RZ/V2H AI Software Development Kit Version 5.00

Release Note

R11AN0840EJ0500
Version.5.00
31 July, 2024

Introduction

RZ/V2H AI Software Development Kit (AI SDK) is an AI application development environment for RZ/V2H Evaluation Board Kit. This release note describes the contents of the RZ/V2H AI SDK.

Contents

1. Release Items

The release items in the RZ/V2H AI SDK are as follows.

1.1 Name and Version

RZ/V2H AI Software Development Kit Version 5.00

1.2 Target Board

RZ/V2H Evaluation Board Kit (Secure type) [RTK0EF0168C04000BJ]

Note: Any software support provided is for evaluation purposes only.

1.3 Features

This package provides standard components necessary to develop AI applications.

1. RZ/V2H AI SDK
   - Provided as RTK0EF0180F05000SJ.zip.

   - SD Card Image Files

     These are WIC image files (.wic.bmap and .wic.gz), which contains the followings for RZ/V2H evaluation Board Kit.

     ✓ Bootloader
     ✓ Linux Kernal Images
     ✓ Linux Device Tree
     ✓ Linux Root Filesystem

     User can use the WIC image files to easily create a SD Card to boot the Linux on RZ/V2H Evaluation Board Kit.

     User must prepare the SD card with a capacity of 16GB or larger for write these WIC image files to the SD card.

   - Cross Compiler

     This is a compiler for Linux application, which runs on RZ/V2H Evaluation Board Kit.

   - RZ/V2H AI SDK Installer

     This is an installer for AI application development environment, which runs on Docker.

     It includes DRP-AI Translator i8 v1.02 installer.

2. RZ/V2H AI SDK Source Code
   - Provided as RTK0EF0180F05000SJ_linux-src.zip.

   - Yocto Linux Recipe

     This is the Linux source code of RZ/V2H AI SDK.

1.4 Major updates

- Supported DRP-AI TVM v2.3.0.
- Updated RZ/V2H Linux BSP.
- Updated RZ/V2H Graphics Library to v1.2.2.
- Updated RZ/V2H Video Codec Library to v3.1.1.
- Updated RZ/V2H OpenCV Accelerator to v1.10.
- Updated RZ/V2H DRP-AI Driver to v1.01.

1.5 File Contents

1.5.1 RZ/V2H AI SDK

Table 1-1 RZ/V2H AI SDK Contents list shows the file contents of RTK0EF0180F05000SJ.zip.

Table 1-1 RZ/V2H AI SDK Contents list

Contents	Explanation
r11an0840ej0500-rzv2h-ai-sdk.pdf	This document
board_setup	Files required for booting the board.
eSD.zip	SD Card image files containing the followings for RZ/V2H Evaluation Board Kit. ✓ Bootloader ✓ Linux Kernel Image (The boot program) ✓ Linux Device Tree File (The configuration file for booting) ✓ Linux Root Filesystem
core-image-weston-rzv2h-evk-ver1.wic.bmap	
core-image-weston-rzv2h-evk-ver1.wic.gz	
ai_sdk_setup	Files required for installing RZ/V2H AI SDK on Ubuntu PC.
poky-glibc-x86_64-core-image-weston-aarch64-rzv2h-evk-ver1-toolchain-3.1.31.sh	Application cross compiler installer.
Dockerfile	Dockerfile for installing RZ/V2H AI SDK
DRP-AI_Translator_i8-v1.02-Linux-x86_64-Install	DRP-AI Translator i8 installer
references	Reference information
linux_licenses.zip	Linux license information. Referred by Linux License List.
core-image-weston-rzv2h-evk-ver1.manifest	Manifest file that contains software component information.
documents	Related documents
r20ut5336ej0102-drp-ai-translator-i8.pdf	DRP-AI Translator i8 User's Manual (Document only for DRP-AI Translator i8 user)
r20ut5184ej0103-drp-ai.pdf	DRP-AI Quantizer User's Manual (Document only for DRP-AI Translator i8 user)
r11an0841ej0500-rzv2h-ai-sdk(Linux License List).pdf	List of license information included in Linux files and application cross compiler. Copyright information is not included.

1.5.2 RZ/V2H AI SDK Source Code

To see the file contents of RTK0EF0180F05000SJ_linux-src.zip, please refer to README.txt included in the package.

For more information on RZ/V2H AI SDK Source Code, please refer to following web page.

https://renesas-rz.github.io/rzv_ai_sdk/5.00/howto_build_aisdk_v2h.html

1.6 Specification and Configuration

Please refer to following web page regarding the RZ/V2H AI SDK Specification and Configuration.

https://renesas-rz.github.io/rzv_ai_sdk/5.00/ai-sdk.html

2. How to install and use AI SDK

Please see the RZ/V AI SDK GitHub pages (https://renesas-rz.github.io/rzv_ai_sdk/5.00/).

Version History

Ver.	Date	Description	
		Page	Summary
3.00	29 Feb, 2024	-	Issued.
4.00	31 May, 2024	-	Supported DRP-AI TVM v2.2.1. Increased free space on the Linux Root Filesystem to approximately 10 GB.
5.00	31 Jul, 2024	-	Supported DRP-AI TVM v2.3.0. Supported RZ/V2H Linux BSP update. Supported RZ/V2H Graphics Library update to v1.2.2. Supported RZ/V2H Video Codec Library update to v3.1.1. Supported RZ/V2H OpenCV Accelerator update to v1.10. Supported RZ/V2H DRP-AI Driver update to v1.01.

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.
2. Processing at power-on

   The state of the product is undefined at the time when power is supplied. The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the time when power is supplied. In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the time when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the time when power is supplied until the power reaches the level at which resetting is specified.
3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.
4. Handling of unused pins

   Handle unused pins in accordance with the directions given under handling of unused pins in the manual. The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of the LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible.
5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is stabilized. When the clock signal is generated with an external resonator or from an external oscillator during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Additionally, when switching to a clock signal produced with an external resonator or by an external oscillator while program execution is in progress, wait until the target clock signal is stable.
6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.
8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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