Smart Configurator for RX V2.2.0

Release Note

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Introduction

Thank you for using the Smart Configurator for RX.

This document describes the restrictions and points for caution. Read this document before using the product.

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1. Introduction

Smart Configurator is a utility for combining software to meet your needs. It supports the following three functions related to the embedding of Renesas drivers in your systems: importing middleware, generating driver code, and setting pins.

1.1 System requirements

The operating environment is as follows.

1.1.1 PC

- IBM PC/AT compatibles (Windows® 10, Windows® 8.1, Windows® 7)
- Processor: 1 GHz or higher (must support hyper-threading, multi-core CPUs)
- Memory capacity: 2 GB or more recommended. Minimum requirement is 1 GB or more (64-bit Windows requires 2 GB or more)
- Hard disk capacity: 200 MB or more spare capacity
- Display: 1024 x 768 or higher resolution, 65,536 or more colors
- All other necessary software environments in addition to Windows OS: .NET Framework version4.5

1.1.2 Development Environments

- Renesas electronics Compiler for RX [CC-RX] V3.01.00 or later
- GCC for Renesas 4.8.4.201902 or later (*1)
- IAR Embedded Workbench 4.10.2 or later (*2)

(*1) RX23W is not supported
(*2) RX110, RX23W and RX72M are not supported

2. Support List

2.1 Support Devices List

Below is a list of devices supported by the Smart Configurator for RX V2.2.0.

Table 2-1 Support Devices

Group (HW Manual number)	PIN	Device name
RX110 Group (R01UH0421EJ0120)	36pin	R5F5110HAxLM, R5F5110JAxLM, R5F51101AxLM, R5F51103AxLM
	40pin	R5F51101AxNF, R5F51103AxNF, R5F5110HAxNF, R5F5110JAxNF
	48pin	R5F51101AxNE, R5F51103AxNE, R5F51104AxNE, R5F51105AxNE, R5F5110JAxNE, R5F51101AxFL, R5F51103AxFL, R5F51104AxFL, R5F51105AxFL, R5F5110JAxFL
	64pin	R5F51101AxLF, R5F51103AxLF, R5F51104AxLF, R5F51105AxLF, R5F5110JAxLF, R5F51101AxFK, R5F51103AxFK, R5F51104AxFK, R5F51105AxFK, R5F5110JAxFK, R5F51101AxFM, R5F51103AxFM, R5F51104AxFM, R5F51105AxFM, R5F5110JAxFM
RX111 Group (R01UH0365EJ0130)	36pin	R5F51111AxLM, R5F51113AxLM, R5F5111JAxLM
	40pin	R5F51111AxNF, R5F51113AxNF, R5F5111JAxNF
	48pin	R5F51111AxFL, R5F51113AxFL, R5F51114AxFL, R5F51115AxFL, R5F51116AxFL, R5F51117AxFL, R5F51118AxFL, R5F5111JAxFL, R5F51111AxNE, R5F51113AxNE, R5F51114AxNE, R5F51115AxNE, R5F51116AxNE, R5F51117AxNE, R5F51118AxNE, R5F5111JAxNE
	64pin	R5F51111AxFM, R5F51113AxFM, R5F51114AxFM, R5F51115AxFM, R5F51116AxFM, R5F51117AxFM, R5F51118AxFM, R5F5111JAxFM, R5F51111AxFK, R5F51113AxFK, R5F51114AxFK, R5F51115AxFK, R5F51116AxFK, R5F51117AxFK, R5F51118AxFK, R5F5111JAxFK, R5F51111AxLF, R5F51113AxLF, R5F51114AxLF, R5F51115AxLF, R5F51116AxLF, R5F51117AxLF, R5F51118AxLF, R5F5111JAxLF
RX113 Group (R01UH0448EJ0110)	64pin	R5F51135AxFM, R5F51136AxFM, R5F51137AxFM, R5F51138AxFM
	100pin	R5F51135AxLJ, R5F51136AxLJ, R5F51137AxLJ, R5F51138AxLJ, R5F51135AxFP, R5F51136AxFP, R5F51137AxFP, R5F51138AxFP
RX130 Group (R01UH0560EJ0200)	48pin	R5F51303AxFL, R5F51305AxFL, R5F51303AxNE, R5F51305AxNE, R5F51306AxNE, R5F51306AxFL, R5F51307AxNE, R5F51307AxFL, R5F51308AxNE, R5F51308AxFL, R5F51306BxFL
	64pin	R5F51303AxFM, R5F51305AxFM, R5F51303AxFK, R5F51305AxFK, R5F51306AxFK, R5F51306AxFM, R5F51307AxFK, R5F51307AxFM, R5F51308AxFK, R5F51308AxFM R5F51308AxFK, R5F51308AxFM, R5F51306BxFK, R5F51306BxFM
	80pin	R5F51303AxFN, R5F51305AxFN, R5F51306AxFN, R5F51306BxFN
	100pin	R5F51305AxFP, R5F51306AxFP, R5F51307AxFP, R5F51308AxFP, R5F51305BxFP, R5F51306BxFP
RX230 Group (R01UH0496EJ0110)	48pin	R5F52305AxNE, R5F52306AxNE, R5F52305AxFL, R5F52306AxFL
	64pin	R5F52305AxND, R5F52306AxND, R5F52305AxFM, R5F52306AxFM, R5F52305AxLF, R5F52306AxLF
	100pin	R5F52305AxLA, R5F52306AxLA, R5F52305AxFP, R5F52306AxFP

Table 2-2 Support Devices

Group (HW Manual number)	PIN	Device name
RX231 Group (R01UH0496EJ0110)	48pin	R5F52315AxNE, R5F52316AxNE, R5F52317AxNE, R5F52318AxNE, R5F52315CxNE, R5F52316CxNE, R5F52317BxNE, R5F52318BxNE, R5F52315AxFL, R5F52316AxFL, R5F52317AxFL, R5F52318AxFL, R5F52315CxFL, R5F52316CxFL, R5F52317BxFL, R5F52318BxFL
	64pin	R5F52315AxND, R5F52316AxND, R5F52317AxND, R5F52318AxND, R5F52315CxND, R5F52316CxND, R5F52317BxND, R5F52318BxND, R5F52315AxFM, R5F52316AxFM, R5F52317AxFM, R5F52318AxFM, R5F52315CxFM, R5F52316CxFM, R5F52317BxFM, R5F52318BxFM, R5F52315CxLF, R5F52316CxLF
	100pin	R5F52315AxLA, R5F52316AxLA, R5F52317AxLA, R5F52318AxLA, R5F52315CxLA, R5F52316CxLA, R5F52317BxLA, R5F52318BxLA, R5F52315AxFP, R5F52316AxFP, R5F52317AxFP, R5F52318AxFP, R5F52315CxFP, R5F52316CxFP, R5F52317BxFP, R5F52318BxFP
RX23T Group (R01UH0520EJ0110)	48pin	R5F523T3AxFL, R5F523T5AxFL
	52pin	R5F523T5AxFD, R5F523T3AxFD
	64pin	R5F523T5AxFM, R5F523T3AxFM
RX24T Group (R01UH0576EJ0200)	64pin	R5F524TAAxFM, R5F524T8AxFM
	80pin	R5F524TAAxFF, R5F524T8AxFF, R5F524TAAxFN, R5F524T8AxFN
	100pin	R5F524TCAxFP, R5F524T8AxFP, R5F524TBAxFP, R5F524TEAxFP, R5F524TAAxFP
RX24U Group (R01UH0658EJ0100)	100pin	R5F524UEAxFP, R5F524UCAxFP, R5F524UBAxFP
	144pin	R5F524UEAxFB, R5F524UBAxFB, R5F524UCAxFB
RX64M Group (R01UH0377EJ0110)	100pin	R5F564MFCxFP, R5F564MFCxLJ, R5F564MFDxFP, R5F564MFDxLJ, R5F564MGCxFP, R5F564MGCxLJ, R5F564MGDxFP, R5F564MGDxLJ, R5F564MJCxFP, R5F564MJCxLJ, R5F564MJDxFP, R5F564MJDxLJ, R5F564MLCxFP, R5F564MLCxLJ, R5F564MLDxFP, R5F564MLDxLJ
	144/145pin	R5F564MFCxFB, R5F564MFCxLK, R5F564MFDxFB, R5F564MFDxLK, R5F564MGCxFB, R5F564MGCxLK, R5F564MGDxFB, R5F564MGDxLK, R5F564MJCxFB, R5F564MJCxLK, R5F564MJDxFB, R5F564MJDxLK, R5F564MLCxFB, R5F564MLCxLK, R5F564MLDxFB, R5F564MLDxLK
	176/177pin	R5F564MFDxFC, R5F564MFDxBG, R5F564MFDxLC, R5F564MFCxFC, R5F564MFCxBG, R5F564MFCxLC, R5F564MGDxFC, R5F564MGDxBG, R5F564MGDxLC, R5F564MGCxFC, R5F564MGCxBG, R5F564MGCxLC, R5F564MJDxFC, R5F564MJDxBG, R5F564MJDxLC, R5F564MJCxFC, R5F564MJCxBG, R5F564MJCxLC, R5F564MLDxFC, R5F564MLDxBG, R5F564MLDxLC, R5F564MLCxFC, R5F564MLCxBG, R5F564MLCxLC

