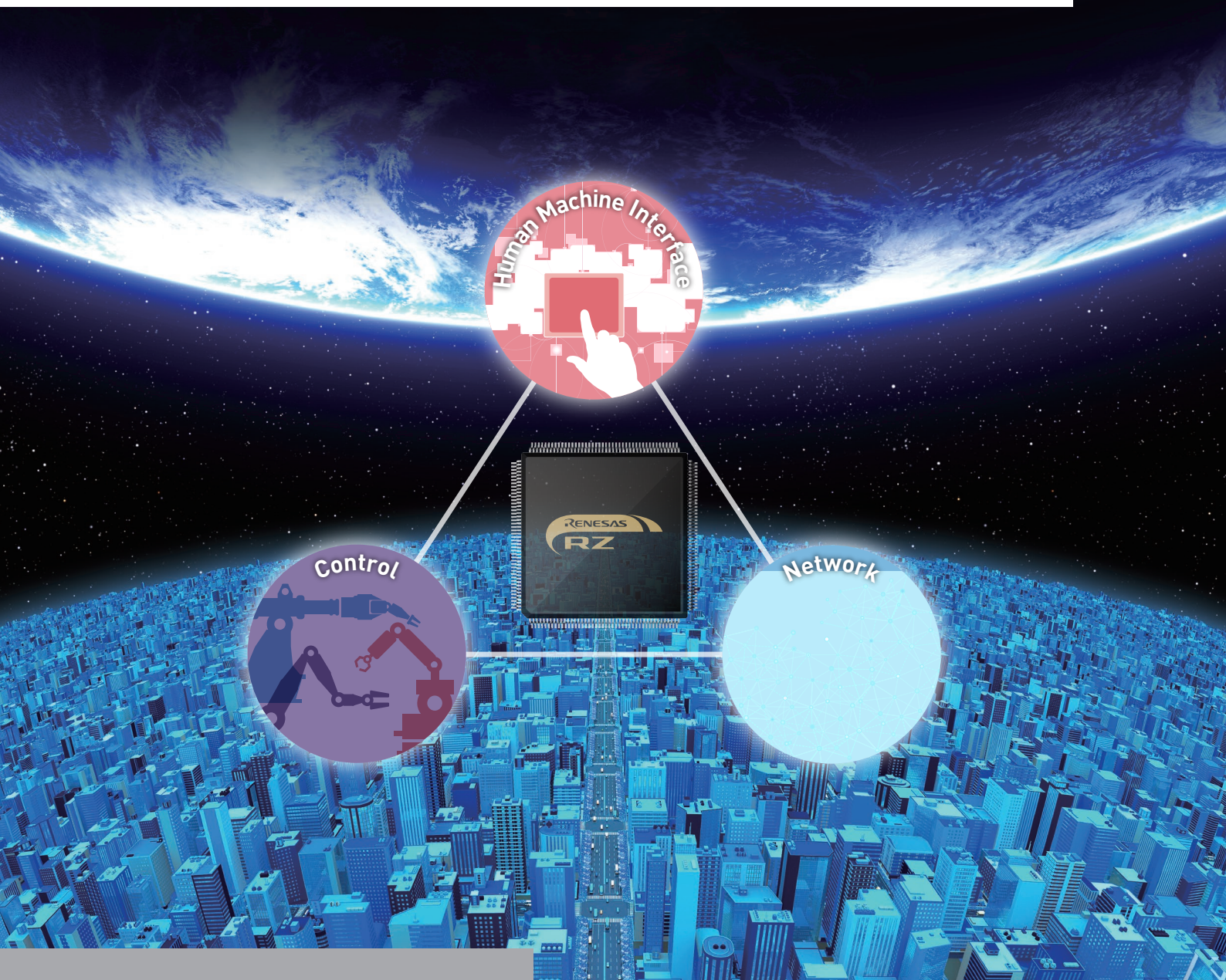


# RZ FAMILY MICROPROCESSORS

64-Bit & 32-Bit High-performance MPUs



# THE NEXT-GENERATION PROCESSOR TO MEET THE NEEDS OF THE SMART SOCIETY HAS ARRIVED.



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The utilization of intelligent technology is advancing in all aspects of our lives, including electric household appliances, industrial equipment, building management, power grids, and transportation. The cloud-connected “smart society” is coming ever closer to realization. Microcontrollers are now expected to provide powerful capabilities not available previously, such as high-performance and energy-efficient control combined with interoperability with IT networks, support for human-machine interfaces, and more. To meet the demands of this new age, Renesas has drawn on its unmatched expertise in microcontrollers to create the RZ family of embedded processors. The lineup of these “next-generation processors that are as easy to use as conventional microcontrollers” to meet different customer requirements.

## The Zenith of the Renesas micro

As embedded processors to help build the next generation of advanced products, the RZ family offers features not available elsewhere and brings new value to customer applications.

### RZ/V Series



64-bit Cortex®-A CPU, up to 1GHz  
Low-power Embedded AI  
for Vision-AI Application

### RZ/G Series



32/64-bit Cortex®-A CPU, up to 1.5Hz  
3D Graphics  
for HMI Application

### RZ/A Series



32-bit Cortex®-A CPU, up to 528MHz  
10MB Embedded RAM  
for HMI Application

### RZ/T Series



32-bit Cortex®-R CPU, up to 600MHz  
Real-time Control  
Multi-protocol Encoder I/F  
for AC Servo, Actuator, Inverter

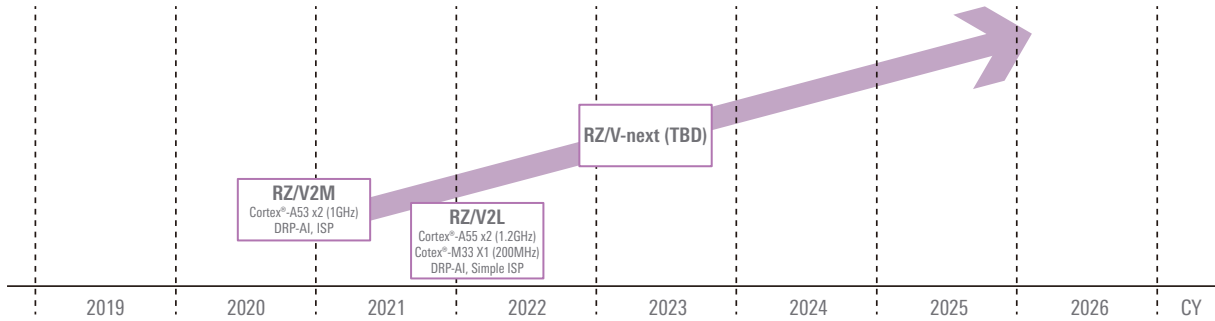
### RZ/N Series



32-bit Cortex®-A/M CPU, up to 500MHz  
Multi-protocol Industrial Network  
for PLC, Remote IO, Gateway

# RZ/V Series

## RZ/V Series Roadmap



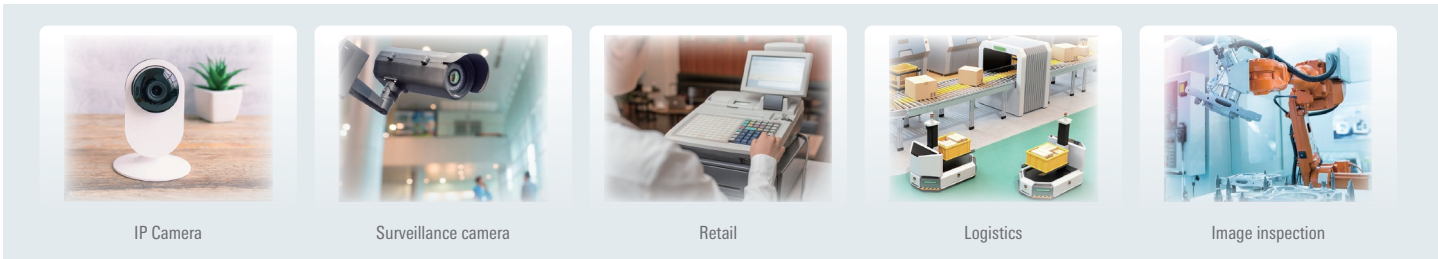
## RZ/V Series Features

- AI Accelerator "DRP-AI" achieves high-speed AI inference and low power consumption
- 4K (2160p30) video codec and high-performance image signal processor (ISP) (RZ/V2M)
- Provides image signal processor (Simple ISP) function with DRP library (RZ/V2L)
- Equipped with a 3D Graphics Engine for fast image rendering (RZ/V2L)
- Adopts Civil Infrastructure Platform (CIP) Linux kernel that can be supported for more than 10 years

\* DRP: Dynamically Reconfigurable Processor

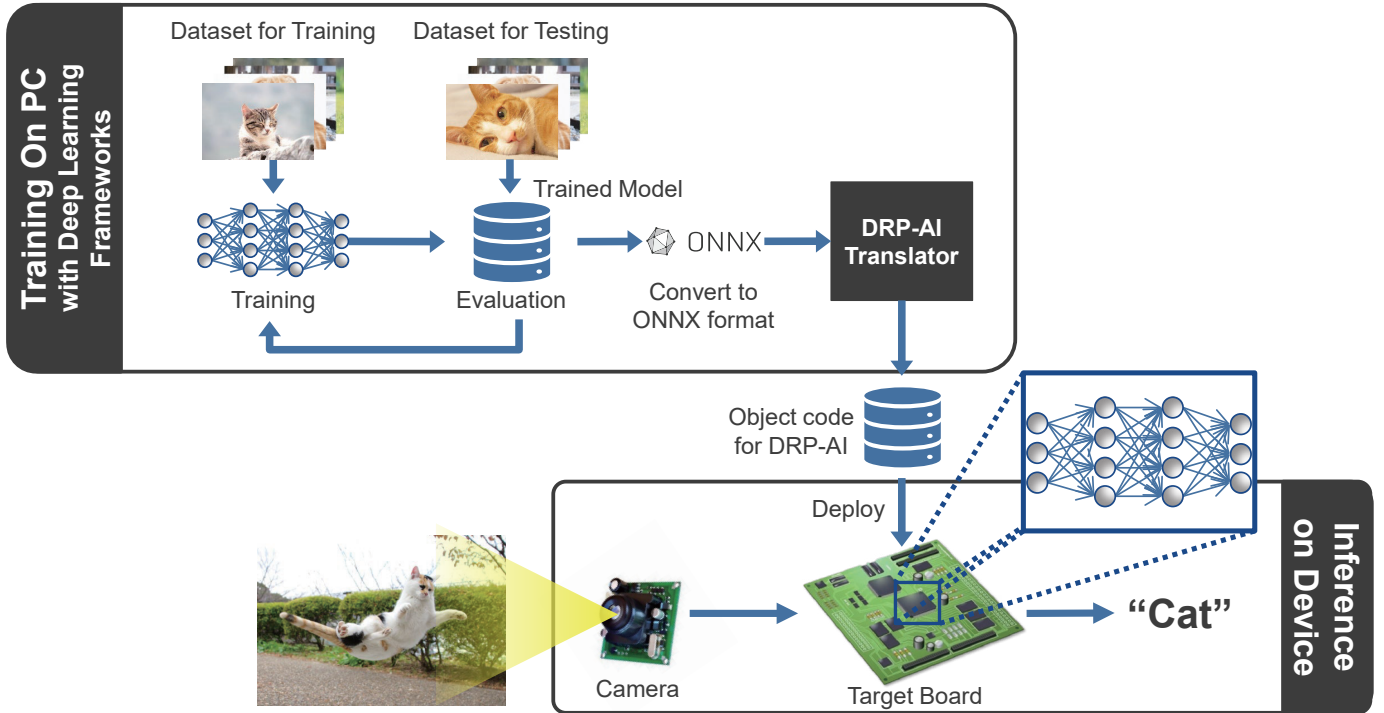


## RZ/V Series Application

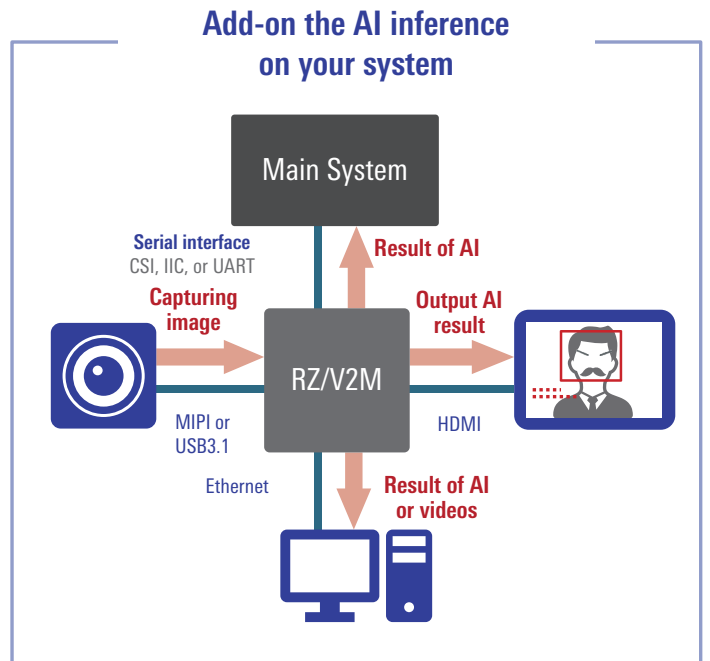
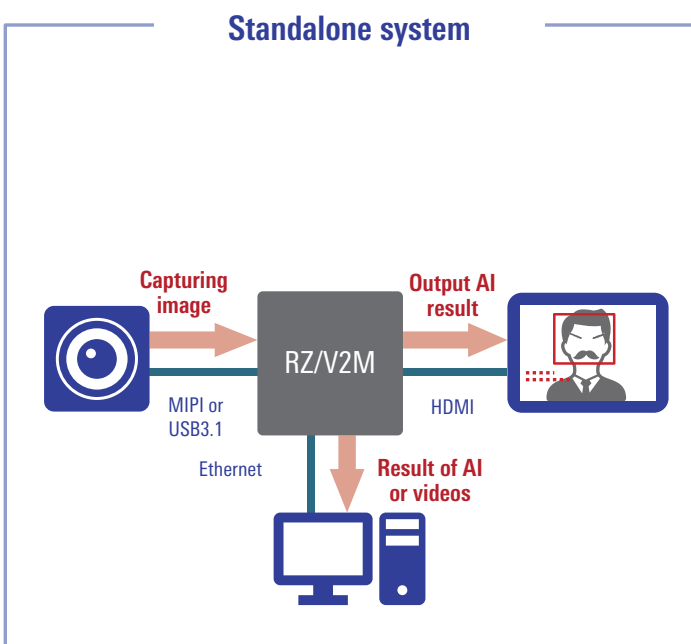


## AI Development Flow

- Open frameworks can be used for learning
- Converts from industry standard ONNX Format to executable with DRP-AI Translator



## Use Case



## RZ/V2M Group

### CPU

- 2× Cortex-A53 (up to 1.0GHz)

