



Introduction to MT8735+MT8193 HDMI

Mediatek
Version 0.1



Agenda

- Overview
- HDMI Feature
- Hardware Connection
- Software overview
- Audio BCK config
- Driver Configuration
- SW Customization
- Release
- FAQ

Overview

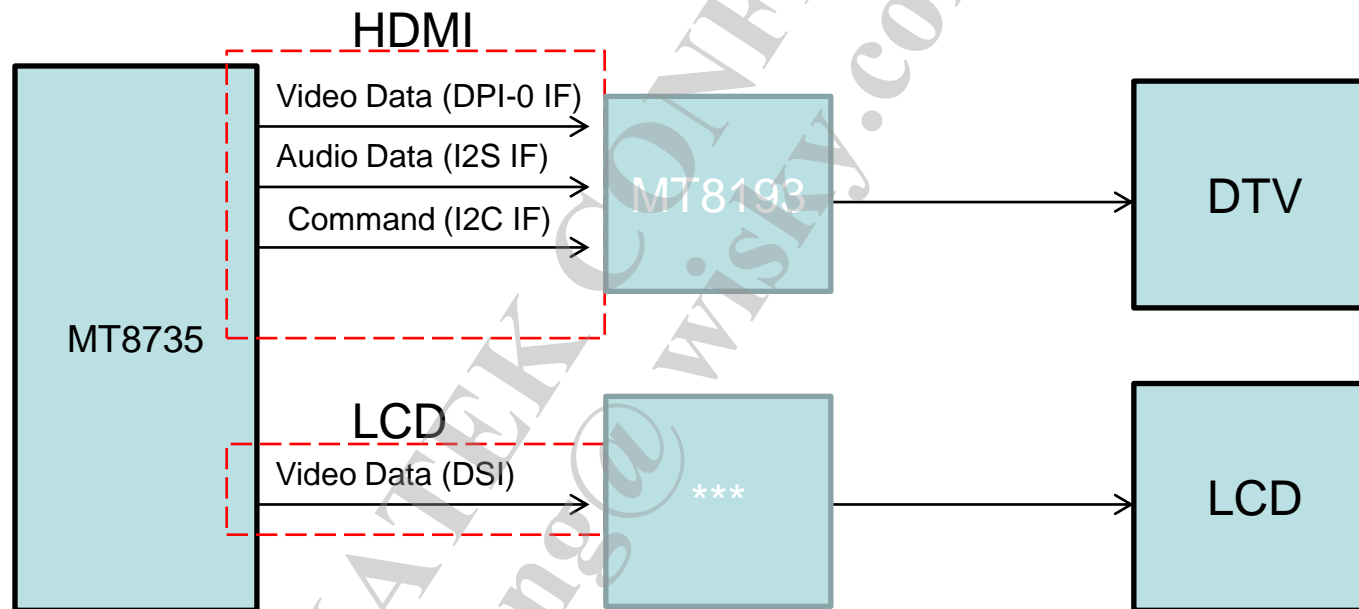
- MT8735 HDMI is implemented by using companion chip(MT8193), and use DPI I/F for video data, I2S I/F for audio data, I2C for control.
- The HDMI resolution is limited by MT8735 system performance, which is 1080p@30Hz highest now.