Table 2-3 Support Devices

Group (HW Manual number)	PIN	Device name
RX65N Group (R01UH0590EJ0210)	100pin	R5F565N9AxLJ, R5F565N9BxLJ, R5F565N9ExLJ, R5F565N9FxLJ, R5F565N7AxLJ, R5F565N7BxLJ, R5F565N7ExLJ, R5F565N7FxLJ, R5F565N4AxLJ, R5F565N4BxLJ, R5F565N4ExLJ, R5F565N4FxLJ, R5F565N9AxFP, R5F565N9BxFP, R5F565N9ExFP, R5F565N9FxFP, R5F565N7AxFP, R5F565N7BxFP, R5F565N7ExFP, R5F565N7FxFP, R5F565N4AxFP, R5F565N4BxFP, R5F565N4ExFP, R5F565N4FxFP, R5F565NCHxLJ, R5F565NCDxLJ, R5F565NEHxLJ, R5F565NEDxLJ, R5F565NCHxFP, R5F565NCDxFP, R5F565NEHxFP, R5F565NEDxFP
	144/145pin	R5F565N9AxFB, R5F565N9BxFB, R5F565N9ExFB, R5F565N9FxFB, R5F565N7AxFB, R5F565N7BxFB, R5F565N7ExFB, R5F565N7FxFB, R5F565N4AxFB, R5F565N4BxFB, R5F565N4ExFB, R5F565N4FxFB, R5F565NCHxFB, R5F565NCDxFB, R5F565NEHxFB, R5F565NEDxFB, R5F565N9AxLK, R5F565N9BxLK, R5F565N9ExLK, R5F565N9FxLK, R5F565N7AxLK, R5F565N7BxLK, R5F565N7ExLK, R5F565N7FxLK, R5F565N4AxLK, R5F565N4BxLK, R5F565N4ExLK, R5F565N4FxLK, R5F565NCHxLK, R5F565NCDxLK, R5F565NEHxLK, R5F565NEDxLK
	176/177pin	R5F565NCHxBG, R5F565NCDxBG, R5F565NEHxBG, R5F565NEDxBG, R5F565NCHxFC, R5F565NCDxFC, R5F565NEHxFC, R5F565NEDxFC, R5F565NCHxLC, R5F565NCDxLC, R5F565NEHxLC, R5F565NEDxLC
RX651 Group (R01UH0590EJ0210)	64pin	R5F5651CHxFM,R5F56514FxFM, R5F5651EHxFM, R5F5651CDxFM, R5F56514FxBP, R5F56514BxFM, R5F56519FxBP, R5F5651CDxBP, R5F5651EDxBP, R5F5651EDxFM, R5F56517BxBP, R5F5651EHxBP, R5F56519BxBP, R5F56517FxBP, R5F5651CHxBP, R5F56519FxFM, R5F56517BxFM, R5F56514BxBP, R5F56519BxFM, R5F56517FxFM
	100pin	R5F56519AxLJ, R5F56519BxLJ, R5F56519ExLJ, R5F56519FxLJ, R5F56517AxLJ, R5F56517BxLJ, R5F56517ExLJ, R5F56517FxLJ, R5F56514AxLJ, R5F56514BxLJ, R5F56514ExLJ, R5F56514FxLJ, R5F56519AxFP, R5F56519BxFP, R5F56519ExFP, R5F56519FxFP, R5F56517AxFP, R5F56517BxFP, R5F56517ExFP, R5F56517FxFP, R5F56514AxFP, R5F56514BxFP, R5F56514ExFP, R5F56514FxFP
	144/145pin	R5F56519AxFB, R5F56519BxFB, R5F56519ExFB, R5F56519FxFB, R5F56517AxFB, R5F56517BxFB, R5F56517ExFB, R5F56517FxFB, R5F56514AxFB, R5F56514BxFB, R5F56514ExFB, R5F56514FxFB, R5F5651CDxFB, R5F5651CHxFB, R5F5651EDxFB, R5F5651EHxFB, R5F56519AxLK, R5F56519BxLK, R5F56519ExLK, R5F56519FxLK, R5F56517AxLK, R5F56517BxLK, R5F56517ExLK, R5F56517FxLK, R5F56514AxLK, R5F56514BxLK, R5F56514ExLK, R5F56514FxLK, R5F5651CDxLK, R5F5651CHxLK, R5F5651EDxLK, R5F5651EHxLK
	176/177pin	R5F5651CDxBG, R5F5651CDxFC, R5F5651CHxBG, R5F5651CHxFC, R5F5651EDxBG, R5F5651EDxFC, R5F5651EHxBG, R5F5651EHxFC, R5F5651CDxLC, R5F5651CHxLC, R5F5651EDxLC, R5F5651EHxLC

Table 2-4 Support Devices

Group (HW Manual number)	PIN	Device name
RX66T Group (R01UH0749EJ0100)	64pin	R5F566TAAxFM, R5F566TAExDFM, R5F566TEAxFM, R5F566TEExFM
	80pin	R5F566TAAxFF, R5F566TAExFF, R5F566TEAxFF, R5F566TEExFF, R5F566TAAxFN, R5F566TAExFN, R5F566TEAxFN, R5F566TEExFN
	100pin	R5F566TKCxFP, R5F566TAExFP, R5F566TFFxFP, R5F566TFCxFP, R5F566TFExFP, R5F566TFBxFP, R5F566TFAxFP, R5F566TABxFP, R5F566TAFxFP, R5F566TEFxFP, R5F566TKFxFP, R5F566TKGxFP, R5F566TKAxFP, R5F566TKExFP, R5F566TKBxFP, R5F566TEBxFP, R5F566TEExFP, R5F566TEAxFP, R5F566TAAxFP, R5F566TFGxFP
	112pin	R5F566TAAxFH, R5F566TAExFH, R5F566TEExFH, R5F566TEAxFH
	144pin	R5F566TKCxFB, R5F566TFGxFB, R5F566TFCxFB, R5F566TKGxFB
RX71M Group (R01UH0493EJ0110)	100pin	R5F571MLCxFP, R5F571MLDxFP, R5F571MLGxFP, R5F571MLHxFP, R5F571MJCxFP, R5F571MJDxFP, R5F571MJGxFP, R5F571MJHxFP, R5F571MGCxFP, R5F571MGDxFP, R5F571MGGxFP, R5F571MGHxFP, R5F571MFCxFP, R5F571MFDxFP, R5F571MFGxFP, R5F571MFHxFP, R5F571MLCxLJ, R5F571MLDxLJ, R5F571MLGxLJ, R5F571MLHxLJ, R5F571MJCxLJ, R5F571MJDxLJ, R5F571MJGxLJ, R5F571MJHxLJ, R5F571MGCxLJ, R5F571MGDxLJ, R5F571MGGxLJ, R5F571MGHxLJ, R5F571MFCxLJ, R5F571MFDxLJ, R5F571MFGxLJ, R5F571MFHxLJ
	144/145pin	R5F571MLCxLK, R5F571MLDxLK, R5F571MLGxLK, R5F571MLHxLK, R5F571MJCxLK, R5F571MJDxLK, R5F571MJGxLK, R5F571MJHxLK, R5F571MGCxLK, R5F571MGDxLK, R5F571MGGxLK, R5F571MGHxLK, R5F571MFCxLK, R5F571MFDxLK, R5F571MFGxLK, R5F571MFHxLK, R5F571MLCxFB, R5F571MLDxFB, R5F571MLGxFB, R5F571MLHxFB, R5F571MJCxFB, R5F571MJDxFB, R5F571MJGxFB, R5F571MJHxFB, R5F571MGCxFB, R5F571MGDxFB, R5F571MGGxFB, R5F571MGHxFB, R5F571MFCxFB, R5F571MFDxFB, R5F571MFGxFB, R5F571MFHxFB
	176/177pin	R5F571MLCxFC, R5F571MLDxFC, R5F571MLGxFC, R5F571MLHxFC, R5F571MJCxFC, R5F571MJDxFC, R5F571MJGxFC, R5F571MJHxFC, R5F571MGCxFC, R5F571MGDxFC, R5F571MGGxFC, R5F571MGHxFC, R5F571MFCxFC, R5F571MFDxFC, R5F571MFGxFC, R5F571MFHxFC, R5F571MLCxLC, R5F571MLDxLC, R5F571MLGxLC, R5F571MLHxLC, R5F571MJCxLC, R5F571MJDxLC, R5F571MJGxLC, R5F571MJHxLC, R5F571MGCxLC, R5F571MGDxLC, R5F571MGGxLC, R5F571MGHxLC, R5F571MFCxLC, R5F571MFDxLC, R5F571MFGxLC, R5F571MFHxLC, R5F571MLCxBG, R5F571MLDxBG, R5F571MLGxBG, R5F571MLHxBG, R5F571MJCxBG, R5F571MJDxBG, R5F571MJGxBG, R5F571MJHxBG, R5F571MGCxBG, R5F571MGDxBG, R5F571MGGxBG, R5F571MGHxBG, R5F571MFCxBG, R5F571MFDxBG, R5F571MFGxBG, R5F571MFHxBG
RX72T Group (R01UH0803EJ0050)	100pin	R5F572TKExFP, R5F572TFFxFP, R5F572TKFxFP, R5F572TFGxFP, R5F572TKCxFP, R5F572TFBxFP, R5F572TFExFP, R5F572TFCxFP, R5F572TFAxFP, R5F572TKAxFP, R5F572TKBxFP, R5F572TKGxFP
	144pin	R5F572TKGxFB, R5F572TKCxFB, R5F572TFGxFB, R5F572TFCxFB
RX72M Group (R01UH0804EJ0100)	176pin	R5F572MNHxFC, R5F572MDDxBG, R5F572MNDxFC, R5F572MDHxBG, R5F572MDDxFC, R5F572MNHxBG, R5F572MNDxBG, R5F572MDHxFC
	224pin	R5F572MDDxBD, R5F572MDHxBD, R5F572MNHxBD, R5F572MNDxBD
RX23W Group (R01UH0823EJ0050)	56pin	R5F523W8BxNG, R5F523W8AxNG, R5F523W7BxNG, R5F523W7AxNG
	85pin	R5F523W7AxBL, R5F523W8AxBL, R5F523W8BxBL, R5F523W7BxBL