### Vision and AI

- AI Accelerator; DRP-AI at 1.0 TOPS/W class
- Image Signal Processor (ISP) of multi-stream available
- Camera Interface; 2× MIPI CSI-2
- Face and Human Detection Engine

### Video and Graphics

- H.265/H.264 Multi Codec
- JPEG Codec Engine
- 2D Graphics Engine

### Display Interface

- MIPI-DSI (4-lane)
- HDMI 1.4a

### Audio Interface

- Serial Sound Interface × 1ch

### Communication Interface

- SD Host × 2ch
- PCI-Express 2.0 (1-lane) × 1ch
- Gigabit Ethernet × 1ch
- USB3.1 Gen1 Host/Function × 1ch
- I<sup>2</sup>C Bus × 4ch
- SCI × 6ch
- UART × 2ch

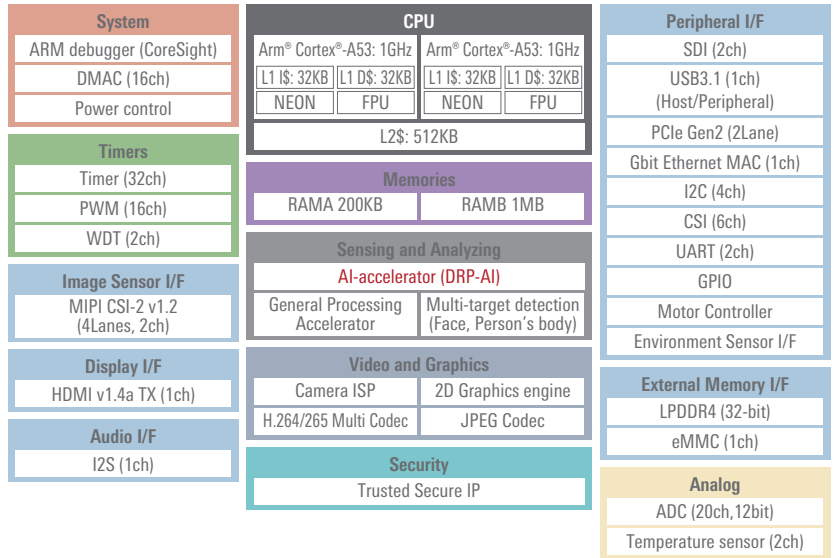
### Memory Interface

- NAND Flash Interface ONFI1.0 × 1ch
- eMMC 4.5.1 × 1ch
- 32-bit LPDDR4-3200 × 1ch

### Security

- Hardware Security Engine

## RZ/V2M block diagram



## RZ/V2L Group

### CPU

- 2× Cortex-A55 or 1× Cortex-A55 (up to 1.2GHz)
- 1× Cortex-M33 (up to 200MHz)

### Vision and AI

- AI Accelerator; DRP-AI
- \* Image Signal Processor (Simple ISP) Function is provided as DRP Library
- Camera Interface; 1× MIPI CSI-2 / 1× Digital Parallel

### Video and Graphics

- H.264 Codec
- 3D Graphics Engine

### Display Interface

- MIPI-DSI (4-lane)
- Digital Parallel

### Audio Interface

- Serial Sound Interface × 4ch

### Communication Interface

- Gigabit Ethernet × 2ch
- USB2.0 Host × 1ch
- USB2.0 Host/Function × 1ch
- I<sup>2</sup>C Bus × 4ch
- SCI × 2ch
- UART × 5ch

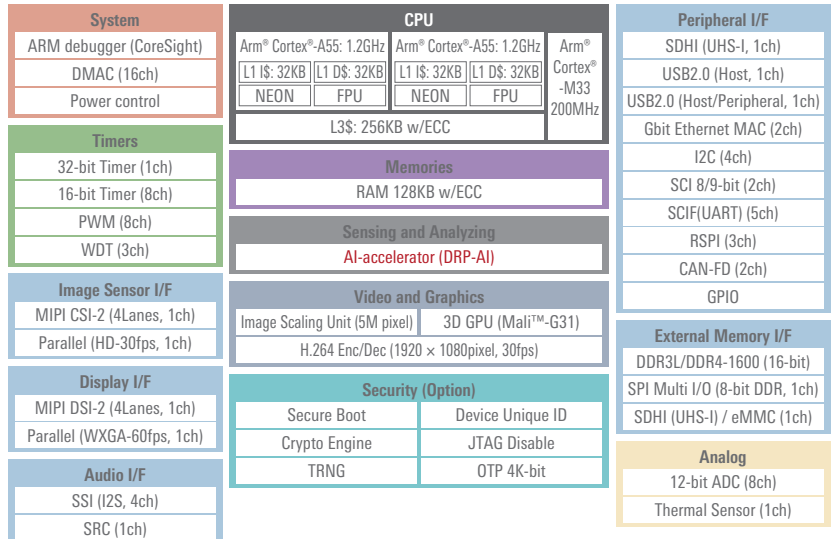
### Memory Interface

- SPI Multi I/O (8bit DDR) × 1ch
- SDHI (UHS-I) / eMMC × 1ch
- 16-bit DDR3L-1333/DDR4-1600 × 1ch

### Security

- Hardware Security Engine (Option)

## RZ/V2L block diagram

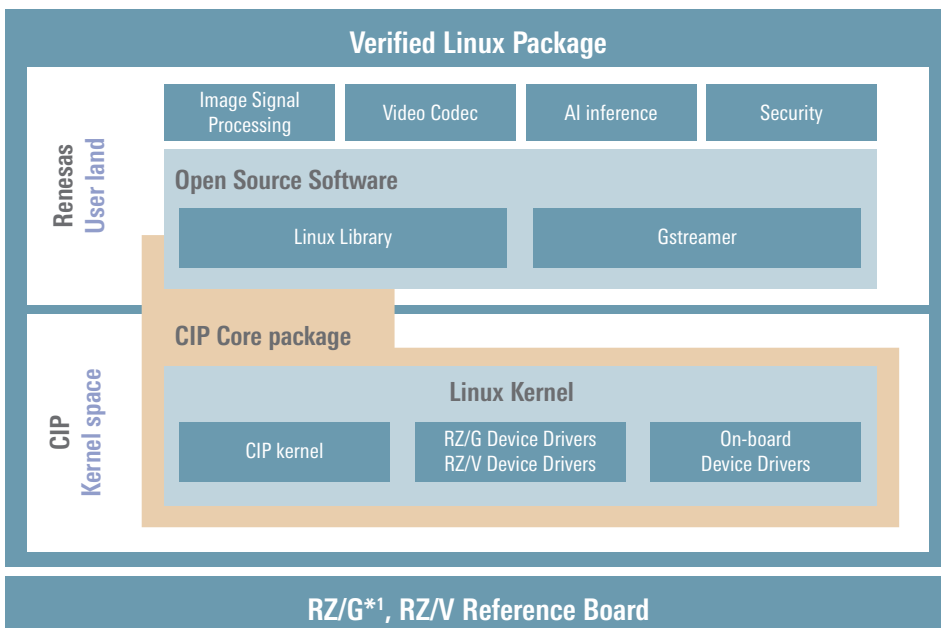


## Super Long Term Software Support

Renesas RZ/G2 and RZ/V2 microprocessors are the only embedded MPUs that meet the long-term support demands for industrial and infrastructure equipment manufacturers through the 10+ year support offered by the Super Long Term Support (SLTS) kernel maintained by the Civil Infrastructure Platform (CIP). The CIP SLTS Linux kernel supports countermeasures against vulnerability to security attacks with a long-term maintenance period of 10 years or more. This reduces Linux maintenance costs and simplifies adoption of reliable industrial-grade Linux.

## Verified Linux Package(VLP) Reduces Cost and Simplifies Design

The "Verified Linux Package (VLP)" for the RZ/G and RZ/V series is a combination of the Civil Infrastructure Platform (CIP) Core Package and the basic software (Linux BSP, multimedia, graphics, security, etc.) for IoT devices. This packaged software is verified by Renesas and is available. With VLPs, you can start developing applications quickly while minimizing Linux maintenance resources.



### Multimedia

- H.264 Codec (up to 1080p)
- H.265 Codec (up to 2160p)
- 2D graphics

### AI Inference

- DRP-AI

### CIP SLTS Kernel

- Civil Infrastructure Platform project
- 10+ years super long term support Reliability/Security/Real-time

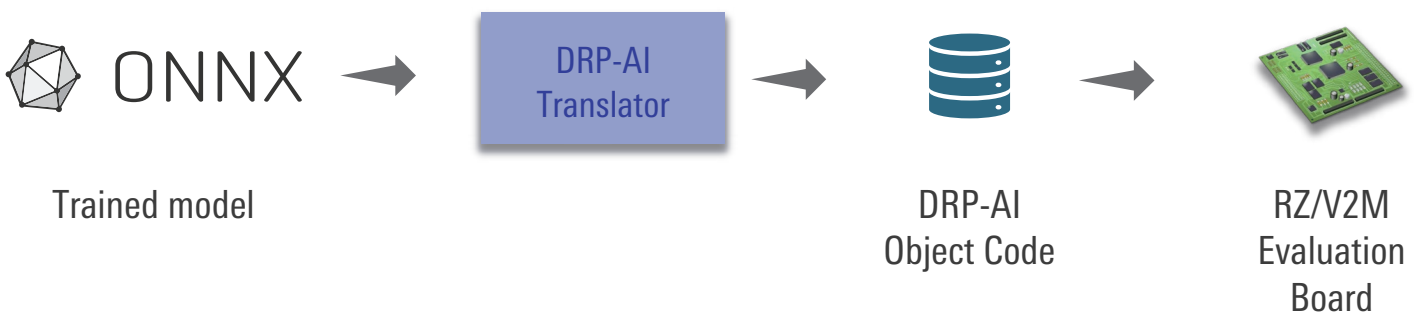
\*1: RZ/G Reference Board is used for Kernel development as a software development platform for CIP projects.

## Development Environment for AI

### DRP-AI Translator

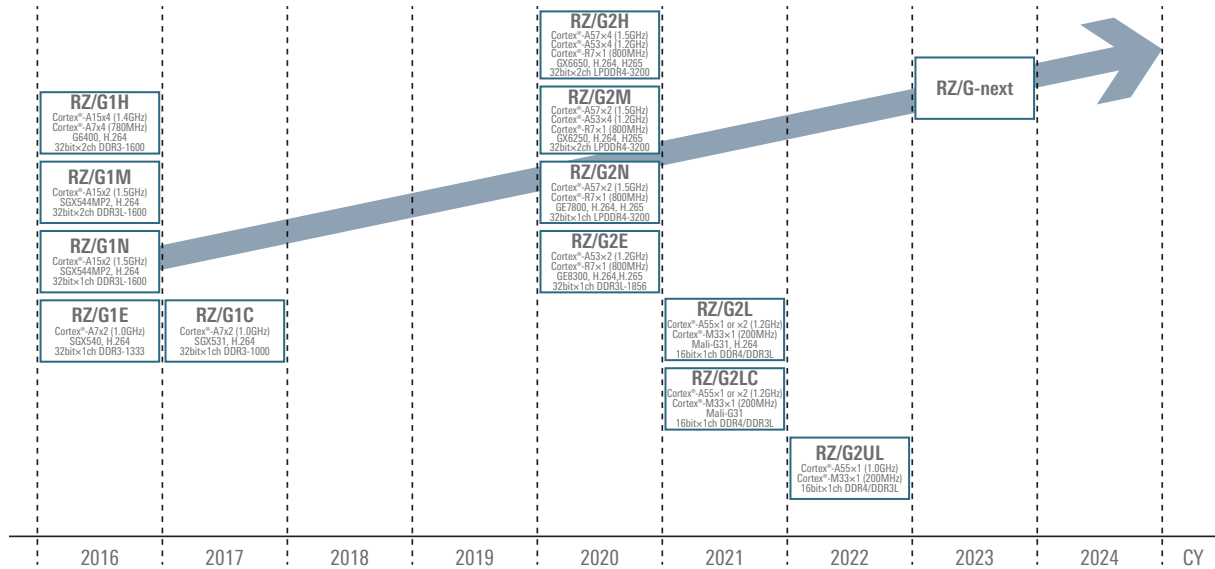
Converts ONNX\* format into object code for DRP-AI.

\* ONNX: Open Neural Network Exchange



# RZ/G Series

## RZ/G Series Roadmap



## RZ/G2 Platform Highlights

- High Performance  
64-bit Arm Cortex-A cores, plus powerful 3D graphics engine and video engine capable of supporting up to 4K UHD, to offer the highest performance
- Wide Coverage  
Entry-level RZ/G2L Group 3 products equipped with Cortex-A55 with improved processing performance have been newly added to the RZ/G2 lineup
- High Reliability  
Built-in Error Correction Code (ECC) for internal and external memory, which is essential for high-reliability mission critical systems
- Super Long Term Support (SLTS)  
Applying Civil Infrastructure Platform (CIP) Linux, the Linux kernel will be provided with over 10 years of support
- Verified Linux Package  
Renesas verifies and provides a Linux package that combines CIP and Linux basic software. Minimize your Linux maintenance resources

## RZ/G2 Group Specification 1

Items	RZ/G2H	RZ/G2M	RZ/G2N	RZ/G2E
CPU (Arm® Cortex®-A)	4× Cortex®-A57@1.5GHz 4× Cortex®-A53@1.2GHz L1,L2 Parity/ECC	2× Cortex®-A57@1.5GHz 4× Cortex®-A53@1.2GHz L1,L2 Parity/ECC	2× Cortex®-A57@1.5GHz L1,L2 Parity/ECC	2× Cortex®-A53@1.2GHz L1,L2 Parity/ECC
CPU (Arm® Cortex®-R)	1× Cortex®-R7@800MHz L1,TCM w/ECC	1× Cortex®-R7@800MHz L1,TCM w/ECC	1× Cortex®-R7@800MHz L1,TCM w/ECC	1× Cortex®-R7@800MHz L1,TCM w/ECC
DRAM I/F	32-bit ×2ch LPDDR4(3200) w/ECC	32-bit ×2ch LPDDR4(3200) w/ECC	32-bit ×1ch LPDDR4(3200) w/ECC	32-bit ×1ch DDR3L(1856) w/ECC
Video in	2×MIPI-CSI2, 2×Digital (RGB/YCbCr) up to 8 input image can be captured	2×MIPI-CSI2, 2×Digital (RGB/YCbCr) up to 8 input image can be captured	2×MIPI-CSI2, 2×Digital (RGB/YCbCr) up to 8 input image can be captured	1×MIPI-CSI2, 1×Digital(RGB/YCbCr) up to 2 input image can be captured
Video Codec	Support up to 4k resolutions Decoding: H.265, Encoding and Decoding: H.264	Support up to 4k resolutions Decoding: H.265, Encoding and Decoding: H.264	Support up to 4k resolutions Decoding: H.265, Encoding and Decoding: H.264	Support up to FHD resolutions Decoding: H.265, Encoding and Decoding: H.264
3D GFX	PowerVR GX6650@600MHz	PowerVR GX6250@600MHz	PowerVR GE7800@600MHz	PowerVR GE8300@600MHz
Display out	1×HDMI, 1×LVDS, 1×Digital RGB	1×HDMI, 1×LVDS, 1×Digital RGB	1×HDMI, 1×LVDS, 1×Digital RGB	2×LVDS or 1×LVDS, 1×Digital RGB
USB	USB2.0×2ch (1H, 1H/F/OTG) USB3.0/2.0×1ch (DRD)	USB2.0×2ch (1H, 1H/F/OTG) USB3.0/2.0×1ch (DRD)	USB2.0×2ch (1H, 1H/F/OTG) USB3.0/2.0×1ch (DRD)	USB2.0×1ch (H/F) USB3.0/2.0×1ch (DRD)
Gbit Ether	1ch	1ch	1ch	1ch
CAN	2ch (support CAN-FD)	2ch (support CAN-FD)	2ch (support CAN-FD)	2ch (support CAN-FD)
PCIe	2ch (Rev2.0 1Lane) one of the 2ch is shared with SATA	2ch (Rev2.0 1Lane)	2ch (Rev2.0 1Lane) one of the 2ch is shared with SATA	1ch (Rev2.0 1Lane)
SATA	1ch (Pin Shared)	No	1ch (Pin Shared)	No
Package	1022pin FCBGA, 29mm×29mm 0.8mm ball pitch	1022pin FCBGA, 29mm×29mm 0.8mm ball pitch	1022pin FCBGA, 29mm×29mm 0.8mm ball pitch	552pin FCBGA, 21mm×21mm 0.8mm ball pitch

