

RENESAS TECHNICAL UPDATE

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Product Category	MPU/MCU		Document No.	TN-MC*-A022A/E	Rev.	1.00
Title	Notes on Use of IICRST with I2C Bus Interface 2 (IIC2) and I2C Bus Interface 3 (IIC3)		Information Category	Technical Notification		
Applicable Product	See below	Lot No.	Reference Document	See below		
		All				

The following is a supplemental description regarding use of I²C bus interface 2 (IIC2) and I²C bus interface 3 (IIC3) with applicable products as well as register functions. Note that in some products the register names ICCRA and ICCRB are used instead of ICCR1 and ICCR2, respectively. The registers in question are referred to below as ICCR1 and ICCR2, but the description should be taken to refer to ICCRA and ICCRB when appropriate.

Issue

Accessing ICE and IICRST during I²C bus operation

< Problem >

When 0 is written to ICE in ICCR1 or 1 is written to IICRST in ICCR2 during I²C bus operation, the values of BBSY in ICCR2 and STOP in ICSR become undefined.

< Conditions >

The above problem occurs when 0 is written to ICE in ICCR1 or 1 is written to IICRST in ICCR2 when any of conditions (1) to (4) below is satisfied.

- (1) In master transmit mode (MST = 1 and TRS = 1 in ICCR1), when the IIC2 or IIC3 module holds access rights to the I²C bus.
- (2) In master receive mode (MST = 1 and TRS = 0 in ICCR1), when the IIC2 or IIC3 module holds access rights to the I²C bus.
- (3) In slave transmit mode (MST = 0 and TRS = 1 in ICCR1), when the IIC2 or IIC3 module is performing a data transmit operation.
- (4) In slave receive mode (MST = 0 and TRS = 0 in ICCR1), when the IIC2 or IIC3 module is transmitting an acknowledge signal.

< Workarounds >

The undefined state of BBSY in ICCR2 can be canceled by using one of the following workarounds.

- BBSY is set to 1 when a start condition (SCL is high-level and SDA falling edge) is input.
- BBSY is cleared to 0 when an end condition (SCL is high-level and SDA rising edge) is input.
- In master transmit mode, write 1 to BBSY and 0 to SCP in ICCR2 while SCL and SDA are both high-level to generate a start condition. BBSY is set to 1 when a start condition (SCL is high-level and SDA falling edge) is output.

- In master transmit mode or master receive mode, when SDA is low-level and there is no device other than the IIC2 or IIC3 module to drive SCL low, write 0 to BBSY and SCP in ICCR2 to generate an end condition. BBSY is cleared to 0 when an end condition (SCL is high-level and SDA rising edge) is output.
- Writing 1 to FS in SAR causes BBSY to be cleared to 0. (This applies only to products with an FS bit in SAR.)

Supplemental Description of Register Functions

Using IICRST for register initialization

- Writing 1 to IICRST in ICCR2 causes SDAO and SCLO in ICCR2 to be set to 1.
- In master transmit mode or slave transmit mode, writing 1 to IICRST causes TDRE in ICSR to be set to 1.
- During a reset interval triggered by setting IICRST to 1, write access to BBSY, SCP, and SDAO in ICCR2 is disabled.
- Writing 1 to IICRST does not clear the BBSY bit in ICCR2 to 0. However, depending on the states of pins SCL and SDA, an end condition (SCL is high-level and SDA rising edge) may occur, resulting in BBSY being cleared to 0. In addition, there may be similar effects on other bits as well.
- During a reset interval triggered by setting IICRST to 1, data reception and transmission halts. However, the functions that detect start conditions, end conditions, and bus arbitration lost conditions are active. This means that the states of ICCR1, ICCR2, and ICSR may be updated, depending on the signals input to SCL and SDA.

[Applicable Products and Reference Documents]