2.2 Support Components List

Below is a list of Components supported by the Smart Configurator for RX V2.2.0.

Table 2-5 Support Components **○: Support, /: Non-support**

No	Components	Mode	RX110	RX111	RX113	RX130	RX230, RX231	RX23T	RX23W	RX24T, RX24U	RX64M	RX65N, RX651	RX66T	RX71M	RX72M	RX72T	Remarks
1	8-Bit Timer	-	/	/	○	○	○	○	○	○	○	○	○	○	○	○	
2	CRC Calculator	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
3	D/A Converter	-	/	○	○	○	○	○	○	○	○	○	○	○	○	○	
4	DMA Controller	-	/	/	/	/	○	/	○	/	○	○	○	○	○	○	
5	I2C Slave Mode	I2C mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		SMBus mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
6	I2C Master Mode	I2C mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 3
		SMBus mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
7	LCD Controller		/	/	○	/	/	/	/	/	/	/	/	/	/	/	
8	PWM Mode Timer	PWM mode 1	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		PWM mode 2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
9	SCI/SCIF Clock Synchronous Mode	Transmission	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
		Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2, 3, 4 in Table 4
		Transmission/Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
10	SCI/SCIF Asynchronous Mode	Transmission	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
		Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
		Transmission/Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
		Multi-processor Transmission	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
		Multi-processor Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
		Multi-processor Transmission/Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 2 in Table 4
11	SPI Clock Synchronous Mode	Slave transmit/receive	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Slave transmit only	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Master transmit/receive	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Master transmit only	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
12	SPI Operation Mode	Slave transmit/receive	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Slave transmit only	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Master transmit/receive	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Master transmit only	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Multi-master transmit/receive	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Multi-master transmit only	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
13	Event Link Controller	-	/	○	○	○	○	/	○	/	○	○	○	○	○	○	
14	Watchdog Timer	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
15	Clock Frequency Accuracy Measurement Circuit	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
16	Group Scan Mode S12AD	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	

Table 2-6 Support Components

○: Support, /: Non-support

No	Components	Mode	RX110	RX111	RX113	RX130	RX230, RX231	RX23T	RX23W	RX24T, RX24U	RX64M	RX65N, RX651	RX66T	RX71M	RX72M	RX72T	Remarks
17	Comparator	-	/	/	○	○	○	/	○	/	/	/	○	/	○	○	
18	Compare Match Timer	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 3 in Table 3
19	Single Scan Mode S12AD	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
20	Smart Card Interface Mode	Transmission	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Transmission/Reception	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
21	Dead-time Compensation Counter	-	○	○	○	○	○	○	/	○	○	○	○	○	○	○	
22	Data Transfer Controller	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
23	Data Operation Circuit	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
24	Normal Mode Timer		○	○	○	○	○	○	○	○	○	○	○	○	○	○	
25	Buses	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
26	Programmable Pulse Generator	-	/	/	/	/	/	/	/	/	○	○	/	○	/	/	
27	Ports	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
28	Port Output Enable	-	/	○	○	○	○	○	○	○	○	○	○	○	○	○	
29	Real Time Clock	Binary	○	○	○	○	○	/	○	/	○	○	/	○	/	/	
		Calendar	○	○	○	○	○	/	○	/	○	○	/	○	/	/	
30	Remote Control Signal Receiver	-	/	/	/	○	/	/	/	/	/	/	/	/	/	/	
31	Low-Power Timer	-	/	/	○	○	○	/	○	/	/	/	/	/	/	/	
32	Phase Counting Mode Timer	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
33	Interrupt Controller	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
34	General PWM Timer	Saw-wave PWM mode	/	/	/	/	/	○	/	○	○	/	○	○	○	○	Refer to No 1 in Table 4
		Saw-wave one-shot pulse mode	/	/	/	/	/	○	/	○	○	/	○	○	○	○	Refer to No 1 in Table 4
		Triangle-wave PWM mode 1	/	/	/	/	/	○	/	○	○	/	○	○	○	○	Refer to No 1 in Table 4
		Triangle-wave PWM mode 2	/	/	/	/	/	○	/	○	○	/	○	○	○	○	Refer to No 1 in Table 4
		Triangle-wave PWM mode 3	/	/	/	/	/	○	/	○	○	/	○	○	○	○	Refer to No 1 in Table 4
35	Low Power Consumption	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
36	Complementary PWM Mode Timer	Complementary PWM mode 1	/	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Complementary PWM mode 2	/	○	○	○	○	○	○	○	○	○	○	○	○	○	
		Complementary PWM mode 3	/	○	○	○	○	○	○	○	○	○	○	○	○	○	Refer to No 1 in Table 3
37	Continuous Scan Mode S12AD	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
38	Voltage Detection Circuit	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
39	Delta-Sigma Modulator Interface	Master	/	/	/	/	/	/	/	/	/	/	/	/	○	/	
		Slave	/	/	/	/	/	/	/	/	/	/	/	/	○	/	

3. Changes

This chapter describes changes to the Smart Configurator for RX V2.2.0.

3.1 New support

3.1.1 Supports RX23W and RX72M group devices

New support to RX23W and RX72M group devices from Smart Configurator for RX V2.2. For the supported components, refer to "2.2 Support Components List".

3.1.2 New feature to support Amazon FreeRTOS project in Smart Configurator

Amazon FreeRTOS project import and configuration has been newly supported in Smart Configurator. By using the new import feature in e^2 studio 7.5.0, Amazon FreeRTOS project with pre-loaded FreeRTOS components (object, kernel and Amazon libraries) can be downloaded from Renesas Github easily and configure using Smart Configurator GUI.

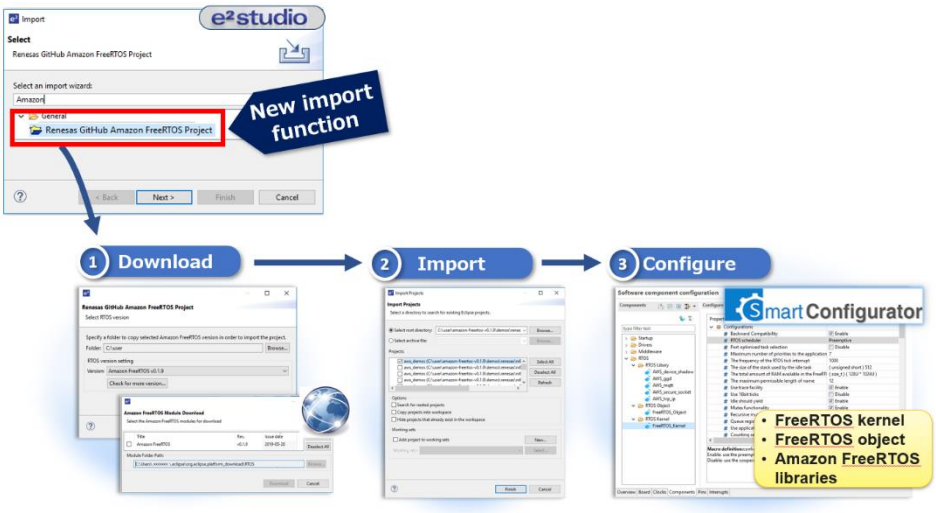

Figure 3-1 Configure Amazon FreeRTOS project using Smart Configurator in e^2 studio

3.1.3 Display port direction on MCU Package view

From Smart Configurator for RX V2.2.0, direction of Ports (input direction or output direction) is displayed on MCU Package view.

