RL78 Software Migration Guide

CS+ to e² studio Migration (CC-RL)

Introduction

This application note is a guide that explains how to modify a project created in C compiler CC-RL for the integrated development environment CS+, preparing it for use as a project created in e² studio, also a Renesas integrated development environment (IDE).

Supported IDE versions

・CS+ V3.01.00

・e² studio V4.0.0.26

Target Device

RL78 Family

When applying this application note to another microcomputer, modify the program according to the specifications for the target microcomputer and conduct an extensive evaluation of the modified program.

Contents

1. CS+ Project Import

(1) After starting up the Renesas Electronics e² studio IDE, go to [**File**] and select [**Import…**].
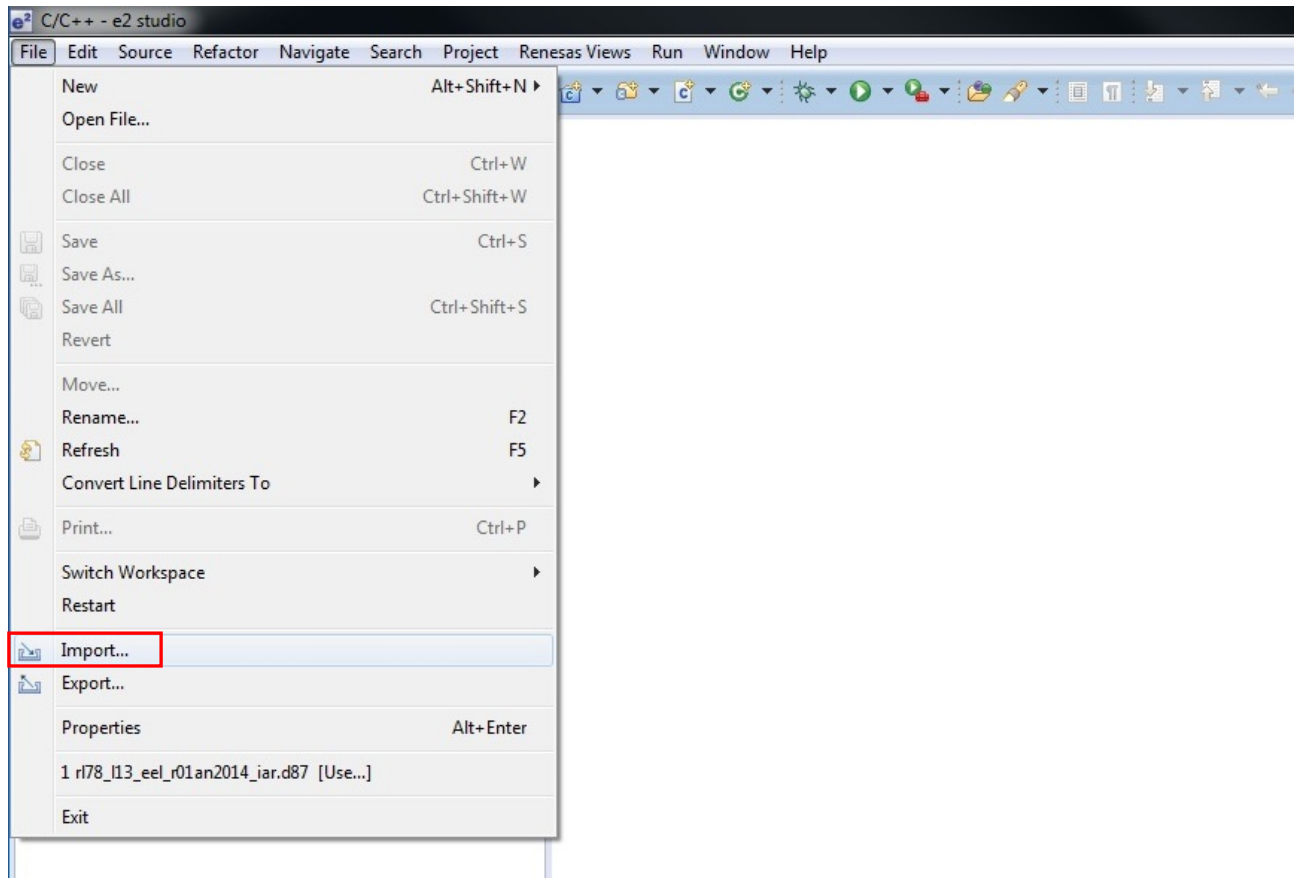

Figure 1.1 File Menu

(2)   From **[General]**, select **[Renesas Common Project File]**, then click **[Next >]**.
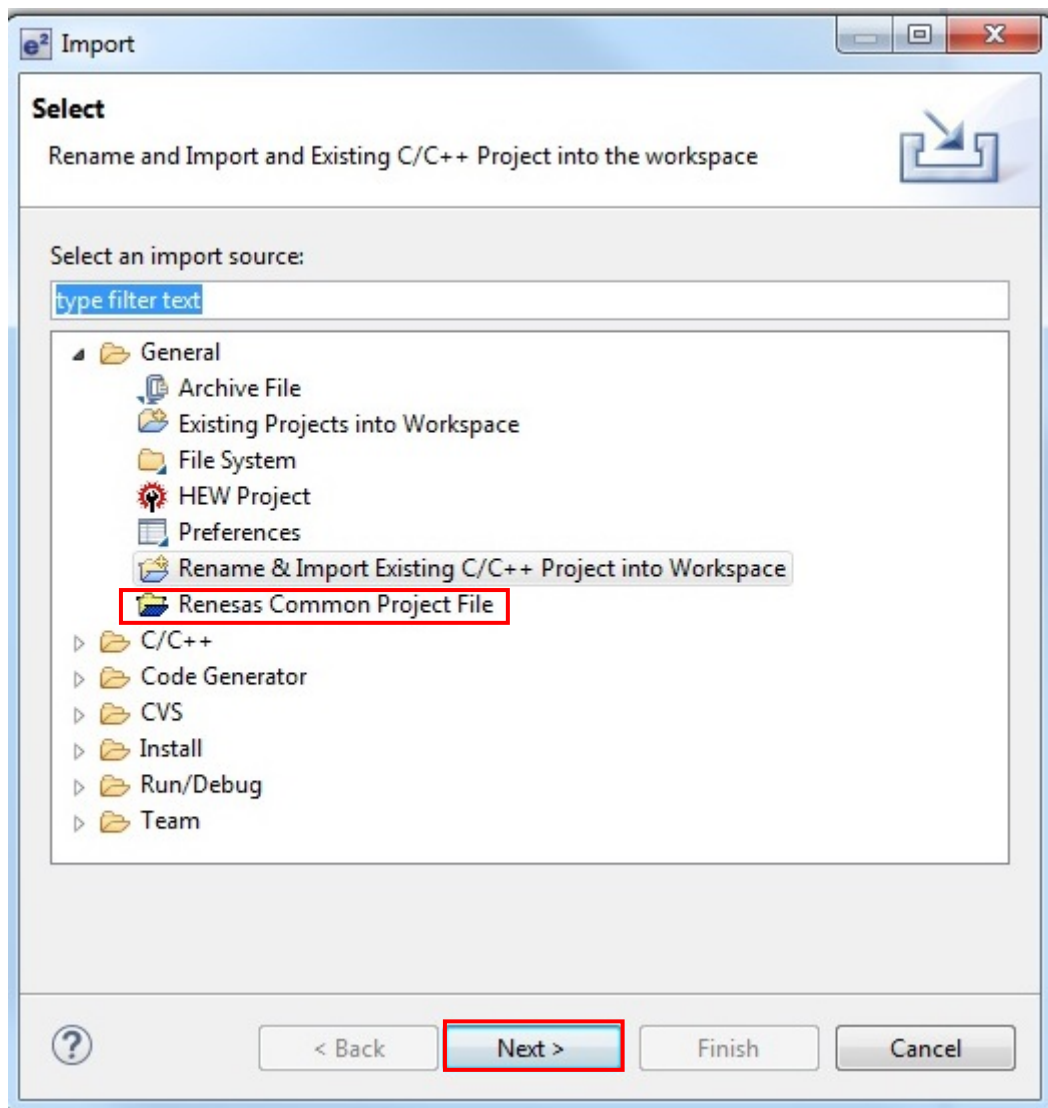

Figure 1.1 Project Import Wizard (1/2)

