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RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-RA*-A0127A/E	Rev.	1.00
Title	RA8M1 Group, RA8D1 Group, RA8T1 Group, RA8E2 Group, correction of the bus function		Information Category	Technical Notification		
Applicable Product	RA8M1 Group RA8D1 Group RA8T1 Group RA8E2 Group	Lot No. All	Reference Document	RA8M1 Group User's Manual : Hardware Rev.1.10 RA8D1 Group User's Manual : Hardware Rev.1.10 RA8T1 Group User's Manual : Hardware Rev.1.10 RA8E2 Group User's Manual : Hardware Rev.1.00		

The descriptions of Buses and Port States in Each Processing Mode are corrected.

Added 14.9 Usage Notes

14.9.1 BC0 pin when in Software Standby Mode (SSTBY) and SBYCR.OPE=1 for RA8M1, RA8D1, RA8E2

Added 13.9 Usage Notes

13.9.1 BC0 pin when in Software Standby Mode (SSTBY) and SBYCR.OPE=1 for RA8T1

When entering Software Standby Mode with SBYCR.OPE = 1, the BC0 pin outputs the value of the least significant bit of the address signal most recently accessed. If you want to selectively output this value as a high-level or low-level, perform one of the following operations.

- If you want to output high-level, perform a dummy read of an odd address with an 8-bit data size before entering Software Standby Mode. If you want to output low-level, perform a dummy read of an even address before entering Software Standby Mode.
- Before entering Software Standby Mode, set BC0 pin to a general I/O port and output high-level or low-level. Set it to BC0 pin again after returning from Software Standby Mode.

If you do not specify a value for the BC0 pin in Software Standby Mode, these operations are not necessary.

Appendix 1. Port States in Each Processing Mode for RA8M1, RA8D1, RA8E2

Before correction

Function	**Pin function**	**Reset**	**Software Standby mode(SSTBY)**		**Deep Software Standby mode 1,2,3 (DSTBY1,2,3)**		**After Deep Software Standby mode is canceled (return to startup mode)**	
			OPE=0	**OPE=1**	**DSTBY1**	**DSTBY2/ DSTBY3**	**IOKEEP = 0**	**IOKEEP = 1[*1]**
External bus (CS, SDRAM area)	EBCLK/SDCLK	Hi-Z	High-level output		Keep		Hi-Z	Keep
	Dxx/DQxx	Hi-Z	Hi-Z		Hi-Z		Hi-Z	
	Axx/DQMx	Hi-Z	Hi-Z	Keep-O	Keep		Hi-Z	Keep
	BCx/CSx/RD/WRx/WE	Hi-Z	Hi-Z	High-level output	Keep		Hi-Z	Keep
	ALE	Hi-Z	Hi-Z	Low-level output	Keep		Hi-Z	Keep

	CKE/SDCS/RAS/CAS	Hi-Z	Hi-Z	SDSELF.SFEN = 0: High-level output SDSELF.SFEN = 1: Low-level output	Keep	Hi-Z	Keep
P400/P401	Other than function IRQ5-DS	Hi-Z	Keep-O*2		Hi-Z	Hi-Z	
Others	—	Hi-Z	Keep-O		Keep	Hi-Z	Keep

Note: Hi-Z: High-impedance
Keep-O: Output pins retain their previous values. Input pins go to high-impedance.
Keep-I: Pin states are retained same as during periods in Normal mode.
Keep: Pin states are retained same as during periods in Software Standby mode.
Note 1. Retains the I/O port state until the DPSBYCR.IOKEEP bit is cleared to 0.
Note 2. Input is enabled if the pin is specified as the Software Standby canceling source while it is used as an external interrupt pin.
Note 3. Input is enabled if the pin is specified as the Deep Software Standby canceling source.
Note 4. Input is enabled while the pin is used as an input pin.
Note 5. For host operation, set the USBHS.SYSCFG.DRPD bit to 1 to enable the USBHS_DP and USBHS_DM pull-down resistors.
For device operation, set the USBHS.SYSCFG.DPRPU bit to 1 to enable the DP pull-up resistor.

After correction

Function	**Pin function**	**Reset**	**Software Standby mode(SSTBY)**		**Deep Software Standby mode 1,2,3 (DSTBY1,2,3)**		**After Deep Software Standby mode is canceled (return to startup mode)**	
			OPE=0	**OPE=1**	**DSTBY1**	**DSTBY2/ DSTBY3**	**IOKEEP = 0**	**IOKEEP = 1*1**
External bus (CS, SDRAM area)	EBCLK/SDCLK	Hi-Z	High-level output		Keep		Hi-Z	Keep
	Dxx/DQxx	Hi-Z	Hi-Z		Hi-Z		Hi-Z	
	Axx/DQMx	Hi-Z	Hi-Z	Keep-O	Keep		Hi-Z	Keep
	BC0	Hi-Z	Hi-Z	*6	Keep		Hi-Z	Keep
	BC1 to BC3/CSx/RD/WRx/WE	Hi-Z	Hi-Z	High-level output	Keep		Hi-Z	Keep
	ALE	Hi-Z	Hi-Z	Low-level output	Keep		Hi-Z	Keep
	CKE/SDCS/RAS/CAS	Hi-Z	Hi-Z	SDSELF.SFEN = 0: High-level output SDSELF.SFEN = 1: Low-level output	Keep		Hi-Z	Keep
P400/P401	Other than function IRQ5-DS	Hi-Z	Keep-O*2		Hi-Z		Hi-Z	
Others	—	Hi-Z	Keep-O		Keep		Hi-Z	Keep

