

RE01 1500KB Group

CMSIS Driver Package Rev1.30

Introduction

This document explains how to use CMSIS Driver Package for RE01 1500 KB Group and its restrictions. In this package, driver software can be used to shorten development time and increase development efficiency.

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1. CMSIS PACKAGE Introduction

1.1 Folder Structure

Figure 1.1 shows the folder structure of CMSIS Package. It is recommended to read Getting Started folder under Documents folder before you begin the development.

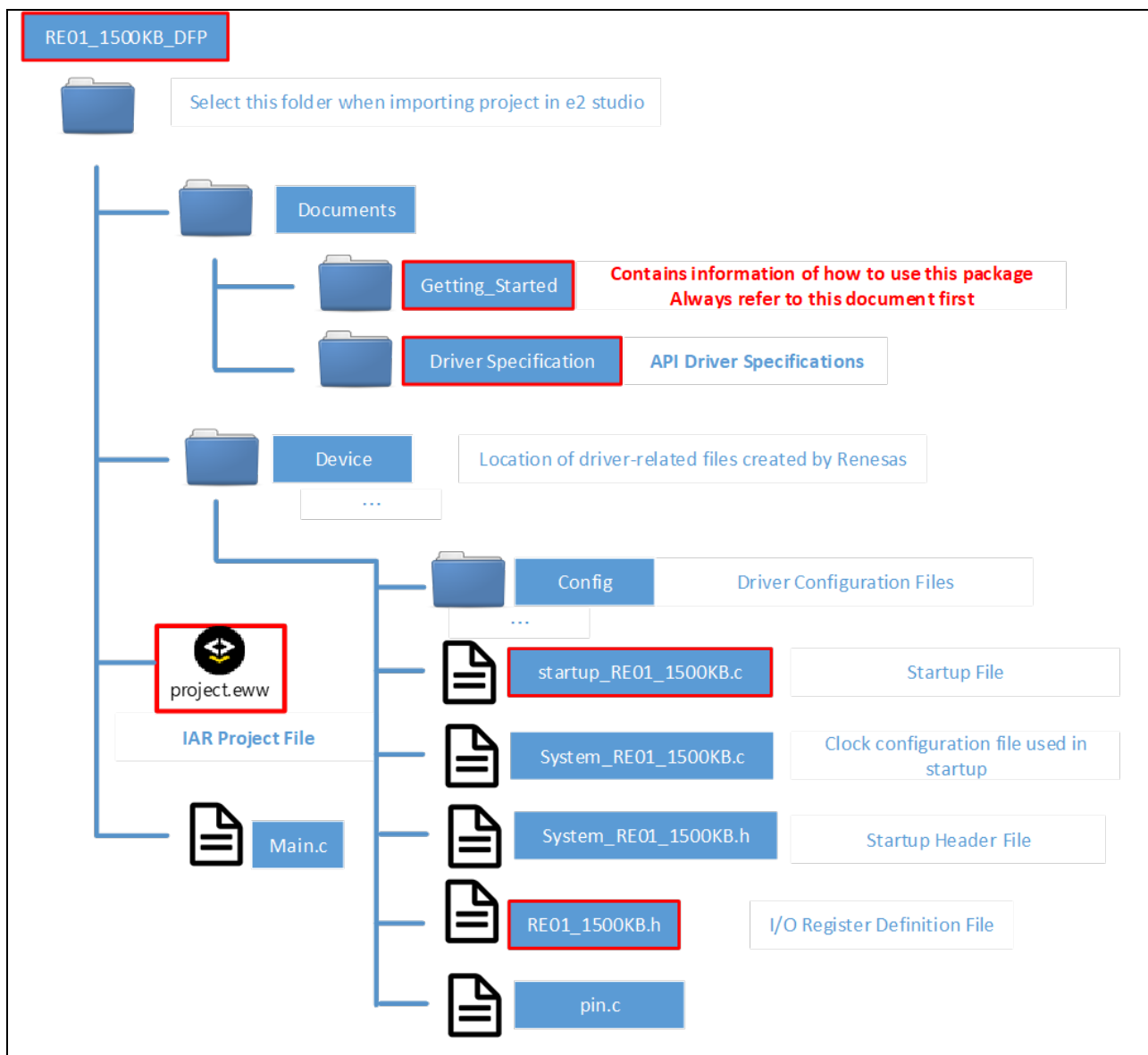


Figure 1.1 Main Files and Folder Structure in CMSIS Package

1.2 Reference Documents

Table 1-1 1.1 Reference Documents

No	Document Name	Content	Document Number
1	Getting Started Guide to Development Using CMSIS Package	Introduction of user code and how to use CMSIS PACKAGE	R01AN4660

2. Operating Environment

2.1 Device

RE Family RE01 1500KB Group

2.2 Development Environment

It is recommended to use CMSIS package with the development environment listed below:

IDE	Compiler	Debugger
IAR EWARM V8.5 or later (IAR Embedded Workbench® for ARM)	IAR v8.5 or Later (Optimize Low)	IAR I-Jet
		Segger J-Link(OB)
Renesas e2 studio 2020-7(64bit) or later ※The 32-bit version of e2studio is maintenance only.	GCC V.6 GNU 6-2017-q2-update (Optimize -O2)	Segger J-Link(OB)
	IAR v8.5 or Later using IAR plug-in (Optimize Low)	

3. Improvements from Older Version

3.1 Improvements in Rev 1.30

No.	Category	Target File	Details