← Pin Compatible →



## RZ/G2 Group Specification 2

Items	RZ/G2L	RZ/G2LC	RZ/G2UL (Type2) Pin compatible with RZ/G2LC	RZ/G2UL (Type1) Full function
CPU (Arm® Cortex®-A)	1× or 2× Cortex®-A55@1.2GHz L1,L3 Parity/ECC	1× or 2× Cortex®-A55@1.2GHz L1,L3 Parity/ECC	1× Cortex®-A55@1.0GHz L1,L3 Parity/ECC	1× Cortex®-A55@1.0GHz L1,L3 Parity/ECC
CPU (Arm® Cortex®-M)	1× Cortex®-M33@200MHz	1× Cortex®-M33@200MHz	1× Cortex®-M33@200MHz	1× Cortex®-M33@200MHz
DRAM I/F	16-bit ×1ch DDR4-1600/DDR3L-1333 w/ECC	16-bit ×1ch DDR4-1600/DDR3L-1333 w/ECC	16-bit ×1ch DDR4-1600/DDR3L-1333 w/ECC	16-bit ×1ch DDR4-1600/DDR3L-1333 w/ECC
Video in	1×MIPI CSI-2 or 1×Digital Parallel input	1×MIPI CSI-2	1×MIPI CSI-2	1×MIPI CSI-2
Video Codec	Support up to Full HD @30fps resolutions Encoding and Decoding: H.264	–	–	–
3D GFX	Arm Mali-G31 GPU @500MHz	Arm Mali-G31 GPU @500MHz	–	–
Display out	1×MIPI DSI or 1×Digital Parallel output	1×MIPI DSI	–	1×Digital Parallel output
USB	USB2.0×2ch (1Host, 1Host/Function/OTG)	USB2.0×2ch (1Host, 1Host/Function/OTG)	USB2.0×2ch (1Host, 1Host/Function/OTG)	USB2.0×2ch (1Host, 1Host/Function/OTG)
Gbit Ether	2ch	1ch	1ch	2ch
CAN	2ch (support CAN-FD)	2ch (support CAN-FD)	2ch (support CAN-FD)	2ch (support CAN-FD)
12-bit ADC	8ch	–	–	2ch
Package	551pin LFBGA, 21mm×21mm 0.8mm ball pitch 456pin LFBGA, 15mm×15mm 0.5mm ball pitch	361pin LFBGA, 13mm×13mm 0.5mm ball pitch	361pin LFBGA, 13mm×13mm 0.5mm ball pitch	361pin LFBGA, 13mm×13mm 0.5mm ball pitch

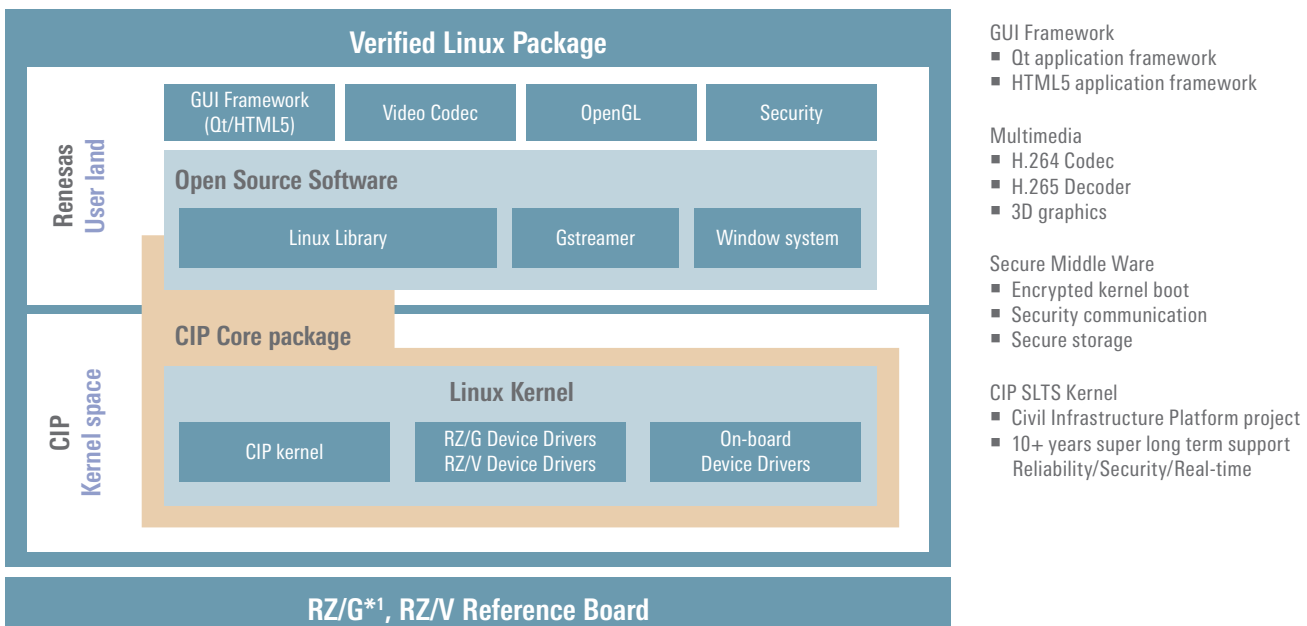
← Pin Compatible →

## Super Long Term Software Support

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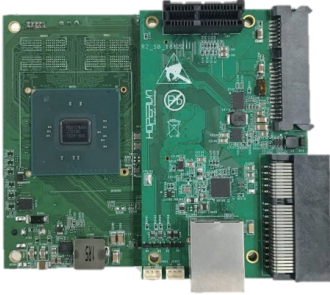


\*1: RZ/G Reference Board is used for Kernel development as a software development platform for CIP projects.

## Flexible Development Kits

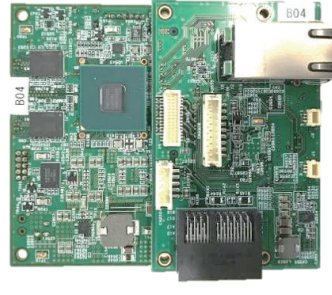
RZ/G2 development kits support the industry standard 96Boards specification and SMARC specification to enable evaluation and speed development with wide variety of mezzanine boards and existing carrier boards. Renesas provides circuit schematics, component BOMs, and board layout data to make it easy to spin your own custom hardware.

### RZ/G2H,G2M,G2N Development Kit (96Boards format compatible)



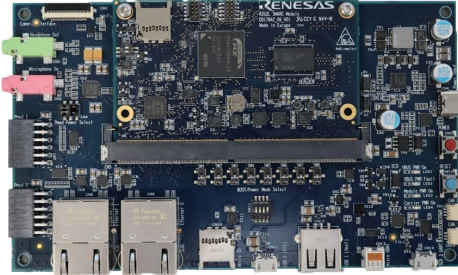
- Main Memory: 4 GB DDR4
- QSPI NOR FLASH 64 MByte
- I<sup>2</sup>C EEPROM 512 Byte
- External Storage: micro SD × 1
- Connectivity: USB 2.0 × 2ch, USB 3.0 × 1ch, GbE × 1
- HDMI out / LVDS out or MIPI DSI out
- Wi-Fi + BT

### RZ/G2E Development Kit (96Boards format compatible)



- Main Memory: 2 GB DDR3L
- QSPI NOR FLASH 64 MByte
- I<sup>2</sup>C EEPROM 512 Byte
- External Storage: micro SD × 1
- Connectivity: USB 2.0 × 2ch, USB 3.0 × 1ch, GbE × 1
- HDMI out / LVDS out or MIPI DSI out
- Wi-Fi + BT

### RZ/G2L SMARC v2.1 Module board + Carrier Board



- Module board (Dimension: 82mm x 50mm)
  - Processor: RZ/G2L / RZ/G2LC / RZ/G2UL
  - Main Memory: 2GB DDR4 (1GB ×2)
  - QSPI NOR FLASH: 64MB
  - eMMC Memory: 64GB
  - External Storage: micro SD ×1
  - A/D Converter Interface ×6
  - JTAG connector
- Carrier board (Dimension: 160mm × 100mm)
  - Gigabit Ethernet ×2
  - USB2.0 × 2ch (OTG ×1ch, Host ×1ch)
  - MIPI CSI-2 Camera connector (can connect to Google Coral Camera)
  - Micro HDMI (output) connector
  - CAN-FD ×2
  - External Storage: micro SD ×1
  - Audio Line in ×1
  - Audio Line out ×1
  - PMOD ×2
  - USB-Type C for Power Input









## RZ/G Series Application

The HMI can be made more expressive by making full use of the 3D graphics and video capabilities.



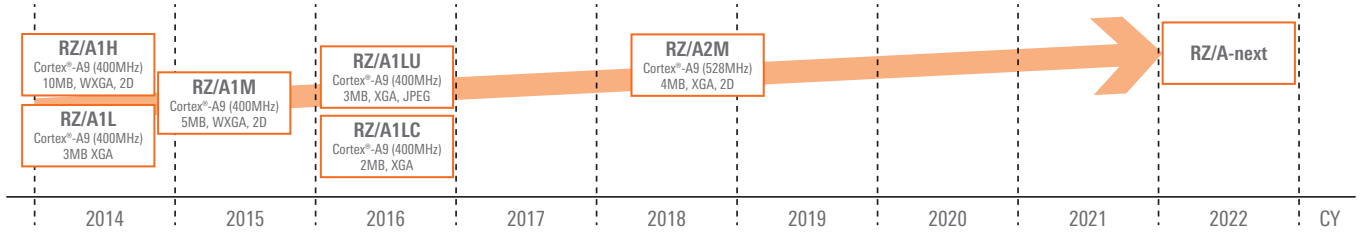
## RZ/G Linux Platform Solutions from Partner Companies

Visit the webpage below for the latest information on RZ/G Linux Platform development tools, including solutions from partner companies.  
<https://www.renesas.com/products/microcontrollers-microprocessors/rz/softtools.html#rzg>



# RZ/A Series

## RZ/A Series Roadmap



## RZ/A Series Application

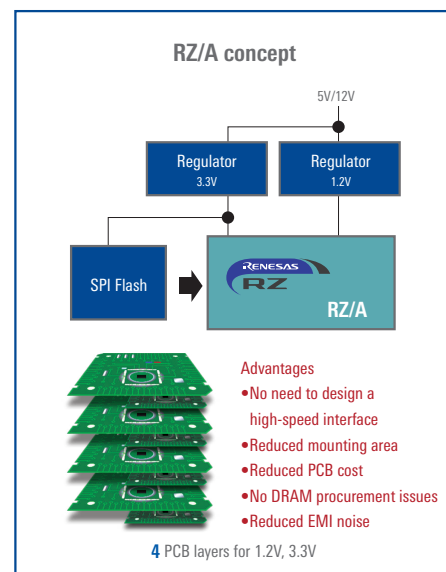
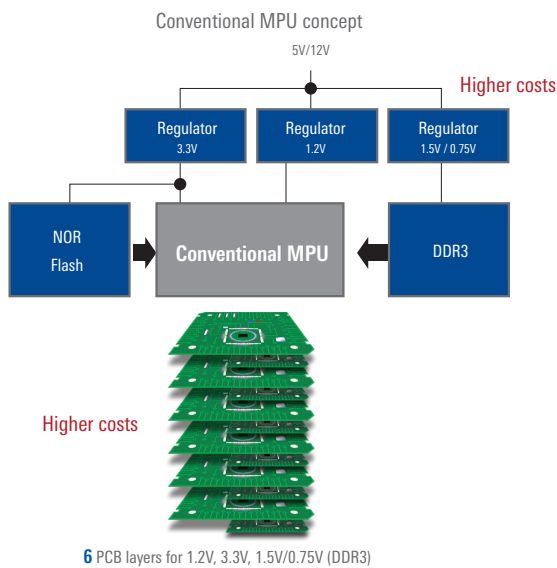


## RZ/A Series Features

- Large-capacity on-chip RAM: 10MB
- Graphics display and camera input capabilities on a single chip
- Rich peripheral functions and software