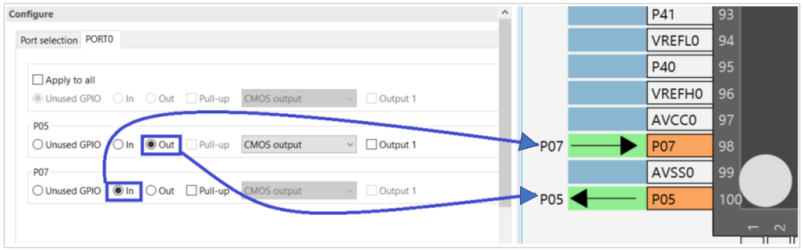

Figure 3-2 Ports direction on MCU Package view

3.1.4 Support selection of Standard CL in Sub-clock oscillator drive capacity control

From Smart Configurator for RX V2.2.0, Standard CL is added to the selection of Sub-clock Oscillator drive capacity control for RX devices (RX110, RX111, RX113, RX130, RX231).

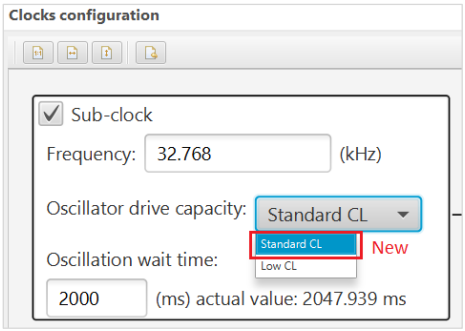

Figure 3-3 New selection of Standard CL in Sub-clock oscillator

3.1.5 New function of Reset to default

Reset the configuration of software component to default settings has been newly supported in Smart Configurator for RX V2.2.0.

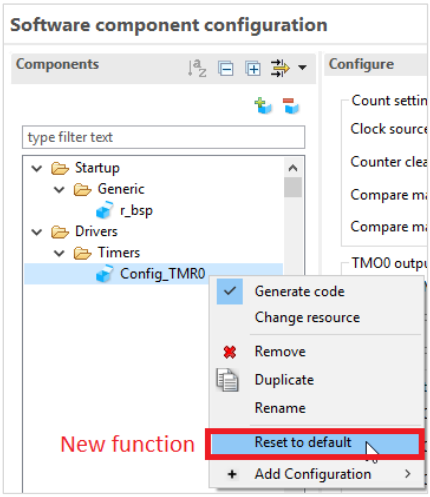

Figure 3-4 New function of Reset to default settings

3.2 Correction of issues/limitations

Table 3-1 List of Correction of issues/limitations

○: Applicable, /: Not Applicable

No	Description	RX110	RX111	RX113	RX130	RX230, RX231	RX23T	RX23W	RX24T, RX24U	RX64M	RX65N, RX651	RX66T	RX71M	RX72M	RX72T	Remarks
1	Issue on using double buffer function in Complementary PWM Mode Timer	/	/	/	/	/	○	/	○	○	○	○	○	/	○	
2	Issue on using double buffer function in Complementary PWM Mode Timer	/	/	/	/	/	/	/	/	○	○	/	○	/	/	
3	Issue of PWM Mode Timer after change device	○	○	○	○	○	○	/	○	○	○	○	○	/	○	
4	Issue on using Single Scan Mode S12AD after change device	/	○	○	○	○	/	/	/	○	○	○	○	/	/	
5	Issue on using Event Link Controller	/	/	/	/	○	/	/	/	/	○	/	/	/	/	Only in RX231 and RX651 LPC
6	Issue on using Real Time Clock	/	/	/	/	/	/	/	/	○	○	/	○	/	/	
7	Issue on using output buffer amplifier of D/A Converter	/	/	/	/	/	/	/	/	○	○	/	/	/	/	
8	Issue on using Programmable Pulse Generator	/	/	/	/	/	/	/	/	○	○	/	○	/	/	
9	Issue on using Buses	/	/	/	/	/	/	/	/	/	/	○	/	/	○	
10	Limitation of insufficient wait time after Sub-clock Oscillator Control bit (RTCEN) is changed to operate the sub-clock oscillator	○	○	○	○	○	/	/	/	○	○	/	○	/	/	
11	Issue of build error when using Group Scan Mode S12AD	/	/	/	/	/	/	/	/	/	○	/	/	/	/	
12	Issue of clock source checking for clock source switching on release from sleep mode	○	○	○	/	/	/	/	/	○	○	○	○	/	○	
13	Issue when using I2C Bus Interface in Master Mode	○	○	○	○	○	○	/	○	○	○	○	○	/	○	TOOL NEWS R20TS0425
14	Issue of lacking sampling time when using self-diagnosis function of 12-bit A/D converter in Single Scan Mode	/	/	/	/	○	/	/	/	/	/	/	/	/	/	TOOL NEWS R20TS0434
15	Issue of lacking interrupt setting code when using SPI Clock Synchronous Mode component in Slave transmit only	/	/	/	/	/	/	/	/	/	/	○	/	/	○	TOOL NEWS R20TS0434
16	Issue of incorrect Fast-Mode Plus Enable bit when using I2C Bus Interface	/	/	/	/	/	/	/	/	○	○	/	○	/	/	TOOL NEWS R20TS0434
17	Issue of count stop for General PWM timer	/	/	/	/	/	/	/	/	/	/	○	/	/	○	TOOL NEWS R20TS0436
18	Issue of build error when using S12AD1 in Group Scan Mode component	/	/	/	/	/	/	/	/	/	/	○	/	/	/	

3.2.1 Fixed the issue on using double buffer function in Complementary PWM Mode Timer

The issue of incorrect initial PWM duty ratio value of TGRE and TRGF registers when using double buffer function in Complementary PWM Mode Timer has been fixed.

3.2.2 Fixed the issue on using output compare interrupt of CMTW channel in Compare Match Timer component

The limitation of TOCn pin (n = 0 to 3) has to be selected when using output compare interrupt of CMTW channels even though TOCn pin is not intended to be used has been fixed.

3.2.3 Fixed the issue of PWM Mode Timer after change device

The issue of TIOCmn pin (m = A to D, n = 0 to 9) of TPU and MTU channels may change to Output disabled after change device has been fixed.

3.2.4 Fixed the issue on using Single Scan Mode S12AD after change device

The issue of analog input channels selection may not be ported over after change device has been fixed.

3.2.5 Fixed the issue on using Event Link Controller

The issue of incorrect macro definition value for masking Port Buffer Register has been fixed.

3.2.6 Fixed the issue on using Real Time Clock

The issue of incorrect Frequency Register H/L (RFRH/RFRL) value when using main clock oscillator as the clock source for Real Time Clock has been fixed.

3.2.7 Fixed the issue on using output buffer amplifier of D/A Converter

The issue of stabilization time for output buffer amplifier in D/A Converter may not be updated after changing clock setting has been fixed.

3.2.8 Fixed the issue on using Programmable Pulse Generator

The issue of pulse output pins cannot output signal if only configure even number Group (Group 0,2,4,6) of pins and output trigger signal other than MTU0/TPU0 is selected has been fixed.

3.2.9 Fixed the issue on using Buses

The issue of PMR.Bn bit of WR1#, WR0#, A0, D8 to D15, WR#, BC0#, BC1# pins are not initialized to 0 when using external bus has been fixed.

3.2.10 Fixed the limitation of insufficient wait time after Sub-clock Oscillator Control bit (RTCEN) is changed to operate the sub-clock oscillator

The issue of insufficient wait time (6 clocks of source count) after Sub-clock Oscillator Control bit (RTCEN) is changed to operate the sub-clock oscillator has been fixed.

Error location :

Source file : < Real Time Clock configuration name >.c

Function : R_< Real Time Clock configuration name >_Create

```
/***********************************************************************
* Function Name: R_Config_RTC_Create
* Description  : This function initializes the RTC module
* Arguments    : None
* Return Value : None
***********************************************************************/
void R_Config_RTC_Create(void)
{
  : (codes are omitted)
/* Set sub-clock oscillator */
    while (1U != RTC.RCR3.BIT.RTCEN)
    {
        RTC.RCR3.BIT.RTCEN = 1U;
    }

    /* Stop all counters */
    RTC.RCR2.BYTE = 0x00U;
    while (RTC.RCR2.BIT.START != 0U)
    {
        /* Wait for the register modification to complete */
    }
  : (codes are omitted)
}
```

Code for wait time is not generated

3.2.11 Fixed the issue of build error when using Group Scan Mode S12AD

The issue of build error caused on generated code when start trigger for group C selected to "Compare match between TADCORA and TCNT, or between TADCORB and TCNT in MTU4" has been fixed.

