

[Notes]

R20TS0100EJ0100
Rev.1.00
Dec. 01, 2016

RX Driver Package,
RX Family 12-bit A/D Converter (S12AD) Module
Firmware Integration Technology,
RX65N/RX651 Group 12-bit A/D Converter (S12AD)
Firmware Integration Technology

Outline

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

1. Using the compare function of S12AD

1. Using the Compare Function of S12AD

1.1 Applicable Products

- RX Family 12-bit A/D Converter (S12AD) Firmware Integration Technology (S12AD FIT module)
- RX65N/RX651 Group 12-bit A/D Converter (S12AD) Firmware Integration Technology (RX65N S12AD FIT module)

The relevant revision and document are as shown in "Table 1, S12AD FIT Module Applicable Products" and "Table 2, RX65N S12AD FIT Module Applicable Product".

Table 1 S12AD FIT Module Applicable Products

S12AD FIT module revision	Document number
Rev.2.00	R01AN1666EU0200
Rev.2.10	R01AN1666EU0210
Rev.2.11	R01AN1666EJ0211

Table 2 RX65N S12AD FIT Module Applicable Product

RX65N S12AD FIT module revision	Document number
Rev.1.00	R01AN3545EJ0100

The problem also applies to the following RX Driver Package products which include the above S12AD FIT or RX65N S12AD FIT module*1.

Note 1: The S12AD FIT module is included as r_s12ad_rx_v*.*.zip (*.* is the revision number).

The RX65N S12AD FIT module is included as r_s12ad_rx65n_v1.00.zip.

- RX Driver Package

The product name and revision of the relevant RX Driver Package products and the revision of the included S12AD FIT module are as shown in "Table 3, Products Which Include the S12AD FIT Module".

Table 3 Products Which Include the S12AD FIT Module

RX Driver Package product name	RX Driver Package revision	Document number	Included FIT module and revision
RX110, RX111, RX113, RX130, RX230, RX231, RX23T, RX24T, RX63N, RX631, RX64M, RX71M Group RX Driver Package Ver.1.10	Rev.1.10	R01AN3345EJ0100	S12AD FIT module Rev.2.11
RX110, RX111, RX113, RX130, RX230, RX231, RX23T, RX24T, RX63N, RX631, RX64M, RX65N, RX651, RX71M Group RX Driver Package Ver.1.11	Rev.1.11	R01AN3467EJ0111	S12AD FIT module Rev.2.11
			RX65N S12AD FIT module Rev.1.00
RX64M, RX71M Group RX Driver Package Ver.1.02	Rev.1.02	R01AN2606EJ0102	S12AD FIT module Rev.2.10
	Rev.1.03	R01AN2606EJ0103	S12AD FIT module Rev.2.10
	Rev.1.04	R01AN2606EJ0104	S12AD FIT module Rev.2.10

1.2 Applicable MCUs

RX64M, RX65N/RX651, and RX71M groups

1.3 Details

The status flag clear processing of the compare function of S12AD in the RX64M, RX65N/RX651, and RX71M groups has an error. When applicable MCUs select a channel from AN116 to AN120 as the target channel of the compare function, the following phenomenon occurs due to the error.

- When interruption is not used (polling operation)

Either of the following phenomena will occur:

- Compare match for the target channel cannot be detected.
- Compare match for the target channel continues to be detected (false detection).

- When interruption is used

- A compare match interruption for the target channel continues to occur (a callback function continues to be called).

1.4 Condition

When S12AD of applicable MCUs uses a channel from AN116 to AN120 as the target channel and the compare function is used.

1.5 Workaround

To avoid this problem, take any of the following (1) and (2) steps.

(1) Change the source code of the S12AD FIT module to the correct processing.

In the source code, change the status flag clear processing of the compare function to the correct processing.

The details of the modification depend on the MCU in use.

The details of the modification are as follows. Modify the processing in blue to the processing in red for each function.

- RX64M or RX71M group

Change the `adc_get_and_clr_cmpi_flags` function in "r_s12ad_rx64m.c" or "r_s12ad_rx71m.c" as follows.

Before modification: Extract (1 part) from the source codes

```
static uint32_t adc_get_and_clr_cmpi_flags(uint8_t unit)
{
uint32_t  flags;

(Omit)

    flags |= ((uint32_t)S12AD1.ADCMPSR1.BIT.CMPF1) << 16;
    S12AD1.ADCMPANSR1.BIT.CMPS1 = 0;
```

After modification:

```
static uint32_t adc_get_and_clr_cmpi_flags(uint8_t unit)
{
uint32_t  flags;

(Omit)

    flags |= ((uint32_t)S12AD1.ADCMPSR1.BIT.CMPF1) << 16;
    S12AD1.ADCMPSR1.WORD = 0;
```

■ RX65N/RX651 group

Change the `adc_get_and_clr_cmpi_flags` function in "r_s12ad_rx65x.c" as follows.

Before modification: Extract (2 parts) from the source codes

```
static uint32_t adc_get_and_clr_cmpi_flags(uint8_t unit)
{
uint32_t  flags;

(Omit)

    flags |= (((uint32_t)S12AD1.ADCMPSR1.WORD) << 16);
    S12AD1.ADCMPANSR1.WORD = 0;

    if(0 == S12AD1.ADCMPANSR1.WORD)
    {
        nop();
    }
}
```

After modification:

```
static uint32_t adc_get_and_clr_cmpi_flags(uint8_t unit)
{
uint32_t  flags;

(Omit)

    flags |= (((uint32_t)S12AD1.ADCMPSR1.WORD) << 16);
    S12AD1.ADCMPSR1.WORD = 0;

    if(0 == S12AD1.ADCMPSR1.WORD)
    {
        nop();
    }
}
```

(2) Do not use the target channels.

Do not set a channel from AN116 to AN120 as the target channel of the compare function of S12AD.

1.6 Schedule for Fixing the Problem

- S12AD FIT module, RX65N S12AD FIT module

This problem will be fixed in Revision: Rev.2.20 (document number: R01AN1666EJ0220).

Remarks: The RX65N S12AD FIT module will be integrated into the S12AD FIT module from the next revision.

- RX Driver Package

The S12AD FIT module (Rev.2.20) modified in accord with this note will be included with the next version.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Dec. 01, 2016	-	First edition issued

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