

AN INTRODUCTION TO GENERAL-PURPOSE RA MCU KITS

renesas.com/ra/kits

RENESAS ELECTRONICS CORPORATION
RENESAS ADVANCED (RA) MCU KITS

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AGENDA



**Renesas Advanced
MCU Kits
Vision, Objective &
Strategy**

**Innovation
Enablement &
Product Lineup**

**Getting Started
Is Easy!**

**More Information &
Support**

VISION OF RENESAS ADVANCED MCU KITS

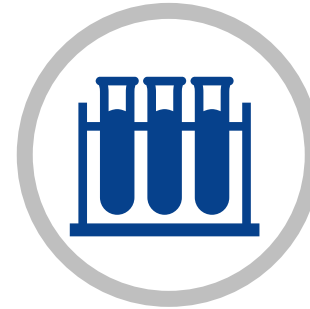
Deliver an **unmatched innovation experience** through scalable, flexible & ecosystem-ready Renesas Advanced MCU kits that enable users to **bring their innovative products to market faster.**

OBJECTIVE

To enable a large number of use cases so customers, engineers, developers, distributors, partners, etc. can do more



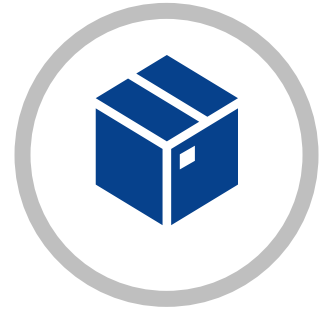
Proof-of-Concepts



Functional Evaluation



Getting Started Reference



Solutions & Demos



Trainings & Workshops



Maker Community

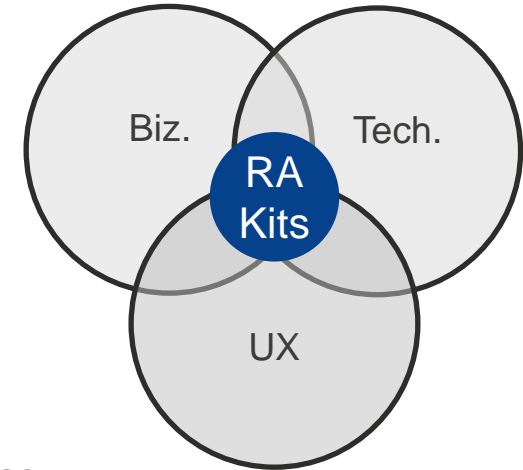
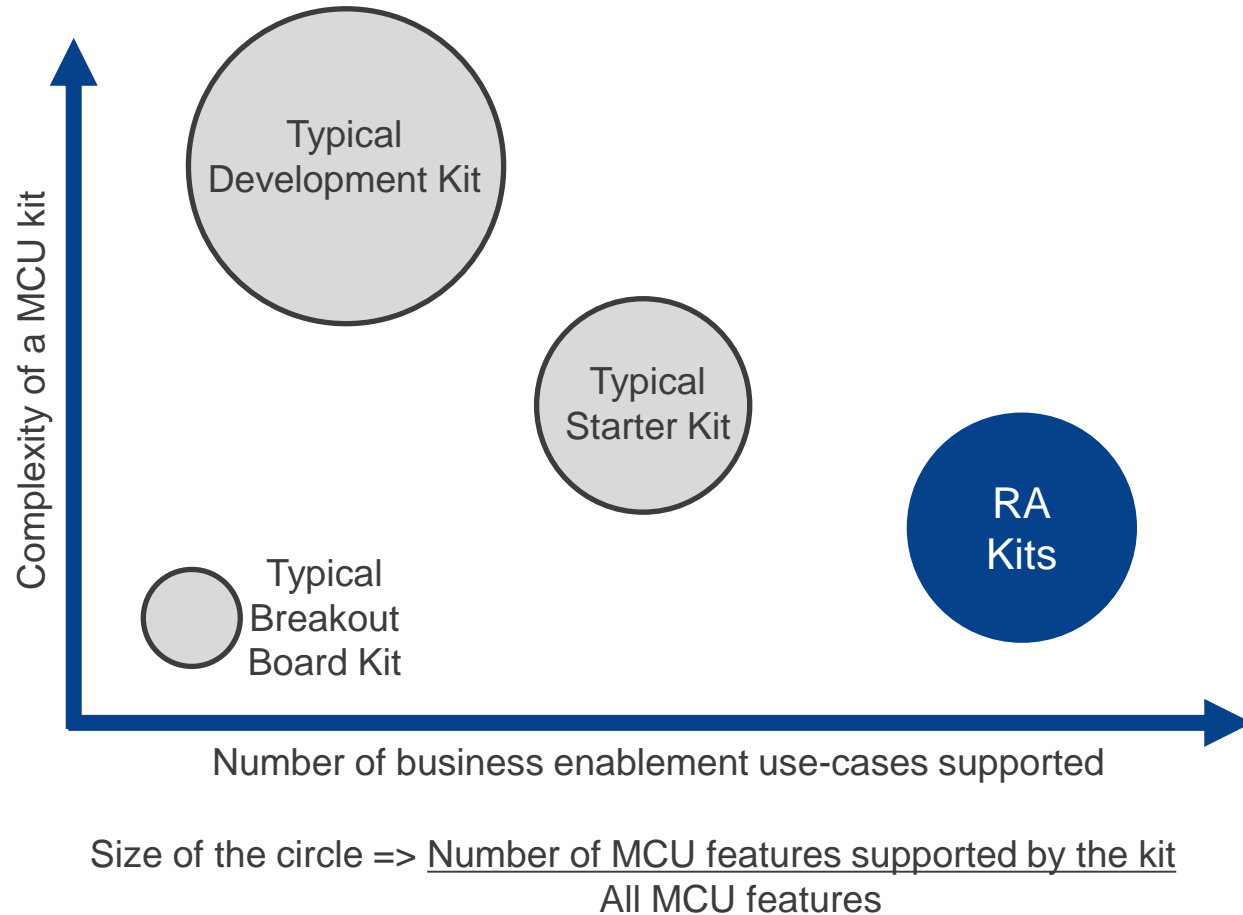


Research & Academia



Promotions & Lead Generation

STRATEGY



Business

- Serve global customer base
- Facilitate cross-selling
- Lower NRE & faster time to market

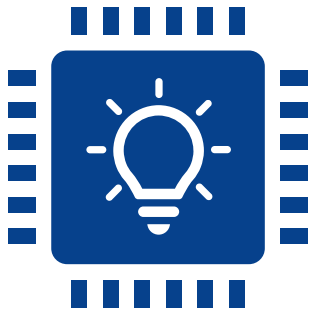
Technical

- Useful for innovation
- Support prioritized MCU peripherals
- Ecosystem ready

User Experience

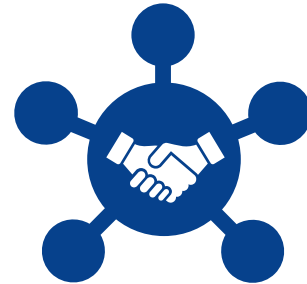
- Delightful to use
- Beautifully designed & presented

DIFFERENTIATION THAT SETS YOU APART



Innovation Ready

A winning combination of standardization & flexibility



Ecosystem Ready

Enhance functionality on your terms



World Ready

Compliant with many international standards



Fun Ready

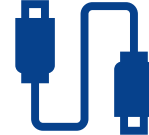
Take the guesswork out of your innovation experience

INNOVATION READY

A winning combination of standardization & flexibility that enables shorter learning curve & faster time to market