Error location:

Source file : r_cg_s12ad.h

```
: (codes are omitted)
/*
    A/D Group C Trigger Select Register (ADGCTRGR)
*/
/* Group C A/D Conversion Start Trigger Select (TRSC) */
  : (codes are omitted)
#define _0A_AD_TRSC_TRG4BN                    (0x0AU) /* Compare match
between MTU4.TADCORB and MTU4.TCNT */
#define _0B_AD_TRSC_TRG4AN _TRG4BN            (0x0BU) /* Compare match
                                  between MTU4.TADCORA and MTU4.TCNT, or
                                  between MTU4.TADCORB and MTU4.TCNT */
#define _0C_AD_TRSC_TRG4ABN                   (0x0CU) /* Compare match
                                  between MTU4.TADCORA and MTU4.TCNT,
                                  and between MTU4.TADCORB and MTU4.TCNT
                                 (when interrupt skipping function 2 is
                                  in use) */
: (codes are omitted)
```

Unnecessary space inserted

3.2.12 Fixed the issue of clock source checking for clock source switching on release from sleep mode

The issue of clock source checking for setting clock source switching on release from sleep mode has been fixed.

Error location:

Source file : < Low Power Consumption configuration name >.c

Function : R_< Low Power Consumption configuration name >_Sleep

For RX110, RX111 and RX113

```
/***********************************************************************
* Function Name: R_Config_LPC_Sleep
* Description  : This function enables sleep mode
* Arguments    : None
* Return Value : status -
*                    MD_OK or MD_ERROR1
***********************************************************************/
MD_STATUS R_Config_LPC_Sleep(void)
{
  : (codes are omitted)
    /* When RSTCKEN is enable, only possible clock source is LOCO */
    if ((SYSTEM.RSTCKCR.BIT.RSTCKEN == 1U) &&
(SYSTEM.SCKCR3.BIT.CKSEL != 0U))                    Checking incorrect clock
    {
        status = MD_ERROR1;

    }
  : (codes are omitted)
}
```

For RX64M, RX651, RX65N, RX66T, RX71M and RX72T

```
/***********************************************************************
* Function Name: R_Config_LPC_Sleep
* Description  : This function enables sleep mode
* Arguments    : None
* Return Value : status -
*                    MD_OK or MD_ERROR1
***********************************************************************/
MD_STATUS R_Config_LPC_Sleep(void)
{
  : (codes are omitted)
    /* When RSTCKEN is enable, the possible clock source is HOCO or
main clock oscillator */
    if ((SYSTEM.RSTCKCR.BIT.RSTCKEN == 1U) &&          Checking incorrect clock
(SYSTEM.SCKCR3.BIT.CKSEL != _0100_LPC_CLOCKSOURCE_HOCO) &&
        (SYSTEM.SCKCR3.BIT.CKSEL  != _0200_LPC_CLOCKSOURCE_MAINCLK))
    {
        status = MD_ERROR1;

    }
  : (codes are omitted)
}
```

3.2.13 Fixed the issue when using I2C Bus Interface in Master Mode

The limitation of communication may not perform correctly when using I2C Bus Interface in Master Mode has been fixed.

3.2.14 Fixed the issue of lacking sampling time when using self-diagnosis function of 12-bit A/D converter in Single Scan Mode

The issue of lacking sampling time when using self-diagnosis function of 12-bit A/D converter in Single Scan Mode has been fixed.

3.2.15 Fixed the issue of lacking interrupt setting code when using SPI Clock Synchronous Mode component in Slave transmit only

The issue of lacking interrupt setting code for group AL0 interrupt SPEI0 when using SPI Clock Synchronous Mode component in Slave transmit only has been fixed.

3.2.16 Fixed the issue when using I2C Bus Interface with Fast-mode Plus enabled

The limitation of communication may not perform correctly due to wrong value of Fast-Mode Plus Enable bit (ICFER.FMPE) when using I2C Bus Interface in Master Mode or Slave Mode has been fixed.

3.2.17 Fixed the issue of count stop for General PWM timer

The issue of count cannot stop by count stop function when the count stop source select to software source count stop has been fixed.

3.2.18 Fixed the issue of build error when using S12AD1 in Group Scan Mode component

The issue of build error when selecting "Fixed mode" and "Voltage of reference power supply" as self diagnosis setting for RX71M S12AD1 channel in Group Scan Mode has been fixed.

Error location:

Source file : < Group Scan Mode S12AD configuration name >.c

Function : R_< Group Scan Mode S12AD configuration name >_Create

```
/***********************************************************************
* Function Name: R_Config_S12AD1_Create
* Description  : This function initializes the S12AD1 channel
* Arguments    : None
* Return Value : None
***********************************************************************/
void R_Config_S12AD1_Create(void)
{
  : (codes are omitted)
  S12AD1.ADGSPCR.WORD = _0000_AD_GPAPRIORITY_DISABLE;
  S12AD1.ADCER.WORD = _0000_AD_RESOLUTION_12BIT |
                      _0000_AD_AUTO_CLEARING_DISABLE |
                      _0200_AD_SELFTDIAGST_AVCC1 |
                      _0400_AD_SELFTDIAGST_FIX |
                      _0800_AD_SELFTDIAGST_ENABLE |
                      _0000_AD_RIGHT_ALIGNMENT;
  S12AD1.ADADC.BYTE = _00_AD_1_TIME_CONVERSION | _00_AD_ADDITION_MODE;
  : (codes are omitted)
}
```

Undefined macro definition

3.3 Specification changes

Table 3-2 List of Specification changes

○: Applicable, /: Not Applicable

No	Description	RX110	RX111	RX113	RX130	RX230, RX231	RX23T	RX23W	RX24T, RX24U	RX64M	RX65N, RX651	RX66T	RX71M	RX72M	RX72T	Remarks
1	Changed GUI of Compare Match Timer component	/	/	/	/	/	/	/	/	○	○	/	○	/	/	
2	Changed GUI of D/A Converter component	/	/	/	/	/	/	/	/	/	○	/	/	/	/	
3	Changed code sequence of skip setting and A/D start trigger setting in Complementary PWM Mode	○	○	○	○	○	○	/	○	○	○	○	○	/	○	
4	Changed specification of A/D trigger output pin when using Multi-Function Timer Pulse Unit related components	/	/	/	/	/	○	/	○	/	/	/	/	/	/	
5	Changed code in Low Power Consumption component	○	○	○	○	○	/	/	○	/	/	/	/	/	/	
6	Changed code specification before executing wait instruction to enter low power consumption modes	○	○	○	/	/	/	/	/	○	/	○	/	/	/	

3.3.1 Changed GUI of Compare Match Timer component

From Smart Configurator for RX V2.2.0, GUI of Output compare setting in Compare Match Timer component has been changed for RX64M, RX651, RX65N and RX71M.

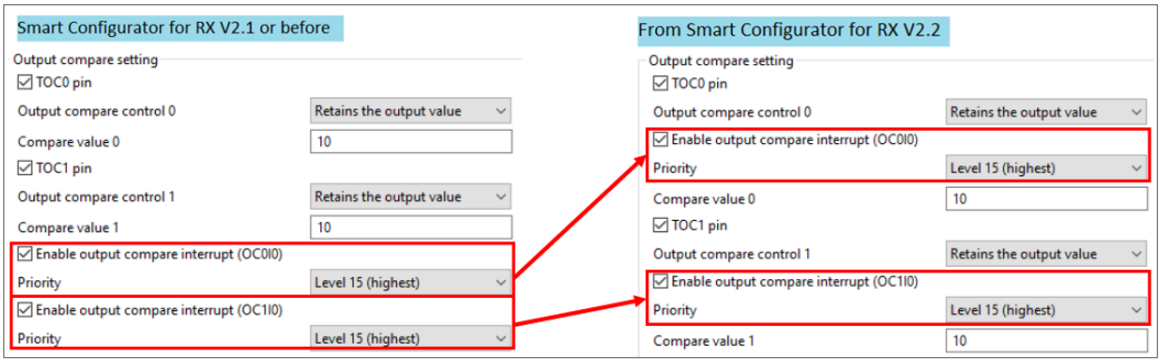

Figure 3-5 Compare Match Timer component

3.3.2 Changed GUI of D/A Converter component

From Smart Configurator for RX V2.2, selection of "Wait for DAn amplifier stable" (n=0,1) has been removed from D/A Converter component for RX651 and RX65N. Code generated is not changed by removal of this selection.