1	Specification change	Linker file	Added standard library function to expand RAM
2	Bug fix	CMSIS-Core	External noise immunity enhancement and current reduction measures (QUICK MODE) when EHC is not used (Tool News: R20TS0635)
3	Specification change	CMSIS-Core	Changed the argument when calling the R_LPM_IOPowerSupplyModeSet function in the main function from the direct value (0x00) to the define value (LPM_IOPOWER_SUPPLY_NONE).
4	Specification change	CMSIS-Core	Creating a heap area entity in the GCC environment -Call Stack size and Heap size can be changed from r_system_cfg.h in GCC environment.
5	Specification change	R_EHC driver	Code copy processing change in r_ehc_Startup function due to No.1 change
6	Specification change	R_SYSTEM driver	Removed the following three definitions that are not working -SYSTEM_CFG_STACK_MAIN_BYTES -SYSTEM_CFG_STACK_PROCESS_BYTES -SYSTEM_CFG_HEAP_BYTES
7	Bug fix	R_PIN	Delete unnecessary CCC pin setting function (R_CCC_Pinset / R_CCC_Pinclr)

8	Specification change	R_PIN	Added ICU all channel setting function (R_ICU_Pinset / R_ICU_Pinclr)
9	Specification change	R_PIN	Separate the R_GPT_COM_Pinset / R_GPT_COM_Pinclr functions as follows: <ul style="list-style-type: none">• R_GPT_COMA_Pinset / R_GPT_COMA_Pinclr• R_GPT_COMB_Pinset / R_GPT_COMA_Pinclr

4. Restrictions

4.1 Restriction List History

The following issues have been fixed in Rev 1.20. For the latest complete list of restrictions, please see the tool news of this package on our website.