(3)   Select the Renesas Common Project File (.rcpe) created in CS+. Change the debug software to [**E1/E20 (RL78)**], and click **[Finish (F)]** to import the project. ("Select Target" automatically shows a device setup in CS+.)
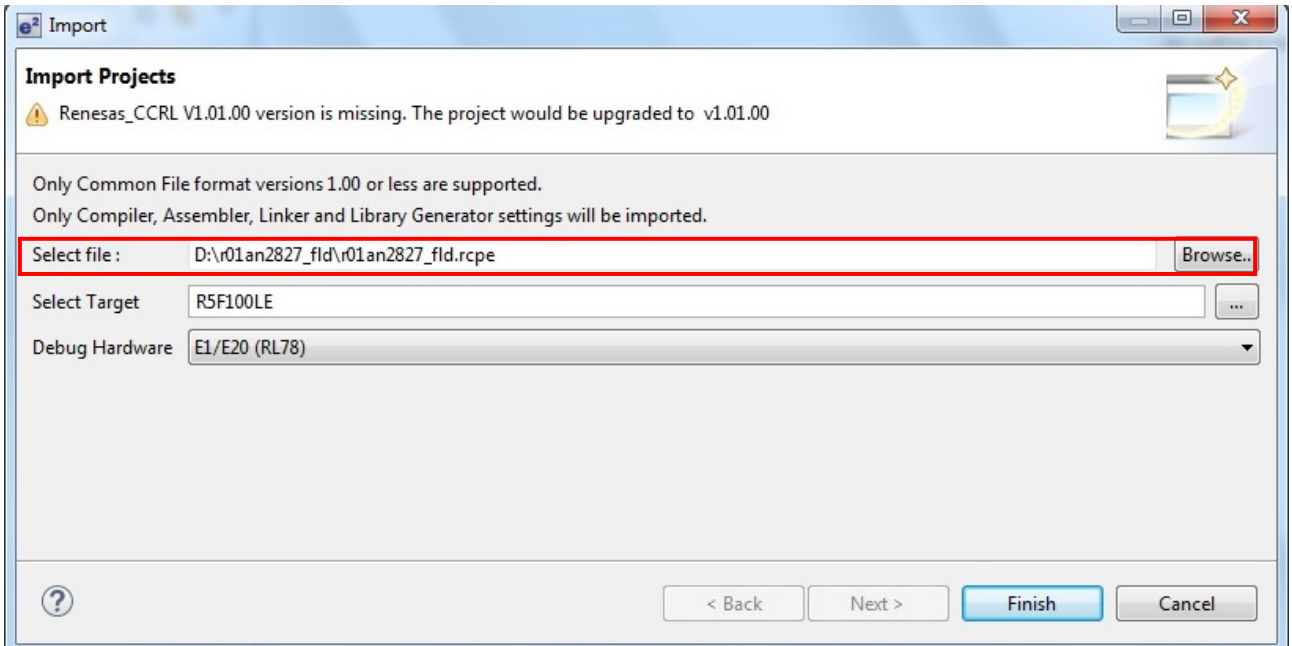

Figure 1.2   Project Import Wizard (2/2)

2. Debugger Connection

(1)   Display the menu in Project Explorer by right-clicking on the imported project name. In the menu, select [**Properties (R)**].
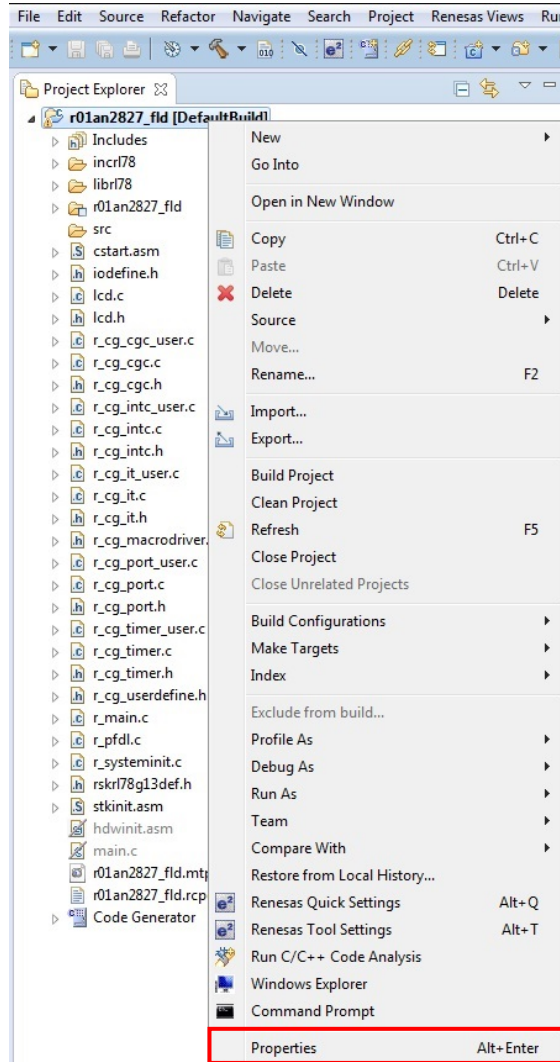

Figure 2.1 Project Menu

(2)   From the **[C/C++ Build]** menu, select **[Settings]**. From **[Tool Settings]**, select **[Converter]** → **[Output]**. In the
output settings, delete the output hex file to prevent the file from being output.
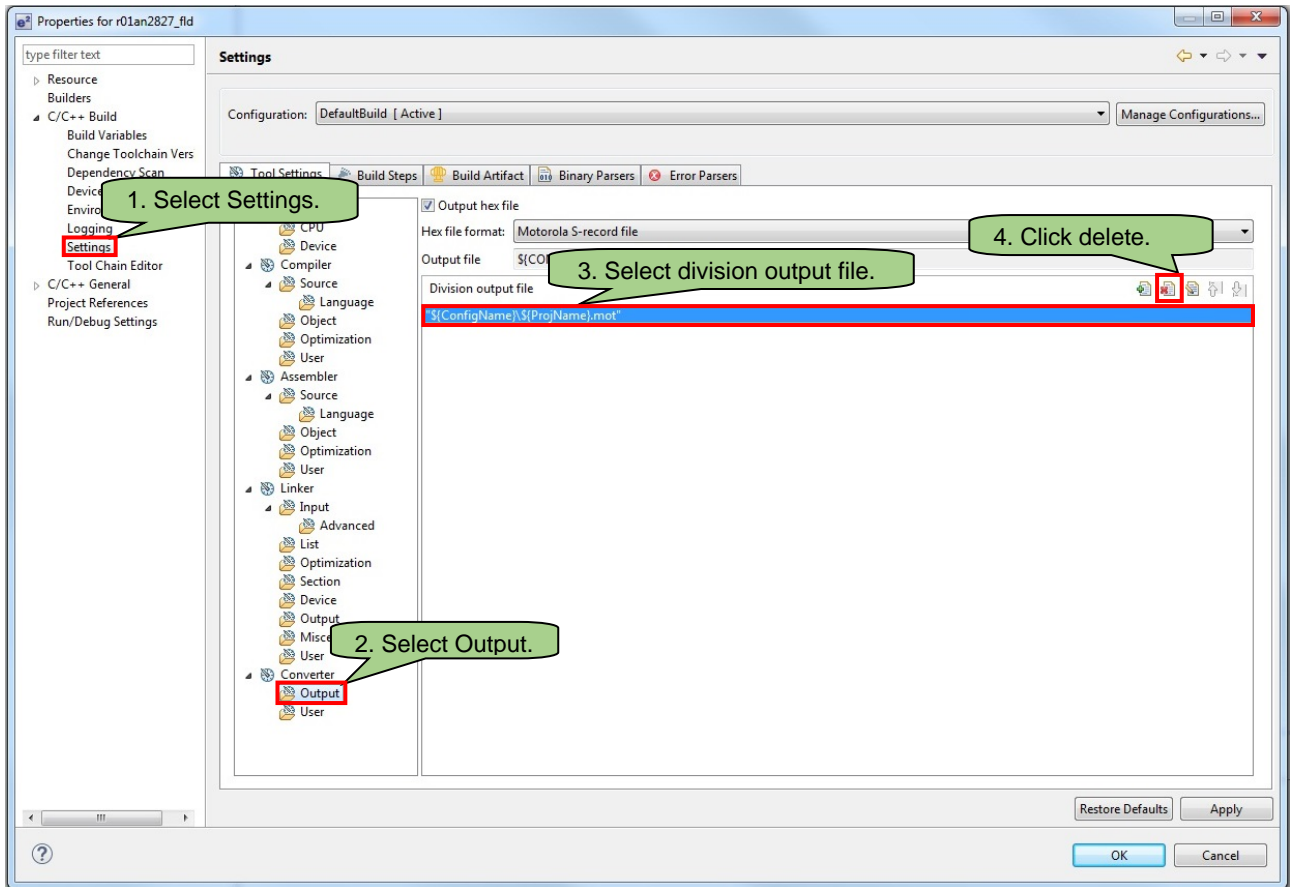

Figure 2.2 Project Properties (1/6)

(3)   Select **[Compiler] ➔ [Source]**, then modify the include file directory. (Add "../" before the directory name.)

