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Linux Interface Specification Device Driver SD/MMC

User's Manual: Software

R-Car H3/M3/M3N/E3/D3/V3U/V3H Series

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How to Use This Manual

- **[Readers]**

This manual is intended for engineers who develop products which use the R-Car H3/M3/M3N/E3/D3/V3U/V3H processor.

- **[Purpose]**

This manual is intended to give users an understanding of the functions of the R-Car H3/M3/M3N/E3/D3/V3U/V3H processor device driver and to serve as a reference for developing hardware and software for systems that use this driver.

- **[How to Read This Manual]**

It is assumed that the readers of this manual have general knowledge in the fields of electrical

— engineering, logic circuits, microcontrollers, and Linux.

→ Read this manual in the order of the CONTENTS.

— To understand the functions of a multimedia processor for R-Car H3/M3/M3N/E3/D3/V3U/V3H

→ See the R-Car H3/M3/M3N/E3/D3/V3U/V3H User's Manual.

— To know the electrical specifications of the multimedia processor for R-Car H3/M3/M3N/E3/D3/V3U/V3H

→ See the R-Car H3/M3/M3N/E3/D3/V3U/V3H Data Sheet.

- **[Conventions]**

The following symbols are used in this manual.

Data significance: Higher digits on the left and lower digits on the right

Note: Footnote for item marked with Note in the text

Caution: Information requiring particular attention

Remark: Supplementary information

Numeric representation: Binary ... xxxx, 0bxxxx, or xxxxB

Decimal ... xxxx

Hexadecimal ... 0xxxxx or xxxxH

Data type: Double word ... 64 bit

Word ... 32 bits

Half word ... 16 bits

Byte ... 8 bits

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Table of Contents

1. Overview	1
1.1 Overview	1
1.2 Function	1
1.3 Connected Port.....	3
1.4 Reference	3
1.4.1 Standard.....	3
1.4.2 Related Documents	5
1.5 Restrictions	5
1.6 Notice.....	6
2. Terminology.....	7
3. Operating Environment.....	8
3.1 Hardware Environment	8
3.2 Module Configuration.....	9
3.3 State Transition Diagram	9
4. External Interface.....	10
4.1 GPIO Customization Interface.....	11
4.1.1 Card Power Control.....	11
4.1.2 Card Detection.....	12
4.1.3 Mechanical Write Protect Switch.....	13
4.1.4 Voltage Switch	13
4.2 Error Codes	17
4.3 Transfer Mode Setting (DMA/PIO)	17
4.4 Driving Capability	18
4.4.1 Setting for SoC	18
4.4.2 Setting for eMMC	19
5. Integration	20
5.1 Directory Configuration.....	20
5.2 Integration Procedure.....	21
5.3 Option Setting	21
5.3.1 Module Parameters.....	21
5.3.2 Kernel Parameters	21
5.3.3 Setting of Dip-SW (R-CarV3U System Evaluation Board Falcon).....	21
5.3.4 Setting of Jumper Switch (R-CarD3 System Evaluation Board Draak).....	21

1. Overview

1.1 Overview

This manual explains the driver module (this module) that controls the SD card/MMC interfaces on R-Car H3/M3/M3N/E3/D3/V3U/V3H.

1.2 Function

This module transmits/receives data to/from the SD card/MMC interfaces on the R-CarH3-SiP/M3-SiP/M3N-SiP/E3/D3/V3U/V3H System Evaluation Board.

The following table lists the function of this module.

Table 1-1 Driver Function¹

Function	support status
SD Memory Card ⁵	SD, SDHC, SDXC ² support
SDIO Card ⁵	support
eMMC	support
Transfer mode	SD/SDIO: 1bit,4bit eMMC: 1bit,4bit,8bit
Bus speed mode	SD: Default Speed(DS), High Speed(HS), UHS-I (SDR104 / SDR50 / SDR25 / SDR12) support, UHS-I(DDR50), UHS-II Not support SDIO: Default Speed(DS), High Speed(HS), UHS-I (SDR104 / SDR50 / SDR25 / SDR12) support, UHS-I(DDR50), UHS-II Not support eMMC: Backward-compatible, high-speed, HS200, HS400 support
DMA function	Internal DMAC support
Card power control	support ³
Card Detection(CD)	support ³
Card Detection(DAT3)	Not support
Write Protection	Not support
SPI mode	Not support
SD Mechanical Write Protect Switch	support ³
SD CPRM Security	Not support
SDIO CMD52 During Data Transfer(C52PUB)	Not support
SDIO Data Transfer Abort(IOABT)	Not support
SDIO Read Wait(RWREQ)	Not support
SDIO Wake Up	Not support
SDIO Suspend/Resume	Not support
eMMC Boot operation	Not support
RPMB	support ⁴
Power Off Notification	support
High Priority Interrupt(HPI)	Not support
Command Queuing	Not support
Enhanced Strobe in HS400 Mode	Not support
Cache Barrier	Not support
Cache Flushing report	Not support
RPMB Throughput Improve	Not support
Secure Write Protection	Not support

