



# LCD Television Service Manual

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**Chassis: MTK8222**

**Product Type: LCD32V86、LCD32V86P**

**Ver 1.0**

**Hisense Electric Co., Ltd.**

**April, 2009**

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# Service Manual

## 1. Precautions and notices

BEFORE SERVICING THE LCD TV, READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

WHEN REPLACEMENT PARTS ARE REQUIRED, BE SURE TO USE REPLACEMENT PARTS SPECIFIED BY THE MANUFACTURER.

Proper service and repair is important to the safe, reliable operation of all Hisense Electric Co., Ltd Equipment. The service procedures recommended by Hisense and described in this Service Guide are effective methods of performing service operations. Some of these service operations require the use of tools specially designed for the purpose. The special tools should be used when and as recommended.

It is important to note that this manual contains various CAUTIONS and NOTICES which should be carefully read in order to minimize the risk of personal injury to service personnel. The possibility exists that improper service methods may damage the equipment. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Hisense could not possibly know, evaluate and advise the service trade of all conceivable ways in which service might be done or of the possible hazardous consequences of each way. Consequently, Hisense has not undertaken any such broad evaluation. Accordingly, a serviceman that uses a service procedure or tools,

which are not recommended by Hisense, must first satisfy himself thoroughly that neither his safety nor the safe of the equipment will be jeopardized by the service method selected.

Hereafter throughout this manual, Hisense Electric Co., Ltd will be referred to as Hisense.

### 1.1 Warning

#### 1.1.1

Critical components having special safety characteristics are identified with a ▲ by the Ref. No. in the parts list. Use of substitute replacement parts, which do not have the same specified safety characteristics, may create shock, fire, or other hazards.

Under no circumstances should the original design be modified or altered without written permission from Hisense. Hisense assumes no liability, express or implied, arising out of any unauthorized modification of design. Serviceman assumes all liability.

#### DANGERRCAUTION CAUTION

TO ENSURE THE CONTINUED RELIABILITY OF THIS PRODUCT, USE ONLY ORIGINAL MANUFACTURER'S REPLACEMENT PARTS, WHICH ARE LISTED WITH THEIR PART NUMBERS IN THE PARTS LIST SECTION OF THIS SERVICE GUIDE.

#### 1.1.2.

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD).

Careless handling during repair can reduce life drastically. When repairing, make sure

that you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.

1. Never replace modules or other components while the unit is switched on.

2. When making settings, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

### 1.1.3

To prevent electrical shock, do not use this polarized ac plug with an extension cord, receptacle, or the outlet unless the blades can be fully inserted to prevent blade exposure.

To prevent electrical shock, match wide blade or plug to wide slot, fully insert.

### 1.1.4

When replacement parts are required, be sure to use replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock, or other hazards.

### 1.1.5

Safety regulations require that after a repair the set must be returned in its original condition. In particular attention should be paid to the following points.

- Note: The wire trees should be routed correctly and fixed with the mounted cable clamps.

- The insulation of the mains lead should be checked for external damage.

### 1.1.6

- (1) Do not touch Signal and Power Connector while this product operates. Do not

touch EMI ground part and Heat Sink of Film Filter.

(2) Do not supply a voltage higher than that specified to this product. This may damage the product and may cause a fire.

(3) Do not use this product in locations where the humidity is extremely high, where it may be splashed with water, or where flammable materials surround it. Do not install or use the product in a location that does not satisfy the specified environmental conditions. This may damage the product and may cause a fire.

(4) If a foreign substance (such as water, metal, or liquid) gets inside the panel module, immediately turn off the power. Continuing to use the product may cause fire or electric shock.

(5) If the product emits smoke, and abnormal smell, or makes an abnormal sound, immediately turn off the power. Continuing to use the product, it may cause fire or electric shock.

(6) Do not disconnect or connect the connector while power to the product is on. It takes some time for the voltage to drop to a sufficiently low level after the power has been turned off. Confirm that the voltage has dropped to a safe level before disconnecting or connecting the connector.

(7) Do not pull out or insert the power cable from/to an outlet with wet hands. It may cause electric shock.

(8) Do not damage or modify the power cable. It may cause fire or electric shock.

(9) If the power cable is damaged, or if the connector is loose, do not use the product:

otherwise, this can lead to fire or electric shock.

(10) If the power connector or the connector of the power cable becomes dirty or dusty, wipe it with a dry cloth. Otherwise, this can lead to fire.

(11) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

### 1.2 Notes

Notes on Safe Handling of the LCD panel and during service

The work procedures shown with the Note indication are important for ensuring the safety of the product and the servicing work. Be sure to follow these instructions.

- Before starting the work, secure a sufficient working space.
- At all times other than when adjusting and checking the product, be sure to turn OFF the POWER Button and disconnect the power cable from the power source of the TV during servicing.
- To prevent electric shock and breakage of PC board, start the servicing work at least 30 seconds after the main power has been turned off. Especially when installing and removing the power board, start servicing at least 2 minutes after the main power has been turned off.
- While the main power is on, do not touch any parts or circuits other than the ones specified. If any connection other than the one specified is made between the measuring

equipment and the high voltage power supply block, it can result in electric shock or activation of the leakage-detection circuit breaker.

- When installing the LCD module in, and removing it from the packing carton, be sure to have at least two persons perform the work.
- When the surface of the panel comes into contact with the cushioning materials, be sure to confirm that there is no foreign matter on top of the cushioning materials before the surface of the panel comes into contact with the cushioning materials. Failure to observe this precaution may result in, the surface of the panel being scratched by foreign matter.
- When handling the circuit board, be sure to remove static electricity from your body before handling the circuit board.
- Be sure to handle the circuit board by holding the large parts as the heat sink or transformer. Failure to observe this precaution may result in the occurrence of an abnormality in the soldered areas.
- Do not stack the circuit boards. Failure to observe this precaution may result in problems resulting from scratches on the parts, the deformation of parts, and short-circuits due to residual electric charge.
- Routing of the wires and fixing them in position must be done in accordance with the original routing and fixing configuration when servicing is completed. All the wires are routed far away from the areas that become hot (such as the heat sink). These wires are fixed in position with the wire clamps so that the wires do not move, thereby ensuring



that they are not damaged and their materials do not deteriorate over long periods of time. Therefore, route the cables and fix the cables to the original position and states using the wire clamps.

- Perform a safety check when servicing is completed. Verify that the peripherals of the serviced points have not undergone any deterioration during servicing. Also verify that the screws, parts and cables removed for servicing purposes have all been returned to their proper locations in accordance with the original setup.



The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the set.

## 2. Product Function Specifications

### Specifications

Model Name		LCD32V86P
Dimension (W×H×D)(mm)	Without stand	788×511×101
	With stand	788×561×252
Weight(kg)	Without stand	10,5
	With stand	12,5
LCD Panel Minimum size(diagonal)		81
Screen resolution		1920×1080
Power consumption		130W
Audio power		6W+6W

Power supply		Refer to rating label
Receiving systems	RF	PAL、SECAM、D/K、B/G、I、L、L'
	AV	PAL,SECAM,NTSC
Channel range		VHF/UHF : 48. 25-863. 25MHz
Environmental conditions		Temperature 5°C~ 35°C Humidity:20%-80% RH, Atmospheric pressure: 86kPa-106kPa
Component Input		480I、480P、576I、576P 720P/50Hz、720P/60Hz、1080I/50Hz、1080I/60Hz 1080P/50Hz、1080P/60Hz
VGA Input		VGA ( 640×480 60Hz ) 、 SVGA ( 800×600 60Hz ) XGA ( 1024×768 60Hz )
HDMI Input		RGB/60Hz ( 640×480、800×600、1024×768 ) YUV/50Hz ( 576P、720P、1080I、1080P ) YUV/60Hz ( 480I、480P、720P、1080I、1080P )
SCART Input		CVBS、RGB、Y/C

### 3. LCD Panel Spec

#### LCD32V86

Panel: LTA320AP02 \ROH SN: 1058148

#### LCD32V86P

Panel: T315HW02V0 \ROH SN: 1057323

#### 3.1 Panel: LTA320AP02 \ROH

##### 3.1.1 General Description

###### Description

LTA320AP02 is a color active matrix liquid crystal display (LCD) that uses amorphous silicon TFT (Thin Film Transistor) as switching components. This model is composed of a TFT LCD panel, a driver circuit and a back light unit.

The resolution of a 32.0" is 1366 x 768 and this model can display up to 16.7 Million colors with wide viewing angle of 89° or higher in all directions. This panel is intended to support applications to provide an excellent performance for Flat Panel Display such as Home-alone Multimedia TFT-LCD TV and High Definition TV.

###### Features

- RoHS compliance (Pb-free)
- High contrast & aperture ratio
- PVA (Patterned Vertical Align) mode
- Wide viewing angle ( $\pm 178^\circ$ )
- High speed response
- HD resolution (16:9)
- Low Power consumption
- Direct U-Type 4 CCFLs (Cold Cathode Fluorescent Lamp)
- DE (Data Enable) mode
- LVDS (Low Voltage Differential Signaling) interface (1pixel/clock)

##### 3.1.2 General Features

Items	Specification	Unit	Note
Module Size	760.0(H <sub>TYP</sub> ) x 450.0(V <sub>TYP</sub> )	mm	±1.0mm
	50.5 (D <sub>MAX</sub> )		
Weight	7,500Max)	g	
Pixel Pitch	0.51075(H) x 0.51075(V)	mm	
Active Display Area	697.68(H) x 392.25(V)	mm	
Surface Treatment	Haze 7%,Hard-coating(3H)	-	
Display Colors	8 bit - 16.7M	colors	
Number of Pixels	1366 x 768	pixel	
Pixel Arrangement	RGB Horizontal stripe	-	
Display Mode	Normally Black	-	
Luminance of White	450 (Typ.)	cd/m <sup>2</sup>	

3.1 Panel: T315HW02V0 \ROH

3.1.1 General Description

This specification applies to the 31.5 inch Color TFT-LCD Module T315HW02 V0. This LCD module has a TFT active matrix type liquid crystal panel 1920x1080 pixels, and diagonal size of 31.5 inch. This module supports 1920x1080 HDTV mode (Non-interlace).

Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arranged in vertical stripes. Gray scale or the brightness of the sub-pixel color is determined with a 8-bit gray scale signal for each dot.

The T315HW02 V0 has been designed to apply the 8-bit 1 channel LVDS interface method. It is intended to support displays where high brightness, wide viewing angle, high color saturation, and high color depth are very important.

The T315HW02 V0 model is RoHS verified which can be distinguished on panel label.