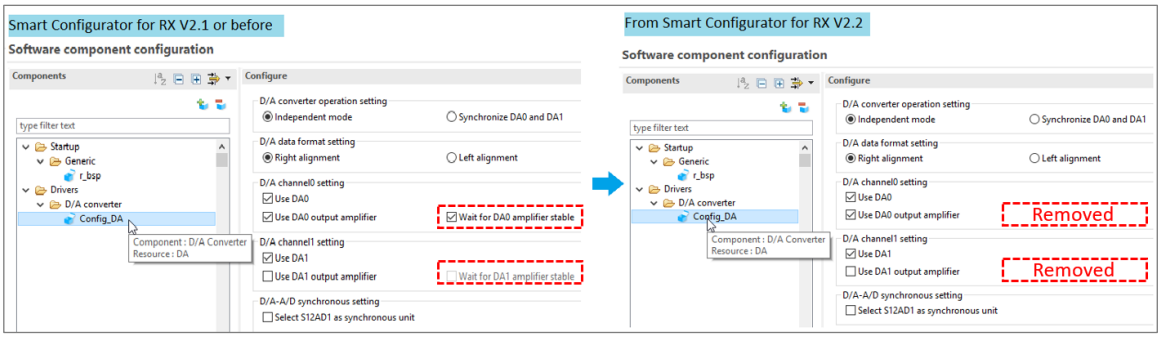

Figure 3-6 D/A Converter component

3.3.3 Changed code sequence of skip setting and A/D start trigger setting in Complementary PWM Mode

Function below has been updated to change the code sequence of skip setting and A/D start trigger setting when using Complementary PWM Mode

Source file : < Complementary PWM Mode Timer configuration name >.c

Function : R_< Complementary PWM Mode Timer configuration name >_Create

Before specification change (using RX64M as example):

```
/***********************************************************************
* Function Name: R_Config_MTU3_MTU4_Create
* Description  : This function initializes the MTU3 channel
* Arguments    : None
* Return Value : None
***********************************************************************/
void R_Config_MTU3_MTU4_Create(void)
{
    : (codes are omitted)
    MTU.TOLBRA.BYTE = MTU.TOCR2A.BYTE & 0x3FU;
    MTU.TITMRA.BIT.TITM = 1U;
    MTU.TITCR2A.BYTE = _00_MTU_TRGCOR_4_7_SKIP_COUNT_0;
    MTU3.TIER.BYTE = _00_MTU_TGIEA_DISABLE | _00_MTU_TGIEB_DISABLE |
                     _00_MTU_TTGE_DISABLE;
    : (codes are omitted)

    MTU3.TMDR1.BYTE = _0D_MTU_CMT1 | _10_MTU_BFA_BUFFER |
                      _20_MTU_BFB_BUFFER;
    : (codes are omitted)
}
```

After specification change:

```
/***********************************************************************
* Function Name: R_Config_MTU3_MTU4_Create
* Description  : This function initializes the MTU3 channel
* Arguments    : None
* Return Value : None
***********************************************************************/
void R_Config_MTU3_MTU4_Create(void)
{
    : (codes are omitted)
    MTU.TOLBRA.BYTE = MTU.TOCR2A.BYTE & 0x3FU;

    MTU3.TIER.BYTE = _00_MTU_TGIEA_DISABLE | _00_MTU_TGIEB_DISABLE |
                     _00_MTU_TTGE_DISABLE;
    : (codes are omitted)
    MTU.TITMRA.BIT.TITM = 1U;
    MTU.TITCR2A.BYTE = _00_MTU_TRGCOR_4_7_SKIP_COUNT_0;
    MTU3.TMDR1.BYTE = _0D_MTU_CMT1 | _10_MTU_BFA_BUFFER |
                      _20_MTU_BFB_BUFFER;
    : (codes are omitted)
}
```

3.3.4 Changed specification of A/D trigger output pin when using Multi-Function Timer Pulse Unit related components

When using Smart Configurator for RX V2.1.0 or before, A/D trigger output pins are set to Used automatically when Phase counting mode, PWM mode, Complementary PWM mode or Normal mode component is added to the project for RX23T, RX24T, RX24U. From this version onward, specification has been changed to enable A/D trigger output pin if pin source is configured.

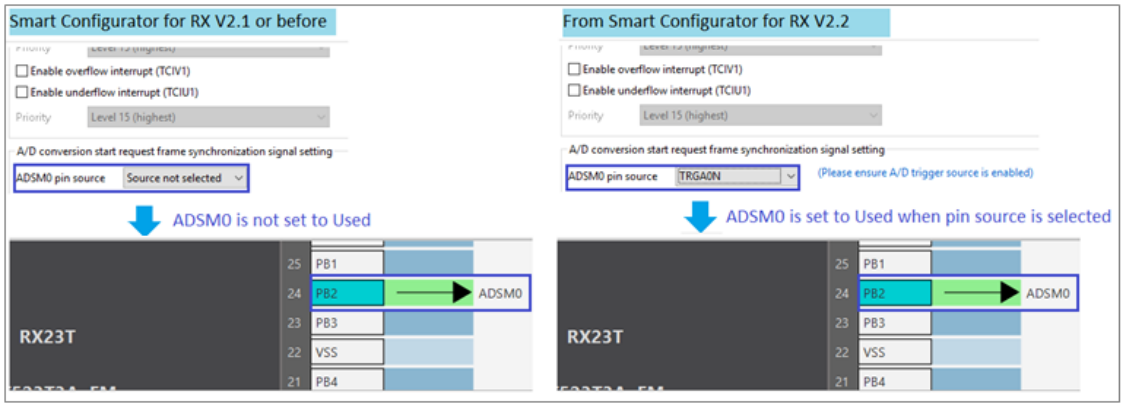

Figure 3-7 Multi-Function Timer Pulse Unit related components

3.3.5 Changed code in Low Power Consumption component

Function below has been updated to disable deep sleep mode before selecting sleep mode.

Source file : < Low Power Consumption configuration name >.c

Function : R_< Low Power Consumption configuration name >_Sleep

Before specification change (using RX231 as example):

```
/***********************************************************************
* Function Name: R_Config_LPC_Sleep
* Description  : This function enables sleep mode
* Arguments    : None
* Return Value : status -
*                    MD_OK or MD_ERROR1
***********************************************************************/
MD_STATUS R_Config_LPC_Sleep(void)
{
  : (codes are omitted)
    /* Disable protect bit */
    SYSTEM.PRCR.WORD = 0xA502U | protect_dummy;

    /* Select sleep mode */
    SYSTEM.SBYCR.BIT.SSBY = 0U;
  : (codes are omitted)
}
```

After specification change:

```
/***********************************************************************
* Function Name: R_Config_LPC_Sleep
* Description  : This function enables sleep mode
* Arguments    : None
* Return Value : status -
*                    MD_OK or MD_ERROR1
***********************************************************************/
MD_STATUS R_Config_LPC_Sleep(void)
{
  : (codes are omitted)
    /* Disable protect bit */
    SYSTEM.PRCR.WORD = 0xA502U | protect_dummy;

    /* Disable deep sleep mode */
    SYSTEM.MSTPCRC.BIT.DSLPE = 0U;

    /* Select sleep mode */
    SYSTEM.SBYCR.BIT.SSBY = 0U;

  : (codes are omitted)
}
```

3.3.6 Changed code specification before executing wait instruction to enter low power consumption modes

Functions below has been updated to set DTC module to stop state and disable DMAC activation before entering low power consumption modes.

Source file : < Low Power Consumption configuration name >.c

Function : R_< Low Power Consumption configuration name >_SoftwareStandby

Before specification change (using RX64M as example):

```
/***********************************************************************
* Function Name: R_Config_LPC_SoftwareStandby
* Description  : This function enables software standby mode
* Arguments    : None
* Return Value : status -
*                    MD_OK or MD_ERROR1
***********************************************************************/
MD_STATUS R_Config_LPC_SoftwareStandby(void)
{
    /* Note: please do not use digital filter in Interrupt Controller*/
    MD_STATUS status = MD_OK;

    uint16_t protect_dummy = (uint16_t)(SYSTEM.PRCR.WORD & 0x000BU);
    /* Disable protect bit */
    SYSTEM.PRCR.WORD = 0xA502U | protect_dummy;

    /* When oscillation stop detection function is enabled, SSBY bit is
invalid */
    if (SYSTEM.OSTDCR.BIT.OSTDE == 1U)
    {
        status = MD_ERROR1;

    }

        /* Select standby mode */
        SYSTEM.SBYCR.BIT.SSBY = 1U;
        SYSTEM.DPSBYCR.BIT.DPSBY = 0U;

        /* Prevent out-of-order execution */
        while (1U != SYSTEM.SBYCR.BIT.SSBY)
        {
            nop();
        }

        /* Initiate the low-power mode */
        wait();

    /* Restore the previous state of the protect register */
    SYSTEM.PRCR.WORD = (uint16_t)(0xA500U | protect_dummy);

    return status;
}
```

