents have been based on information at the time of publication. Now changed or invalid information may be included.

The URL in the Tool News also may be subject to change or become invalid without prior notice.

## Corporate Headquarters

TOYOSU FORESIA, 3- 2- 24 Toyosu,  
Koto-ku, Tokyo 135- 0061, Japan

[www.renesas.com](http://www.renesas.com)

## Contact information

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:

[www.renesas.com/contact/](http://www.renesas.com/contact/)

## Trademarks

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.