

## Quick Start Guide for the e<sup>2</sup> studio for macOS

## 1. Overview

This quick start guide describes how to install the  $e^2$  studio for macOS and to install the related toolchains and register them with the  $e^2$  studio. The target engineers of this guide are those who are developing software for Renesas MCUs or MPUs by using the  $e^2$  studio in a macOS environment and who have already learned the basics of operating macOS. This guide explains the steps from installing macOS through to construction of the environment. The methods for operating the  $e^2$  studio after having started it are the same as those for the Windows version. For those methods, refer to the quick start guide for the Windows version with the title given below on the product page of the  $e^2$  studio (https://www.renesas.com/e2studio).

Title: "e<sup>2</sup> studio Quick Start Guide for RX, RL78, RH850, RISC-V MCU Family"

### 1.1 Differences between the e<sup>2</sup> studio for macOS and the e<sup>2</sup> studio for Windows

The  $e^2$  studio for macOS and the  $e^2$  studio for Windows differ in the following ways.

# Table 1 Range of Support by the e<sup>2</sup> studio for Windows and for macOS (Based on the 2024-04 Versions)

	For Windows	For macOS
Supported devices	RA, RL78, RX, RZ, and RH850 families, DA devices, and RISC-V MCU	RA, RL78, and RX families and DA devices
Supported toolchains	<ul> <li>Compilers from Renesas         <ul> <li>CC-RH</li> <li>CC-RL</li> <li>CC-RX</li> </ul> </li> <li>Open-source toolchains         <ul> <li>GCC for RL78</li> <li>LLVM for Renesas RL78</li> <li>GCC for Renesas RX</li> <li>ARM GNU for RA family</li> <li>LLVM Embedded Toolchain for Arm</li> </ul> </li> </ul>	<ul> <li>Open-source toolchains         <ul> <li>LLVM for Renesas RL78</li> <li>GCC for Renesas RX</li> <li>ARM GNU for RA family</li> <li>LLVM Embedded Toolchain for Arm</li> </ul> </li> </ul>
Supported emulators*	<ul> <li>Emulators from Renesas         <ul> <li>E2 emulator</li> <li>E2 emulator Lite</li> <li>E1 emulator</li> <li>E20 emulator</li> </ul> </li> <li>Emulator from partners         <ul> <li>J-Link from SEGGER</li> </ul> </li> </ul>	<ul> <li>Emulators from Renesas         <ul> <li>E2 emulator</li> <li>E2 emulator Lite</li> </ul> </li> <li>Emulator from partners         <ul> <li>J-Link from SEGGER</li> </ul> </li> </ul>

Note: For details on the emulators for each device and family, see "Additional Details" on the product page of the e<sup>2</sup> studio for individual families listed in table 2. For detailed information on DA devices supported by the e<sup>2</sup> studio, see "Target Devices" on the product page of the e<sup>2</sup> studio.



Family Name	URL for the Product Page of the e <sup>2</sup> studio for Individual Families
RA family	https://www.renesas.com/software-tool/e2studio-information-ra-family
RL78 family	https://www.renesas.com/software-tool/e2studio-information-rl78-family
RX family	https://www.renesas.com/software-tool/e2studio-information-rx-family
DA device	https://www.renesas.com/software-tool/e-studio

 Table 2
 List of Product Pages of the e<sup>2</sup> studio for Individual Families

## 2. Operating Environment

The following operating environments were used in creating this quick start guide.

- e<sup>2</sup> studio 2024-04 macOS: <u>https://www.renesas.com/e2studio</u>
- Flexible Software Package (FSP) v5.3.0 for Renesas RA MCU Family: https://github.com/renesas/fsp
- macOS Sonoma 14.2.1

## 3. Installation

## 3.1 Downloading an Installer

If you are using a product of the RL78 family, RX family, or DA devices, download the e<sup>2</sup> studio for macOS from the following product page.

https://www.renesas.com/software-tool/e-studio

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	e² studio				
	Overview Downloads	Documentation Design & Development	Explore Support	Videos & Training Additional Detail	s
	Download	s			
		-			
	All Types	Start typing to filter results by title	Q		
	Туре 🔶	Title 🗢		Date 🔶	
	Upgrade - IDE	e <sup>2</sup> studio 2024-07 installer for Linux 合 RUN 1,479.12 MB 日本語		Jul 22, 2024	
	Upgrade - IDE	e <sup>2</sup> studio 2024-07 installer for Windows 合 ZIP 1,600.66 MB <u>日本語</u>		Jul 22, 2024	
	Upgrade - IDE	e <sup>2</sup> studio 2024-07 installer for macOS 合 XZ 706.42 MB <u>日本語</u>		Jul 22, 2024	
	Upgrade - IDE	e² studio V7.8.0 installer (Offline installer) 台 ZIP 1,396.24 MB <u>日本語</u>		Apr 20, 2020	
				4 items	

