

RAA271084
Complex Device Driver
User's manual

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1. Introduction

The purpose of this document is to describe the information related to Complex Device Driver Component for RAA271084 Power Management IC.

This document shall be used as reference by users of automotive ECU development. The system overview of complete AUTOSAR architecture is shown in the below Figure:

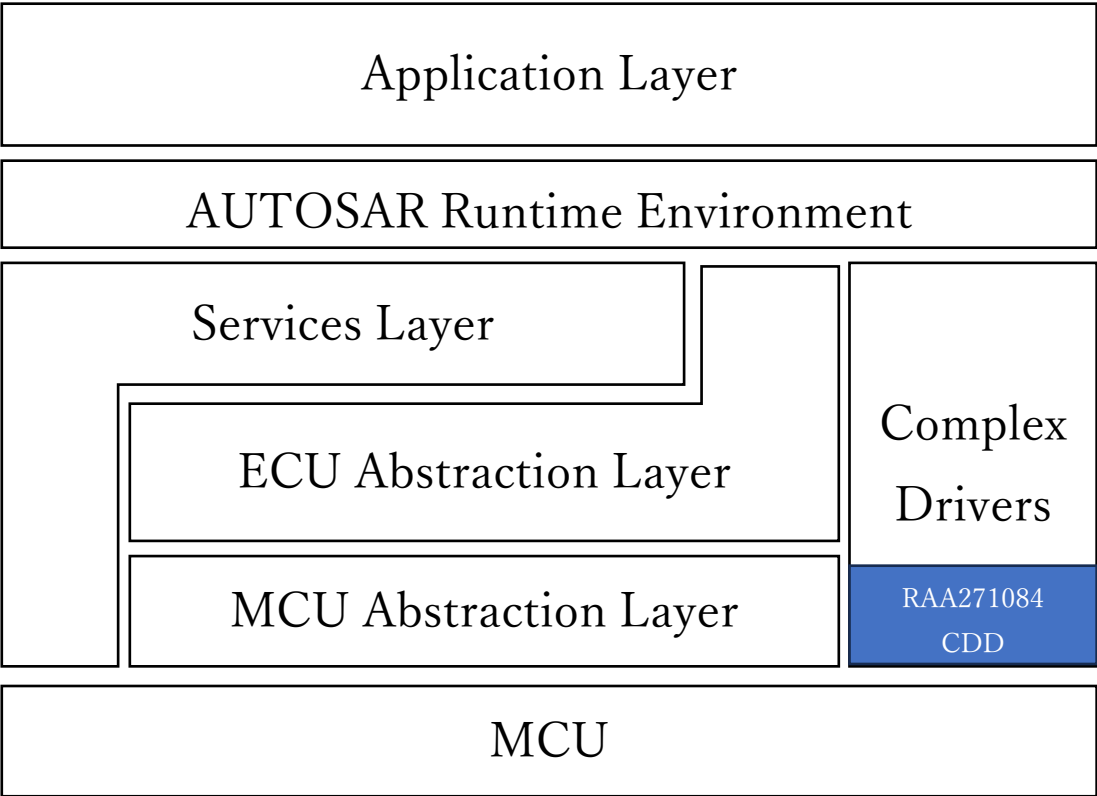


Figure1. System Overview of AUTOSAR Architecture

The deliverables provided are samples, not QM products or ASIL products.

1.1 Document Overview

The document has been segmented for easy reference. Provides an overview of the contents of the document.

Section	Contents
Section 1 (Introduction)	The section explains the purpose of this document.
Section 2 (Reference Documents)	The section lists documents referred for developing this document.
Section 3 (Integration)	The section explains how to integrate into system.
Section 4 (Architecture)	The section explains architecture details.
Section 5 (API)	This section explains API details.

2. Reference Documents

No	Title	Revision
1	RAA271084 datasheet	Rev.0.00.10(T.B.D)
2	RAA271084 Safety application note	Rev.1.0(T.B.D)

3. Integration

This section describes how to integrate RAA271084 CDD into system.

3.1 File structure

RAA271084 CDD consists of the following files.

User shall put these files in build system and set include path.

[Header files]

CDD_RAA271084\inc\

- CDD_RAA271084.h
- CDD_RAA271084_Types.h

[Source files]

CDD_RAA271084\src\

- CDD_RAA271084.c
- CDD_RAA271084_PBcfg.c
- CDD_RAA271084_Version.c

3.1 Environment

RAA271084 CDD supports the following environment. If user would like to run on another environment, please contact to Renesas Electronics salesperson.

