[Notes]
CS+ Code Generator for RX,
e^2 studio Code Generator Plug-in,
AP4 Coding Assistance Tool for RX

R20TS0314EJ0100
Rev.1.00
Jun. 1, 2018

Outline

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

1. Using the voltage detection circuits

1. Using the Voltage Detection Circuits

1.1 Applicable Products

- V1.03.00 and later versions of CS+ Code Generator for RX (CS+ for CC V3.00)
- V2.0.2 and later versions of the Code Generator plug-in (e^2 studio V3.0.1.9)
- V1.02.00 and later versions of AP4 Coding Assistance Tool for RX

1.2 Applicable MCUs

- RX family: RX110, RX111, RX113, RX130, RX230, RX231, RX23T, and RX24T groups

1.3 Details

When using the voltage detection circuits (LVDAa and LVDAb), “wait time” must be added to the following function for the voltage monitoring 1 interrupt and the voltage monitoring 2 interrupt after code is generated.
- void R_LVDx_Start(void) function(Note) in the r_cg_lvd.c source file
Note: x = 1 or 2

Refer to the Technical Updates on the relevant MCUs for details.
https://www.renesas.com/search/keyword-search.html#genre=document&q=tnrxa194

1.4 Workaround

In the body of the following function, set the LVDnCMPE bit(Note 1) to “1” (voltage monitoring n circuit comparison result output enable(Note 1)) and then add “wait time of 2 us (2 microseconds) or longer”.
- void R_LVDx_Start(void) function(Note 2) in the r_cg_lvd.c source file
Note 1: n = 1 or 2
Note 2: x = 1 or 2

- Example: When using the LVD1 voltage detection circuit

  Add the processing in red in the body of the void R_LVD1_Start(void) function in r_cg_lvd.c.

Before modification:

```
void R_LVD1_Start(void)
{
    uint16_t protect_dummy = (uint16_t)(SYSTEM.PRCR.WORD & 0x000FU);
    uint16_t w_count;

    /* Disable protect bit */
    SYSTEM.PRCR.WORD = 0xA508U;

    SYSTEM.LVCMPCR.BIT.LVD1E = 1U;

    /* Wait for LVD voltage detection to start */
    for (w_count = 0U; w_count <= _453_LVD1_STABLE_WAIT_TIME; w_count++)
    {
        nop();
    }

    SYSTEM.LVD1CR0.BIT.LVD1CMPE = 1U;
    SYSTEM.LVD1SR.BIT.LVD1DET = 0U;
    SYSTEM.LVD1CR0.BIT.LVD1RIE = 1U;

    /* Non-Maskable Interrupt Status Clear Register setting */
    ICU.NMICLR.BIT.LVD1CLR = 1U;

    /* Non-Maskable Interrupt Enable Register setting */
    ICU.NMIER.BIT.LVD1EN = 1U;

    /* Restore the previous state of the protect register */
    SYSTEM.PRCR.WORD = (uint16_t)(0xA500U | protect_dummy);
}
```

After modification:

```
void R_LVD1_Start(void)
{
    uint16_t protect_dummy = (uint16_t)(SYSTEM.PRCR.WORD & 0x000FU);
    uint16_t w_count;

    /* Disable protect bit */
    SYSTEM.PRCR.WORD = 0xA508U;

    SYSTEM.LVCMPCR.BIT.LVD1E = 1U;

    /* Wait for LVD voltage detection to start */
    for (w_count = 0U; w_count <= _453_LVD1_STABLE_WAIT_TIME; w_count++)
    {
        nop();
    }

    SYSTEM.LVD1CR0.BIT.LVD1CMPE = 1U;
    for (w_count = 0U; w_count <= _453_LVD1_STABLE_WAIT_TIME; w_count++)
    {
        nop();
    }
    SYSTEM.LVD1SR.BIT.LVD1DET = 0U;
    SYSTEM.LVD1CR0.BIT.LVD1RIE = 1U;

    /* Non-Maskable Interrupt Status Clear Register setting */
    ICU.NMICLR.BIT.LVD1CLR = 1U;

    /* Non-Maskable Interrupt Enable Register setting */
    ICU.NMIER.BIT.LVD1EN = 1U;

    /* Restore the previous state of the protect register */
    SYSTEM.PRCR.WORD = (uint16_t)(0xA500U | protect_dummy);
}
```

1.5 Schedule for Fixing the Problem

This problem will be fixed in a later version. A revised version will be available in July 2018.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Jun. 1, 2018	-	First edition issued

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■Inquiry

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