Figure 1 Product Page of the e<sup>2</sup> studio



For the users of MCUs of the RA family, we recommend downloading the platform installer from the tag page of the Flexible Software Package (FSP) version you will be using on the FSP page for the RA family among the Renesas GitHub Web pages. The page is shown below.

#### https://github.com/renesas/fsp

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← → C ±5 g	github.com/renesas/fsp/releases/tag/v5.3.0	G &
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	Releases / v5.3.0	
	<b>v5.3.0</b> (Latest)	Compare -
	☐ renesas-fsp-development released this Apr 30 · 1 commit to master since this release	affe
	Release Notes	
	Flexible Software Package (FSP) for Renesas RA MCU Family, version 5.3.0.	
	Minimum e2 studio version for FSP 5.3.0 is e2 studio 2024-04	
	Download the FSP with e2 studio Windows installer for this release, setup_fsp_v5_3_0_e2s_v2024-04.exe	e, from <u>here</u> .
	Download the FSP with e2 studio Windows installer for this release, setup_fsp_v5_3_0_e2s_v2024-04.exe Download the FSP with e2 studio Linux Appimage for this release, setup_fsp_v5_3_0_e2s_v2024-04.Appi support_renesas.com/knowledgeBase/19934358 for information on installing e2 studio and related softwar	Image, from here. Refer to https://en-
	Download the FSP with e2 studio Linux AppImage for this release, setup_fsp_v5_3_0_e2s_v2024-04.AppI	Image, from here. Refer to https://en- re components in a Linux PC.
	Download the FSP with e2 studio Linux Appimage for this release, setup_fsp_v5_3_0_e2s_v2024-04.Appi support_renesas.com/knowledgeBase/19934358 for information on installing e2 studio and related softwar	Image, from here. Refer to https://en- re components in a Linux PC.

Figure 2 Flexible Software Package (FSP) Page for the RA Family (Example of the v5.3.0 Tag Page)



## 3.2 Proceeding Installation

If you are using a product of the RL78 family, RX family, or DA devices, extract the E2studio.app file from the downloaded archive and move the file to the application folder.

Double-click on E2studio.app in the application folder to start the e<sup>2</sup> studio.

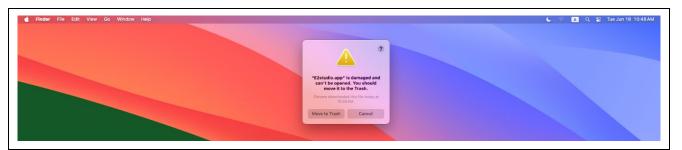


Figure 3 Error in Starting the e<sup>2</sup> studio

If the ["E2studio.app" is damaged and can't be opened. You should move it to the Trash.] error message appears when the e<sup>2</sup> studio is started, open the terminal window and run the following command.

xattr -d com.apple.quarantine /Applications/E2studio.app

● ● ● Last login: Tue Jun 18 10:11:31 2023-007-user©PC-2023-007 ~ % xa	on ttys000 attr -d com.apple.quarantine /A	7-user — -zsh — 131×15 pplications/E2studio.app	=	
Last login: Tue Jun 18 10:11:31 2023-007-user@PC-2023-007 ~ % xa	on ttvs000 attr -d com.apple.quarantine /A	pplications/E2studio.app	=	
_				

Figure 4 Entering the Terminal Command



If you are using an RA family MCU, enter the following commands from the terminal to change the attribute. Example:

cd /FolderPath

xattr -dr com.apple.quarantine setup\_fsp\_v5\_3\_0\_e2s\_v2024\_04.pkg

Enter the name of the folder above "setup\_fsp\_v5\_3\_0\_e2s\_v2024\_04.pkg" as FolderPath.

Start the installer of which attribute has been changed and proceed installation.

(1) [Introduction]

Click on [Continue] to start the installation.



