Date: Mar. 20, 2013

RENESAS TECHNICAL UPDATE

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Product Category	MPU & MCU		Document No.	TN-16C-A229A/E	Rev.	1.00
Title	Errata to R32C/102 Group, R32C/151 Group, R32C/152 Group, R32C/153 Group, R32C/156 Group, R32C/157 Group User's Manuals Regarding CAN Module		Information Category	Technical Notification		
Applicable Product	R32C/102 Group R32C/151 Group, R32C/152 Group R32C/153 Group, R32C/156 Group R32C/157 Group	Lot No.	Reference Document	User's Manuals: Hardware of Applicable Products		

This document describes corrections to the chapter "CAN module" in the User's Manuals: Hardware of the above groups.
The corrections are indicated in red in the list below.

Page and section numbers are based on the R32C/151 Group. Refer to the table on the last page for the corresponding pages and chapters in other groups.

•Page 470 of 628
The description in 25.1.20.8 BLIF Bit is corrected as follows:

Before correction

The BLIF bit is set to 1 if 32 consecutive dominant bits are detected on the CAN bus while the CAN module is in CAN operation mode.
After the BLIF bit is set to 1, 32 consecutive dominant bits are detected again under either of the following conditions:

- After this bit is set to 0 from 1, recessive bits are detected.
- After this bit is set to 0 from 1, the CAN module enters CAN reset mode or CAN halt mode and then enters CAN operation mode again.

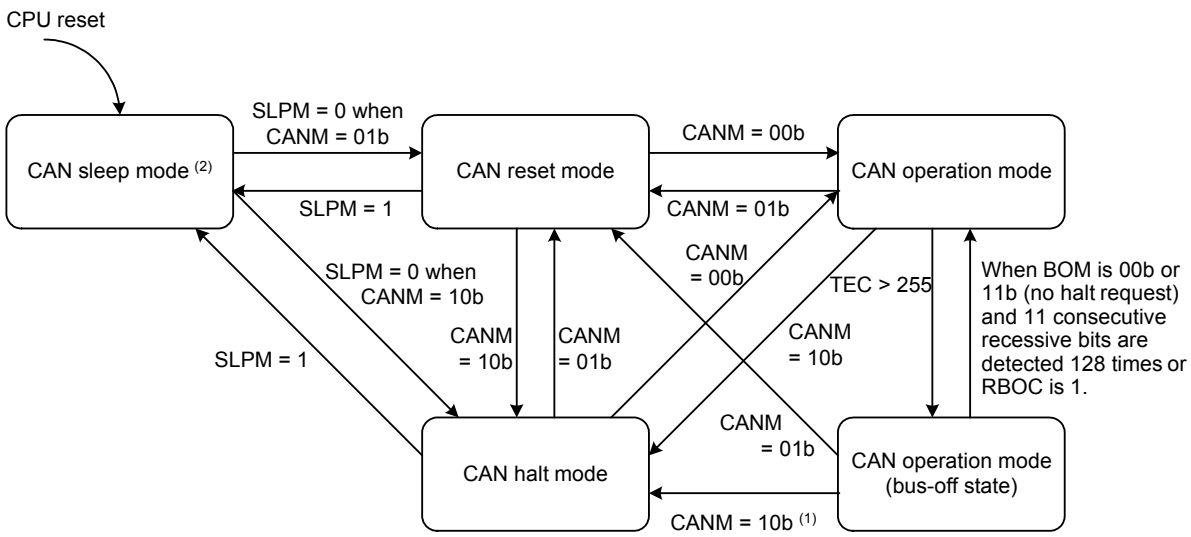
Corrections

The BLIF bit becomes 1 if 32 consecutive dominant bits are detected on the CAN bus while the CAN module is in CAN operation mode.
After the BLIF bit becomes 1, bus lock can be detected again after either of the following conditions is satisfied:

- After this bit is set to 0 from 1, recessive bits are detected (bus lock is resolved).
- After this bit is set to 0 from 1, the CAN module enters CAN reset mode and then enters CAN operation mode again (internal reset).

