everyday genius

MT8183 HDMI

Version: 1.0

Release date: 2019-03-21

Specifications are subject to change without notice.

Document Revision History

Revision	Date	Description
1.0	2019-03-04	Initial Draft

Table of Contents

1. Introduction

The document is about MT8183 HDMI software configuration.

1.1 Purpose

The document is for customer to configure and use HDMI in MT8183 Project.

1.2 Definitions, Acronyms and Abbreviations

No

1.3 References

No

1.4 Overview

Section 1 is the introduction and includes a description of the project.
Section 2 is about 8183 hdmi feature.
Section 3 is about 8183 hdmi hardware connection.
Section 4 is about 8183 hdmi software overview.
Section 5 is about 8183 hdmi software customization.

2. Specific Contents

2.1 Introduction of MT8183 HDMI

MT8183 HDMI is implemented by using companion chip(ITE66121), and use DPI I/F for video data, I2S I/F for audio data, I2C for control.

The HDMI resolution is limited by MT8183 system performance, which is 1080p@30Hz highest now.

2.2 MT8183 HDMI Feature

a. Resolution Support (up to 74MHz)
b. 480p,720p@60Hz,1080@30Hz
c. HDCP is not Supported
d. Support RGB color space
e. Support PCM 44.1/48K 2CH
f. Not support CEC