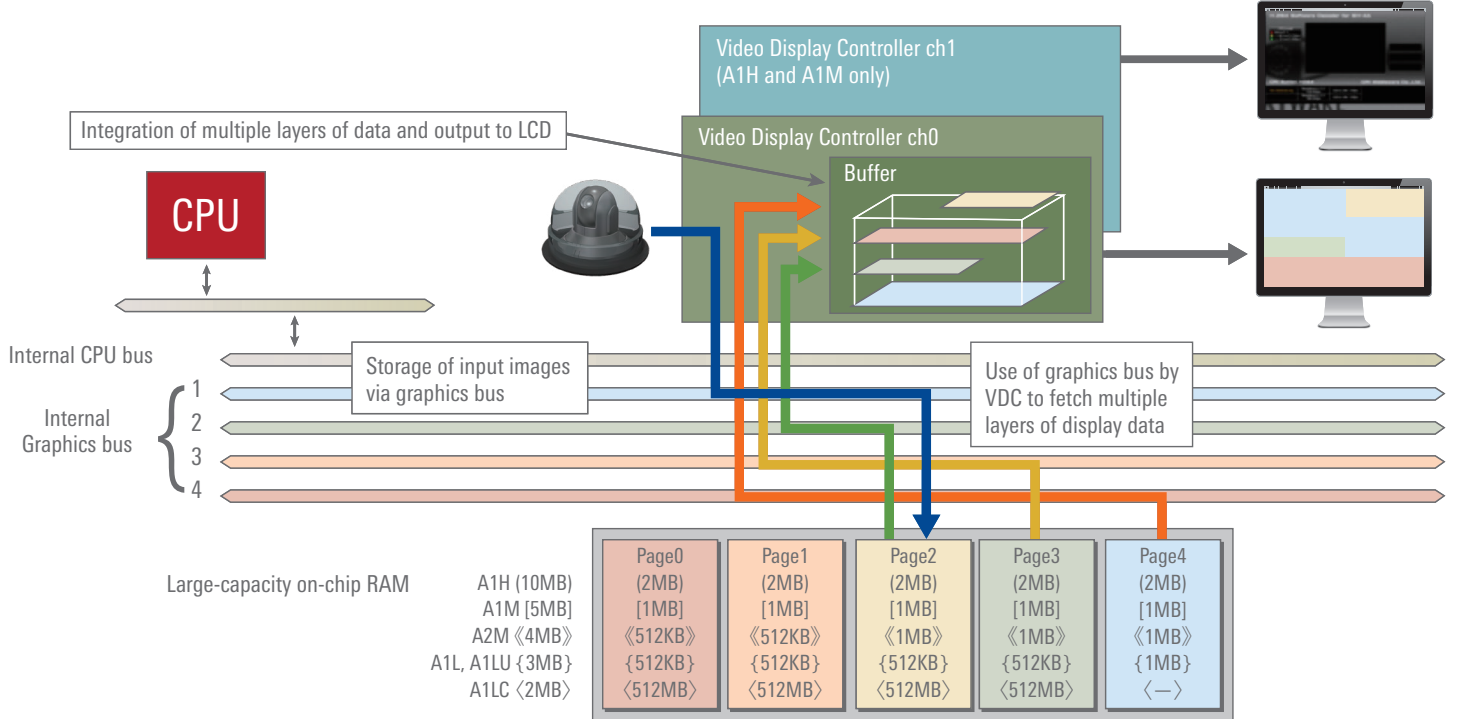
### Large-capacity on-chip RAM: 10MB

#### DRAM-less solution



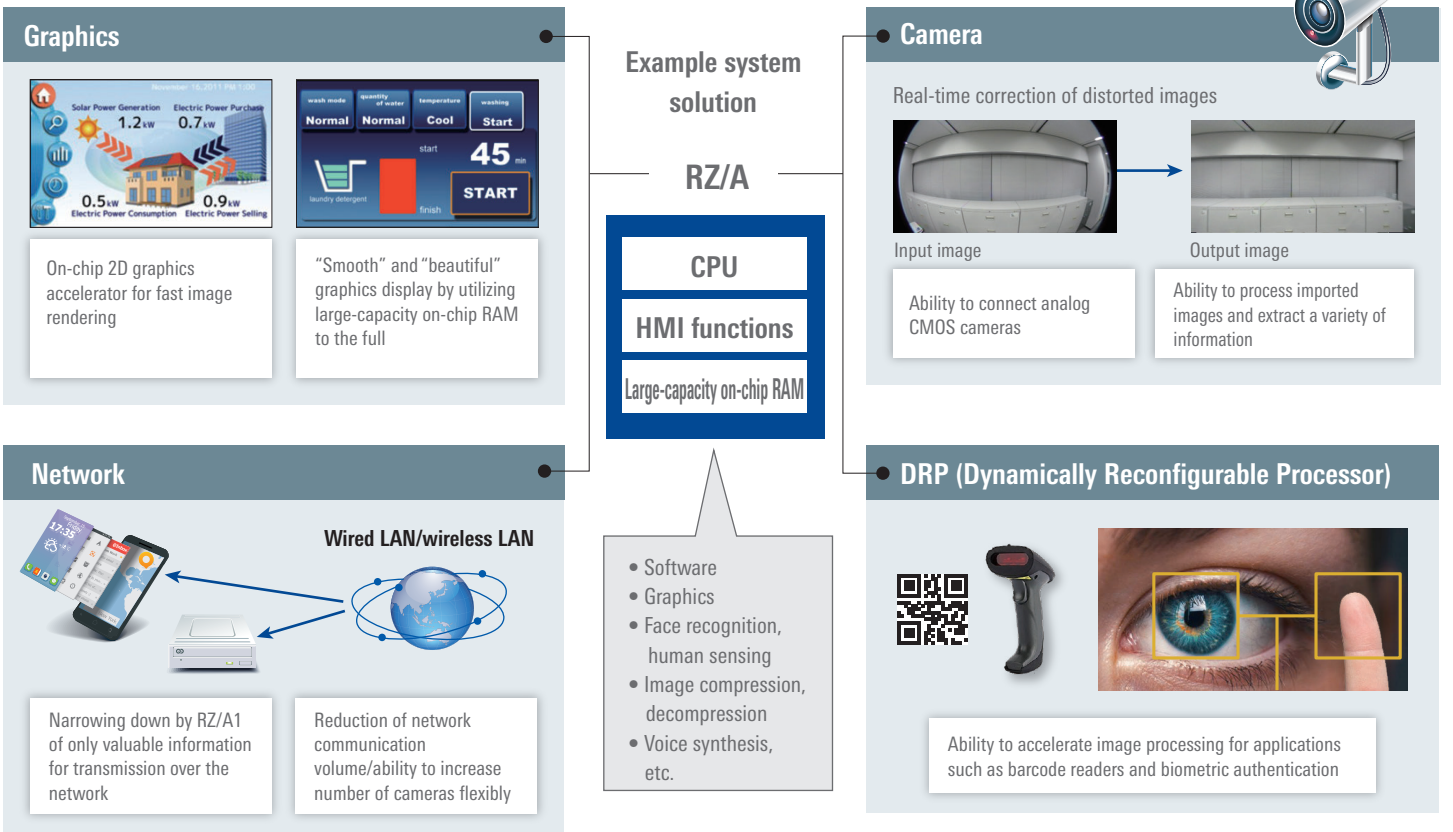


■ Graphics display and camera input capabilities on a single chip



The bus configuration with independent buses for images and hardware-based superimposition processing make it easy to create graphical applications.

■ Rich peripheral functions and software



With ample peripheral functions and software, a single chip can cover a wide range of fields, including display, camera input, communication, and audio functions.

## DRP Library

- The RZ/A2M's DRP\* can process applications such as image processing several to dozens of times faster than software processing that relies on the CPU, resulting in a faster system.
- A wide variety of DRP libraries are available, and users do not need to code the DRP itself by calling it from user programs using the DRP driver.
- The functions processed by the DRP can be dynamically changed from the user program, allowing multiple different processes to be used in combination.



### Image Signal Processing (Simple ISP group)

- Simple ISP with Color Calibration and 3DNR
- Simple ISP with Object Detection by Color (HSV)
- Simple ISP with Distortion Correction, etc.



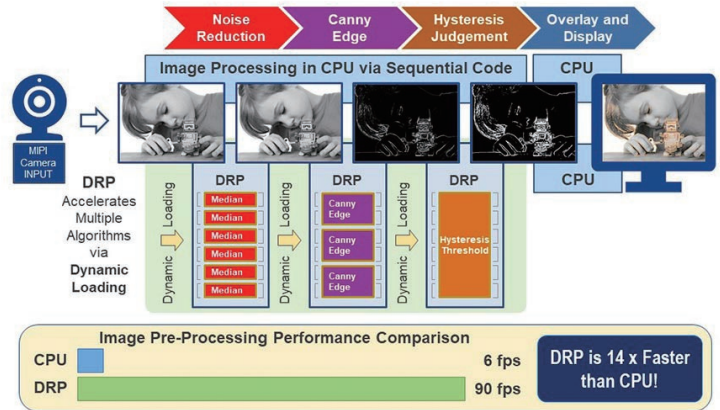
### Image Transformation and Filter

- Bayer to Grayscale / RGB
- Gamma Correction
- Median Blur, etc.



### Feature Detection

- Canny Edge Detection
- Harris' Corner Detection
- Find Contours, etc.



## RZ/A2M Group

### CPU (Arm® Cortex®-A9)

- Operating frequency: 528MHz
- Single-precision/double-precision FPU
- Arm® NEON™

### On-chip memory

- 4MB

### Main graphics and camera input functions

- Video display controller (VDC6): 1 channel  
LCD output: Max. WXGA  
Screen superimposition: 3 layers  
Video input: Max. XGA
- CMOS camera input (CEU): 1 channel
- MIPI-CSI2 interface: 1 channel
- Distortion compensation unit (IMR): 1 channel
- 2D graphics engine: 1 channel
- Sprite engine: 1 channel
- JPEG coding engine: 1 channel

### Main memory interface functions

- NOR flash, SDRAM, NAND flash
- Serial flash: 1-bit/4-bit/8-bit: 1 channel, 8-bit: 1 channel (ability to run stored programs directly)
- SD/MMC host interface: 2 channels

### Main communication functions

- USB 2.0 High Speed: 2 channels (Host/Function switchable)
- 10M/100M EtherMAC: 2 channels
- SCIF: 5 channels
- I<sup>2</sup>C: 4 channels
- SSI: 4 channels
- RSPI: 3 channels
- CAN-FD: 2 channels

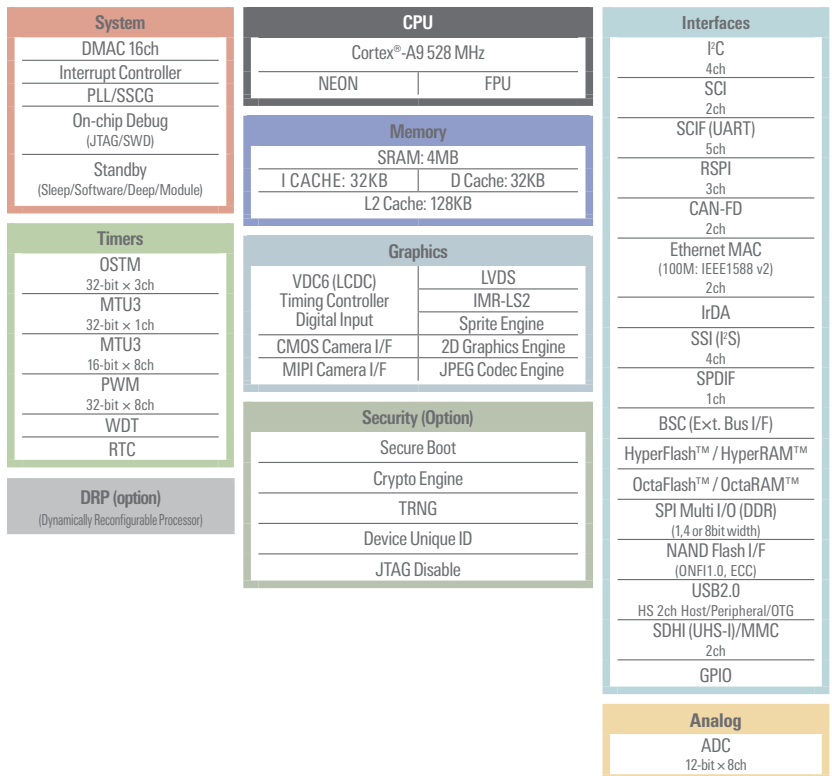
### Optional functions

- DRP (Dynamically Reconfigurable Processor)

### Package

- 176-LFBGA (13mm×13mm, 0.8mm pitch)
- 256-LFBGA (11mm×11mm, 0.5mm pitch)
- 272-FBGA (17mm×17mm, 0.8mm pitch)
- 324-FBGA (19mm×19mm, 0.8mm pitch)

## RZ/A2M block diagram



## RZ/A1H Group and RZ/A1M Group (Pin Compatible)

### CPU (Arm® Cortex®-A9)

- Operating frequency: 400MHz
- Single-precision/double-precision FPU
- Arm® NEON™

### On-chip memory

- RZ/A1H: 10MB
- RZ/A1M: 5MB

### Main graphics and camera input functions

- Video display controller (VDC5): 2 channels  
LCD output: Max. WXGA  
Screen superimposition: 4 layers  
Video input: Max. XGA (CVBS analog input supported)
- CMOS camera input (CEU): 1 channel
- PAL/NTSC decoder (DVDEC): 2 channels
- Distortion compensation unit (IMR): 1 channel
- Open VG accelerator: 1 channel
- JPEG coding engine: 1 channel

### Main memory interface functions

- NOR flash, SDRAM, NAND flash
- QSPI serial flash: 2 channels (ability to run stored programs directly)
- SD host interface: 2 channels
- MMC host interface: 1 channel

### Main communication functions

- USB 2.0 High Speed: 2 channels (Host/Function switchable)
- 10M/100M EtherMAC: 1channel
- SCIF: 8 channels
- I<sup>2</sup>C: 4 channels
- SSI: 6 channels
- RSPI: 5 channels
- Ethernet AVB: 1 channel
- CAN: 5 channels

### Package

- 256-LFBGA (11mm × 11mm, 0.5mm pitch)
- 256-LFQFP (28mm × 28mm, 0.4mm pitch)
- 324-FBGA (19mm × 19mm, 0.8mm pitch)

## RZ/A1LU Group

### CPU (Arm® Cortex®-A9)

- Operating frequency: 400MHz
- Single-precision/double-precision FPU
- Arm® NEON™

### On-chip memory

- 3MB

### Main graphics and camera input functions

- LCD controller (VDC5): 1 channel  
LCD output: Max. WXGA  
Screen superimposition: 3 layers  
Video input: Max. XGA
- CMOS camera input (CEU): 1 channel
- JPEG coding engine: 1 channel

### Main memory interface functions

- NOR flash, SDRAM
- QSPI serial flash: 1 channel (ability to run stored programs directly)
- SD host interface: 2 channels
- MMC host interface: 1 channel

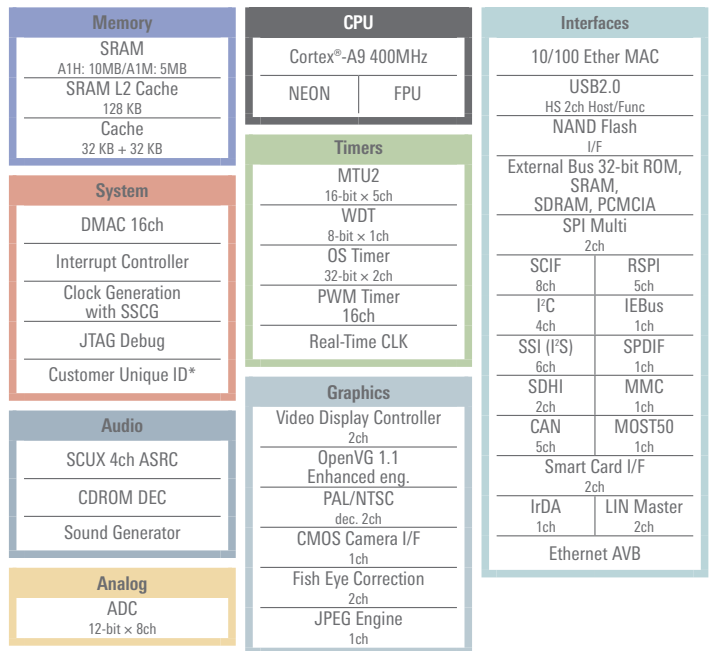
### Main communication functions

- USB 2.0 High Speed: 2 channels (Host/Function switchable)
- 10M/100M EtherMAC: 1channel
- SCIF: 5 channels
- I<sup>2</sup>C: 4 channels
- SSI: 4 channels
- RSPI: 3 channels
- Ethernet AVB: 1 channel
- CAN: 2 channels

