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# RZ/T2H Group

## Release Note for RZ/T2H Example program V2.00

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### Introduction

This is the release note for example program running on RZ/T2H.

### Target Device

RZ/T2H

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## 1. Release Notes

This example program is for RZ/T2H.

## 2. Deliverables

Deliverables	Example program for RZ/T2H(Ver 2.00)
Files	r01an7146ej0200-rzt2h- example-program-package.zip
	<i>This zip file contains this documentation and example programs.</i>
	r01an7146ej0200-rzt2h -example-program-package.pdf
	<i>This documentation. It is included in the above zip file.</i>

## 3. Tools

- Development environment (EWARM)
  - ◇Flexible Software Package(FSP) for RZ/T2 v2.2.0
  - ◇IDE: Embedded Workbench® for Arm (EWARM)
    - Version 9.60.2 + patch(EWARM patch for RZT2H rev1.0)
  - ◇FSP Smart Configurator (FSP SC) 2024-10
  - ◇Debug probe
    - IAR I-jet
- Development environment (e<sup>2</sup> studio)
  - ◇Flexible Software Package(FSP) for RZ/T2 v2.2.0
  - ◇IDE: e<sup>2</sup> Studio 2024-10
    - Toolchain version
      - GNU ARM Embedded: 12.2Rel.1 arm-12.24
      - GCC ARM A-Profile (AArch64 bare-metal): 10.3.1.20210621
  - ◇Debug probe
    - Segger J-Link OB

## 4. Features

The following table lists Modules used by example program. "File name" in bold are added/updated example programs.

Mainly used module name	Supported by FSP or not	File name
Analog to Digital Converter (r_adc)	Yes	<b>RZT2H_EVB_adc_Rev200.zip</b>
I/O Ports (r_ioport)	Yes	<b>RZT2H_EVB_bsp_Rev200.zip</b>
Controller Area Network Flexible Data(r_canfd)	Yes	<b>RZT2H_EVB_canfd_Rev200.zip</b>
Clock Generation Circuit (r_cgc)	Yes	<b>RZT2H_EVB_cgc_Rev200.zip</b>
Compare Match Timer(r_cmt)	Yes	<b>RZT2H_EVB_cmt_Rev200.zip</b>
Compare Match Timer W (r_cmtw)	Yes	<b>RZT2H_EVB_cmtw_Rev200.zip</b>
Cyclic Redundancy Check(CRC) Calculator(r_crc)	Yes	<b>RZT2H_EVB_crc_Rev200.zip</b>
Data Operation Circuit (r_doc)	Yes	<b>RZT2H_EVB_doc_Rev200.zip</b>
Direct Memory Access Controller (r_dmac)	Yes	<b>RZT2H_EVB_dmac_Rev0200.zip</b>
Delta-sigma interface (r_dsmif) General PWM Timer (r_gpt) Port Output Enable for GPT (r_poeg)	Yes	<b>RZT2H_EVB_dsmif_gpt_poeg_Rev200.zip</b>
Event Link Controller (r_elc)	Yes	<b>RZT2H_EVB_elc_Rev200.zip</b>
Ethernet (r_ether) Ethernet PHY (r_ether_phy) Ethernet SWITCH (r_ether_switch) Ethernet SELECTOR (r_ether_selector)	Yes	<b>RZT2H_EVB_Ethernet_Rev200.zip</b>
FreeRTOS Port (rm_freertos_port)	Yes	<b>RZT2H_EVB_FreeRTOS_Rev200.zip</b>
FreeRTOS Plus TCP (rm_freertos_plus_tcp)	Yes	<b>RZT2H_EVB_FreeRTOSplusTCP_Rev200.zip</b>
General PWM Timer (r_gpt)General PWM Timer phase count Motor Control Driver (r_gpt_phase_count)	Yes	<b>RZT2H_EVB_gpt_phase_count_Rev200.zip</b>
Expanded Serial Peripheral Interface (xSPI) HyperBus (r_xspi_hyper)	Yes	<b>RZT2H_EVB_HyperRAM_Rev200.zip</b>
IIC Master on IIC(r_iic_master)	Yes	<b>RZT2H_EVB_iic_master_Rev200.zip</b>
IIC Slave on IIC(r_iic_slave)	Yes	<b>RZT2H_EVB_iic_slave_Rev200.zip</b>
Multi-Function Timer Pulse Unit 3 phase count Motor Control Driver (r_mtu3_phase_count)	Yes	<b>RZT2H_EVB_mtu3_phase_count_Rev200.zip</b>
Multi-Function Timer Pulse Unit 3 (r_mtu3) Multi-Function Timer Pulse Unit 3 Three-Phase Motor Control Driver (r_mtu3_three_phase) Port Output Enable 3 (r_poe3)	Yes	<b>RZT2H_EVB_mtu3_poe3_Rev200.zip</b>
Multi-Function Timer Pulse Unit 3 (r_mtu3)	Yes	<b>RZT2H_EVB_mtu3_Rev200.zip</b>
PCI Express 3.0 Interface(r_pcie_ep) PCI Express 3.0 Interface(r_pcie_rc)	Yes	<b>RZT2H_EVB_pcie_Rev200.zip</b>
Real Time Clock (r_rtc)	Yes	<b>RZT2H_EVB_rtc_Rev200.zip</b>
Serial Communications Interface (SCI) UART (r_sci_uart)	Yes	<b>RZT2H_EVB_sci_uart_Rev200.zip</b>
Serial Peripheral Interface (r_spi)	Yes	<b>RZT2H_EVB_spi_Rev200.zip</b>

MCU Board Support Package	Yes	RZT2H_EVB_tfu_Rev200.zip
Temperature Sensor Unit (r_tsu)	Yes	RZT2H_EVB_tsu_Rev200.zip
USB Host Communications Device Class Driver (r_usb_hcdc)	Yes	RZT2H_EVB_usb_hcdc_Rev200.zip
USB Host Human Interface Device Class Driver (r_usb_hhid)	Yes	RZT2H_EVB_usb_hhid_Rev200.zip
USB Host Mass Storage Class Driver (r_usb_hmsc)	Yes	RZT2H_EVB_usb_hmsc_Rev200.zip
USB Peripheral Communications Device Class (r_usb_pcdc)	Yes	RZT2H_EVB_usb_pcdc_Rev200.zip
USB Peripheral Mass Storage Class (r_usb_pmsc)	Yes	RZT2H_EVB_usb_pmsc_Rev200.zip
Expanded Serial Peripheral Interface (xSPI) OSPI (r_xspi_ospi)	Yes	RZT2H_EVB_xspi_ospi_Rev200.zip
Expanded Serial Peripheral Interface (xSPI) QSPI (r_xspi_qspi)	Yes	RZT2H_EVB_xspi_qspi_Rev200.zip

**Revision History**

Rev.	Date	Description	
		Page	Summary
2.00	Nov. 26, 2024	-	First Edition issued

# 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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