Smart Configurator for RH850 V1.9.0

Release Note

Introduction

Thank you for using the Smart Configurator for RH850.
This document describes the restrictions and points for caution. Read this document before using the product.

Contents

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

- System: x64/x86 based processor
    Windows® 11
    Windows® 10 (64-bit version)
    Windows® 8.1 (64-bit version)
- Memory capacity: We recommend 4 GB or more.
- Capacity of hard disk: At least 500 MB of free space.
- Display: Graphics resolution should be at least 1024 x 768, and the mode should display at least 65,536 colors.
- Processor: 1 GHz or higher (must support hyper-threading, multi-core CPUs)

1.1.2 Development Environments

- Renesas electronics Compiler for RH850 [CC-RH] V2.05.00 or later
- GHS Multi V8.1.4 or later
- IAR Embedded Workbench for RH850 V3.10.1 [Note] or later

  - Note:
- IAR Embedded Workbench for RH850 V3.10.1 doesn't support RH850/U2B yet, so Smart Configurator doesn't support to create RH850/U2B IAR project and generate code.

2.   Support List

2.1   Support Devices List

Below is a list of devices supported by the Smart Configurator for RH850 V1.9.0.

Table 2-1 Support Devices

Group (HW Manual number)	PIN	Device name (Device file version)
RH850/F1KM-S1 Group (R01UH0684EJ0130)	48pin	R7F701693, R7F701694, R7F701695 (V1.40)
	64pin	R7F701690, R7F701691, R7F701692 (V1.40)
	80pin	R7F701687, R7F701688, R7F701689 (V1.40)
	100pin	R7F701684, R7F701685, R7F701686 (V1.40)
RH850/F1KM-S2 Group (R01UH0684EJ0130)	100pin	R7F701760 (V1.40)
	144pin	R7F701762 (V1.40)
	176pin	R7F701764 (V1.40)
RH850/F1KM-S4 Group (R01UH0684EJ0130)	100pin	R7F701760, R7F701644, R7F701645 (V1.40)
	144pin	R7F701762, R7F701646, R7F701647 (V1.40)
	176pin	R7F701764, R7F701648, R7F701649 (V1.40)
	232pin	R7F701650, R7F701651 (V1.40)
	272pin	R7F701652, R7F701653 (V1.40)
RH850/U2A16 Group (R01UH0864EJ0130)	292pin	R7F702300[1], R7F702300A (V1.20), R7F702300B (V1.10)
	373pin	R7F702300[1], R7F702300A (V1.20), R7F702300B (V1.10)
	516pin	R7F702300[1], R7F702300A (V1.20), R7F702300B (V1.10)
RH850/U2A8 Group (R01UH0864EJ0130)	292pin	R7F702301[1], R7F702301A (V1.20), R7F702301B (V1.00)
	373pin	R7F702301[1], R7F702301A (V1.20), R7F702301B (V1.00)
RH850/U2A6 Group (R01UH0864EJ0130)	144pin	R7F702302 (V1.10)
	156pin	R7F702302 (V1.10)
	176pin	R7F702302 (V1.10)
	292pin	R7F702302 (V1.10)
RH850/F1KH-D8 Group (R01UH0684EJ0111)	176pin	R7F701708, R7F701709 (V1.20)
	233pin	R7F701710, R7F701711 (V1.20)
	324pin	R7F701714, R7F701715 (V1.20)
RH850/C1M-A2 Group (R01UH0607EJ0120)	252pin	R7F701275 (V1.10)
RH850/U2B6 Group (R01UH0923EJ0050)	292pin	R7F70255x (V1.10)
RH850/U2B10 Group (R01UH0923EJ0050)	292pin	R7F70254x (V1.00)
	373pin	R7F70254x (V1.00)
	468pin	R7F70254x (V1.00)

Note 1. The devices are not supported in CS+V8.08 or later.
     If you want to use these devices, you can use CS+V8.07 or earlier or obtain the device files via Renesas distributor.

2.2   Support Components List

Below is a list of Components supported by the Smart Configurator for RH850 V1.9.0.

Table 2-2 Support Components

✓ : Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	RH850 U2B	Remarks
1	A/D Converter	-	✓	✓	✓	✓	✓	
2	CSI Master	Master Transmit	✓	-	✓	✓	-	
		Master Receive	✓	-	✓	✓	-	
		Master Transmit/Receive	✓	-	✓	✓	-	
3	CSI Slave	Slave Transmit	✓	-	✓	✓	-	
		Slave Receive	✓	-	✓	✓	-	
		Slave Transmit/Receive	✓	-	✓	✓	-	
4	Data CRC	-	✓	✓	✓	✓	-	
5	DMA Controller	-	✓	✓	✓	✓	✓	
6	DTS Controller	-	-	✓	-	✓	-	
7	Error Control Module	-	-	✓	-	✓	-	
8	ATOM Signal Output Mode Compare	-	-	✓	-	-	-	
9	ATOM Signal Output Mode Immediate	-	-	✓	-	-	-	
10	ATOM Signal Output Mode PWM	-	-	✓	-	-	-	
11	ATOM Signal Output Mode Serial	-	-	✓	-	-	-	
12	Dead Time Module	-	-	✓	-	-	-	
13	GTM Clock	-	-	✓	-	-	-	
14	TIM Bit Compression Mode	-	-	✓	-	-	-	