### Package

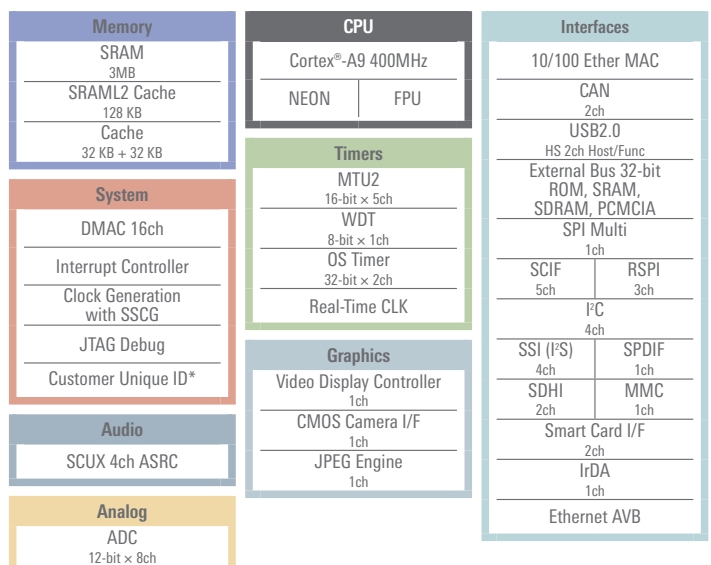
- 176-LFBGA (8mm × 8mm, 0.5mm pitch)
- 176-LFQFP (24mm × 24mm, 0.5mm pitch)
- 208-LFQFP (28mm × 28mm, 0.5mm pitch)

## RZ/A1H, and RZ/A1M block diagram



\*=Option

## RZ/A1LU block diagram



\*=Option

## RZ/A1L, RZ/A1LC Group

### CPU (Arm® Cortex®-A9)

- Operating frequency: 400MHz
- Single-precision/double-precision FPU
- Arm® NEON™

### On-chip memory

- RZ/A1L: 3MB
- RZ/A1LC: 2MB

### Main graphics and camera input functions

- LCD controller (VDC5): 1 channel  
LCD output: Max. WXGA  
Screen superimposition: 3 layers  
Video input: Max. XGA

- CMOS camera input (CEU): 1 channel

### Main memory interface functions

- NOR flash, SDRAM, NAND flash
- QSPI serial flash: 1 channel (ability to run stored programs directly)
- SD host interface: 2 channels
- MMC host interface: 1 channel

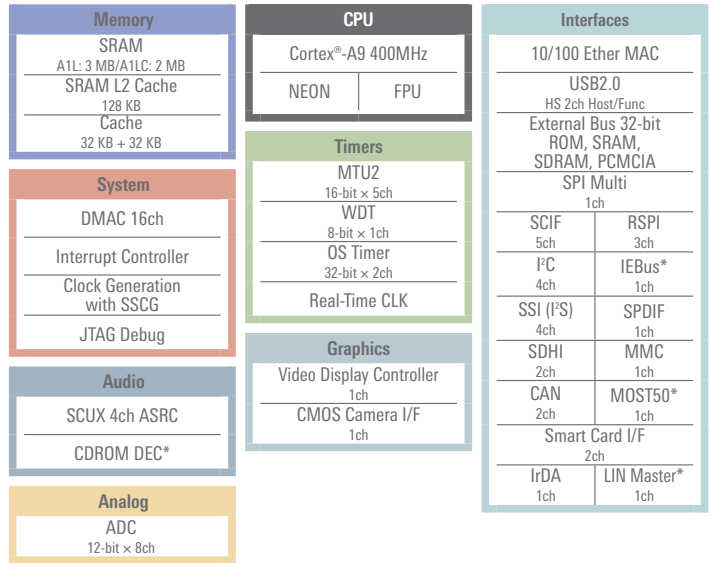
### Main communication functions

- USB 2.0 High Speed: 2 channels (Host/Function switchable)
- 10M/100M EtherMAC: 1 channel
- SCIF: 5 channels
- I<sup>2</sup>C: 4 channels
- SSI: 4 channels
- RSPI: 3 channels
- CAN: 2 channels

### Package

- 176-LFBGA (8mm × 8mm, 0.5mm pitch)
- 176-LFQFP (24mm × 24mm, 0.5mm pitch)
- 208-LFQFP (28mm × 28mm, 0.5mm pitch)
- 233-FBGA (15mm × 15mm, 0.8mm pitch)

## RZ/A1L, RZ/A1LC block diagram



\* RZ/A1L Group specification only.

## RZ/A Series: Development Environments (Integrated Development Environments)

				
Development environments	<ul style="list-style-type: none"> <li>DS-5 </li> </ul>	<ul style="list-style-type: none"> <li>IAR Embedded Workbench® for Arm® </li> </ul>	<ul style="list-style-type: none"> <li>eBinder </li> </ul>	<ul style="list-style-type: none"> <li>e² studio*3 </li> </ul>
Compilers	<ul style="list-style-type: none"> <li>Arm CC*1</li> </ul>	<ul style="list-style-type: none"> <li>IAR C/C++ compiler*2</li> </ul>	<ul style="list-style-type: none"> <li>Arm CC*1</li> </ul>	<ul style="list-style-type: none"> <li>GNU tool*4</li> </ul>
ICEs	<ul style="list-style-type: none"> <li>DSTREAM™</li> <li>ULINKpro™</li> <li>ULINKproD™</li> <li>ULINK2™ </li> </ul>	<ul style="list-style-type: none"> <li>I-jet™/I-jet Trace™ for Arm Cortex®-A/R/M</li> <li>JTAGjet-Trace </li> </ul>	<ul style="list-style-type: none"> <li>PARTNER-Jet2 from Kyoto Microcomputer Co., Ltd. </li> <li>adviceLUNAII from DTS INSIGHT Corporation</li> </ul>	<ul style="list-style-type: none"> <li>J-Link LITE from Segger</li> <li>J-Link series from Segger*5 </li> </ul>

\*1. Arm CC is included in DS-5 Starter Kit for RZ/A and RZ/T, which is available free of charge, and in the popularly priced DS-5 RZ/A Edition. There is also a free evaluation version that provides full functionality but is limited to 30 days of use. Contact a DS-5 sales agent for details.











\*2. A free evaluation license is available provided the 30-day time-limited evaluation or the permanent 32KB size-limited evaluation ([www.iar.com/EWARM](http://www.iar.com/EWARM))

\*3. Eclipse-based development environment from Renesas (<https://www.renesas.com/e2studio>)

\*4. GNU TOOLS & SUPPORT Website (<https://gcc-renesas.com>)

\*5. Renesas does not handle ICes from Segger. Contact a sales agent for details.

## RZ/A Series: Development Tools (Debuggers, ICes)

	 Kyoto Microcomputer Co., Ltd.	 Our insight, your value	
Debuggers	<ul style="list-style-type: none"> <li>PARTNER-Jet2 </li> </ul>	<ul style="list-style-type: none"> <li>microVIEW-PLUS </li> </ul>	<ul style="list-style-type: none"> <li>CSIDE version 7 </li> </ul>
ICEs		<ul style="list-style-type: none"> <li>adviceLUNA II </li> </ul>	<ul style="list-style-type: none"> <li>PALMiCE4  </li> </ul>
Supported compilers	<ul style="list-style-type: none"> <li>exeGCC from Kyoto Microcomputer</li> <li>GNU tool*1</li> <li>Arm CC*2</li> <li>IAR C/C++ compiler,*3 etc.</li> </ul>	<ul style="list-style-type: none"> <li>Arm CC*2</li> <li>GNU tool,*1 etc.</li> </ul>	<ul style="list-style-type: none"> <li>Arm CC*2</li> <li>IAR C/C++ compiler*3</li> <li>GNU tool,*1 etc.</li> </ul>

\*1. GNU TOOLS & SUPPORT Website (<https://gcc-renesas.com>)

\*2. Arm CC is included in DS-5. In addition to the popularly priced DS-5 RZ/A and RZ/T editions, a fully functional evaluation version of DS-5 that expires after 30 days is available free of charge. Contact your DS-5 dealer for details.

\*3. Two versions of the software are available for download free of charge. One limits the code size to 32KB and can be used with no time limitation. The other has no limit on code size and expires after 30 days. ([www.iar.com/EWARM](http://www.iar.com/EWARM))

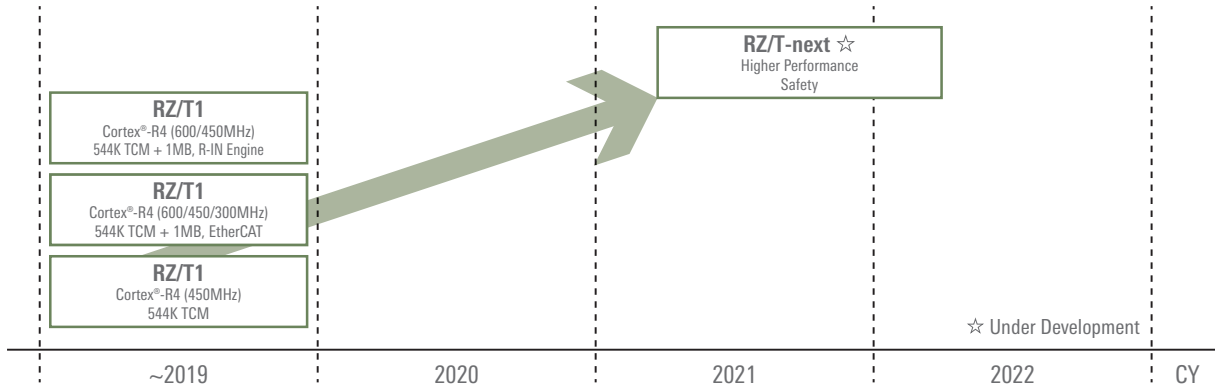
## RZ/A Series: Solutions from Partner Companies

Visit the webpage below for the latest information on RZ/A Series development tools, including solutions from partner companies.  
<https://www.renesas.com/products/microcontrollers-microprocessors/rz/softtools.html#rza>



# RZ/T Series

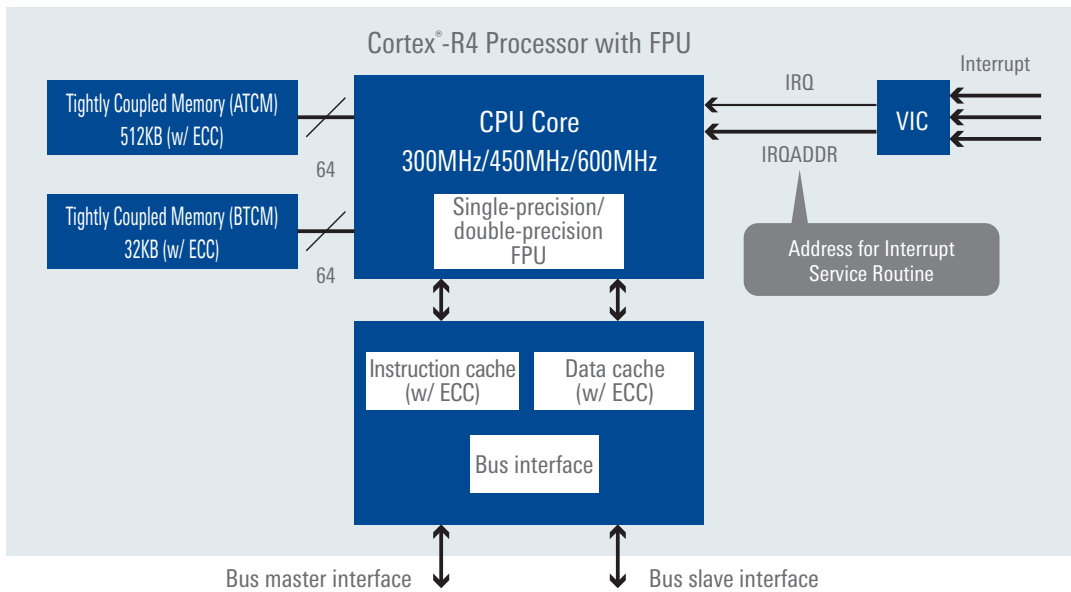
## RZ/T Series Roadmap



## RZ/T Series Features

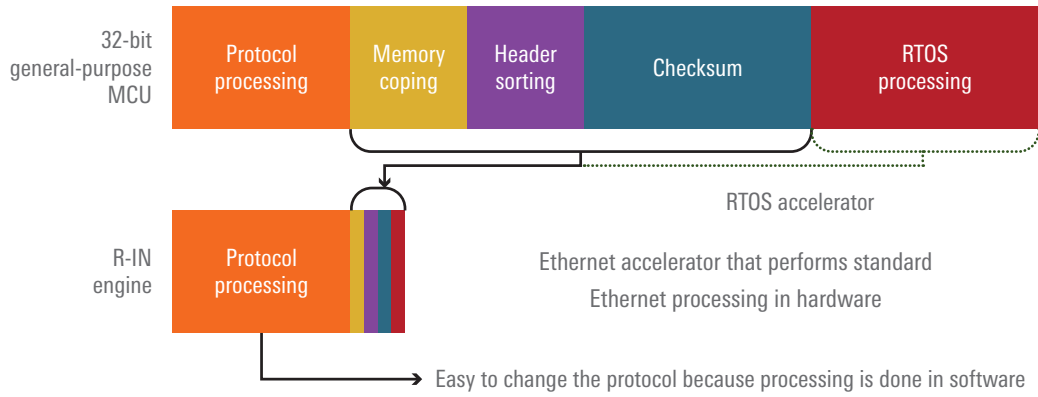
- High-performance, high-speed real-time control
- R-IN engine
- Integrated peripheral functions

### ■ High-performance, high-speed real-time control



- High-speed RAM directly connected to the CPU for high-speed processing and dependable real-time responsiveness without caching
- ECC for enhanced reliability
- Vectored Interrupt Controller (VIC) to assure interrupt responsiveness suitable for embedded control

