

# RA6M5 Group

Cloud Kit for RA6M5 Microcontroller Group  
CK-RA6M5 v2 with DA16600 Pmod Board  
Quick Start Guide

Renesas RA Family  
RA6 Series

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(Rev.5.0-1 October 2020)

## Corporate Headquarters

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan  
[www.renesas.com](http://www.renesas.com)

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# 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.

## Renesas CK-RA6M5 v2 Disclaimer

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## Precautions

This Cloud Kit is only intended for use in a laboratory environment under ambient temperature and humidity conditions. A safe separation distance should be used between this and any sensitive equipment. Its use outside the laboratory, classroom, study area, or similar such area invalidates conformity with the protection requirements of the Electromagnetic Compatibility Directive and could lead to prosecution.

The product generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications. There is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, which can be determined by turning the equipment off or on, you are encouraged to try to correct the interference by one or more of the following measures:

- Ensure attached cables do not lie across the equipment.
- Reorient the receiving antenna.
- Increase the distance between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that which the receiver is connected.
- Power down the equipment when not in use.
- Consult the dealer or an experienced radio/TV technician for help.

Note: It is recommended that wherever possible shielded interface cables are used.

The product is potentially susceptible to certain EMC phenomena. To mitigate against them it is recommended that the following measures be undertaken:

- The user is advised that mobile phones should not be used within 10 m of the product when in use.
- The user is advised to take ESD precautions when handling the equipment.

The Cloud Kit does not represent an ideal reference design for an end product and does not fulfill the regulatory standards for an end product.

## Renesas RA Family

**CK-RA6M5 v2 with DA16600 Pmod Board**
**Contents**

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## 1. Kit Contents

The following components are included in the kit:

1. CK-RA6M5 v2 board
2. Micro USB device cable (type-A male to micro-B male) x2
3. Micro USB host cable (type-A female to micro-B male)
4. USB-C device cable (type-C male to type-C male)
5. US159-DA16600EVZ Pmod board

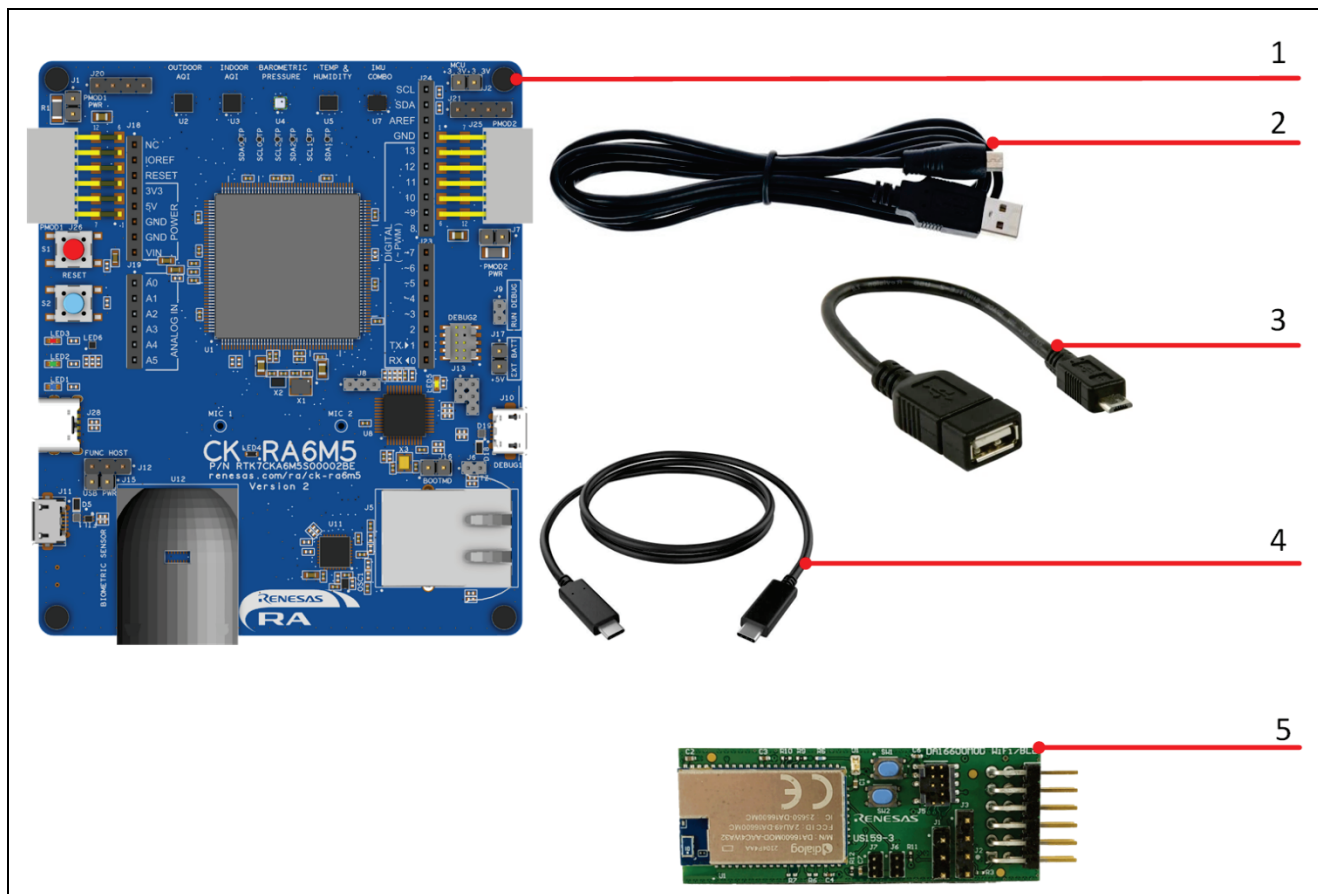


Figure 1. CK-RA6M5 v2 Kit Contents

## 2. Ordering Information

- CK-RA6M5 v2 kit orderable part number:

RTK7CKA6M5S08002BE Base kit plus US159-DA16600EVZ Pmod Board

Note: The underlined character in the orderable part number represents the kit version.