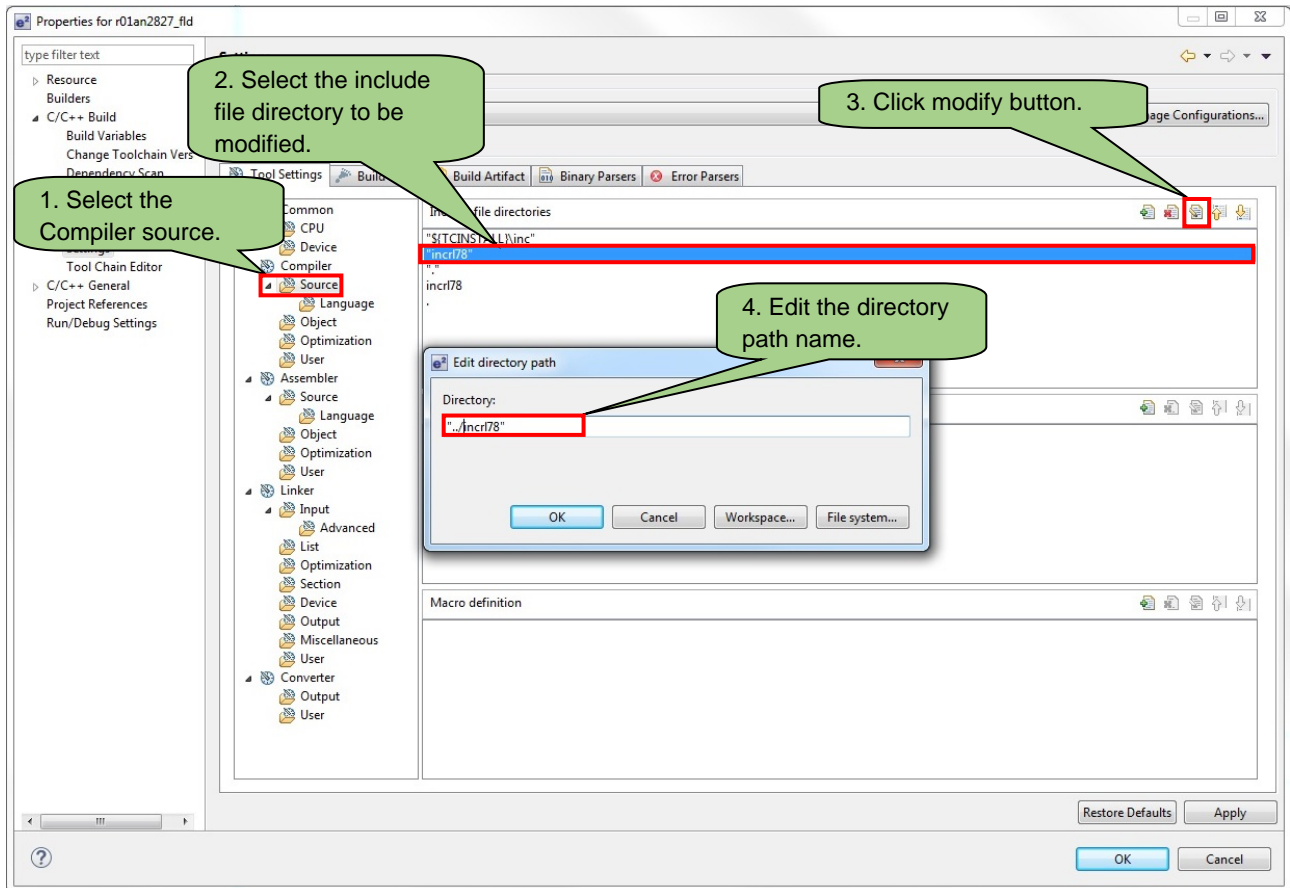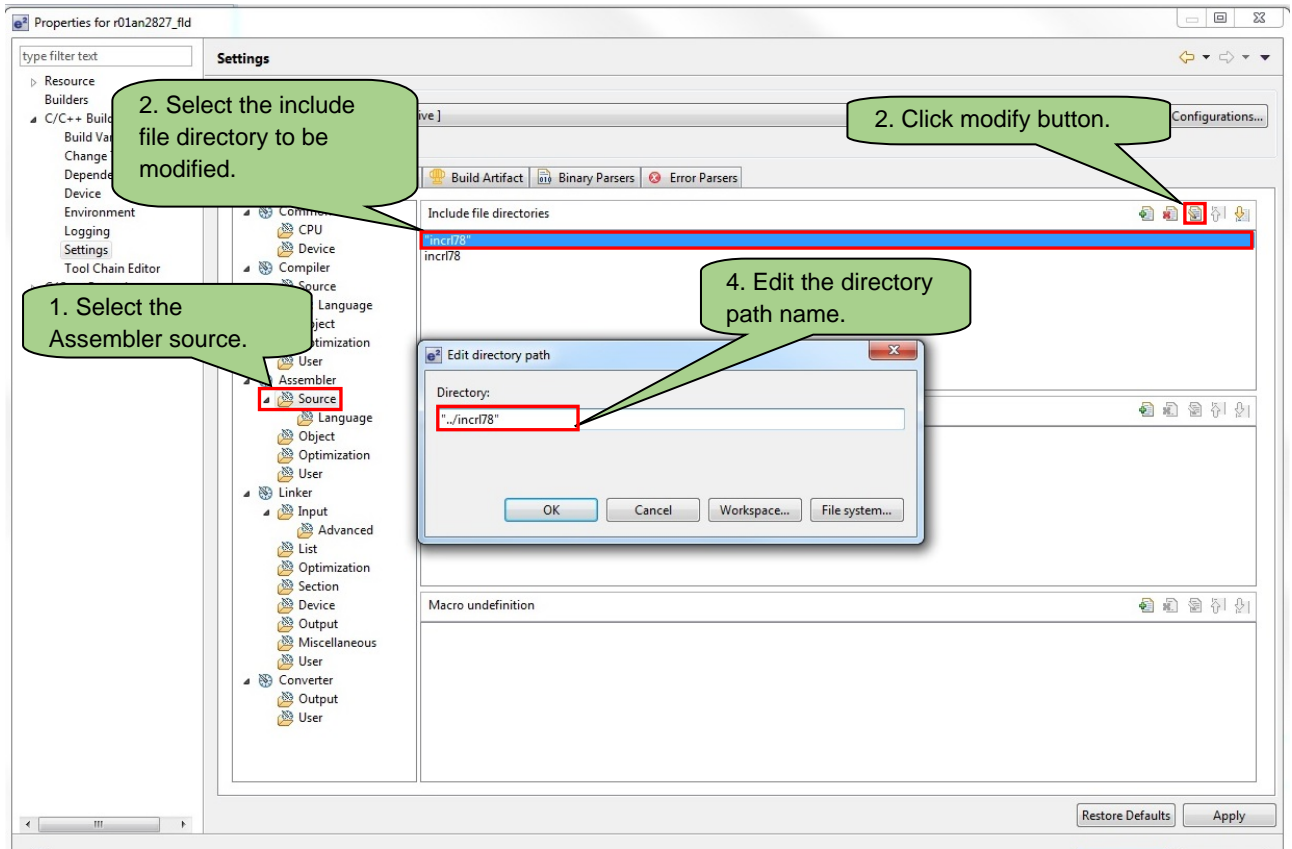*Step (3) is only necessary for projects that include a library.

Figure 2.3 Project Properties (2/6)

(4)   Select **[Assembler]** → **[Source]**, then modify the include file directory. (Add "../" before the directory name.)

*Step (4) is only necessary for projects that include a library.

Figure 2.4 Project Properties (3/6)

(5)   Select **[Linker] → [Input]**, then input the name of the library to be included. (Select from the library folder.)

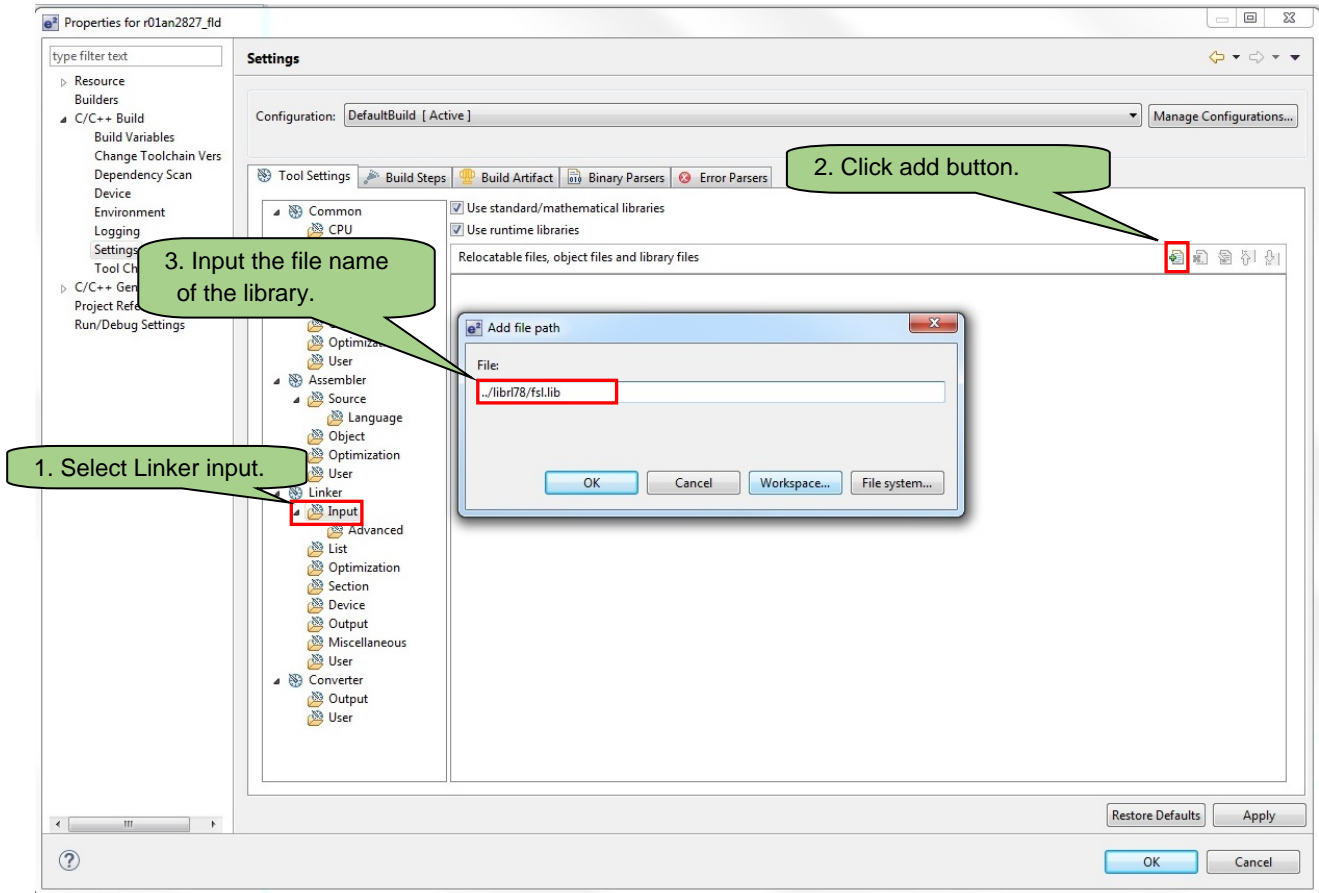*Step (5) is only necessary for projects that include a library.