•Page 479 of 628
Note 3 is added to Figure 25.34 as follows:

Before correction

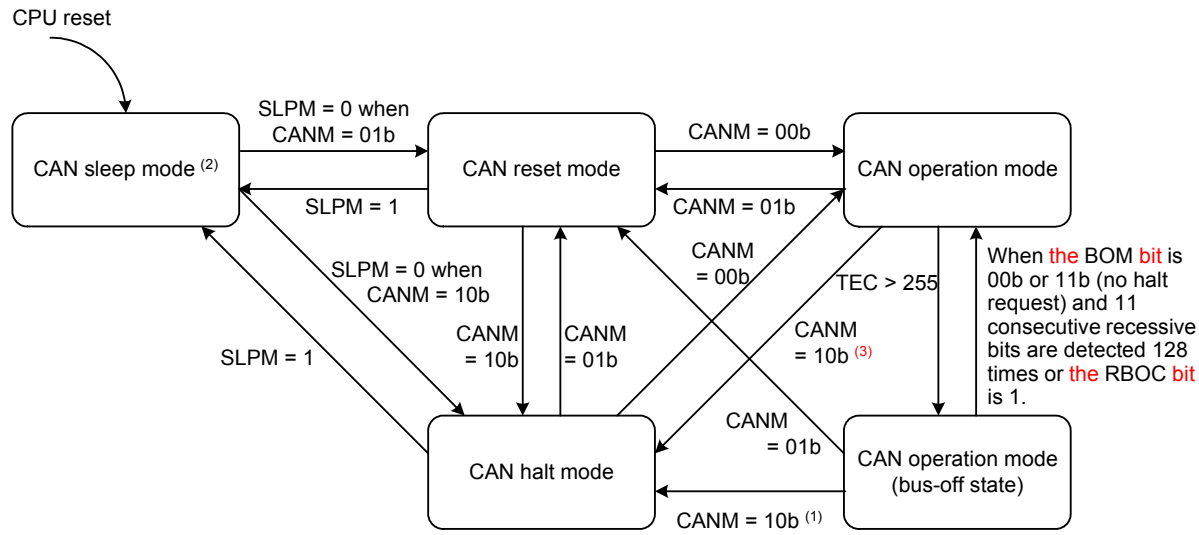


CANM, SLPM, BOM, and RBOC: Bits in the CiCTLR register

Notes:
1. The transition timing from the bus-off state to CAN halt mode depends on the setting of the BOM bit.
   - When the BOM bit is 01b, the state transition timing is immediately after entering the bus-off state.
   - When the BOM bit is 10b, the state transition timing is at the end of the bus-off state.
   - When the BOM bit is 11b, the state transition timing is at the setting of the CANM bit to 10b (CAN halt mode).
2. Write only to the SLPM bit to exit/set CAN sleep mode.

Figure 25.34 Transition between CAN Operating Modes (i = 0, 1)

Corrections



CANM, SLPM, BOM, and RBOC: Bits in the CiCTLR register

Notes:
1. The transition timing from the bus-off state to CAN halt mode depends on the setting of the BOM bit.
   - When the BOM bit is 01b, the state transition timing is immediately after entering the bus-off state.
   - When the BOM bit is 10b, the state transition timing is at the end of the bus-off state.
   - When the BOM bit is 11b, the state transition timing is at the setting of the CANM bit to 10b (CAN halt mode).
2. Write only to the SLPM bit to exit/set CAN sleep mode.
3. The CAN module does not enter CAN Halt mode while the CAN bus is locked in dominant state. Enter CAN reset mode instead.

Figure 25.34 Transition between CAN Operating Modes (i = 0, 1)

•Page 481 of 628
Table 25.9 is corrected as follows:

Before correction

Table 25.9 Operation in CAN Reset Mode and CAN Halt Mode

Mode	Receiver	Transmitter	Bus-Off
CAN reset mode	CAN module enters CAN reset mode without waiting for the end of message reception.	CAN module enters CAN reset mode after waiting for the end of message transmission. (1, 4)	CAN module enters CAN reset mode without waiting for the end of bus-off recovery.
CAN halt mode	CAN module enters CAN halt mode after waiting for the end of message reception. (2, 3)	CAN module enters CAN halt mode after waiting for the end of message transmission. (1, 4)	[When the BOM bit is 00b] A halt request from a program will be acknowledged only after bus-off recovery. [When the BOM bit is 01b] CAN module enters automatically to CAN halt mode without waiting for the end of bus-off recovery (regardless of a halt request from a program). [When the BOM bit is 10b] CAN module enters automatically to CAN halt mode after waiting for the end of bus-off recovery (regardless of a halt request from a program). [When the BOM bit is 11b] CAN module enters CAN halt mode (without waiting for the end of bus-off recovery) if a halt is requested by a program during bus-off.