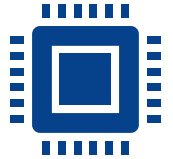
System & Control



Debugging



Connectivity



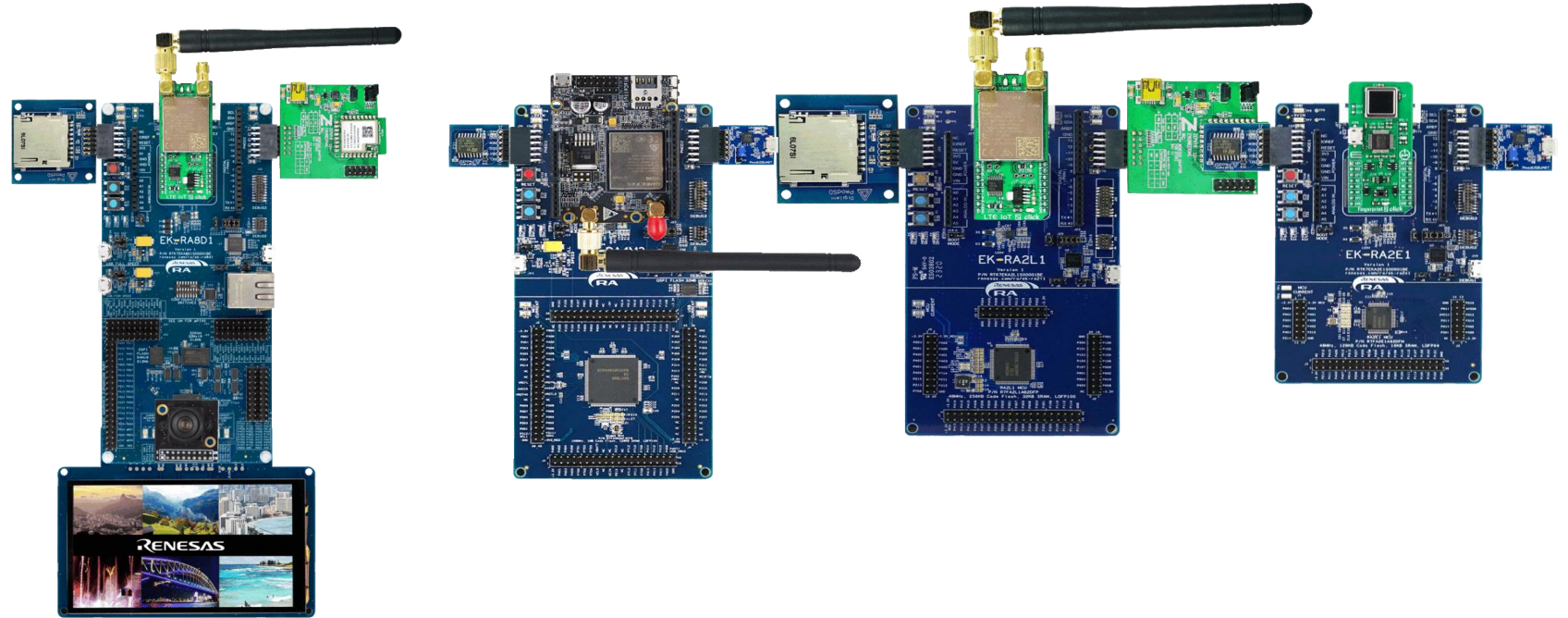
MCU Access

Standardized feature set across most RA kits			
User buttons & LEDs	Debug On-Board	USB FS (Device)	Male pin headers
MCU current measurement	Debug In	SPI, UART, I2C	Basic prototyping

Additional feature set available on some RA kits			
Additional LDO current	Debug Out	Ethernet	Enhanced prototyping
Multiple power sources		Octo-SPI, Quad-SPI	Graphics Expansion Port
USB current measurement		USB FS (Host)	
Capacitive touch button		USB HS (Host & Device)	

ECOSYSTEM READY

Enhance
functionality on your
terms & choose from
hundreds of 3rd party
add-ons from
popular ecosystems



Connect RA kits with add-ons and prototyping board

WORLD READY

Compliant with many international standards
Documentation available in English & Japanese

EMC/EMI Standards

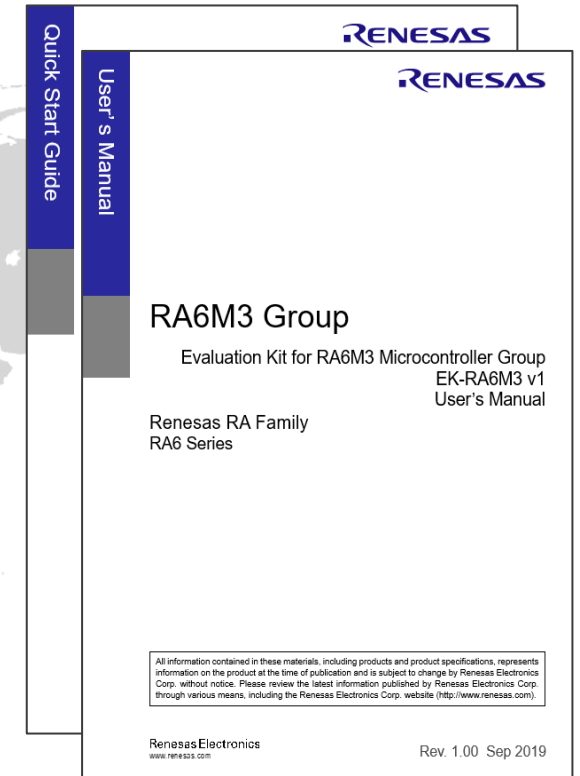
- FCC Notice (Class A) – Part 15
- Innovation, Science & Economic Development Canada ICES-003 Compliance: CAN ICES-3 (A)/NMB-3(A)
- CE Class A (EMC Directive 2004/108/EEC)
- Taiwan Chinese National Standard 13438, C6357 compliance, Class A limits
- Australia/New Zealand AS/NZS CISPR 32:2015, Class A

Waste, Recycling & Material Selection

- EU RoHS
- China SJ/T 113642014, 10-year environmental protection use period

Safety Standards

- UL 94V-0



User's manual & quick start guide



FUN READY!

Take the guesswork out of your innovation experience for an unmatched, systematic & methodical approach to start developing

Watch the [video](#)

The screenshot shows the top navigation bar of the Renesas website with the logo and tagline 'BIG IDEAS FOR EVERY SPACE'. It includes a search bar, a 'Smart' dropdown, and icons for a globe, shopping cart, and lock. The main navigation menu contains 'PRODUCTS', 'APPLICATIONS', 'DESIGN & SUPPORT', 'BUY & SAMPLE', and 'ABOUT'. Below the navigation is a video player with the title 'Innovate with Renesas Advanced (RA) Microcontrollers Kits in 5 Easy Steps'. The video content features a man in a blue shirt standing behind a table with several Renesas RA development kits. A list of five steps is displayed on the left side of the video frame:

- 1 Get your kit
- 2 Familiarize with your kit
- 3 Download & install software & tools
- 4 Explore & customize example projects
- 5 Expand functionality

Click the image to watch the video

RA KITS - PRODUCT PORTFOLIO

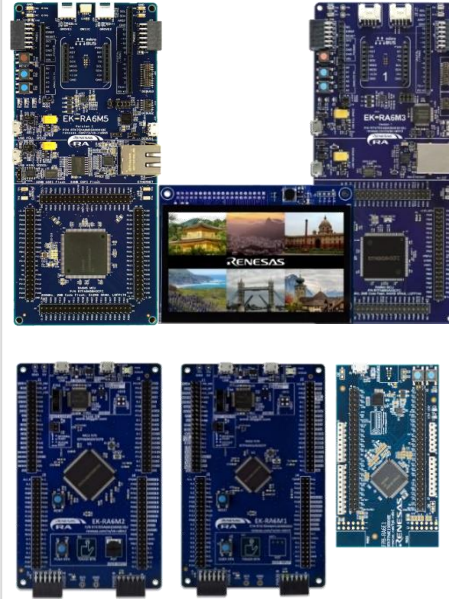
General-Purpose MCU Kits

- Differentiated functionality
 - Remarkable ease-of-use
 - Broad ecosystem support
 - Multiple debugging modes
 - Feature standardization and scalability across RA8, RA6, RA4, and RA2 MCU Series
-
- Basic MCU pin access
 - Limited ecosystem support
 - On-board debugging only
 - Design reuse across various Renesas MCU families: Synergy, RA, and RL78