Table 2-3 Support Components

✓ : Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	RH850 U2B	Remarks
15	TIM Gated Periodic Sampling Mode	-	-	✓	-	-	-	
16	TIM Input Event Mode	-	-	✓	-	-	-	
17	TIM Input Prescaler Mode	-	-	✓	-	-	-	
18	TIM Pulse Integration Mode	-	-	✓	-	-	-	
19	TIM PWM Measurement Mode	-	-	✓	-	-	-	
20	TIM Serial Shift Mode	-	-	✓	-	-	-	
21	Time Base Unit	-	-	✓	-	-	-	
22	Interrupt Controller	-	✓	✓	✓	✓	✓	Only table reference method
23	Key Return	-	✓	-	✓	-	-	
24	MSPI Master	Transmit	-	✓	-	-	✓	No support LVDS mode
		Receive	-	✓	-	-	✓	
		Transmit/Receive	-	✓	-	-	✓	
25	MSPI Slave	Transmit	-	✓	-	-	✓	
		Receive	-	✓	-	-	✓	
		Transmit/Receive	-	✓	-	-	✓	
26	OS Timer	-	✓	✓	✓	✓	-	
27	Ports	-	✓	✓	✓	✓	✓	
28	Real-Time Clock	-	✓	✓	✓	-	-	
29	RIIC Master	-	✓	✓	✓	✓	✓	
30	RIIC Slave	-	✓	✓	✓	✓	✓	

Table 2-4 Support Component

✓ : Support, -: Non-support

No	Components	Mode	RH850F 1KM	RH850 U2A	RH850F1K H	RH850C 1M	RH850 U2B	Remarks
31	SCI3 Asynchronous Mode	Transmission	-	✓	-	✓	-	
		Reception	-	✓	-	✓	-	
		Transmission / Reception	-	✓	-	✓	-	
		Multi-processor Transmission	-	✓	-	✓	-	
		Multi-processor Reception	-	✓	-	✓	-	
		Multi-processor Transmission / Reception	-	✓	-	✓	-	
32	SCI3 Clock Synchronous Mode	Transmission	-	✓	-	✓	-	
		Reception	-	✓	-	✓	-	
		Transmission / Reception	-	✓	-	✓	-	
33	Stand-by Controller	-	✓	✓	✓	-	-	Only Stop and DeepStop mode
34	Clock Divider	-	✓	✓	✓	✓	✓	
35	Delay Count	-	✓	✓	✓	✓	✓	
36	External Event Count	-	✓	✓	✓	✓	✓	
37	Input Interval Timer	-	✓	✓	✓	✓	✓	
38	Input Period Count Detection	-	✓	✓	✓	✓	✓	
39	Input Position Detection	-	✓	✓	✓	✓	✓	
40	Input Pulse Interval Judgment	-	✓	✓	✓	✓	✓	
41	Input Pulse Interval Measurement	-	✓	✓	✓	✓	✓	
42	Input Signal Width Judgement	-	✓	✓	✓	✓	-	
43	Input Signal Width Measurement	-	✓	✓	✓	✓	-	
44	Interval Timer	-	✓	✓	✓	✓	✓	
45	One-Pulse Output	-	✓	✓	✓	✓	✓	

Table 2-5 Support Components

✓ : Support, -: Non-support

No	Components	Mode	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	RH850 U2B	Remarks
46	One-Shot Pulse output	-	✓	✓	✓	✓	✓	
47	Overflow Interrupt Output (Input Period Count Detection)	-	✓	✓	✓	-	-	
48	Overflow Interrupt Output (Width Measurement)	-	✓	✓	✓	-	✓	
49	PWM Output	-	✓	✓	✓	✓	✓	
50	Triangle PWM Output	-	✓	✓	✓	✓	-	
51	Triangle PWM Output with Dead Time	-	-	✓	✓	✓	✓	
52	UART Interface	Transmission	✓	✓	✓	✓	✓	
		Reception	✓	✓	✓	✓	✓	
		Transmission / Reception	✓	✓	✓	✓	✓	
53	Window Watchdog Timer	-	✓	✓	✓	✓	-	
54	ADC Boundary Flag Generator	-	-	-	-	-	✓	

2.3   New Support

2.3.1   Support to define symbolic name in Pin configuration

From Smart Configurator for RH850 V1.9.0, new feature of define symbolic name is supported in [Pin number] view. By defining the user`s own symbol for pin function, user can maintain same software even if the device is changed. The symbolic name can be migrated when changing device only on condition that the pin with symbolic name is assigned. The driver code for symbolic name is generated in file Pin.h when generating code.

Figure 2-1 Symbolic name setting

Figure 2-2 Code in Pin.h

Note:
1) RH850/F1KM and RH850/F1KH does not support the symbolic name function.
2) Smart Configurator does not support to define symbolic name for APORT, JPORT and IPORT.

2.3.2 Support User code protection feature for Smart Configurator Code Generation component

The Smart Configurator for RH850V1.9.0 and the later version now incorporates an enhanced user code protection feature. This feature empowers users to insert codes to any location in the generated codes by utilizing the specific tags "Start user code" and "End user code", as shown in

Figure 2-3. After the next code generation, the inserted user codes will be protected and automatically merged into the generated files.

/* Start user code */
User code can be added between the specific tags
/* End user code */

Figure 2-3 Specific tags for user code protection feature

When the lines of generated codes before and after the inserted user codes are updated due to changes in GUI configuration or the version update of Smart Configurator, merge conflict codes will be generated out.