Series	Group	Reference Document Title	Rev.	Document No.
H8/300H Tiny	H8/3687	H8/3687 Group Hardware Manual	5.00	REJ09B0027-0500
	H8/3694	H8/3694 Group Hardware Manual	5.00	REJ09B0028-0500
	H8/36049	H8/36049 Group Hardware Manual	3.00	REJ09B0060-0300
	H8/36064	H8/36064 Group Hardware Manual	2.00	REJ09B0068-0200
	H8/36077,H8/36079	H8/36079 Group H8/36077 Group Hardware Manual	3.00	REJ09B0216-0300
	H8/36087	H8/36087 Group Hardware Manual	2.00	REJ09B0160-0200
	H8/36094	H8/36094 Group Hardware Manual	1.00	REJ09B0268-0100
	H8/36109	H8/36109 Group Hardware Manual	1.50	REJ09B0240-0150
	H8/36912	H8/36912 Group H8/36092 Group Hardware Manual	3.00	REJ09B0105-0300
H8/300H Super Low Power	H8/38076R	H8/38076R Group Hardware Manual	4.00	REJ09B0093-0400
	H8/38086R	H8/38086R Group Hardware Manual	3.00	REJ09B0182-0300
	H8/38099	H8/38099 Group Hardware Manual	2.00	REJ09B0309-0200
	H8/38602R	H8/38602R Group Hardware Manual	3.00	REJ09B0152-0300
	H8/38776	H8/38776 Group Hardware Manual	1.00	REJ09B0348-0100
	H8/38799	H8/38799 Group Hardware Manual	1.00	REJ09B0380-0100
H8S/2300	H8S/2368	H8S/2368 Group Hardware Manual	6.00	REJ09B0050-0600
	H8S/2378, H8S/2378R	H8S2378 H8S/2378R Group Hardware Manual	7.00	REJ09B0109-0700
H8S/2400	H8S/2426,2426R,2424	H8S/2426 H8S/2426R H8S/2424 Group Hardware Manual	2.00	REJ09B0466-0200
	H8S/2437	H8S/2437 Group Hardware Manual	2.00	REJ09B0059-0200
	H8S/2456,2456R,2454	H8S/2456 H8S/2456R H8S/2454 Group Hardware Manual	2.00	REJ09B0467-0200
H8S/2500	H8S/2556,H8S/2552, H8S/2506	H8S/2556 Group H8S/2552 Group H8S/2506 Group Hardware Manual	6.00	REJ09B0099-0600
H8S Tiny	H8S/20115,20103, H8S/20215,20203, H8S/20235,20223	H8S/20103 H8S/20203 H8S/20223 H8S/20115 H8S/20215 H8S/20235 Group Hardware Manual	2.00	REJ09B0465-0200
H8SX/1500	H8SX/1544	H8SX/1544 Group Hardware Manual	3.00	REJ09B0381-0300
H8SX/1600	H8SX/1622	H8SX/1622 Group Hardware Manual	2.00	REJ09B0414-0200
	H8SX/1635,H8SX/1635L	H8SX/1635 Group H8SX/1636L Group Hardware Manual	2.00	REJ09B0496-0200
	H8SX/1638,H8SX/1638L	H8SX/1638 Group H8SX/1638L Group Hardware Manual	2.00	REJ09B0364-0200
	H8SX/1645,H8SX/1645L	H8SX/1645 Group H8SX/1645L Group Hardware Manual	2.00	REJ09B0497-0200
	H8SX/1648G,H8SX/1648H H8SX/1648A,H8SX/1648L	H8SX/1648 H8SX/1648A H8SX/1648L H8SX/1648G H8SX/1648H Group Hardware Manual	2.00	REJ09B0365-0200
	H8SX/1653	H8SX/1653 Group Hardware Manual	1.00	REJ09B0219-0100
	H8SX/1655,H8SX/1655M	H8SX/1655 Group H8SX/1655M Group Hardware Manual	2.00	REJ09B0499-0200
	H8SX/1658R,H8SX/1658M	H8SX/1658R Group H8SX/1658M Group Hardware Manual	2.00	REJ09B0413-0200
	H8SX/1663	H8SX/1663 Group Hardware Manual	1.00	REJ09B0294-0100
	H8SX/1665,H8SX/1665M	H8SX/1665 Group H8SX/1665M Group Hardware Manual	2.00	REJ09B0498-0200
	H8SX/1668R,H8SX/1668M	H8SX/1668R Group H8SX/1668M Group Hardware Manual	2.00	REJ09B0412-0200

Series	Group	Reference Document Title	Rev.	Document No.
SH7080	SH7083, SH7084, SH7085, SH7086	SH7080 Group Hardware Manual	4.00	REJ09B0181-0400
SH7137	SH7131, SH7132, SH7136, SH7137	SH7137 Group Hardware Manual	3.00	REJ09B0402-0300
SH7200	SH7201	SH7201 Group Hardware Manual	2.00	REJ09B0321-0200
	SH7203	SH7203 Group Hardware Manual	3.00	REJ09B0313-0300
	SH7205	SH7205 Group Hardware Manual	2.00	REJ09B0372-0200
	SH7206	SH7206 Group Hardware Manual	3.00	REJ09B0191-0300
SH7210	SH7211	SH7211 Group Hardware Manual	3.00	REJ09B0344-0300
SH7216	SH7214, SH7216	SH7216 Group Hardware Manual	1.01	REJ09B0543-0101
SH7260	SH7261	SH7261 Group Hardware Manual	2.00	REJ09B0320-0200
	SH7262, SH7264	SH7262 Group SH7264 Group Hardware Manual	2.00	REJ09B0445-0200
	SH7263	SH7263 Group Hardware Manual	3.00	REJ09B0290-0300
	SH7265	SH7265 Group Hardware Manual	2.00	REJ09B0351-0200
SH7280	SH7285, SH7286	SH7280 Group Hardware Manual	1.00	REJ09B0393-0100
SH7641	SH7641	SH7641 Hardware Manual	4.00	REJ09B0023-0400
SH-Ether	SH7652	SH7652 Group Hardware Manual	2.00	REJ09B0440-0200
	SH7670	SH7670 Group Hardware Manual	2.00	REJ09B0437-0200