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Renesas Electronics Corporation

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R8C/10, R8C/11, R8C/12, R8C/13 Groups

Differences of R8C/10, R8C/11, R8C/12 and R8C/13 Groups

1. Abstract

The following document is for the reference when checking the differences of the R8C/10, R8C/11, R8C/12 and R8C/13 Groups.

2. Introduction

The application example described in this document is applied to the following MCUs:

- Applicable MCU: R8C/10, R8C/11, R8C/12 and R8C/13 Groups

3. Description of Differences

3.1 Functional Differences

Table 3.1 lists the Functional Differences(1).

Table 3.1 Functional Differences(1)

Item	R8C/10 Group	R8C/12 Group	R8C/11 Group	R8C/13 Group
Minimum Instruction Execution Time	62.5ns (f(XIN)=16MHz, VCC=3.0 to 5.5V) 100ns (f(XIN)=10MHz, VCC=2.7 to 5.5V)		50ns (f(XIN)=20MHz, VCC=3.0 to 5.5V) 100ns (f(XIN)=10MHz, VCC=2.7 to 5.5V)	
Data Flash	–	Included	–	Included
Reprogram Endurance of Program Area	Minimum 100 times	Minimum 1,000 times	Minimum 100 times	Minimum 1,000 times
Power-On Reset Function	–		Included	
Voltage Detection Circuit	–		Included Vdet detection Voltage detection interrupt Hardware reset 2	
Clock Generating Circuit	XIN, on-chip oscillator (low-speed)		XIN, on-chip oscillator (low-speed, high-speed)	
Watchdog Timer	Included	Included Reset start enabled	Included	Included Reset start enabled
Protect	Protect settable to CM0, CM1, OCD, PM0, PM1, PD0 registers		Protect settable to CM0, CM1, OCD, HR0, HR1, PM0, PM1, PD0, VCR2, D4INT registers	
Output Compare	–		Included Output compare mode of Timer C	
Return from Stop Mode by INT3	Disabled		Enabled when “no filter” and output compare mode are selected for Timer C	
A/D Converter	10 bits x 8 channels		10 bits x 12 channels	
Input Pin of A/D Converter	Select from port P0		Select from port P0, P1_0 to P1_3	
CPU Clock of EW1 Mode	5MHz or below	20MHz or below	5MHz or below	20MHz or below
Bit7 in FMR1 register	Set to “0”	Set to “1”	Set to “0”	Set to “1”
Disable Reprogramming Block 0, 1	Enabled	Enabled Settable every block	Enabled	Enabled Settable every block
0FFFFh Address	Write FFh	Option function selection register	Write FFh	Option function selection register

NOTES:
1. Refer to the hardware manual for details and electrical characteristics.

3.2 Differences of Pin Function

Table 3.2 lists the Differences of Pin Function.

Table 3.2 Differences of Pin Function

R8C/10, R8C/12 Groups	R8C/11, R8C/13 Groups	Remarks
P13/$\overline{\text{K13}}$/AN11	P13/$\overline{\text{K13}}$	
P12/$\overline{\text{K12}}$/AN10/CMP02	P12/$\overline{\text{K12}}$	
P11/$\overline{\text{K11}}$/AM9/CMP01	P11/$\overline{\text{K11}}$	
P10/$\overline{\text{K10}}$/AN8/CMP00	P10/$\overline{\text{K10}}$	
P32/$\overline{\text{INT2}}$/CNTR1/CMP12	P32/$\overline{\text{INT2}}$/CNTR1	
P31/TZOUT/CMP11	P31/TZOUT	
P30/$\overline{\text{CNTR0}}$/CMP10	P30/$\overline{\text{CNTR0}}$	

3.3 SFR Differences

Table 3.3 lists the SFR Differences.

Table 3.3 SFR Differences

R8C/10 Group	R8C/12 Group	R8C/11 Group	R8C/13 Group	Remarks
PM1	PM1	PM1	PM1	NOTES 1
–		HR0		
PRCR		PRCR		
–		HR1		
–		VCR1		
–		VCR2		
–		D4INT		
–		CMP1IC		
–		CMP0IC		
TCC0		TCC0		
TCC1		TCC1		
TM0		TM0		
–		TM1		
ADCON0		ADCON0		
–		TCOUT		
FMR1	FMR1	FMR1	FMR1	NOTES 1

NOTES:
1. SFRs of the R8C/10 and R8C/11 groups are the same. SFRs of the R8C/12 and R8C/13 groups are the same.

3.4 Differences of Interrupt Vector

Table 3.4 lists the Differences of Fixed Vector Tables and Table 3.5 lists the Differences of Relocatable Vector Table.

Table 3.4 Differences of Fixed Vector Tables

Interrupt Factor of R8C/10, R8C/12 Groups	Interrupt Factor of R8C/11, R8C/13 Groups
Watchdog timer Oscillation stop detection	Watchdog timer Oscillation stop detection Voltage detection

Table 3.5 Differences of Relocatable Vector Table

Interrupt Factor of R8C/10, R8C/12 Groups	Interrupt Factor of R8C/11, R8C/13 Groups	Software Interrupt Number
–	Compare 1	16
–	Compare 0	28

4. Reference

Hardware Manual
- R8C/10 Group Hardware Manual
- R8C/11 Group Hardware Manual
- R8C/12 Group Hardware Manual
- R8C/13 Group Hardware Manual

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REVISION HISTORY	R8C/10, R8C/11, R8C/12, R8C/13 Groups Differences of R8C/10, R8C/11, R8C/12 and R8C/13 Groups

Rev.	Date	Description	
		Page	Summary
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