3.2 General Features

Items	Specification	Unit	Note
Active Screen Size	31.51 inches		
Display Area	698.4 (H) x 392.85 (V)	mm	
Outline Dimension	760.0(H) x 450.0(V) x 45(D)	mm	With inverter
Driver Element	a-Si TFT active matrix		
Display Colors	16.7M	Colors	
Number of Pixels	1920x1080	Pixel	
Pixel Pitch	0.36375	mm	
Pixel Arrangement	RGB vertical stripe		
Display Mode	Normally Black		
Surface Treatment	AG, 3H		Haze = 11

## 4. Chassis Layout and Overall Wiring Diagrams

### Boards and Chassis Layout

#### LCD32V86:

No	Description	Part No.	Type/Model	PCB/ Model
(1)	Main board	120726	RSAG2.908.1497-7\ROH	RSAG7.820.1637\VER.E\ROH
(2)	Power board	120822	RSAG2.908.1285-2\ROH	RSAG7.820.1377\VER.B\ROH
(3)	Keypad PCA	120779	RSAG2.908.1573-3\ROH	RSAG7.820.1755\VER.A\ROH
(4)	IR board	121198	RSAG2.908.1566-2\ROH	0RSAG7.820.1725\VER.C\ROH

#### LCD32V86P:

No	Description	Part No.	Type/Model	PCB/ Model
(1)	Main board	121184	RSGA2.908.1497-15\ROH	RSAG7.820.1637\VER.E\ROH
(2)	Power board	120822	RSAG2.908.1285-2\ROH	RSAG7.820.1377\VER.B\ROH
(3)	Keypad PCA	120779	RSAG2.908.1573-3\ROH	15RSAG7.820.1755\VER.A\ROH
(4)	IR board	121198	RSAG2.908.1566-2\ROH	RSAG7.820.1725\VER.C\ROH

## 5. Factory/Service OSD Menu and Adjustment

### 5.1 To enter the Factory OSD Menu

- a. With factory RC (remote control)
  1. Press “M” button and enter factory mode.
  2. Press “Menu” button and enter factory OSD menu.
  3. Press “CH+”/“CH-” button select the function menu, press “VOL+”/“VOL-” enter the selected function menu. Press “VOL+”/“VOL-” button adjust values in the menu.
- b. With user’s RC
  1. Power TV On
  2. Press Menu button and call up User OSD Menu
  3. Select Audio-> Balance
  4. Enter 0->5->3 ->2 in sequence.  
Note: If necessary, re-do number keys.
  5. Factory OSD appears.
  6. Press Menu again and leave factory OSD.

### 5.2 Factory OSD Menu

#### 5.2.1 White Balance

**Note: Different source has different WB values. Before adjusting, please change to desired source.**

##### 1. Auto Color

For VGA and Component Video sources, WB values must be adjusted. And at others signal sources, the “auto colour “does not work.

Before adjusting, prepare the signal instruments such as DVD or K-8256 first, and find the video picture with gray and color bars. Then please change to desired source.

	source	Timing	Pattern	Notes
<b>1</b>	<b>ADC VGA</b>	<b>1024*768</b>	<b>gray-3color</b>	<b>For VGA source</b>
<b>2</b>	<b>ADC HDTV</b>	<b>720P</b>	<b>gray-3color</b>	<b>For Component Video</b>

Notes:

- a、 Press “M” button and enter factory mode.
- b、 Press “Menu” button and enter factory OSD menu.
- c、 Select the item “Auto Color” .
- d、 Press VOL+ button to auto color.

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e、Close the OSD menu after 5 seconds.

### 5.2.2 Factory Option

Item 0	Item 1	Note
White Balance	R DRV	Red Driver adjust
	G DRV	Green Driver adjust
	B DRV	Blue Driver adjust
	R CUT	Red Cut adjust
	G CUT	Green Cut adjust
	B CUT	Blue Cut adjust
<b>Note: Before adjusting, please change to desired source. Different source has different WB values.</b>		
Set Channel	Zhong Shi	Qingdao Jiangxi Road factory
	Huang Dao	Huangdao Industrial Park
	Gui Yang	Gui Yang Industrial Park
	Liao Ning	Liao Ning Industrial Park
	Hungary	Hisense Hungary
	Australia	Hisense Australia
	France	Hisense France
Auto Color	For VGA and Component Video sources, WB values must be adjusted	And at others signal sources, the "auto colour "does not work.
Color Temp		Standard\cool\warm
Color Temp	R Offset	
	G Offset	
	B Offset	
Video Curve	Brightness Min	Min Brightness
	Brightness Mid	Mid Brightness
	Brightness Max	Max Brightness
	Contrast Min	Min Contrast
	Contrast Mid	Mid Contrast
	Contrast Max	Max Contrast s
	Saturation Min	Min Saturation
	Saturation Mid	Mid Saturation
	Saturation Max	Max Saturation
Factory Option	To FAC	M-Can enter factory mode with factory RC or user RC. U-Can enter factory mode only with user's RC.
	Logo Option	Logo Selection
	OSD	

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<b>MODE “M” is only used for factory production.</b>		
Version Info		
	Version:	Current Software version
	Date:	The date of current version
<b>Note:</b> Software version info of the TV, readable only.		
Clean Protected		Clean data except WB data and Auto Color data
Clean All		Clean all data

**Note:** The factory menu date varies according to different sources. In case changing the factory data by error, you can choose to “Clean Protected”, by which you can resume the default value.

**To clear the EEPROM:**

- a. Select the item “Clean All” .
- b. Press VOL+ button to clear the EEPROM data.
- c. Close the OSD menu after 5 seconds.
- d. Restart the TV.

### 5.3 Designer Menu

Item 0	Item 1	Item 2	Note
Designer Menu	Picture Mode	SOURCE	The current program source
		VIVID Brightness	Brightness of VIVID mode
		VIVID Contrast	Contrast of VIVID mode
		VIVID Saturation	Saturation of VIVID mode
		STD Brightness	Brightness of STD mode
		STD Contrast	Contrast of STD mode
		STD Saturation	Saturation of STD mode
		MOVIE Brightness	Brightness of Movie mode
		MOVIE Contrast	Contrast of Movie mode
		MOVIE Saturation	Saturation of Movie mode
Sound Mode	Volume Curve	Volume Min	When value is 1 Think about the



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			before adjusting
		Volume 25	When value is 25 Think about the Audio out power before adjusting
		Volume Mid	When value is 50 Think about the Audio out power before adjusting
		Volume 75	When value is 75 Think about the Audio out power before adjusting
		Volume Max	When value is 100 Think about the Audio out power before adjusting
	Audio Mode	Audio Mode	Standard 、 user 、 Music 、 Speech, Music
		120HZ	Different frequencies for different Audio Mode
		500HZ	
		1.5kHz	
		5kHz	
		10kHz	

**The above “Factory/Service OSD Menu” are reference only, please refer to the actual units to determine the appearances.**

## 6 Software Upgrading

### The first upgrading method:

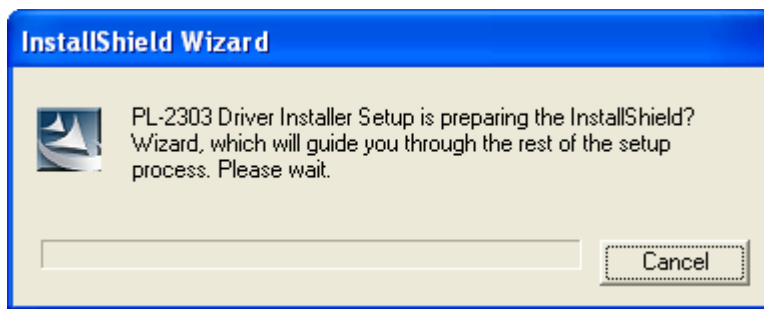
The software is upgraded by a burning tool-MtkTool, which can burn the program file \*.bin to the main board of the unit.

### 6.1 Get ready for upgrading

#### 6.1.1 Install the driver



Double click the icon MTKtools2.44.04+cp210xDriver.rar , install the driver.



Select the default value, the driver will be installed step by step.

#### 6.1.2 Hardware connecting

Connect the unit to your pc with a USB-to-serial port cable. USB port connects to your pc, and serial port to the TV's RS232 port.

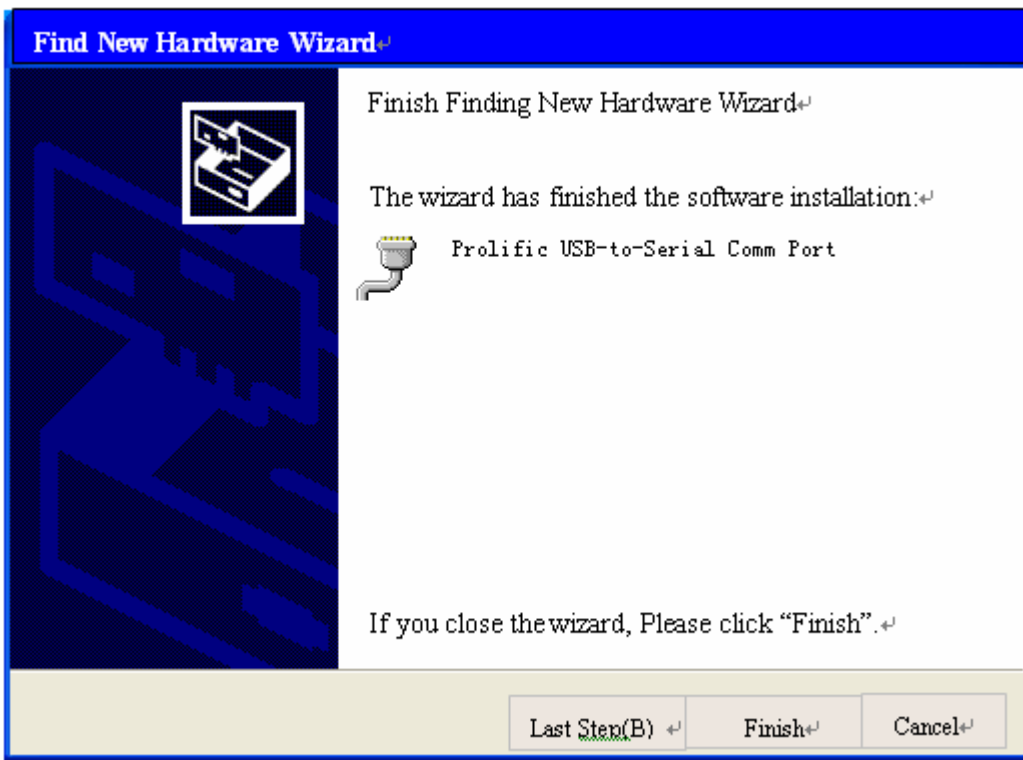
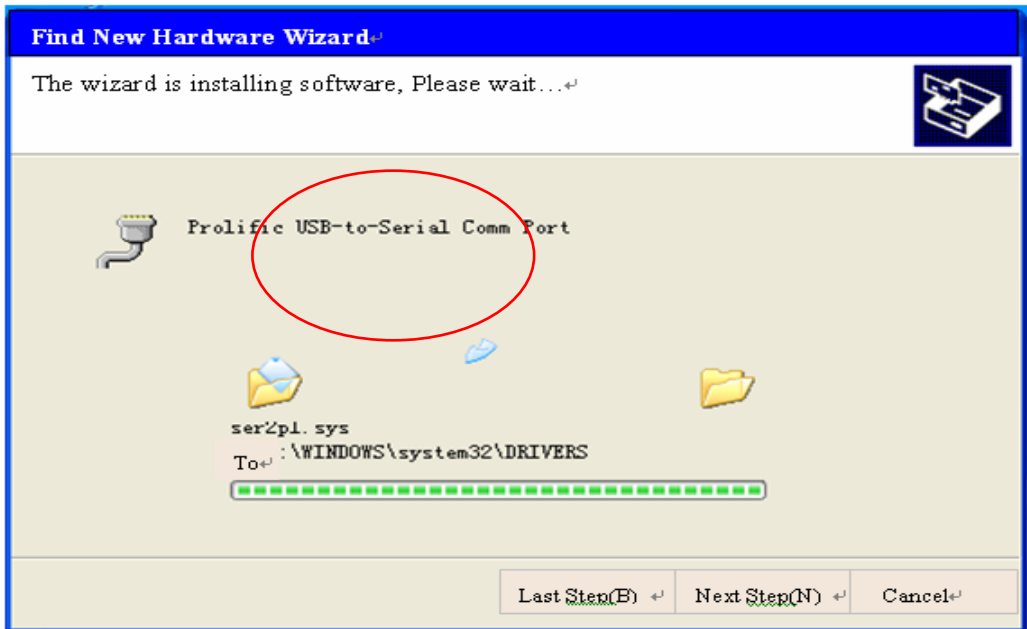