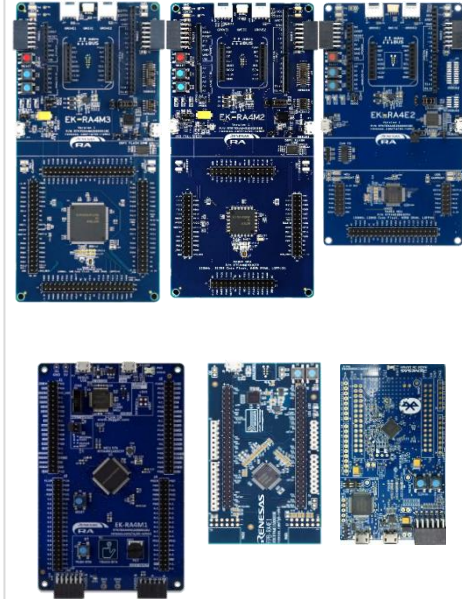
RA8 Series MCUs



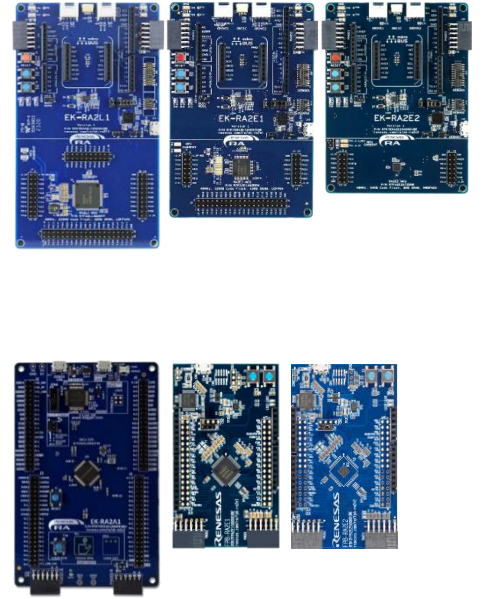
RA6 Series MCUs



RA4 Series MCUs



RA2 Series MCUs



3rd Party/Partner Kits

- Access to partner's ecosystem & tools



A sampling of general-purpose RA MCU Evaluation Kits

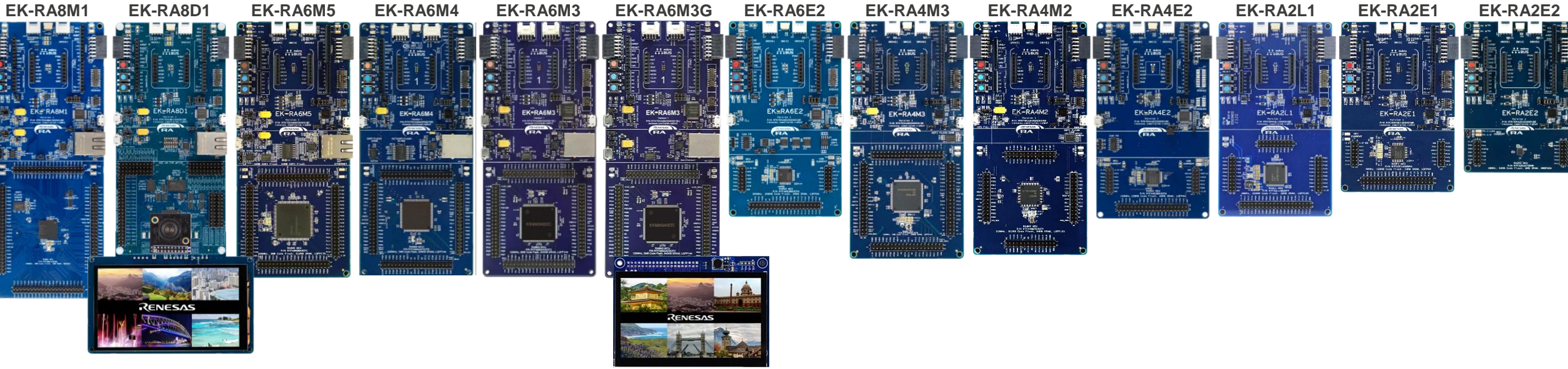
PRODUCT LINE UP

RA8 Series MCUs

RA6 Series MCUs

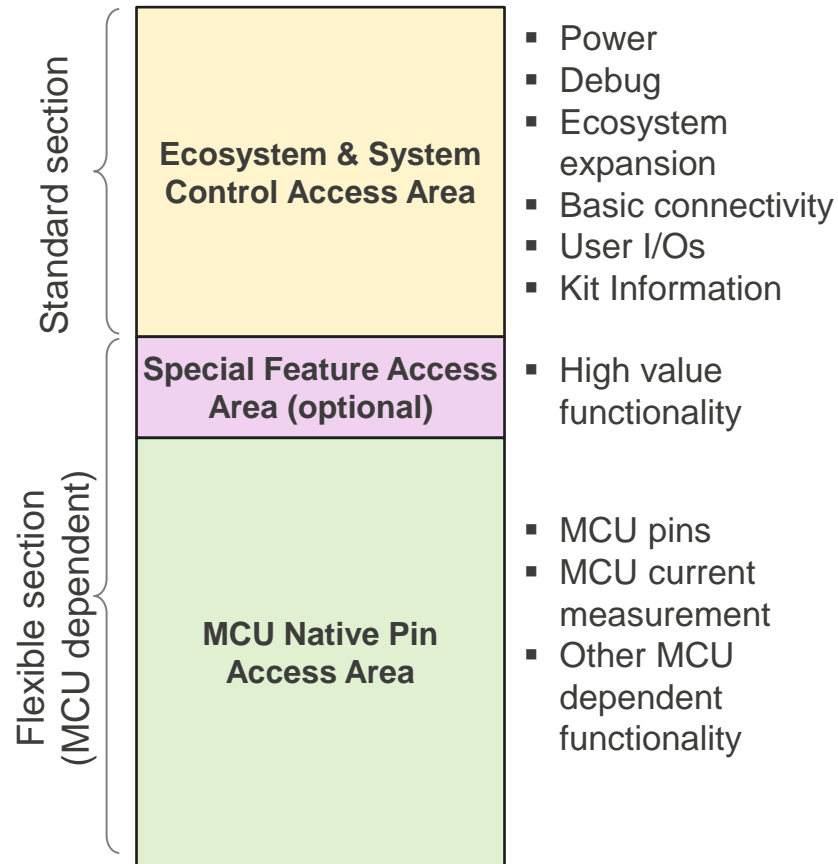
RA4 Series MCUs

RA2 Series MCUs



Differentiated Functionality with Remarkable Ease-of-Use
 Feature Standardization and Scalability across RA8, RA6, RA4, and RA2 MCU Series

FEATURED INNOVATION KITS - ARCHITECTURE



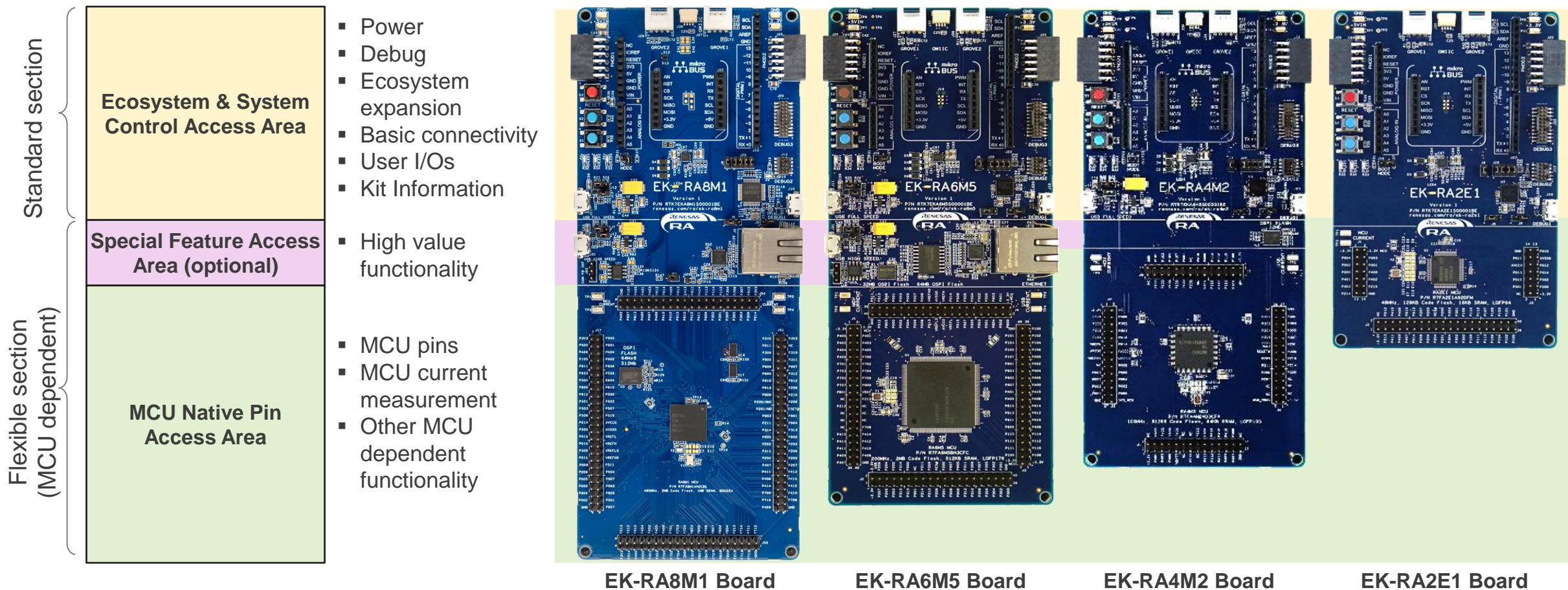
Key Features of Architecture

- Scalable design framework
- Feature access organization
- On-board access to most-popular ecosystems

Benefits of Architecture

- ✓ Applicable across RA MCUs – new kits
- ✓ Shorter learning curve for users
- ✓ Improved user experience
- ✓ Maximize hardware design reuse
- ✓ Lower NRE
- ✓ Faster time to market
- ✓ Brings more innovation to users
- ✓ Allows for vast functionality expansion
- ✓ Fuels partner engagement and ecosystem utilization

FEATURED INNOVATION KITS - ARCHITECTURE



EK-RA8D1

EVALUATION KIT FOR RA8D1 MCU GROUP

Key Features

Special Feature Access

- MIPI DSI & Parallel Graphics Expansion Ports
- Camera Expansion Port
- Ethernet
- USB High Speed Host & Device
- 64 MB SDRAM
- 64 MB External Octo-SPI Flash

MCU Native Pin Access

- R7FA8D1BHECBD MCU
- 480 MHz, Arm Cortex®-M85 core
- 2 MB Code Flash, 1 MB SRAM
- 224 pins, BGA package
- Native pin access
- MCU & USB current measurement
- DC/DC mode configuration

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS, HS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I3C & analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



renesas.com/ra/ek-ra8d1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7EKA8D1S01001BE

(Orderable part number)



EK-RA8D1

EVALUATION KIT FOR RA8D1 MCU GROUP

... continued

Key Features

MIPI Graphics Expansion Board

- 4.5 Inch backlit TFT display, 16.7M display colors
- 480x854 pixels resolution
- 2-lane MIPI interface
- Capacitive touch overlay (I2C)

