User's Manual

AUTOSAR MCAL R4.0.3

User's Manual

WDG Driver Component Ver.1.0.2

Generation Tool User's Manual

Target Device:
RH850/P1x

Renesas Electronics
www.renesas.com

Rev.0.01 Apr 2015

Notice

1. All information included in this document is current as of the date this document is issued. Such information, however, is subject to change without any prior notice. Before purchasing or using any Renesas Electronics products listed herein, please confirm the latest product information with a Renesas Electronics sales office. Also, please pay regular and careful attention to additional and different information to be disclosed by Renesas Electronics such as that disclosed through our website.
2. Renesas Electronics does not assume any liability for infringement of patents, copyrights, or other intellectual property rights of third parties by or arising from the use of Renesas Electronics products or technical information described in this document. No license, express, implied or otherwise, is granted hereby under any patents, copyrights or other intellectual property rights of Renesas Electronics or others.
3. You should not alter, modify, copy, or otherwise misappropriate any Renesas Electronics product, whether in whole or in part.
4. Descriptions of circuits, software and other related information in this document are provided only to illustrate the operation of semiconductor products and application examples. You are fully responsible for the incorporation of these circuits, software, and information in the design of your equipment. Renesas Electronics assumes no responsibility for any losses incurred by you or third parties arising from the use of these circuits, software, or information.
5. When exporting the products or technology described in this document, you should comply with the applicable export control laws and regulations and follow the procedures required by such laws and regulations. You should not use Renesas Electronics products or the technology described in this document for any purpose relating to military applications or use by the military, including but not limited to the development of weapons of mass destruction. Renesas Electronics products and technology may not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable domestic or foreign laws or regulations.
6. Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.
7. Renesas Electronics products are classified according to the following three quality grades: "Standard", "High Quality", and "Specific". The recommended applications for each Renesas Electronics product depends on the product's quality grade, as indicated below. You must check the quality grade of each Renesas Electronics product before using it in a particular application. You may not use any Renesas Electronics product for any application categorized as "Specific" without the prior written consent of Renesas Electronics. Further, you may not use any Renesas Electronics product for any application for which it is not intended without the prior written consent of Renesas Electronics. Renesas Electronics shall not be in any way liable for any damages or losses incurred by you or third parties arising from the use of any Renesas Electronics product for an application categorized as "Specific" or for which the product is not intended where you have failed to obtain the prior written consent of Renesas Electronics. The quality grade of each Renesas Electronics product is "Standard" unless otherwise expressly specified in a Renesas Electronics data sheets or data books, etc.

   "Standard": Computers; office equipment; communications equipment; test and measurement equipment; audio and visual equipment; home electronic appliances; machine tools; personal electronic equipment; and industrial robots.

   "High Quality": Transportation equipment (automobiles, trains, ships, etc.); traffic control systems; anti-disaster systems; anti- crime systems; safety equipment; and medical equipment not specifically designed for life support.

   "Specific": Aircraft; aerospace equipment; submersible repeaters; nuclear reactor control systems; medical equipment or systems for life support (e.g. artificial life support devices or systems), surgical implantations, or healthcare intervention (e.g. excision, etc.), and any other applications or purposes that pose a direct threat to human life.
8. You should use the Renesas Electronics products described in this document within the range specified by Renesas Electronics, especially with respect to the maximum rating, operating supply voltage range, movement power voltage range, heat radiation characteristics, installation and other product characteristics. Renesas Electronics shall have no liability for malfunctions or damages arising out of the use of Renesas Electronics products beyond such specified ranges.
9. Although Renesas Electronics endeavors to improve the quality and reliability of its products, semiconductor products have specific characteristics such as the occurrence of failure at a certain rate and malfunctions under certain use conditions. Further, Renesas Electronics products are not subject to radiation resistance design. Please be sure to implement safety measures to guard them against the possibility of physical injury, and injury or damage caused by fire in the event of the failure of a Renesas Electronics product, such as safety design for hardware and software including but not limited to redundancy, fire control and malfunction prevention, appropriate treatment for aging degradation or any other appropriate measures. Because the evaluation of microcomputer software alone is very difficult, please evaluate the safety of the final products or system manufactured by you.
10. Please contact a Renesas Electronics sales office for details as to environmental matters such as the environmental compatibility of each Renesas Electronics product. Please use Renesas Electronics products in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. Renesas Electronics assumes no liability for damages or losses occurring as a result of your noncompliance with applicable laws and regulations.
11. This document may not be reproduced or duplicated, in any form, in whole or in part, without prior written consent of Renesas Electronics.
12. Please contact a Renesas Electronics sales office if you have any questions regarding the information contained in this document or Renesas Electronics products, or if you have any other inquiries.