Item	Content
IDE	CS+ V8.10.00
Compiler	CC-RH V2.0
Peripheral drivers	Smart configurator for RH850 V1.9.0

4. Architecture

This section describes system architecture relating to RAA271084 CDD.

4.1 Hardware architecture

MCU communicates RAA271084 by several signal lines shown in the below Figure.

- (1) SPI
SPI is used for configuration of RAA271084 and watchdog response.
- (2) ERROR_M
ERROUT_M is used for error signal from MCU to RAA271084
- (3) RESET
RESET is used for resetting signal from RAA271084 to MCU.
- (4) GPIO
GPIO is used for error signal from RAA271084 to MCU.

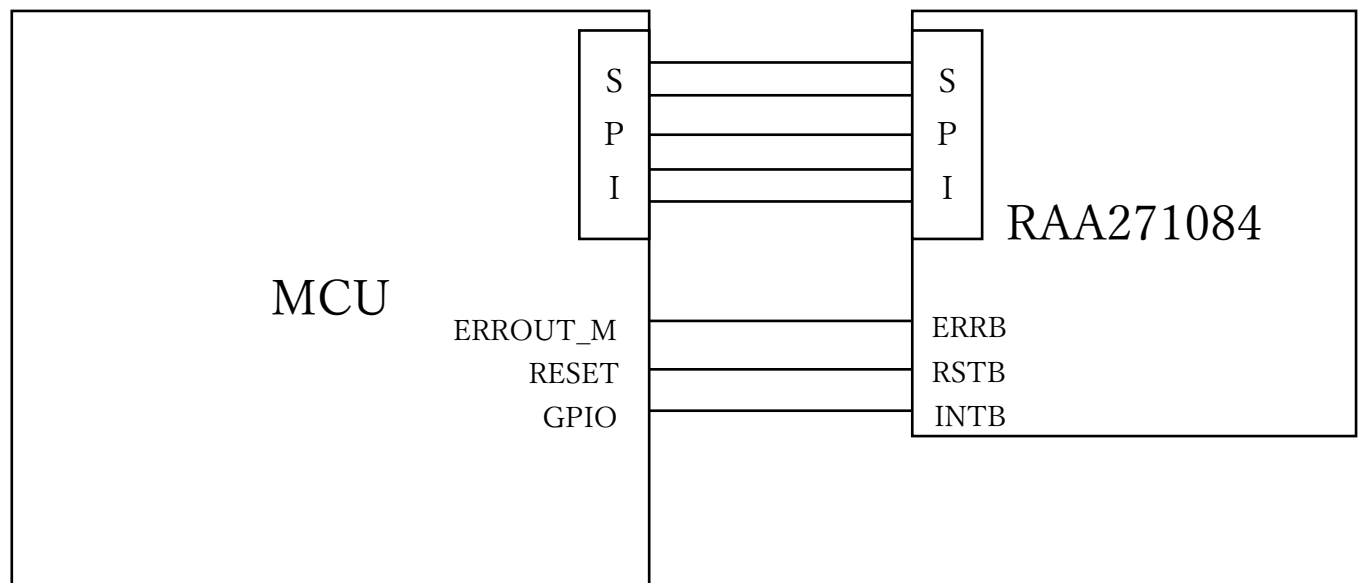


Figure2. Hardware block diagram

4.2 Software architecture

Software block diagram is shown in the below figure.

RAA271048 CDD is received request from application, RAA271084 CDD executes the process via SPI driver.

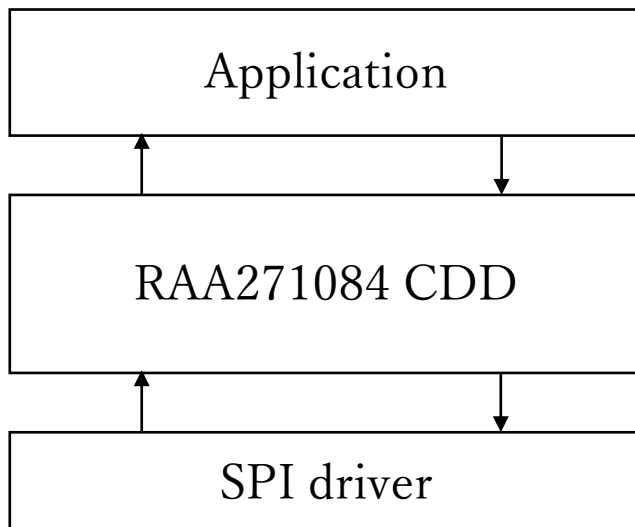


Figure3. Software block diagram

4.3 Features

RAA271084 CDD supports the following features.

