Entry Level MPU with the AI accelerator (DRP-AI)

RENESAS RZ/V2L EMBEDDED AI MPU

More Cost-Efficient Vision AI solution

In order to utilize embedded AI, it is necessary to overcome various issues such as heat dissipation, shortening of development period, and cost, as well as the performance of AI accelerators and CPUs.

We have released a new product RZ/V2L for the entry class of the Renesas RZ/V series that solves such problems. Equipped with Renesas’ original AI accelerator DRP-AI (Dynamically Reconfigurable Processor for AI), it realizes high-precision AI inference and industry-leading power efficiency.

Key Features

- 64-bit Arm® Cortex®-A55 (1.2GHz, dual or single core) and Cortex®-M33
- DRP-AI (1TOPS/W class) capable of running the Tiny YOLOv2 program at 28 frames per second (fps)
- Simple ISP functions required for machine vision are provided in the DRP library
- 16-bit, single-channel DDR memory interface
- 3-D graphics functions (Arm® Mali™-G31 GPU)
- Video codec (H.264)
- CMOS sensor interfaces (MIPI-CSI and Parallel) for camera input
- Display interfaces (MIPI-DSI and Parallel)
- Memory with error checking and correction (ECC)
- Available in 15mm square or 21mm square BGA packages that are pin-compatible with the RZ/G2L
- Provides a single-chip PMIC solution (RAA215300) optimized for the RZ/V2L group
- Released a Winning Combination HMI SoM with AI Accelerator provided by RZ/V2L and powerful Power&Timing ICs of Renesas

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Block Diagram

### Reference Board (Evaluation Kit)

The reference board of RZ/V2L has a SMARC v2.1 Module board + Carrier board configuration.

**SMARC v2.1 Module board**
- **CPU**
  - Arm® Cortex®-A55 (1.2GHz)
  - Arm® TrustZone®
  - 16 × DMAC
  - Interrupt Controller
  - PLL/SSCG
  - Standby (Deep/Soft/Power/Module)

- **AI Accelerator**
  - DRP-AI

- **Memory**
  - RAM 128KB w/ECC

- **Video & Graphics**
  - Mali™-G31

- **Security (Option)**
  - Secure Boot
  - Crypto Engine
  - TRNG

- **Timers**
  - 1 × 32bit MTU3
  - 8 × 16bit MTU3
  - 8 × 32bit PWM
  - 3 × WDT

- **Audio**
  - 4 × SSI (I²S)
  - 1 × SRC

- **Interfaces**
  - 1 × SPI Multi I/O (8bit DOR)
  - 1 × SDHI(UHS-I/MMC)
  - 1 × SDHI(UHS-I)
  - 1 × USB2.0 Host
  - 1 × USB2.0 Host / Function
  - 1 × SDHI(UHS-I)

- **Analog**
  - 8 × 12bit ADC

- **AI Accelerator; DRP-AI**
- **2× Cortex®-A55 (1.2GHz), Cortex®-M33 (200MHz)**
- **16bit DDR3L/DDR4-1600 (in line ECC)**
- **Simple ISP (provided in the DRP library)**
- **Camera IF; MIPI-CSI2 (4 lanes) and Parallel**
- **H.264 codec**
- **3D graphics function (Arm™ Mali™-G31)**
- **Display IF; MIPI-DSI (4 lanes) and Parallel**

For more details on RZ/V2L Group MPUs, please visit: RZ/V2L: https://www.renesas.com/rzv2l

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