

RE01 1500KB Group

CMSIS Driver Package Rev1.10

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.

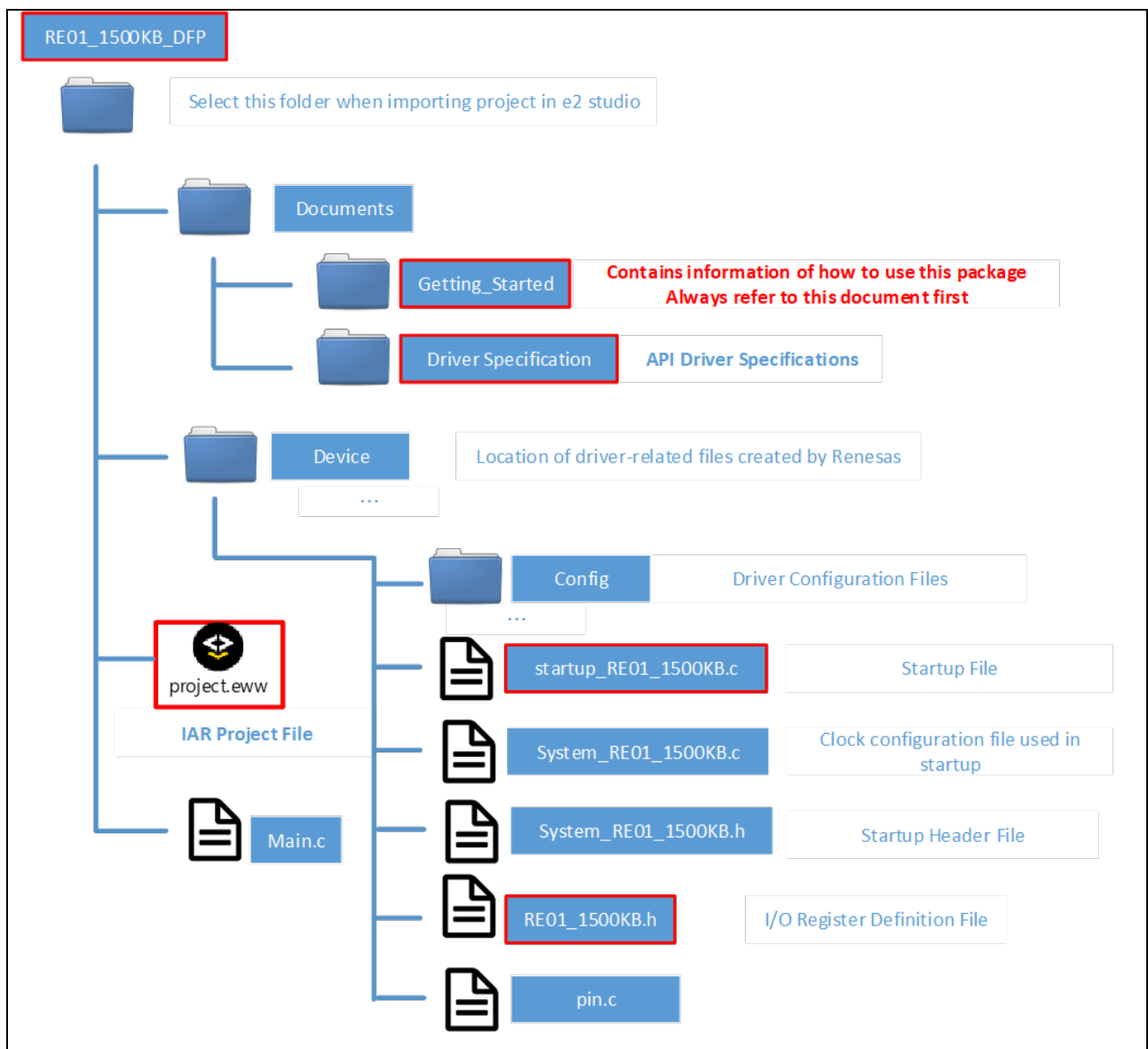


Figure 1.1 Main Files and Folder Structure in CMSIS Package

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 V8.4 or later (IAR Embedded Workbench® for ARM)	IAR v8.4 or Later (Optimize Low)	IAR I-Jet
		Segger J-Link(OB)
Renesas e2 studio V.7 or later	GCC V.6 GNU 6-2017-q2-update (Optimize -O2)	Segger J-Link(OB)