Figure 5 Starting Installation of the FSP

#### (2) [License]

Click on [Continue] to continue the installation.

e e e e e e e e e e e e e e e e e e e	tall Renesas RA Flexible Software Package (FSP) v5.3.0 with e2 studio 2024-04 Software License Agreement	
<ul> <li>Introduction</li> <li>License</li> <li>Destination Select</li> <li>Installation Type</li> <li>Installation</li> <li>Summary</li> </ul>	<ul> <li>With not exply but the rost of the Agreement will remain in faces.</li> <li>Ja. Each cytoperses</li> <li>With a spectra of the Agreement and a spectra of the Agreement, are rangement and randomizing between the practice indexists for both physic materials of the Agreement. No shall have not addressed to be subject matterials of the Agreement shall be biologic upon the garteries under some spectra of the Agreement and the Advectory of the Agreement and the Ad</li></ul>	
	See https://www2.cnesus.cu/_cuitem/infivesco/rec_college/license/	

Figure 6 License Agreement for Installation of the FSP



#### (3) Agreement

Click on [Agree] to continue the installation.

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Software License Agreement  Marchalter  Software Softwar	
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Figure 7 Agreement for Installation of the FSP

(4) Installation location

If you wish to change the installation location, click on [Change Install Location] to specify the desired location.

Click on [Install] to continue the installation.

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Introduction License Destination Steps Installation Type Installation Type Installation Summary	mputer. Ion of this software on the disk "Macintosh HD".	
	Change Install Location Go Back Install	

Figure 8 Installation Location for the FSP

#### (5) Entering a password

Enter the login password. Click on [Install Software] to continue the installation.

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	Install Software	Go Back Continue	





#### (6) Completion of installation

After installation has been completed, the [The installation was successful.] window will appear. Clicking on [Close] completes the installation.

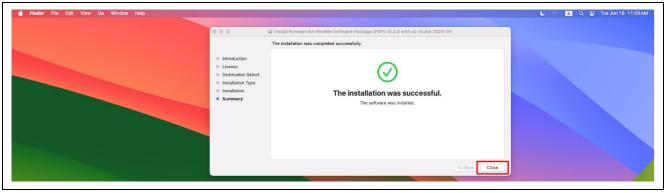


Figure 10 Completion of Installation of the FSP



## 4. Running the e<sup>2</sup> studio

(1) Running the  $e^2$  studio from the terminal

Open a terminal window and go to the path where the  $e^2$  studio has been installed. Use the open command in the folder where the  $e^2$  studio has been installed to run the  $e^2$  studio.

Example:

cd /Applications open e2studio.app



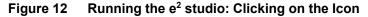
Figure 11 Running the e<sup>2</sup> studio: Entering the Command

(2) Running the e<sup>2</sup> studio from the launchpad

You can also run the e<sup>2</sup> studio by clicking on the icon for the e<sup>2</sup> studio on the launchpad.



Note: If you installed the e<sup>2</sup> studio for the RA family and the e<sup>2</sup> studio for the RL78 and RX families and DA devices, the icon for either the former or latter version of the e<sup>2</sup> studio may be displayed on the launchpad.





### (3) Selecting a workspace

After you run the e<sup>2</sup> studio, specify the path for the workspace for use in [Workspace] (example: /Users/user/e2\_studio/workspace) and click on [Launch].

• • •	e <sup>s</sup> studio Launcher	
Select a directory as workspace e <sup>a</sup> studio uses the workspace directory t	o store its preferences and development artifacts.	
Users/user/e2_studio/workspace	Browse	
Use this as the default and do not ask	again	
Recent Workspaces		
	Cancel	

Figure 13 Running the e<sup>2</sup> studio: Selecting a Workspace



## 5. Custom Installation and Registration of Toolchains

In the following cases, you will need to obtain an installer for the toolchain and install and register it with the  $e^2$  studio.

- You will be using RX or RL78 family devices.
- You will be using a version of the ARM GNU toolchain that is not included in the installer for the e<sup>2</sup> studio.

## 5.1 Toolchain for RX or RL78 Family Devices

When a software project for use on a device of the RX or RL78 family is to be built in the e<sup>2</sup> studio, GCC for Renesas RX or LLVM for Renesas RL78 is required.

Installers for each of the toolchains can be obtained from the "Open Source Tools for Renesas" site (<u>https://llvm-gcc-renesas.com/</u>; downloading some toolchains requires user registration).