2.3 MT8183 HDMI Hardware connection

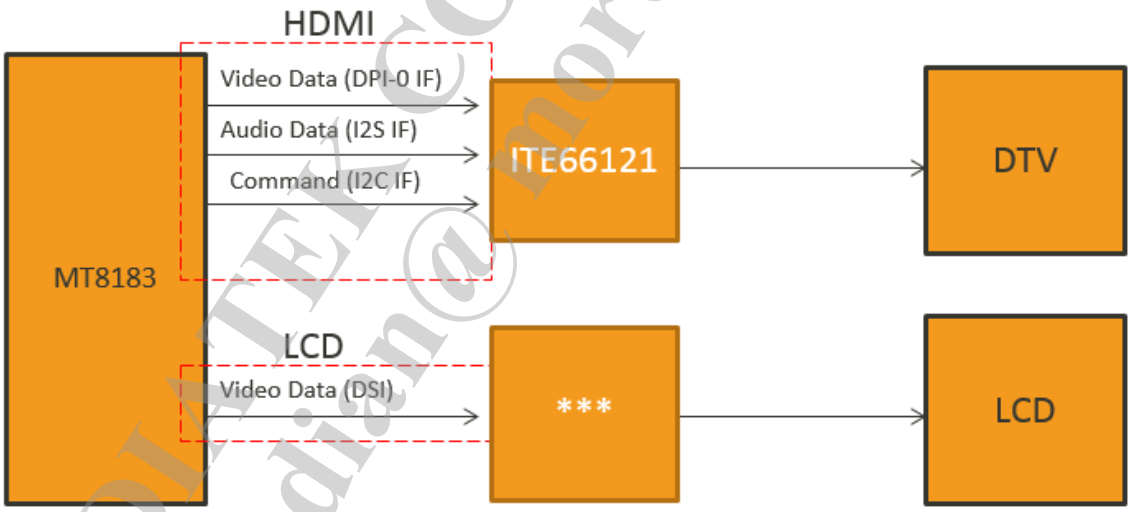

Figure 2-1. hardware connection

2.4 MT8183 HDMI software overview

2.4.1 Software overview 1

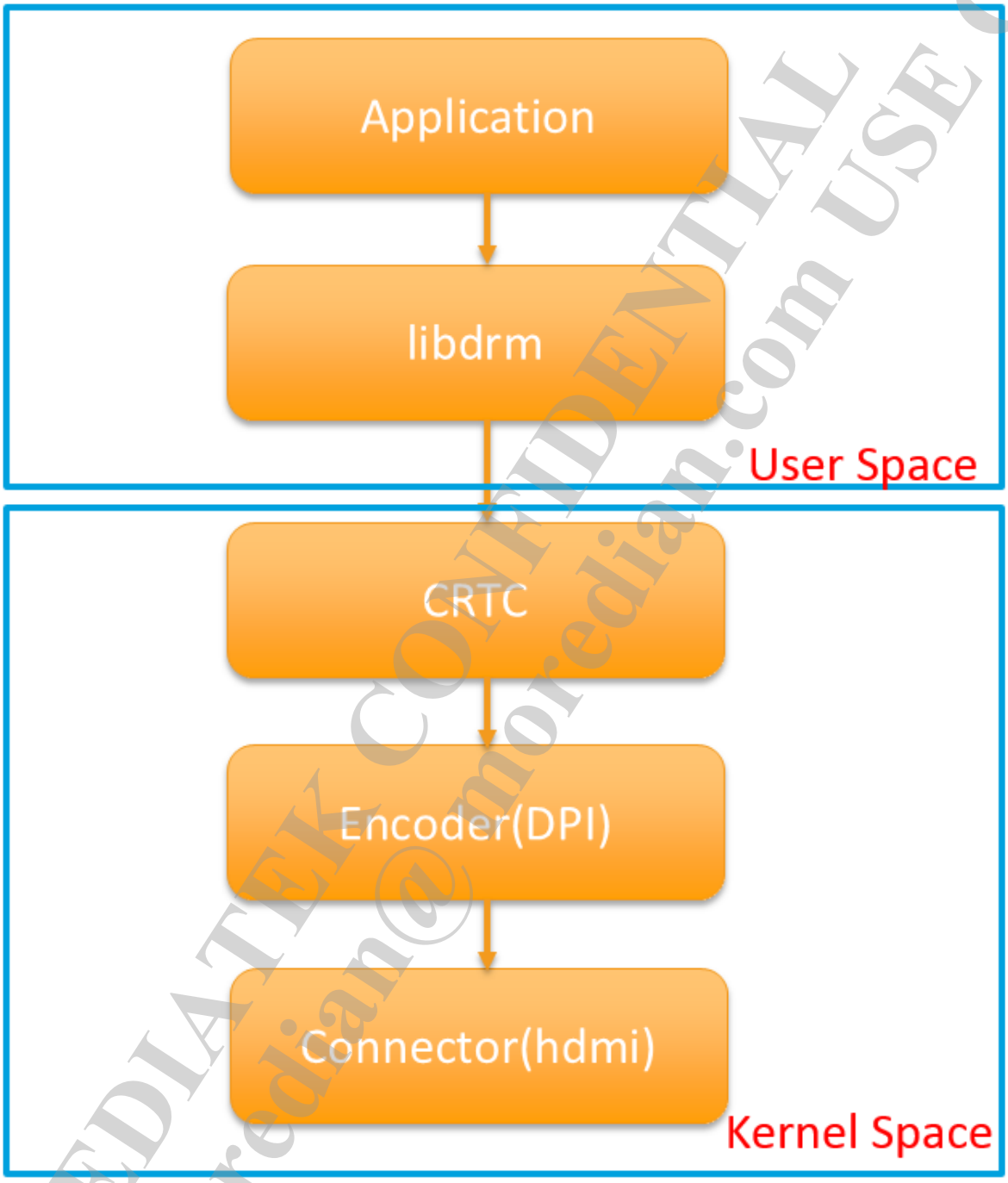

Figure 2-2. software block diagram

2.4.2 Software overview 2

a. Support resolution

1080@30Hz,720p@60Hz, 480p

b. Note:

Resolution list depend on EDID.

It will select the resolution output if one resolution is selected and TV support

2.4.3 Software overview 3

Receive the broadcast of HDMI states

a. Active
   Enable HDMI
   Get EDID
   Initialize color space / deep color / resolution
   Show notification on status bar

b. No device / plug-in only
   Disable HDMI
   Clear EDID
   Clear notification

2.4.4 Software overview 4

Figure 2-3. kernel driver flow

2.5 MT8183 HDMI software configuration

Turn on following options to enable MT8183 HDMI feature (the words with green color depends on your project)

1. Add config

   kernel-4.4/arch/arm64/configs/aiv8183m1_64_bsp_debug_defconfig

   kernel-4.4/arch/arm64/configs/aiv8183m1_64_bsp_defconfig

   CONFIG_DRM_ITE66121=y

2. Device tree configuration

   kernel-4.4/arch/arm64/boot/dts/aiv8183m1_64_bsp.dts

   add red label code as the following picture.

```
            vib_timer = <25>;
            vib_limit = <9>;
            vib_vol= <9>;
        };
        ite166121_hdmi: ite166121_hdmi@0 {
            compatible = "mediatek,mt8183-hdmitx";
        };

        mt_pmic_customization: mt_pmic_customization@0 {
            compatible = "mediatek,mt-pmic-custom-setting";
            custom-reg = <0x1c32 0x1 0x7 0x0 /* LDO_VRF12_OP_EN *
                          0x18ba 0x1 0x1 0x0 /* RG_VPA_NDIS_EN */
            >;
            disable-modem = <1>;
        };
};

&ite166121_hdmi {
        pinctrl-names = "hdmi_poweron", "hdmi_poweroff";
        pinctrl-0 = <&hdmi_pins_funcmode>;
        pinctrl-1 = <&hdmi_pins_gpiomode>;
```