HDMI Feature-Video

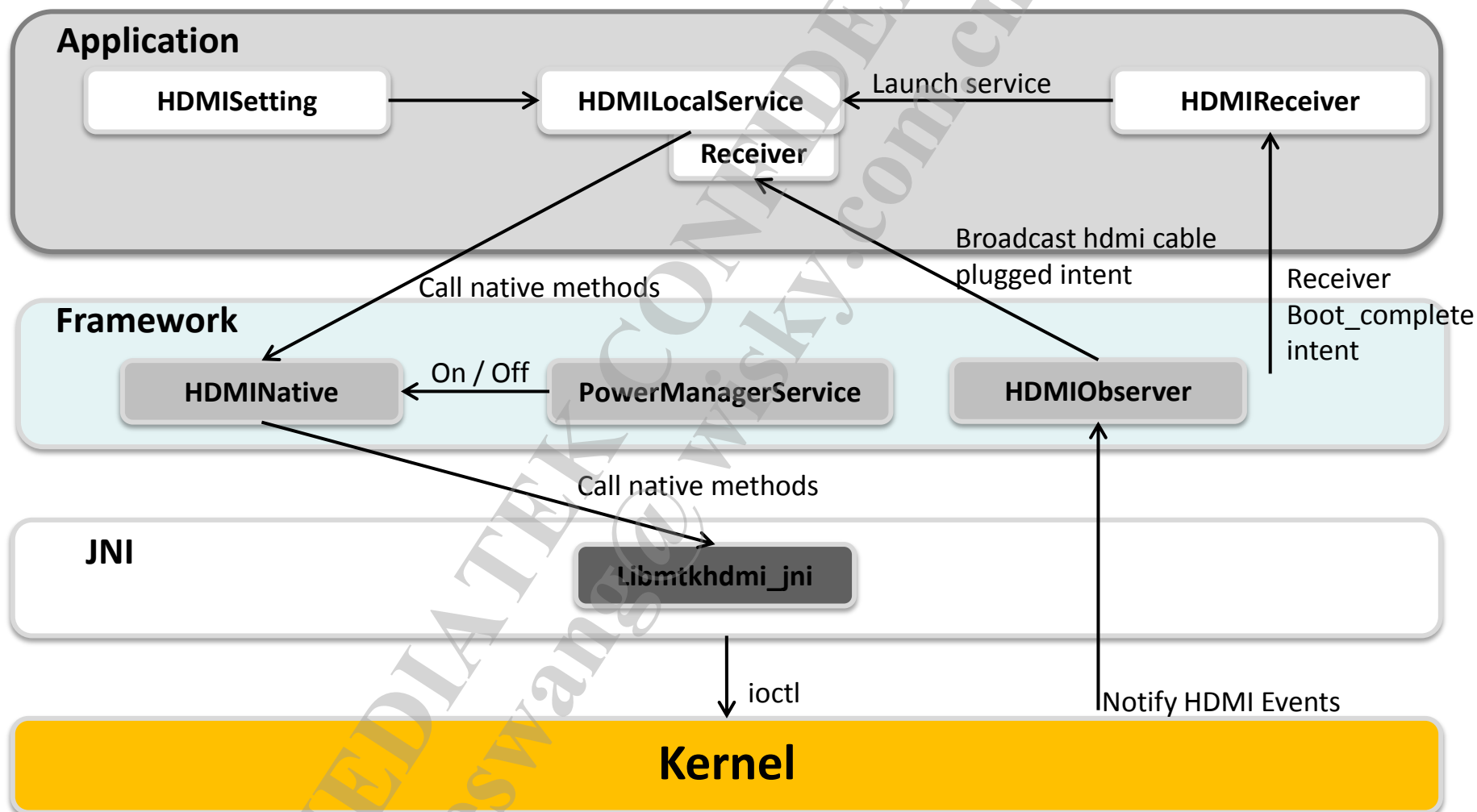
- Resolution Support (up to 74MHz)
 - 480p,720p@60Hz,1080@30Hz
- HDCP is not Supported in MT8193 Internal
- Support RGB color space, not support YCbCr
- Support PCM 44.1/48K 2CH
- Not support CEC

Hardware Connection

- LCD Mirror mode



Software overview



Software overview - HDMI Settings

- 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.