Note: Hi-Z: High-impedance
Keep-O: Output pins retain their previous values. Input pins go to high-impedance.
Keep-I: Pin states are retained same as during periods in Normal mode.
Keep: Pin states are retained same as during periods in Software Standby mode.
Note 1. Retains the I/O port state until the DPSBYCR.IOKEEP bit is cleared to 0.
Note 2. Input is enabled if the pin is specified as the Software Standby canceling source while it is used as an external interrupt pin.
Note 3. Input is enabled if the pin is specified as the Deep Software Standby canceling source.
Note 4. Input is enabled while the pin is used as an input pin.
Note 5. For host operation, set the USBHS.SYSCFG.DRPD bit to 1 to enable the USBHS_DP and USBHS_DM pull-down resistors.
For device operation, set the USBHS.SYSCFG.DPRPU bit to 1 to enable the DP pull-up resistor.
Note 6. Depending on the operation before the transition to Software Standby Mode, either High-level or Low-level is output. See section 14.9.1 BC0 pin when in Software Standby Mode (SSTBY) and SBYCR.OPE=1.

Appendix 1. Port States in Each Processing Mode for RA8T1

Before correction

Function	Pin function	Reset	Software Standby mode(SSTBY)		Deep Software Standby mode 1,2,3 (DSTBY1,2,3)		After Deep Software Standby mode is canceled (return to startup mode)	
			OPE=0	OPE=1	DSTBY1	DSTBY2/ DSTBY3	IOKEEP = 0	IOKEEP = 1[*1]
External bus (CS, SDRAM area)	EBCLK/SDCLK	Hi-Z	High-level output		Keep		Hi-Z	Keep
	Dxx/DQxx	Hi-Z	Hi-Z		Hi-Z		Hi-Z	
	Axx/DQMx	Hi-Z	Hi-Z	Keep-O	Keep		Hi-Z	Keep
	BCx/CSx/RD/WRx/WE	Hi-Z	Hi-Z	High-level output	Keep		Hi-Z	Keep
	ALE	Hi-Z	Hi-Z	Low-level output	Keep		Hi-Z	Keep
	CKE/SDCS/RAS/CAS	Hi-Z	Hi-Z	SDSELF.SFEN = 0: High-level output SDSELF.SFEN = 1: Low-level output	Keep		Hi-Z	Keep
P400/P401	Other than function IRQ5-DS	Hi-Z	Keep-O[*2]		Hi-Z		Hi-Z	
Others	—	Hi-Z	Keep-O		Keep		Hi-Z	Keep

Note: Hi-Z: High-impedance
Keep-O: Output pins retain their previous values. Input pins go to high-impedance.
Keep-I: Pin states are retained same as during periods in Normal mode.
Keep: Pin states are retained same as during periods in Software Standby mode.
Note 1. Retains the I/O port state until the DPSBYCR.IOKEEP bit is cleared to 0.
Note 2. Input is enabled if the pin is specified as the Software Standby canceling source while it is used as an external interrupt pin.
Note 3. Input is enabled if the pin is specified as the Deep Software Standby canceling source.
Note 4. Input is enabled while the pin is used as an input pin.

After correction

Function	Pin function	Reset	Software Standby mode(SSTBY)		Deep Software Standby mode 1,2,3 (DSTBY1,2,3)		After Deep Software Standby mode is canceled (return to startup mode)	
			OPE=0	OPE=1	DSTBY1	DSTBY2/ DSTBY3	IOKEEP = 0	IOKEEP = 1[*1]
External bus (CS, SDRAM area)	EBCLK/SDCLK	Hi-Z	High-level output		Keep		Hi-Z	Keep
	Dxx/DQxx	Hi-Z	Hi-Z		Hi-Z		Hi-Z	
	Axx/DQMx	Hi-Z	Hi-Z	Keep-O	Keep		Hi-Z	Keep
	BC0	Hi-Z	Hi-Z	[*5]	Keep		Hi-Z	Keep
	BC1 to BC3/CSx/RD/WRx/WE	Hi-Z	Hi-Z	High-level output	Keep		Hi-Z	Keep
	ALE	Hi-Z	Hi-Z	Low-level output	Keep		Hi-Z	Keep
	CKE/SDCS/RAS/CAS	Hi-Z	Hi-Z	SDSELF.SFEN = 0: High-level output SDSELF.SFEN = 1: Low-level output	Keep		Hi-Z	Keep
P400/P401	Other than function IRQ5-DS	Hi-Z	Keep-O[*2]		Hi-Z		Hi-Z	
Others	—	Hi-Z	Keep-O		Keep		Hi-Z	Keep

Note: Hi-Z: High-impedance
Keep-O: Output pins retain their previous values. Input pins go to high-impedance.
Keep-I: Pin states are retained same as during periods in Normal mode.
Keep: Pin states are retained same as during periods in Software Standby mode.
Note 1. Retains the I/O port state until the DPSBYCR.IOKEEP bit is cleared to 0.
Note 2. Input is enabled if the pin is specified as the Software Standby canceling source while it is used as an external interrupt pin.
Note 3. Input is enabled if the pin is specified as the Deep Software Standby canceling source.

Note 4. Input is enabled while the pin is used as an input pin.

Note 5. Depending on the operation before the transition to Software Standby Mode, either High-level or Low-level is output. See section 13.9.1 BC0 pin when in Software Standby Mode (SSTBY) and SBYCR.OPE=1.