No.	Restriction Details	Status				
		Rev 1.00	Rev 1.01	Rev 1.10	Rev 1.20	Rev 1.30
1	Restrictions when placing GDT driver functions to RAM (r01an4947)	Not fixed	Fixed	Fixed	Fixed	Fixed
2	Restrictions when placing PMIP driver functions to RAM (r01an4947)	Not fixed	Fixed	Fixed	Fixed	Fixed
3	Restrictions when placing LPM driver functions to RAM (r20ts0510)	Not fixed	Fixed	Fixed	Fixed	Fixed
4	Program writes to invalid area in GDT driver (r20ts0551)	Not fixed	Not fixed	Fixed	Fixed	Fixed
5	Incorrect LVD setting in EHC driver (r20ts0552)	Not fixed	Not fixed	Fixed	Fixed	Fixed
6	RAM allocation issue of GetTransferByte function in DTC driver(r01an5278)	Not fixed	Not fixed	Fixed	Fixed	Fixed
7	Pin outputs Hi-Z during USART driver initialization (r01an5278)	Not fixed	Not fixed	Fixed	Fixed	Fixed
8	USART driver ch9 reception interrupt does not perform correctly when DTC is used (r01an5278)	Not fixed	Not fixed	Fixed	Fixed	Fixed
9	R_PMIP_Send function is not placed to RAM in PMIP driver	Not fixed	Not fixed	Fixed	Fixed	Fixed
10	Incorrect communication data format setting in SPI driver	Not fixed	Not fixed	Fixed	Fixed	Fixed
11	VCOM setup time or hold time does not follow the value set in the configuration file (R20TS0574).	Not fixed	Not fixed	Not fixed	Fixed	Fixed
12	AGT register write confirmation process is looped until a timeout occurs (R20TS0574)	Not fixed	Not fixed	Not fixed	Fixed	Fixed
13	AGT timer does not stop after releasing the SMIP driver (R20TS0574)	Not fixed	Not fixed	Not fixed	Fixed	Fixed
14	Data format of the SPI does not follow the configuration setting (SMIP_CFG_SPI_BIT_ORDER definition) when executing R_SMIP_Resume function. (R01AN5561)	Fixed	Fixed	Not fixed	Fixed	Fixed

15	Precautions regarding improper settings when not using the Energy Harvest Control Circuit (EHC) (R20TS0635)	Not fixed	Not fixed	Not fixed	Not fixed	Fixed
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5. How to Open and Load a Project

5.1 EWARM

When using IAR EWARM, double click .eww file (IAR project file) inside the ZIP file.

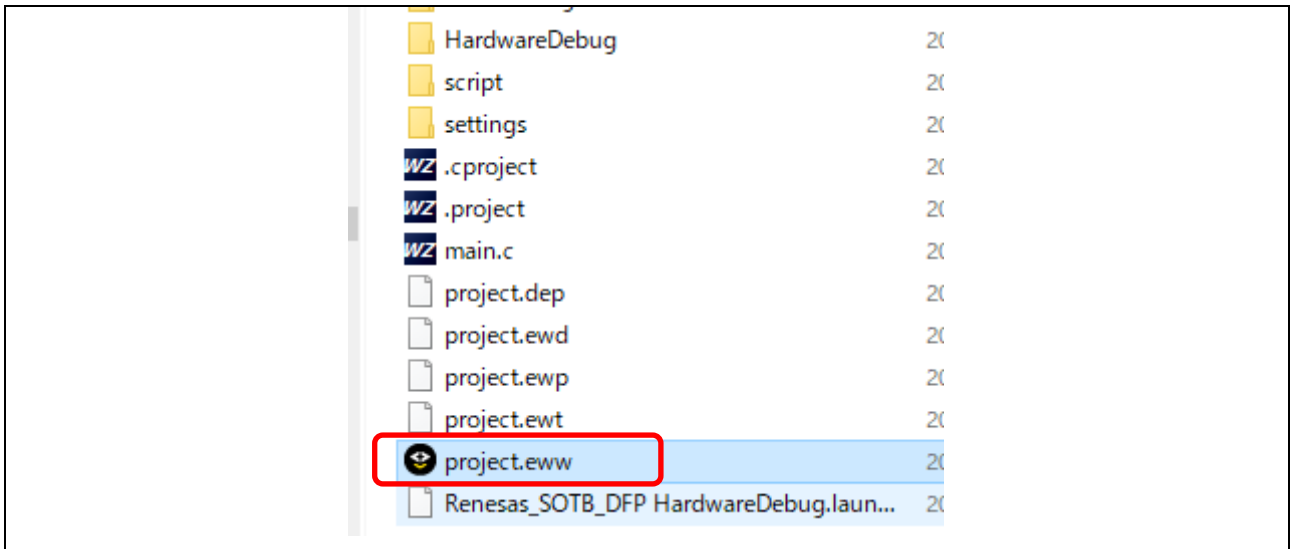


Figure 4.1 How to Open Existing EWARM Project

5.2 e2 studio

When using Renesas e2 studio, follow the steps explained below.