USB connector: to PC.

Serial connector: to TV's RS232 port.

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For the first connecting, the pc will recognize and automatically install the USB device. The process is just like the installation of a mini disk, see the following picture.



## 6.2 Upgrading with the MtkTool

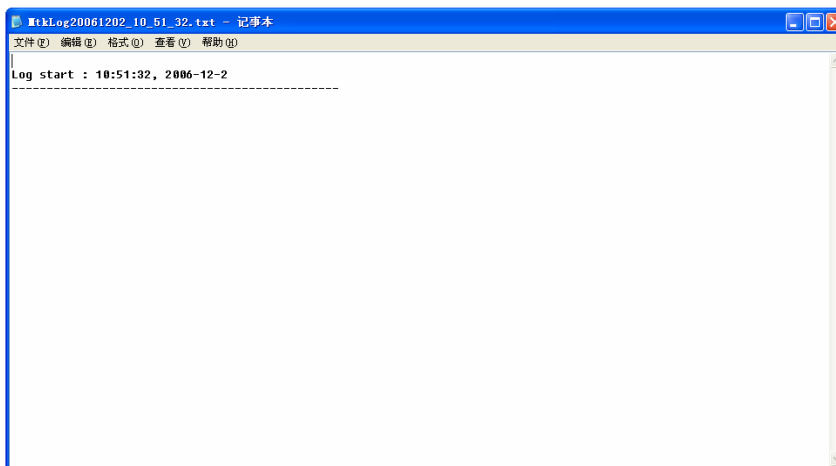
MTKtool is a green program needing no installation. It is saved in the folder




. There are five folders/files in this folder altogether.

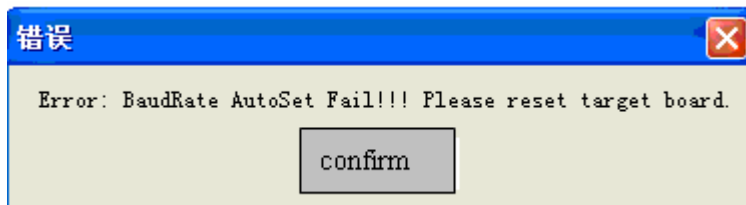


The MtkTool using log is restored in the MtkLog folder. It records the running time and date whenever the tool is used. The log will be a txt file named by the date and time.



After connecting the TV with your PC, double click  icon, open the MtkTool.

If following error appears, it means the related port is not be set properly.



Ignore these errors, click “Confirm” and enter the MtkTool main interface, see the following picture.

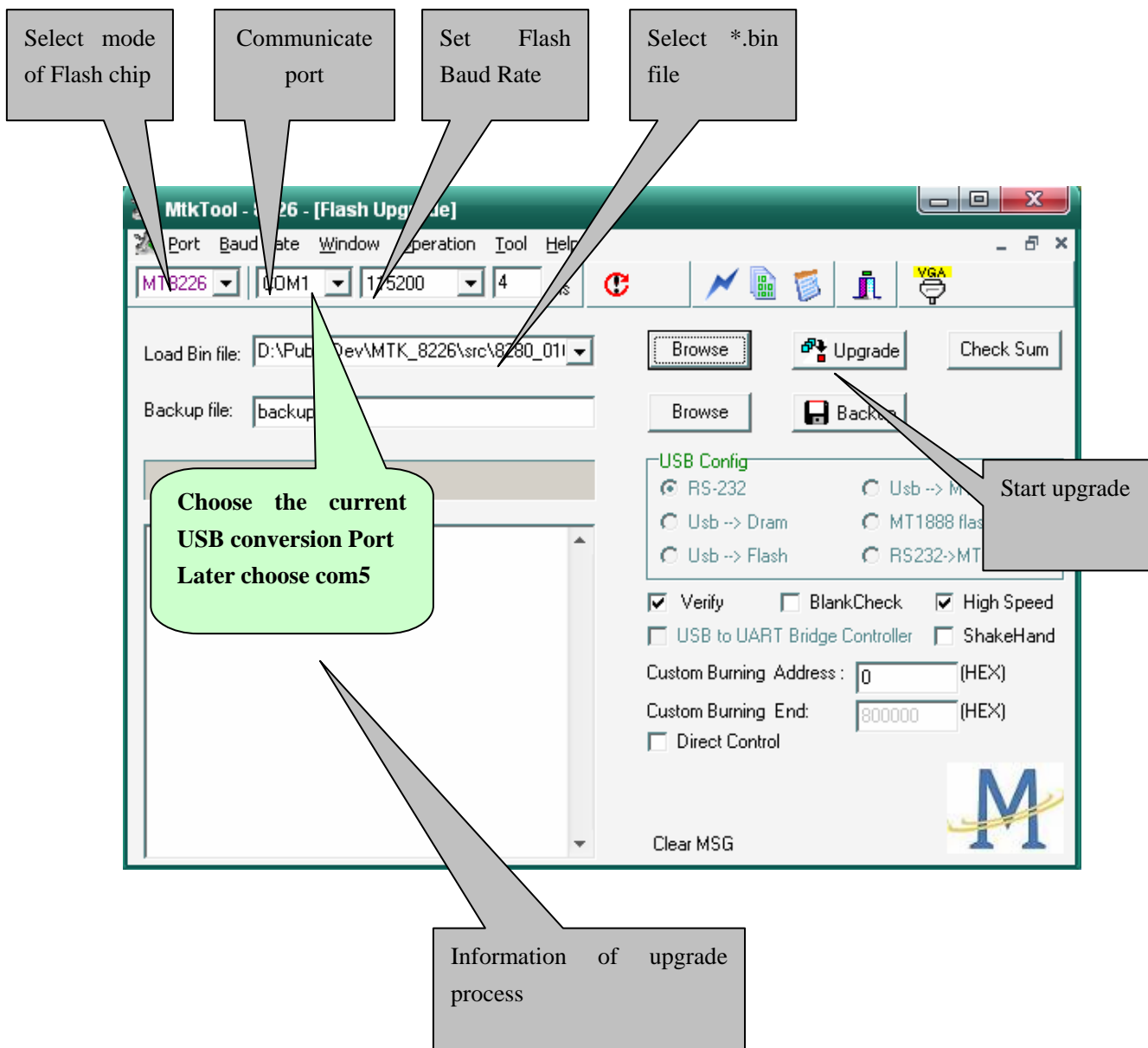
Flash chip model

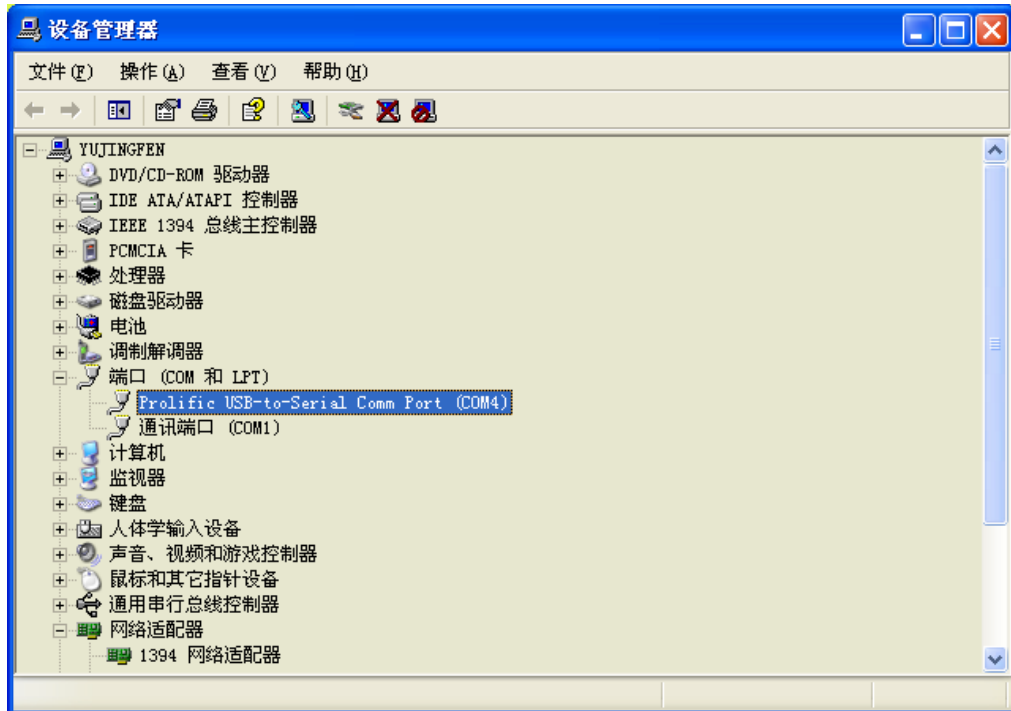
Please refer to follow steps to update the software:

- 1—Select mode of Flash chip to MT8226 as the below picture.
- 2—Refer to the next page instruction to select the communicate port.

