**Outline**

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

1. Notes on callback functions when RSPI and DMAC are combined

### 1. Notes on Callback Functions When RSPI and DMAC Are Combined

#### 1.1 Applicable Products

1. RSPI module Firmware Integration Technology (RSPI FIT module)
   - The applicable revision numbers and document numbers are as follows.

<table>
<thead>
<tr>
<th>RSPI FIT module revision number</th>
<th>Document number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rev.2.05</td>
<td>R01AN1827EJ0205</td>
</tr>
<tr>
<td>Rev.2.04</td>
<td>R01AN1827EJ0204</td>
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<tr>
<td>Rev.2.03</td>
<td>R01AN1827EJ0203</td>
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<td>Rev.2.02</td>
<td>R01AN1827EJ0202</td>
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<td>Rev.2.01</td>
<td>R01AN1827EJ0201</td>
</tr>
<tr>
<td>Rev.2.00</td>
<td>R01AN1827EJ0200</td>
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</table>

2. RX Driver Package
   - The RSPI FIT module in (1) is also included in the RX Driver Package.
   - The product names and revision numbers of the applicable RX Driver Package and the revision numbers of the RSPI FIT module are as follows.

<table>
<thead>
<tr>
<th>RX Driver Package product name</th>
<th>RX Driver Package revision number</th>
<th>Document number</th>
<th>Revision number of the included RSPIFIT module</th>
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</thead>
<tbody>
<tr>
<td>RX Family RX Driver Package Ver.1.26</td>
<td>Rev.1.26</td>
<td>R01AN5401EJ0126</td>
<td>Rev.2.05</td>
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<tr>
<td>RX Family RX Driver Package Ver.1.25</td>
<td>Rev.1.25</td>
<td>R01AN5371EJ0125</td>
<td>Rev.2.05</td>
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<td>RX Family RX Driver Package Ver.1.24</td>
<td>Rev.1.24</td>
<td>R01AN5267EJ0124</td>
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<td>R01AN4873EJ0122</td>
<td>Rev.2.03</td>
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<tr>
<td>RX Family RX Driver Package Ver.1.20</td>
<td>Rev.1.20</td>
<td>R01AN4794EJ0120</td>
<td>Rev.2.01</td>
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<tr>
<td>RX Family RX Driver Package Ver.1.19</td>
<td>Rev.1.19</td>
<td>R01AN4677EJ0119</td>
<td>Rev.2.00</td>
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</tbody>
</table>
1.2 Applicable Devices
   RX110, RX111, RX113, and RX130 groups
   RX230, RX231, RX23E-A, RX23W, RX23T, RX24T, and RX24U groups
   RX64M, RX651, RX65N, and RX66T groups
   RX71M, RX72T, RX72M, and RX72N groups

1.3 Details and Conditions
   We have identified an error in the processing of the DMAC callback function in the sample program. Therefore, either or both of the following problems may occur if you create a callback function according to the sample program code and perform any one of the R_RSPI_Write, R_RSPI_Read, and R_RSPI_WriteRead functions, thus combining RSPI with DMAC.

   (1) Second communication does not start.
      If the program lacks processing for writing 0 to the SPE bit, the second and subsequent communications will not start.

   (2) Missing data occurs in transmission or reception.
      An internal transmit buffer empty interrupt request may persist. In this case, missing transmission or reception data may occur in the subsequent communications.
1.4 Workarounds

If you use it in combination with DMAC, add each of the following processing to the callback function.

The following description is based on the sample program for RSPI FIT module Rev.2.05 as an example.

(1) Workaround for when the second communication does not start

If you use it in combination with DMAC, write 0 to the SPE bit in the user DMAC callback function, which is called at the end of communication.