(Note 1) "Renesas Electronics" as used in this document means Renesas Electronics Corporation and also includes its majority- owned subsidiaries.

(Note 2) "Renesas Electronics product(s)" means any product developed or manufactured by or for Renesas Electronics.

Abbreviations and Acronyms

Abbreviation / Acronym	Description
API	Application Programming Interface
AUTOSAR	AUTomotive Open System ARchitecture
BSWMDT	Basic Software Module Description Template
DEM	Diagnostic Event Manager
ECU	Electronic Control Unit
ID/Id	Identifier
MCAL	MicroController Abstraction Layer
MCU	MicroController Unit
WDG/Wdg	Watchdog Driver
WDTA	Window Watchdog Timer A
XML	eXtensible Mark-up Language

Definitions

Terminology	Description
BSWMDT File	This file contains Common Published Information of WDG driver.
ECU Configuration Description File	Input file to WDG Driver Generation Tool. It is generated by ECU Configuration Editor.
Sl.No.	Serial Number
Translation XML File	This file contains the translation and device specific header file path.

Table of Contents

List of Figures

List of Tables

Chapter 1 Introduction

The Watchdog Driver provides services for initialization, changing the operation mode and triggering the Watchdog.

The WDG Driver module comprises of two sections as Embedded Software and the Generation Tool to achieve scalability and configurability.

The document describes the features of the WDG Driver Generation Tool. WDG Driver Generation Tool is a command line tool that extracts information from ECU Configuration Description File and BSWMDT File and generates WDG Driver C Source and C Header files (Wdg_59_Driver<A>_Cfg.h and Wdg_59_Driver<A>_PBcfg.c).

This document contains information on the options, input and output files of the WDG Driver Generation Tool. In addition, this manual covers a step-by-step procedure for the usage of tool. ECU Configuration Description File contains information about WDG configuration.

Remark Based on the value for the parameter 'VendorApiInfix', WDG Generation Tool generates Wdg_59_DriverA_Cfg.h and Wdg_59_DriverA_PBcfg.c files. Hence in this document 'Wdg_59_Driver<A>_Cfg.h and Wdg_59 _Driver<A>_PBcfg.c' term is used.

1.1 Document Overview

This user manual is organized as given in the table below:

Section	Contents
Section 1 (Introduction)	Provides an introduction to the document and explains how information is organized in this manual.
Section 2 (Reference)	Provides a list of documents referred while developing this document.
Section 3 (WDG Driver Generation Tool Overview)	Provides the WDG Driver Generation Tool Overview.
Section 4 (Input Files)	Provides information about ECU Configuration Description File.
Section 5 (Output Files)	Explains the output files that are generated by the WDG Driver Generation Tool.
Section 6 (Precautions)	Contains precautions to be taken during configuration of ECU Configuration Description File.
Section 7 (User Configuration Validation)	Describes about user configuration validation done by the WDG Driver Generation Tool.
Section 8 (Messages)	Describes all the Error/Warning/Information messages of R4.0.3 which helps the user to understand the probable reason for the same.
Section 9 (Notes)	Provides notes to help the user to understand this document better.

Chapter 2 Reference

2.1 Reference Documents

The following table lists the documents referred to create this document:

Sl. No	Title	Version
1.	**Autosar R4.0** AUTOSAR_SWS_WatchdogDriver.pdf	2.5.0
2.	**P1x Parameter Definition File** R403_WDG_P1M_04_05_10_to_15_18_to_23.arxml	1.0.3

2.2 Trademark Notice

Microsoft and Windows are trademarks/registered trademarks of Microsoft Corporation.

Chapter 3 WDG Driver Generation Tool Overview

WDG Driver Generation Tool overview is shown below.

