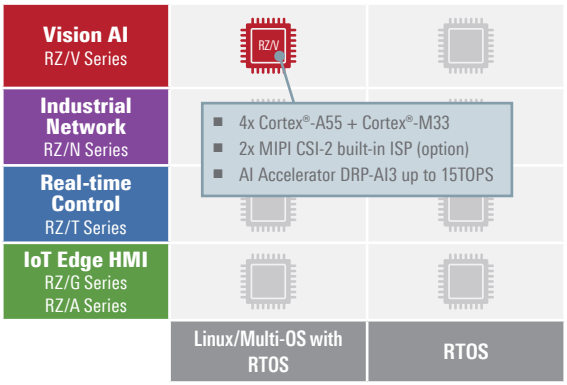
15 TOPS, Power-Efficient 64-bit Embedded AI Microprocessor

RENESAS RZ/V2N GROUP

Build advanced AI processing and camera processing applications with Renesas RZ/V2N Vision AI MPU developed based on Renesas' proprietary AI accelerator (DRP-AI3), and delivers AI performance of up to 15 TOPS. The RZ/V2N MPU provides high-performance AI inference through its embedded quad Arm® Cortex®-A55 CPUs and an Arm® Cortex®-M33 CPU. The RZ/V2N MPU is also embedded with an image signal processor (ISP) and 2 channels of MIPI® CSI-2® to improve AI accuracy and simultaneously process captured images.

The RZ/V2N is an ideal microprocessor for applications such as monitoring camera, mobile robot and driver monitoring system (DMS), where advanced AI processing must be implemented without a cooling fan.



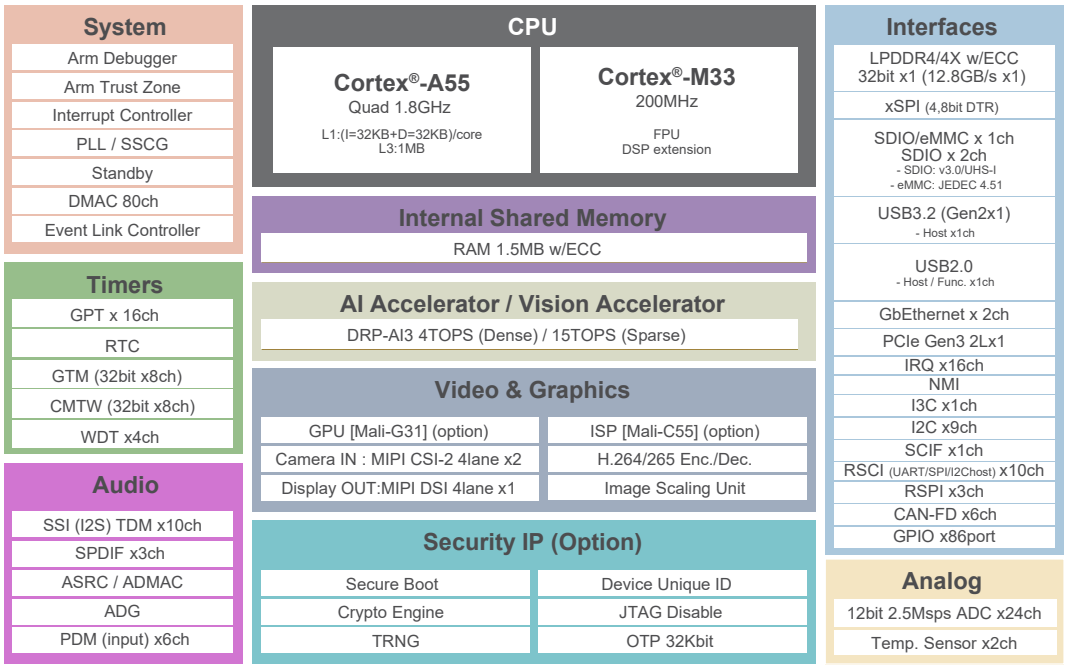
Features

- 4x Cortex®-A55 (1.8GHz) and Cortex®-M33 (200MHz)
- AI Accelerator DRP-AI3 upto 15TOPS at Sparse
- High power efficiency: 10TOPS/W
- Support low standby power
- 2x MIPI CSI-2 with Arm® Mali™-C55 ISP (option)
- LPDDR4/LPDDR4X Memory Interface, 2x Giga-bit Ethernet
- PCIe® Interface (Gen3/2-lane), 6x CAN Interface (CAN-FD)
- 12bit ADC 24ch
- Package : 15x15mm 840-pin BGA 0.5mm pitch