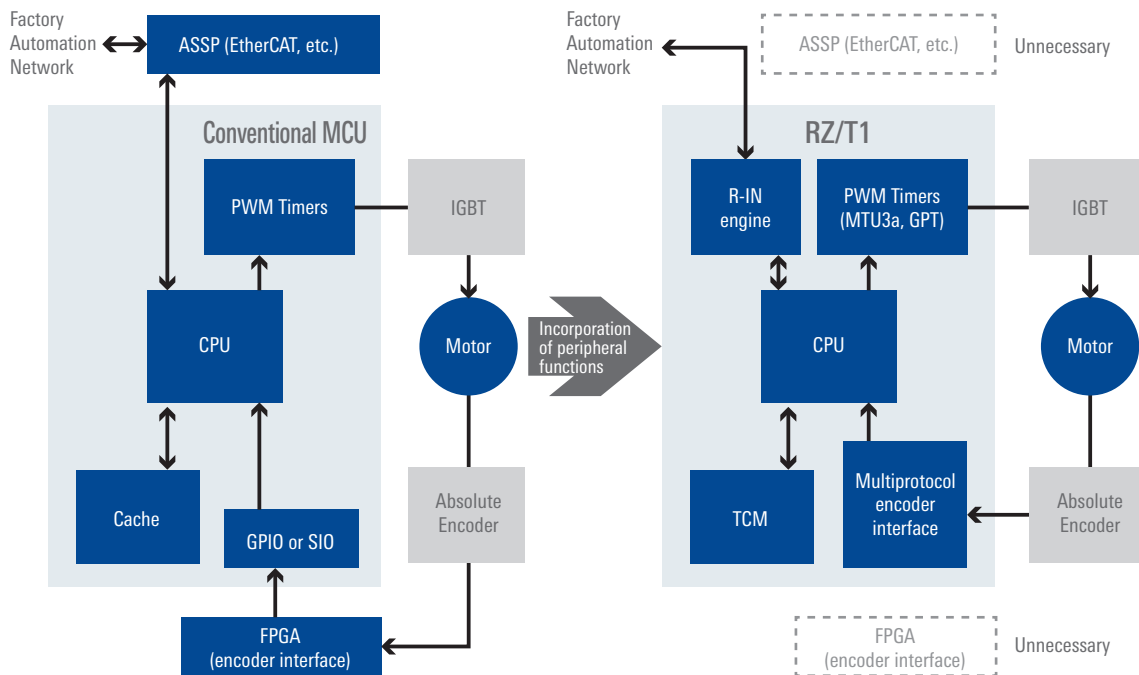
■ R-IN engine



**High-speed, energy-efficient communication**  
**Flexible support for multiple protocols**

- R-IN engine industrial Ethernet communication accelerator performs standard Ethernet processing in hardware.
- Network processing is up to four times as fast.

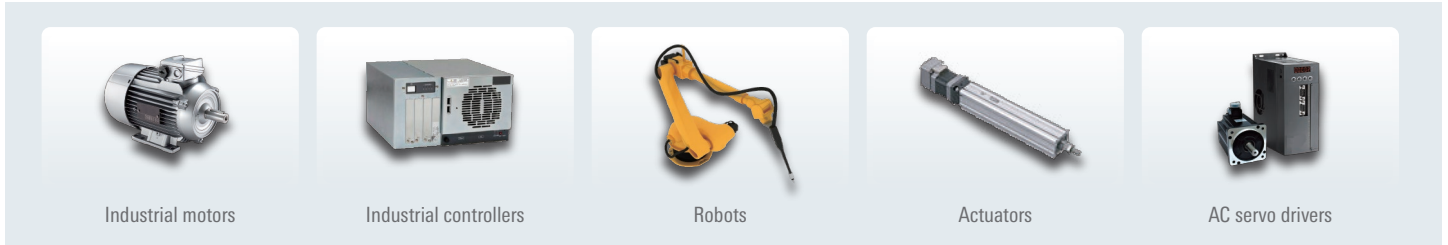
■ Integrated peripheral functions



- The encoder interface was external with conventional FPGA or ASIC approaches but is now integrated on-chip.
- This one-chip AC servo solution helps reduce the component count and save space.

## RZ/T Series Application

High-speed operation at 300MHz/450MHz/600MHz provides higher performance and improved functionality for industrial equipment such as industrial motors or AC servo drivers. Products incorporating the R-IN engine accelerator for industrial Ethernet communication can also handle a variety of industrial Ethernet processing tasks without sacrificing real-time performance.



## RZ/T1 Group

### High performance CPU

- Arm® Cortex®-R4 Processor
- Operating frequency: 300MHz/450MHz/600MHz
- High-performance, high-speed real-time control
- Single-precision/double-precision floating-point unit

### R-IN engine (option)

- Arm® Cortex®-M3
- Operating frequency: 125MHz
- HW-RTOS accelerator
- R-IN engine instruction memory: 512KB (w/ ECC) + data memory: 512KB (w/ ECC)

### On-chip memory

- Tightly Coupled Memory: 512KB (w/ ECC) + 32KB (w/ ECC)
- Extended RAM instruction memory 512KB (w/ ECC) + data memory: 512KB (w/ ECC) (option)

### Features

- Industrial Ethernet communication accelerator with multi-protocol support (R-IN engine) (option)
- EtherCAT slave controller (option)
- PWM timer: MTU3a, GPT
- Encoder interface (Nikon A-format™/BiSS-C/EnDat2.2/HIPERFACE DSI®/Tamagawa) (option)

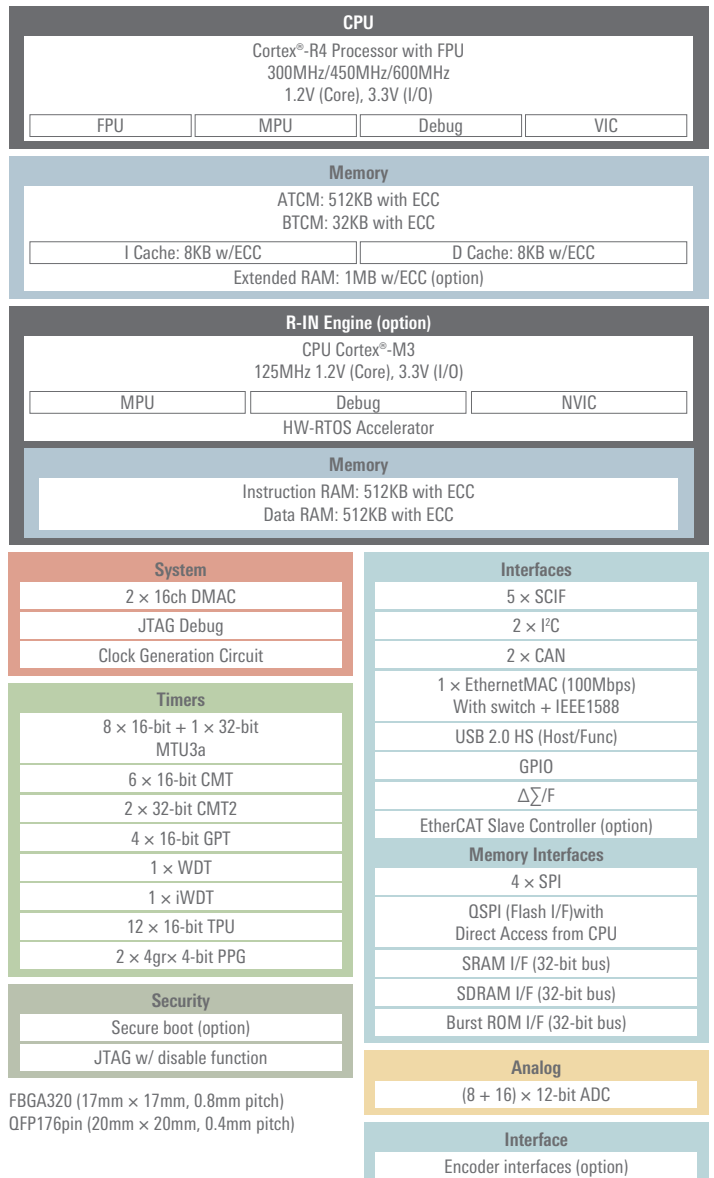
Note: 2ch encoder support depends on the combination of the selected protocol.

- High Speed USB
- Secure boot (option)
- Safety functions
  - ECC memory
  - CRC (32-bit)
  - Independent WDT: Operating on dedicated on-chip oscillator
- ΔΣ interface
- 100Mbps EtherMAC (with Ethernet switch)
- Ethernet accelerator
- Power supply voltage: 1.2V, 3.3V

### Package

- FBGA 320pin (17mm × 17mm, 0.8mm pitch)
- QFP 176pin (20mm × 20mm, 0.4mm pitch)

## RZ/T1 Group block diagram



FBGA320 (17mm × 17mm, 0.8mm pitch)  
QFP176pin (20mm × 20mm, 0.4mm pitch)



## RZ/T1 Product Lineup

CPU	Tightly coupled memory	Extended RAM								
600 MHz + R-IN Engine (150MHz)	512KB +32KB	– (1MB for R-IN)							R7S910017	R7S910018
450 MHz + R-IN Engine (150MHz)	512KB +32KB	– (1MB for R-IN)							R7S910015	R7S910016
600 MHz	512KB +32KB	1MB		R7S910007	R7S910013	R7S910027	R7S910028			
450 MHz	512KB +32KB	1MB		R7S910006		R7S910025	R7S910026			
		–	R7S910001	R7S910002	R7S910011					
300 MHz	512KB +32KB	–				R7S910035	R7S910036			
Package			176 QFP	320 BGA	320 BGA	320 BGA	320 BGA	320 BGA	320 BGA	320 BGA
Encoder I/F			–		Yes	–	Yes	–	Yes	
Industrial Ethernet			– (Standard Ethernet)			EtherCAT		Multi-protocol support		

## Utilizing the Arm® Ecosystem

### Utilizing Renesas' Experience and the Arm® Ecosystem

Customers can benefit from solutions combining Renesas' accumulated experience in the microcontroller industry and the global ecosystem of Arm® partners. Products such as development environments, OS, and middleware are available from partner companies supporting the RZ/T series.



## RZ/T Series: Development Environments (Integrated Development Environments)

Development environments	<ul style="list-style-type: none"> <li>IAR Embedded Workbench® for Arm®</li> </ul>	<ul style="list-style-type: none"> <li>DS-5</li> </ul>	<ul style="list-style-type: none"> <li>e² studio*1</li> </ul>
Compilers	<ul style="list-style-type: none"> <li>IAR C/C++ compiler*2</li> </ul>	<ul style="list-style-type: none"> <li>Arm CC*3</li> </ul>	<ul style="list-style-type: none"> <li>GNU tool*4</li> </ul>
Other tools	<ul style="list-style-type: none"> <li>AP4 code generation tool from Renesas is compatible.</li> </ul>	<ul style="list-style-type: none"> <li>AP4 code generation tool from Renesas is compatible.</li> </ul>	<ul style="list-style-type: none"> <li>Code generation function available as a plug-in.</li> </ul>
ICEs	<ul style="list-style-type: none"> <li>I-jet™/I-jet Trace™ for Arm Cortex®-A/R/M</li> <li>JTAGjet-Trace</li> </ul>	<ul style="list-style-type: none"> <li>DSTREAM™</li> <li>ULINKpro™</li> <li>ULINKproD™</li> <li>ULINK2™</li> </ul>	<ul style="list-style-type: none"> <li>J-Link LITE from Segger</li> <li>J-Link series from Segger*5</li> </ul>

\*1. Eclipse-based development environment from Renesas (<http://renesas.com/e2studio>)

\*2. Two versions of the software are available for download free of charge. One limits the code size to 32KB and can be used with no time limitation. The other has no limit on code size and expires after 30 days. ([www.iar.com/EWARM](http://www.iar.com/EWARM))

\*3. Arm CC is included in DS-5. In addition to the popularly priced DS-5 RZ/A and RZ/T editions, a fully functional evaluation version of DS-5 that expires after 30 days is available free of charge. Contact your DS-5 dealer for details.

\*4. GNU TOOLS & SUPPORT Website (<https://gcc-renesas.com>)

\*5. Renesas does not handle ICEs from Segger. Contact a sales agent for details.

## RZ/T Series: Development Tools (Debuggers, ICEs)

Debuggers	<ul style="list-style-type: none"> <li>PARTNER-Jet2</li> </ul>	<ul style="list-style-type: none"> <li>microVIEW-PLUS</li> </ul>	<ul style="list-style-type: none"> <li>CSIDE version 7</li> </ul>
ICEs		<ul style="list-style-type: none"> <li>adviceLUNA II</li> </ul>	<ul style="list-style-type: none"> <li>PALMiCE4</li> </ul>
Supported compilers	<ul style="list-style-type: none"> <li>exeGCC from Kyoto Microcomputer</li> <li>GNU tool*1</li> <li>Arm CC*2</li> <li>IAR C/C++ compiler,*3 etc.</li> </ul>	<ul style="list-style-type: none"> <li>Arm CC*2</li> <li>GNU tool,*1 etc.</li> </ul>	<ul style="list-style-type: none"> <li>Arm CC*2</li> <li>IAR C/C++ compiler*3</li> <li>GNU tool,*1 etc.</li> </ul>

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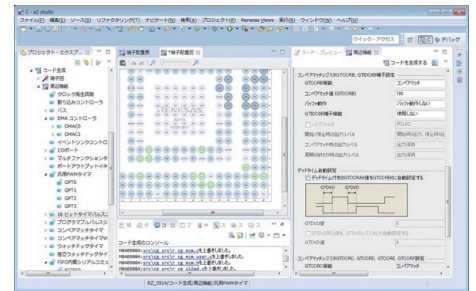
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## e2 studio: Integrated Development Environment Based on Eclipse

e2 studio is an integrated development environment based on the Eclipse open source integrated development environment and CDT plug-ins supporting development in C/C++. The version of e2 studio that is compatible with the RZ/T series provides support for a code generation plug-in.