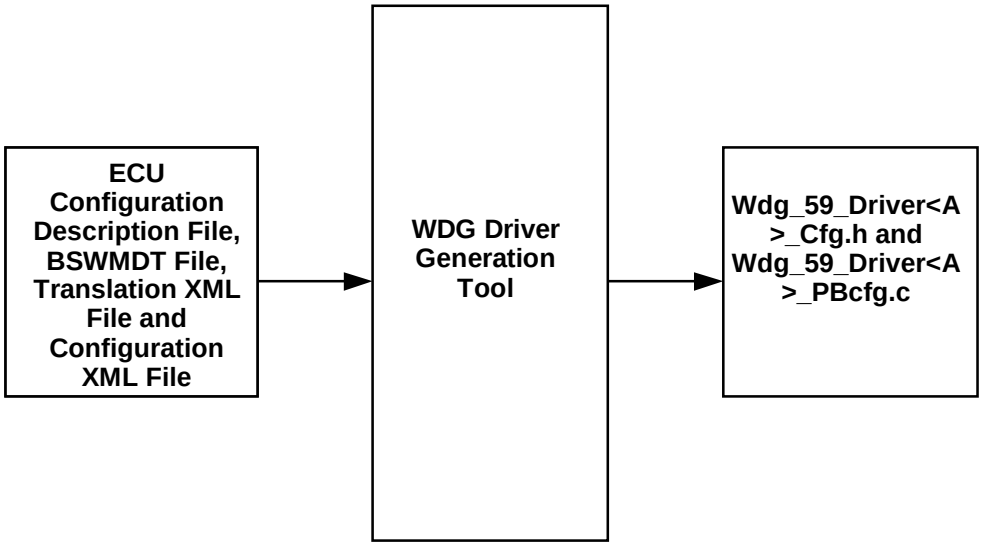

Figure 3-1 Overview of WDG Driver Generation Tool

WDG Driver Generation Tool is a command line tool that extracts, analyzes the configuration details provided in the input file and validates correctness of the data and provides scalability and configurability for WDG Driver module. It accepts ECU Configuration Description File(s), BSWMDT File, Translation XML File and Configuration XML File as input and displays appropriate context sensitive error messages for wrong input and exits. Tool creates the Log file (Wdg.log) that contains the list of Error/Warning/Information messages in the output directory.

For the error free input file, the tool generates the following output files: Wdg_59_Driver<A>_Cfg.h and Wdg_59_Driver<A>_PBcfg.c

Wdg_59_Driver<A>_Cfg.h will be compiled and linked with WDG Driver Component. Wdg_59_Driver<A>_PBcfg.c will be compiled and linked separately from the other C Source files and placed in flash.

Remark

- In case of errors the generation tool returns a 1, in case of no errors the generation tool returns a 0.
- WDG Driver Generation Tool uses “Common Published Information” from WDG module specific BSWMDT File. WDG module specific BSWMDT File should not be updated manually since it is “Static Configuration” file.

Chapter 4 Input Files

WDG Driver Generation Tool accepts ECU Configuration Description File(s), BSWMDT File, Translation XML File and Configuration XML File as input. WDG Driver Generation Tool needs information about WDG Driver module. Hence ECU Configuration Description File should contain configuration of WDG Driver module. Generation Tool ignores any other AUTOSAR component configured in the ECU Configuration Description File. ECU Configuration Description File can be generated using configuration editor.

ECU Configuration Description File must comply with AUTOSAR standard ECU Configuration Description File format.

Remark The detailed explanation about the parameters and containers are found in Parameter Definition File mentioned in the Reference Documents section.

Chapter 5 Output Files

WDG Driver Generation Tool generates configuration details in C Header and C Source files (Wdg_59_Driver<A>_Cfg.h, Wdg_59_Driver<A>_PBcfg.c).

The content of each output file is given in the table below:

Table 5-1 Output Files Description

Output File	Details
Wdg_59_Driver<A>_Cfg.h	This file contains pre-compile time parameters. This file also contains the macro definitions for development error detect, version info API, compile switch to allow/ forbid disabling Watchdog Driver during runtime and Watchdog Driver Id. This file also contains information for maximum Watchdog Timer timeout, Minimum Watchdog Timer timeout, configuration set handles, resolution of Watchdog time out period and Watchdog trigger mode.
Wdg_59_Driver<A>_PBcfg.c	This file contains post-build configuration data.

Remark Output files generated by WDG Driver Generation Tool should not be modified or edited manually.