Before modification

```c
void DMA_CallBack_R(void)
{
    volatile dmaca_return_t    ret_dmaca;
    dmaca_stat_t             p_stat_dmaca;

    my_rspi_handle->channel = RSPI_CHANNEL;

    /* check DMA end */
    /*** DMACA transfer end check ***/
    ret_dmaca = R_DMACA_Control(DMACA_CH1, DMACA_CMD_STATUS_GET, (dmaca_stat_t*)&p_stat_dmaca);
    if (DMACA_SUCCESS != ret_dmaca)
    {
        return;
    }

    if (false != (p_stat_dmaca.dtif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH1, DMACA_CMD_DTIF_STATUS_CLR, (dmaca_stat_t*)&p_stat_dmaca);
        R_RSPI_IntSpriIerClear(my_rspi_handle);
        R_RSPI_IntSpriDmacdtcFlagSet(my_rspi_handle, RSPI_SET_TRANS_STOP);
    }

    if (false != (p_stat_dmaca.esif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH1, DMACA_CMD_ESIF_STATUS_CLR, (dmaca_stat_t*)&p_stat_dmaca);
    }

    transfer_busy = false;
    return;
}
```
After modification (Add the parts shown in red.)

```c
void DMA_CallBack_R(void)
{
    volatile dmaca_return_t ret_dmaca;
    dmaca_stat_t p_stat_dmaca;

    my_rspi_handle->channel = RSPI_CHANNEL;

    /* check DMA end */
    /**** DMACA transfer end check ****/
    ret_dmaca = R_DMACA_Control(DMACA_CH1, DMACA_CMD_STATUS_GET,
                                (dmaca_stat_t*)&p_stat_dmaca);
    if (DMACA_SUCCESS != ret_dmaca)
    {
        return;
    }

    if (false != (p_stat_dmaca.dtif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH1, DMACA_CMD_DTIF_STATUS_CLR,
                                    (dmaca_stat_t*)&p_stat_dmaca);
        R_RSPI_IntSpriIerClear(my_rspi_handle);
        RSPI0.SPCR.BIT.SPE = 0;
        R_RSPI_IntSpriDmacdtcFlagSet(my_rspi_handle, RSPI_SET_TRANS_STOP);
    }

    if (false != (p_stat_dmaca.esif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH1, DMACA_CMD_ESIF_STATUS_CLR,
                                    (dmaca_stat_t*)&p_stat_dmaca);
    }

    transfer_busy = false;
    return;
}
```
(2) Workaround for when missing data occurs in transmission or reception

If you use it in combination with DMAC, write 0 to the SPTIE bit in the user DMAC callback function, which is called at the completion of DMAC transmission.

Before modification

```c
void DMA_CallBack_W(void)
{
    volatile dmaca_return_t ret_dmaca;
    dmaca_stat_t p_stat_dmaca;

    my_rspi_handle->channel = RSPI_CHANNEL;

    /* check DMA end */
    
    /*** DMACA transfer end check ***/
    ret_dmaca = R_DMACA_Control(DMACA_CH0, DMACA_CMD_STATUS_GET,
    (dmaca_stat_t*)&p_stat_dmaca);
    if (DMACA_SUCCESS != ret_dmaca)
    {
        return;
    }

    if (false != (p_stat_dmaca.dtif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH0, DMACA_CMD_DTIF_STATUS_CLR,
        (dmaca_stat_t*)&p_stat_dmaca);
        R_RSPI_IntSptiIerClear(my_rspi_handle);
        R_RSPI_IntSptiDmacdtcFlagSet(my_rspi_handle, RSPI_SET_TRANS_STOP);
    }

    if (false != (p_stat_dmaca.esif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH0, DMACA_CMD_ESIF_STATUS_CLR,
        (dmaca_stat_t*)&p_stat_dmaca);
    }

    return;
}
```
After modification (Add the parts shown in red.)

```c
void DMA_CallBack_W(void)
{
    volatile dmaca_return_t    ret_dmaca;
    dmaca_stat_t               p_stat_dmaca;

    my_rspi_handle->channel = RSPI_CHANNEL;

    /* check DMA end */
    /*** DMACA transfer end check ***/
    ret_dmaca = R_DMACA_Control(DMACA_CH0, DMACA_CMD_STATUS_GET,
                                 (dmaca_stat_t*)&p_stat_dmaca);
    if (DMACA_SUCCESS != ret_dmaca)
    {
        return;
    }

    if (false != (p_stat_dmaca.dtif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH0, DMACA_CMD_DTIF_STATUS_CLR,
                                     (dmaca_stat_t*)&p_stat_dmaca);
        RSPI0.SPCR.BIT.SPTIE = 0;
        R_RSPI_IntSpriClear(my_rspi_handle);
        R_RSPI_IntSptiDmacdtcFlagSet(my_rspi_handle, RSPI_SET_TRANS_STOP);
    }

    if (false != (p_stat_dmaca.esif_stat))
    {
        ret_dmaca = R_DMACA_Control(DMACA_CH0, DMACA_CMD_ESIF_STATUS_CLR,
                                     (dmaca_stat_t*)&p_stat_dmaca);
    }

    return;
}
```

1.5 Schedule for Fixing the Problem
This problem will be fixed in the next version.
Revision History

<table>
<thead>
<tr>
<th>Rev.</th>
<th>Date</th>
<th>Page</th>
<th>Description</th>
</tr>
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<tr>
<td>1.00</td>
<td>Jul.01.20</td>
<td>-</td>
<td>First edition issued</td>
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