

RENESAS TECHNICAL UPDATE

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

Product Category	MPU/MCU		Document No.	TN-RX*-A0214A/E	Rev.	1.00
Title	Note on Accessing Registers when the Battery Backup Function Is Not Used in RX230 Group and RX231 Group		Information Category	Technical Notification		
Applicable Product	RX230 Group, RX231 Group	Lot No.	Reference Document	RX230 Group, RX231 Group User's Manual: Hardware Rev.1.20 (R01UH0496EJ0120)		
		All				

This document describes a note on access to registers in the battery backup power domain when the battery backup function is not to be used in the case of RX230 and RX231 group products.

1. Note

In the case of access to registers in the battery backup power domain immediately after the VBATTCR.VBATDIS bit is set to 1 (battery backup function disabled) while the VCC voltage is less than 2.23 V after power has been turned on, the registers may not be read or written correctly.

2. Cause

While power is being turned on, power is not supplied to the battery backup power domain until the VCC voltage has reached 2.23 V or the VBATTCR.VBATDIS bit is set to 1.

The supply of power to the battery backup power domain starts when the VCC voltage reaches 2.23 V or the VBATTCR.VBATDIS bit is set to 1. The voltage in the domain takes a certain time to reach the operating voltage.

Correct reading or writing is not possible in the case of access to the registers in the domain during this period.

3. Countermeasure

When the battery backup function is not to be used, set the VBATTCR.VBATDIS bit to 1, wait until the VBATTSR.VBATRLVDETF flag can be cleared, and then access the registers in the battery backup power domain.

4. Corrections to the User's Manual

The following corrections are made to the User's Manual: Hardware with regard to the note covered in this document.

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Figure 12.2, Operation for Switching to Battery Backup Function is corrected as follows.