### C/C++ perspective: code generation plug-in

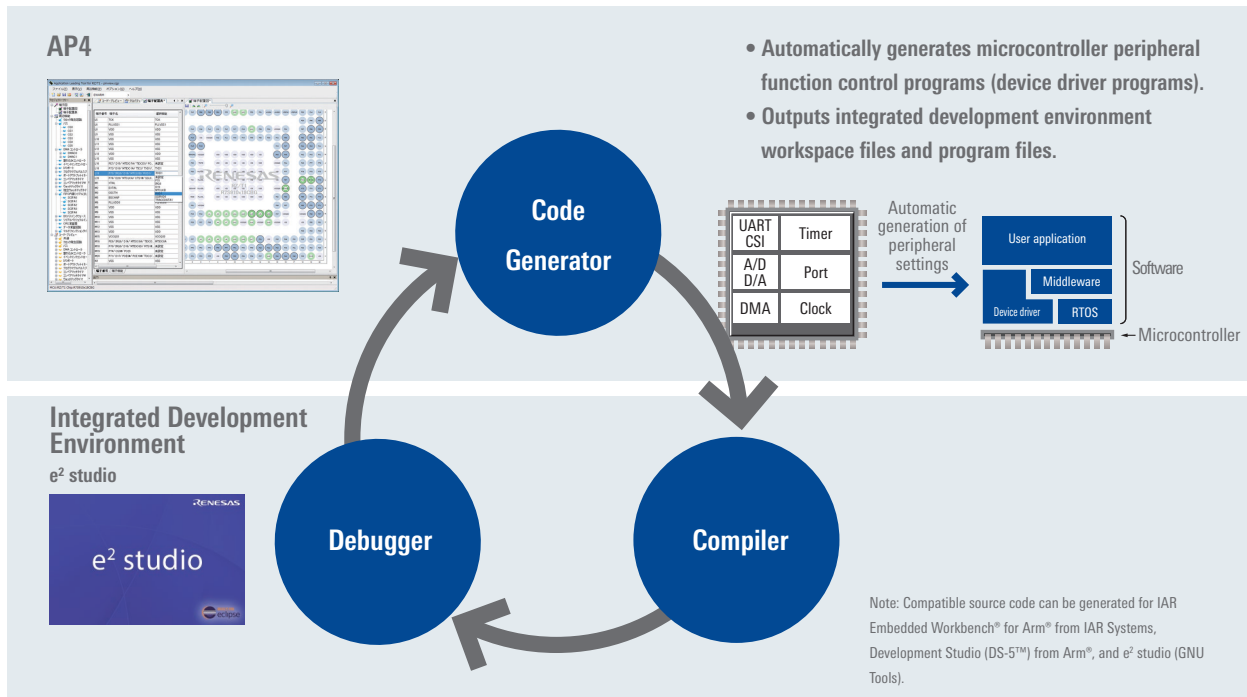
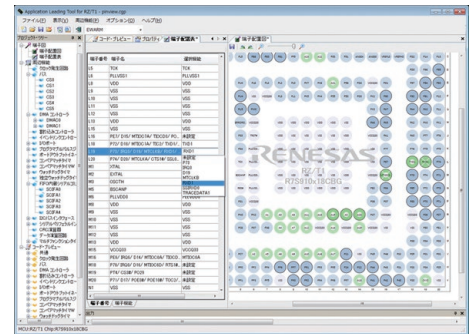
A code generation plug-in is available that enables the user to generate device driver programs for peripheral functions of Renesas microcontrollers (timers, UART, A/D converter, etc.) by entering settings in a graphical user interface. It is possible to specify the processing of multiplexed pins in a pin table and view a pin assignment diagram to confirm the settings.



## AP4: Code Generation Support Tool

AP4 is a standalone tool that automatically generates peripheral function control programs (device driver programs) based on settings entered by the user. The build tool (compiler) is selectable. This makes it possible to generate peripheral function control program code to match a specific build tool and enables interoperation with integrated development environments. (<https://www.renesas.com/ap4>)

The version of AP4 that is compatible with the RZ/T series can generate compatible source code for IAR Embedded Workbench® for Arm® from IAR Systems, Development Studio (DS-5™) from Arm®, and e2 studio (GNU Tools).



## RZ/T Series: Solutions from Partner Companies

Visit the webpage below for the latest information on RZ/T Series development tools, including solutions from partner companies. <https://www.renesas.com/products/microcontrollers-microprocessors/rz/softtools.html#zt>



## RZ/T1-Starter-Kit-Plus

<https://www.renesas.com/RZT1-Starter-Kit-Plus>

- The Renesas Starter Kit+ for RZ/T1 is the perfect starter kit for developers who are new to the RZ/T1.
- The kit includes an LCD display module, J-LINK Lite debugging emulator, and e<sup>2</sup> studio integrated development environment so you can start evaluating the RZ/T1 immediately after opening the box.
- Ordering number: RTK7910018S01000BE



- RZ/T1 (R7S910018)
- QSPI FlashROM 64Mbyte
- SDRAM 64Mbyte × 2
- NOR Flash 64Mbyte × 2
- Rich interface
- Serial, USB, CAN
- Digilent Pmod I/F (PMOD connector)
- $\Delta\Sigma$  I/F (DSMI connector)
- Ethernet (10/100Base, EtherCAT) I/F etc.
- Audio codec
- Includes Segger's simple debug probe "J-LINK Lite"
- Includes LCD for debugging

## RZ/T1 Motion Control Solution Kit

<https://www.renesas.com/YDRIVE-IT-RZT1>

- RZ/T1 Motion Control Solution Kit is a complete hardware and software solution for the Renesas RZ/T1 MPU. It delivers best-in-class processing power and real-time architecture to run tighter control loops, network connectivity to support deterministic communication, and high-speed encoder interface – effectively serving as a connected servo solution on a single chip.
- The kit includes an RZ/T1 CPU card, and a dual channel 3-phase inverter to support dual channel servo motor control with current and position feedback.
- Ordering number: YDRIVE-IT-RZT1

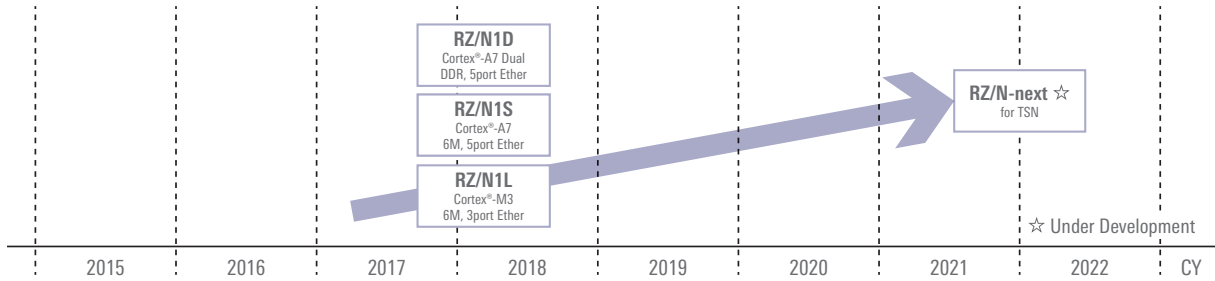


- Package includes all parts needed for motor control evaluation
- Supports safe design and can be used for reference
- Includes multifunction utility tool
- Servo control software is available



# RZ/N Series

## RZ/N Series Roadmap



## RZ/N Series Features

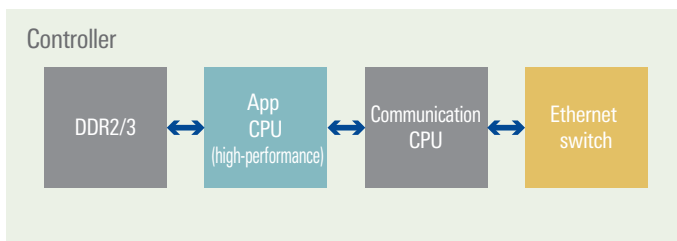
1. Provides optimized microcontrollers for a variety of industrial network applications
2. Integrated R-IN engine (accelerator) supporting main industrial Ethernet protocols
3. Redundant network configuration reduces network downtime to zero

### 1. Provides optimized microcontrollers for a variety of industrial network applications

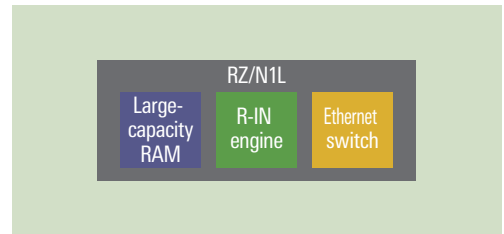
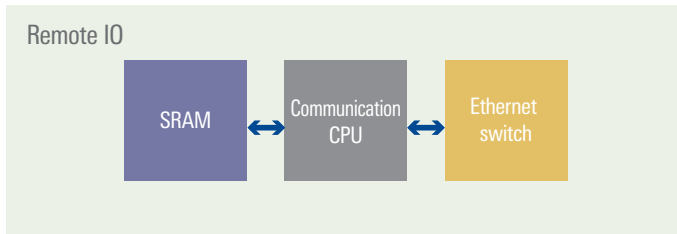
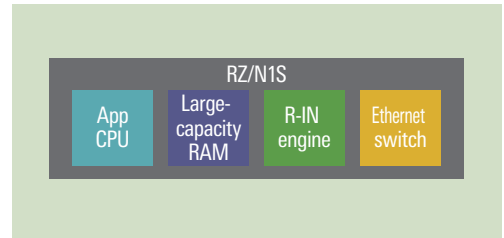
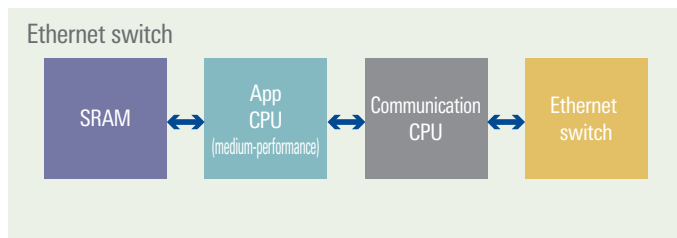
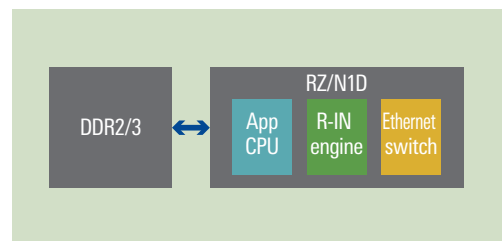
The three CPU types lineup and integrated 5-port gigabit Ethernet switch make it possible to provide the optimal microcontrollers for a wide range of industrial network applications.

- Lineup of three CPU types for excellent hardware scalability: Dual-core Cortex®-A7 (500MHz × 2), single-core Cortex®-A7 (500MHz), and R-IN engine only (125MHz).
- 5-port gigabit Ethernet switch and two independent MAC units support applications such as PLC devices and Ethernet switches. Integration of peripheral components helps reduce BOM cost.

Conventional configuration



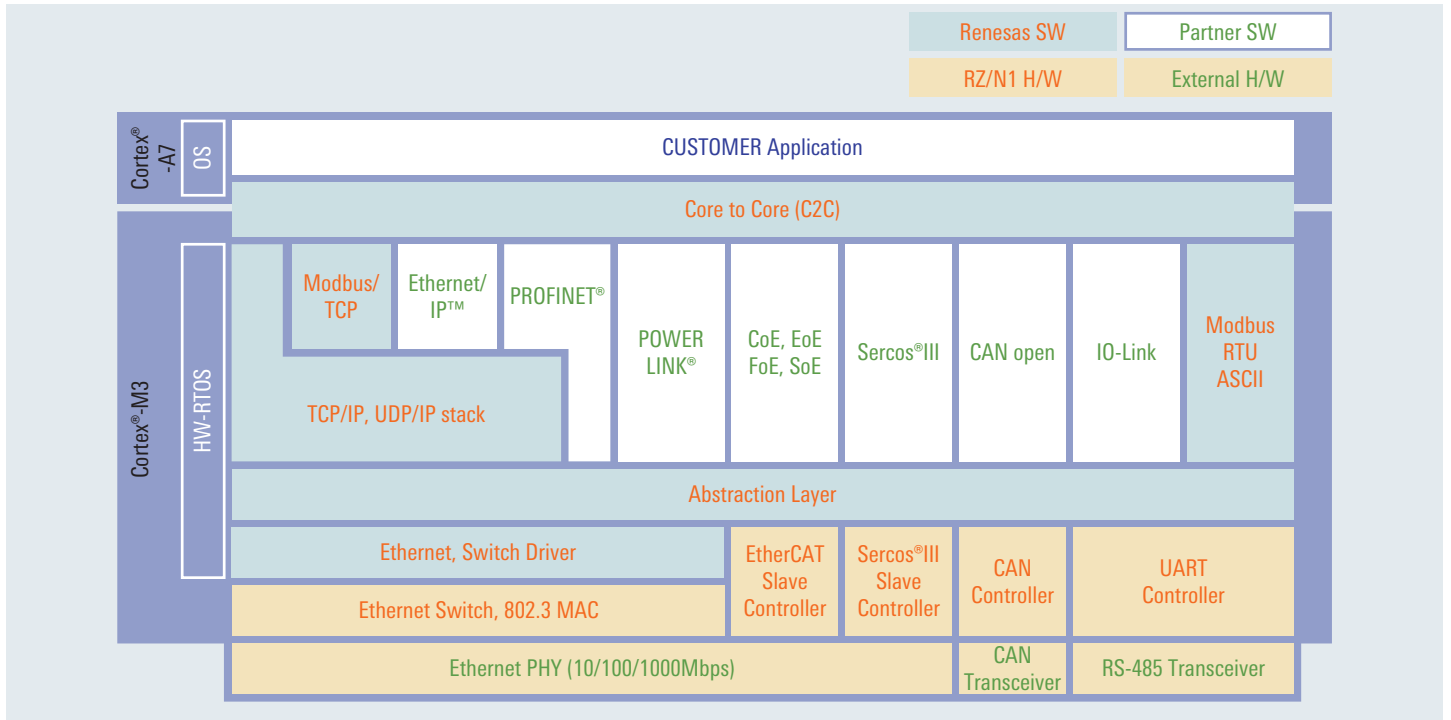
Configuration using RZ/N1



2. Integrated R-IN engine (accelerator) supporting main industrial Ethernet protocols

The R-IN engine accelerator supports a wide range of protocols and enables high-speed processing.

It reduces the load on the main CPU (Arm® Cortex®-A7) and contributes to highly efficient application control.



3. Redundant network configuration reduces network downtime to zero

Advanced redundant network configuration support helps eliminate network downtime.