¹ Aggressively clock gating to substitute in RuntimePM.

² SDXC memory card that has been formatted with the exFAT cannot be mounted because BSP standard file system does not support the exFAT.

³ This function corresponds to the GPIO customization interface in the device-dependent. Please refer to 4.1 for details.

⁴ For details on how to use the RPMB function, please refer to the R-Car Series, 3rd Generation Security Board Support Package User's Manual.

⁵ R-Car V3U/V3H does not support SD/SDIO.

1.3 Connected Port

This module supports SD/MMC ports on R-CarH3-SiP/M3-SiP/M3N-SiP/E3/D3/V3U/V3H System Evaluation Board.

Table 1-2 Connected port (R-Car H3/M3/M3N)

channel	connected to	support status	Remark
SDHI0	SD Card Connector (CN13)	Yes	4bit
SDHI2(MMC0)	eMMC Connector	Yes	8bit
SDHI3	SD Card Connector (CN14)	Yes	4bit

Table 1-3 Connected port (R-Car E3)

channel	connected to	support status	Remark
SDHI0	SD Card Connector (CN13)	Yes	4bit
SDHI1	microSD Card Connector (CN14)	Yes	4bit
SDHI3(MMC1)	eMMC Connector	Yes	8bit

Table 1-4 Connected port (R-Car D3)

channel	connected to	support status	Remark
SDHI2(MMC0)	eMMC Connector	Yes	8bit

Table 1-5 Connected port (R-Car V3U)

channel	connected to	support status	Remark
SDHI2(MMC0)	eMMC Connector	Yes	8bit.
SDHI2	microSD Card Connector (CN4)	No.	R-Car V3U support only MMC.

Table 1-6 Connected port (R-Car V3H)

channel	connected to	support status	Remark
SDHI2(MMC0)	eMMC Connector	Yes	8bit.

1.4 Reference

1.4.1 Standard

The following table shows the standard that this module corresponds.

Table 1-7 Standard

Reference No.	Issue	Title	Edition	Date
-	SD Card Association	SD Specifications Part 1 Physical Layer Simplified Specification	Version 4.10	Jan. 22, 2013
-	SD Card Association	SD Specifications Part E1 SDIO Simplified Specification	3.00	Feb. 25, 2011
JESD84-B51	JEDEC STANDARD Multi Media Card Association	Embedded Multi-Media Card (e•MMC) Electrical Standard (5.1)	5.1	Feb. 2015

1.4.2 Related Documents

The following table shows the document related to this module.

Table 1-8 Related Documents (R-Car H3/M3/M3N/E3/D3/V3U/V3H)

Reference No.	Issue	Title	Edition	Date
-	Renesas Electronics	R-Car Series, 3rd Generation User's Manual: Hardware	Rev.2.20	Jun. 30, 2020
-	Renesas Electronics	R-CarH3-SiP System Evaluation Board Salvator-X Hardware Manual RTP0RC7795SIPB0011S	Rev.1.09	May. 11, 2017
-	Renesas Electronics	R-CarM3-SiP System Evaluation Board Salvator-X Hardware Manual RTP0RC7796SIPB0011S	Rev.0.04	Oct. 3, 2016
-	Renesas Electronics	R-CarH3-SiP/M3-SiP/M3N-SiP System Evaluation Board Salvator-XS Hardware Manual	Rev.2.04	Jul. 17, 2018
-	Renesas Electronics	R-CarE3 System Evaluation Board Ebisu Hardware Manual RTP0RC77990SEB0010S	Rev.0.03	Apr. 11, 2018
-	Renesas Electronics	R-CarE3 System Evaluation Board Ebisu-4D (E3 board 4xDRAM) Hardware Manual	Rev.1.01	Jul. 19, 2018
	Renesas Electronics	R-CarD3 System Evaluation Board Hardware Manual RTP0RC77995SEB0010S	Rev.1.20	Jul. 25, 2017
-	Renesas Electronics	R-Car V3U Series User's Manual	Rev.0.5	Jul. 31, 2020
-	Renesas Electronics	R-CarV3U System Evaluation Board Falcon Hardware Manual	Rev.0.01	Sep. 11, 2020
	Renesas Electronics	R-CarV3H System Evaluation Board Condor-I Hardware Manual	Rev.0.02	Nov. 11, 2019
	Renesas Electronics	R-Car V3H_2 Additional Document for User's Manual: Hardware	Rev.0.50	Jul. 31, 2020

1.5 Restrictions

None.