Before correction

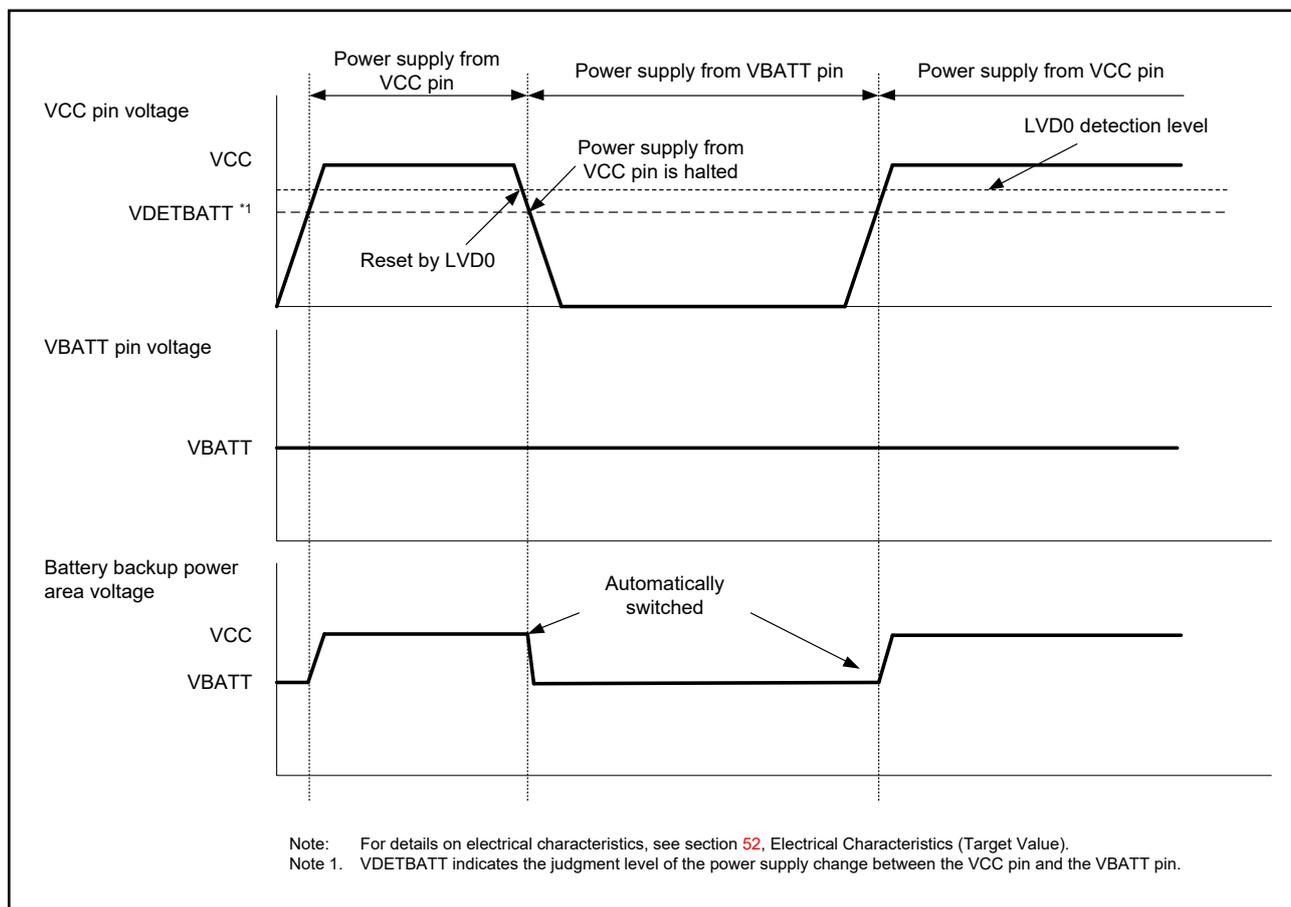


Figure 12.2 Operation for Switching to Battery Backup Function

After correction

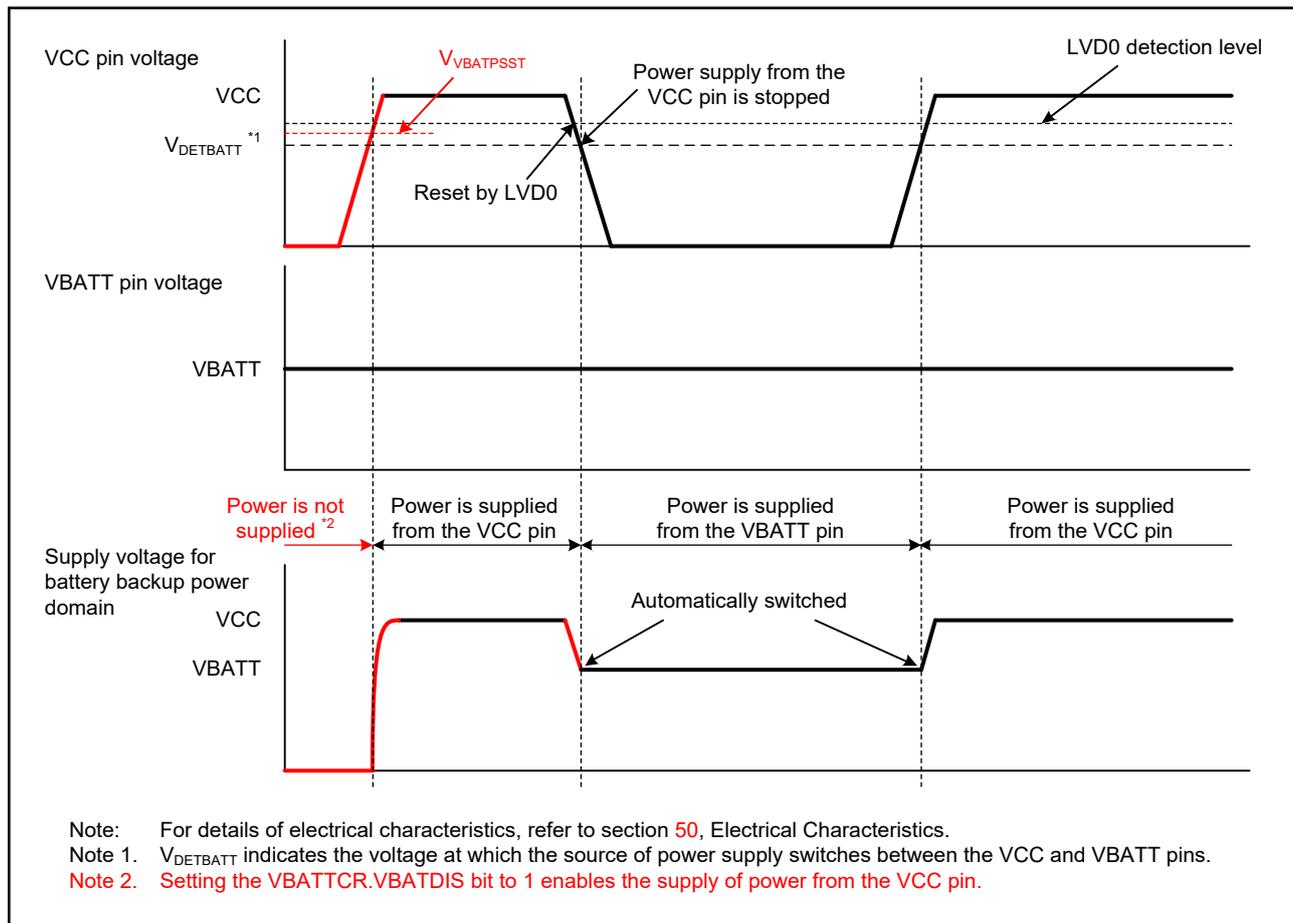


Figure 12.2 Switching to Battery Backup as the Source of Power

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2 in 12.4, Usage Notes is corrected as follows.

Before correction

2. When the battery backup function is not used, set the VBATTTCR.VBATTDIS bit to 1 (battery backup function disabled).

After correction

2. When the battery backup function is not **to be** used, set the VBATTTCR.VBATTDIS bit to 