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RENESAS TECHNICAL UPDATE

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Product Category	MPU&MCU		Document No.	TN-SH7-A648A/E	Rev.	1.00
Title	Differences between the current version and the slim version of the SH7146 series		Information Category	Product Generation Change		
Applicable Product	SH7146F series □ SH7149F series SH7146M series □ SH7149M series		Lot No.	Reference Document	SH7146 Group Hardware Manual REJ09B0229	
			all			

In the Slim version of the SH7146 series, a portion of the debugging functions have been removed and electrical characteristics such as consumption current and AC characteristic(s) have been improved. There is no change about reliability of device process and etc. However, actual power of characteristic is different because chip layout is different. Differences between the current version and the slim version of the SH7146 series are as follows.

1. Differences of type number

Table1 shows differences between the current version and the slim version of the SH7146 series.

Table 1. Differences between the current version and the slim version of the SH7146 series

Type	Group	Current version	Slim version	Remarks
Flash ROM	SH7146	R5F71464 R N80FPV □ R mask □ j	R5F71464 A N80FPV □ A mask □ j	Switch to the Slim version
		R5F71464 D R80FPV □ R mask □ j	R5F71464 D R80FPV □ A mask □ j	Switch to the Slim version
	SH7149	R5F71494 R N80FPV □ R mask □ j	R5F71494 A N80FPV □ A mask □ j	Switch to the Slim version
		R5F71494 D R80FPV □ R mask □ j	R5F71494 D R80FPV □ A mask □ j	Switch to the Slim version
		R5F71491 R Y80FAV □ R mask □ j	-	Continue mass production of the current version
Mask ROM	SH7146	R5M71464 A NXXXFPV* □ A mask □ j	R5M71464 B NXXXFPV* □ B mask □ j	Switch to the Slim version
		R5M71464 D XXXXFPV* □ A mask □ j	R5M71464 D XXXXFPV* □ B mask □ j	Switch to the Slim version
	SH7149	R5M71494 A NXXXFPV* □ A mask □ j	R5M71494 B NXXXFPV* □ B mask □ j	Switch to the Slim version
		R5M71494 D XXXXFPV* □ A mask □ j	R5M71494 D XXXXFPV* □ B mask □ j	Switch to the Slim version
		R5M71491 A YXXXFAV* □ A mask □ j	-	Continue mass production of the current version
Flash type supporting E10A full functions	SH7146	R5E71464 R N80FPV □ R mask □ j	-	Continue mass production of the current version
	SH7149	R5E71494 R N80FPV □ R mask □ j	-	Continue mass production of the current version
		R5E71491 R N80FAV □ R mask □ j	-	Continue mass production of the current version

[Note]* XXX: ROM code

2. Differences of functions and specifications

Table2 shows differences of functions and specifications between the current version and the slim version of the SH7146 series.

Table2 Differences of functions and specifications between the current version and the slim version of the SH7146 series

No	Type	Item	Description
1	Flash ROM	Reduce emulator function	Remove internal bus trace function
2			Reduce the number of brake channel (10ch-->4ch)
3		Reduce UBC PC trace function	Reduce the number of BRSR/BRDR register which stores branch source and branch destination address (8-->4)

3. Differences of characteristic

Table3 shows differences of characteristic between the current version and the slim version of the SH7146 series. Following characteristics are common in Flash ROM type and mask ROM type.

Table 3.1 Differences of characteristic between the current version and the Slim version (power supply current)

No	Item	Symbol	Outside guaranteed value				Remark	
			Current version		Slim version			
			Typ.	Max.	Typ.	Max.		
1	power supply current	Icc	In normal operation	<u>150mA</u>	<u>165mA</u>	<u>80mA</u>	<u>125mA</u>	
			In sleep mode	<u>140mA</u>	<u>150mA</u>	<u>65mA</u>	<u>110mA</u>	
			In software standby mode	<u>20mA</u>	<u>60mA</u>	<u>10mA</u>	<u>40mA</u>	Ta□ 50□ Ž
				-	<u>120mA</u>	-	<u>80mA</u>	50□ Ž fa
			In deep software standby mode	<u>20uA</u>	<u>50uA</u>	<u>5uA</u>	<u>30uA</u>	Ta□ 50□ Ž
				-	<u>120uA</u>	-	<u>80uA</u>	50□ Ž fa

Table 3.1 Differences of characteristic between the current version and the Slim version (AC bus timing)

No	Item	Symbol	Outside guaranteed value				Remark	
			Current version		Slim version			
			Min.	Max.	Min.	Max.		
1	AC bus timing	Address delay time 1	tAD1	1ns	<u>20ns</u>	1ns	<u>18ns</u>	
2		CS delay time	tCSD	1ns	<u>20ns</u>	1ns	<u>18ns</u>	
3		Read strobe delay time	tRSD	1/2tBcyc +1ns	1/2tBcyc + <u>20ns</u>	1/2tBcyc +1ns	1/2tBcyc + <u>18ns</u>	
4		Read data setup time 1	tRDS1	1/2tBcyc + <u>20ns</u>	-	1/2tBcyc + <u>18ns</u>	-	
5		Read data access time	tACC	tBcyc*□ n+1.5□ j - <u>35ns</u>	-	tBcyc*□ n+1.5□ j - <u>33ns</u>	-	
6		Access time from read strobe	tOE	tBcyc*□ n+1□ j - <u>35ns</u>	-	tBcyc*□ n+1□ j - <u>31ns</u>	-	
7		Write strobe delay time 1	tWSD1	1/2tBcyc +1ns	1/2tBcyc + <u>20ns</u>	1/2tBcyc +1ns	1/2tBcyc + <u>18ns</u>	
8		Write data delay time 1	tWDD1	-	<u>20ns</u>	-	<u>18ns</u>	
9		WAIT setup time	tWTS	1/2tBcyc + <u>18ns</u>	-	1/2tBcyc + <u>17ns</u>	-	
10		WAIT hold time	tWTH	1/2tBcyc + <u>18ns</u>	-	1/2tBcyc + <u>7ns</u>	-	