Chapter 6 Precautions

- ECU Configuration Description File and BSWMDT File must comply with AUTOSAR standard for R4.0.3 ECU Configuration Description File and BSWMDT File respectively.
- The input file must contain WDG Driver, MCU Driver and DEM component related configuration.
- Default Translation XML File (Wdg_X1x.trxml) should be present in same location of Wdg_X1x.exe when the variant specific trxml file is not given as input in command line.
- Default Configuration XML File (Wdg_X1x.cfgxml) must be present in same location of Wdg_X1x.exe.
- If Translation XML File is not provided on the command line, Wdg_X1x.trxml which is present in same location of Wdg_X1x.exe is considered as ‘default’ Translation XML File.
- If Configuration XML File is not provided on the command line, Wdg_X1x.cfgxml which is present in same location of Wdg_X1x.exe is considered as ‘default’ Configuration XML File.
- Translation XML File should contain the file extension ‘.trxml’.
- Configuration XML File should contain the file extension ‘.cfgxml’.
- All the function names and the string values configured should follow C syntax for variables. It can only contain alphanumeric characters and “_”. It should start with an alphabet.
- If the output files generated by WDG Driver Generation Tool are modified externally, then they may not produce the expected results or may lead to error/warning/Information messages.
- Short Name for a container should be unique within a name space.
- C Source and C Header files will be generated by the Watchdog Driver Generation Tool based on the configuration of the parameters ‘VENDOR-ID’ and ‘VENDOR-API-INFIX’ in the WDG Driver specific BSWMDT File.
- An error free ECU Configuration Description File generated from configuration editor has to be provided as input to the WDG Driver Generation Tool. Otherwise Tool may not produce the expected results or may lead to errors/warnings/information.
- User has to make sure that the respective device specific configuration file is used, otherwise Tool may not produce the expected results or may lead to errors/warnings/information messages.
- The description file should always be generated using AUTOSAR specified configuration editor and it should not be edited manually.

Remark Please refer the WDG Component User Manual for deviations from AUTOSAR specifications, if any.

Chapter 7 User Configuration Validation

This section provides help to analyze the error, warning and information messages displayed during the execution of WDG Driver Generation Tool. It ensures conformance of input files with syntax and semantics. It also performs validation on the input file for correctness of the data.

For more details on list of Error/Warning/Information messages that are displayed as a result of input file validation, refer Chapter 8 "*Messages*".

The Generation Tool displays errors or warning or information when the user has configured incorrect inputs. The format of Error/Warning/Information message is as shown below.

- ERR/WRN/INF<mid><xxx>: <Error/Warning/Information Message>.

  where,
  <mid>: 102 - WDG Driver Module Id (102) for user configuration checks.
  000 - for command line checks.
  <xxx>: 001-999 - Message Id.
- File Name: Name of the file in which the error has occurred.
- Path: Absolute Path of the container in which the parameter is present.

'File Name' and 'Path' need not be present for all Error/Warning/Information messages.

Chapter 8 Messages

The messages help to identify the syntax or semantic errors in the ECU Configuration Description File. Hence it ensures validity and correctness of the information available in the ECU Configuration Description File.

The following section gives the list of error, warning and information messages displayed by the Generation Tool.

8.1 Error Messages

ERR102001: Number of fields is not same for the entity 'Structure Name'.

This error occurs, if the number of fields is not same in the structure that is to be generated in the output file.

ERR102002: Field 'Field Name' is empty in the entity 'Structure Name'.

This error occurs, if the structure fields that are to be generated in the output file are empty.

ERR102003: 'WDG Driver' Component is not present in the input file(s).

This error occurs, if WDG Driver Component is not present in the input ECU Configuration Description File(s).

ERR102004: The parameter 'parameter name' in the container 'container name' should be configured.

This error occurs, if any of the mandatory configuration parameter(s) mentioned below is (are) not configured in ECU Configuration Description File.

The list of mandatory parameters with respect to container is listed below:

Parameter Name	Container Name
WdgDevErrorDetect	WdgGeneral
WdgDisableAllowed	
WdgIndex	
WdgVersionInfoApi	
WdgVaryingActivationCodeMode	
WdgTriggerLocation	
WdgDeviceName	
WdgInitialTimeout	
WdgRunArea	

Parameter Name	Container Name
WdgMaxTimeout	WdgGeneral
WdgCriticalSectionProtection	
WdgVersionCheckExternalModules	
WdgClockRef	
WdgRegReadBackEnable	
WdgTriggerMode	WdgPublishedInformation
WdgClkSettingsFast	WdgSettingsFast
WdgClkSettingsSlow	WdgSettingsSlow
-	WdgSettingsOff
WdgDefaultMode	WdgSettingsConfig

ERR102005: The reference path <path> provided for the parameter 'Parameter Name' within the container 'Container Name' is incorrect.