1.6 Notice

- 1) The Drivability of SD/MMC I/F depends on individual board.

Refer to 4.4 Driving Capability and adjust the driving capability value according to your board.

Ex)

In R-Car M3N Salvator X/XS, if eMMC drive (HS400 mode) cannot be recognized, refer to 4.4.2 Setting for eMMC, change driving capability from 1 to 0.

```
&sdhi2 {  
    fixed-emmc-driver-type = <0>;  
};
```

- 2) R-CarV3U System Evaluation Board Falcon

- Micro-SD port (CN4) does not support. (R-Car V3U have only MMC0)

2. Terminology

The following table shows the terminology related to this module.

Table 2-1 Terminology

Terms	Explanation
MMC	Multi Media Card This media corresponds to the standard of the removable disk which was established in 1998 by Sun Disk and Siemens jointly.
eMMC	Embedded Multi Media Card
SD	Secure Digital This media corresponds to the standard of the removable disk which was established in 1999 by Panasonic, Sun Disk and Toshiba jointly.
SDIO	Secure Digital Input/Output This media corresponds to I/O interface standard of SD card which uses the specifications of the physical shape and the electrical feature. It can use a SD card socket. There is a card with wireless LAN or a digital camera function.
DMA	Direct Memory Access
DMAC	DMA Controller
SDHI	SD card host interface H/W module
SPI	Serial Peripheral Interface
CPRM	Content Protection for Recordable Media
GPIO	General-purpose I/O
HPI	High Priority Interrupt
RPMB	Replay Protected Memory Block

3. Operating Environment

3.1 Hardware Environment

The following table shows the hardware needed to use this module.

Table 3-1 Hardware Environment (R-Car H3/M3/M3N/E3/D3/V3U/V3H)

Name	Version	Manufacturer
R-CarH3-SiP System Evaluation Board Salvator-X	-	Renesas Electronics
R-CarM3-SiP System Evaluation Board Salvator-X	-	Renesas Electronics
R-CarH3-SiP/M3-SiP/M3N-SiP System Evaluation Board Salvator-XS	-	Renesas Electronics
R-Car-E3 System Evaluation Board Ebisu	-	Renesas Electronics
R-CarE3 System Evaluation Board Ebisu-4D	-	Renesas Electronics
R-CarD3 System Evaluation Board Draak		Renesas Electronics
R-CarV3U System Evaluation Board Falcon	-	Renesas Electronics
R-CarV3H System Evaluation Board Condor-I		Renesas Electronics

3.2 Module Configuration

The following figure shows the configuration of this module.