Software overview - HDMIReceiver

- Receive Boot_complete intent
- Launch HDMILocalService

Software overview - HDMI LocalService

- Receive the broadcast of HDMI states
 - Active
 - Enable HDMI
 - Get EDID
 - Initialize color space / deep color / resolution
 - Show notification on status bar
 - Acquire SCREEN_DIM_WAKE_LOCK
 - No device / plug-in only
 - Disable HDMI
 - Clear EDID
 - Clear notification
 - Release SCREEN_DIM_WAKE_LOCK

Software overview - HDMIObserver

- Extends **UEventListener**
 - Many Android services (i.e., Battery) use it to get information from Kernel
 - Implemented by socket
- Initialization
 - startObserving("DEVPATH=/devices/virtual/switch/**mtk_hdmi**")
 - String name = event.get("**SWITCH_NAME**")
 - int state = Integer.parseInt(event.get("**SWITCH_STATE**"))
- Detect the state of HDMI
 - Active 、 No device
- Broadcast the state if the state changes

Software overview - Kernel driver flow

- UI is enable → audio_video_enable(ioctl) → Detect hotplug/pord → send notify hdmi state to APP → APP get edid(ioctl) → APP send deepcolor(ioctl)&video config(ioctl) → setting hdmi video → setting hdmipll → setting dgi → open/close hdcp

Software overview – code patch

- CR : ALPS02069215

SW Configuration

- Turn on following options to enable MT8193 HDMI feature

Kernel space:

alps/kernel-3.10/arch/arm64/configs/tb6735a2_64_debug_defconfig

alps/kernel-3.10/arch/arm64/configs/tb6735a2_64_defconfig

- CONFIG_CUSTOM_KERNEL_HDMI="MT8193"
- CONFIG_MTK_HDMI_SUPPORT=y
- CONFIG_MTK_MULTIBRIDGE_SUPPORT=y
- CONFIG_MTK_MT8193_SUPPORT=y

User space:

alps/device/mediatek/tb6735a2_64/ProjectConfig.mk

- MTK_HDMI_SUPPORT = yes

Driver Configuration - DCT

DCT tool:

```
alps\bootable\bootloader\preloader\tools\dct
```

DWS file:

```
alps\bootable\bootloader\lk\target\tb6735a2_64\dct\dct
```

```
alps\bootable\bootloader\preloader\custom\tb6735a2_64\dct\dct
```

```
alps\kernel-3.10\drivers\misc\mediatek\mach\mt6735\tb6735a2_64\dct\dct
```

```
alps\vendor\mediatek\proprietary\custom\tb6735a2_64\kernel\dct\dct
```

Driver Configuration - DCT

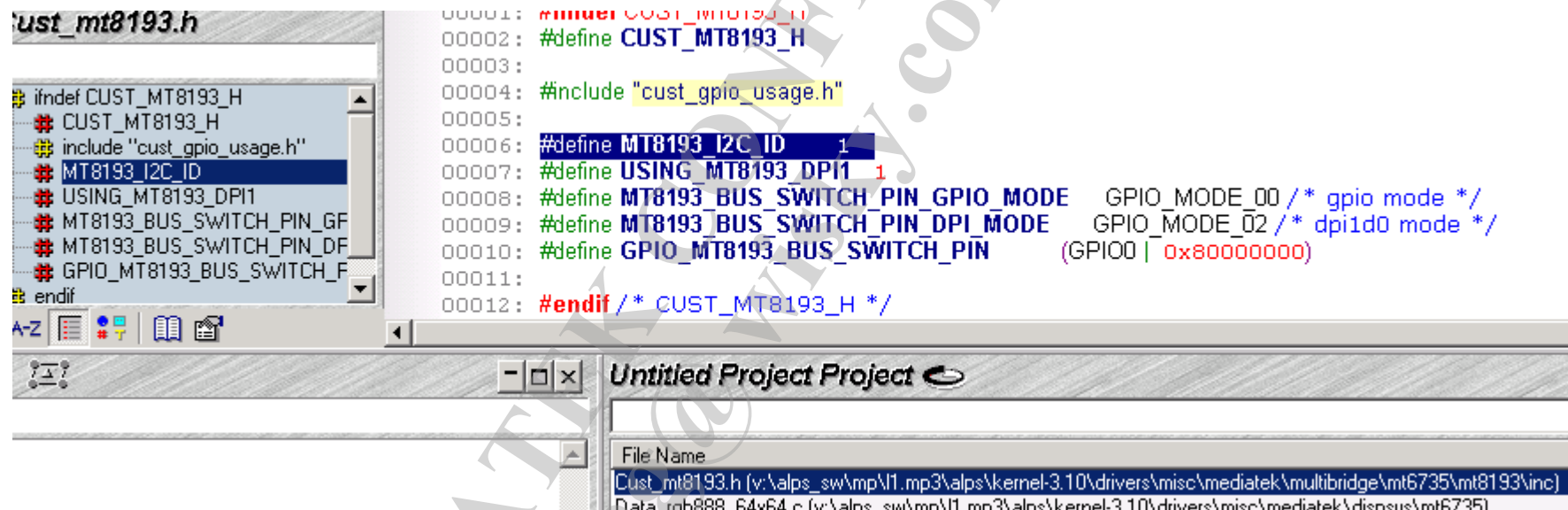
- DPI Part
 - Please refer to your PCB&Sch,&GPIO Table, for refer platform, DPI is set as below :