Figure 2.5 Project Properties (4/6)

(6)　　Select the **[Linker] Device**. Make sure "Set enable/disable on-chip debug by link option" and "Set user option byte" are set in the same manner as CS+. (The import may be disabled even if it is set to enabled in CS+.)
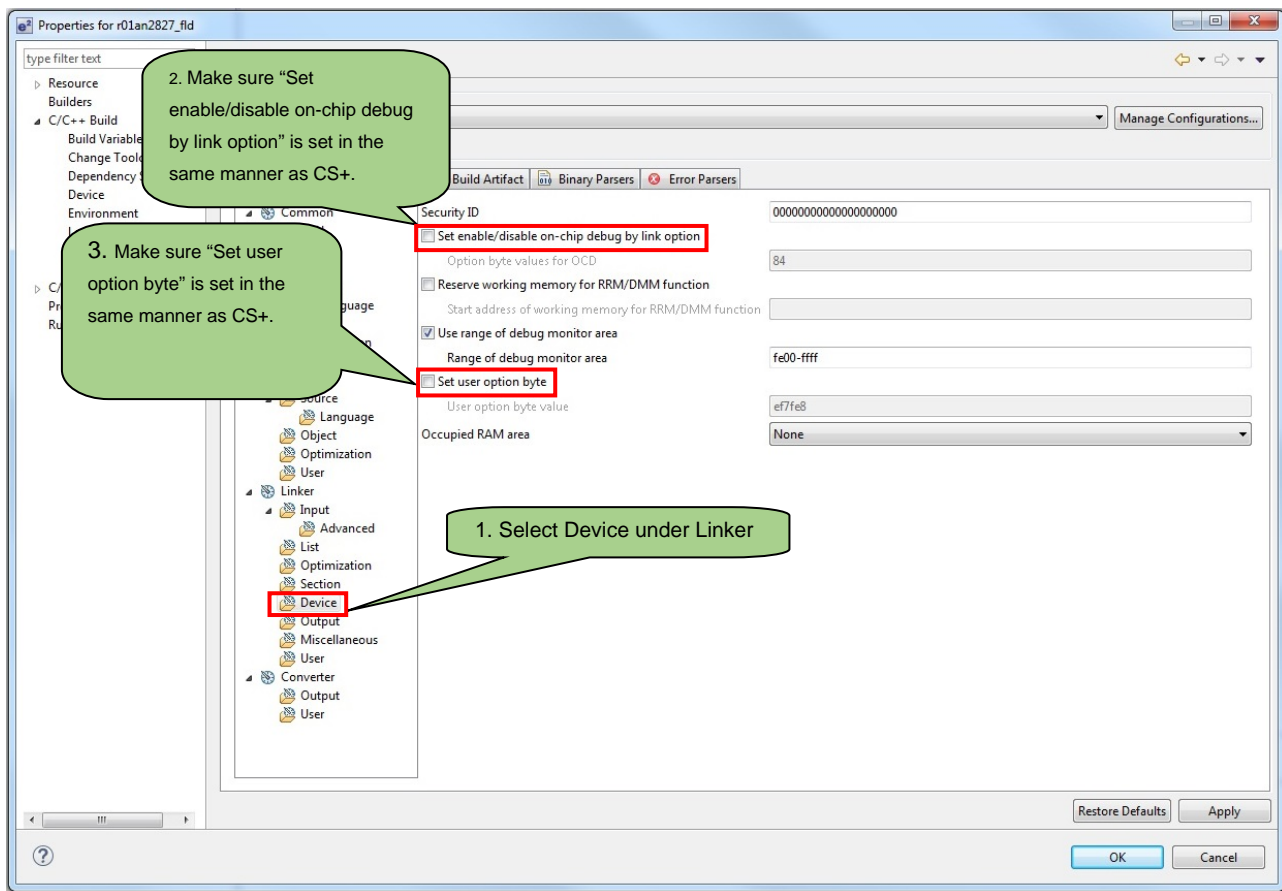

Figure 2.6 Project Properties (5/6)

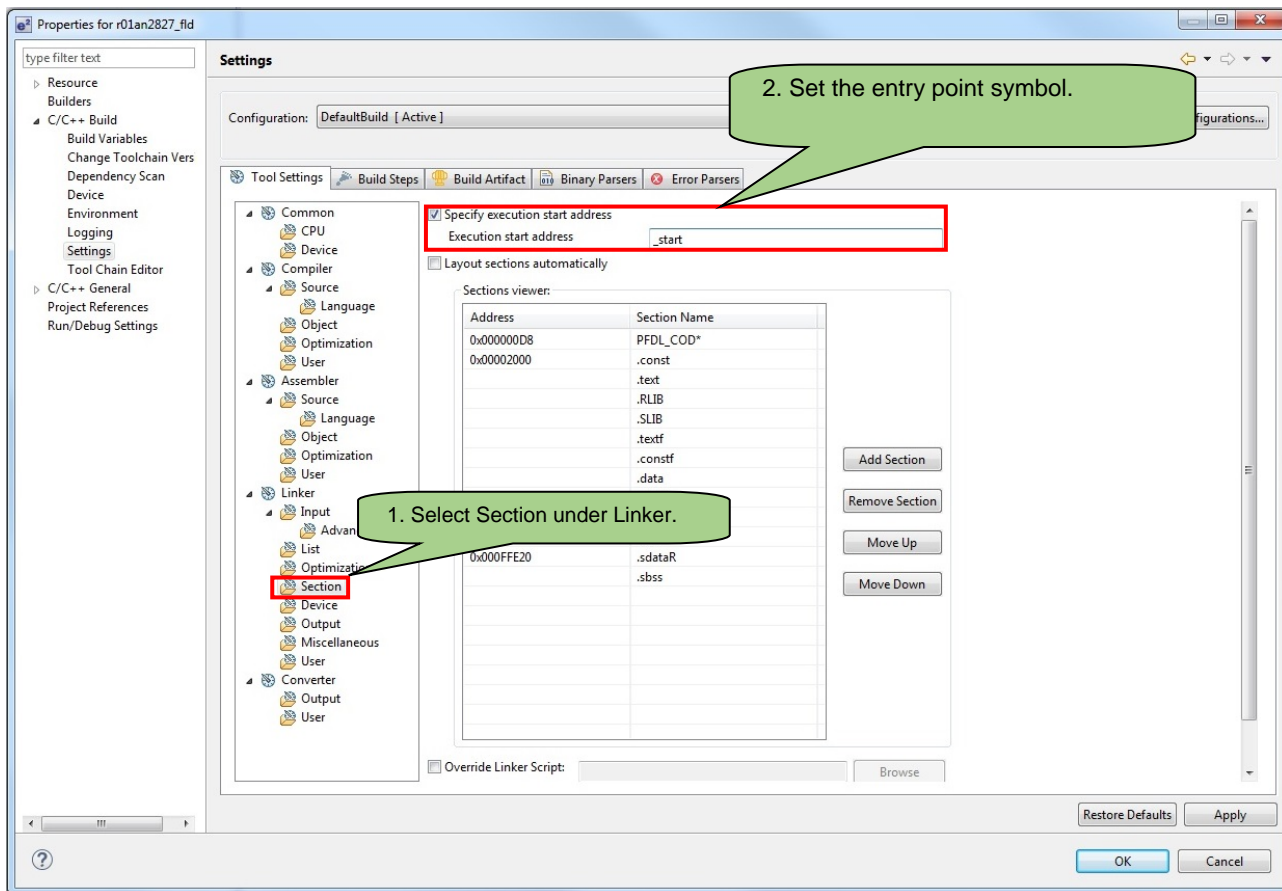(7)   Select the **[Linker] Section**, and then set the entry point symbol.

Figure 2.7 Project Properties (6/6)

* Step (7) can be skipped by pre-setting it as shown in Figure 2.8 on the CS+ side.

(1) Select the **CC-RL link option** tab.

