



# ENTRY-CLASS 64-BIT ARM® CORTEX®-A55 MPU RENESAS RZ/A3UL GROUP

## Entry-class 64-bit Arm® Cortex®-A55 MPU (1 GHz, Single Core)

The RZ/A3UL delivers significant performance, including the highest operating frequency of 1GHz and the ability to connect to high-speed DDR3L/DDR4 RAM. In addition to its high-performance features, RZ/A3UL is an entry-class device providing a cost-effective solution for HMI, IoT Gateway, and audio equipment.



361-pin, 13x13mm PBGA  
(0.5mm pitch)

### Key Features

- 64-bit Arm® Cortex®-A55 (1GHz, single core)
- 16-bit, DDR3L/DDR4-1600 (in line ECC)
- Octal-SPI Flash/RAM I/F\*
- CMOS sensor interfaces (MIPI-CSI2) for camera input
- Display interfaces (Parallel RGB888/RGB666)
- Memory with Error Checking and Correction(ECC)
- Pin-compatible with Linux-based RZ/G2UL and RISC-V based RZ/Five
- RZ/A3UL evaluation kit includes recommended analog devices such as PMIC solution (DA9062), programmable clock generator (5P35023), GreenPAK (SLG46538) and Renesas flash memory (AT25QL128A)

\*The Octa Memory Controller in the RZ/A3UL can connect to one OctaFlash / OctaRAM each that supports the Macronix Serial Multi-I/O (MXSMIO\*) Octa Peripheral Interface (OPI). OctaRAM can only be connected to OPI-compatible memory.

### Benefits

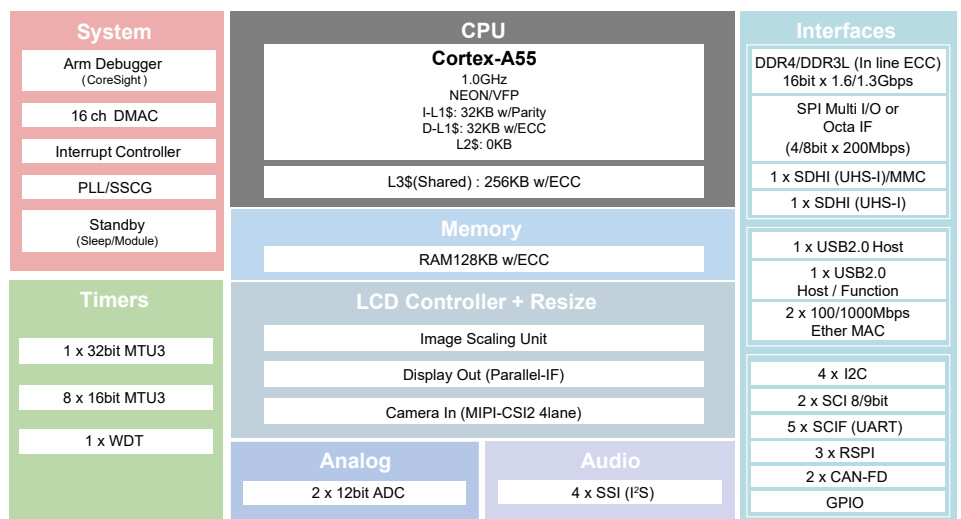
- Cost-effective solution based on high operating frequency of 1GHz on 64bit CPU
- Compatible with major RTOS – Azure RTOS and FreeRTOS
- Build compact systems at low cost with fast RTOS-based startup
- Free to choose between DDR3L/DDR4 or Octal-SPI memory interface that best-fit the product design
- Octal-SPI memory interface enables compact size and cost reduction due to lesser layers of PCB needed

### Target Applications

- Simple camera/ Simple HMI in home appliances and industrial display
- Retail Point of System (POS)
- IoT Gateway/Controller
- Sound System