(1) Initialize

Initialize configurations of RAA271084. It also executes confirmation of reset factor and BIST result in initialize phase.

(2) Watch dog processing

Start and answer for watchdog processing.

(3) Error management

Get and clear detail error information of RAA271084.

(4) Version information

Get version of RAA271084 CDD.

5. API

This section describes API of RAA271084 CDD.

5.1 Type definition

This section explains the type definitions of RAA271084 CDD.

No	Definition's name
1	Raa271084_WdtType
2	Raa271084_ActivateResetType
3	Raa271084_ConfigType
4	Raa271084_WdtQaAInfoType
5	Raa271084_ErrorInfoType
6	Raa271084_VersionInfoType

5.1.1 Raa271084_WdtType

3.1.1 Raa271084_WdtType		
Name:	Raa271084_WdtType	
Type:	enum	
Range:	RAA_WDT_8	8ms
	RAA_WDT_16	16ms
	RAA_WDT_32	32ms
	RAA_WDT_64	64ms
Description:	Type which defines the watch dog interval.	

5.1.2 Raa271084_ActivateResetType

3.1.2 Raa271084_ActivateResetType		
Name:	Raa271084_ActivateResetType	
Type:	enum	
Range:	RAA_ACTIVATERESET_FALSE	Reset inactivate
	RAA_ACTIVATERESET_TRUE	Reset activate
Description:	Type which defines the reaction of watch dog timeout.	

5.1.3 Raa271084_ConfigType

Name:	Raa271084_ConfigType		
Type:	struct		
	Type	Name	Explanation
	Raa271084_WatchdogTimerType	watchdogTimer	Watch dog timer interval
	Raa271084_ActivateResetType	activateReset	Watch dog timeout reaction
Description:	Type which defines the configuration.		

5.1.4 Raa271084_WdtQaAInfoType

Name:	Raa271084_WdtQaAInfoType		
Type:	struct		
	Type	Name	Explanation
	uint8_t	question	Question value
	uint8_t	waitCount	Wait count when 2ms interval use
Description:	Type which defines the watch dog process.		

5.1.5 Raa271084_ErrorInfoType

Name:	Raa271084_ErrorInfoType		
Type:	struct		
	Type	Name	Explanation
	uint8_t	faultStatus1	Fault status 1
	uint8_t	faultStatus2	Fault status 2
	uint8_t	faultStatus3	Fault status 3
	uint8_t	faultStatus4	Fault status 4
	uint8_t	faultStatus5	Fault status 5
	uint8_t	faultStatus6	Fault status 6
	uint8_t	faultStatus7	Fault status 7
	uint8_t	faultStatus8	Fault status 8
Description:	Type which defines the fault status. Refer to RAA271084 datasheet in more detail.		

5.1.6 Raa271084_VersionInfoType

Name:	Raa271084_VersionInfoType		
Type:	struct		
	Type	Name	Explanation
	uint16_t	vendorID	Vendor ID
	uint16_t	moduleID	Module ID
	uint8_t	swMajorVersion	Major version
	uint8_t	swMinorVersion	Minor version
	uint8_t	swPatchVersion	Patch version
Description:	Type which defines the version information.		

5.2 Function definition

This section explains the function definitions of RAA271084 CDD.

No	API's name
1	CDD_RAA271084_Init
2	CDD_RAA271084_Start
3	CDD_RAA271084_WdtQuestion
4	CDD_RAA271084_WdtAnswer
5	CDD_RAA271084_GetErrorInfo
6	CDD_RAA271084_ClearErrorInfo
7	CDD_RAA271084_GetStatus
8	CDD_RAA271084_GetVersionInfo

5.2.1 CDD_RAA271084_Init

Name:	CDD_RAA271084_Init		
Prototype:	void CDD_RAA271084_Init(void);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	None	NA	NA
Parameters InOut:	None	NA	NA
Parameters Out:	None	NA	NA
Return Value:	None		
Description:	This API performs the initialization of RAA271084 CDD. This API returns error (RAA_E_NOT_OK) when Build-In Self-test is not passed.		
Preconditions:	SPI driver has been already initialized.		