3. Improvements from Older Version

3.1 Improvements in Rev 1.10

No.	Category	Target File	Details
1	Update	SVD, I/O header file	Update in peripheral function definition file (RE01_1500KB.SVD, RE01_1500KB.h) -Added control bit for internal LDO circuit
2	Specification change	CMSIS-Core	Change in MOCO, LOCO, and SOSC oscillation stabilization waiting time -Fixed wrong removal of software waiting loops by compiler optimization
3	Specification change	CMSIS-Core, R_SYSTEM driver	Improved PLL clock setting check by preprocessor -Revised macro value in r_core_cfg.h when PLL clock is not used during startup
4	Specification change	CMSIS-Core, R_EHC driver	Added macro for LVD setting during EHC startup in r_core_cfg.h -Added a macro in R_EHC driver to allow user to select voltage detection level of LVD1 during EHC startup
5	Bug fix	R_EHC driver	Added LVD stabilization time during EHC startup in startup code (Tool news: R20TS0552)
6	Specification change	R_EHC driver	Change in LVD interrupt handler setting during EHC startup Previous version: LVD interrupt handler is already prepared in driver Current version: Interrupt handler (function name: NMI_Handler) for VCC voltage drop is now created by user.
7	Specification change	R_EHC driver	Change in LVD interrupt handler processing during EHC startup

			-Added process to reduce device power consumption before setting QUICKMODE bit to 0
8	Specification change	R_SYSTEM driver	Added macro definition to control a new protect register bit (PRC4 bit in PRCR register)
9	Specification change	R_PMIP driver	Added macro to select Memory In Pixel (MIP) LCD initialization data
10	Specification change	R_PMIP driver	Modified the waiting time for VCOM output prohibition period during the start of data transfer -Changed waiting time from 4 ms to 5 ms And default value of configuration macro changed
11	Specification change	R_SMIP driver	Deleted unnecessary AGT module stop setting
12	Specification addition	R_SMIP driver	Added macro to switch the bit order of communication data format. - Added SMIP_CFG_SPI_BIT_ORDER macro definition to select LSB/MSB in r_smip_cfg.h
13	Bug fix	R_DTC driver	Fixed the issue where GetTransferByte function cannot be allocated to RAM using macro in r_dtc_cfg.h -Added DTC_CFG_R_DTC_GET_TRANSFER_BYTE definition in r_dtc_cfg.h
14	Specification change	R_PIN	Following the procedure in user manual, PMR bit is now set to 0 before pin setting
15	Specification change	R_PIN	Related to bug fix in USART driver (No.17), steps are added to avoid SCIn pin to output Hi-Z
16	Bug fix	R_GDT driver	Fixed the issue where the program writes to invalid area when calling R_GDT_Shrink and R_GDT_Fount function (Tool news: R20TS0551) -Changed the method to access variables used in v_gdt_cpuline_byte_rd_gdt_limit function in r_gdt_api.c
17	Bug fix	USART driver	Improved pin setting procedure inside driver -Fixed the issue where pin outputs Hi-Z for several cycles during pin setting
18	Bug fix	USART driver	Fixed the issue where reception end interrupt does not perform properly when DTC is used for SCI9 reception process and DMAC is not used by any other processes
19	Bug fix	R_PMIP driver	Fixed the issue where R_PMIP_Send function cannot be allocated to RAM using macro in r_pmip_cfg.h

			<p>-R_PMIP_Send function is now allocated to RAM by using the definition in r_pmip_api.h as written below.</p> <pre>#if (PMIP_CFG_R_PMIP_SEND == SYSTEM_SECTION_RAM_FUNC) #define FUNC_LOCATION_R_PMIP_SEND __attribute__((section(".ramfunc")))</pre>
20	Bug fix	R_SPI driver	<p>Fixed incorrect communication data format setting.</p> <p>-Fixed the issue where communication data format is inversely set by the control function. The program communication data format was set to MSB when LSB setting was chosen. Likewise, communication data format was set to LSB when MSB setting was chosen.</p>

4. Restrictions

4.1 Restriction List History

The following issues have been fixed in Rev 1.10. 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
1	Restrictions when placing GDT driver functions to RAM (r01an4947)	Not fixed	Fixed	Fixed
2	Restrictions when placing PMIP driver functions to RAM (r01an4947)	Not fixed	Fixed	Fixed
3	Restrictions when placing LPM driver functions to RAM (r20ts0510)	Not fixed	Fixed	Fixed
4	Program writes to invalid area in GDT driver (r20ts0551)	Not fixed	Not fixed	Fixed
5	Incorrect LVD setting in EHC driver (r20ts0552)	Not fixed	Not fixed	Fixed
6	RAM allocation issue of GetTransferByte function in DTC driver (r01an5278)	Not fixed	Not fixed	Fixed
7	Pin outputs Hi-Z during USART driver initialization (r01an5278)	Not fixed	Not fixed	Fixed
8	USART driver ch9 reception interrupt does not perform correctly when DTC is used (r01an5278)	Not fixed	Not fixed	Fixed
9	R_PMIP_Send function is not placed to RAM in PMIP driver	Not fixed	Not fixed	Fixed
10	Incorrect communication data format setting in SPI driver	Not fixed	Not fixed	Fixed

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.