If the merge conflict occurs, conflict message in red will be displayed in the Smart Configurator console, as shown in Figure 2-4 The conflict message and File compare view. User can click the conflicted file in the console message to open the File Compare view as shown in Figure 2-4 The conflict message and File compare view and then can resolve the conflict.
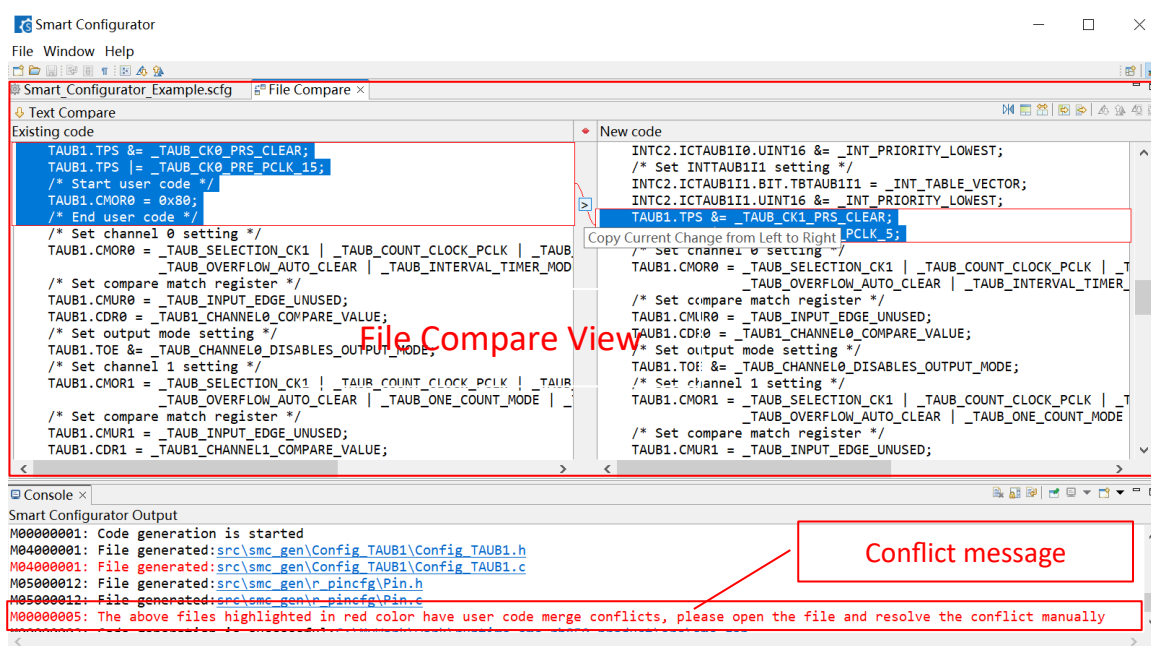
Figure 2-4 The conflict message and File compare view

There are two methods to resolve the conflict:
1) Click button "Copy Current Change from Left to Right" and then delete unused code to resolve conflict.
2) resolve the conflict manually by editing the code in the right panel directly.

3. Changes

This chapter describes changes to the Smart Configurator for RH850 V1.9.0.

3.1 Correction of Issues/Limitations

Table 3-1 List of Correction of Issues/Limitations

✓: Applicable, -: Not Applicable

No	Description	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	RH850 U2B	Remarks
1	Fixed the issue that the Interrupt generation function does not work in Error Control Module	-	✓	-	-	-	
2	Fixed the issue that noise filter function does not work when using Overflow Interrupt Output function.	-	✓	-	-	-	
3	Fixed the issue the wakeup trigger is not generated in Stand-by Controller	✓	-	✓	-	-	
4	Fixed the issue the MSPI channel can't stop transmission by calling Stop() API	-	✓	-	-	✓	

3.1.1 Fixed the issue that the Interrupt generation function does not work in Error Control Module

When "Interrupt generation" is selected in Error Control Module, the setting code for register "ECMINCFGi_j" is not generated in driver code.

This issue is fixed from Smart Configurator for RH850 V1.9.0.

Figure 3-1 Interrupt generation setting

3.1.2 Fixed the issue that noise filter function does not work when using Overflow Interrupt Output function.

When using TAUJ2_2, TAUD2_3, TAUJ3_2, TAUJ3_3 as Overflow Interrupt Output (Input Period Count Detection) and Overflow Interrupt Output (Width Measurement) function, even though "Enable digital noise elimination" is checked on GUI, the noise filter function does not work.
This issue is fixed from Smart Configurator for RH850 V1.9.0.

Figure 3-2. Noise filter setting

3.1.3 Fixed the issue the wakeup trigger is not generated in Stand-by Controller

In Stand-by Controller, when selecting below wake-up factor, these factors can't wake up the chip from DeepSTOP mode to RUN mode.
This issue is fixed from Smart Configurator for RH850 V1.9.0.

Figure 3-3. Wake-up factor that can't generate trigger

3.1.4 Fixed the issue that the MSPI channel can't stop transmission by calling Stop() API.

When using MSPI Master and MSPI Slave, the channels can't be stopped successfully by calling R_{Config_MSPImn}_Stop() API.
This issue is fixed from Smart Configurator for RH850 V1.9.0.

3.2　　Specification Changes

Table 3-2 List of Specification Changes

✓ : Applicable, -: Not Applicable

No	Description	RH850 F1KM	RH850 U2A	RH850 F1KH	RH850 C1M	RH850 U2B	Remarks
1	Improved theTAU input signal selection.	-	✓	-	✓	✓	
2	Improved TAUD and TAUB Noise Filter setting	✓	✓	✓	✓	✓	
3	Improved Drive Strength setting for communication components	✓	-	✓	-	-	
4	Improved A/D Converter PWM-Diag function API	-	✓	-	-	-	
5	Improved start trigger mode of One-Shot Pulse Output function	-	-	-	✓	✓	
6	Improved [Pin Function] tree category by adding node "Analog power supply"	✓	✓	✓	✓	✓	
7	Improved include part of "r_cg_main.c" by generating a new file "r_smc_entry.h"	✓	✓	✓	✓	✓	
8	Improved MSPI Master callback function setting	-	✓	-	-	✓	
9	Improved MSPI Fixed FIFO memory mode function	-	✓	-	-	✓	
10	Improved the "Show view" dialog in Standalone Smart Configurator	✓	✓	✓	✓	✓	

3.2.1　Improved the TAU input signal selection

From Smart Configurator for RH850 V1.9.0, one TAU input signal can trigger the two channels simultaneously. The previous pin conflict message in Console is eliminated.

3.2.2　Improved TAUD and TAUB Noise Filter setting

From Smart Configurator for RH850 V1.9.0, user can set noise filter in TAUD and TAUB components with input pins.