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- 3—Press the icon beside the baud rate and make sure it is green as the below picture.
- 4—Set the flash baud rate to 115200 as the below picture.
- 5—Click the browse button to select the \*.bin file that will be updated.
- 6—Click the “start” button to update software.

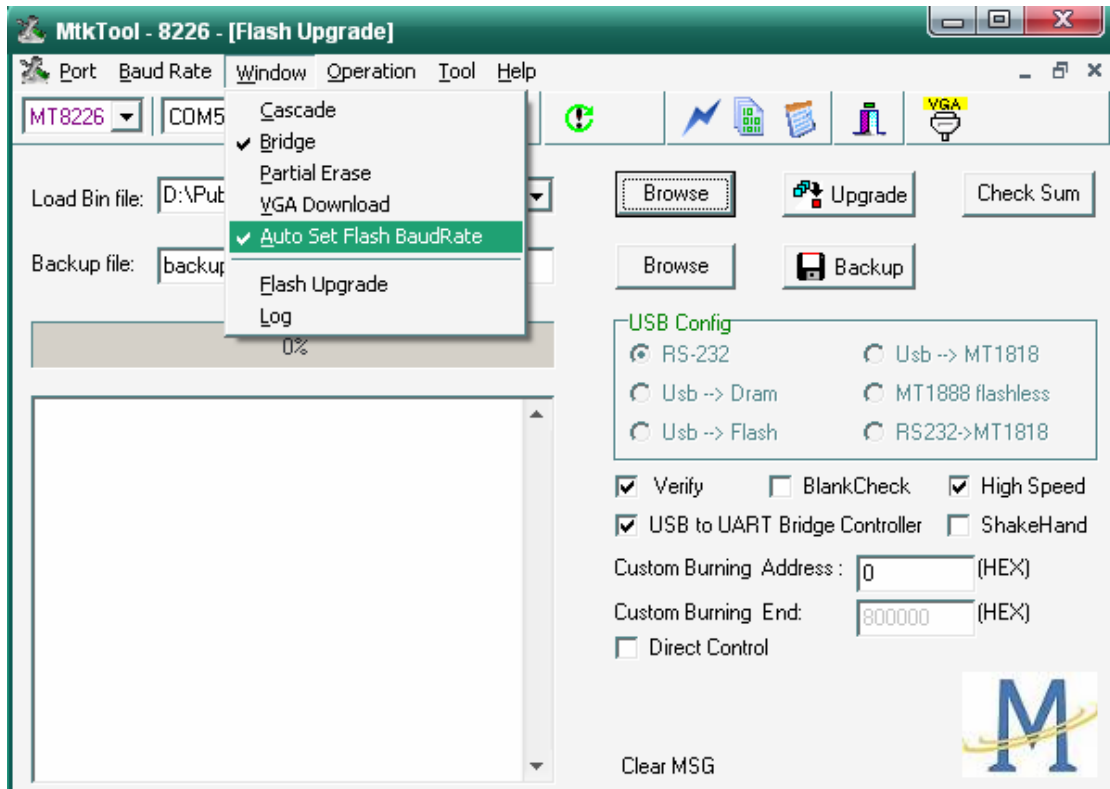




Open “Device Manager” and find which port is connected with the TV. In this operation, COM5 is connected to the TV; so, select “COM5” in the MtkTool main interface. Select the right baud rate according to chip model. For this unit( chip model is MT8226), select 115200..So choose “Auto Set Flash BaudRate”

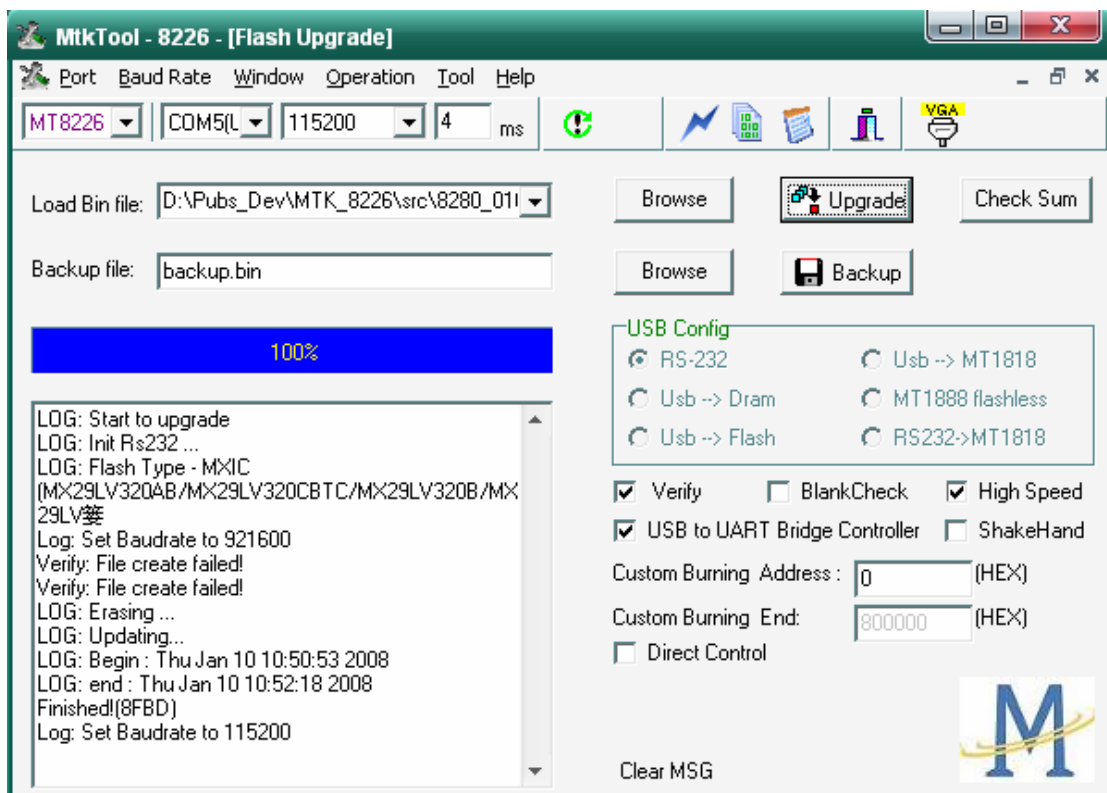
**Note:** Whether or not click the “Auto Set Flash Baud Rate” in the “window” menu depends on the chip type. If the flash chip does not support high speed transport, do not select this option; otherwise, reserve the selected mood.

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Click “Browse” button, find the upgrading program file, and select it. Press “Upgrade” button and start upgrading.

The following interface appears on the screen, indicating upgrading successfully.



### 6.3 Update with USB directly

The second update method is with USB directly:

MTK8222 Series can update with USB, the software name should be **HISENSE.bin**.

The Updating Steps is set the Source to "DMP interface", insert the USB(the update file **HISENSE.bin**,which should be in root directory),The TV automatic identify the upgrading software. step by step according as the informations of the upgrading process.



(USB to the Main board directly)

