RZ/T1 Group

Note of How to Use USB Sample Driver in On-chip Extended SRAM

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Introduction

This application note describes precautions when USB sample driver operates using On-chip extended SRAM.

Target Device

RZ/T1 Group

Related Documents

1. RZ/T1 Group User's Manual: Hardware (Document No.R01UH0483EJ0120)
2. RZ/T1 Group USB Peripheral Basic firmware (Document No.R01AN2630EJ0120)
3. RZ/T1 Group USB Peripheral Communications Device Class Driver (PCDC) (Document No.R01AN2631EJ0120)
4. RZ/T1 Group USB Peripheral Mass Storage Class Driver (PMSC) (Document No.R01AN2632EJ0120)
5. RZ/T1 Group USB Host Basic Firmware (Document No.R01AN2633EJ0120)
6. RZ/T1 Group USB Host Mass Storage Class Driver (HMSC) (Document No.R01AN2634EJ0120)
7. RZ/T1 Group USB Host Communications Device Class Driver (HCDC) (Document No.R01AN2635EJ0120)
8. RZ/T1 Group USB Host Human Interface Device Class Driver (HHID) (Document No.R01AN2636EJ0120)

— Renesas Electronics Website
http://www.renesas.com/
— USB Devices Page
http://www.renesas.com/prod/usb/

Contents

1. Overview

USB sample driver is premised on arranging variables on ATCM.

If you move the variable to Data RAM(2200_0000h – 2207_FFFFh) and enable the cache function of Cortex-R4, you need to leave some variables in ATCM.

This application note describes the variables to be left in ATCM.

1.1 Target sample program

Sample programs covered by this application note is shown below.

Table 1 Target sample program list

sample program name	description
an_r01an2630ej0120_rzt1_usb	USB Peripheral Basic firmware
an_r01an2631ej0120_rzt1_usb	USB Peripheral Communications Device Class Driver (PCDC)
an_r01an2632ej0120_rzt1_usb	USB Peripheral Mass Storage Class Driver (PMSC)
an_r01an2633ej0120_rzt1_usb	USB Host Basic Firmware
an_r01an2634ej0120_rzt1_usb	USB Host Mass Storage Class Driver (HMSC)
an_r01an2635ej0120_rzt1_usb	USB Host Communications Devices Class Driver (HCDC)
an_r01an2636ej0120_rzt1_usb	USB Host Human Interface Device Class Driver (HHID)

1.2 Purpose and Target user

User who places variables in Data RAM(2200_0000h-2207_FFFFh) and enables cache function of Cortex-R4.

