To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: http://www.renesas.com

April 1st, 2010
Renesas Electronics Corporation

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RENESAS TECHNICAL UPD

Nippon Bldg., 2-6-2, Ohte-machi, Chiyoda-ku, Tokyo 100-0004, Japan
RenesasTechnology Corp.

Product Category	MPU&MCU		Document No.	TN-SH7-A468B/E	Rev.	2.0
Title	SH7760 changes of the electrical characteristics and USB module and other modules functional explanation.		Information Category	Technical Notification		
Applicable Product	SH7760	Lot No. ALL	Reference Document	SH7760 Hardware Manual (ADE-602-291 Rev.1.0)		

There are errata in the technical update (TN-SH7-468A/E) in the following points.

9. HAC Interface Module Signal Timing (Table 33.28)
10. SSI Interface Module Signal Timing (Table 33.29)

1. Absolute Maximum Ratings (Table 33.1)

Before change (rev 1.0)		After change	
Item	Symbol	Item	Symbol
I/O, CPG, ADC, USB power supply voltage	V_{DDQ} V_{DD-CPG} AV_{CC-ADC}	I/O, CPG, ADC power supply voltage	V_{DDQ} V_{DD-CPG} AV_{CC-ADC}

2. DC Characteristics (Table 33.2)

Item		Symbol	Before change (rev 1.0)			After change			Unit
			Min.	Typ.	Max.	Min.	Typ.	Max.	
Input voltage	I2C1_SCL,I2C1_SDA, I2C0_SCL,I2C_SDA	V_{IH}	$V_{DDQ} \times 0.8$	—	5.5	$V_{DDQ} \times 0.7$	—	5.5	V
	Other input pins		$V_{DDQ} \times 0.8$	—	V_{DDQ} + 0.3	2.2	—	V_{DDQ} + 0.3	
	I2C1_SCL,I2C1_SDA, I2C0_SCL,I2C_SDA	V_{IL}	–0.5	—	$V_{DDQ} \times 0.1$	–0.5	—	$V_{DDQ} \times 0.3$	

Before change (rev 1.0)

Notes: 1. Regardless of whether or not the PLL is used, connect V_{DDQ} and AV_{CC_ADC} to V_{DD-CPG}, $V_{DD-PLL1/2/3}$ to V_{DD}, and V_{SS-CPG} and $V_{SS-PLL1/2/3}$ to GND. The LSI may be damage when not filling this.

After change

Notes: 1. Regardless of whether or not the PLL is used, please supply the same voltage to V_{DDQ} , AV_{CC-ADC} and V_{DD-CPG}, supply the same voltage $V_{DD-PLL1/2/3}$ and V_{DD}, connect V_{SS}, V_{SS-CPG} and $V_{SS-PLL1/2/3}$ to GND. The LSI may be damage when not filling this.

The continuation from 2. DC Characteristics (Table 33.2)

Before change (rev 1.0)			After change		
Item		Symbol	Item		Symbol
Output voltage	all output pins	V_{OH}	Output voltage	all output pins*6	V_{OH}

After change

Notes: 6. I2Cn_SCL and I2Cn_SDA pins are removed.

3. CMT Module Signal Timing (Table 33.13)

Item	Symbol	Before change (rev 1.0)		After change		Unit
		Min.	Max.	Min.	Max.	
CMT_CTR output delay time	t_{TMD}	—	36	—	8	ns
CMT_CTR input setup time	t_{TMS}	20	—	6	—	ns
CMT_CTR input hold time	t_{TMH}	20	—	2	—	ns

4. HCAN2 Module Signal Timing (Table 33.14)

Item	Symbol	Before change (rev 1.0)		After change		Unit
		Min.	Max.	Min.	Max.	
CAN_TX output delay time	t_{CAND}	—	100	—	6	ns
CAN_RX input setup time	t_{CANS}	100	—	4	—	ns
CAN_RX input hold time	t_{CANH}	100	—	2.5	—	ns

5. GPIO Signal Timing (Table 33.15)

Item	Symbol	Before change (rev 1.0)		After change		Unit
		Min.	Max.	Min.	Max.	
GPIO output delay time	t_{IOPD}	—	20	—	9	ns
GPIO input setup time	t_{IOPS}	20	—	7	—	ns
GPIO input hold time	t_{IOPH}	20	—	5	—	ns