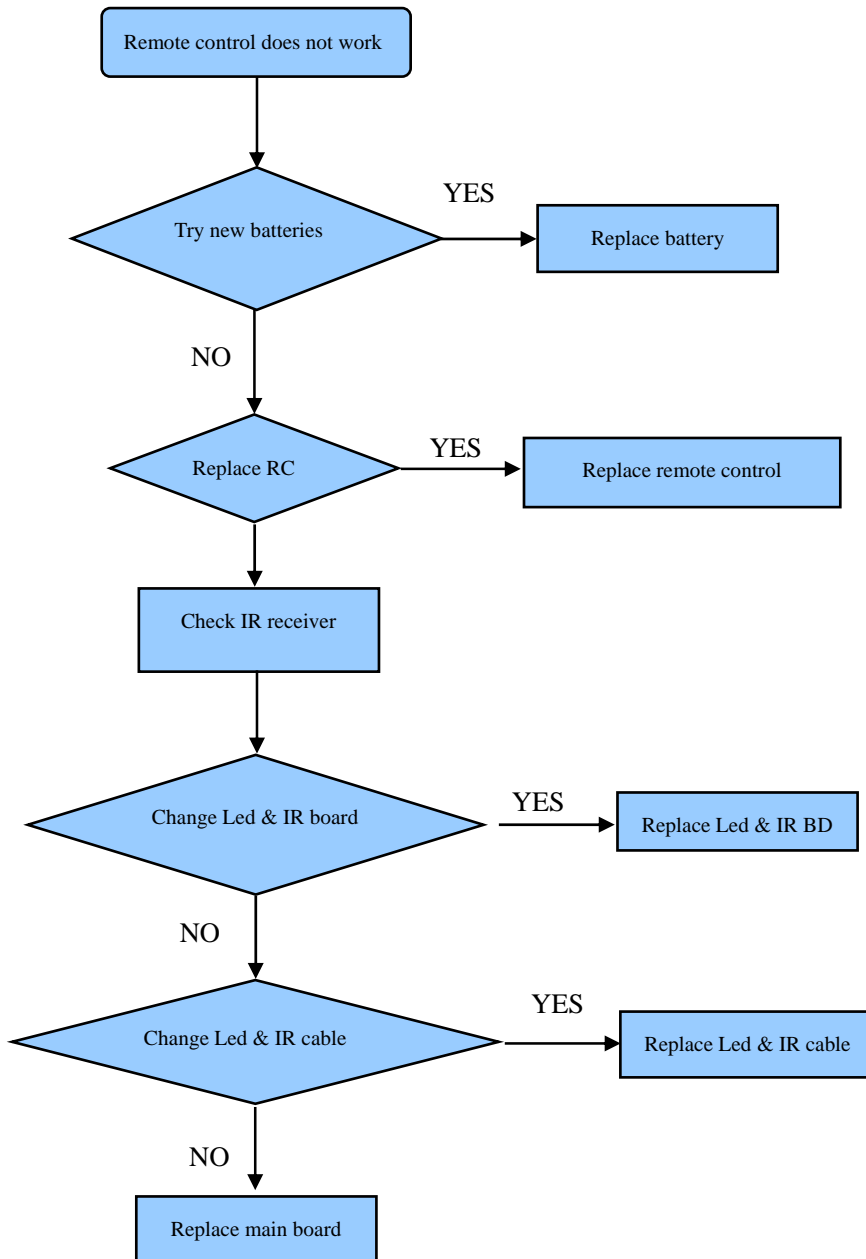




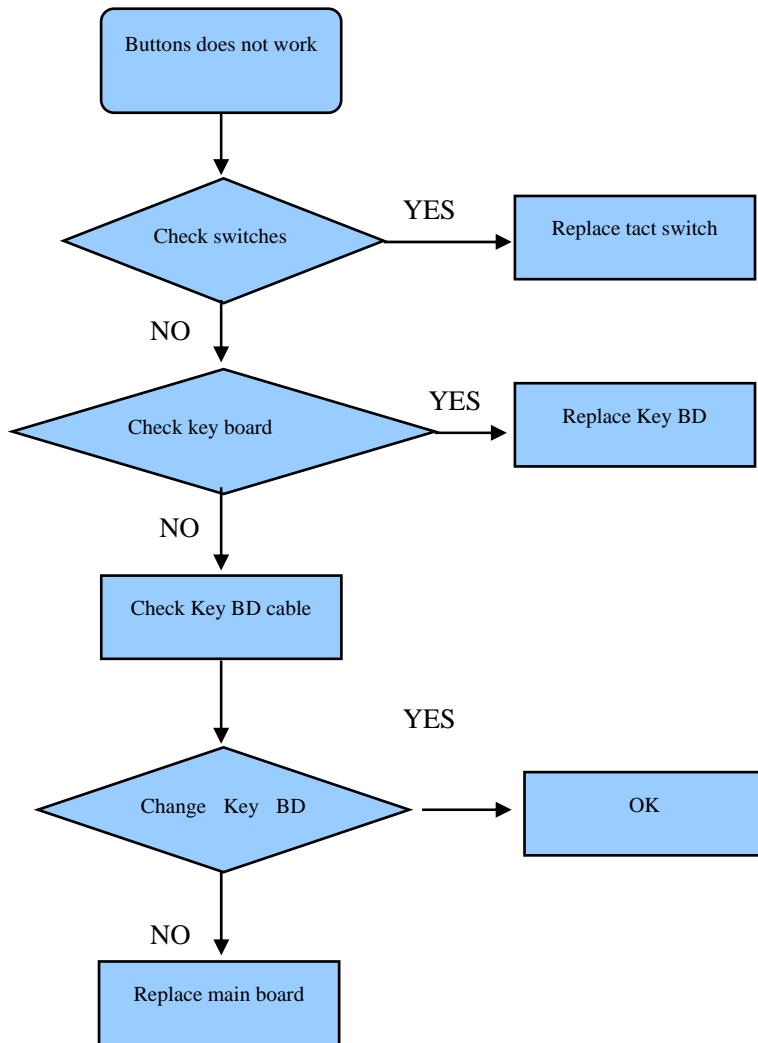
**After upgrading, you must confirm the software in the Factory Menu and you'd better "CLEAR UNPROTECTLY".**

## 7. Troubleshooting

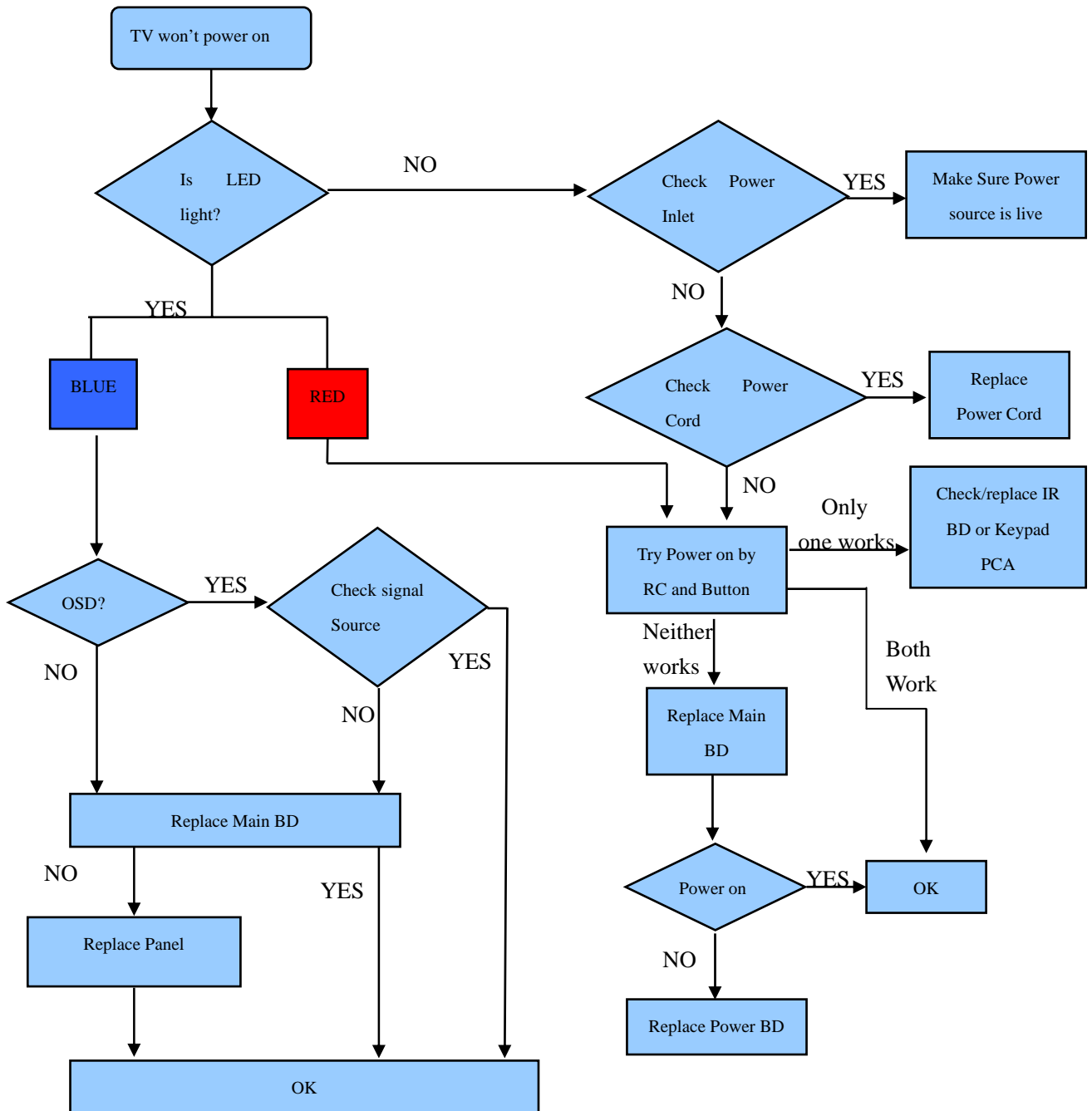
### 7.1 Troubleshooting for Remote Control