Figure 2-4. device tree configuration 1

```
&ite166121_hdmi {
    pinctrl-names = "hdmi_poweron", "hdmi_poweroff";
    pinctrl-0 = <&hdmi_pins_funcmode>;
    pinctrl-1 = <&hdmi_pins_gpiomode>;
    vcn33-supply = <&mt_pmic_vcn33_wifi_ldo_reg>;
    vcn18-supply = <&mt_pmic_vcn18_ldo_reg>;
    vrf12-supply = <&mt_pmic_vrf12_ldo_reg>;
    hdmi_power_gpios = <&pio 160 0>;
    status = "okay";
    ports {
        port {
                it66121_in: endpoint {
                    remote-endpoint = <&dpi_out>;
                };
        };
    };
};

&dpi {
```

Figure 2-5. device tree configuration 2

```
    };
};

&dpi {
    status = "okay";
    port {
        dpi_out: endpoint {
            remote-endpoint = <&it66121_in>;
        };
    };
};
```

Figure 2-6. device tree configuration 3

```
hdmi_pins_funcmode: hdmi_pins_funcmode {
    pins_cmd_dat {
        pinmux = <PINMUX_GPIO12__FUNC_I2S5_BCK>,
                 <PINMUX_GPIO46__FUNC_I2S5_LRCK>,
                 <PINMUX_GPIO47__FUNC_I2S5_DO>,
                 <PINMUX_GPIO13__FUNC_DBPI_D0>,
                 <PINMUX_GPIO14__FUNC_DBPI_D1>,
                 <PINMUX_GPIO15__FUNC_DBPI_D2>,
                 <PINMUX_GPIO16__FUNC_DBPI_D3>,
                 <PINMUX_GPIO17__FUNC_DBPI_D4>,
                 <PINMUX_GPIO18__FUNC_DBPI_D5>,
                 <PINMUX_GPIO19__FUNC_DBPI_D6>,
                 <PINMUX_GPIO20__FUNC_DBPI_D7>,
                 <PINMUX_GPIO21__FUNC_DBPI_D8>,
                 <PINMUX_GPIO22__FUNC_DBPI_D9>,
                 <PINMUX_GPIO23__FUNC_DBPI_D10>,
                 <PINMUX_GPIO24__FUNC_DBPI_D11>,
                 <PINMUX_GPIO25__FUNC_DBPI_HSYNC>,
                 <PINMUX_GPIO26__FUNC_DBPI_VSYNC>,
                 <PINMUX_GPIO27__FUNC_DBPI_DE>,
                 <PINMUX_GPIO28__FUNC_DBPI_CK>,
                 <PINMUX_GPIO113__FUNC_SCL6>,
```

Figure 2-7. device tree configuration 4

```
                 <PINMUX_GPIO114__FUNC_SDA6>;
    };
};
hdmi_pins_gpiomode: hdmi_pins_gpiomode {
    pins_cmd_dat {
        pinmux = <PINMUX_GPIO12__FUNC_GPIO12>,
                 <PINMUX_GPIO46__FUNC_GPIO46>,
                 <PINMUX_GPIO47__FUNC_GPIO47>,
                 <PINMUX_GPIO13__FUNC_GPIO13>,
                 <PINMUX_GPIO14__FUNC_GPIO14>,
                 <PINMUX_GPIO15__FUNC_GPIO15>,
                 <PINMUX_GPIO16__FUNC_GPIO16>,
                 <PINMUX_GPIO17__FUNC_GPIO17>,
                 <PINMUX_GPIO18__FUNC_GPIO18>,
                 <PINMUX_GPIO19__FUNC_GPIO19>,
                 <PINMUX_GPIO20__FUNC_GPIO20>,
                 <PINMUX_GPIO21__FUNC_GPIO21>,
                 <PINMUX_GPIO22__FUNC_GPIO22>,
                 <PINMUX_GPIO23__FUNC_GPIO23>,
                 <PINMUX_GPIO24__FUNC_GPIO24>,
                 <PINMUX_GPIO25__FUNC_GPIO25>,
                 <PINMUX_GPIO26__FUNC_GPIO26>,
                 <PINMUX_GPIO27__FUNC_GPIO27>,
                 <PINMUX_GPIO28__FUNC_GPIO28>,
```

Figure 2-8. device tree configuration 5

```
                        <PINMUX_GPIO28__FUNC_GPIO28>,
                        <PINMUX_GPIO113__FUNC_GPIO113>,
                        <PINMUX_GPIO114__FUNC_GPIO114>;
    };
};
```

Figure 2-9. device tree configuration 6

```
dpi:dpi0@14015000 {
    compatible = "mediatek,mt8183-dpi";
    reg = <0 0x14015000 0 0x1000>;
    interrupts = <GIC_SPI 237 IRQ_TYPE_LEVEL_LOW>;
    clocks = <&mmsys_config MMSYS_DPI_MM_CK>,
         <&mmsys_config MMSYS_DPI_IF_CK>,
         <&topckgen TOP_TVDPLL_CK>;
    clock-names = "pixel", "engine", "pll";
};

mutex: mutex@14016000 {
    compatible = "mediatek,mt8183-disp-mutex";
```

Figure 2-10. device tree configuration 7