(2) Under **Output Code**, specify **YES(-ENTry)** in the specify execution start address box.
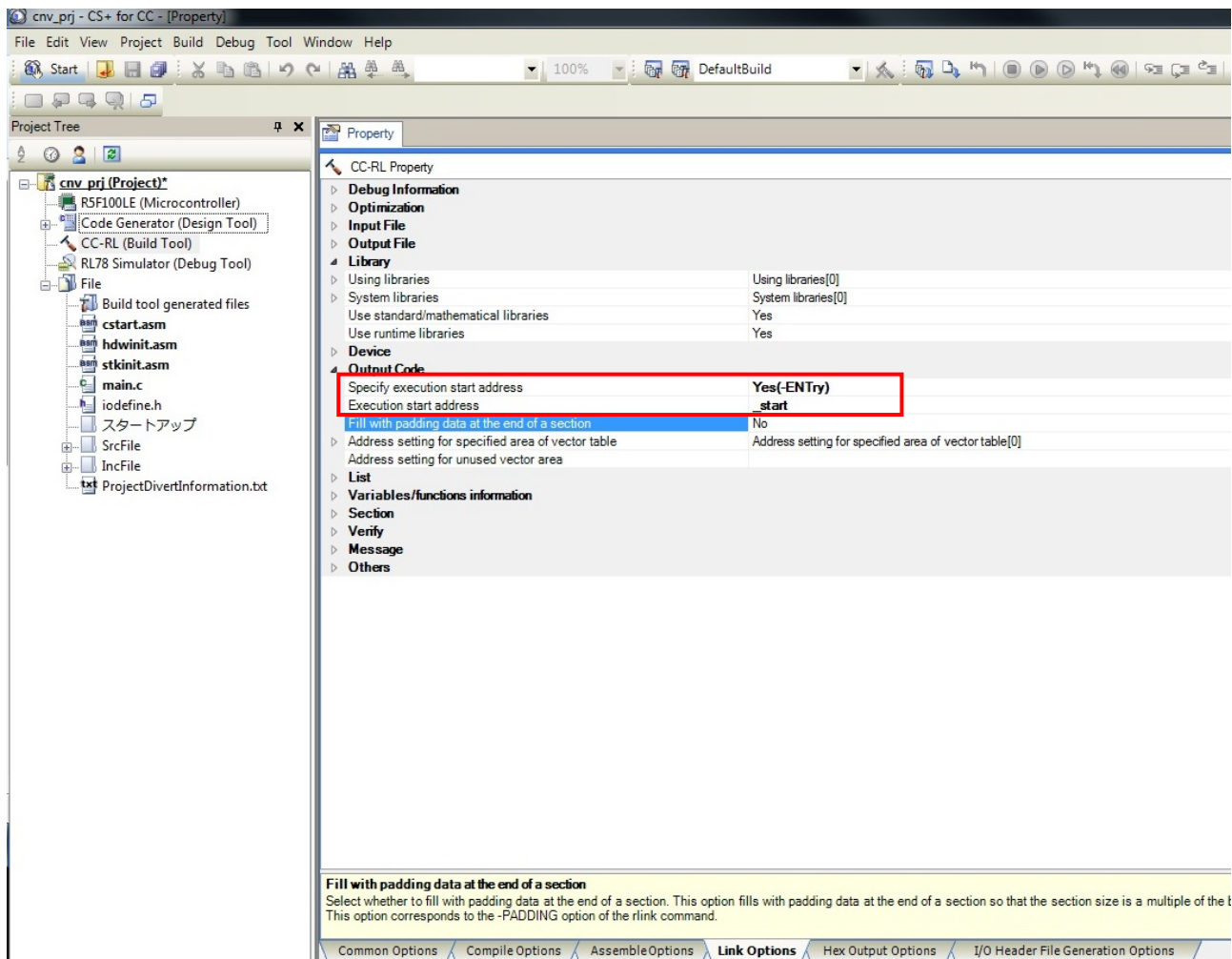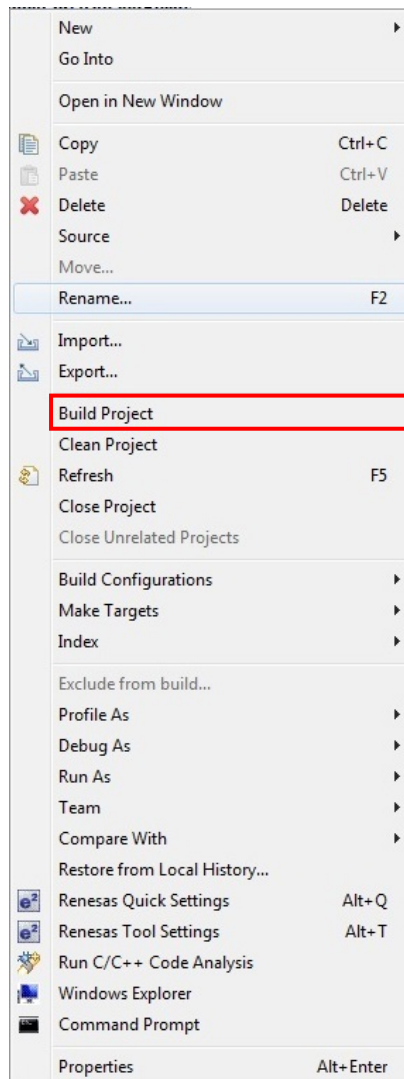
(3) Set execution start address to **[_start]**.

Figure 2.8 Link Options (CS+)

(8) In the project explorer, right click on the imported project name to display the following menu. Select **[Build Project (B)]**.

Figure 2.9 Build Project

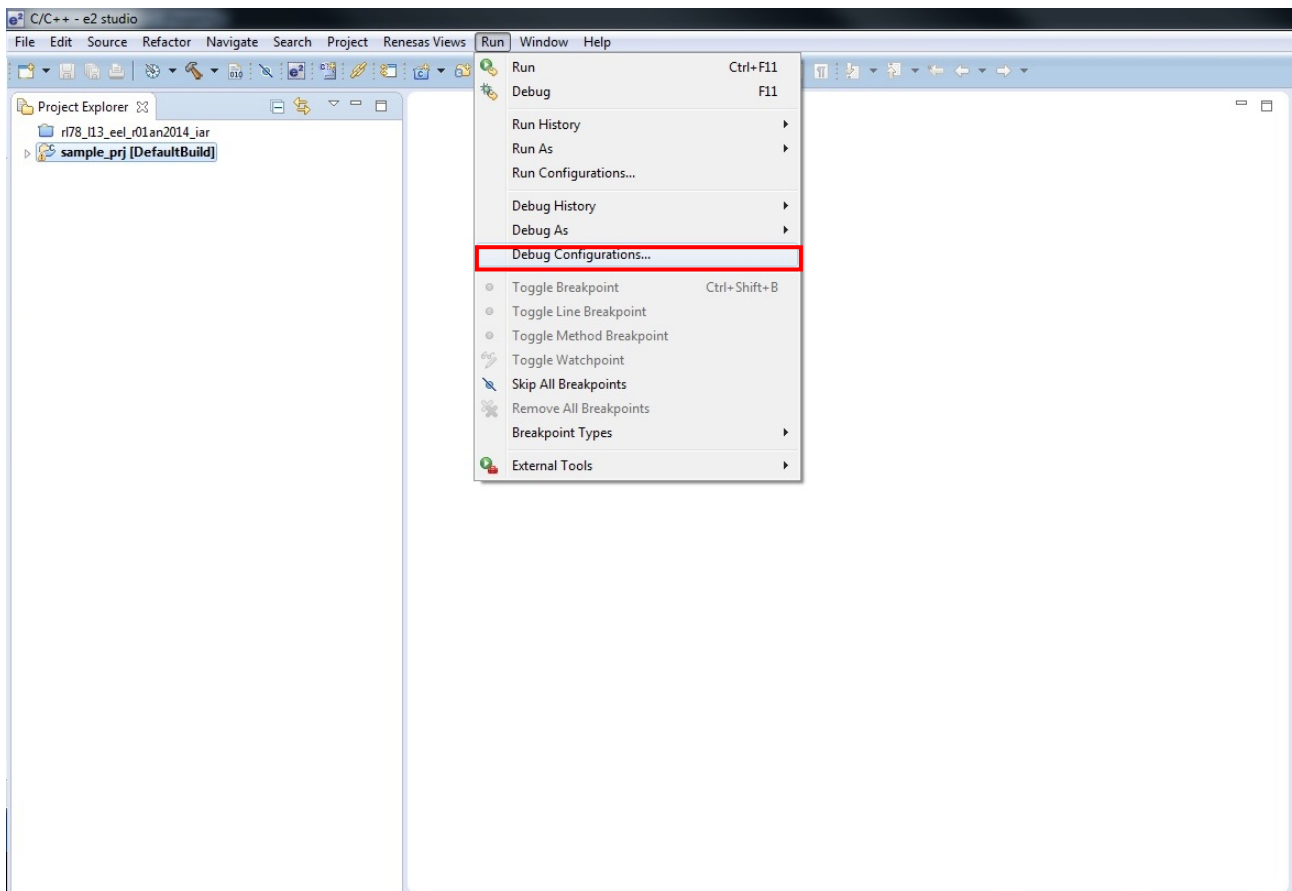(9)   From the **[Run]** menu, select **[Debug Configurations…(B)]**.