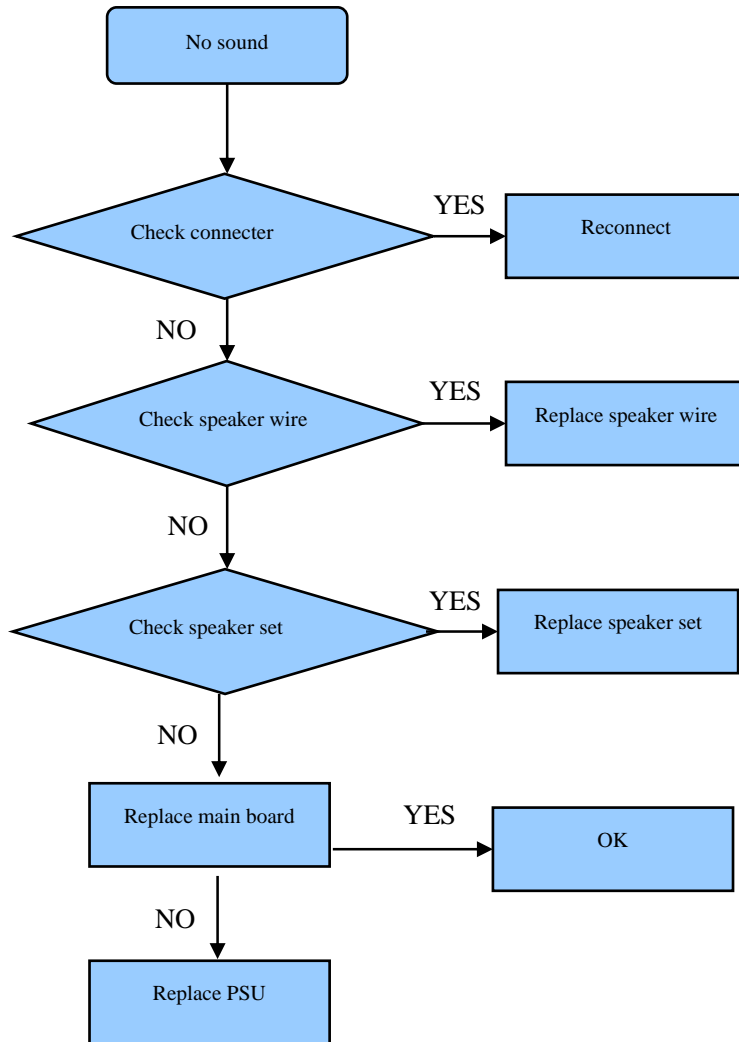
## 7.2 Troubleshooting for Function Key



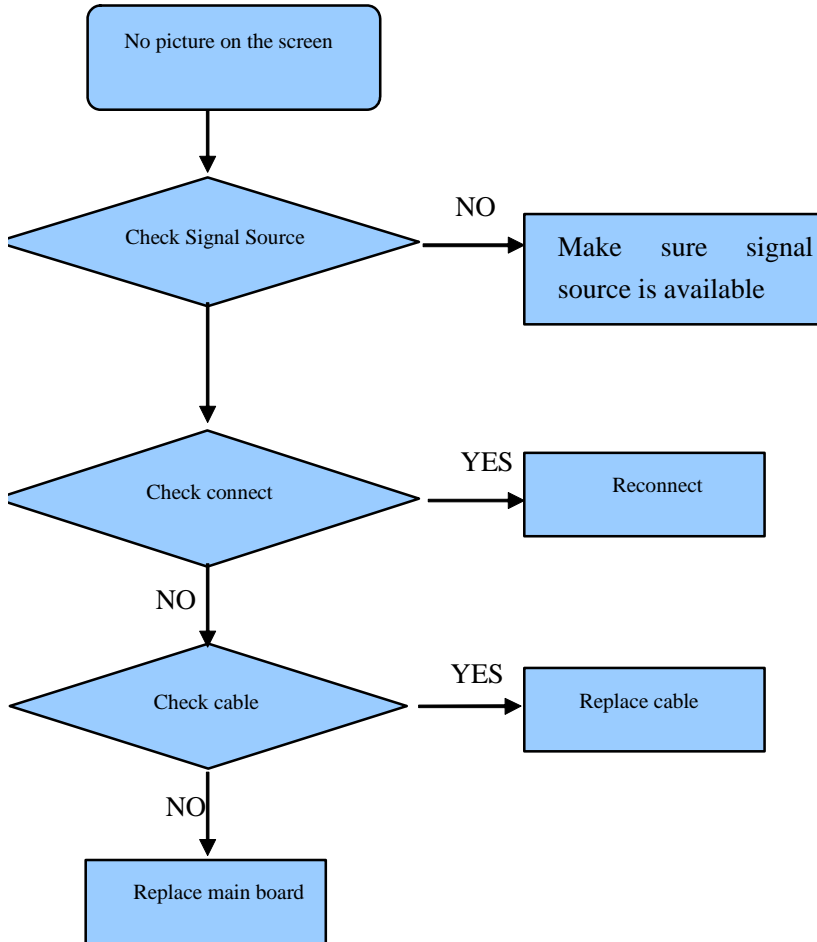
### 7.3 TV won't Power On



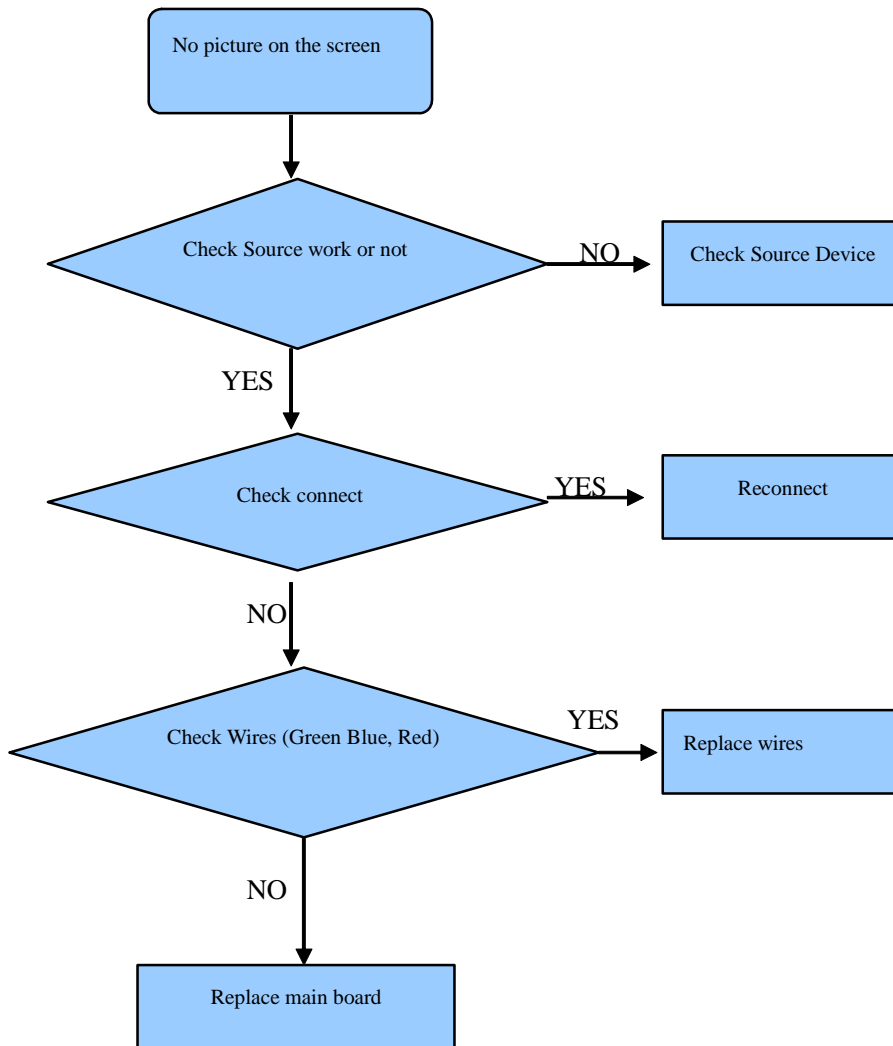
## 7.4 Troubleshooting for Audio



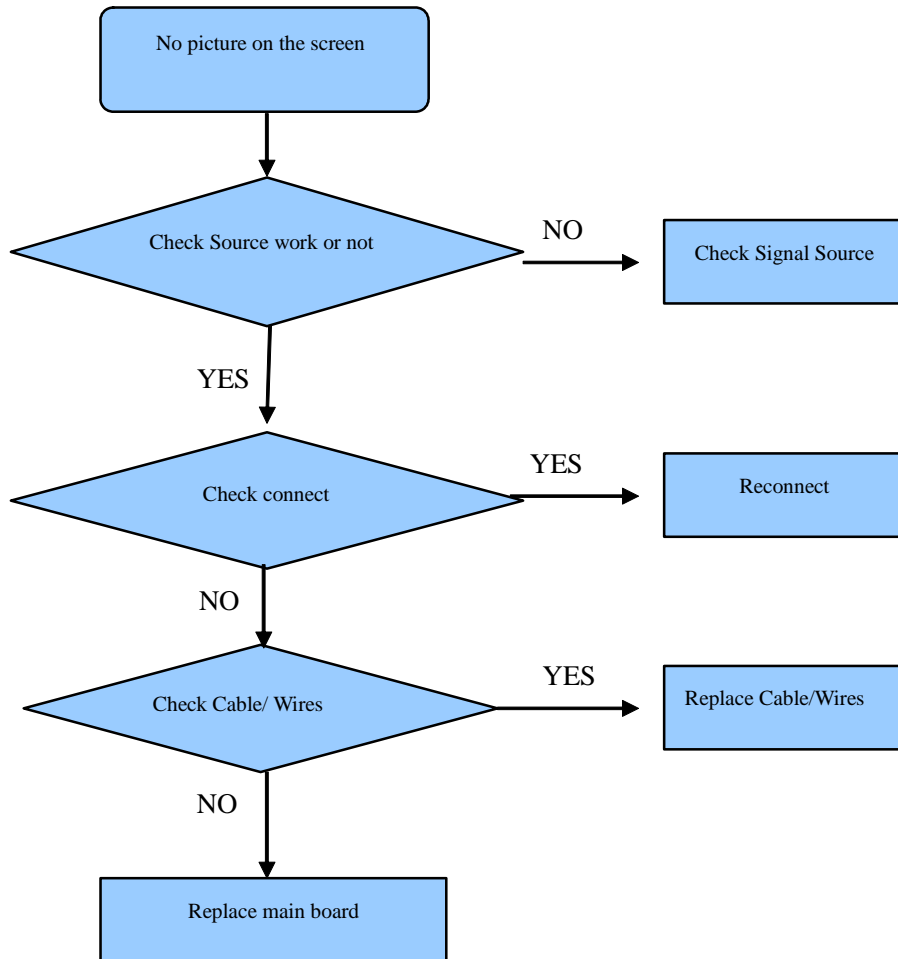
## 7.5 Troubleshooting for TV/VGA/HDMI input



