

Promotion Kit S5D9 (PK-S5D9)

Quick Start Guide

Renesas Synergy™ Platform
Synergy Tools & Kits
Kits: PK-S5D9

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General Precautions

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.

Introduction

This is the Quick Start Guide for the Renesas Synergy™ Promotion Kit S5D9 (PK-S5D9).

1. In the box

The following components are included in the Promotion Kit (PK-S5D9):

- PK-S5D9 Main Board
- One USB Type A to Micro-B cable
- Quick Start Guide (QSG, this document)

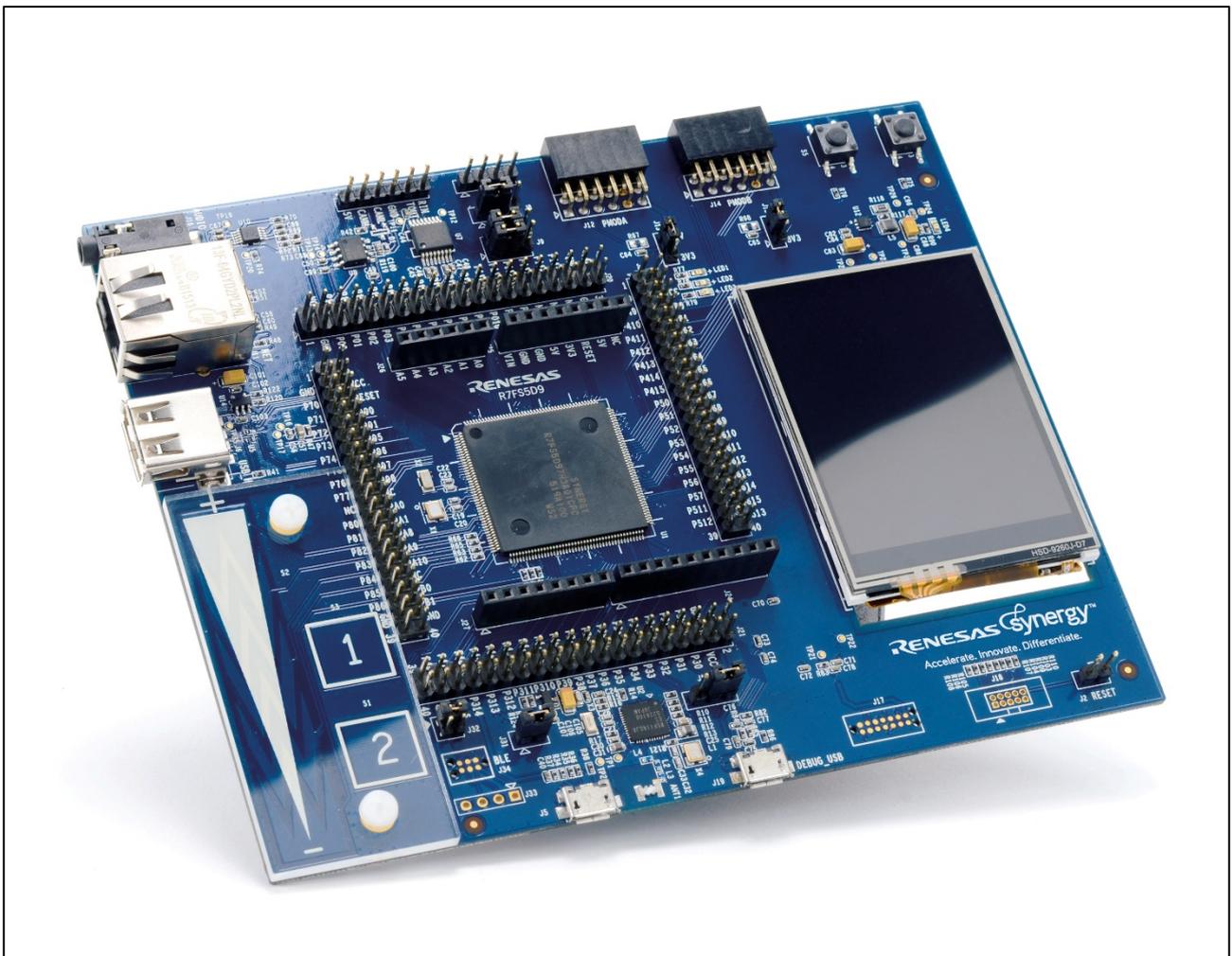


Figure 1 PK-S5D9

2. Overview

This Promotion Kit and the associated development tools allow you to evaluate the Renesas Synergy™ Platform using a device from the S5D9 Group of Renesas Synergy Microcontrollers (MCUs). This QSG walks you through the Out-of-Box Demonstration application. It provides a link to the website, which guides you through downloading and installing additional software. The website also shows you how to load, configure, generate, build, and execute the Blinky Project using the Synergy Software Package (SSP).