5.2.2 CDD_RAA271084_Start

Name:	CDD_RAA271084_Start		
Prototype:	void CDD_RAA271084_Start(void);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	None	NA	NA
Parameters InOut:	None	NA	NA
Parameters Out:	None	NA	NA
Return Value:	None		
Description:	This API performs to start watch dog.		
Preconditions:	CDD_RAA271084_Init shall be called before calling this API.		

5.2.3 CDD_RAA271084_WdtQuestion

Name:	CDD_RAA271084_WdtQuestion		
Prototype:	void CDD_RAA271084_WdtQuestion(Raa271084_WdtQaAInfoType *wdtQaAInfo);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	None	NA	NA
Parameters InOut:	None	NA	NA
Parameters Out:	uint8_t	wdtQaAInfo->question	0~255
	uint8_t	wdtQaAInfo->waitCount	1~15
Return Value:	None		
Description:	This API performs to obtain question from RAA271084.		
Preconditions:	CDD_RAA271084_Start shall be called before calling this API.		

5.2.4 CDD_RAA271084_WdtAnswer

Name:	CDD_RAA271084_WdtAnswer		
Prototype:	void CDD_RAA271084_WdtAnswer(uint8_t answer);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	uint8_t	answer	0~255
Parameters InOut:	None	NA	NA
Parameters Out:	None	NA	NA
Return Value:	None		
Description:	This API performs to set answer to RAA271084.		
Preconditions:	-		

5.2.5 CDD_RAA271084_GetErrorInfo

Name:	CDD_RAA271084_GetErrorInfo		
Prototype:	void CDD_RAA271084_GetErrorInfo(Raa271084_ErrorInfoType *errinfo);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	None	NA	NA
Parameters InOut:	None	NA	NA
Parameters Out:	uint8_t	errinfo->faultStatus1	0x00~0xFF
	uint8_t	errinfo->faultStatus2	0x00~0xFF
	uint8_t	errinfo->faultStatus3	0x00~0xFF
	uint8_t	errinfo->faultStatus4	0x00~0xFF
	uint8_t	errinfo->faultStatus5	0x00~0xFF
	uint8_t	errinfo->faultStatus6	0x00~0xFF
	uint8_t	errinfo->faultStatus7	0x00~0xFF
	uint8_t	errinfo->faultStatus8	0x00~0xFF
Return Value:	None		
Description:	This API performs to get error information from RAA271084.		
Preconditions:	-		

5.2.6 CDD_RAA271084_ClearErrorInfo

Name:	CDD_RAA271084_ClearErrorInfo		
Prototype:	void CDD_RAA271084_ClearErrorInfo(uint8_t id);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	uint8	id	1~8
Parameters InOut:	None	NA	NA
Parameters Out:	None	NA	NA
Return Value:	None		
Description:	This API performs to clear error of RAA271084. Input parameter id is corresponding to fault status 1~8.		
Preconditions:	-		

5.2.7 CDD_RAA271084_GetStatus

Name:	CDD_RAA271084_GetStatus		
Prototype:	uint8_t CDD_RAA271084_GetStatus(void);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	None	NA	NA
Parameters InOut:	None	NA	NA
Parameters Out:	None	NA	NA
Return Value:	Type	Value/Range	
	uint8_t	FALSE, TRUE	
Description:	This API performs to get initialization result. TRUE is initialization success, FALSE is initialization failed.		
Preconditions:	-		

5.2.8 CDD_RAA271084_GetVersionInfo

Name:	CDD_RAA271084_GetVersionInfo		
Prototype:	void CDD_RAA271084_GetVersionInfo(Raa271084_VersionInfoType *versioninfo);		
Sync/Async:	Synchronous		
Reentrancy:	Non-Reentrant		
Parameters In:	Type	Parameter	Value/Range
	None	NA	NA
Parameters InOut:	None	NA	NA
Parameters Out:	uint16_t	versioninfo->vendorID	0x3B
	uint16_t	versioninfo->moduleID	T.B.D
	uint8_t	versioninfo->swMajorVersion	T.B.D
	uint8_t	versioninfo->swMinorVersion	T.B.D
	uint8_t	versioninfo->swPatchVersion	T.B.D
Return Value:	None		
Description:	This API performs to get version information of RAA271084 CDD.		
Preconditions:	-		