Camera Expansion Board

- Off-the-shelf Arducam CMOS OV3640 Camera Module
- ¼ Inch 3.1 Megapixel image sensor
- Up to 15 fps in QXGA (2048x1536 pixels) resolution



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EK-RA8M1

EVALUATION KIT FOR RA8M1 MCU GROUP

Key Features

Special Feature Access

- Ethernet
- USB High Speed Host & Device
- 64 MB External Octo-SPI Flash
- CAN FD PHY

MCU Native Pin Access

- R7FA8M1AHECBD MCU
- 480 MHz, Arm Cortex®-M85 core
- 2 MB Code Flash, 1 MB SRAM
- 224 pins, BGA package
- Native pin access
- MCU & USB current measurement
- DC/DC mode configuration

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS, HS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C/I3C)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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(User manual, quick start guide, development tools, schematics, design files & example projects)

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EK-RA6M5

EVALUATION KIT FOR RA6M5 MCU GROUP

Key Features

Special Feature Access

- Ethernet
- USB High Speed Host & Device
- 64 MB External Octo-SPI Flash
- 32 MB External Quad-SPI Flash
- CAN FD

MCU Native Pin Access

- R7FA6M5BH3CFC MCU
- 200 MHz, Arm Cortex®-M33 core
- 2 MB Code Flash, 512 KB SRAM
- 176 pins, LQFP package
- Native pin access
- MCU & USB current measurement points

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS, HS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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(User manual, quick start guide, development tools, schematics, design files & example projects)

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EK-RA6M4

EVALUATION KIT FOR RA6M4 MCU GROUP

Key Features

Special Feature Access

- Ethernet
- 64 MB External Octo-SPI Flash
- 32 MB External Quad-SPI Flash

MCU Native Pin Access

- R7FA6M4AF3CFB MCU
- 200 MHz, Arm Cortex®-M33 core
- 1 MB Code Flash, 256 KB SRAM
- 144 pins, LQFP package
- Native pin access
- MCU & USB current measurement points

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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(User manual, quick start guide, development tools, schematics, design files & example projects)

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EK-RA6M3

EVALUATION KIT FOR RA6M3 MCU GROUP

Key Features

Special Feature Access

- Ethernet
- USB High Speed Host & Device
- 32 MB External QSPI Flash

MCU Native Pin Access

- R7FA6M3AH3CFC MCU
- 120 MHz, Arm Cortex®-M4 core
- 2 MB Code Flash, 640 KB SRAM
- 176 pins, LQFP package
- Native pin access through 4x 40-pin male headers
- MCU & USB current measurement points

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS, HS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- MCU boot configuration jumper



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(User manual, quick start guide, development tools, schematics, design files & example projects)

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(Orderable part number)



EK-RA6M3G

GRAPHICS EVALUATION KIT FOR RA6M3 MCU GROUP

Key Features

Special Feature Access

- 4.3" 480x272 px color TFT LCD with capacitive touch
- Ethernet
- USB High Speed Host & Device
- 32 MB External QSPI Flash

MCU Native Pin Access

- R7FA6M3AH3CFC MCU
- 120 MHz, Arm Cortex®-M4 core
- 2 MB Code Flash, 640 KB SRAM
- 176 pins, LQFP package
- Native pin access through 4x 40-pin male headers
- MCU & USB current measurement points

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS, HS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- MCU boot configuration jumper

Featured Software Library

- Segger™ emWin Embedded GUI



[renesas.com/ra/ek-ra6m3g](https://www.renesas.com/ra/ek-ra6m3g)

(User manual, quick start guide, development tools, schematics, design files & example projects)

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EK-RA6E2

EVALUATION KIT FOR RA6E24 MCU GROUP

Key Features

Special Feature Access

- 32 MB External Quad-SPI Flash
- CAN FD PHY

MCU Native Pin Access

- R7FA6E2BB3CFM MCU
- 200 MHz, Arm Cortex®-M33 core
- 256 KB Code Flash, 40 KB SRAM
- 64 pins, LQFP package
- Native pin access through male pin headers
- MCU & USB current measurement

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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EK-RA4M3

EVALUATION KIT FOR RA4M3 MCU GROUP

Key Features

Special Feature Access

- 32 MB External QSPI Flash

MCU Native Pin Access

- R7FA4M3AF3CFB MCU
- 100 MHz, Arm Cortex®-M33 core
- 1 MB Code Flash, 128 KB SRAM
- 144 pins, LQFP package
- Native pin access through male pin headers
- MCU & USB current measurement points

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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EK-RA4M2

EVALUATION KIT FOR RA4M2 MCU GROUP

Key Features

Special Feature Access

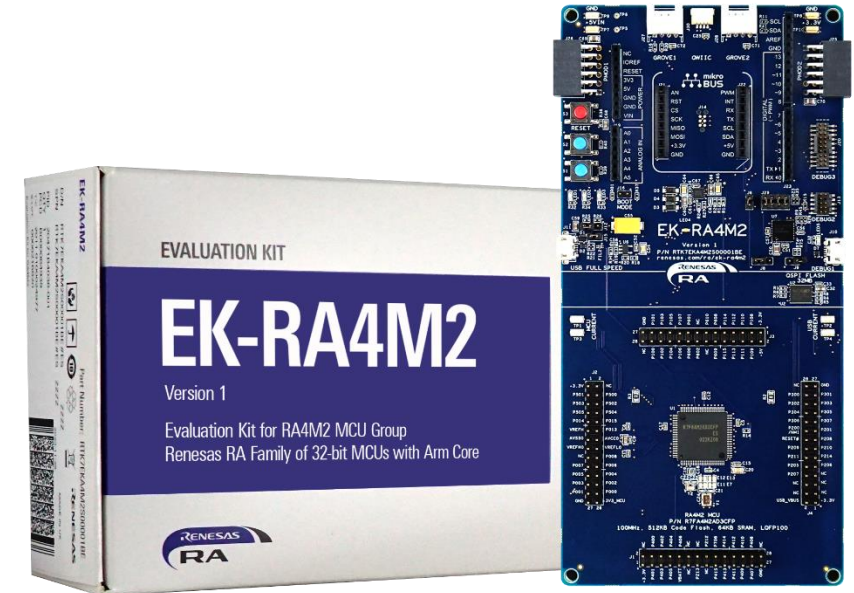
- 32 MB External QSPI Flash

MCU Native Pin Access

- R7FA4M2AD2CFP MCU
- 100 MHz, Arm Cortex®-M33 core
- 512 KB Code Flash, 64 KB SRAM
- 100 pins, LQFP package
- Native pin access through male pin headers
- MCU & USB current measurement points

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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EK-RA4E2

EVALUATION KIT FOR RA4E2 MCU GROUP

Key Features

Special Feature Access

- CAN FD PHY

MCU Native Pin Access

- R7FA4E2B93CFM MCU
- 100 MHz, Arm Cortex®-M33 core
- 128 KB Code Flash, 40 KB SRAM
- 64 pins, LQFP package
- Native pin access through male pin headers
- MCU & USB current measurement

Ecosystem & System Control Access

- USB Full Speed Host & Device
- 5 V input through USB (Debug, FS) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (ETM, SWD & JTAG)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & analog)
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- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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EK-RA2L1

EVALUATION KIT FOR RA2L1 MCU GROUP

Key Features

MCU Native Pin Access

- R7FA2L1AB2DFP MCU
- 48 MHz, Arm Cortex®-M23 core
- 256 KB Code Flash, 32 KB SRAM
- 100 pins, LQFP package
- Native pin access through male pin headers
- MCU current measurement points

Ecosystem & System Control Access

- 5 V input through USB (Debug) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (SWD)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & Analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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EK-RA2E1

EVALUATION KIT FOR RA2E1 MCU GROUP

Key Features

MCU Native Pin Access

- R7FA2E1A92DFM MCU
- 48 MHz, Arm Cortex®-M23 core
- 128 KB Code Flash, 16 KB SRAM
- 64 pins, LQFP package
- Native pin access through male pin headers
- MCU current measurement points
- DC/DC mode configuration

Ecosystem & System Control Access

- 5 V input through USB (Debug) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (SWD)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & Analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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(Orderable part number)



EK-RA2E2

EVALUATION KIT FOR RA2E2 MCU GROUP

Key Features

MCU Native Pin Access

- R7FA2E2A72DNK MCU
- 48 MHz, Arm Cortex®-M23 core
- 64 KB Code Flash, 8 KB SRAM
- 24 pins, HWQFN package
- Native pin access through male pin headers
- MCU current measurement points
- DC/DC mode configuration

Ecosystem & System Control Access

- 5 V input through USB (Debug) or external power supply
- Debug on-board (Segger J-Link®)
- Debug in (SWD)
- Debug out (SWD)
- 3 User LEDs & 2 User buttons
- 2 SeeedGrove® system (I2C & Analog)
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MikroElektronika™ mikroBUS
- SparkFun® Qwiic® (I2C)
- MCU boot configuration jumper



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(User manual, quick start guide, development tools, schematics, design files & example projects)