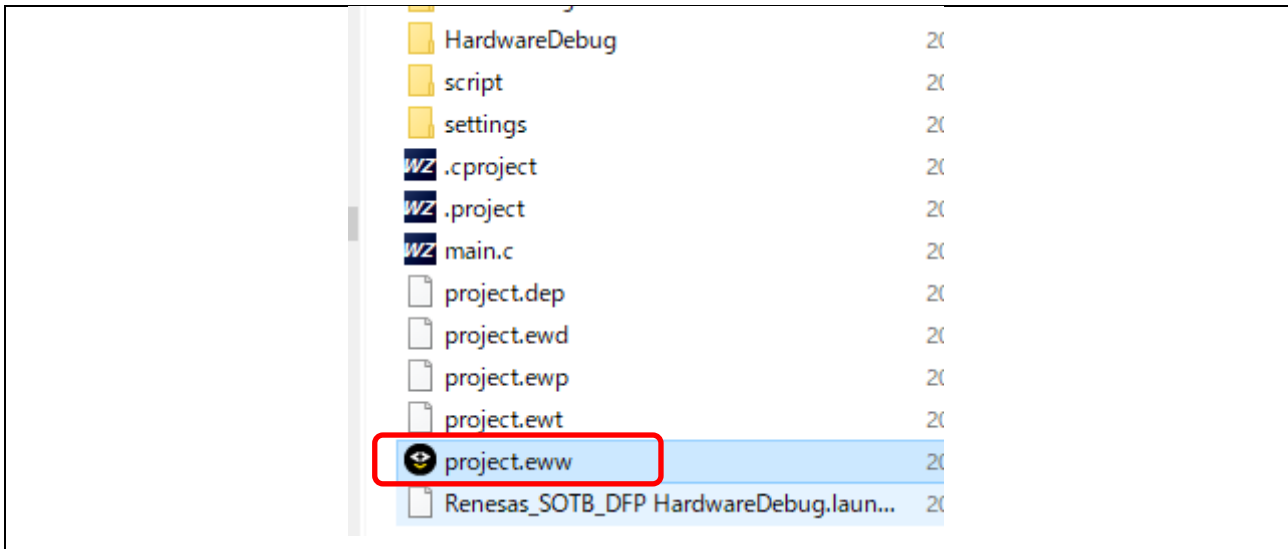


Figure 4.1 How to Open Existing EWARM Project

5.2 e2 studio

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

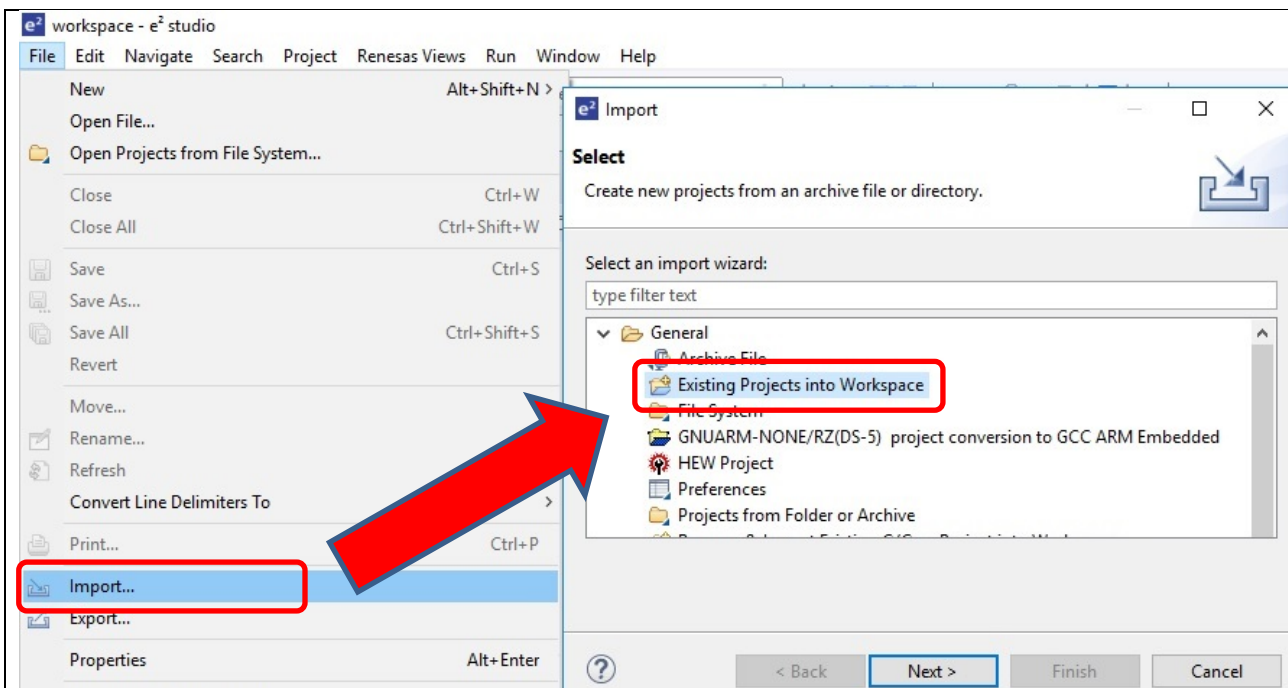


Figure 4.2 How to Open Existing e2 studio Project (Step 1)