BOM bit: Bit in the CiCTLR register (i = 0, 1)
Notes:
1. If several messages are requested to be transmitted, mode transition occurs after the completion of the first transmission. In a case that the CAN reset mode is being requested during suspend transmission, mode transition occurs when the bus is idle, the next transmission ends, or the CAN module becomes a receiver.
2. If the CAN bus is locked at the dominant level, the program can detect this state by monitoring the BLIF bit in the CiEIFR register.
3. If a CAN bus error occurs during reception after CAN halt mode is requested, the CAN mode transits to CAN halt mode.
4. If a CAN bus error or arbitration lost occurs during transmission after CAN reset mode or CAN halt mode is requested, the CAN mode transits to the requested CAN mode.

Corrections

Table 25.9 Operation in CAN Reset Mode and CAN Halt Mode

Mode	Receiver	Transmitter	Bus-off
CAN reset mode	CAN module enters CAN reset mode without waiting for the end of message reception	CAN module enters CAN reset mode after waiting for the end of message transmission (1, 4)	CAN module enters CAN reset mode without waiting for the end of bus-off recovery
CAN halt mode	CAN module enters CAN halt mode after waiting for the end of message reception (2, 3)	CAN module enters CAN halt mode after waiting for the end of message transmission (1, 2, 4)	- When the BOM bit is 00b A halt request from a program will be acknowledged only after bus-off recovery - When the BOM bit is 01b CAN module automatically enters CAN halt mode without waiting for the end of bus-off recovery (regardless of a halt request from a program) - When the BOM bit is 10b CAN module automatically enters CAN halt mode after waiting for the end of bus-off recovery (regardless of a halt request from a program) - When the BOM bit is 11b CAN module enters CAN halt mode (without waiting for the end of bus-off recovery) if a halt is requested by a program during bus-off

BOM bit: Bit in the CiCTLR register (i = 0, 1)

Notes:

1. If several messages are requested to be transmitted, mode transition occurs after the completion of the first message transmission. When CAN reset mode is being requested during suspend transmission, mode transition occurs when the bus is idle, the next transmission ends, or the CAN module becomes a receiver.
2. If the CAN bus is locked in dominant state, the program can detect this state by monitoring the BLIF bit in the CiEIFR register. The CAN module does not enter CAN Halt mode while the CAN bus is locked in dominant state. Enter CAN reset mode instead.
3. If a CAN bus error occurs during reception after CAN halt mode is requested, the CAN module enters CAN halt mode. However, the CAN module does not enter CAN Halt mode when the CAN bus is locked in dominant state.
4. If a CAN bus error or arbitration lost occurs during transmission after CAN reset mode or CAN halt mode is requested, the CAN module enters the requested operating mode. However, the CAN module does not enter CAN Halt mode when the CAN bus is locked in dominant state.

<Reference Documents>

Applicable Product	Manual and Document Number	Page Number, Figure/Title Number		
		BLIF Bit	Figure X.34	Table X.9
R32C/102 Group	R32C/102 Group User's Manual: Hardware Rev.1.01 (REJ09B0578-0101)	Page 409 24.1.20.8	Page 418 Figure 24.34	Page 420 Table 24.9
R32C/151 Group	R32C/151 Group User's Manual: Hardware Rev.1.10 (REJ09B0503-0110)	Page 470 25.1.20.8	Page 479 Figure 25.34	Page 481 Table 25.9
R32C/152 Group	R32C/152 Group User's Manual: Hardware Rev.1.10 (REJ09B0504-0110)	Page 484 25.1.20.8	Page 493 Figure 25.34	Page 495 Table 25.9
R32C/153 Group	R32C/153 Group User's Manual: Hardware Rev.1.10 (REJ09B0505-0110)	Page 498 25.1.20.8	Page 507 Figure 25.34	Page 509 Table 25.9
R32C/156 Group	R32C/156 Group User's Manual: Hardware Rev.1.10 (REJ09B0506-0110)	Page 469 25.1.20.8	Page 478 Figure 25.34	Page 480 Table 25.9
R32C/157 Group	R32C/157 Group User's Manual: Hardware Rev.1.10 (REJ09B0507-0110)	Page 483 25.1.20.8	Page 492 Figure 25.34	Page 494 Table 25.9