This quick start guide describes the methods for installing toolchains and registering toolchains with the  $e^2$  studio, taking GCC for Renesas RX as an example.

#### (1) Downloading toolchains

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	GENERAL + SERVICES + PRODUCTS + SUPPORT + HELP + LINKS + DOCUMENTATION +	
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	Latest News	

Figure 14 Open Source Tools for Renesas: GCC for Renesas RX

#### (2) Installing toolchains

Extract the downloaded archive and move the result to an appropriate folder. Enter the command from the terminal to change the attribute of the folder. If you download LLVM for Renesas RL78 and extract the archive, the name of the folder will include spaces. Change the name to one which does not include spaces.

#### Example:

cd /FolderPath	
xattr –dr com.apple.quarantine gcc-for-renesas-rx-mac	

Enter the name of the folder above "gcc-for-renesas-rx-mac" as FolderPath.



#### (3) Registering toolchains

Register toolchains with the  $e^2$  studio when an  $e^2$  studio project is created or by using the menu bar. The following describes how to register toolchains with the  $e^2$  studio by using the menu bar. Select [Help – Add Renesas Toolchains] from the menu bar of the  $e^2$  studio.

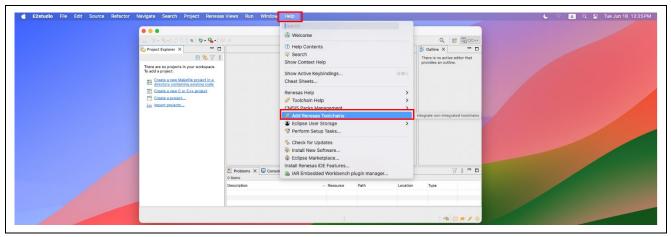


Figure 15 Registering Toolchains: Menu Bar

Select [GCC for Renesas RX] under [Toolchain Type] and click on [Add].

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	2 <b>2 4</b> 0		Cancel	Apply and Close	

Figure 16 Registering Toolchains: [Renesas Toolchain Management]



Register the gcc-for-renesas-rx-mac folder which has been extracted from the archive in [Location] by using [Browse].

After the file has been registered, click on [OK].

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	> Tracing Validation > Version Control (Team) > XML	Download Scan Add	Ramovo
	2 🗠 🖆 🛞	Cancel	Apply and Close
			m=×0

Figure 17 Registering Toolchains: [Add New Toolchain]

When the item [GCC for Renesas RX] under [Toolchain Type] has been selected, registration of the toolchain is completed.

Click on [Apply and Close] to complete the registration.

		. 0	Preferences	
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		Version Control (Team)     XML     O		Alances

Figure 18 Registering Toolchains: Completion of Registration of [GCC for Renesas RX]



## 5.2 Installing and Registering the ARM GNU Toolchain

When a version of the ARM GNU toolchain that is not included in the installer for the  $e^2$  studio is to be installed, register it through the following method.

(1) Downloading the ARM GNU toolchain

Download the ARM GNU toolchain obtained from the Web page of ARM (<u>https://developer.arm.com/downloads/-/arm-gnu-toolchain-downloads</u>). This quick start guide describes

the methods for installing the downloaded .pkg file and registering it with the e<sup>2</sup> studio. For downloading a compressed file such as ".tar.xz", refer to section 5.1.

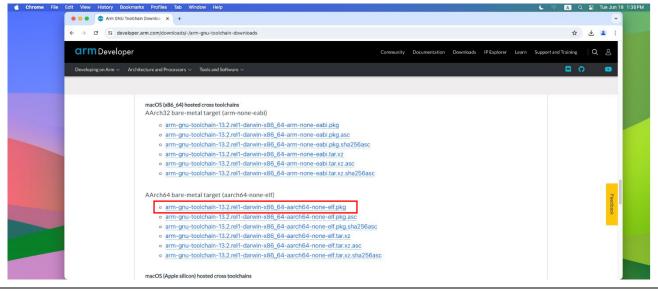


Figure 19 ARM GNU Toolchain Page (Example of 13.2.rel1 and .pkg Files)

(2) Installing the ARM GNU toolchain

Start the downloaded installer and proceed the installation. Confirm that the installer has started and click on [Continue].