1 (battery backup function disabled). **After that, wait until clearing of the VBATTISR.VBATRLVDETF flag becomes possible and proceed to the next step. Figure 12.5 shows an example of the procedure for setting the VBATTTCR register.**

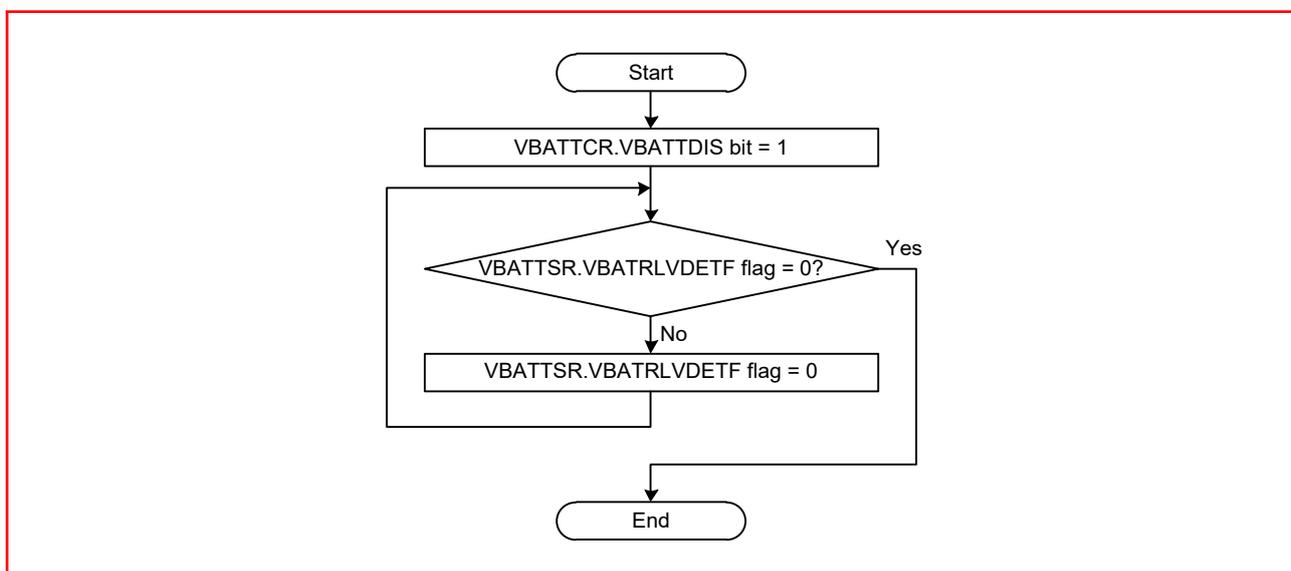


Figure 12.5 Example of the Procedure for Setting the VBATTTCR Register when Battery Backup Function is Not to be Used

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The characteristic of $V_{VBATPSST}$ is added to Table 50.61, Battery Backup Function Characteristics, and some descriptions are modified as follows.