6. I^2C Electrical Characteristics (2. I^2C DC characteristics) (Table 33.17)

Item	Symbol	Before change (rev 1.0)		After change		Unit
		Min.	Max.	Min.	Max.	
Input voltage	t_{IH}	$V_{DDQ} \times 0.8$	5.5	$V_{DDQ} \times 0.7$	5.5	V
	t_{IL}	– 0.5	$V_{DDQ} \times 0.1$	– 0.5	$V_{DDQ} \times 0.3$	V

7. I^2C Electrical Characteristics (3. I^2C AC characteristics) (Table 33.18)

Item	Symbol	Before change (rev 1.0)			After change			Unit
		Min.	Typ.	Max.	Min.	Typ.	Max.	
I2Cn_SCL frequency	t_{Icyc}	0	—	400	—	—	400	kHz
I2Cn_SCL/I2Cn_SDA rise time	t_{ICr}	—	—	300	20 + 0.1Cb*	—	300	ns
I2Cn_SCL/I2Cn_SDA fall time	t_{ICf}	—	—	300	20 + 0.1Cb*	—	300	ns

After change

Note: * Cb is the total capacity of one bus line. (max. 400pF)

8. I^2C Electrical Characteristics (4. I^2C Schmitt characteristics) (Table 33.19)

Item	Symbol	Before change (rev 1.0)		After change		Unit
		Min.	Max.	Min.	Max.	
Threshold voltage	VTT+	—	$V_{DDQ} \times 0.8$	$V_{DDQ} \times 0.7$	—	V
	VTT–	$V_{DDQ} \times 0.1$	—	—	$V_{DDQ} \times 0.3$	V

9 HAC Interface Module Signal Timing (Table 33.28)

Item	Symbol	Before change (rev 1.0)		After change		Unit
		Min.	Max.	Min.	Max.	
HAC_BIT_CLK Input high level width	t_{ICL_HIGH}	$t_{pcyc}/2$	—	2 x t_{pcyc}	—	ns
HAC_BIT_CLK Input low level width	t_{ICL_Low}	$t_{pcyc}/2$	—	2 x t_{pcyc}	—	ns

10. SSI Interface Module Signal Timing (Table 33.29)

Item	Symbol	Before change (rev 1.0)		After change		Unit
		Min.	Max.	Min.	Max.	
Output cycle time	t_{OSCK}	T.B.D	T.B.D	40	710	ns
Input cycle time	t_{ISCK}	T.B.D	T.B.D	80	3300	ns
Input high level width / Input low level width	t_{IHC}/t_{ILC}	T.B.D	—	30	—	ns
Output high level width / Output low level width	t_{OHC}/t_{OLC}	T.B.D	—	13	—	ns

11. A/D Converter Characteristics (Table 33.30)

Before change (rev 1.0)
Notes: 2. $AV_{CC\text{-}ADC}$= GND

After change
Notes: 2. $AV_{SS\text{-}ADC}$= GND

12. Section 16 Timer/Counter (CMT)

(1) 16.4.4 16-Bit Timer: Input Capture 4 lines

Before change (rev 1.0)
The counters will retain their values or can be cleared to H'0000 by disabling the timer enable bits.
After change
The counters will be cleared to H'0000 by disabling the timer enable bits.

(2) 16.4.5 16-Bit Timer: Output Compare 6 lines

Before change (rev 1.0)
The counters will retain their values or can be cleared to H'0000 by disabling the timer enable bits.
After change
The counters will be cleared to H'0000 by disabling the timer enable bits.

(3) 16.4.7 Counter: Up-Counter with Capture 4 lines

Before change (rev 1.0)
The counters will retain their values or can be cleared to H'0000 by disabling the timer enable bits.
After change
The counters will be cleared to H'0000 by disabling the timer enable bits.

13. Section 21 USB Host Module (USB)

Before change (rev 1.0)

The USB Host Controller module supports Open Host Controller Interface (Open HCI) Specification for the Universal Serial Bus (USB) as well as the Universal Serial Bus specification Ver.1.1.

After change

The USB Host Controller module supports Open Host Controller Interface (Open HCI) Specification*2 for the Universal Serial Bus (USB) as well as the Universal Serial Bus specification Ver.1.1 *1.

[Note] *1 : Moreover, refer to the USB Host Electrical Characteristics section for the electrical characteristics of USB Host.

*2 : Part of registers is not supported. For details, see section 21.3, Register Descriptions and section 21.6, Restrictions on HcRhDescriptorA.