1.3 Terms and Abbreviations

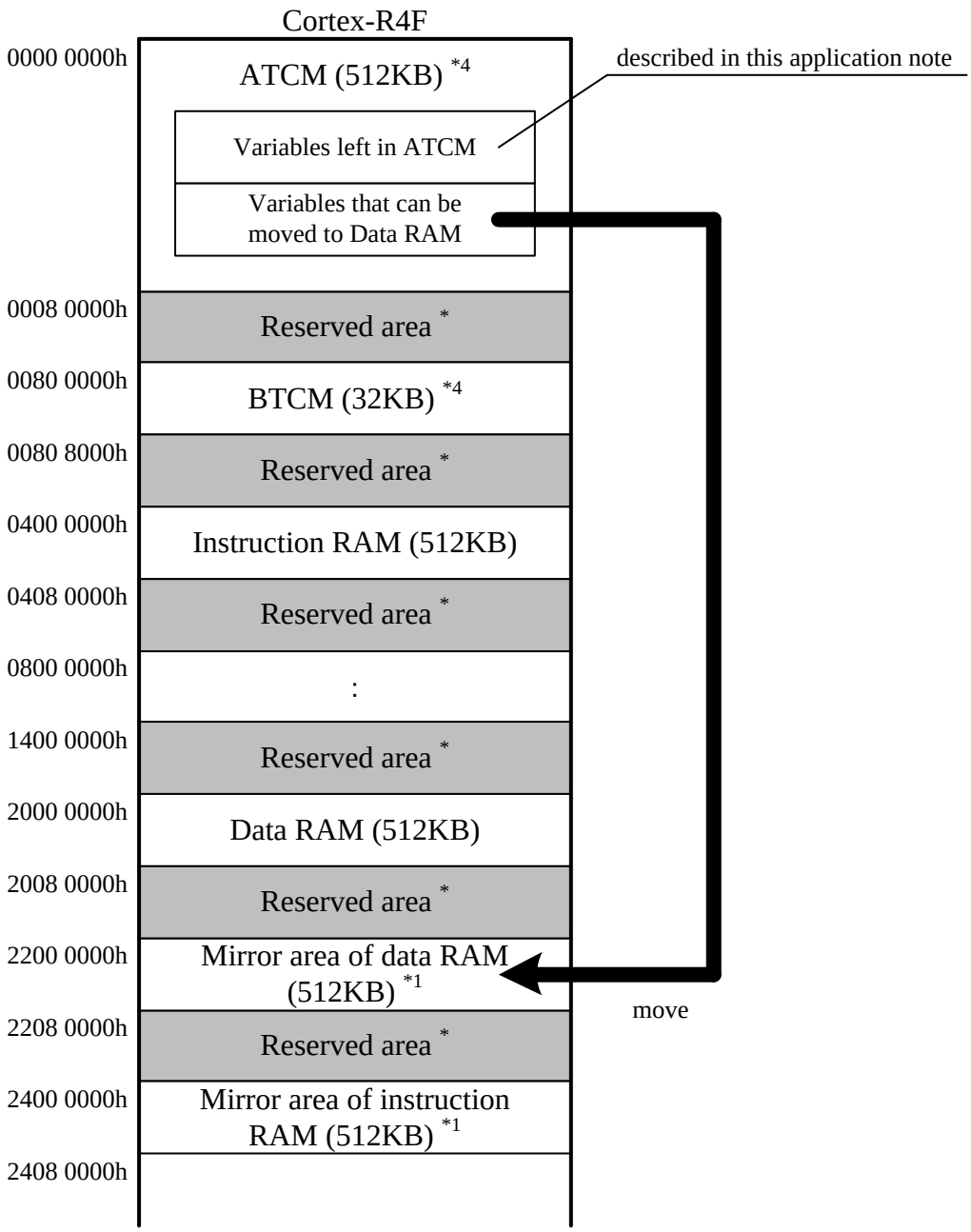
The terms and abbreviations used in this application note are as follows.

MSC	:	Mass Storage Class Driver
CDC	:	Communications Device Class Driver
HID	:	Human Interface Device Class Driver
USB	:	Universal Serial Bus
Host Basic	:	USB Basic Host Driver
Peripheral Basic	:	USB Basic Peripheral Driver

2. Address Map

Figure 1 shows the Memory Map (RAM related only) when Cortex-R4 becomes bus master.

For all Memory Map of RZ/T1, refer to RZ/T1 Group User's Manual: Hardware (Document No.R01UH0483).



Note: Reserved areas should not be accessed.

Notes: 1. Can be cached. (For other areas, caching should not be enabled by the MPU.)

4. Cortex-R4F tightly coupled memory space

Figure 1 Memory Map

3. Variables to be left in ATCM

This chapter shows the variables to be left in ATCM with each of seven types of USB sample program.

In this chapter, only USB related variables are described.

Variables filled with orange cells in table cells are variables defined in the source contained in folders under src/drv/usbh/basic.

3.1 USB Peripheral Basic firmware

This chapter shows the variables to be left in ATCM of USB sample program an_r01an2630ej0120_rzt1_usb.

Table 2 List of variables to be left in ATCM (USB Peripheral Basic firmware)

variables	file
usb_smpl_bi_data_base	r_usb_vendor_papl.c
usb_smpl_bo_data	r_usb_vendor_papl.c
usb_smpl_ii_data	r_usb_vendor_papl.c
usb_smpl_io_data	r_usb_vendor_papl.c

3.2 USB Peripheral Communications Device Class Driver (PCDC)

This chapter shows the variables to be left in ATCM of USB sample program an_r01an2631ej0120_rzt1_usb.

Table 3 List of variables to be left in ATCM (USB Peripheral Communications Device Class Driver (PCDC))

variables	file
cdc_eptbl1	r_usb_pcdc_descriptor.c
cdc_trans_data_base	r_usb_pcdc_apl.c
usb_gcdc_LineCoding	r_usb_pcdc_driver.c

3.3 USB Peripheral Mass Storage Class Driver (PMSC)

This chapter shows the variables to be left in ATCM of USB sample program an_r01an2632ej0120_rzt1_usb.