This error occurs, if path provided for the reference parameters mentioned in the below table are incorrect:

Parameter Name	Container Name
WdgClockRef	WdgGeneral
WDG_E_DISABLE_REJECTED	WdgDemEventParameterRefs
WDG_E_MODE_FAILED	
WDG_E_TRIGGER_TIMEOUT	
WDG_E_READBACK_FAILURE	

ERR102006: The value configured for the parameter 'WdgClkSettingsFast' in the container 'WdgSettingsFast' and value of the parameter 'WdgClkSettingsSlow' in the container 'WdgSettingsSlow' are same.

This error occurs, if the value configured for the parameter WdgClkSettingsFast in the container WdgSettingsFast and value of the parameter WdgClkSettingsSlow in the container WdgSettingsSlow are same.

ERR102007: The value configured for the parameter 'WdgClkSettingsSlow' in the container 'WdgSettingsSlow' is faster (valid configuration should be WdgClkSettingsSlow > WdgSettingsFast) than the value of the parameter 'WdgClkSettingsFast' in the container 'WdgSettingsFast'.

This error occurs, if the value configured for the parameter WdgClkSettingsSlow in the container WdgSettingsSlow is faster than the value of the parameter WdgClkSettingsFast in the container WdgSettingsFast.

ERR102008: The value of the parameter 'WdgInitialTimeout' is greater than the value of the parameter 'WdgMaxTimeout'.

This error occurs, if the value of the parameter WdgInitialTimeout is greater than the value of the parameter WdgMaxTimeout.

ERR102009: The value of the parameter 'WdgDisableAllowed' should not be <false> since the value of the parameter 'WdgDefaultMode' is configured as <WDGIF_OFF_MODE>.

This error occurs, if the value of the parameter WdgDisableAllowed is false and the value of the parameter WdgDefaultMode is configured as WDGIF_OFF_MODE.

ERR102010: The total instances of 'WdgSettingsConfig' container per WDTA instance is more than <1>.

This error occurs, if the total instance of WdgSettingsConfig container per WDTA instance is more than 1.

ERR102011: The macro definition <Macro name> is not found in <Translation Header File name> translation C Header File. The macro label format should be 'Macro format'.

This error occurs, if the macro definitions "RENESAS_ICWDTA<WDG instance>NMI_IMR" and "RENESAS_ICWDTA<WDG instance>_IMR" are not present in Translation Header File.

ERR102012: "DriverA" or "DriverB" WDG instance is not present in input ECU Configuration Description File(s). "DEFINITION-REF" tags in WDG specific ECU Configuration Description File should contain "DriverA/ Wdg" or "DriverB/Wdg".

This error occurs, if "DriverA" or "DriverB" WDG instance is not present in description file.

Note: P1x device supports only one instance i.e. DriverA.

ERR102014: The reference to BSWMDT file 'MODULE-DESCRIPTION-REF' should not refer to the same 'VendorApiInfix' for two different WDG drivers. 'VendorApiInfix' should be unique for each hardware driver.

This error occurs, if the value of 'VendorApiInfix' is not unique for each hardware driver.

ERR102015: The value configured for the parameter 'WdgIndex' is same for all the configured WDG drivers. The value of WdgIndex should be unique for each hardware driver.

This error occurs, if the value configured for the parameter WdgIndex is same for all the configured WDG drivers.

ERR102016: The short name of the container 'WdgSettingsConfig' should be unique across the Drivers.

This error occurs, if the short name of WdgSettingsConfig container is not same across the Drivers.

ERR102017: The parameter 'WDG_E_READBACK_FAILURE' in the container ‘WdgDemEventParameterRefs’ should be should be configured since parameter 'WdgRegReadBackEnable' in container 'WdgGeneral' is not configured as 'DISABLED'.

This error will occur, if the parameter 'WDG_E_READBACK_FAILURE' in the container WdgDemEventParameterRefs’ is not configured when parameter 'WdgRegReadBackEnable' in container 'WdgGeneral' is not configured as 'DISABLED'.

8.2 Warning Messages

WRN102001: The value of the parameter 'WdgInitialTimeout' is configured as <0> and 'WdgDefaultMode' is not configured as <WDGIF_OFF_MODE>. Hence, Watchdog hardware will be enabled directly after Wdg Module initialization and WDG counter will expire after <calculated_value in msec>.

This warning occurs, if WdgInitialTimeout parameter is configured as 0 and WdgDefaultMode is not configured as WDGIF_OFF_MODE.

8.3 Information Messages

INF102001: The duration of 75% of one WDG trigger cycle for slow mode is <slow_time_value msec>.