Figure 2.10 Run Menu

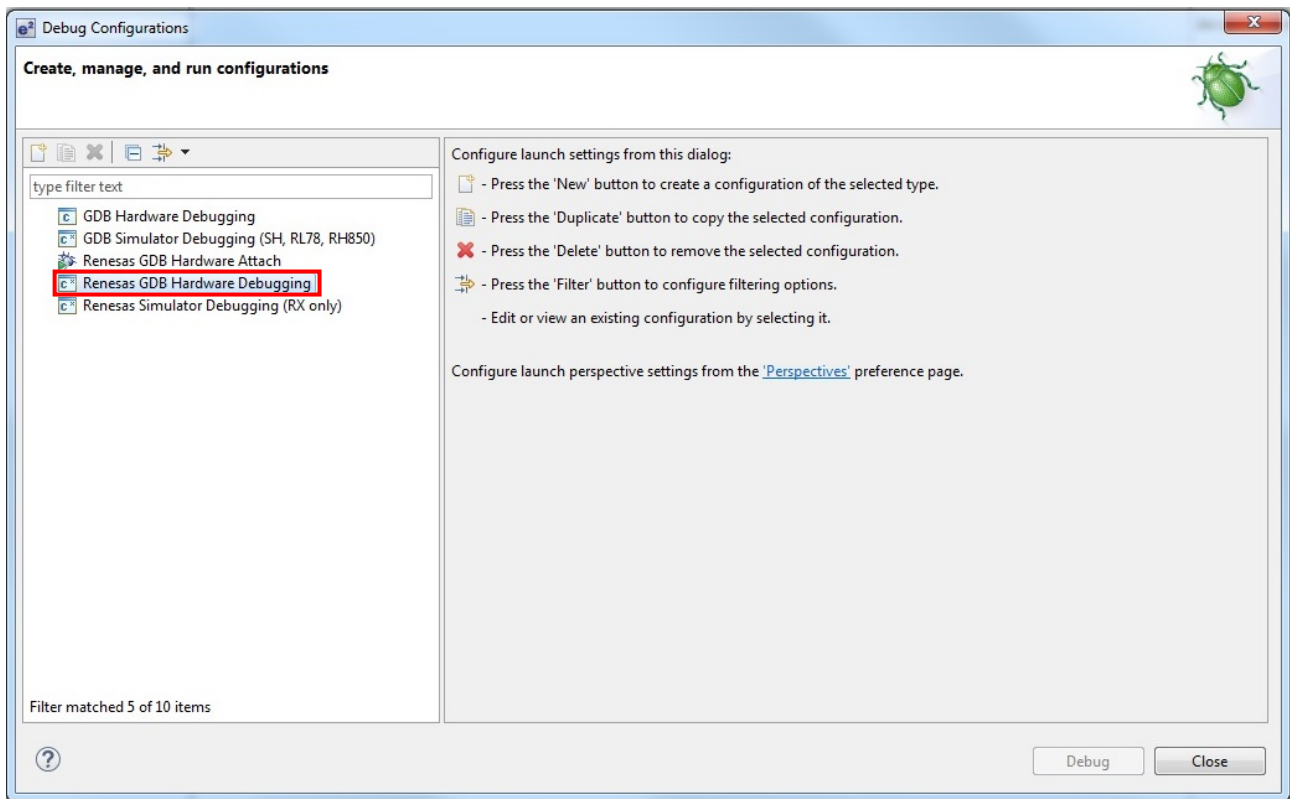(10)   Select **[Renesas GDB Hardware Debugging]**, click the "New" [ ] icon to create a new configuration.

Figure 2.11 Debug Configurations (1/5)

(11)   Go to the Debug Configurations **[Main]** tab, click **[Search project (H)]** in the C/C++ application, and add
[Load module file (.x)] located in the project build folder (the file output in step (8)).
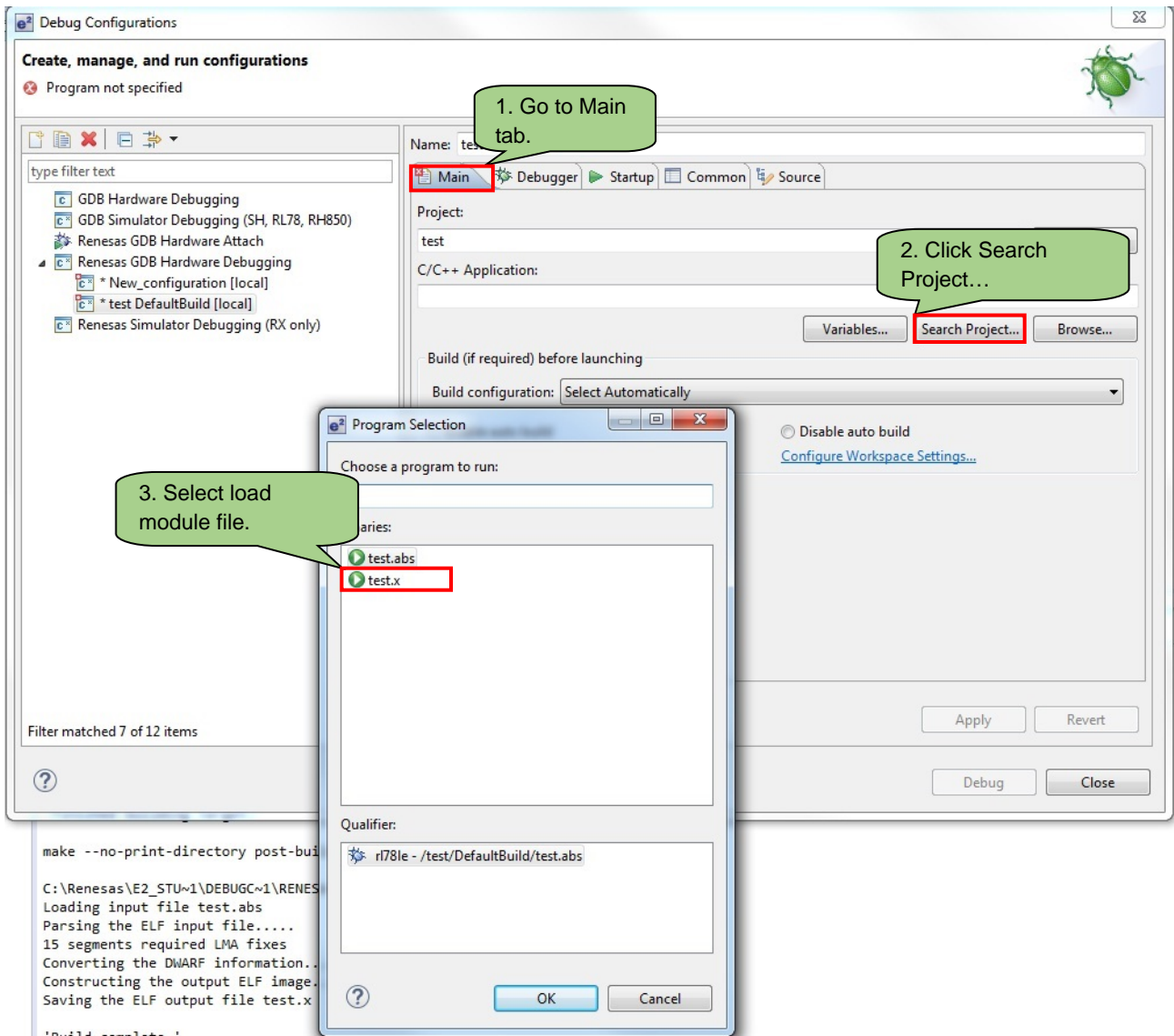

Figure 2.12 Debug Configurations (2/5)