Figure 3-4.　Noise filter setting

3.2.3 Improved Drive strength setting for communication components

From Smart Configurator for RH850 V1.9.0, user can select different drive strength on communication components UI to adapt to different baud rate.
Communication components supporting Drive strength setting:
MSPI Master, MSPI Slave, RIIC Master, RIIC Slave, UART Interface, SCI3 Asynchronous Mode, SCI3 Clock Synchronous Mode, CSI Master, CSI Slave

Take RH850/U2A UI as an example:

Figure 3-5. Drive strength setting UI for RH850/U2A

Take RH850/U2A code as an example

```
  /* Set MSPI0SC pin */
  PORT0.PKCPROT = _WRITE_PROTECT_ENABLE;
  PORT0.PWE = SETBIT(3U);
  PORT0.PCR2_12.UINT32 = (PORT0.PCR2_12.UINT32 & _PCR_DEFAULT_VALUE) | _PCR_SET_PM;
  PORT0.PCR2_12.UINT32 &= _PCR_CLEAR_PDSC;
  PORT0.PCR2_12.UINT32 &= _PCR_CLEAR_PUCC;
  PORT0.PCR2_12.UINT32 |= _PCR_ALT_OUT3;
  PORT0.PCR2_12.UINT32 |= _PCR_SET_PMC;
  PORT0.PCR2_12.UINT32 &= _PCR_CLEAR_PM;
  PORT0.PCR2_12.UINT32 &= _PCR_ALT_OUT_SETTING;
  PORT0.PWE = _PORT_WRITE_PROTECT_DISABLE;
  PORT0.PKCPROT = _WRITE_PROTECT_DISABLE;
```

Figure 3-6. Drive strength setting code for RH850/U2A

3.2.4 Improved A/D Converter PWM-Diag function API

From Smart Configurator for RH850 V1.9.0, when "Use scan group 4" and "PWM-Diag enable" are used, the API for PWM-Diag function is improved as below:
Source file: <Configuration-name>.c
API removed:
void R_<Configuration-name>_ScanGroup4_OperationOn(void)
void R_<Configuration-name>_ScanGroup4_OperationOff(void)
MD_STATUS R_<Configuration-name>_ScanGroup4_GetResult(uint16_t * const buffer, uint8_t buffer_size)

API newly added:
MD_STATUS R_<Configuration-name>_ScanGroup4_GetPWMDiagResult(uint16_t * const buffer)

Figure 3-7. PWM-Diag enable setting

3.2.5 Improved start trigger mode of One-Shot Pulse Output function

From Smart Configurator for RH850 V1.9.0, "Trigger mode" is added to UI of One-Shot Pulse Output function to select "Hardware trigger" or "Software trigger". Hardware trigger is the only one way to start One-Shot Pulse Output function in Smart Configurator for RH850V1.8 and before, now Software trigger is added as another way to start the One-Shot Pulse Output function. When using "Software trigger", API "void R_<*Configuration-name*>_SoftwareTriggerOn()" will be generated.
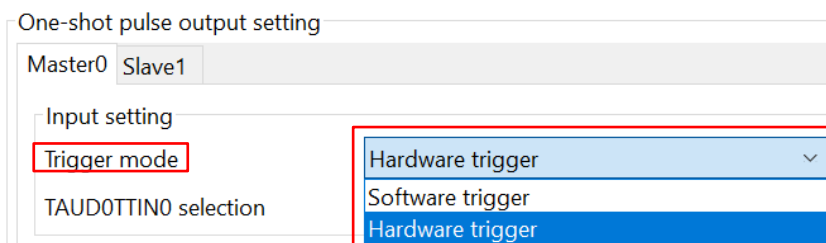
Figure 3-8. U2B Trigger mode setting

3.2.6 Improved [Pin Function] tree category by adding node "Analog power supply"

From Smart Configurator for RH850 V1.9.0, "Analog power supply" category is added in the tree of [Pins] -> [Pin Functions]. The pins under the "Analog power supply" category are read-only.
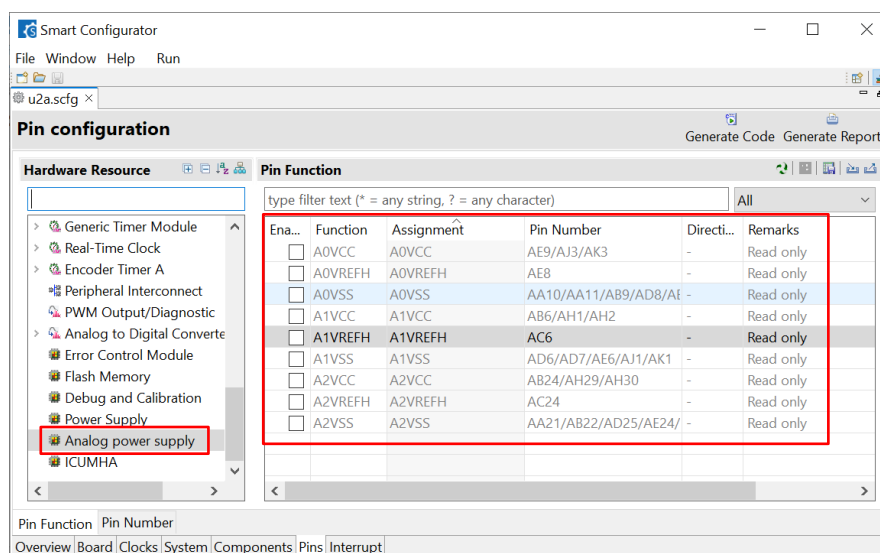
Figure 3-9. Analog power supply view

3.2.7 Improved include part of "r_cg_main.c" by generating a new file "r_smc_entry.h"

From Smart Configurator for RH850 V1.9.0, all include files in "r_cg_main.c" are moved to "r_smc_entry.h" which is a new file generated by Smart Configurator, and "r_cg_main.c" includes "r_smc_entry.h" only.

3.2.8 Improved MSPI Master callback function setting

From Smart Configurator for RH850 V1.9.0, the interrupt routines in file "Config_MSPI*nm*_user.c" is always called by the corresponding common interrupt routine in file "r_cg_mspi_common_user.c", regardless of the setting of "Callback function setting" on GUI.