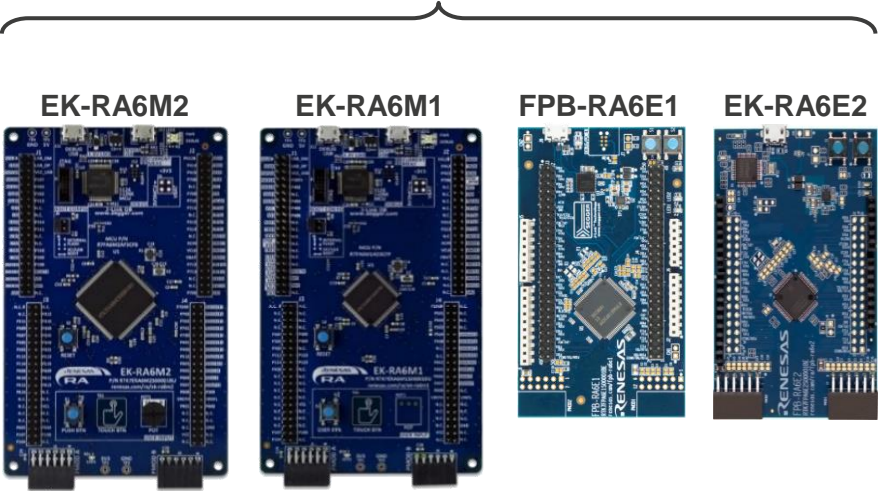
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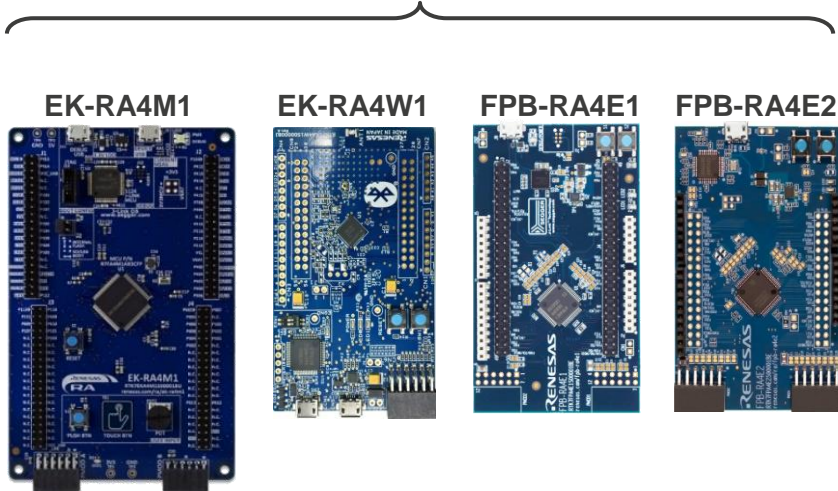


BASIC PIN-OUT KITS – PRODUCT LINE UP

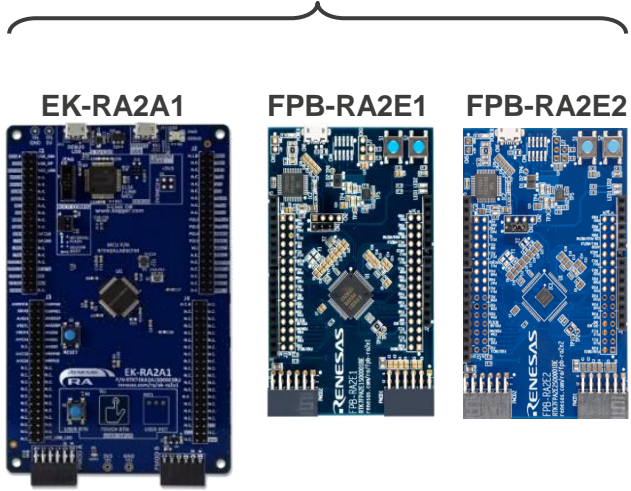
RA6 Series MCUs



RA4 Series MCUs



RA2 Series MCUs



Basic MCU Pin Access

Design reuse across various Renesas MCU families: Synergy, RA, and RL78

EK-RA6M2

EVALUATION KIT FOR RA6M2 MCU GROUP

Key Features

- R7FA6M2AF3CFB MCU
- 120 MHz, Arm Cortex®-M4 core
- 1 MB Code Flash, 384 KB SRAM
- 144 pins, LQFP package
- Native pin access through 4x 40-pin male headers
- MCU current measurement points
- USB Full Speed Device
- 5 V input through USB Debug
- Debug on-board (Segger J-Link®)
- Debug in (SWD & JTAG)
- 2 Digilent Pmod™ (SPI & UART)
- User LED
- Mechanical user button
- Capacitive user button
- MCU boot configuration jumper



renesas.com/ra/ek-ra6m2

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7EKA6M2S00001BU

(Orderable part number)



EK-RA6M1

EVALUATION KIT FOR RA6M1 GROUP

Key Features

- R7FA6M1AD3CFP MCU
- 120 MHz, Arm Cortex®-M4 core
- 512 KB Code Flash, 256 KB SRAM
- 100 pins, LQFP package
- Native pin access through 4x 40-pin male headers
- MCU current measurement points
- USB Full Speed Device
- 5 V input through USB Debug
- Debug on-board (Segger J-Link®)
- Debug in (SWD & JTAG)
- 2 Digilent Pmod™ (SPI & UART)
- User LED
- Mechanical user button
- Capacitive user button
- MCU boot configuration jumper



renesas.com/ra/ek-ra6m1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7EKA6M1S00001BU

(Orderable part number)



FPB-RA6E2

FAST PROTOTYPING BOARD FOR RA6E1 MCU GROUP

Key Features

- R7FA6E2BB3CFM MCU
- 200 MHz, Arm Cortex®-M33 core
- 256 KB Code Flash, 40 KB SRAM
- 64 pins, LQFP package
- Native pin access through male pin headers
- MCU current measurement points
- 5 V input through USB (Debug) or external power supply
- Debug on-board (Segger J-Link®)
- 2 User LEDs & 1 User button
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MCU boot configuration jumper



renesas.com/ra/fpb-ra6e2

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7FPA6E2S00001BE

(Orderable part number)

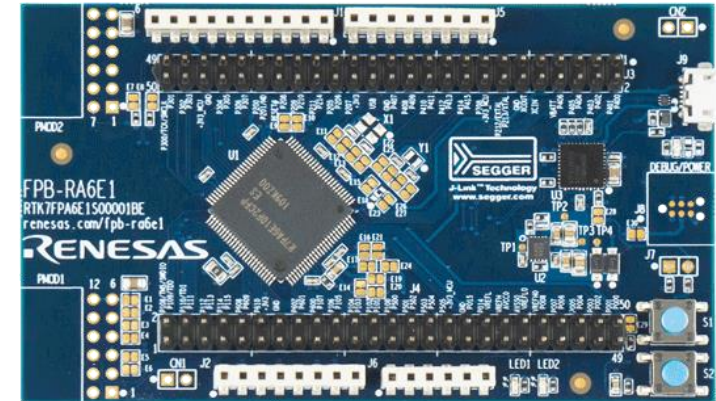


FPB-RA6E1

FAST PROTOTYPING BOARD FOR RA6E1 MCU GROUP

Key Features

- R7FA6E10F2CFP MCU
- 100 MHz, Arm Cortex®-M33 core
- 1 MB Code Flash, 256 KB SRAM
- 100 pins, LQFP package
- Native pin access through male pin headers
- MCU current measurement points
- 5 V input through USB (Debug) or external power supply
- Debug on-board (Segger J-Link®)
- 2 User LEDs & 1 User button
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MCU boot configuration jumper



renesas.com/ra/fpb-ra6e1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7FPA6E1S00001BE

(Orderable part number)



EK-RA4M1

EVALUATION KIT FOR RA4M1 MCU GROUP

Key Features

- R7FA4M1AB3CFP MCU
- 48 MHz, Arm Cortex®-M4 core
- 256 KB Code Flash, 32 KB SRAM
- 100 pins, LQFP package
- Native pin access through 4x 40-pin male headers
- MCU current measurement points
- USB Full Speed Device
- 5 V input through USB Debug
- Debug on-board (Segger J-Link®)
- Debug in (SWD & JTAG)
- 2 Digilent Pmod™ (SPI & UART)
- User LED
- Mechanical user button
- Capacitive user button
- MCU boot configuration jumper



renesas.com/ra/ek-ra4m1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7EKA4M1S00001BU

(Orderable part number)



EK-RA4W1

EVALUATION KIT FOR RA4W1 MCU GROUP

Key Features

- R7FA4W1AD2CNG MCU
- 48 MHz, Arm Cortex®-M4 core
- 512 KB Code Flash, 96 KB SRAM
- 56 pins, QFN package
- MCU headers: 28 pins x2
- MCU current measurement points
- USB Full Speed device
- 5 V input through USB debug
- Debug on-board (Segger J-Link®)
- Digilent Pmod™ (SPI)
- Arduino™ (Uno R3)
- User LED
- Mechanical user button
- MCU boot configuration jumper



renesas.com/ra/ek-ra4w1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7EKA4W1S0000BJ

(Orderable part number)