Applications

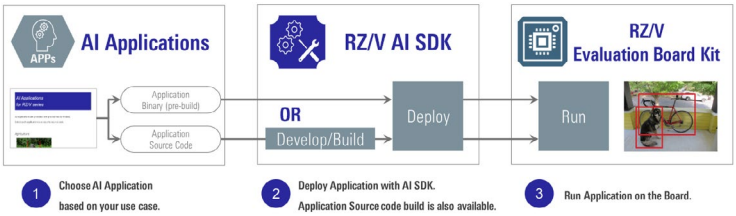
- Monitoring camera
  - Parking lot monitoring
  - Congestion retention analysis
  - Visual inspection
- Mobile robot
  - Vaccume cleaner, Lawn mowing
- DMS

RZ/V2N Block Diagram



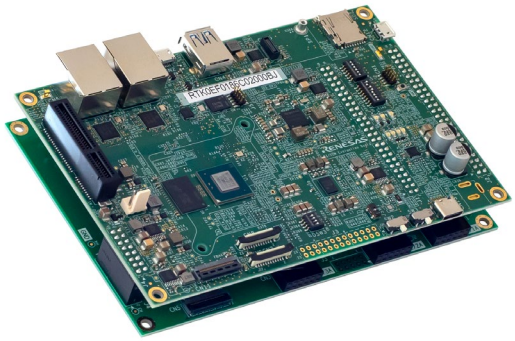
AI Development Tools

Renesas provides various free AI applications with pre-trained AI models. Visit renesas AI SDK and start evaluation.



Evaluation Board Kit (EVK)

RZ/V2N Evaluation Board Kit (EVK) consists of two boards – the main board, an expansion board for HDMI® and audio interfaces. Accessories include a microSD sub board and an eMMC™ sub board that can be connected to the main board.



P/N: RTK0EF0186C03000BJ

Main Board (Dimension: 153 mm x 100 mm)

- Processor: RZ/V2N
- PMIC: RAA215300
- Clock Generator: 5L35023B
- Main Memory: LPDDR4X (8 GB)
- xSPI Flash Memory: 64 MB
- External Memory: microSD Slot
- Sub Board Connector*1 (eMMC™ or microSD Slot)
- High Speed Interface
  - Gigabit Ethernet x 2 ports
  - USB3.2 Gen2 x 1 ch (Host only)
  - USB2.0 x 1 ch (OTG x 1 ch)
  - PCIe® Gen3 x 1 ch (2 lanes max.)
  - MIPI® CSI-2® x 2 ch
  - MIPI® DSI® x 1 ch

Expansion Board (Dimension: 153 mm x 100 mm)

- HDMI® Tx x 1ch
- Audio Auxiliary Input x 1 ch
- Audio Microphone Input x 1 ch
- Audio Headphone Output x 1 ch
- Pmod™ x 4 ch

microSD Sub Board (Dimension: 24 mm x 18 mm)

- External Memory: microSD Slot

eMMC Sub Board (Dimension: 24 mm x 18 mm)

- eMMC™: 64 GB

Note 1: The sub boards are exclusive connections. Please select the sub board according to your system.

Ordering Information

Product Group	RZ/V2N			
Part Number	R9A09G056N41GBG	R9A09G056N42GBG	R9A09G056N45GBG	R9A09G056N46GBG
3G Graphics Accelerator	N/A	Mali™-G31	N/A	Mali™-G31
Image Signal Processor	N/A			
Security	N/A		Available	
Package	FCBGA			
Pin Count	840-Pin			
Package Information	15-mm square, 0.50-mm pitch			

Product Group	RZ/V2N			
Part Number	R9A09G056N43GBG	R9A09G056N44GBG	R9A09G056N47GBG	R9A09G056N48GBG
3G Graphics Accelerator	N/A	Mali™-G31	N/A	Mali™-G31
Image Signal Processor	Mali™-C55			
Security	N/A		Available	
Package	FCBGA			
Pin Count	840-Pin			
Package Information	15-mm square, 0.50-mm pitch			

For more information, visit
www.renesas.com/rzv2n

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www.renesas.com/contact/

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