Interrupt routine in Config_mspi*nm*_user.c:
"R_<*Configuration-name*>_Callback_Interrupt_Send"
"R_<*Configuration-name*>_Callback_Interrupt_Receive"
"R_<*Configuration-name*>_Callback_Interrupt_Error"

Common interrupt routine in "r_cg_mspi_common_user.c":
"r_mspin_interrupt_send"
"r_mspin_interrupt_receive"
"r_mspin_interrupt_error"
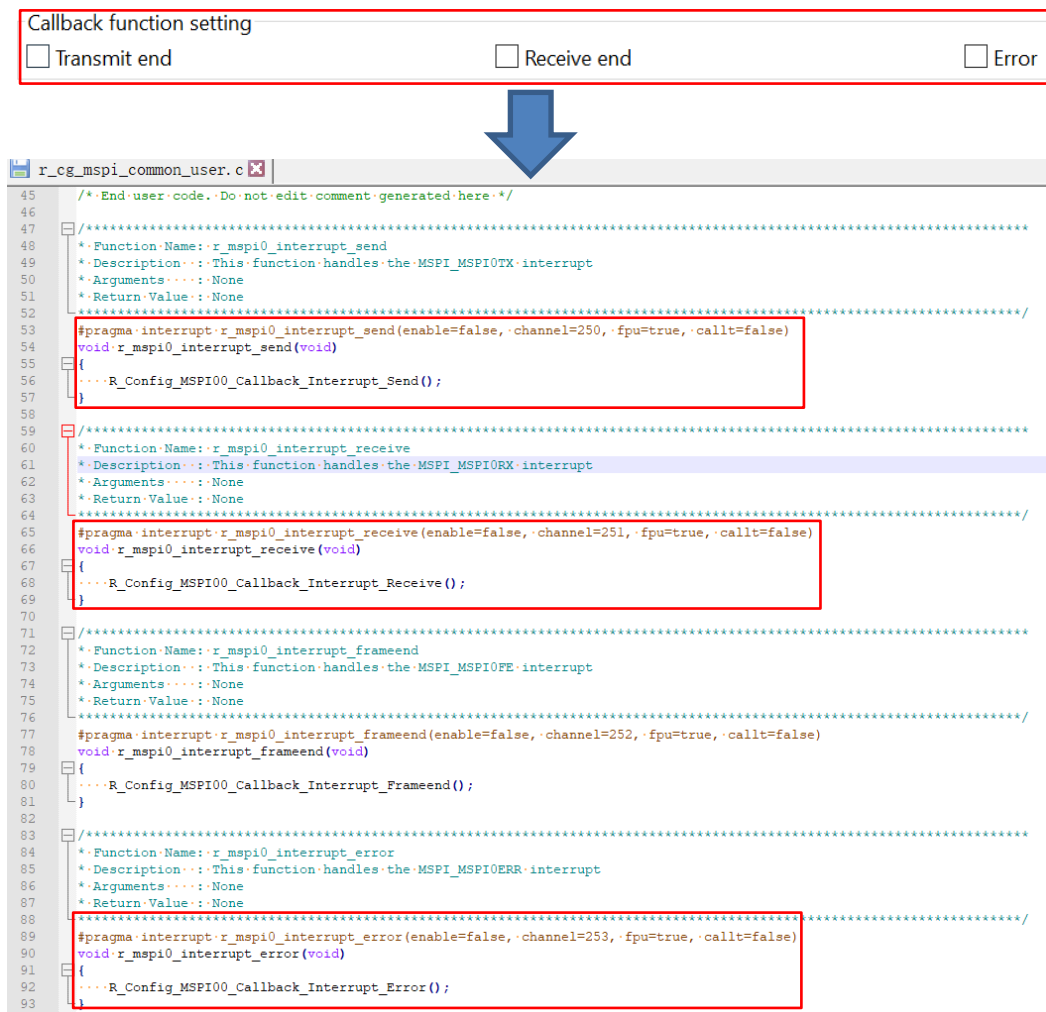
Figure 3-10. Callback function setting and code

3.2.9 Improved MSPI Fixed FIFO memory mode function

From Smart Configurator for RH850 V1.9.0, when selecting Fixed FIFO memory mode, MSPI Master and MSPI Slave components are improved below two points:

1) The max transferred Frame count is changed to 65535 from 8, 16 or 32 which is the FIFO buffer stage size.

2) Receiving function is improved that receiver can receive the remaining data successfully even when remaining data number in FIFO buffer is less than the half of the FIFO buffer stage size.

Figure 3-11. Fixed FIFO memory mode setting

3.2.10 Improved the "Show view" dialog in Standalone Smart Configurator

From Smart Configurator for RH850 V1.9.0, when configuring the "Show View" dialog by selecting [Window] -> [Show View] in Standalone Smart Configurator menu, the following items are removed from the menu.

- Bookmarks
- Markers
- Minimap
- Navigator (Deprecated)
- Problems
- Progress
- Tasks
- Welcome
- Cheat Sheets

4. List of RENESAS TOOL NEWS AND TECHNICAL UPDATE

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

Issue date	Document No.	Description	Applicable MCUs	Fixed version
Mar.16, 2019	R20TS0407	1. Build error occurs when setting not to generate clocks 2. RAM size display error https://www.renesas.com/document/tnn/notes-rh850-smart-configurator	RH850F1KM	V1.2.0
Jun. 01, 2016	R20TS0431	When using PLL0 Clock https://www.renesas.com/document/tnn/notes-rh850-smart-configurator-0	RH850F1KM	V1.2.0
Jul.01, 2019	R20TS0441	1. When using PWM output and triangle PWM output slave setting 2. Port input buffer setting error 3. Port drive strength control setting error 4. Port register setting error https://www.renesas.com/document/tnn/notes-smart-configurator-rh850	RH850F1KM	V1.2.0
Aug.01, 2019	R20TS0463	1. When using the input pulse interval measurement function 2. When using the Clocked Serial Interface in Master mode https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-0	RH850F1KM	V1.2.0
Oct.16, 2019	R20TS0500	1. When using data CRC 2. When using one-pulse outputs https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-1	RH850F1KM	V1.2.0
Apr.16, 2020	R20TS0569	When using CSI master and CSI slave https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-2	RH850F1KM	V1.3.0
May.16, 2020	R20TS0576	When using CSI master and CSI slave https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-3	RH850F1KM	V1.3.0
Feb. 16, 2021	R20TS0668	When using CSI master https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-4	RH850F1KM	V1.4.0