3. Connecting the board components

To power up the board and get started with the preloaded Out-of-Box Demonstration application, follow these steps:

- 1) Connect the Micro USB end of the supplied USB cable to the PK-S5D9 board J19 connector (DEBUG_USB).

Note: The kit contains a SEGGER J-Link® On-board (OB). The J-Link provides full debug and programming capabilities for the PK-S5D9 Kit.

- 2) Connect the other end of the USB cable to the USB port on your workstation.

LED4 turns green, indicating a good connection.

4. Running the Out-of-Box Demo

Once the PK-S5D9 is plugged in, it powers up and performs a self-test. After the test, the LCD displays a splash screen as shown in Figure 2.

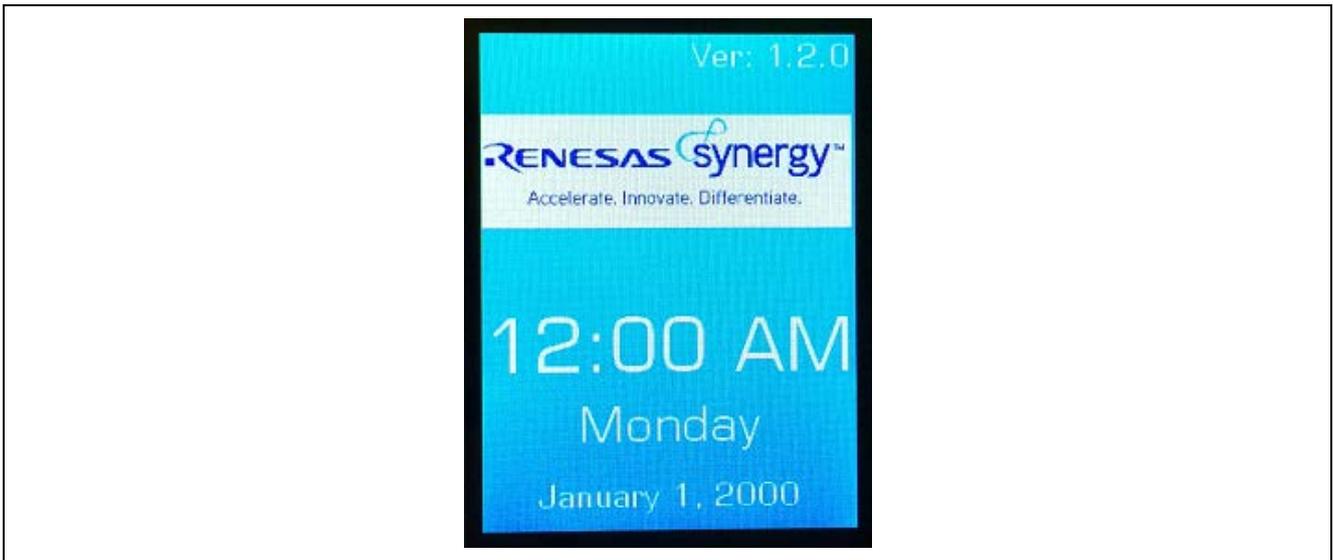


Figure 2 PK-S5D9 splash screen

Tap the splash screen to enter the Thermostat demonstration.

In this demonstration, the SSP uses the A/D converter to read the internal temperature sensor of the MCU and displays this information on the LCD display shown in Figure 3.



Figure 3 PK-S5D9 thermostat demonstration

Tap the Settings icon to adjust the system including Units, Set Time, and Set Date as seen in Figure 4.



Figure 4 PK-S5D9 Units, Set Time, and Set Date

5. Next steps

- 1) Visit [renesassynergy.com/tools](http://www.renesassynergy.com/tools) to learn more about development tools & utilities. Visit <http://www.renesassynergy.com/gallery> to download them
- 2) Download the application note *PK-S5D9 v.1.0 Out-of-Box Demo Programming Guide* from <http://www.renesassynergy.com/docs> to learn more about hardware and software for this Promotion Kit
- 3) If you need technical support or want to live chat with a Synergy Platform expert, visit <http://renesassynergy.com/support>
- 4) Learn more about:
 - a. Synergy Kits at <http://www.renesassynergy.com/kits>
 - b. Synergy Microcontrollers at <http://www.renesassynergy.com/microcontrollers>
 - c. Explore and modify other Synergy Application Projects that run on the PK-S5D9 kit at <http://www.renesassynergy.com/kits/pk-s5d9>
 - d. Synergy Software at <http://www.renesassynergy.com/software>
 - e. Synergy Solutions at <http://www.renesassynergy.com/solutions>

Website and Support

Support: <https://synergygallery.renesas.com/support>

Technical Contact Details:

- America: <https://www.renesas.com/en-us/support/contact.html>
- Europe: <https://www.renesas.com/en-eu/support/contact.html>
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FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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Revision History

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		Page	Summary
1.00	Dec 20, 2016	-	First publication
1.01	Mar 23, 2017	All	Technical term changed from Promotional Kit to Promotion Kit
1.02	Apr 9, 2018	-	Minor update

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