This information occurs to provide 75% interrupt time for slow mode. In this information message ‘slow_time_value’ will be evaluated as follows:

slow_value = Power factor from WdgClkSettingsSlow slow_time_value = integer ((0.75((2slow_value)/clock))/1000)

INF102002: The duration of 75% of one WDG trigger cycle for fast mode is <fast_time_value msec>.

This information occurs to provide 75% interrupt time for fast mode. In this information message ‘fast_time_value’ will be evaluated as follows:

fast_value = Power factor from WdgClkSettingsFast fast_time_value = integer ((0.75((2fast_value)/clock))/1000)

Chapter 9 Notes

“Generation Tool” and “Tool” terminologies are used interchangeably to refer WDG Driver Generation Tool.

Revision History

Sl.No.	Description	Version	Date
1.	Initial Version	1.0.0	18-Oct-2013
2.	Following changes are made: 1. Chapter 2 is updated for addition of PDF reference. 2. WdgRegReadBackEnable parameter is added in ERR102004 error message table. 3. A note is added for ERR102012 error message. 4. WdgDemEventParameterRefs container and its parameters are added in the table of error message ERR102005. 5. Error message ERR102017 is added newly. 6. Error messages ERR102015 and ERR102016 are rephrased. 7. Chapter 6 Precautions is updated.	1.0.1	26-Sep-2014
3.	Following change is made: 1. Updated Chapter 2 to add PDF reference.	1.0.2	28-Apr-2015

AUTOSAR MCAL R4.0.3 User's Manual
WDG Driver Component Ver.1.0.2
Generation Tool User's Manual

Publication Date: Rev.0.01, April 28, 2015

Published by: Renesas Electronics Corporation

SALES OFFICES Renesas Electronics Corporation http://www.renesas.com

Refer to "http://www.renesas.com/" for the latest and detailed information.

Renesas Electronics America Inc.
2880 Scott Boulevard Santa Clara, CA 95050-2554, U.S.A.
Tel: +1-408-588-6000, Fax: +1-408-588-6130

Renesas Electronics Canada Limited
1101 Nicholson Road, Newmarket, Ontario L3Y 9C3, Canada
Tel: +1-905-898-5441, Fax: +1-905-898-3220

Renesas Electronics Europe Limited
Dukes Meadow, Millboard Road, Bourne End, Buckinghamshire, SL8 5FH, U.K
Tel: +44-1628-585-100, Fax: +44-1628-585-900

Renesas Electronics Europe GmbH
Arcadiastrasse 10, 40472 Düsseldorf, Germany
Tel: +49-211-65030, Fax: +49-211-6503-1327

Renesas Electronics (China) Co., Ltd.
7th Floor, Quantum Plaza, No.27 ZhiChunLu Haidian District, Beijing 100083, P.R.China
Tel: +86-10-8235-1155, Fax: +86-10-8235-7679

Renesas Electronics (Shanghai) Co., Ltd.
Unit 204, 205, AZIA Center, No.1233 Lujiazui Ring Rd., Pudong District, Shanghai 200120, China
Tel: +86-21-5877-1818, Fax: +86-21-6887-7858 / -7898

Renesas Electronics Hong Kong Limited
Unit 1601-1613, 16/F., Tower 2, Grand Century Place, 193 Prince Edward Road West, Mongkok, Kowloon, Hong Kong
Tel: +852-2886-9318, Fax: +852 2886-9022/9044

Renesas Electronics Taiwan Co., Ltd.
7F, No. 363 Fu Shing North Road Taipei, Taiwan
Tel: +886-2-8175-9600, Fax: +886 2-8175-9670

Renesas Electronics Singapore Pte. Ltd.
1 harbourFront Avenue, #06-10, Keppel Bay Tower, Singapore 098632
Tel: +65-6213-0200, Fax: +65-6278-8001

Renesas Electronics Malaysia Sdn.Bhd.
Unit 906, Block B, Menara Amcorp, Amcorp Trade Centre, No. 18, Jln Persiaran Barat, 46050 Petaling Jaya, Selangor Darul Ehsan, Malaysia
Tel: +60-3-7955-9390, Fax: +60-3-7955-9510

Renesas Electronics Korea Co., Ltd.
11F. Samik Lavied' or Bldg., 720-2 Yeoksam-Dong, Kangnam-Ku, Seoul 135-080, Korea
Tel: +82-2-558-3737, Fax: +82-2-558-5141

Colophon 1.0

AUTOSAR MCAL R4.0.3

User’s Manual

Renesas Electronics Corporation