

MEDIATEK

everyday genius

MT8183 HDMI

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Document Revision History

Revision	Date	Description
1.0	2019-03-04	Initial Draft

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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

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

2.3 MT8183 HDMI Hardware connection

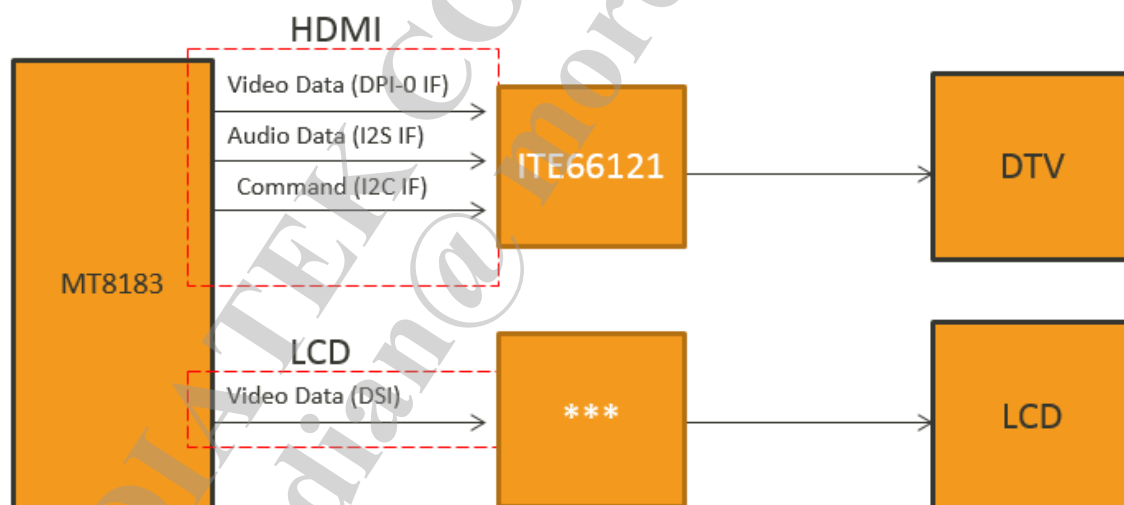


Figure 2-1. hardware connection

2.4 MT8183 HDMI software overview

2.4.1 Software overview 1

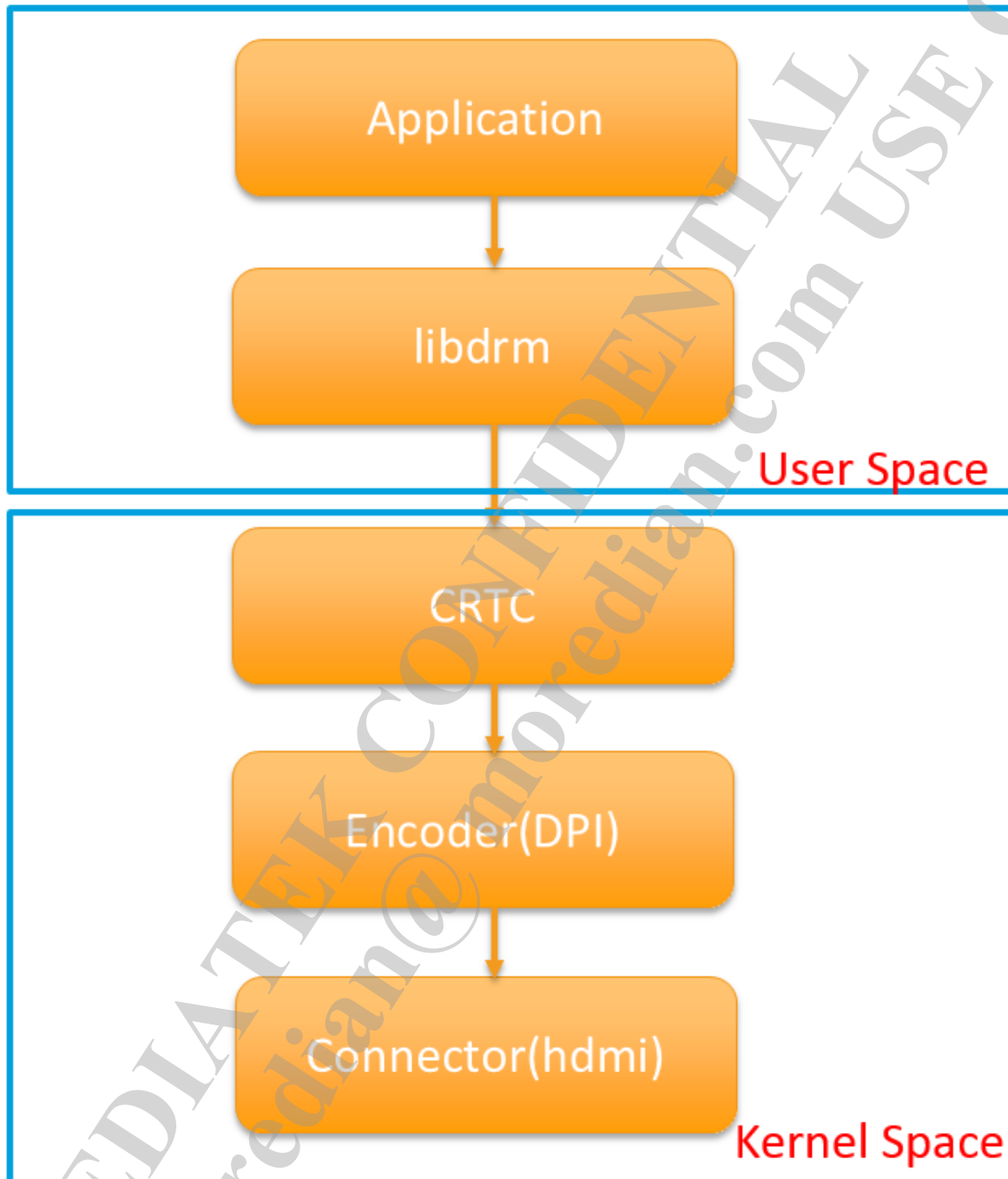


Figure 2-2. software block diagram

2.4.2 Software overview 2

- Support resolution
1080@30Hz, 720p@60Hz, 480p
- 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>;
};
it66121_hdmi: it66121_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>;
};

&it66121_hdmi {
    pinctrl-names = "hdmi_poweron", "hdmi_poweroff";
    pinctrl-0 = <&hdmi_pins_funcmode>;
    pinctrl-1 = <&hdmi_pins_gpiomode>;|
```

Figure 2-4. device tree configuration 1

```
&it66121_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