Table 4 List of variables to be left in ATCM (USB Peripheral Mass Storage Class Driver (PMSC))

variables	file
g_pmsc_atapi_rd_dat_tbl	r_usb_atapi_driver.c
usb_gpmsc_Cbw	r_usb_pmsc_driver.c
usb_gpmsc_Csw	r_usb_pmsc_driver.c

3.4 USB Host Basic Firmware

This chapter shows the variables to be left in ATCM of USB sample program an_r01an2633ej0120_rzt1_usb.

Table 5 List of variables to be left in ATCM (USB Host Basic Firmware)

variables	file
ehci_Itd	r_usb_hEhciMemory.c
ehci_PeriodicFrameList	r_usb_hEhciMemory.c
ehci_Qh	r_usb_hEhciMemory.c
ehci_Qtd	r_usb_hEhciMemory.c
ehci_Sitd	r_usb_hEhciMemory.c
hci_SetupBuffer	r_usb_hHci.c
ohci_EdMemory	r_usb_hOhciMemory.c
ohci_IsoBuffer	r_usb_hOhciMemory.c
ohci_TdMemory	r_usb_hOhciMemory.c
ohci_hcca	r_usb_hOhciMemory.c
usb_ghhub_Data	r_usb_hhubsys.c
usb_ghhub_Descriptor	r_usb_hhubsys.c
usb_ghhub_Status	r_usb_hhubsys.c
usb_shhub_ClassRequest	r_usb_hhubsys.c
usb_shhub_ControlMess	r_usb_hhubsys.c
usb_shhub_DataMess	r_usb_hhubsys.c
usb_ghstd_ClassData	r_usb_hManager.c
usb_ghstd_ClassRequest	r_usb_hManager.c
usb_ghstd_ConfigurationDescriptor	r_usb_hManager.c
usb_ghstd_DeviceDescriptor	r_usb_hManager.c
usb_shstd_DummyData	r_usb_hManager.c
usb_shstd_StdRequest	r_usb_hManager.c
usb_gvendor_smpl_bi_data	r_usb_vendor_hapl.c
usb_gvendor_smpl_bo_data	r_usb_vendor_hapl.c
usb_gvendor_smpl_ii_data	r_usb_vendor_hapl.c
usb_gvendor_smpl_io_data	r_usb_vendor_hapl.c
usb_gvendor_smpl_si_data	r_usb_vendor_hapl.c
usb_gvendor_smpl_so_data	r_usb_vendor_hapl.c

3.5 USB Host Mass Storage Class Driver (HMSC)

This chapter shows the variables to be left in ATCM of USB sample program an_r01an2634ej0120_rzt1_usb.

Table 6 List of variables to be left in ATCM (USB Host Mass Storage Class Driver (HMSC))

variables	file
ehci_Itd	r_usb_hEhciMemory.c
ehci_PeriodicFrameList	r_usb_hEhciMemory.c
ehci_Qh	r_usb_hEhciMemory.c
ehci_Qtd	r_usb_hEhciMemory.c
ehci_Sitd	r_usb_hEhciMemory.c
hci_SetupBuffer	r_usb_hHci.c
ohci_EdMemory	r_usb_hOhciMemory.c
ohci_IsoBuffer	r_usb_hOhciMemory.c
ohci_TdMemory	r_usb_hOhciMemory.c
ohci_hcca	r_usb_hOhciMemory.c
usb_ghhub_Data	r_usb_hhubsys.c
usb_ghhub_Descriptor	r_usb_hhubsys.c
usb_ghhub_Status	r_usb_hhubsys.c
usb_shhub_ClassRequest	r_usb_hhubsys.c
usb_shhub_ControlMess	r_usb_hhubsys.c
usb_shhub_DataMess	r_usb_hhubsys.c
usb_ghstd_ClassData	r_usb_hManager.c
usb_ghstd_ClassRequest	r_usb_hManager.c
usb_ghstd_ConfigurationDescriptor	r_usb_hManager.c
usb_ghstd_DeviceDescriptor	r_usb_hManager.c
usb_shstd_DummyData	r_usb_hManager.c
usb_shstd_StdRequest	r_usb_hManager.c
usb_ghmsc_Cbw	r_usb_hmsc_driver.c
usb_ghmsc_ClassControl	r_usb_hmsc_driver.c
usb_ghmsc_ClassData	r_usb_hmsc_driver.c
usb_ghmsc_Csw	r_usb_hmsc_driver.c
usb_ghmsc_ReceiveData	r_usb_hmsc_driver.c
usb_ghmsc_TransData	r_usb_hmsc_driver.c
usb_ghmsc_Data	r_usb_hstorage_driver.c
ff_fs	r_usb_hmsc_apl.c
file	r_usb_hmsc_apl.c
r_data	r_usb_hmsc_apl.c
w_data	r_usb_hmsc_apl.c