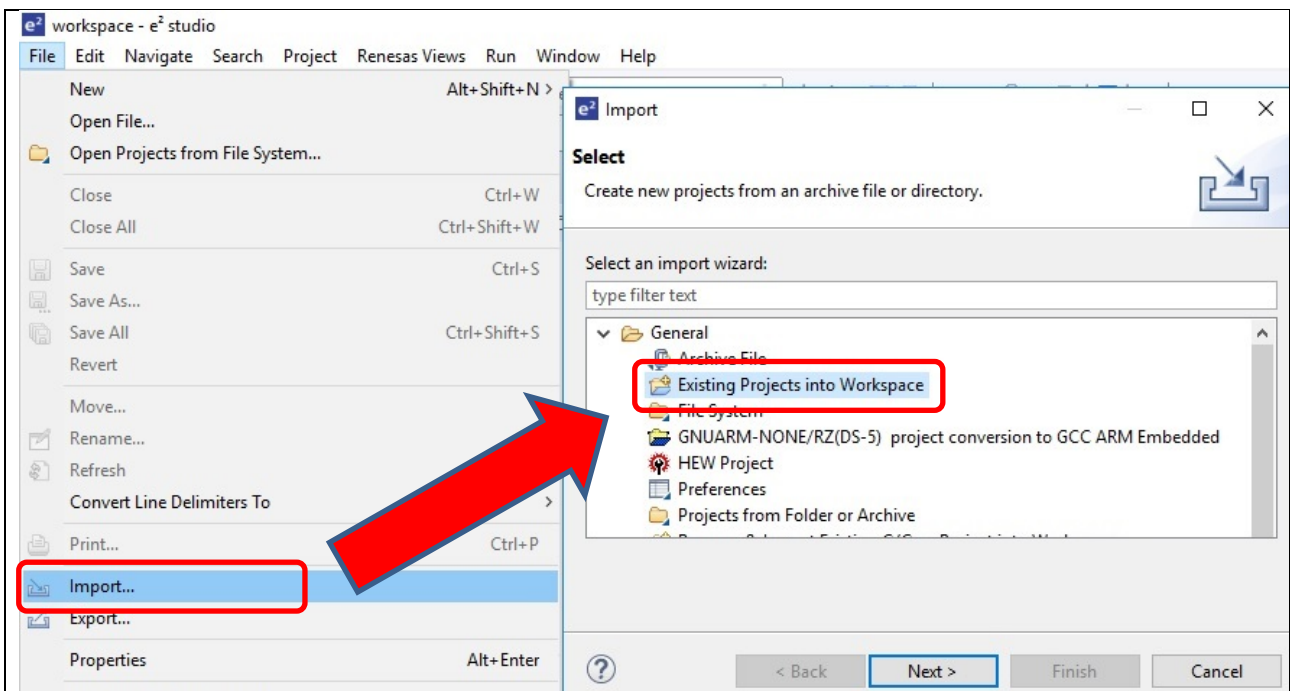


Figure 4.2 How to Open Existing e2 studio Project (Step 1)