- Redundant network connections: Parallel Redundancy Protocol (PRP)
- Looped network connections: HSR (High-availability Seamless Redundancy), DLR (Device Level Ring), RSTP (Rapid Spanning Trees)

RZ/N Series Application



## RZ/N1D Group

### CPU core

- Arm® Cortex®-A7 dual-core processor
- Operating frequency: 500MHz

### Cache memory

- L1 I-cache: 16KB × 2, D-cache: 16KB × 2
- L2: 256KB

### Internal memory

- 2MB (ECC)

### External memory

- DDR2/DDR3 controller
- Quad I/O SPI
- SDIO eMMC
- NAND flash controller

### R-IN engine

- Arm® Cortex®-M3
- Operating frequency: 125MHz
- HW-RTOS accelerator
- Ethernet accelerator

### Main Ethernet communication functions

- EtherCAT slave controller
- Sercos® III slave controller
- HSR switch (400-pin)
- 5-port Ethernet switch

### Other communication functions

- UART × 8 channels
- I<sup>2</sup>C × 2 channels
- USB Host/Function × 1 channel, Host 1 channel
- SPI × 6 channels (master × 4 channels, slave × 2 channels)
- CAN

### Other functions

- LCD controller
- ADC: 12-bit × 8 channels × 2 units (400-pin)
- ADC: 12-bit × 8 channels × 1 unit (324-pin)
- PWM timer, GPT

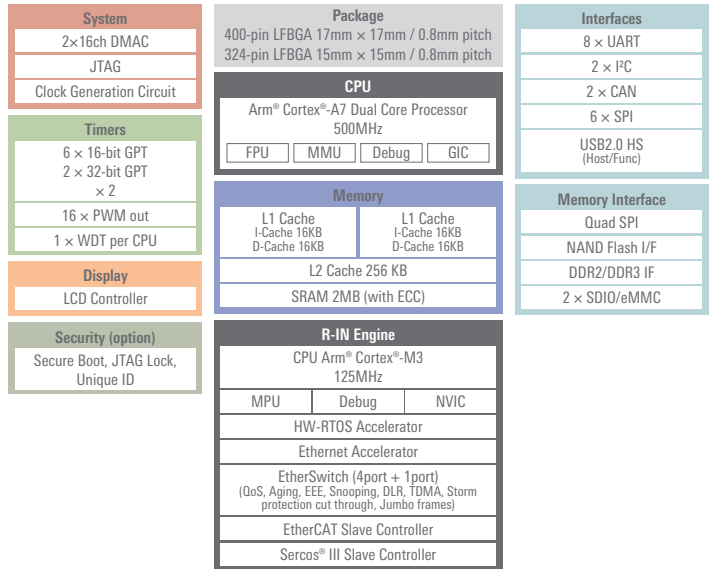
### Package

- 400-pin: LFBGA, 17 × 17mm, 0.8mm pin pitch
- 324-pin: LFBGA, 15 × 15mm, 0.8mm pin pitch

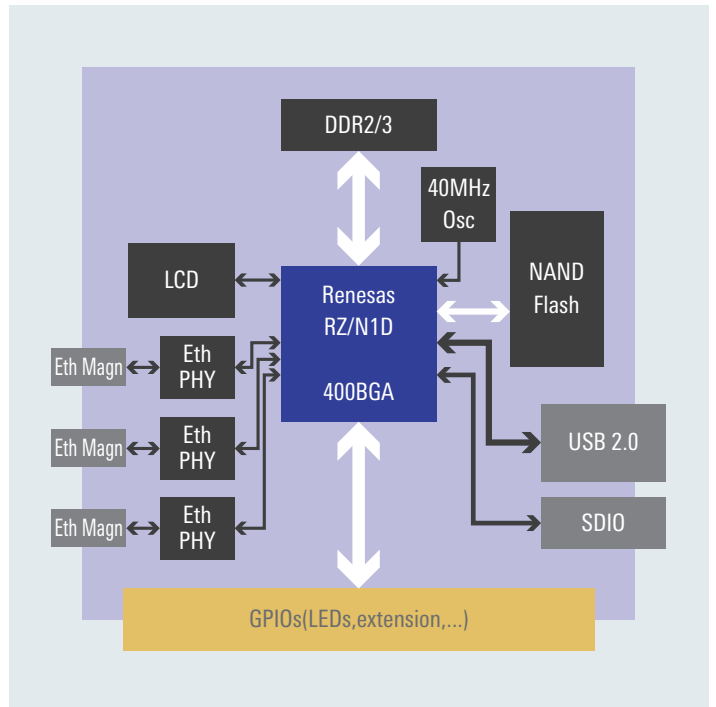
### Operating temperature

- T<sub>j</sub> = -40°C to +110°C

## RZ/N1D Group block diagram



## Application example: Programmable logic controller block diagram





## RZ/N1S Group

### CPU core

- Arm® Cortex®-A7 single-core processor
- Operating frequency: 500MHz

### Cache memory

- L1 I-cache: 16KB, D-cache: 16KB
- L2: 128KB

### Internal memory

- 6MB (ECC)

### External memory

- Quad I/O SPI
- SDIO eMMC
- NAND flash controller

### R-IN engine

- Arm® Cortex®-M3
- Operating frequency: 125MHz
- HW-RTOS accelerator
- Ethernet accelerator

### Main Ethernet communication functions

- EtherCAT slave controller
- Sercos® III slave controller
- 5-port Ethernet switch

### Other communication functions

- UART × 8 channels
- I<sup>2</sup>C × 2 channels
- USB Host/Function × 1 channel, Host 1 channel
- SPI × 6 channels (master × 4 channels, slave × 2 channels)
- CAN

### Other functions

- LCD controller
- ADC: 12-bit × 8 channels × 1 unit
- PWM timer, GPT

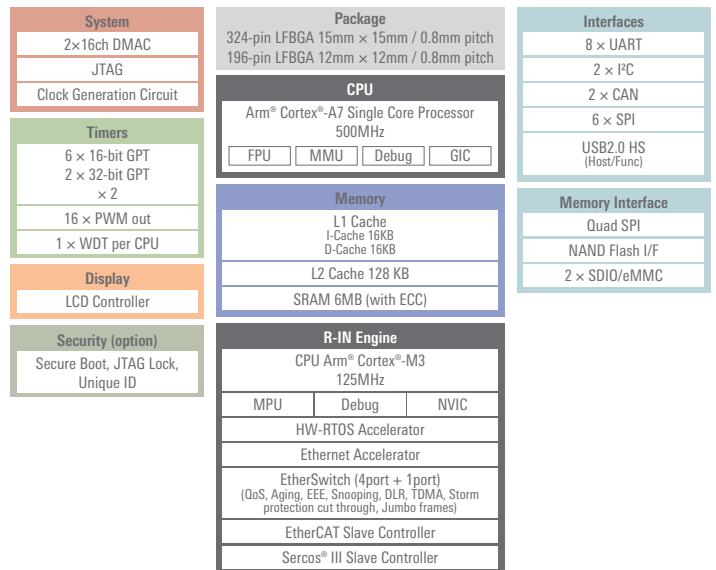
### Package

- 324-pin: LFBGA, 15 × 15mm, 0.8mm pin pitch
- 196-pin: LFBGA, 12 × 12mm, 0.8mm pin pitch

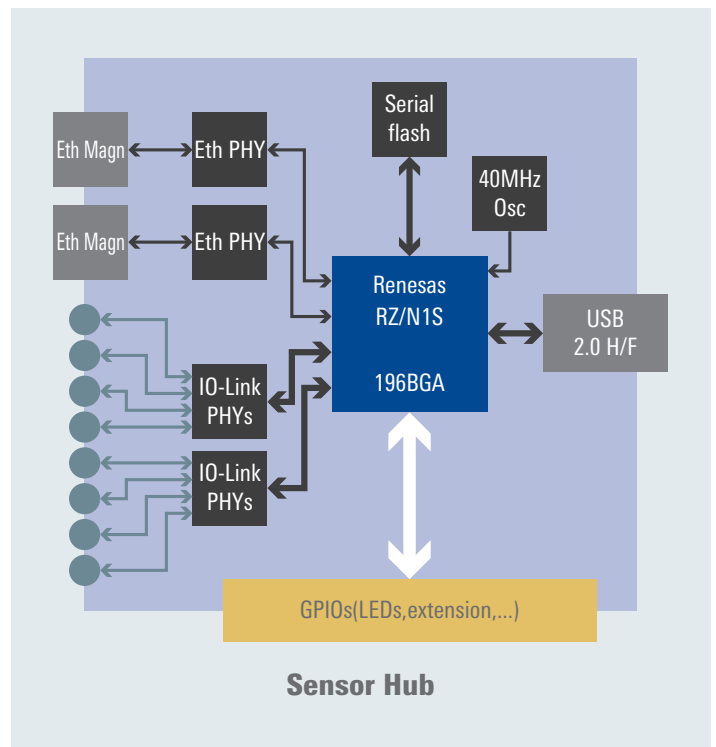
### Operating temperature

- T<sub>j</sub> = -40°C to +110°C

## RZ/N1S Group block diagram



## Application example: Sensor Hub block diagram



## RZ/N1L Group

### R-IN engine

- Arm® Cortex®-M3
- Operating frequency: 125MHz
- HW-RTOS accelerator
- Ethernet accelerator

### Internal memory

- 6MB (ECC)

### External memory

- Quad I/O SPI
- SDIO eMMC
- NAND flash controller

### Main Ethernet communication functions

- EtherCAT slave controller
- Sercos® III slave controller
- GbE Ethernet switch

### Other communication functions

- UART × 8 channels
- I<sup>2</sup>C × 2 channels
- USB Host/Function × 1 channel, Host 1 channel
- SPI × 6 channels (master × 4 channels, slave × 2 channels)
- CAN × 2 channels

### Other functions

- LCD controller
- ADC: 12-bit × 8 channels × 1 unit
- PWM timer, GPT

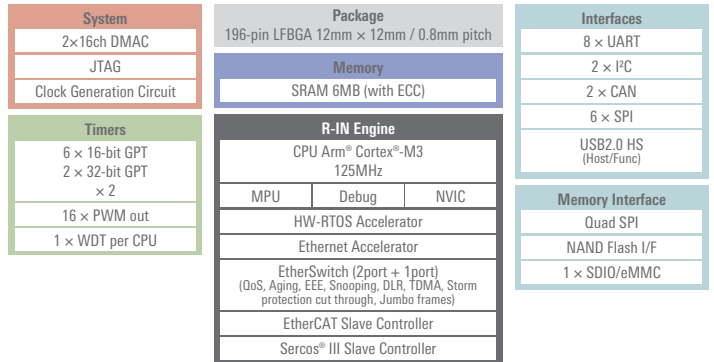
### Package

- 196-pin: LFBGA, 12 × 12mm, 0.8mm pin pitch

### Operating temperature

- T<sub>j</sub> = -40°C to +110°C

## RZ/N1L Group block diagram



## CONNECT IT! ETHERNET RZ/N

<https://www.renesas.com/RZN-YConnect-It>

- CONNECT IT! ETHERNET RZ/N is the perfect solution kit for developers new to developing with the RZ/N1.
- The kit comes with not only an evaluation board, but also a JTAG emulator and various sample software.
- It is possible to evaluate master communication / slave communication of industrial networks.



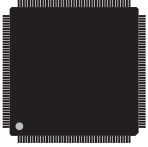


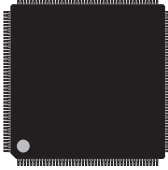

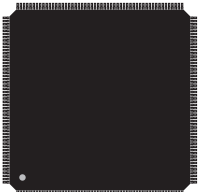


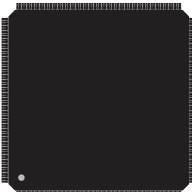













- JTAG emulator
  - IAR I-jet Lite (20-pin flat ribbon/USB cable)
- 2 USB cables
- Startup manuals
- Pin setting tool
- RZ/N Solution Kit DVD
  - User's manual
  - OS (Linux, ThreadX®(Evaluation version), HW-RTOS)
  - Software PLC Codesys
  - Protocol stacks

## RZ/N Series: Solutions from Renesas Partners

Visit the webpage below for the latest information on RZ/N Series development tools, including solutions from partner companies.  
<https://www.renesas.com/products/microcontrollers-microprocessors/rz/softtools.html#rzn>



# RZ Family Package Lineup

				
<b>Pin-type:</b> 176-HLQFP <b>Size:</b> 20 x 20 mm <b>Pitch:</b> 0.40 mm <b>Thickness:</b> 1.70 mm <b>Group:</b> RZ/T1	<b>Pin-type:</b> 176-LFBGA <b>Size:</b> 8 x 8 mm <b>Pitch:</b> 0.50 mm <b>Thickness:</b> 1.40 mm <b>Group:</b> RZ/A1L, A1LC, A1LU	<b>Pin-type:</b> 176-LFBGA <b>Size:</b> 13 x 13 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 1.40 mm <b>Group:</b> RZ/A2M	<b>Pin-type:</b> 176-LFQFP <b>Size:</b> 24 x 24 mm <b>Pitch:</b> 0.50 mm <b>Thickness:</b> 1.70 mm <b>Group:</b> RZ/A1L, A1LU	<b>Pin-type:</b> 196-LFBGA <b>Size:</b> 12 x 12 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 1.70 mm <b>Group:</b> RZ/N1L, N1S
				
<b>Pin-type:</b> 208-LFQFP <b>Size:</b> 28 x 28 mm <b>Pitch:</b> 0.50 mm <b>Thickness:</b> 1.70 mm <b>Group:</b> RZ/A1L, A1LU	<b>Pin-type:</b> 233-FBGA <b>Size:</b> 15 x 15 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 1.9 mm <b>Group:</b> RZ/A1LU	<b>Pin-type:</b> 256-LFBGA <b>Size:</b> 11 x 11 mm <b>Pitch:</b> 0.50 mm <b>Thickness:</b> 1.40 mm <b>Group:</b> RZ/A2M, A1H, A1M	<b>Pin-type:</b> 256-LFQFP <b>Size:</b> 28 x 28 mm <b>Pitch:</b> 0.40 mm <b>Thickness:</b> 1.70 mm <b>Group:</b> RZ/A1H, A1M	<b>Pin-type:</b> 272-FBGA <b>Size:</b> 17 x 17 mm <b>Pitch:</b> 0.8 mm <b>Thickness:</b> 1.90 mm <b>Group:</b> RZ/A2M
				
<b>Pin-type:</b> 320-FBGA <b>Size:</b> 17 x 17 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 2.30 mm <b>Group:</b> RZ/T1	<b>Pin-type:</b> 324-FBGA <b>Size:</b> 19 x 19 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 2.10 mm <b>Group:</b> RZ/A2M, A1H, A1M	<b>Pin-type:</b> 324-LFBGA <b>Size:</b> 15 x 15 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 1.70 mm <b>Group:</b> RZ/N1D, N1S	<b>Pin-type:</b> 361-LFBGA <b>Size:</b> 13 x 13 mm <b>Pitch:</b> 0.50 mm <b>Thickness:</b> 1.40 mm <b>Group:</b> RZ/G2LC, G2UL	
				
<b>Pin-type:</b> 400-LFBGA <b>Size:</b> 17 x 17 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 1.70 mm <b>Group:</b> RZ/N1D	<b>Pin-type:</b> 456-LFBGA <b>Size:</b> 15 x 15 mm <b>Pitch:</b> 0.50 mm <b>Thickness:</b> 1.40 mm <b>Group:</b> RZ/G2L, V2L	<b>Pin-type:</b> 501-FBGA <b>Size:</b> 21 x 21 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 2.40 mm <b>Group:</b> RZ/G1E, G1C	<b>Pin-type:</b> 551-LFBGA <b>Size:</b> 21 x 21 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 1.40 mm <b>Group:</b> RZ/G2L, V2L	
				
<b>Pin-type:</b> 552-FBGA <b>Size:</b> 21 x 21 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 2.45 mm <b>Group:</b> RZ/G2E	<b>Pin-type:</b> 831-FBGA <b>Size:</b> 27 x 27 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 2.40 mm <b>Group:</b> RZ/G1H, G1M, G1N	<b>Pin-type:</b> 841-FCBGA <b>Size:</b> 15 x 15 mm <b>Pitch:</b> 0.50 mm <b>Thickness:</b> 1.90 mm ± 0.2 mm <b>Group:</b> RZ/V2M		
				
<b>Pin-type:</b> 1022-FBGA <b>Size:</b> 29 x 29 mm <b>Pitch:</b> 0.80 mm <b>Thickness:</b> 2.5 mm      3.15 mm <b>Group:</b> RZ/G2M, G2N      RZ/G2H				

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