Before correction

Table 50.61 Battery Backup Function Characteristics

Conditions: $1.8\text{ V} \leq VCC = VCC_USB = AVCC0 \leq 5.5\text{ V}$, $1.8\text{ V} \leq VBATT \leq 5.5\text{ V}$, $VSS = AVSS0 = VREFL0 = VSS_USB = 0\text{ V}$, $T_a = -40\text{ to }+105^\circ\text{C}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Voltage level for switching to battery backup (falling)	$V_{DETBATT}$	1.99	2.09	2.19	V	Figure 50.79	
Hysteresis width	V_{VBATTH}	—	100	—	mV		
VCC-off period for starting power supply switching	$t_{V\text{OFFBATT}}$	—	—	350	μs		
Allowable voltage change rising/falling gradient	$dt/dVCC$	1.0	—	—	ms/V	Figure 50.7	
Level for detection of voltage drop on the VBATT pin (falling)	VBTLVDLVL[1:0] = 10b	$V_{DETBATLVD}$	2.11	2.20	2.29	V	Figure 50.79
	VBTLVDLVL[1:0] = 11b		1.87	2.00	2.13	V	
Hysteresis width for detection of voltage drop on the VBATT pin	$V_{BATLVDH}$	—	50	—	mV		

Note: The VCC-off period for starting power supply switching indicates the period in which VCC is below the minimum value of the voltage level for switching to battery backup ($V_{DETBATT}$).

After correction

Table 50.61 Battery Backup Function Characteristics

Conditions: $1.8\text{ V} \leq VCC = VCC_USB = AVCC0 \leq 5.5\text{ V}$, $1.8\text{ V} \leq VBATT \leq 5.5\text{ V}$, $VSS = AVSS0 = VREFL0 = VSS_USB = 0\text{ V}$, $T_a = -40\text{ to }+105^\circ\text{C}$

Item	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Battery backup switching threshold voltage (negative-going)	$V_{DETBATT}$	1.99	2.09	2.19	V	Figure 50.79	
Hysteresis voltage	V_{VBATTH}	—	100	—	mV		
VCC-off period for switching power supply ^{*1}	$t_{V\text{OFFBATT}}$	—	—	350	μs		
Voltage change ramp rate	$dt/dVCC$	1.0	—	—	ms/V		
VBATT pin low voltage detection level (negative-going)	VBTLVDLVL[1:0] = 10b	$V_{DETBATLVD}$	2.11	2.20	2.29	V	Figure 50.79
	VBTLVDLVL[1:0] = 11b		1.87	2.00	2.13	V	
Hysteresis voltage for VBATT pin low voltage detection	$V_{BATLVDH}$	—	50	—	mV		
Power supply starting threshold voltage for the battery backup power domain (from a cold start) ^{*2}	$V_{VBATPSST}$	—	—	2.23	V		

Note 1. The VCC-off period for switching power supply indicates the period from VCC falling below the minimum value of the battery backup switching threshold voltage ($V_{DETBATT}$) until the source of supply is switched to VBATT. When the VCC recovers within this period, the source may not be switched to VBATT and supply from VCC is continued.

Note 2. When the VCC voltage has reached this threshold voltage, VCC is supplied as the source for the battery backup power domain. Disabling the battery backup function also leads to the supply of VCC as the source for the battery backup power domain.

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Figure 50.79, Battery Backup Function Characteristics is corrected as follows.