After specification change:

```
/***********************************************************************
* Function Name: R_Config_LPC_SoftwareStandby
* Description  : This function enables software standby mode
* Arguments    : None
* Return Value : status -
*                    MD_OK or MD_ERROR1
***********************************************************************/
MD_STATUS R_Config_LPC_SoftwareStandby(void)
{
    /* Note: please do not use digital filter in Interrupt Controller*/
    MD_STATUS status = MD_OK;

    uint16_t protect_dummy = (uint16_t)(SYSTEM.PRCR.WORD & 0x000BU);
    uint8_t dummy_dtcst = DTC.DTCST.BIT.DTCST;
    uint8_t dummy_dmac = DMAC.DMAST.BIT.DMST;

    /* When oscillation stop detection function is enabled, SSBY bit is
invalid */
    if (SYSTEM.OSTDCR.BIT.OSTDE == 1U)
    {
        status = MD_ERROR1;
        return status;
    }
    else
    {
        /* Set DTC and DMAC module to stop state */
        DTC.DTCST.BIT.DTCST = 0U;
        DMAC.DMAST.BIT.DMST = 0U;

        /* Disable protect bit */
        SYSTEM.PRCR.WORD = 0xA502U | protect_dummy;

        /* Select standby mode */
        SYSTEM.SBYCR.BIT.SSBY = 1U;
        SYSTEM.DPSBYCR.BIT.DPSBY = 0U;

        /* Prevent out-of-order execution */
        while (1U != SYSTEM.SBYCR.BIT.SSBY)
        {
            nop();
        }

        /* Initiate the low-power mode */
        wait();
    }

    /* Restore the state of DTC and DMAC if necessary */
    DTC.DTCST.BIT.DTCST = dummy_dtcst;
    DMAC.DMAST.BIT.DMST = dummy_dmac;

    /* Restore the previous state of the protect register */
    SYSTEM.PRCR.WORD = (uint16_t)(0xA500U | protect_dummy);

    return status;
}
```

4. List of RENESAS TOOL NEWS

Below is a list of notifications delivered by RENESAS TOOL NEWS.

Issue date	Document No.	Description	Applicable MCUs	Fixed version
Sep. 1, 2017	R20TS0198	When using the I2C bus interface in slave mode https://www.renesas.com/search/keyword-search.html#genre=document&q=R20TS0198	RX130, RX64M, RX651, RX65N	V1.3.0
Apr. 1, 2018	R20TS0294	When using the bus for peripheral functions https://www.renesas.com/search/keyword-search.html#genre=document&q=R20TS0294	RX230, RX231	V1.4.0
Oct. 01, 2018	R20TS0351	Setting TPU0 channel of PWM Mode Timer https://www.renesas.com/search/keyword-search.html#genre=document&q=R20TS0351	RX65N, RX651, RX64M	V1.5.0
Feb.01, 2019	R20TS0401	Point for caution when using the GTIOCnm pin (n = 0 to 9, m = A, B) of the general PWM timer (GPTW) as a hardware source https://www.renesas.com/search/keyword-search.html#genre=document&q=R20TS0401	RX66T	V2.1.0
Apr.16, 2019	R20TS0425	When using the I2C bus interface in master mode https://www.renesas.com/search/keyword-search.html#q=R20TS0425	RX110, RX111, RX113, RX130, RX230, RX231, RX23T, RX24T, RX24U, RX64M, RX651, RX65N, RX71M	V2.2.0
Jun.01, 2019	R20TS0434	1. When using self-diagnosis function of 12-bit A/D converter in Single Scan Mode 2. When using Serial Peripheral Interface clock synchronous mode in slave transmit 3. When using I2C Bus Interface with Fast-mode Plus enabled https://www.renesas.com/search/keyword-search.html#q=R20TS0434	RX230, RX231, RX66T, RX72T, RX64M, RX651, RX65N, RX71M	V2.2.0
Jun.16, 2019	R20TS0436	When using general PWM timer https://www.renesas.com/search/keyword-search.html#q=R20TS0436	RX66T, RX72T	V2.2.0

5. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RX V2.2.0. Please refer to a document of each module about a caution of a FIT module.

5.1 List of Limitation

Table 5-1 List of Limitation

○: Applicable, /: Not Applicable

No	Description	RX110	RX111	RX113	RX130	RX230, RX231	RX23T	RX23W	RX24T, RX24U	RX64M	RX65N, RX651	RX66T	RX71M	RX72M	RX72T	Remarks
1	Note on using Event Link Controller	/	○	○	○	○	/	○	/	○	○	○	○	○	○	
2	Note on setting clocks for RX72M group devices	/	/	/	/	/	/	/	/	/	/	/	/	○	/	
3	Note on setting ICLK in RX231 group devices	/	/	/	/	○	/	/	/	/	/	/	/	/	/	Only in RX231 group
4	Note on using Data Transfer Controller after device change	/	/	/	○	○	/	/	/	○	○	/	○	/	/	
5	Note when using Smart Configurator for CCRX project in e^2 studio	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
6	Note on using Ports component	○	○	○	○	○	○	○	○	○	○	○	○	/	○	
7	Note on using Clocks	/	/	○	○	○	/	/	/	/	/	/	/	/	/	
8	Note on using MTCLKA and MTCLKB for MTU2 in RX66T, RX72T group devices	/	/	/	/	/	/	/	/	/	/	○	/	/	○	

5.2 Details of Limitation

5.2.1 Note on using Event Link Controller

Event Link Controller component in Smart Configurator for RX does not support Complementary PWM Mode Timer. This limitation will be fixed in next version.

5.2.2 Note on setting clocks for RX72M group devices

When using Smart Configurator for RX V2.2.0 to configure clocks, do not select "x1/2" for System clock (ICLK) and "x1/3" for External bus clock (BCLK). Value of System Clock Control Register (SCKCR) will not be changed by the generated code.

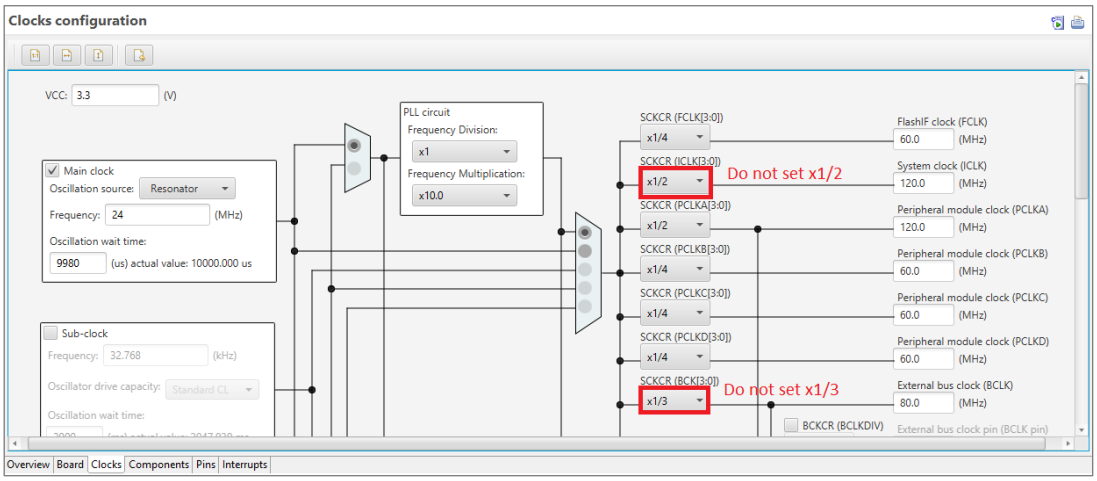

Figure 5-1 Limitation of clocks configuration in RX72M group devices

5.2.3 Note on setting ICLK in RX231 group devices

Configuration of ICLK smaller than PCLK is not supported in Smart Configurator for RX V2.2.0 and before. There is no workaround. This limitation will be fixed in next version.

5.2.4 Note on using Data Transfer Controller after device change

When using Smart Configurator for RX V2.2.0 and before, value generated for the following macro definitions may be incorrect.

Error location :

Source file : <Data Transfer Controller configuration name >.h

Example (red portion is the error)

```
/***********************************************************************
Macro definitions
***********************************************************************/
/* DTC0 Transfer Source Address */
#define _0x00000036_DTC0_SRC_ADDRESS          (0x0x00000036UL)
/* DTC0 Transfer Destination Address */
#define _0x00000017_DTC0_DST_ADDRESS          (0x0x00000017UL)
```

As workaround, close <Project name>.scfg and open again. Once Overview page is opened, generate code and build the project.