FPB-RA4E2

FAST PROTOTYPING BOARD FOR RA4E1 MCU GROUP

Key Features

- R7FA4E2B93CFM MCU
- 100 MHz, Arm Cortex®-M33 core
- 128 KB Code Flash, 40 KB SRAM
- 64 pins, LQFP package
- Native pin access through male pin headers
- MCU current measurement points
- 5 V input through USB (Debug) or external power supply
- Debug on-board (Segger J-Link®)
- 2 User LEDs & 1 User button
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MCU boot configuration jumper



renesas.com/ra/fpb-ra4e2

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7FPA4E2S00001BE

(Orderable part number)

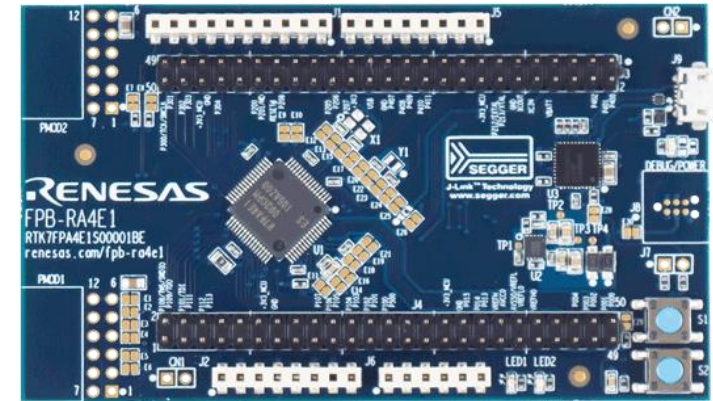


FPB-RA4E1

FAST PROTOTYPING BOARD FOR RA4E1 MCU GROUP

Key Features

- R7FA4E10D2CFM MCU
- 100 MHz, Arm Cortex®-M33 core
- 512 KB Code Flash, 128 KB SRAM
- 64 pins, LQFP package
- Native pin access through male pin headers
- MCU current measurement points
- 5 V input through USB (Debug) or external power supply
- Debug on-board (Segger J-Link®)
- 2 User LEDs & 1 User button
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MCU boot configuration jumper



renesas.com/ra/fpb-ra4e1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7FPA4E1S00001BE

(Orderable part number)



EK-RA2A1

EVALUATION KIT FOR RA2A1 MCU GROUP

Key Features

- R7FA2A1AB3CFM MCU
- 48 MHz, Arm Cortex®-M23 core
- 256 KB Code Flash, 32 KB SRAM
- 64 pins, LQFP package
- Native pin access through 4x 40-pin male headers
- MCU current measurement points
- USB Full Speed Device
- 5 V input through USB Debug
- Debug on-board (Segger J-Link®)
- Debug in (SWD & JTAG)
- 2 Digilent Pmod™ (SPI & UART)
- User LED
- Mechanical user button
- Capacitive user button
- MCU boot configuration jumper



renesas.com/ra/ek-ra2a1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7EKA2A1S00001BU

(Orderable part number)

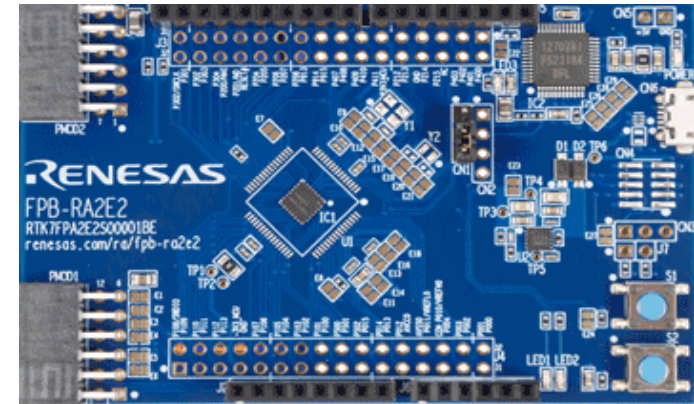


FPB-RA2E2

FAST PROTOTYPING BOARD FOR RA2E1 MCU GROUP

Key Features

- R7FA2E2A74CNK MCU
- 48 MHz, Arm Cortex®-M23 core
- 64 KB Code Flash, 64 KB SRAM
- 24 pins, HWQFN package
- Native pin access through male pin headers
- MCU current measurement points
- 5 V input through USB (Debug) or external power supply
- Debug on-board (Renesas E2 Lite)
- 2 User LEDs & 1 User button
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MCU boot configuration jumper



renesas.com/ra/fpb-ra2e2

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7FPA2E2S00001BE

(Orderable part number)



FPB-RA2E1

FAST PROTOTYPING BOARD FOR RA2E1 MCU GROUP

Key Features

- R7FA2E1A93CFM MCU
- 48 MHz, Arm Cortex®-M23 core
- 128 KB Code Flash, 16 KB SRAM
- 64 pins, LQFP package
- Native pin access through male pin headers
- MCU current measurement points
- 5 V input through USB (Debug) or external power supply
- Debug on-board (Renesas E2 Lite)
- 2 User LEDs & 1 User button
- 2 Digilent Pmod™ (SPI & UART)
- Arduino™ (Uno R3)
- MCU boot configuration jumper



renesas.com/ra/fpb-ra2e1

(User manual, quick start guide, development tools, schematics, design files & example projects)

RTK7FPA2E1S00001BE

(Orderable part number)



MIKROE RA4M1 CLICKER

COMPACT STARTER BOARD FOR RA4M1 MCU GROUP

Key Features

MCU Native Pin Access

- R7FA4M1AB3CFP MCU
- 48 MHz, Arm Cortex®-M4 core
- 256 KB Code Flash, 32 KB SRAM
- 100 pins, LQFP package

Ecosystem & System Control Access

- 5 V input through USB-C(Debug)
- Debug on-board (Segger J-Link®)
- 2 User LEDs & 2 User buttons
- Reset button
- MikroElektronika™ mikroBUS



[Introduction & Unboxing Video](#)



mikroe.com/ra4m1-clicker

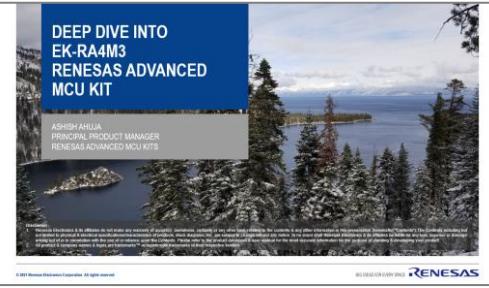
(User manual, quick start guide, schematics, design files & example project)

MIKROE-4350

(Orderable part number)



TOP NOTCH COLLATERAL – DEEP DIVE PRESENTATIONS



Deep-dive presentations are available on renesas.com/ra/<kit-name>
For example: renesas.com/ra/ek-ra6m3

TOP NOTCH COLLATERAL – BLOGS

Renesas RA6 Series Innovation Kits for Connected IoT Applications

Ashish Ahuja
Principal Product Manager and Product Marketing Manager

Published: April 5, 2022

The RA MCU innovation kits for IoT enable users to effortlessly evaluate the features of different RA MCU Groups and develop sophisticated IoT and embedded systems applications. The RA6 series kits feature high-performance MCUs with unmatched integrated connectivity, security, and HMI for your next intelligent IoT and embedded product.

The RA6 series innovation kits provide differentiated functionality that users can utilize to develop proof of concepts, solutions, and demos for wired connectivity, metering, robotics, fire detection, HVAC, and other home and industrial automation and

Renesas RA4 Series Innovation Kits for Secure IoT Applications

Ashish Ahuja
Product Marketing Manager

Published: March 30, 2022

The RA MCU innovation kits for IoT enable users to effortlessly evaluate the features of different RA MCU Groups and develop sophisticated IoT and embedded systems applications. The RA4 series kits feature mid-performance MCUs with integrated connectivity, analog peripherals, and security for your next intelligent IoT and embedded product.

The RA4 series innovation kits provide differentiated functionality that users can utilize to develop proof of concepts, solutions, and demos for various panel control, energy metering, boiler control, theft detection, HVAC, and other home and industrial automation and control applications. The kits meet the requirements of international standards for EMC/EMI, waste, recycling, material selection, and safety allowing for multi-regional compliance and broad use-cases.

Renesas RA2 Series Innovation Kits for Low-Power IoT Applications

Ashish Ahuja
Principal Product Manager and Product Marketing Manager

Published: March 25, 2022

The RA MCU innovation kits for IoT enable users to effortlessly evaluate the features of different RA MCU Groups and develop sophisticated IoT and embedded systems applications. The RA2 series kits feature small pin count MCUs based on Renesas' low-power process technology for your next energy-efficient IoT and embedded product.