Issue date	Document No.	Description	Applicable MCUs	Fixed version
Apr. 05, 2021	R20TS0679	1. When using CSI Master and CSI Slave with CSIG 2. When using CSI Master with CSIH 3. When using Data CRC 4. When using One-Pulse Output and One-Shot Pulse Output 5. When using PWM Output and Triangle PWM Output https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-5	RH850F1KM RH850U2A	V1.4.0
Jun.16, 2021	R20TS0717	1. When using A/D converter with ADCJ2 https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-6	RH850U2A	V1.5.0
Jul. 01, 2021	R20TS0723	1.Notes on using One-Shot Pulse Output, PWM Output, Triangle PWM Output, Triangle PWM Output with Dead Time functions with TAUD1, TAUD2 https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-7	RH850U2A	V1.5.0
Sep. 16, 2021	R20TS0744	1.Notes on selecting PLL0 clock CPLL0OUT as source of CPU Subsystem clock 2.Notes on using CSIH Master receive and Master transmit/receive operation mode https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-8	RH850F1KM RH850F1KH	V1.5.0
Feb. 01, 2022	R20TS0806	1.Notes on using T&H path self-diagnosis function of A/D Converter 2.Notes on redundant macros and wrong comments in A/D Converter header file https://www.renesas.com/document/tnn/notes-smart-configurator-rh850-9	RH850U2A	V1.6.0

5. Points for Limitation

This section describes points for limitation regarding the Smart Configurator for RH850 V1.9.0.

5.1 List of Limitation

Table 5-1 List of Limitation

✓ : Applicable, -: Not Applicable

No	Description	RH850F 1KM	RH850U2 A	RH850F 1KH	RH850C 1M	RH850U 2B	Remarks
1	Note on using RIIC	✓	-	✓	-	-	
2	Note on using OS Timer	✓	-	✓	-	-	
3	Note on using DMA Controller	-	✓	-	-	-	
4	Note on using Symbolic Name	-	✓	-	✓	-	
5	Note on the extra "Run" menu on toolbar	✓	✓	✓	✓	✓	

5.2 Details of Limitation

5.2.1 Note on using RIIC

When using RIIC master or RIIC Slave to send or receive data, error interrupt priority must be higher than any other interrupt priority.

Figure 5-1. RIIC interrupt priority setting

5.2.2　Note on using OS Timer

Smart Configurator only support OSTM0, OSTM1~OSTM4 are not supported.
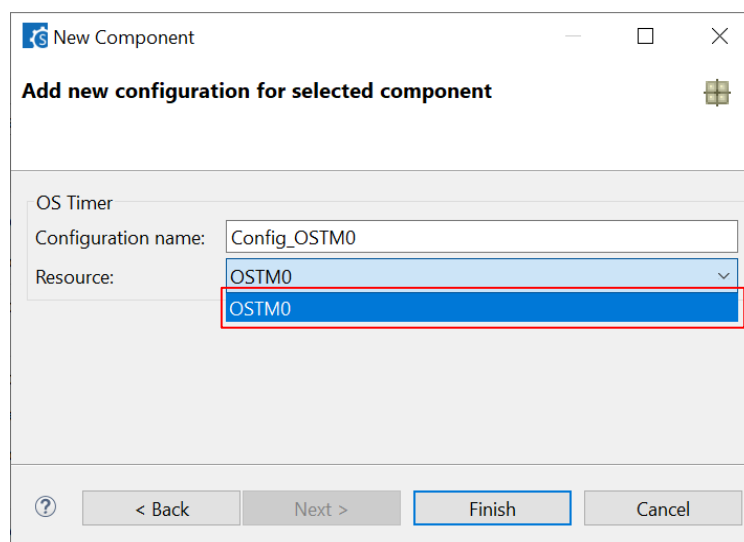
Figure 5-2 OS Timer Resource selection

5.2.3　Note on using DMA Controller

The macro value for the bit TRS of the register DMAjTMR_n is wrong in generated file "r_cg_dma.h". The correct value should be "0x00001000UL".

```
/* Transfer request source (TRS) */
#define _DMAC_AUTO_REQUEST                    (0x00000000UL) /* Auto request */
#define _DMAC_HW_REQUEST                      (0x00010000UL) /* Hardware request */
```

Figure 5-3 Wrong macro value for register bit TRS

5.2.4　Note on using Symbolic Name

The symbolic name for the assigned low effective pin with prefix "_" such as _MSPInSSI, _ERROROUT_C can't be migrated when changing device.
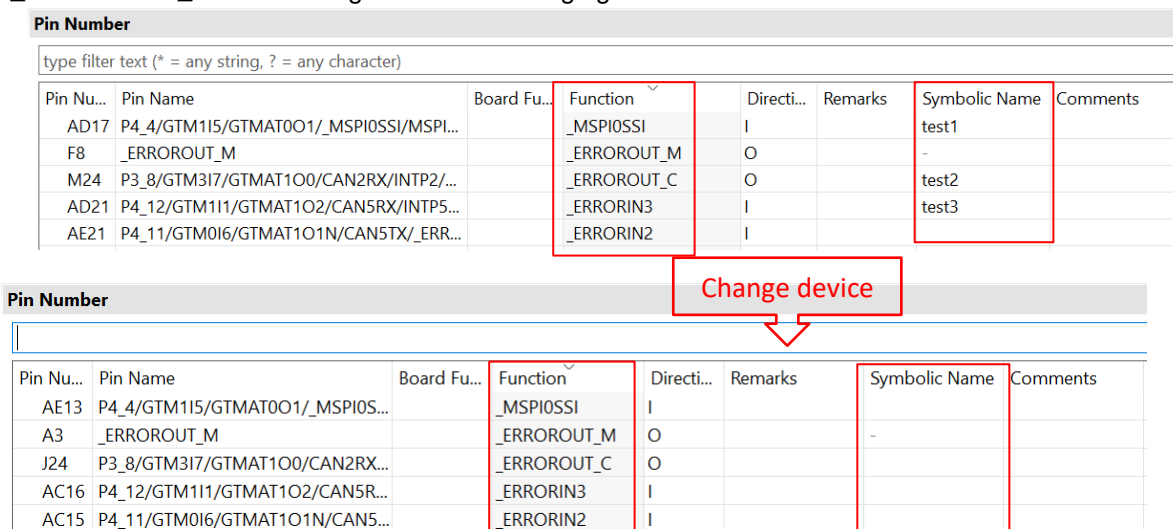
Figure 5-4 Symbolic name for low effective pin not migrated