3.6 USB Host Communications Devices Class Driver (HCDC)

This chapter shows the variables to be left in ATCM of USB sample program an_r01an2635ej0120_rzt1_usb.

Table 7 List of variables to be left in ATCM (USB Host Communications Devices Class Driver (HCDC))

variables	file
ehci_Itd	r_usb_hEhciMemory.c
ehci_PeriodicFrameList	r_usb_hEhciMemory.c
ehci_Qh	r_usb_hEhciMemory.c
ehci_Qtd	r_usb_hEhciMemory.c
ehci_Sitd	r_usb_hEhciMemory.c
hci_SetupBuffer	r_usb_hHci.c
ohci_EdMemory	r_usb_hOhciMemory.c
ohci_IsoBuffer	r_usb_hOhciMemory.c
ohci_TdMemory	r_usb_hOhciMemory.c
ohci_hcca	r_usb_hOhciMemory.c
usb_ghhub_Data	r_usb_hhubsys.c
usb_ghhub_Descriptor	r_usb_hhubsys.c
usb_ghhub_Status	r_usb_hhubsys.c
usb_shhub_ClassRequest	r_usb_hhubsys.c
usb_shhub_ControlMess	r_usb_hhubsys.c
usb_shhub_DataMess	r_usb_hhubsys.c
usb_ghstd_ClassData	r_usb_hManager.c
usb_ghstd_ClassRequest	r_usb_hManager.c
usb_ghstd_ConfigurationDescriptor	r_usb_hManager.c
usb_ghstd_DeviceDescriptor	r_usb_hManager.c
usb_shstd_DummyData	r_usb_hManager.c
usb_shstd_StdRequest	r_usb_hManager.c
cdc_dev_info	r_usb_hcdc_apl.c
usb_ghcdc_ClassRequestData	r_usb_hcdc_driver.c
usb_ghcdc_string_desc	r_usb_hcdc_driver.c

3.7 USB Host Human Interface Device Class Driver (HHID)

This chapter shows the variables to be left in ATCM of USB sample program an_r01an2636ej0120_rzt1_usb.

Table 8 List of variables to be left in ATCM (USB Host Human Interface Device Class Driver (HHID))

variables	file
ehci_Itd	r_usb_hEhciMemory.c
ehci_PeriodicFrameList	r_usb_hEhciMemory.c
ehci_Qh	r_usb_hEhciMemory.c
ehci_Qtd	r_usb_hEhciMemory.c
ehci_Sitd	r_usb_hEhciMemory.c
hci_SetupBuffer	r_usb_hHci.c
ohci_EdMemory	r_usb_hOhciMemory.c
ohci_IsoBuffer	r_usb_hOhciMemory.c
ohci_TdMemory	r_usb_hOhciMemory.c
ohci_hcca	r_usb_hOhciMemory.c
usb_ghhub_Data	r_usb_hhubsys.c
usb_ghhub_Descriptor	r_usb_hhubsys.c
usb_ghhub_Status	r_usb_hhubsys.c
usb_shhub_ClassRequest	r_usb_hhubsys.c
usb_shhub_ControlMess	r_usb_hhubsys.c
usb_shhub_DataMess	r_usb_hhubsys.c
usb_ghstd_ClassData	r_usb_hManager.c
usb_ghstd_ClassRequest	r_usb_hManager.c
usb_ghstd_ConfigurationDescriptor	r_usb_hManager.c
usb_ghstd_DeviceDescriptor	r_usb_hManager.c
usb_shstd_DummyData	r_usb_hManager.c
usb_shstd_StdRequest	r_usb_hManager.c
hid_dev_info	r_usb_hhid_apl.c
usb_shhid_string_desc	r_usb_hhid_driver.c

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Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	Mar 24, 2017		First edition issue

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   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 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. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment 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 moment 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 moment 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 moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has 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. Moreover, 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.

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