Before correction

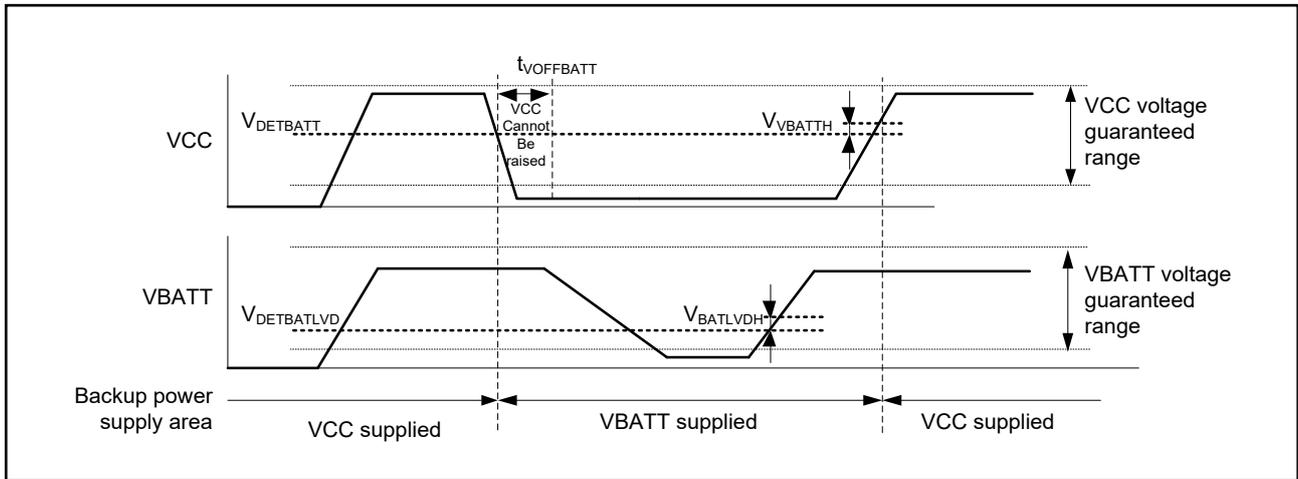


Figure 50.79 Battery Backup Function Characteristics

After correction

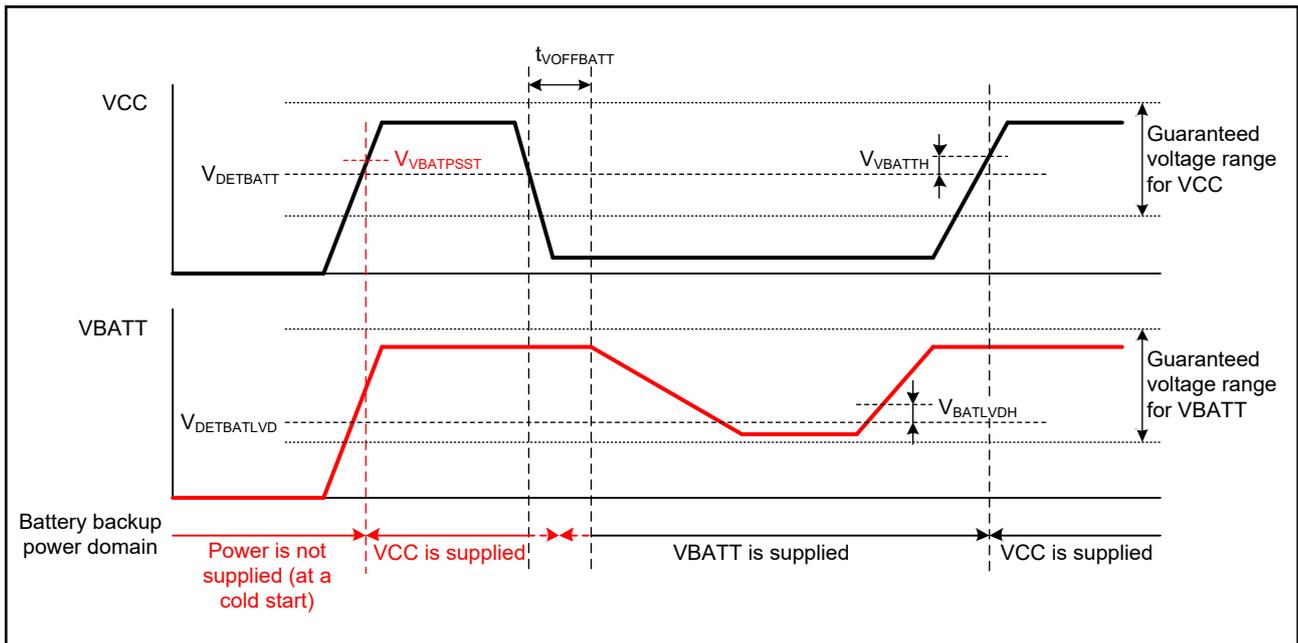


Figure 50.79 Battery Backup Function Characteristics