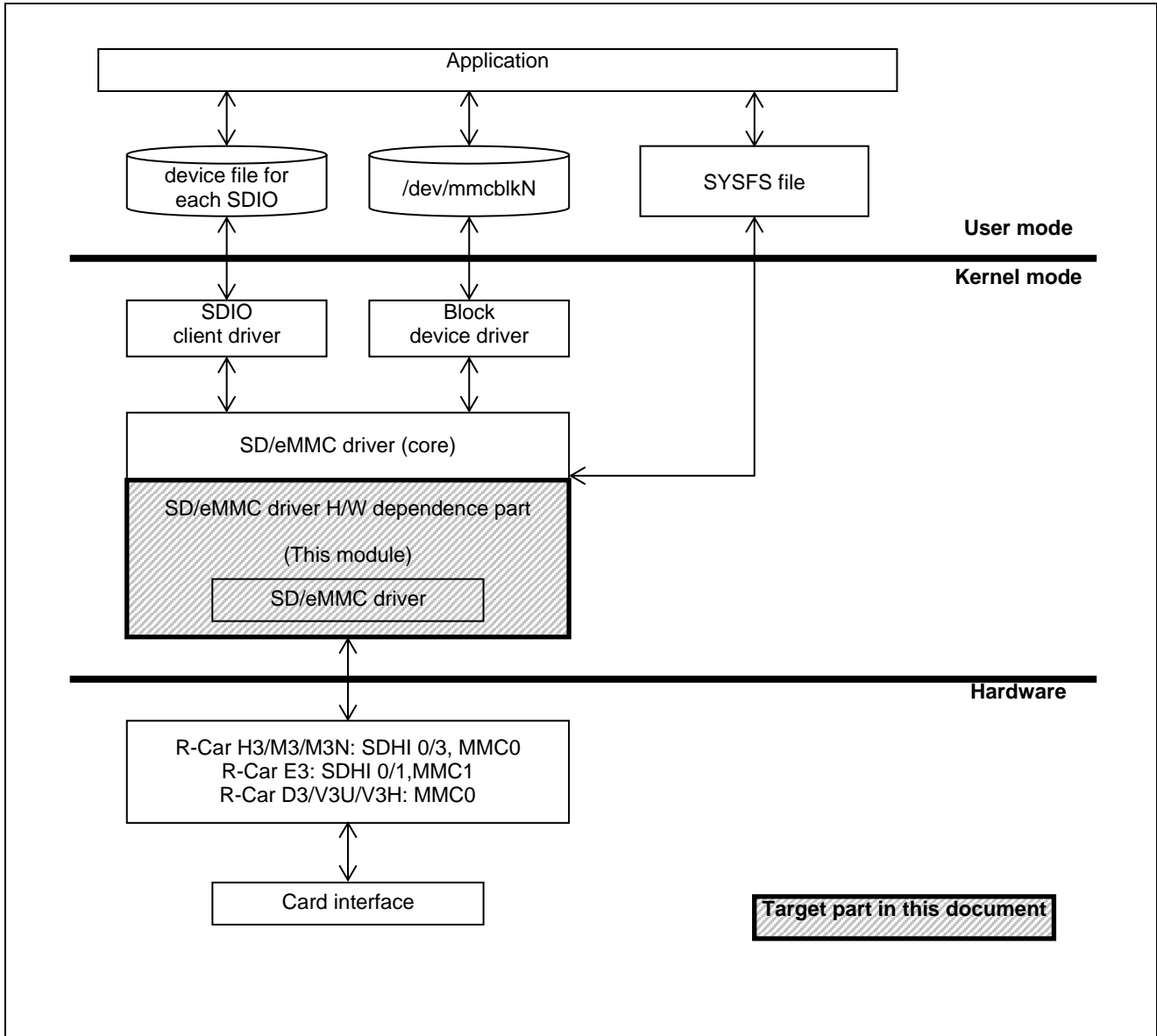


Figure 3-1 Module Configuration

3.3 State Transition Diagram

There is no state transition diagram for this module.

4. External Interface

Detailed explanation is skipped because the external interface of this module is based on Linux.

Device node of this module is described below.

Table 4-1 SDHI Device Node

Channel	Device node	Major number	Minor number
SDHIx	/dev/mmcblkN ⁵	179	0~31

In addition, the device node of SDIO might be different according to SDIO card to use.

ex) SDIO UART card to use

/dev/ttySDIO0

⁵ The numerical value might be different according to the system. (ex, /dev/mmcblk0)

4.1 GPIO Customization Interface

This module uses the interface that can be controlled "Card Power Control", "Card Detection", "Mechanical Write Protect Switch" "Voltage Switch" by GPIO. The GPIO interface can be used when you register GPIO to device tree file in the device-dependent part.

The following table shows the GPIO interface and properties of this module.

Table 4-2 GPIO Customization Interface

Function	Interface	Property
Card Power Control	mmc_regulator_set_ocr	vmmc-supply
Card Detection	mmc_gpio_get_cd	cd-gpios
Mechanical Write Protect Switch	mmc_gpio_get_ro	wp-gpios
Voltage Switch	regulator_set_voltage	vqmmc-supply

4.1.1 Card Power Control

The Card Power Controls GPIO by using regulator driver. The device tree file of device-dependent part registers required information when the regulator driver is used.

The following shows an example of the using this function.

```

/{
    vcc_sdhi0: regulator-vcc-sdhi0 {
        compatible = "regulator-fixed";
        regulator-name = "SDHI0 Vcc";
        regulator-min-microvolt = <3300000>;
        regulator-max-microvolt = <3300000>;
        gpio = <&gpio5 2 GPIO_ACTIVE_HIGH>;
        enable-active-high;
    };
};

&sdhi0 {
    vmmc-supply = <&vcc_sdhi0>;
};

```

Figure 4-1 Configuration Examples for Card Power Control (SDHI)

The Card Power Control of eMMC is controlled by using fixed voltage regulator driver. The device tree file of device-dependent part registers required information when the fixed voltage regulator driver is used.