## 7.6 Troubleshooting for YPbPr input

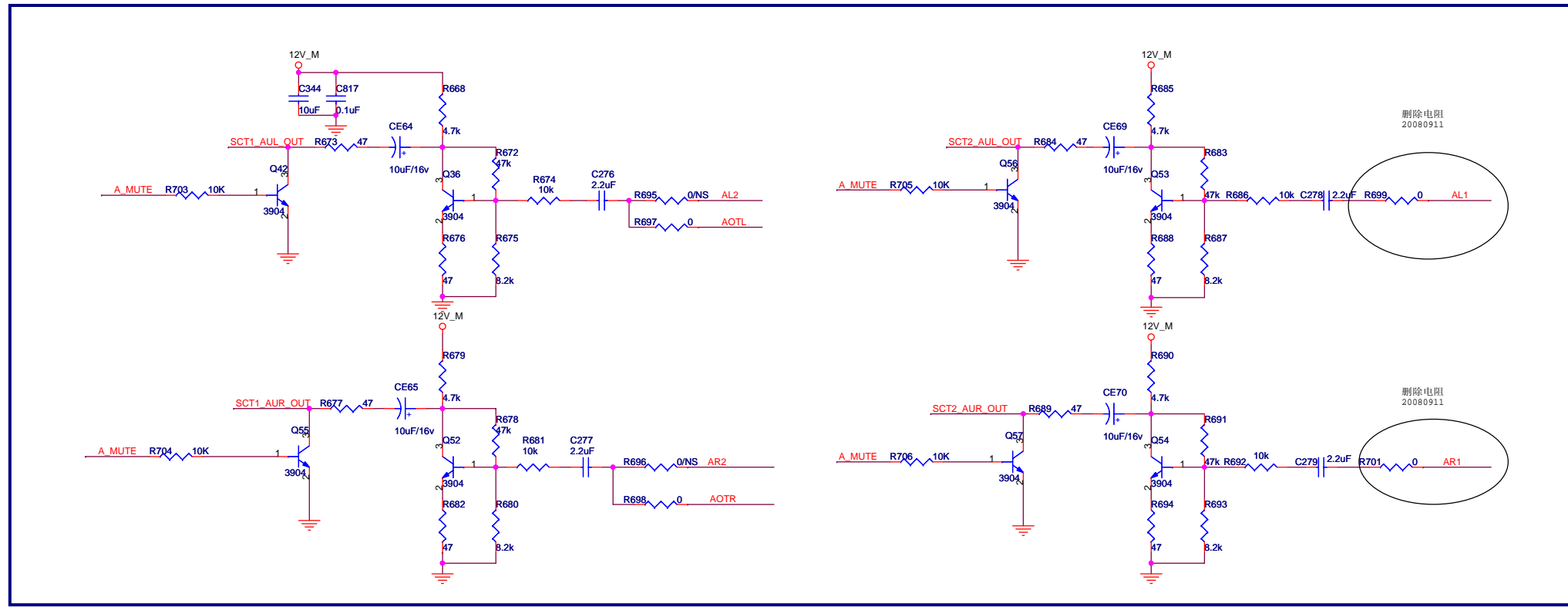


### 7.7 Troubleshooting for Video/S-Video input

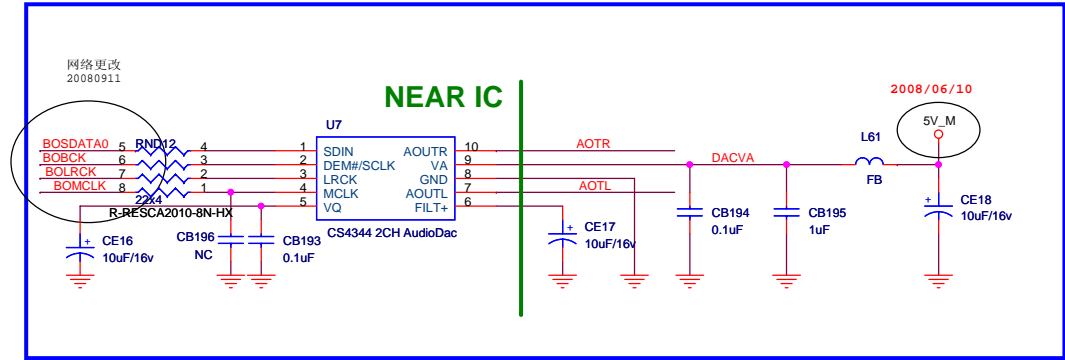
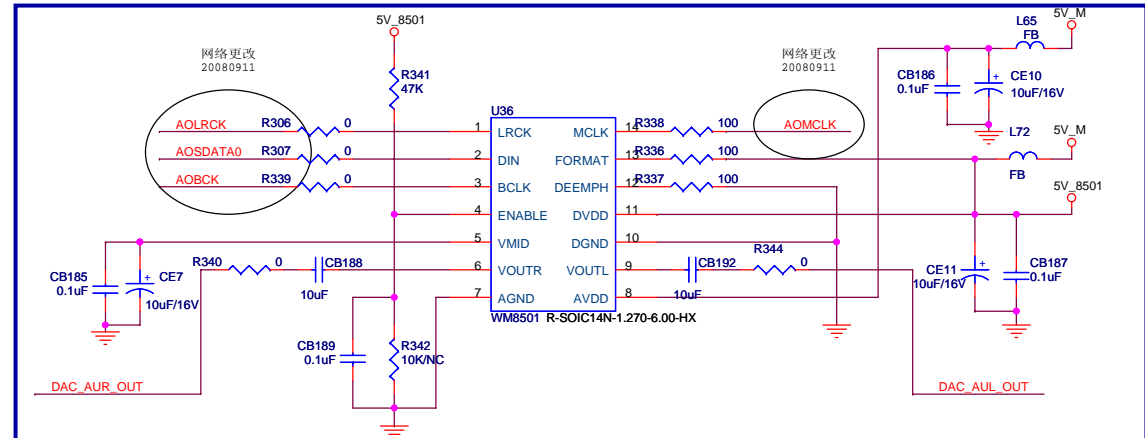
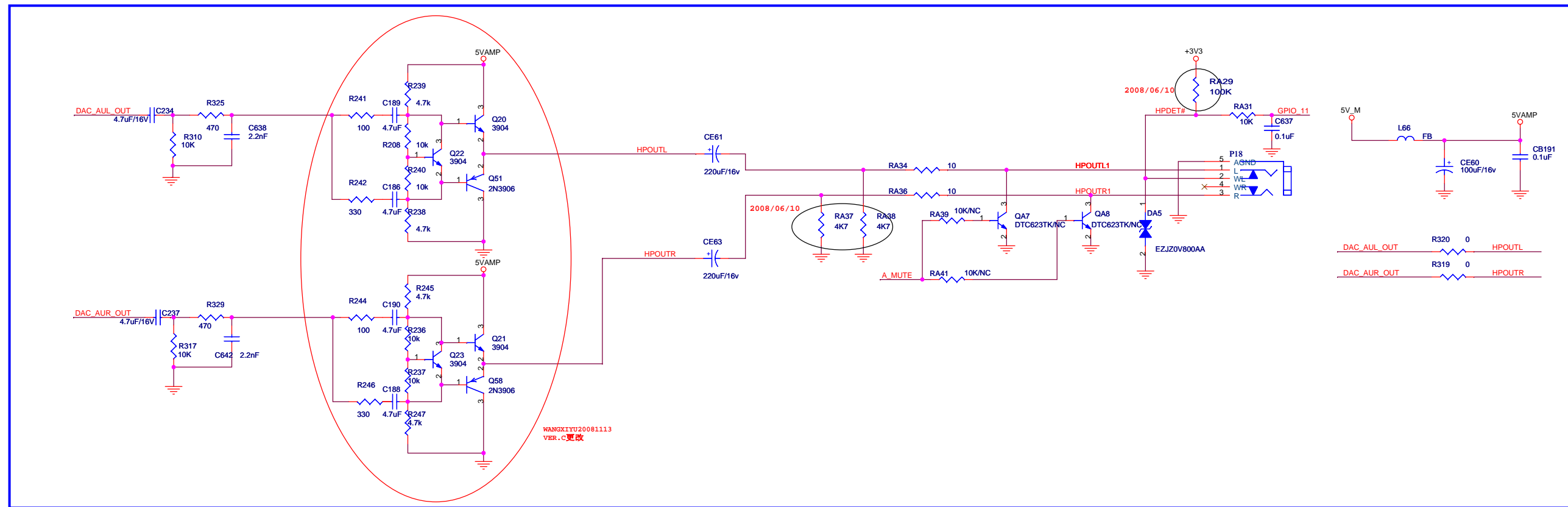


### 8. Schematic circuit diagram





- 5V\_M <<> 5V\_M 2,3,6,8,12,14
- 12V\_M <<> 12V\_M 2,11,14
- +3V3 <<> +3V3 2,3,4,6,7,11,14
- OFF\_MUTE <<> OFF\_MUTE 3,14
- A\_MUTE <<> A\_MUTE 14
- GPIO\_11 <<> GPIO\_11 3
- SCT1\_AUR\_OUT <<> SCT1\_AUR\_OUT 10
- SCT1\_AUL\_OUT <<> SCT1\_AUL\_OUT 10
- SCT2\_AUR\_OUT <<> SCT2\_AUR\_OUT 8,10
- SCT2\_AUL\_OUT <<> SCT2\_AUL\_OUT 8,10
- DAC\_AUL\_OUT <<> DAC\_AUL\_OUT 14
- DAC\_AUR\_OUT <<> DAC\_AUR\_OUT 14
- AOSDATA0 <<> AOSDATA0 3,6,12
- AOBCK <<> AOBCK 3,12
- AOLRCK <<> AOLRCK 3,12
- AGMCLK <<> AGMCLK 3,12
- GND <<> GND 2,3,4,5,6,7,8,9,10,11,12,14
- AR1 <<> AR1 3
- AL1 <<> AL1 3
- AR2 <<> AR2 3
- AL2 <<> AL2 3
- BOSDATA0 <<> BOSDATA0 3,6
- BOBCK <<> BOBCK 3,6
- BOLRCK <<> BOLRCK 3,6
- BOMCLK <<> BOMCLK 3,6