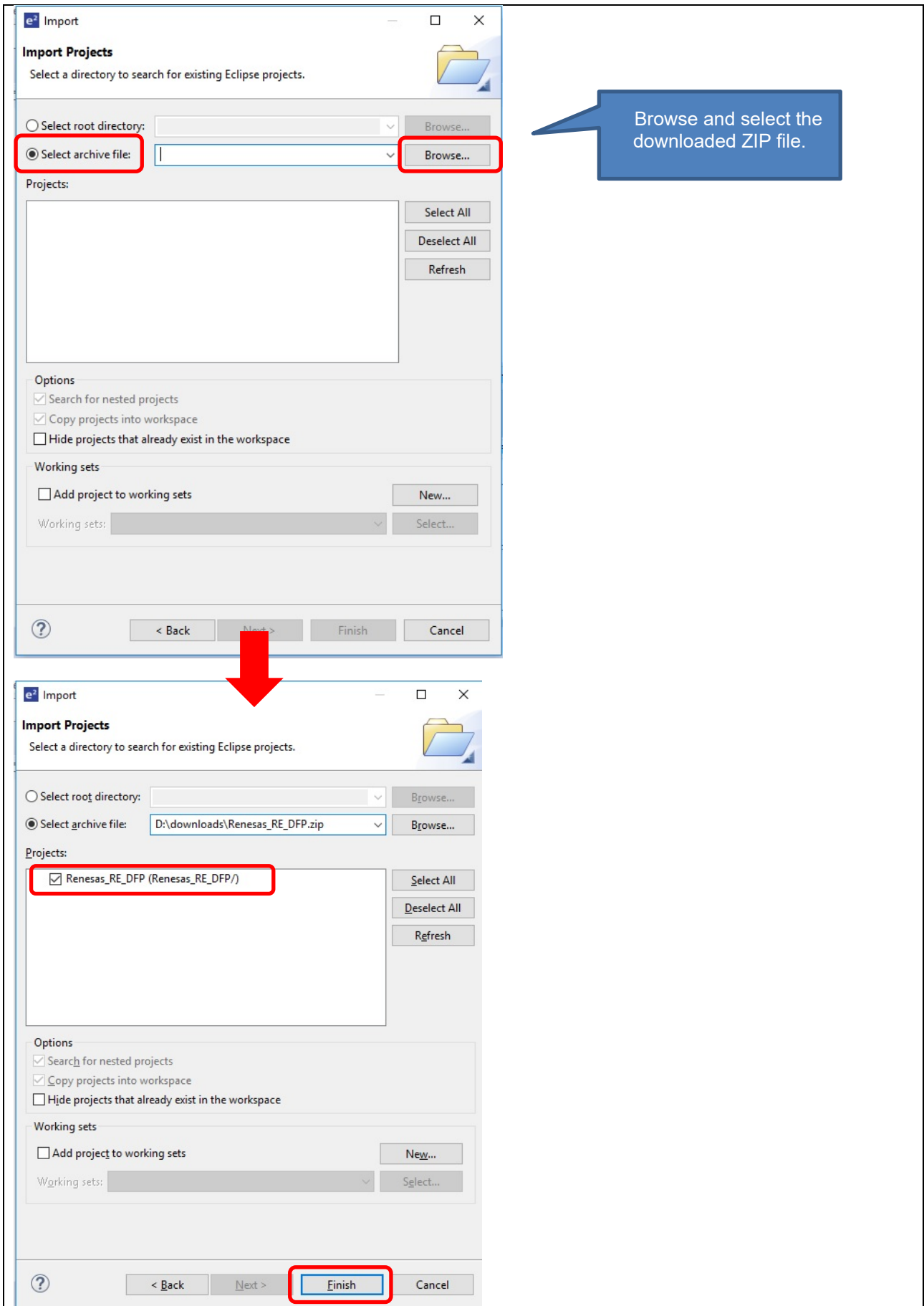


Figure 4.3 How to Open Existing e2 studio Project (Step 2)

When using GCC compiler, select "HardwareDebug" according to Figure 4.4 below.