(12)   Go to the [**Debugger**] tab, select **E1/E20 (RL78)** as the debug hardware, and specify the target device.
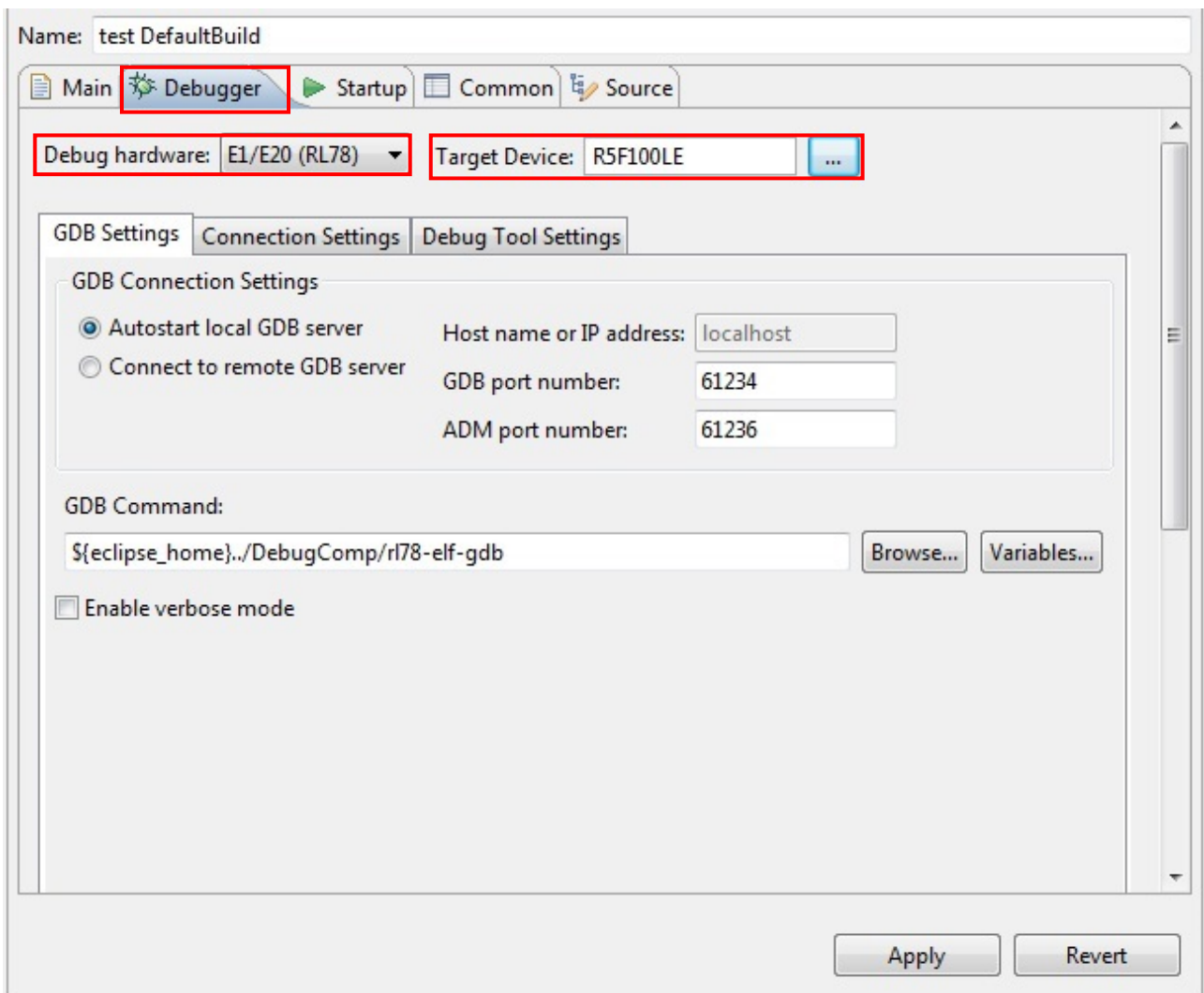

Figure 2.13 Debug Configurations (3/5)

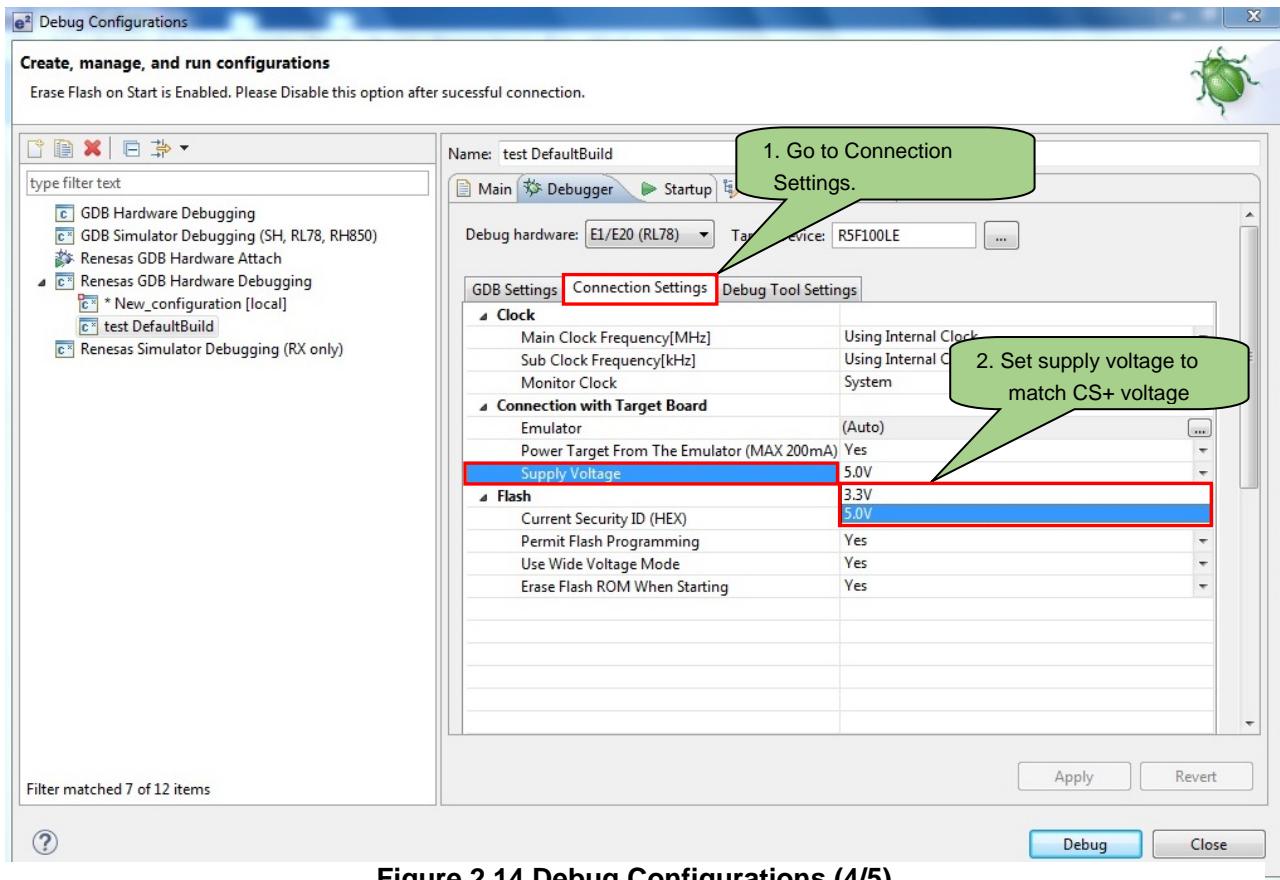(13)   Go to the [**Connection Settings**] tab and set the supply voltage to match that of CS+ setting.

Figure 2.14 Debug Configurations (4/5)

(14)   Go to the **[Common]** tab, change the "Save as" radio button to "Shared File." Click **[Browse (B)…]** to select the launch configuration location. This will save the debug configuration in a file (.launch).
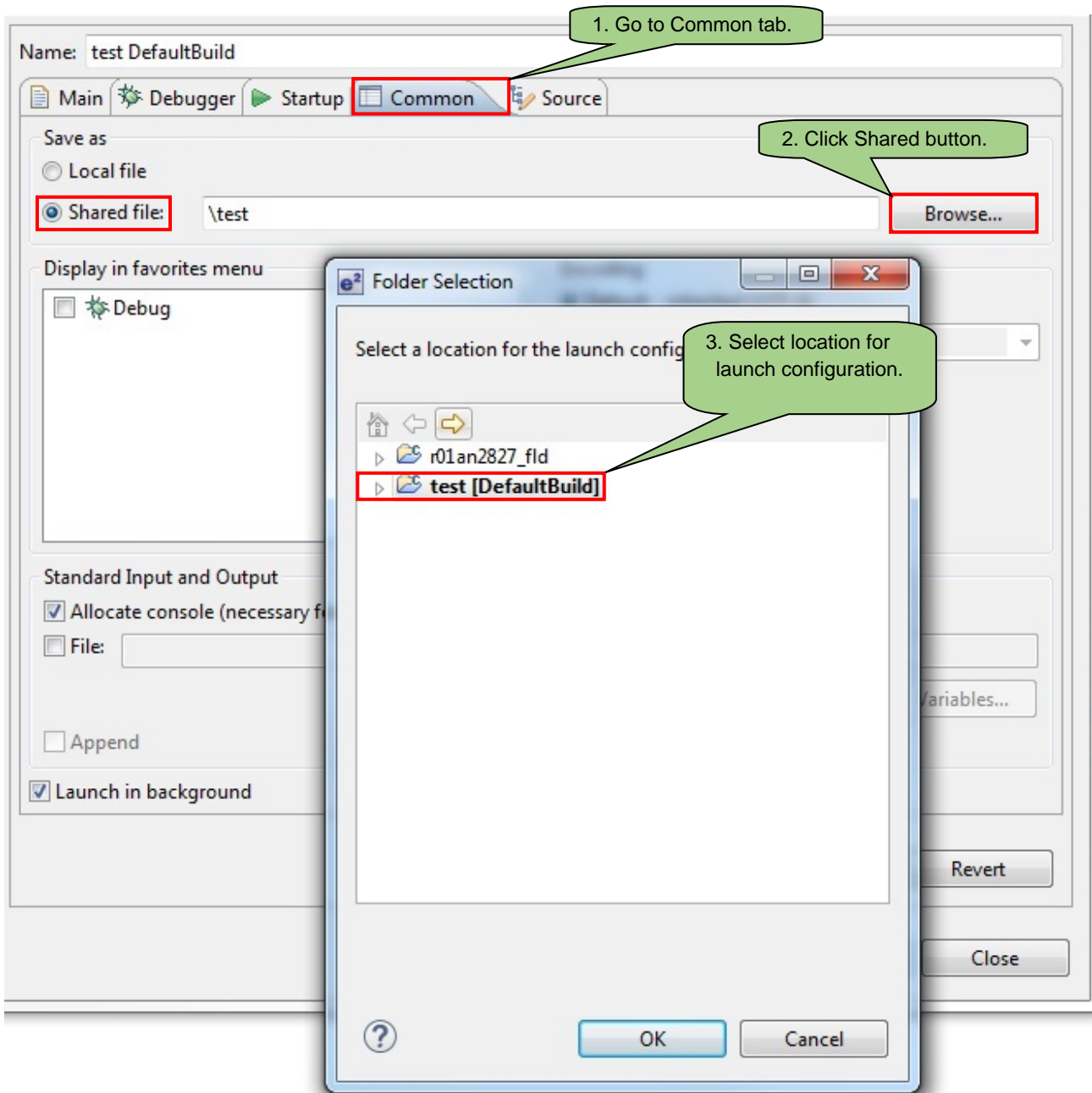