5.2.5 Note when using Smart Configurator for CCRX project in e² studio

Build error E0553103 may occur for “reset_program.S” when adding many components to CCRX project.

```
*Build error : *
make: *** [src/smc_gen/r_bsp/mcu/all/reset_program.obj] Error 4
make: *** Waiting for unfinished jobs....
```

As workaround, exclude file "reset_program.S" from build.
File location: <Workspace name>/<Project name>/src/smc_gen/r_bsp/mcu/all/

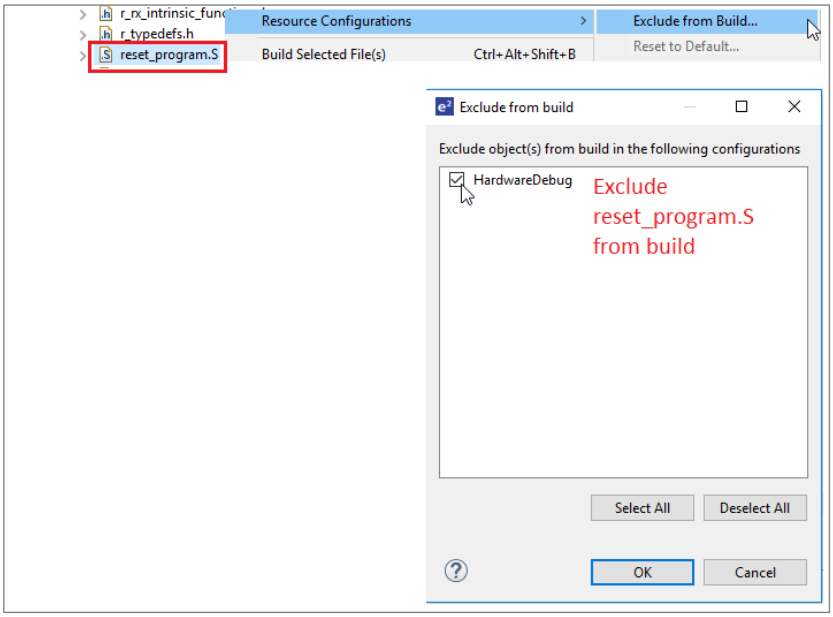

Figure 5-2 Workaround of build error in CCRX project

This limitation will be fixed in next version.

5.2.6 Note on using Ports component

Smart Configurator for RX V.2.2.0 and before does not support initialization of open-drain control register 1 (ODR1) if only pin 7 of the port is enabled. This limitation will be fixed in next version.

5.2.7 Note on using Clocks

Smart Configurator for RX V.2.2.0 and before does not support initialization of Sub-clock or IWDT as LPT (Low Power Timer) clock source for RX113, RX130, RX230, RX231 group devices. This limitation will be fixed in next version.

5.2.8 Note on using MTCLKA and MTCLKB for MTU2 in RX66T, RX72T group devices

Smart Configurator does not support using MTCLKA and MTCLKB as external clock input for MTU2 in RX66T, RX72T group devices. This limitation will be fixed in next version.

6. Points for Caution

This section describes points for caution regarding the Smart Configurator for RX V2.2.0. Please refer to a document of each module about a caution of a FIT module.

6.1 List of Caution

Table 6-1 List of Caution

○: Applicable, /: Not Applicable

No	Description	RX110	RX111	RX113	RX130	RX230, RX231	RX23T	RX23W	RX24T, RX24U	RX64M	RX65N, RX651	RX66T	RX71M	RX72M	RX72T	Remarks
1	Note on configuring GPT interrupt	/	/	/	/	/	/	/	○	○	/	○	○	○	○	
2	Note on SCR.TE bit setting sequence in SCI Clock Synchronous Mode and SCI Clock Asynchronous Mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
3	Note on using only reception in SCI Clock Synchronous Mode	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
4	Notes on using high transfer speed in SCIF Synchronous Mode	/	/	/	/	/	/	/	/	○	/	/	○	/	/	
5	Note on device change functionality	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
6	Note on using Smart Configurator for RTOS project	/	/	/	/	/	/	/	/	○	○	/	○	/	/	Refer to FreeRTOS packages
7	Note on using Smart Configurator for GCC project in e^2 studio 7.4.0	○	○	○	○	○	○	/	○	○	○	○	○	/	○	
8	Note on using Data Transfer Controller	/	/	/	/	/	/	/	/	/	○	/	/	○	/	

6.2 Details of Caution

6.2.1 Note on configuring GPT interrupts

The GPT interrupts are not specified as the Software Configurable Interrupt in the initial state even after the GPT interrupts are configured by GPT component. To specify GPT interrupts as Software Configurable Interrupt source, release unused Software Configurable interrupt source on the Interrupt sheet and allocate GPT interrupts instead.

6.2.2 Note on SCR.TE bit setting sequence in SCI Clock Synchronous Mode and SCI Clock Asynchronous Mode

Sequence of setting SCR.TE bit does not follow the usage note in User's Manual: Hardware.
Instead, SCR.TE bit is set to 1 after changing the pin function to TXDn. Output of TXDn pin becomes high impedance.
Please connect a pull-up resistor to the TXDn line, prevent the TXDn line from becoming high impedance.

6.2.3 Note on using only reception in SCI Clock Synchronous Mode

In SCI Clock Synchronous Mode using internal clock, if only reception is enabled in high communication speed, extra clocks are generated even though reception has been completed.
This is due to the delay in disabling RE to stop the clock after the desired number of data is received.
To prevent this issue, select Transmission/Reception work mode when using Smart Configurator. Use "R_<Configuration Name>_Serial_Send_Receive" function instead of "R_<Configuration Name>_Serial_Receive". The same number of data for tx_num and rx_num should be specified.
Disable TXDn pin in Smart Configurator Pins page and send dummy data if transmission is not required.
There will be warnings when TXDn pin is disabled. These warnings can be ignored as TXDn pin is not intended to be used originally.

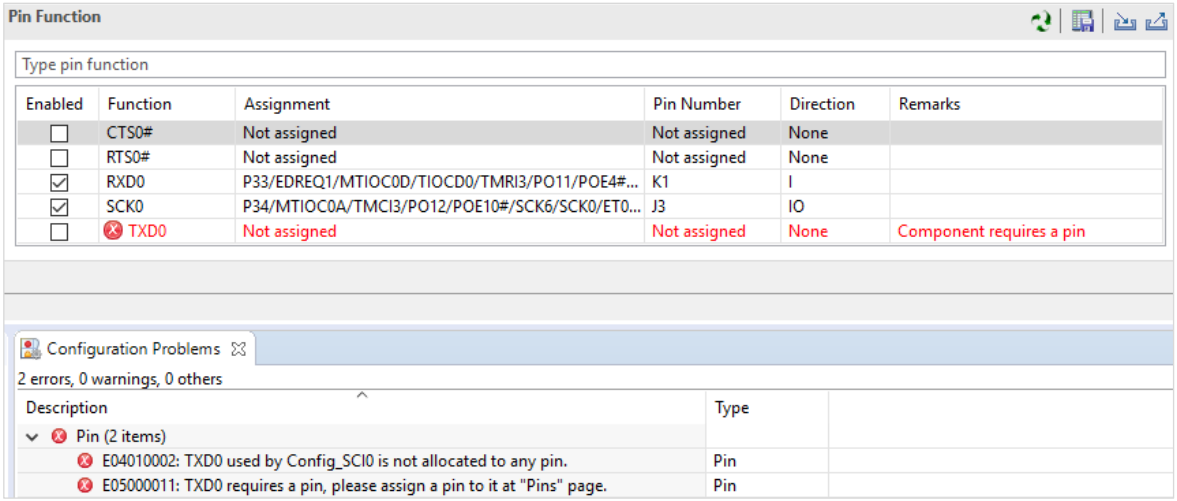

Figure 6-1 Ignore warnings when TXDn pin is disabled (Example with TXD0)

6.2.4 Note on using high transfer speed in SCIF Synchronous Mode

If the number of reception data specified for the API (R_<Configuration Name>_Serial_Receive or R_<Configuration Name>_Serial_Send_Receive) and reception FIFO threshold specified on GUI do not satisfy the formula below:

(Reception Data Size) = n * (Reception FIFO threshold) (n=1,2,3,,,,)

extra clock generation may occur after the desired number of data is received in high communication speed when using internal clock.
To prevent this issue, specify the reception data size and reception FIFO threshold that satisfy the formula.

6.2.5 Note on device change functionality

Save project settings before performing change device operation. After change device, perform these operations:
1. Visual check on Components window and Configuration Problems window. Resolve error and conflicts if there is any.
2. Check each component and converted settings.
3. Re-generate codes.

6.2.6 Note on using Smart Configurator for RTOS project

When using Smart Configurator for RTOS project, only FIT modules are supported. From Smart Configurator for RX V2.2.0, all FIT modules are displayed in "Add component" dialog by default.

6.2.7 Note on using Smart Configurator for GCC project in e² studio 7.4.0

When using default options to create new "GCC for Renesas RX Executable Project" with Smart Configurator in e² studio 7.4.0, build error occurs.

```
C:\example\src\smc_gen\r_bsp/mcu/all/r_bsp_common.h:55:24:
fatal error: stdbool.h: No such file or directory
```

As workaround, use e² studio 7.5.0 to create new "GCC for Renesas RX Executable Project" with Smart Configurator.

6.2.8 Note on using Data Transfer Controller

Smart Configurator does not support sequence transfer, write-back skip, write-skip disable and displacement addition features in RX651, RX65N, RX72M devices.

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Jul.22 19	33	Create new

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.
2. Processing at power-on

   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.
3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.
4. Handling of unused pins

   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.
5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.
6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.
8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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