5.2.5   Note on the extra "Run" menu on toolbar

After launching Smart Configurator, an extra menu "Run" will appear on the toolbar if user has launched the Smart Configurator for RH850 V1.8.0 or earlier version. Please ignore this menu.
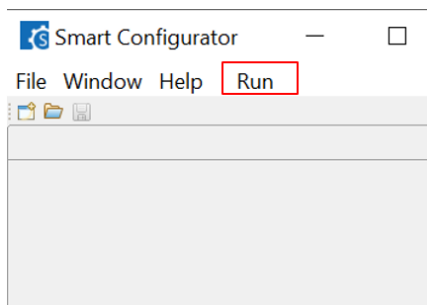
Figure 5-5 Menu "Run" on the toolbar

To remove it, user can reset the perspective according to the below steps:

1) Right-click Smart Configurator icon, select "Reset".
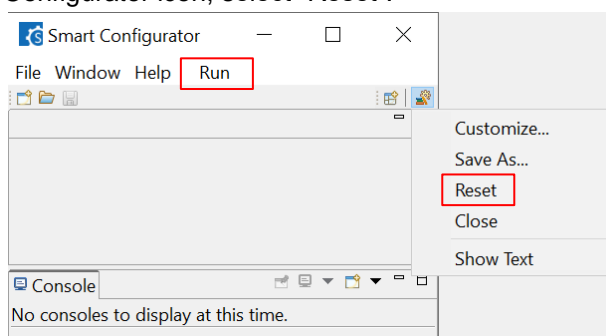
2) Select "Reset Perspective".
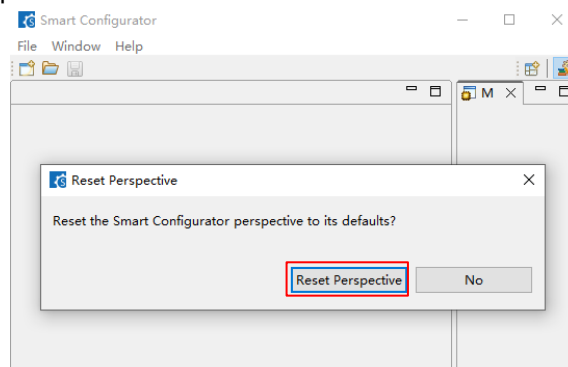
Menu "Run" is removed.
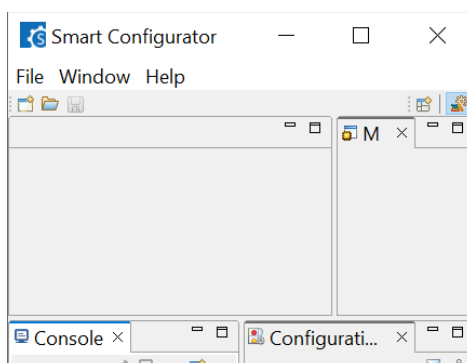
6. Points for Caution

This section describes points for caution regarding the Smart Configurator for RH850 V1.9.0.

6.1 List of Caution

Table 6-1 List of Caution

✓ : Applicable, -: Not Applicable

No	Description	RH850F1KM	RH850U2A	RH850F1K	RH850C1M	RH850U2B	Remarks
1	About the I/O define header file	✓	✓	✓	✓	✓	
2	About loading the project on CS+	✓	✓	✓	✓	✓	
3	About the sample projects	✓	✓	✓	✓	-	
4	About the decimal point	✓	✓	✓	✓	✓	
5	Note on pins sharing functions.	✓	✓	✓	✓	✓	
6	Note on Interrupt Controller resource name	✓	-	-	-	-	
7	Note on DMA/DTS trigger generator setting of MSPI Master	-	✓	-	-	✓	
8	Note on CPU Operating mode of DTS Controller	-	✓	-	-	-	
9	Note on using Smart Configurator when the OS language is Japanese	-	✓	-	-	✓	
10	Note on changing device when using Error Control Module	-	✓	-	✓	-	
11	Note on reloading project for Error Control Module	-	✓	-	-	-	
12	Note on the "Release Notes" or "Tool News" display issue in Renesas Website	✓	✓	✓	✓	✓	

6.2 Details of Caution

6.2.1 About the I/O define header file

Please use Renesas iodefine.h for the header file that defines the register. Because RH850 Smart Configurator outputs code conforming to the definition in Renesas iodefine.h, a build error occurs when using the register definition file provided by other environments.

6.2.2 About loading the project on CS+

When launching RH850 Smart Configurator from CS+, please set 'RH850 Build tool CC-RH plugin' and 'RH850 Build tool GHS CCRH850 plugin' to enable. If these plugins are disable, the error occurs when CS+ project that includes the setting of RH850 Smart Configurator is loaded.

6.2.3 About the sample project

The RH850 Smart Configurator does not output the processing after resetting the microcontroller (including the startup routine).

Therefore, we provide sample projects that include sample startup routines and other necessary processing so that user applications can be built immediately after peripheral modules are set up using the RH850 Smart Configurator.

Please refer to the user guide for sample projects under installation path.