The following shows an example of the using this function.

```
/ {  
    reg_3p3v: regulator1 {  
        compatible = "regulator-fixed";  
        regulator-name = "fixed-3.3V";  
        regulator-min-microvolt = <3300000>;  
        regulator-max-microvolt = <3300000>;  
        regulator-boot-on;  
        regulator-always-on;  
    };  
};  
  
&sdhi2 {  
    vmmc-supply = <&reg_3p3v>;  
};
```

Figure 4-2 Configuration Examples for Card Power Control (MMC)

4.1.2 Card Detection

The Card Detection uses `mmc_gpio_get_cd` function. The GPIO registers the device tree file of device-dependent part.

The following shows an example of the using this function.

```
&sdhi0 {  
    ...  
    ...  
    cd-gpios = <&gpio3 12 GPIO_ACTIVE_LOW>;  
    ...  
};
```

Figure 4-3 Configuration Examples for Card Detection

4.1.3 Mechanical Write Protect Switch

The Mechanical Write Protect Switch uses `mmc_gpio_get_ro` function. The GPIO registers the device tree file of device-dependent part.

The following shows an example of the using this function.

```
&sdhi0 {  
    ...  
    ...  
    wp-gpios = <&gpio3 13 GPIO_ACTIVE_HIGH>;  
    ...  
}
```

Figure 4-4 Configuration Examples for Write Protection

4.1.4 Voltage Switch

The Voltage Switch controls GPIO by using regulator driver. The device tree file of device-dependent part registers required information when the regulator driver is used.

The following shows an example of the using this function.

```

/{
    vccq_sdhi0: regulator-vccq-sdhi0 {
        compatible = "regulator-gpio";

        regulator-name = "SDHI0 VccQ";
        regulator-min-microvolt = <1800000>;
        regulator-max-microvolt = <3300000>;

        gpios = <&gpio5 1 GPIO_ACTIVE_HIGH>;
        gpios-states = <1>;
        states = <3300000 1
                  1800000 0>;
    };
};

/{
    sdhi0_pins: sd0 {
        groups = "sdhi0_data4", "sdhi0_ctrl";
        function = "sdhi0";
        power-source = <3300>;
    };

    sdhi0_pins_uhs: sd0_uhs {
        groups = "sdhi0_data4", "sdhi0_ctrl";
        function = "sdhi0";
        power-source = <1800>;
    };
};

&sdhi0 {
    pinctrl-0 = <&sdhi0_pins>;
    pinctrl-1 = <&sdhi0_pins_uhs>;
    pinctrl-names = "default", "uhs";
    ...
    vqmmc-supply = <&vccq_sdhi0>;
    ...
}

```

Figure 4-5 Configuration Examples for Voltage Switch

The Voltage Switch controls of eMMC is controlled by using fixed voltage regulator driver. The device tree file of device-dependent part registers required information when the fixed voltage regulator driver is used.

The following shows an example of the using this function.

```

/{
    reg_3p3v: regulator1 {
        compatible = "regulator-fixed";
        regulator-name = "fixed-3.3V";
        regulator-min-microvolt = <3300000>;
        regulator-max-microvolt = <3300000>;
        regulator-boot-on;
        regulator-always-on;
    };

    reg_1p8v: regulator0 {
        compatible = "regulator-fixed";
        regulator-name = "fixed-1.8V";
        regulator-min-microvolt = <1800000>;
        regulator-max-microvolt = <1800000>;
        regulator-boot-on;
        regulator-always-on;
    };
};

/{
    sdhi2_pins_uhs: sd2_uhs {
        groups = "sdhi2_data8", "sdhi2_ctrl", "sdhi2_ds";
        function = "sdhi2";
        power-source = <1800>;
    };
};

&sdhi2 {
    pinctrl-0 = <&sdhi2_pins>;
    pinctrl-1 = <&sdhi2_pins_uhs>;
    pinctrl-names = "default", "state_uhs";
    vqmmc-supply = <&reg_1p8v>;
};

```

Figure 4-6 Configuration Examples for Voltage Switch

When a 1.8V fixation amplitude SDIO card (and so on) is used, please set 1.8V amplitude information for regulator driver to device tree file. When its information is set, a 3.3V amplitude card is not detected.