The RA2 series innovation kits provide differentiated functionality that users can utilize to develop proof of concepts, solutions, and demos for various portable consumer, small kitchen, medical, healthcare, wearable, sensor, and data acquisition, and

Beginning to Innovate Has Never Been Easier

Ashish Ahuja
Principal Product Manager and Product Marketing Manager

Published: November 11, 2021

Renesas recommends a five-step, systematic and methodical approach that takes the guesswork out of the innovation experience, making it hassle-free and fun. The five-step approach is recommended for most new users. It allows for structured and orderly exploration of resources that users can utilize to develop smart IoT and embedded products. These steps are listed below and are briefly described as follows:

1. Get your kit
2. Familiarize yourself with your kit
3. Download and install software and tools

Quickly Programming RA MCU Innovation Kits for IoT

Ashish Ahuja
Principal Product Manager and Product Marketing Manager

Published: December 3, 2021

Sometimes users prefer to program a new microcontroller kit using simple programming utilities instead of using full-blown, bulky development toolchains. Doing so is particularly useful when users are getting acquainted with the kit, don't have an IDE installed on their computers, want to quickly explore the functionality of an example project on their RA kits, or are just not ready to dive deep into the source code. Users can quickly and easily program RA MCU innovation kits for IoT using popular flash programming utilities to explore the functionality offered by more than 600 example projects.

This blog provides useful information on programming a pre-built hex file onto an RA kit using Renesas Flash Programmer and Segger® J-Flash Lite without having to build the source code or use an IDE. The EK-RA6M3 kit and Quick Start example project

Accelerate Debugging Using RA MCU Innovation Kits for IoT Applications

Ashish Ahuja
Principal Product Manager and Product Marketing Manager

Published: November 15, 2021

Taking new products to the market faster can sometimes be the difference between success and failure. As IoT and embedded products are becoming more secure and connected, the application software running on these products has become increasingly sophisticated, requiring more development, and debugging effort.

The advanced debugging capabilities available on RA kits provide you the flexibility and convenience to debug the code quickly, easily, and cost-effectively.

Develop Faster Using Example Projects for RA MCU Innovation Kits for IoT

Ashish Ahuja
Principal Product Manager and Product Marketing Manager

Published: December 3, 2021

The firmware running on intelligent and secure IoT products is quite sophisticated. Users who are beginning embedded and IoT application development using RA MCU innovation kits for IoT can utilize 600+ example projects as building blocks to create feature-rich IoT and embedded proof-of-concepts quickly and easily. Example projects for RA kits allow for structured and systematic exploration of the features available on the RA microcontrollers so that the users can provide state-of-art functionality to their customers.

Blogs are available on renesas.com/ra/<kit-name>
For example: renesas.com/ra/ek-ra6m3

TOP NOTCH COLLATERAL – GETTING STARTED VIDEOS



[RA Kit Introduction](#)

[5 Steps to Get Started](#)

[Programming Kits](#)

[Accelerate Debugging](#)

[Example Projects](#)



[RA8 Series Kits Intro & Unboxing](#)

[RA6 Series Kits Intro & Unboxing](#)

[RA4 Series Kits Intro & Unboxing](#)

[RA2 Series Kits Intro & Unboxing](#)

[EK-RA6M4 Intro & Unboxing](#)

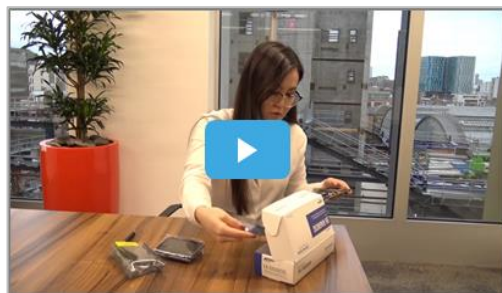
[EK-RA6M3 Intro & Unboxing](#)

Available on renesas.com/ra/kits and on renesas.com/ra/<kit-name>. For example: renesas.com/ra/ek-ra6m3

MANY USEFUL VIDEOS BY PARTNERS & DISTRIBUTORS



[Segger emWin Graphics Solution running on EK-RA6M3G](#)



[RS Components Design Spark EK-RA6M3 Unboxing](#)



[PR TechTalk EK-RA2E1 Getting Started](#)



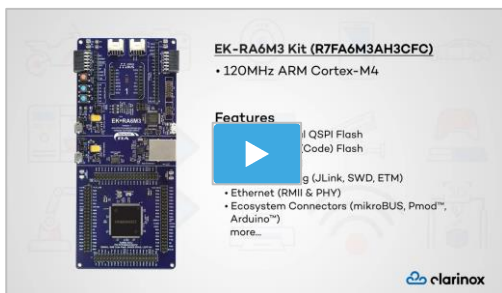
[Mouser Electronics EK-RA4M1 Engineering Bench Talk](#)



[Mikroe RA4M1 Clicker](#)



[RS Components Design Spark EK-RA6M4 Unboxing](#)



[EK-RA6M3 Clarinox IoT on Renesas RA MCUs](#)



[Dev Kit Weekly EK-RA6M3 Introduction](#)



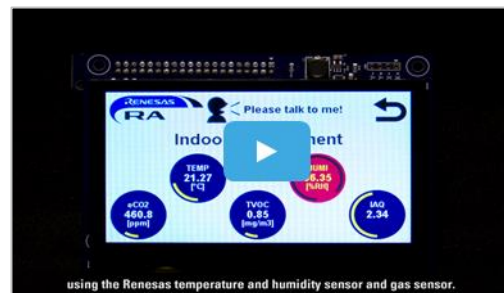
[RS Components Design Spark EK-RA2L1 Unboxing](#)



[Mouser Electronics Connecting EK-RA6M3 to Cloud](#)

Sampling of videos. Click the captions to view videos.

MANY USEFUL VIDEOS BY PARTNERS & DISTRIBUTORS



[HMI Solutions using EK-RA6M3G](#)



[eProxima EK-RA6M5: Publisher demo with timer and LED blinking](#)



[eProxima EK-RA6M5: Service demo with LEDs](#)



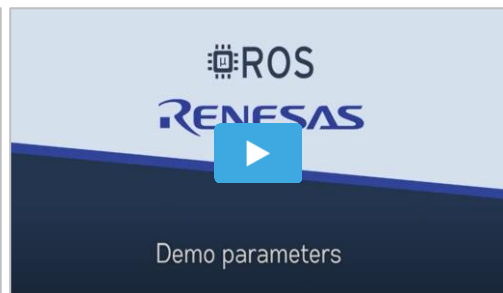
[ARM Pelion Device Management for EK-RA6M3](#)



[PR TechTalk EK-RA6M3 as External Debugger](#)



[EK-RA6M3 Multizone Security Demo](#)



[eProxima EK-RA6M5: Demo parameters](#)



[eProxima EK-RA6M5: Getting started with micro-ROS](#)



[PR TechTalk EK-RA6M3 Segger RTT installation](#)

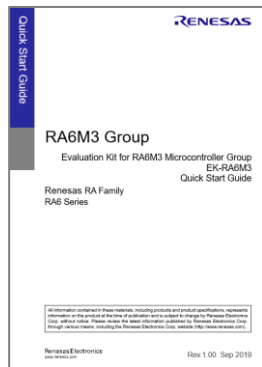


[PR TechTalk EK-RA2L1 Getting Started](#)

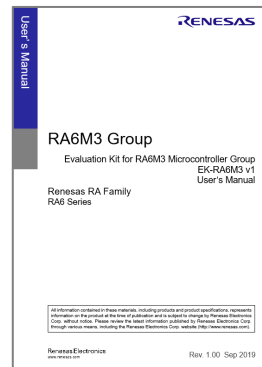
Sampling of videos. Click the captions to view videos.

TOP NOTCH COLLATERAL – ENGINEERING

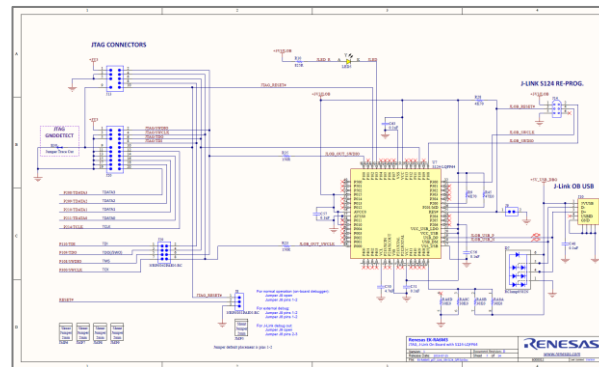
Design Package



Quick start guide

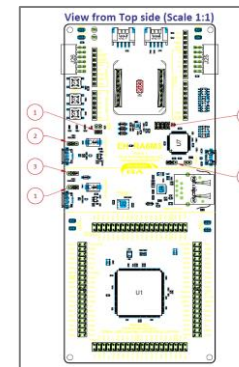


User's manual

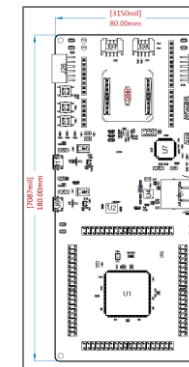


Schematics

Bill of Materials



Design & manufacturing files



Example Projects

All items available on kit website renesas.com/ra/<kit-name>
 For example: renesas.com/ra/ek-ra6m3

GETTING STARTED IS EASY!