Default installation path:

C:\Program Files (x86)\Renesas Electronics\SmartConfigurator\RH850\

6.2.4 About the decimal point

For error-free operation of the RH850 Smart Configurator, use a period (".") as the decimal point and a comma (",") as the digit grouping separator. Which of "." (period), "," (comma) or ", " (space) is used as the decimal point or digit grouping separator differs depending on the language setting of the Windows OS that is used. For example, if you use a comma (",") as the decimal point, the RH850 Smart Configurator may not work correctly. This will occur when you are using Windows OS with language set to other than Japanese or English. If you are using the RH850 Smart Configurator on Windows OS with language set to other than Japanese or English, change the language setting to Japanese or English.

6.2.5 Note on pins sharing functions

When function shared pin selects a shared pin, shared pin displays an error.

But the shared pin can be selected correctly and work correctly.

Example) For RH850/U2A RSENT0

Assign RSENT0RX and RSENT0SPCO to the T24 pin
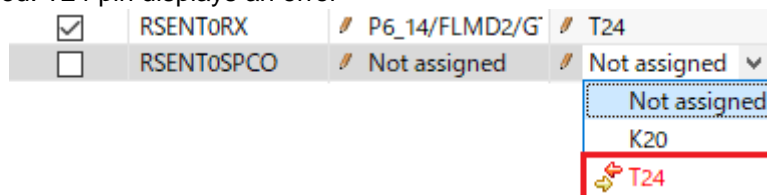
When assigned: T24 pin displays an error

Figure 6-1. pins sharing function sample when assigned

After assignment

Figure 6-2. pins sharing function sample after assigned

6.2.6   Note on Interrupt Controller resource name

In RH850 Smart Configurator V1.2.0, the resource name of the interrupt controller has been changed to "INTC". The resource name of the interrupt controller of the previous version is automatically changed from "ICU" to "INTC".
Therefore, the following file name and macro name are changed.

Table 6-2 File name change

Before change	After change
r_cg_icu.h	r_cg_intc.h

Table 6-3 Macro name change

File name	Before change	After change
r_smc_interrupt.h	ICU_xxx_PRIORITY	INTC_xxx_PRIORITY

6.2.7   Note on DMA/DTS trigger generator setting of MSPI Master

If alternative trigger is selected in Smart Configurator for RH850 V1.5.0, when reloading the project file (.scfg file) into Smart Configurator for RH850 V1.6.0, the alternative trigger signal "Use alternative trigger" can`t be reloaded and the default trigger signal "Trigger1(DTSMSPI12)/Trigger2(DTSMSPI13)" will be used.
There isn`t this cautions when reloading project between Smart Configurator for RH850 V1.5.0 and before, or between Smart Configurator for RH850 V1.6.0 and later.

Figure 6-3. "Use alternative trigger" checked in Smart Configurator for RH850 V1.5.0

Figure 6-4. "Trigger1(DTSMSPI12/Trigger2(DTSMSPI13)" selected after reloading in Smart Configurator for RH850 V1.6.0

6.2.8　Note on CPU Operating mode of DTS Controller

If CPU operating mode selects "User mode" in Smart Configurator for RH850 V1.5.0, after reloading the project in Smart Configurator for RH850 V1.6.0, CPU operating mode will be changed to "Supervisor mode" which is default setting.

There isn`t this cautions when reloading project between Smart Configurator for RH850 V1.5.0 and before, or between Smart Configurator for RH850 V1.6.0 and later.

Figure 6-5. CPU operating mode in Smart Configurator for RH850 V1.5.0

Figure 6-6. CPU operating mode after reloading in Smart Configurator for RH850 V1.6.0

6.2.9　Note on using Smart Configurator when the OS language is Japanese

For RH850/U2x users, we recommend using Smart Configurator on English OS. If your OS is Japanese, you also can add "-Duser.language=en" to "<install directory>\SmartConfigurator\RH850\eclipse\SmartConfigurator.ini" file, then you can see English GUI in Smart Configurator. For RH850/U2x, Smart Configurator Japanese UI is just for your reference, and we do not recommend that you use it.

6.2.10　Note on changing device when using Error Control Module

When using Error Control Module, we don't recommend changing device between RH850/U2A and RH850/C1M. Because most of the error sources of these two devices are different, the error sources can`t migrate.

6.2.11 Note on reloading project for Error Control Module

If user used some error sources of Error Control Module in the project created using Smart Configurator for RH850 V1.7.0 or earlier, when reloading the project using Smart Configurator for RH850 V1.8.0 or later, the error source will be different between the two versions.

Figure 6-7 and Figure 6-8 show the difference.

Figure 6-9 shows the error sources that have such issue.

Figure 6-7. Error source added in Smart Configurator for RH850 V1.7.0 or earlier

Figure 6-8. Error source reloaded in Smart Configurator for RH850 V1.8.0 or later

Figure 6-9. Error sources that have such issue

6.2.12 Note on the "Release Notes", "Tool News" display issue in Renesas Website

For Smart Configurator for RH850 V1.7 or before version, release note or tools news might not be displayed correctly on Renesas Website after clicking the "Renesas Notes" or "Tool News" under the help menu of Smart Configurator. This issue has been fixed from this version.

As a workaround, please use the URL directly:

Release Notes: https://www.renesas.com/rh850-smart-configurator-release-note

Tool News: https://www.renesas.com/rh850-smart-configurator-tn-notes
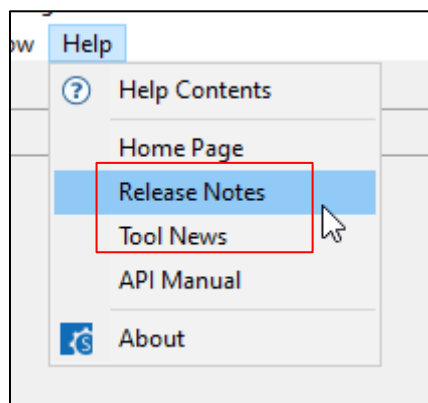
Figure 6-10 Help menu of Smart Configurator

Revision History

Rev.	Section	Description
1.00	-	First edition issued

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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