### Block Diagram

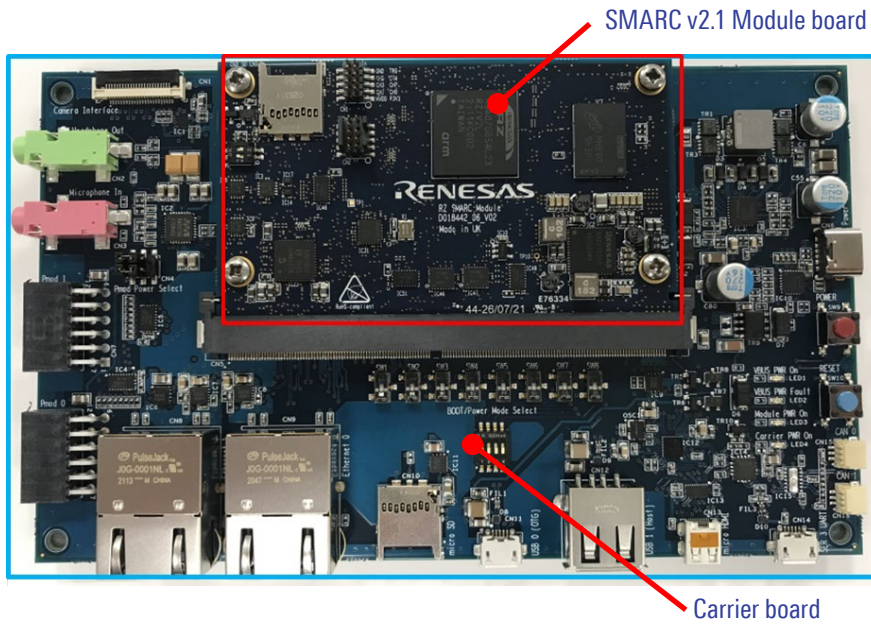
- 64-bit Arm® Cortex®-A55 (1 GHz, single core)
- 16-bit DDR3L/DDR4-1600 (in line ECC)
- Octal-SPI Flash/RAM IF
- Camera IF; MIPI-CSI2 (4 lanes)
- Display IF; Parallel RGB888/RGB666
- 2x Gigabit Ethernet
- 2x CAN (CAN-FD)
- 2x USB2.0 (Host, Host/Peripheral)
- 2x SDHI (UHS-I, UHS-I/MMC)



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## Reference Board (Evaluation Kit)

The reference board of RZ/A3UL has a SMARC v2.1 Module board + Carrier board configuration.



- **Module board (Dimension: 82 mm x 50mm )**
  - Processor: RZ/A3UL
  - Main Memory: 1GB DDR4 (1GB x1)
  - QSPI NOR FLASH: 128Mb
  - eMMC Memory: 64GB
  - External Storage: micro SD x1
  - JTAG connector
  - PMIC (DA9062), Programmable clock generator (5P35023), GreenPAK (SLG46538) and Flash memory (AT25QL128A) used in RZ/A3UL EVK
- **Carrier board (Dimension: 160mm x 100mm )**
  - Gigabit Ethernet x2
  - USB2.0x 2ch (OTG x1ch, Host x1ch)
  - MIPI-CSI Camera connector
  - Parallel Output (RGB888)
  - External Storage : micro SD x1
  - Audio Line in x1
  - Audio Line out x1
  - PMOD x2
  - USB-Type C for Power Input

## Product Information

	R9A07G063U02BG	R9A07G063U01BG
CPU/Frequency	Cortex-A55/1.0GHz	Cortex-A55/1.0GHz
On-Chip RAM	128KB (w/ ECC)	128KB (w/ ECC)
Supported Flash ROM	Serial (DDR), Octal-SPI Flash	Octal-SPI Flash
RAM Interface	DDR3L/DDR4, Octal-SPI RAM	- Octal-SPI RAM
Graphics Engine	Unavailable	Unavailable
LCD Controller	LCDC (1ch)	LCDC (1ch)
Camera Interface	Digital (Serial:MIPI)	Digital (Serial:MIPI)
Ethernet	2 x 10/100/1000 Ethernet	2 x 10/100/1000 Ethernet
Connectivity	1 x USB2.0 Host, 1 x USB2.0 (Host/Function), 2x SDHI (UHS-I)	1 x USB2.0 Host, 1 x USB2.0 (Host/Function), 2x SDHI (UHS-I)
DDR-RAM I/F	Yes	No
Package	361BGA	361BGA

Visit [www.renesas.com/rza3UL](http://www.renesas.com/rza3UL) for more information.

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