- CK-RA6M5 v2 board dimensions: 80 mm (width) x 95 mm (length)
- US159-DA16600EVZ Pmod board dimensions: 14.3 mm (width) × 24.3 mm (length)

### 3. DA16600 Pmod Board

Included in the CK-RA6M5 v2 kit is the DA16600 Pmod board. The Pmod board connects to the CK-RA6M5 v2 board using the Pmod 2 port. Some of the key features of the Pmod board are as follows:

- 3.3 V supply voltage
- Integrated chip antenna
- Cortex-M4F+ at 30 MHz to 160 MHz and Cortex M0+ at 16 MHz
- 802.11b/g/n radio PHY, 2.4 GHz
- Bluetooth 5.1 core qualified
- SoC runs full OS and TCP/IP stack
- Memory: 256 kB ROM, 512 kB RAM, 8 kB OTP, 48 B retention memory and 32 Mb SPI Flash
- RF regulatory certifications: FCC, IC, CE, KC, TELEC, and SRRC
- Wi-Fi Alliance certifications:  
Wi-Fi CERTIFIED b/g/n,  
WPA, WPA2, and WPA3
- Standardized Type 3A Pmod connector supports an expanded UART interface
- LED (D1) to aid in user software debug
- 10-pin 1.27 mm pitch Arm® Cortex-Debug connector (J2) for software development and debug support

**Table 1. CK-RA6M5 v2 Pmod 2 and DA16600 Pmod Board Port Assignments**

| CK-RA6M5 v2 Pmod 2 Port Assignments |                       |                | DA16600 Pmod Board Port Assignments |                       |                 |
|-------------------------------------|-----------------------|----------------|-------------------------------------|-----------------------|-----------------|
| Pin                                 | Option Type-3A (UART) | Signal/Bus     | Pin                                 | Option Type-3A (UART) | Signal/Bus      |
| J25-1                               | CTS                   | P800 (CTS0)    | 1                                   | CTS                   | GPIOA10         |
| J25-2                               | TXD                   | P411 (TXD0)    | 2                                   | TXD                   | GPIOC7_TXD_HOST |
| J25-3                               | RXD                   | P100 (RXD0)    | 3                                   | RXD                   | GPIOC6_RXD_HOST |
| J25-4                               | RTS                   | P413 (RTS0)    | 4                                   | RTS                   | GPIOA2          |
| J25-5                               |                       | GND            | 5                                   |                       | GND             |
| J25-6                               |                       | +3.3 V         | 6                                   |                       | +3.3 V          |
| J25-7                               |                       | P004 (IRQ9-DS) | 7                                   |                       | INT             |
| J25-8                               |                       | P101           | 8                                   |                       | RESET           |
| J25-9                               |                       | P414           | 9                                   |                       | P0_8            |
| J25-10                              |                       | P708           | 10                                  |                       | P0_9            |
| J25-11                              |                       | GND            | 11                                  |                       | GND             |
| J25-12                              |                       | +3.3 V         | 12                                  |                       | +3.3 V          |





## 4. Next Steps

To learn more about the CK-RA6M5 v2 kit and the Quick Start Example Project (QSEP), refer to the CK-RA6M5 v2 – User's Manual, Quick Start Guide, and design package available in the Documents and Download tabs respectively of the CK-RA6M5 v2 webpage at [renesas.com/ra/ck-ra6m5](https://renesas.com/ra/ck-ra6m5)

## 5. Website and Support

Visit the following URLs to learn about the kit and the RA family of microcontrollers, download tools and documentation, and get support.

|                                     |   |
|-------------------------------------|---|
| CK-RA6M5 Resources                  | <a href="https://renesas.com/ra/ck-ra6m5">renesas.com/ra/ck-ra6m5</a>       |
| Cloud Application Notes             | <a href="https://renesas.com/cloudsolutions">renesas.com/cloudsolutions</a> |
| RA Kit Information                  | <a href="https://renesas.com/ra/kits">renesas.com/ra/kits</a>               |
| RA Product Support Forum            | <a href="https://renesas.com/ra/forum">renesas.com/ra/forum</a>             |
| RA Product Information              | <a href="https://renesas.com/ra">renesas.com/ra</a>                         |
| RA Videos                           | <a href="https://renesas.com/ra/videos">renesas.com/ra/videos</a>           |
| RA Kit Feedback and Feature Request | <a href="https://renesas.com/ra/kitfeedback">renesas.com/ra/kitfeedback</a> |
| Renesas Support                     | <a href="https://renesas.com/support">renesas.com/support</a>               |

### Provide Feedback/Request a Feature

Renesas aims to provide the best microcontroller kit experience to help our customers jumpstart innovation and take products to market faster with the RA family of microcontrollers. The Renesas RA microcontroller kits have been designed with a lot of attention to detail and customer-centered thinking in every aspect of the design. Renesas aims to exceed customer expectation.

Renesas looks forward to hearing your feedback and learning how we can enhance your experience. Please share your feedback at [renesas.com/ra/kitfeedback](https://renesas.com/ra/kitfeedback).

**Revision History**

| Rev. | Date       | Description |                 |
|------|------------|-------------|-----------------|
|      |            | Page        | Summary         |
| 1.00 | Sept.20.23 | —           | Initial release |

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Publication Date: Sept.20.23

Published by:     Renesas Electronics Corporation

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