The following shows an example of the using this function.

```
/ {  
vccq_sdhi0: regulator-vccq-sdhi0 {  
    compatible = "regulator-gpio";  
  
    regulator-name = "SDHI0 VccQ";  
    regulator-min-microvolt = <1800000>;  
    regulator-max-microvolt = <3300000>;  
  
    gpios = <&gpio5 1 GPIO_ACTIVE_HIGH>;  
    gpios-states = <1>;  
    states = <3300000 1  
            1800000 0>;  
};  
};
```

Figure 4-7 Configuration Examples for Voltage Switch of 1.8V amplitude fixed voltage.

4.2 Error Codes

This module returns the error that is detected by SDHI in the following error code from H/W dependence part of SD driver to core part of SD driver.

Table 4-3 Error Codes

Detection error	Error code	Description
ERR6	-ETIMEDOUT	Response timeout error
ERR3	-EBUSY -EINVAL -ENOMEM	Data timeout (except response timeout) error
ERR2	-EINTR	END error
ERR1	-EILSEQ	CRC error

4.3 Transfer Mode Setting (DMA/PIO)

To change transfer mode of PIO and DMA, make the following setting with kernel configuration.

Device Drivers --->

<*> MMC/SD/SDIO card support --->

--- MMC/SD/SDIO card support

<*> Renesas SDHI SD/SDIO controller support

< > DMA for SDHI SD/SDIO controllers using SYS-DMAC

-*- DMA for SDHI SD/SDIO controllers using on-chip bus mastering

[] Renesas SDHI PIO transfer mode setting

“Renesas SDHI PIO transfer mode setting” select Yes or No according to the following.

- When switching the transfer mode from DMA to PIO, say Y here.
- When switching the transfer mode from PIO to DMA, say N here.

4.4 Driving Capability

This module has the interface that may select the most appropriate Driving Capability of the SoC and Device (if supported).

4.4.1 Setting for SoC

The following table summarizes the relationship between setting value and Driving Capability for the SoC.

Table 4-4 Driving Capability Setting for SoC

Value	Driving capability
3	2/8
6	2/8
9	3/8
12	4/8
15	5/8
18	6/8
21	7/8
24	8/8

Other values: Setting prohibited

The following shows an example of the using this function. The editing contents of sdhi2_pins and sdhi3_pins are the same as sdhi0_pins.

```

/{
    sdhi0_pins: sd0 {
        groups = "sdhi0_data4", "sdhi0_ctrl";
        function = "sdhi0";
        power-source = <3300>;
        drive-strength = <Value>;    <-- Set the value of the table and add this line.
    };

    sdhi0_pins_uhs: sd0_uhs {
        groups = "sdhi0_data4", "sdhi0_ctrl";
        function = "sdhi0";
        power-source = <1800>;
        drive-strength = <Value>;    <-- Set the value of the table and add this line.
    };
}

```

Figure 4-8 Configuration Examples for Driving Capability for SoC

4.4.2 Setting for eMMC

The following table summarizes the relationship between setting value and Driving Capability for the eMMC.

Table 4-5 Driving Capability Setting for eMMC

Value	Driving capability
0	x1
1	x1.5
2	x0.75
3	x0.5
4	x1.25

Other values: Setting prohibited

The following shows an example of the using this function.

```
&sdhi2 {
    /* used for on-board 8bit eMMC */
    pinctrl-0 = <&sdhi2_pins>;
    pinctrl-1 = <&sdhi2_pins_uhs>;
    pinctrl-names = "default", "state_uhs";

    vmmc-supply = <&reg_3p3v>;
    vqmmc-supply = <&reg_1p8v>;
    bus-width = <8>;
    mmc-hs200-1_8v;
    mmc-hs400-1_8v;
    non-removable;
    fixed-emmc-driver-type = <Value>; <-- Set the value of the table
    status = "okay";
};
```

Figure 4-9 Configuration Examples for Driving Capability for eMMC

5. Integration

5.1 Directory Configuration

The directory configuration is described below.