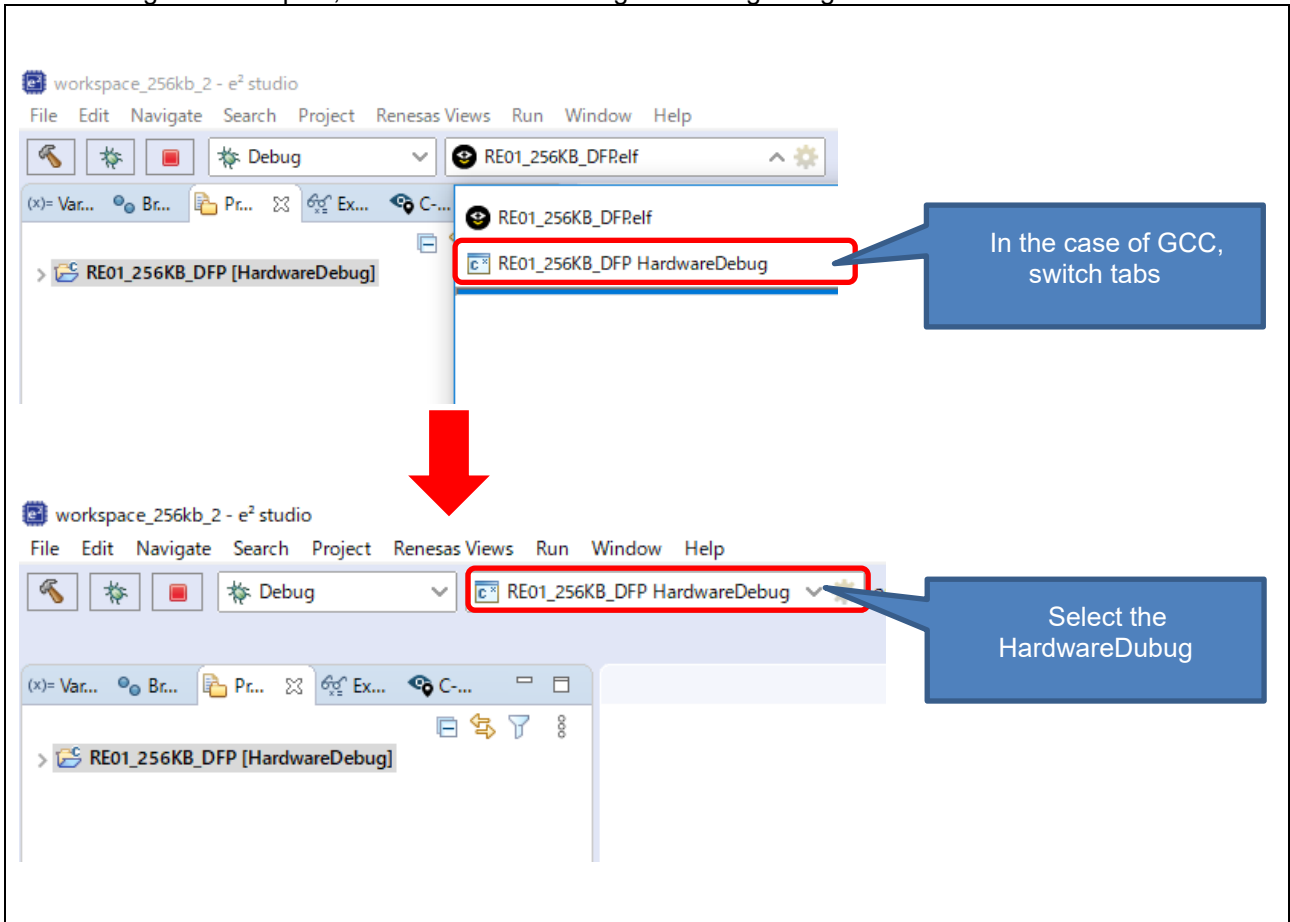


Figure 4.4 Configuration for the e2 studio GCC environment

Revision History

Rev.	Date	Description	
		Page	Summary
1.30	Jan.20.21		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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