V:\ALPS_SW\TRUNK\L1\alps\bootable\bootloader\preloader\custom\tb6735ma2_64\dct\dct\codegen.dws

GPIO	EINT	ADC	KEYPAD	I2C	PMIC	ClockBuffer	POWER	MD1	EINT				
	EintMode	Def.Mode	M0	M1	M2	M3	M4	M5	M6	M7	InPull ...	InPull SelHigh	Def.Dir
GPIO0	<input type="checkbox"/>	2:DPI_D4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO1	<input type="checkbox"/>	2:DPI_D5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO2	<input type="checkbox"/>	2:DPI_D6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO3	<input type="checkbox"/>	2:DPI_D7	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO4	<input type="checkbox"/>	2:DPI_D8	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO5	<input type="checkbox"/>	2:DPI_D9	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO6	<input type="checkbox"/>	2:DPI_D10	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO7	<input type="checkbox"/>	2:DPI_D11	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO8	<input type="checkbox"/>	NC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
GPIO59	<input type="checkbox"/>	2:DPI_CK0	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Driver Configuration - IIC

- IIC port ID define



```

00001: #ifndef CUST_MT8193_H
00002: #define CUST_MT8193_H
00003:
00004: #include "cust_gpio_usage.h"
00005:
00006: #define MT8193_I2C_ID 1
00007: #define USING_MT8193_DPI1 1
00008: #define MT8193_BUS_SWITCH_PIN_GPIO_MODE GPIO_MODE_00 /* gpio mode */
00009: #define MT8193_BUS_SWITCH_PIN_DPI_MODE GPIO_MODE_02 /* dpi1d0 mode */
00010: #define GPIO_MT8193_BUS_SWITCH_PIN (GPIO0 | 0x80000000)
00011:
00012: #endif /* CUST_MT8193_H */
  
```

File Name
 Cust_mt8193.h (v:\alps_sw\mp\l1.mp3\alps\kernel-3.10\drivers\misc\mediatek\multibridge\mt6735\mt8193\inc)
 Data_mh888_64x64.c (v:\alps_sw\mn\l1.mn3\alps\kernel-3.10\drivers\misc\mediatek\vlisnsus\mt6735)

Release(include 2 parts)

Part1 : main patch

ALPS02069215

Part2 : Add HDMI custom code for your project

1) Add HDMI folder to your project

alps/kernel-3.10/drivers/misc/mediatek/mt6735/tb6735a2_64/hdmi

2) Add HDMI make file to your project

alps/kernel-3.10/drivers/misc/mediatek/mt6735/tb6735a2_64/makefile