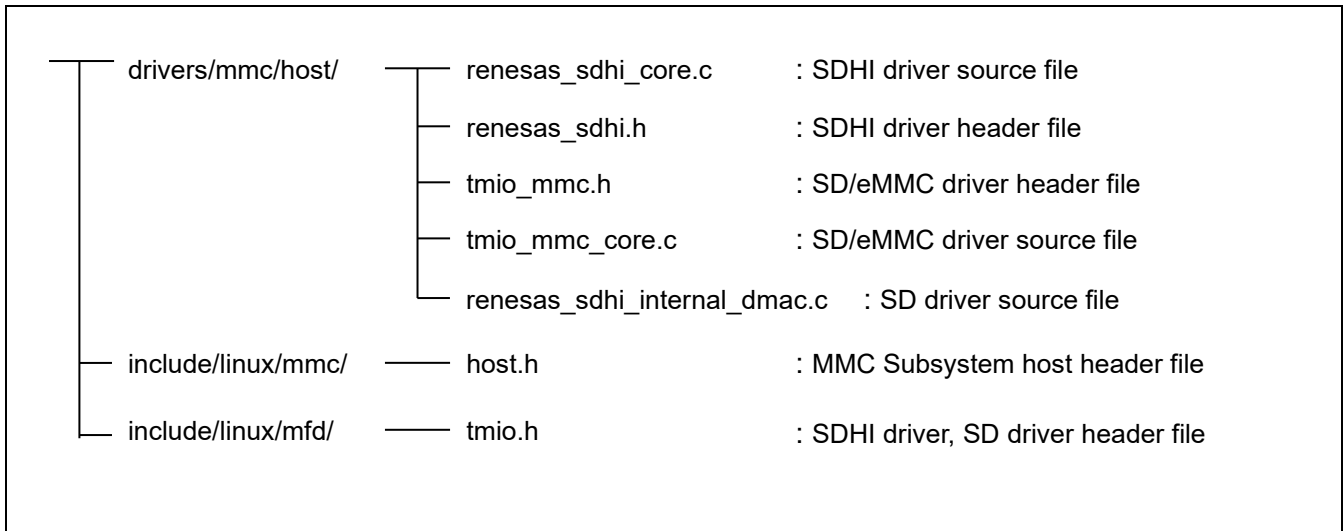


Figure 5-1 Directory Configuration

5.2 Integration Procedure

To enable the function of this module, make the following setting with kernel configuration.

```
Device Drivers --->
  <*> MMC/SD/SDIO card support --->
    --- MMC/SD/SDIO card support
    <*> Renesas SDHI SD/SDIO controller support
    < > DMA for SDHI SD/SDIO controllers using SYS-DMAC
    -*  DMA for SDHI SD/SDIO controllers using on-chip bus mastering
```

5.3 Option Setting

5.3.1 Module Parameters

There are no module parameters.

5.3.2 Kernel Parameters

There are no kernel parameters.

5.3.3 Setting of Dip-SW (R-CarV3U System Evaluation Board Falcon)

The setting of R-Car V3U System Evaluation Board's dip switches is shown in the following table.

Table 5-1 Setting of Dip-SW (R-CarV3U System Evaluation Board Falcon)

Function	Dip-SW	Setting
MMC (default)	SW43	Pin 2 side (U22)
	SW54	Pin 2 side (1.8V)

Other setting: Setting prohibited

5.3.4 Setting of Jumper Switch (R-CarD3 System Evaluation Board Draak)

The setting of R-Car D3 System Evaluation Board's Jumper Switch is shown in the following table.

Table 5-2 Setting of Jumper Switch (R-CarD3 System Evaluation Board Draak)

Function	Jumper Switch	Setting
VDDQ_MMC	JP1	Pin 1-2 short (1.8V)