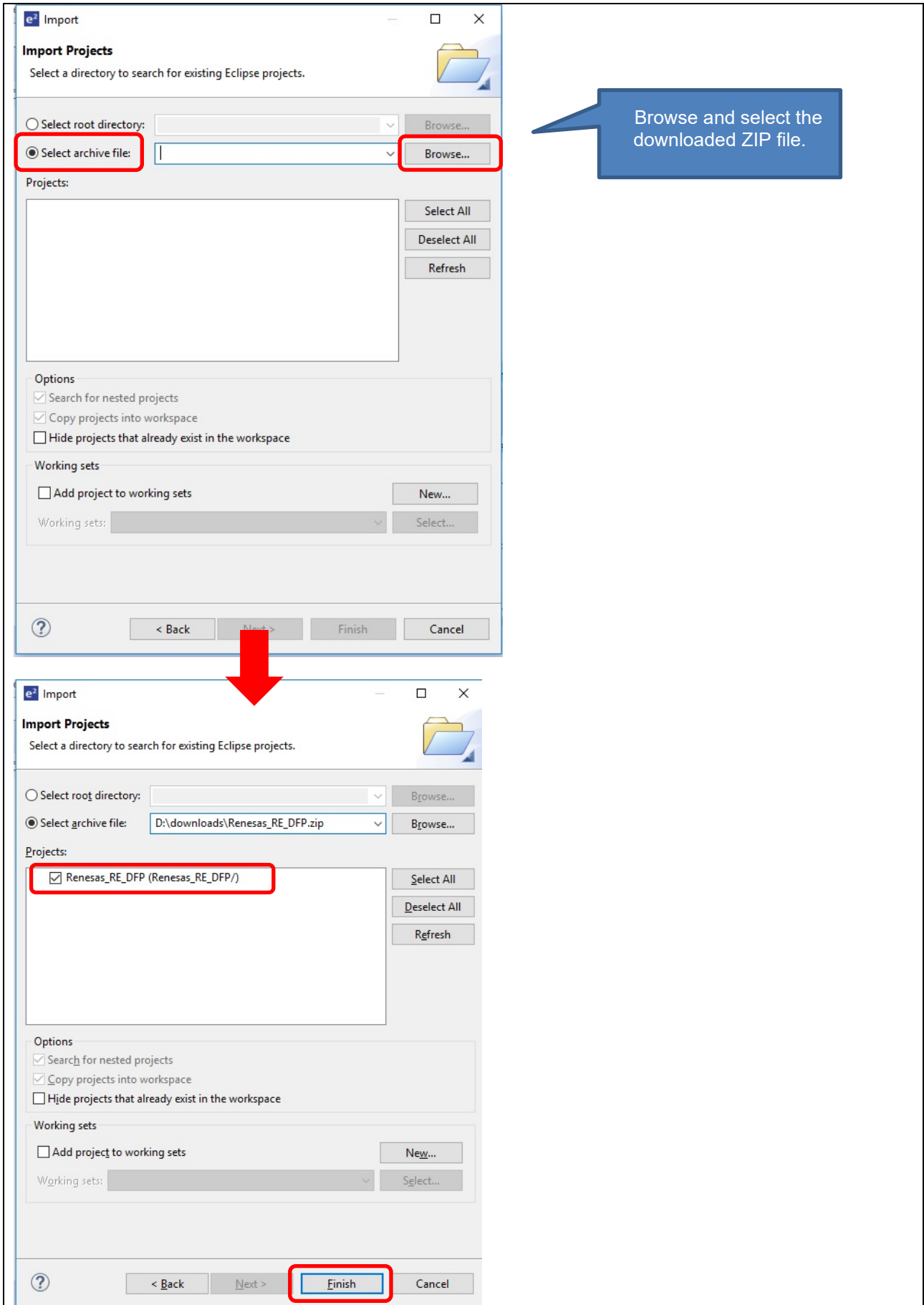


Figure 4.3 How to Open Existing e2 studio Project (Step 2)

Revision History

Rev.	Date	Description	
		Page	Summary
1.01	2019/12/08		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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