Figure 2.15 Debug Configurations (5/5)

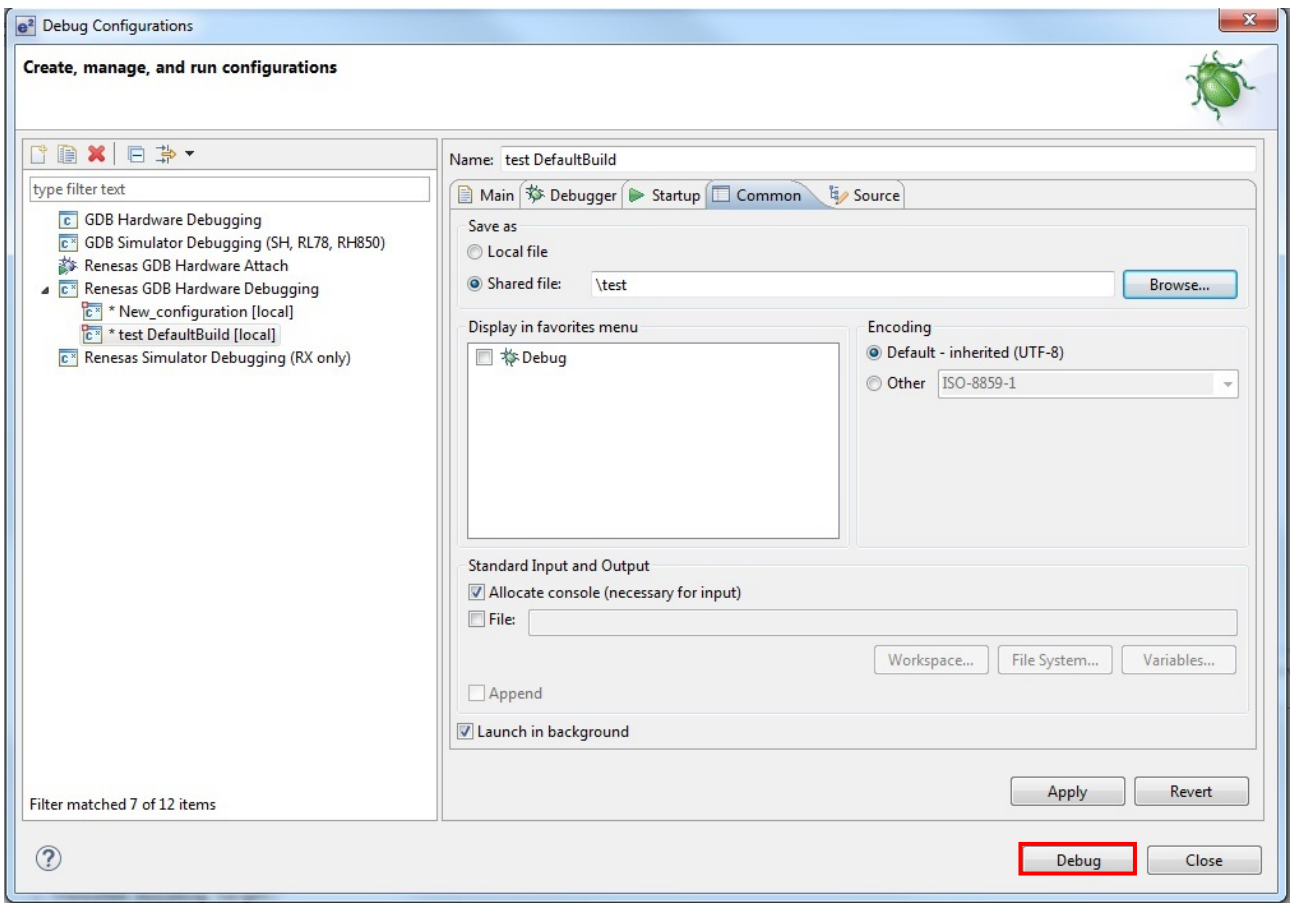(15)   Connection to the debugger can be enabled by clicking **[Debug]**.

Figure 2.16 Debug Configurations Main Menu

3. Debug Configuration File Modification

(1) Local directory files are stored in two places in the debug configuration file (.launch) stored in the project. Modify the locations to "DefaultBuild¥○○.x" and save.
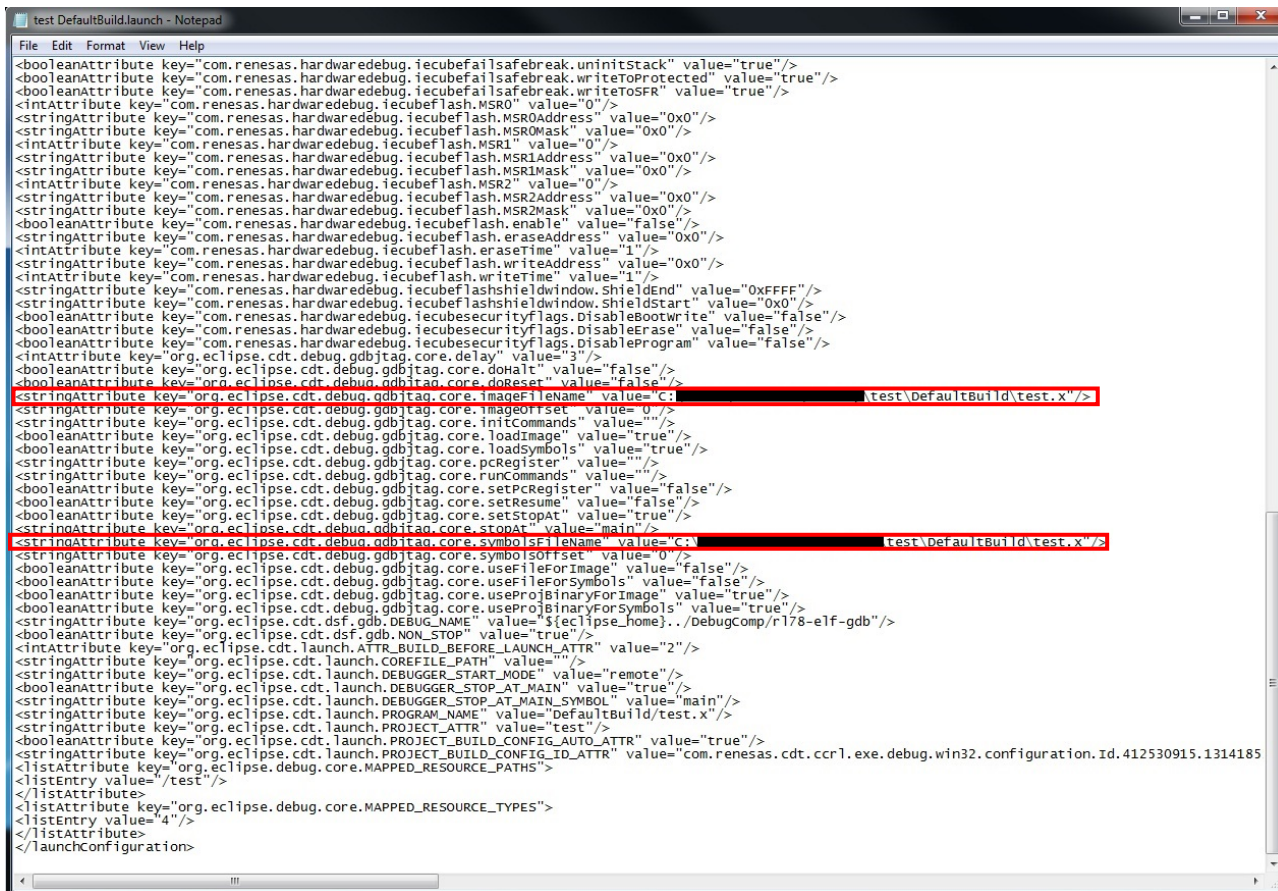

Figure 3.1 Debug Configuration File

4. Sample Code

Sample code can be downloaded from the Renesas Electronics website.

5. Reference Documents

RL78 Family User's Manual: Software (R01US0015E)

RL78 Compiler CC-RL User's Manual (R20UT3123E)

(The latest information can be downloaded from the Renesas Electronics website.)

Website and Support

Renesas Electronics website
 http://www.renesas.com/

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Revision Record	RL78 Software Migration Guide CS+ to e^2 studio Migration (CC-RL)		

Rev.	Date	Description	
		Page	Summary
1.00	Feb. 26, 2016	—	First edition issued

General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU 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. 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 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. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment 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 moment 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 moment 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 moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has 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. Moreover, 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.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of an MPU or MCU in the same group but having a different part number may differ in terms of the 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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