Other setting: Setting prohibited

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REVISION HISTORY	Linux Interface Specification Device Driver SD/MMC User's Manual: Software
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Rev.	Date	Description	
		Page	Summary
0.1	Sep. 25, 2015	-	New creation.
0.2	Nov. 20, 2015	3	Change Restrictions.
		9	Add fixed voltage regulator driver of eMMC to Card Power Control.
		12	Add fixed voltage regulator driver of eMMC to Voltage Switch.
		15	Add Directory Configuration of DMA for R-Car H3.
		16	Add eMMC Integration.
0.3	Mar. 18, 2016	2	Change table of Driver Function.
		4	Change Restrictions.
		9	Change GPIO Customization Interface.
		14	Delete function of Aggressively Clock Gating.
		14	Add function of Card Password (lock/unlock).
		17	Add Directory Configuration of Card Password function.
		18	Delete SD Clock Control Integration.
		18	Add SD Card Password Integration.
0.4	Apr. 15, 2016	All	Add R-Car M3 support.
		3	Change Related Documents.
0.5	Aug. 5, 2016	All	Delete Card Password function.
		2	Table 1-4 Related Documents(R-Car H3/M3) - H3 Document Update. - Add M3 Document.
		3	Change Restrictions.
		5	Table 3-1 Hardware Environment (R-Car H3/M3) - Add M3 Environment.
		14	Change "4.3 Transfer Mode Setting (DMA/PIO)".
		14	Add "4.4 IPMMU Setting".
		19	Change "5.1 Directory Configuration".
0.6	Dec. 16, 2016	8-13, 16, 18	Update information registered in device tree file.
		14	Change the device tree file name.
0.7	Mar. 15, 2017	3	Table 1.4 Related documents(R-Car H3) Add User's Manual: Hardware Rev0.53.
		3, 6	Add Salvator-XS support.
		15, 18, 19	Add R-Car H3 WS2.0 support.
0.8	Jun. 14, 2017	3	Update User's Manual: Hardware Rev0.53 to Rev0.54.
		14-18	Unify notation of chip version.

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Rev.	Date	Description	
		Page	Summary
1.00	Aug. 8, 2017	All	Update document format.
1.01	Oct. 24, 2017	1-3, 5, 6, 14, 17, 18	Add R-Car M3N support.
		3	Update User's Manual: Hardware Rev0.54 to Rev0.55.
1.50	Jan. 29, 2018	3	Update User's Manual: Hardware Rev0.55 to Rev0.80, and delete Rev0.51.
		6, 19	Change the module and directory configuration.
		16,17	Delete IPMMU setting.
		16-18	Add how to set driving capability.
1.51	Mar. 28, 2018	All	Add R-Car E3 support.
1.52	Jun. 27, 2018	15	Fix the Driving Capability Setting for SoC.
1.53	Oct 22, 2018	3	Update User's Manual: Hardware Rev0.80 to Rev1.00.
		16	Change Figure 4-6 Configuration Examples for Driving Capability for eMMC.
		17	Fix file name. "renesas_sdhi.c" --> "renesas_sdhi_core.c"
1.54	Oct 29, 2018	17	Add 4.5 Delay adjustment for eMMC HS 400 mode.
2.00	Dec 25, 2018	3	Update R-CarH3-SiP Salvator-X Hardware Manual: Rev.1.03 to Rev.1.09. Update R-CarM3-SiP Salvator-X Hardware Manual: Rev.0.03 to Rev.0.04 Update Salvator-XS Hardware Manual: Rev.2.00 to Rev.2.04. Update Ebisu Hardware Manual: Rev.0.01 to Rev.0.03. Add Ebisu-4D (E3 board 4xDRAM) Hardware Manual.
		5	Update Salvator-XS name: R-CarH3-SiP/M3-SiP to R-CarH3-SiP/M3-SiP/M3N-SiP. Add Ebisu-4D
2.01	Apr 17, 2019	-	Update AddressList
		2	Update table 1.1 Driver Function.
		4	Update User's Manual: Hardware Rev1.00 to Rev1.50. Add notice for SD/MMC drivability.
2.02	Jun 26, 2019	16	Update Table 4.4 "Driving Capability Setting for SoC" according to R-CarGen3_HW_EC_Manual_Errata_for_Rev150_Apr_10_2019.xlsx.
2.03	Oct 17, 2019	18	Update 4.5 Delay adjustment for eMMC HS400 mode.
2.50	Apr 24, 2020	18	Remove 4.5 Delay adjustment for eMMC HS400 mode. According to HW manual, this feature is not supported.
		All	Add R-Car V3U support.
2.51	Dec 1, 2020	2	Update Table 1-1 Driver Function.
		3	Update Table 1-2 Connected port (R-Car H3/M3/M3N), 1-3 Connected port (R-Car E3), 1-4 Connected port (R-Car V3U).
		4	Update Table 1-5 Related Documents (R-Car H3/M3/M3N/E3/V3U).
		5	Add Notice for R-CarV3U System Evaluation Board Falcon.
		6	Update Table 2-1 Terminology.
		8	Update Figure 3-1 Module Configuration.
		20	Add 5.3.3 Setting of Dip-SW (R-CarV3U System Evaluation Board Falcon).
2.52	Jan 29, 2021	All	Add R-Car V3H support.
2.53	Apr 21, 2021	All	Add R-Car D3 support.
3.00	Dec 10, 2021	-	Update Notice

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