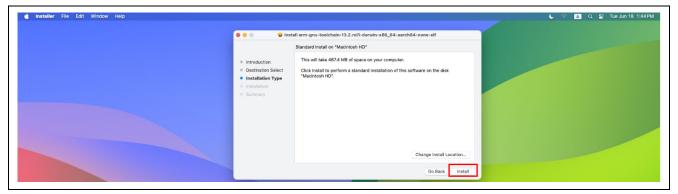
💣 Installer File Edit Window Help			ରେ 🖉 🔍 🕹 Tue Jun 18 1:43PM
••	🔋 💿 😺 İns	tall arm-gnu-toolchain-13.2.rel1-darwin-x86_64-aarch64-none-elf Welcome to the arm-gnu-toolchain-13.2.rel1-darwin-x86_64-aarch64-none-elf Installer	
	Introduction Destination Select Installation Type Installation Summary	You will be guided through the steps necessary to install this software.	
		Go Bask Continue	

Figure 20 Installing the ARM GNU Toolchain: [Introduction]



If you wish to change the installation location, click on [Change Install Location] to specify the desired location.

Click on [Install] to continue the installation.





Enter the login password. Click on [Install Software] to continue the installation.

000	😨 Inst	all arm-gnu-toolchain-13.2.rel1-darwin-x86_6	4-aarch64-none-elf	
	nation Select I <b>lation Type</b> Ilation	Standard Install on "Macintosh HD" This will take 4674 MB of space on your com Click Install to perform a standard installation		
		Installer Installer is trying to install new software. Enter your password to allow this. User		
		Password Install Software Cancel	Change Install Location Go Back Install	

Figure 22 Installing the ARM GNU Toolchain: Entering the Password

After installation has been completed, the [The installation was successful.] window will appear. Clicking on [Close] completes the installation.

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		Go Back Close

Figure 23 Installing the ARM GNU Toolchain: Completion of Installation



## 6. Installing Required Libraries

Using the e<sup>2</sup> studio to debug software requires Python library version 3.10.

You can download this library from a Web page on the Python site (<u>http://www.python.org/downloads/macos</u>).

Start the downloaded installer to complete the installation.

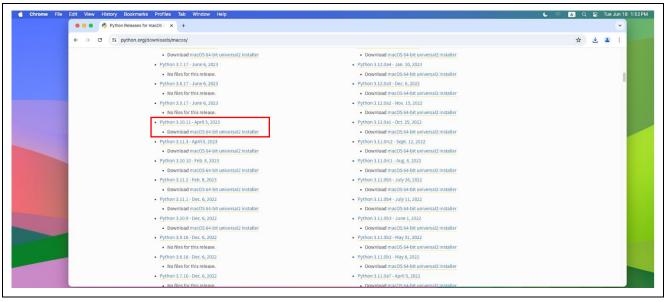


Figure 24 Example of the Page for Downloading Python Library Version 3.10



## 7. SEGGER J-Link

Download the J-Link driver for macOS from the product page of SEGGER (<u>https://www.segger.com/downloads/jlink/</u>).

Start the downloaded installer to complete the installation.

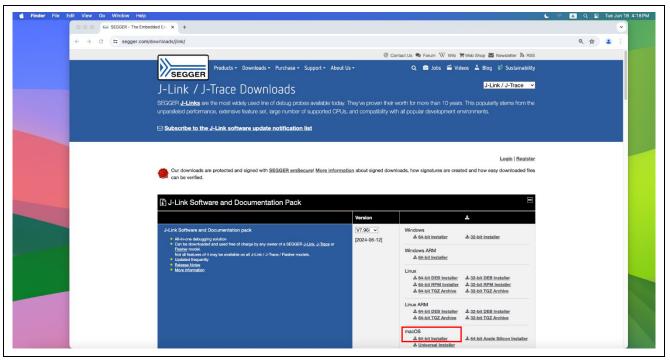


Figure 25 Example of the Page for Downloading the J-Link USB Driver

After the emulator has been connected, display the system information to confirm the state of the J-Link USB driver having been recognized.

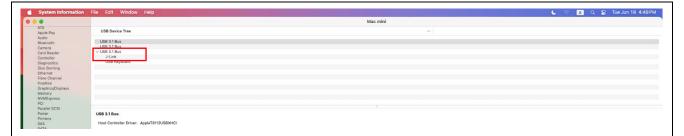


Figure 26 Confirming the State of the J-Link USB Driver Having been Recognized



## **Revision History**

		Description	
Rev.	Date	Page	Summary
1.0	Sep.30.24	—	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 is supplied until the 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 is generated 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.)

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8. Differences between products

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