- 1 Get your kit
- 2 Familiarize with your kit
- 3 Download & install software & tools
- 4 Explore & customize example projects
- 5 Expand functionality

I. Choose your favorite kit

RA MCU Kit Name	RA MCU					Ecosystem Expansion					Debug				Connectivity						Ordering	
	Core Frequency (Hz)	Code Flash (KB)	SRAM (KB)	Terminals	Package	PMOD	Grove	Qwiic	MicroBus	Arduino	Debug MCU	Debug OB	Debug In	Debug Out	UART, SPI, I2C	USB FS	USB HS	CAN-FD	QSPI	OSPI	Ethernet	Part Number
EK-RA8D1	480	2048	1024	224	BGA	x	x	x	x	x	RA4M2	x	x	x	x	x	x			x	x	RTK7EKA8D1S01001BE
EK-RA8M1	480	2048	1024	224	BGA	x	x	x	x	x	RA4M2	x	x	x	x	x	x			x	x	RTK7EKA8M1S00001BE
EK-RA6M5	200	2048	512	176	LQFP	x	x	x	x	x	S124	x	x	x	x	x	x	x	x	x	x	RTK7EKA6M5S00001BE
EK-RA6M4	200	1024	256	144	LQFP	x	x	x	x	x	S124	x	x	x	x				x	x	x	RTK7EKA6M4S00001BE
EK-RA6M3G	120	2048	640	176	LQFP	x	x		x	x	S124	x	x	x	x	x			x		x	RTK7EKA6M3S01001BU
EK-RA6M3	120	2048	640	176	LQFP	x	x		x	x	S124	x	x	x	x	x			x		x	RTK7EKA6M3S00001BU
EK-RA6M2	120	1024	384	144	LQFP	x					S124	x	x		x	x						RTK7EKA6M2S00001BU
EK-RA6M1	120	512	256	100	LQFP	x					S124	x	x		x	x						RTK7EKA6M1S00001BU
EK-RA6E2	200	256	40	64	LQFP	x	x	x	x	x	RA4M2	x	x	x	x	x		x	x			RTK7EKA6E2S00001BE
EK-RA4M3	100	1024	128	144	LQFP	x	x	x	x	x	S124	x	x	x	x	x			x			RTK7EKA4M3S00001BE
EK-RA4M2	100	512	64	100	LQFP	x	x	x	x	x	S124	x	x	x	x	x			x			RTK7EKA4M2S00001BE
EK-RA4M1	48	256	32	100	LQFP	x					S124	x	x		x	x						RTK7EKA4M1S00001BU
EK-RA4E2	100	128	40	64	LQFP	x	x	x	x	x	RA4M2	x	x	x	x	x			x			RTK7EKA4E2S00001BE
EK-RA2L1	48	256	32	100	LQFP	x	x	x	x	x	S124	x	x	x	x							RTK7EKA2L1S00001BE
EK-RA2E2	48	64	8	24	HWQFN	x	x	x	x	x	S124	x	x	x	x	x						RTK7EKA2E2S00001BE
EK-RA2E1	48	128	16	64	LQFP	x	x	x	x	x	S124	x	x	x	x							RTK7EKA2E1S00001BE
EK-RA2A1	48	256	32	64	LQFP	x					S124	x	x		x	x						RTK7EKA2A1S00001BU

Sampling of RA kits. [Full table](https://www.renesas.com/ra/kits) is available on [renesas.com/ra/kits](https://www.renesas.com/ra/kits)

GETTING STARTED IS EASY!

- 1 Get your kit
- 2 Familiarize with your kit
- 3 Download & install software & tools
- 4 Explore & customize example projects
- 5 Expand functionality

II. Order it from one of the leading global or regional distributors



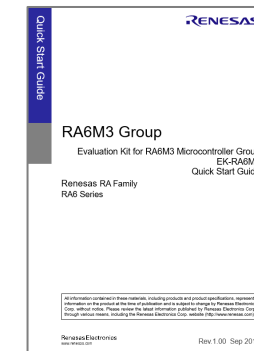
Sampling of distributors
 (List subject to change; please refer to renesas.com/ra/<kit-name> for the list of distributors stocking the kit)

GETTING STARTED IS EASY!

- 1 Get your kit
- 2 Familiarize with your kit
- 3 Download & install software & tools
- 4 Explore & customize example projects
- 5 Expand functionality

I. Obtain the quick start guide & user's manual for your kit from renesas.com/ra/<kit-name>

Kit Name	Kit Homepage
EK-RA8D1	renesas.com/ra/ek-ra8d1
EK-RA8M1	renesas.com/ra/ek-ra8m1
EK-RA6M5	renesas.com/ra/ek-ra6m5
EK-RA6M4	renesas.com/ra/ek-ra6m4
EK-RA6M3G	renesas.com/ra/ek-ra6m3g
EK-RA6M3	renesas.com/ra/ek-ra6m3
EK-RA6M2	renesas.com/ra/ek-ra6m2
EK-RA6M1	renesas.com/ra/ek-ra6m1
EK-RA6E2	renesas.com/ra/ek-ra6e2
EK-RA4M3	renesas.com/ra/ek-ra4m3
EK-RA4M2	renesas.com/ra/ek-ra4m2
EK-RA4M1	renesas.com/ra/ek-ra4m1
EK-RA4E2	renesas.com/ra/ek-ra4e2
EK-RA2A1	renesas.com/ra/ek-ra2a1
EK-RA2E1	renesas.com/ra/ek-ra2e1
EK-RA2E2	renesas.com/ra/ek-ra2e2
EK-RA2L1	renesas.com/ra/ek-ra2l1



Quick start guide



User's manual

II. Run the Quick Start (QS) example project (EP) that is pre-programmed on the kit

GETTING STARTED IS EASY!

- 1 Get your kit
- 2 Familiarize with your kit
- 3 Download & install software & tools**
- 4 Explore & customize example projects
- 5 Expand functionality

- I. Download & install software & tools using the *FSP with e² studio installer* that includes:
 - **Flexible Software Package** – includes Hardware Abstraction Layer (HAL) drivers, Board Support Package (BSP), libraries, etc.
 - **e2 studio** – Integrated Development Environment

Item	Download page
FSP with e ² studio installer	renesas.com/ra/fsp

- II. Need help anytime?
 - Ask questions, get answers from experts & collaborate with community renesas.com/ra/forum

GETTING STARTED IS EASY!



I. Explore & customize Quick Start Example Project

- Visit kit page, for example, EK-RA6M3 webpage renesas.com/ra/ek-ra6m3 and scroll down to “Documentation & Downloads” section
- Download EK-RA6M3 Example Project Bundle
- Extract the downloaded file xxxx-ek-ra6m3-exampleprojects.zip
- Browse to xxxx-ek-ra6m3-exampleprojects\ek_ra6m3_quickstart\quickstart_ek_ra6m3_ep to locate the source code of the QS EP
- Refer to the quick start guide for instructions on modifying, rebuilding & programming the QS EP on your kit

II. Explore & customize additional Example Projects

- In the EK-RA6M3 Example Project Bundle downloaded in the step above, browse to xxxx-ek-ra6m3-exampleprojects\ek_ra6m3\ to locate the example projects provided for this kit
- Open xxxx-ek-ra6m3-exampleprojects.pdf to view the list of tool chain supported for each example project and additional reference documents

GETTING STARTED IS EASY!

- 1 Get your kit
- 2 Familiarize with your kit
- 3 Download & install software & tools
- 4 Explore & customize example projects
- 5 Expand functionality

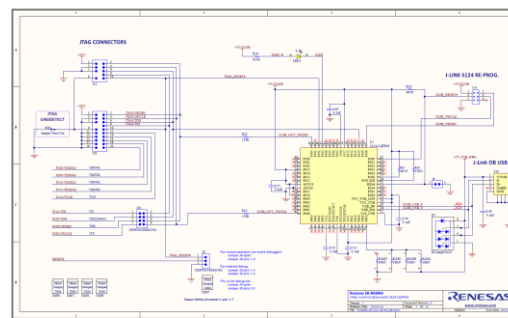
- I. Choose from hundreds of add-on modules from the supported ecosystems to build custom proof-of-concept hardware



- II. Choose from numerous software IPs from Renesas ecosystem partners for additional features

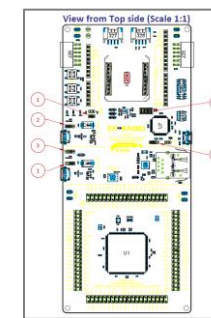


- III. Refer to the kit design package to develop your custom board with feature enhancements

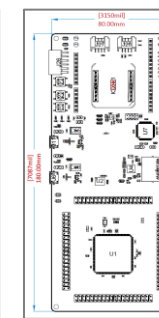


Schematics

BOM



Design & manufacturing files

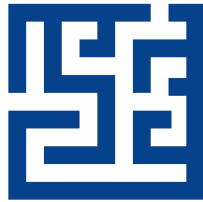


USEFUL RESOURCES



Ordering & Documentation

User Manual, Design Package, Quick Start Guide
renesas.com/ra/<kit-name>



Example Projects

Access FSP and Example Projects for RA Kits
renesas.com/ra/kitEP



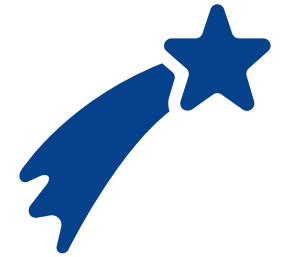
Video Library

Learn more about RA MCU, Kits, FSP, and Tools
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