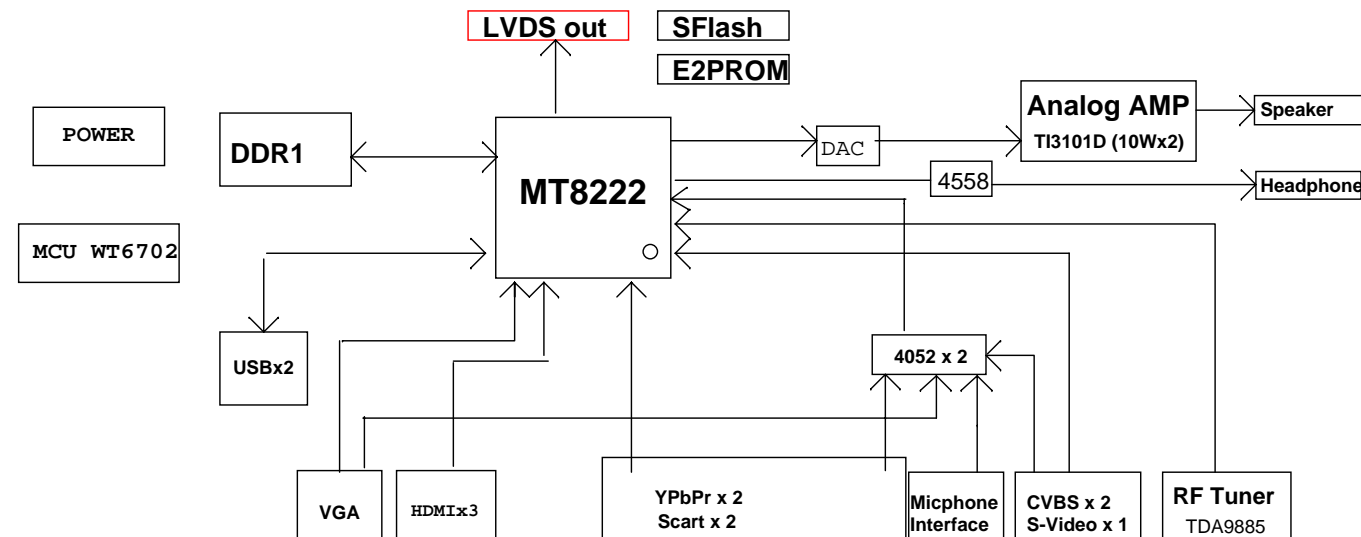


## MT8222\_P1V1 (DDR1) VERSION V1.0

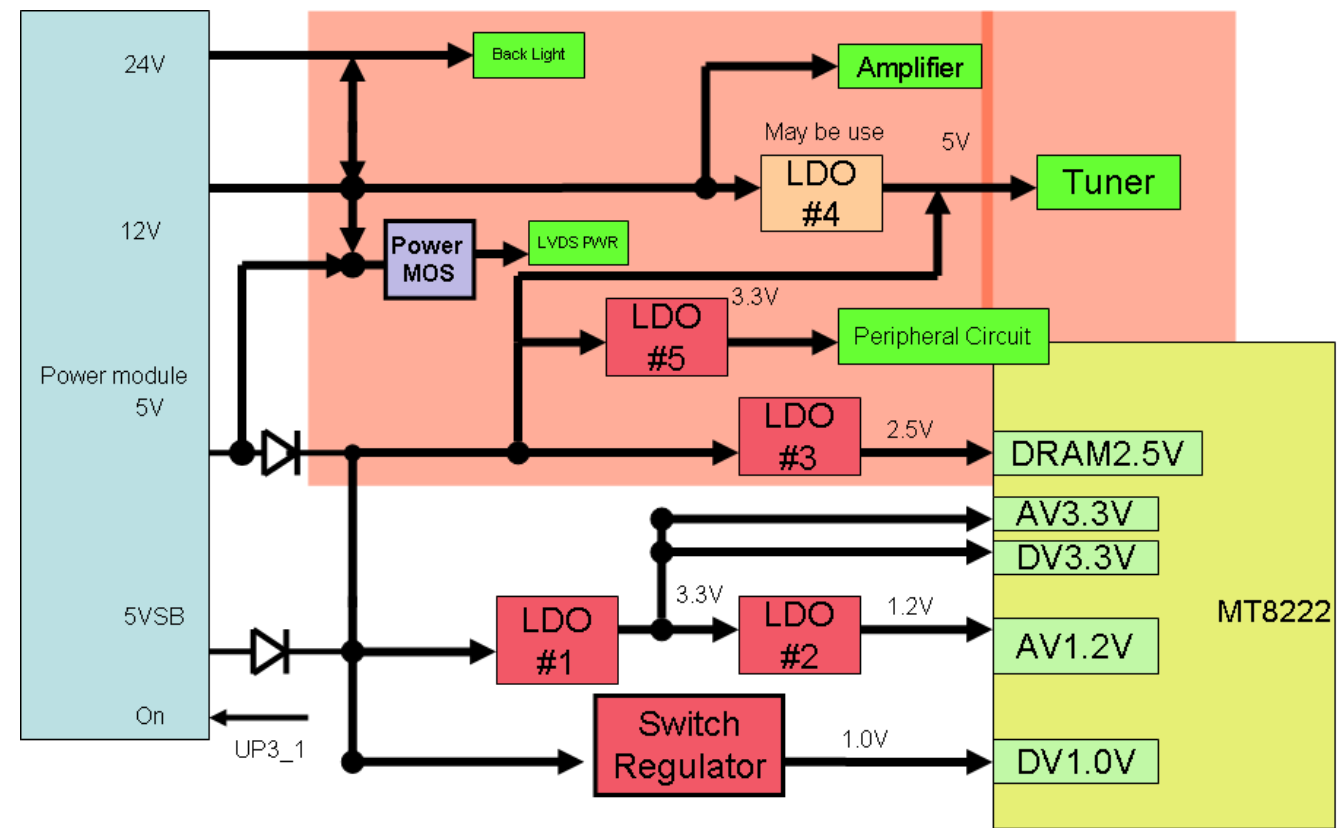
( DDR1 WITH TERMINATION )

### GPIO usage

GPIO Definition	Function define
ADIN0	SCART FS
ADIN1	SCART FS
ADIN2	4052 SWITCH
ADIN3	KEYPAD
ADIN4	KEYPAD
ADIN5	HDMI/VGA EDID E2PROM WP
GPIO_20	Audio MUX
GPIO_21	AMP_MUTE CONTROL
GPIO_22	GAME
GPIO_23	GAME
GPIO_24	GAME
GPIO_25	GAME
PWM0	DIMMING CONTROL
PWM1	Power conversion to 33V
PWM2	SYSTEM E2PROM WP
PWM3	Audio MUX
UP30	BL ON/OFF CONTROL
UP31	NORMAL POWER ON/OFF
UP33	HMDI 0 HPLUG DETECT
UP34	HMDI 1 HPLUG DETECT
UP35	HMDI 2 HPLUG DETECT
GPIO_0	MICPHOTO RESERVE
GPIO_1	LVDS RESERVED
GPIO_2	FCI
GPIO_3	FCI
GPIO_4	LVDS POWER ON/OFF
GPIO_5	AMP_SD/FCI
GPIO_6	SCART1 VIDEO OUTPUT SW/FCI
GPIO_7	FCI
GPIO_8	FCI
GPIO_9	FCI
GPIO_10	FCI
GPIO_11	4052 SWITCH
INT	Audio MUX select bit 0
SPDIFIN	LVDS RESERVED
AOSDATA0	USB0 OC TAG
AOLRCK	USB0 PWR ENABLE
AOBCLK	USB1 PWR ENABLE
AOMCLK	USB1 OC TAG

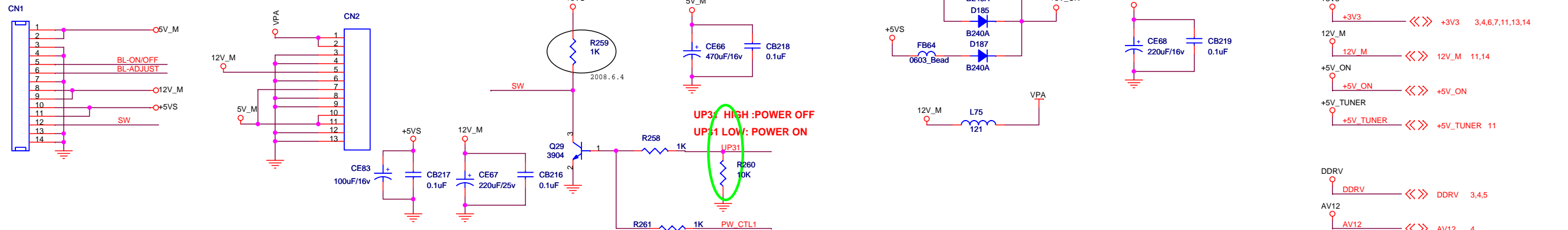


### Power Distribution



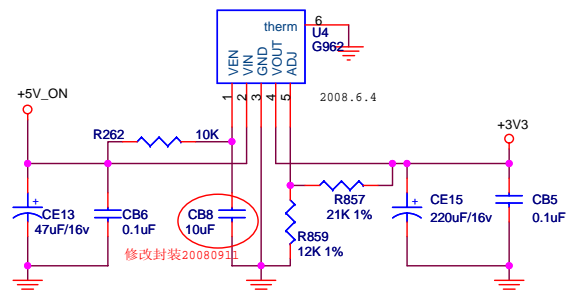
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MAIN POWER



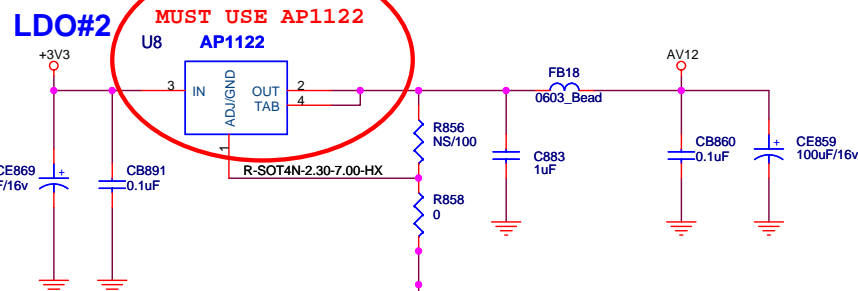
Power for MT8222 only ( Always on )

LDO#1



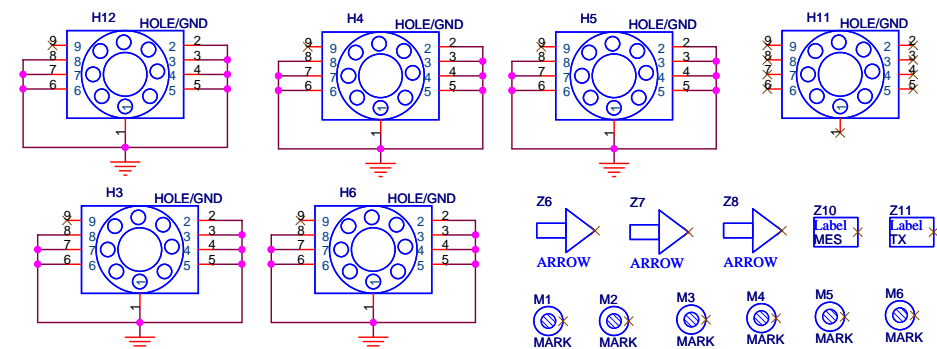
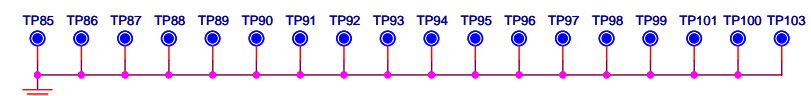
1.2 x (21K+12K)/12K = 3.3V  
 5V to 3.3V  
 Estimated Power consumed : ??? A

LDO#2



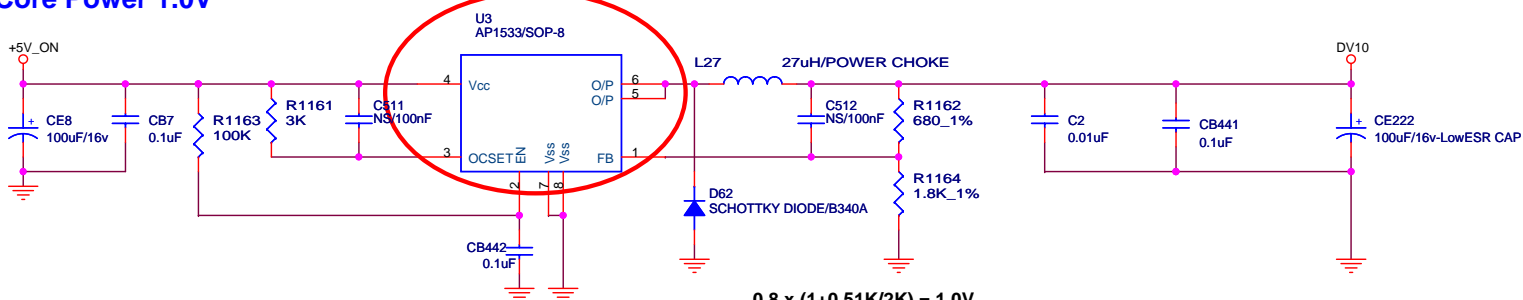
3.3V to 1.2V  
 Estimated Power consumed : ??? A

Test GND Pin ( Spread Around PCB )



Switch Regulator Core Power 1.0V

MUST USE AP1533

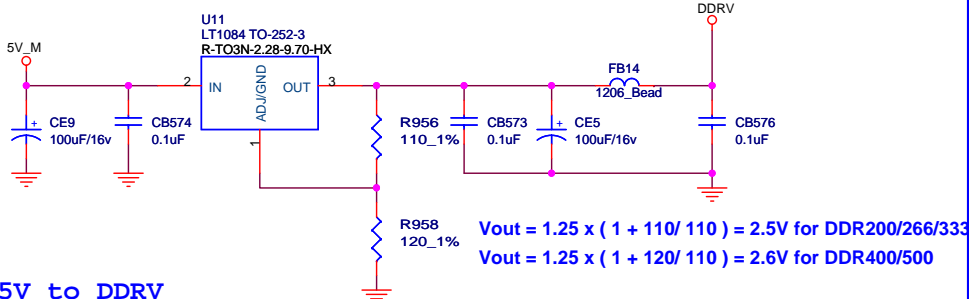


5V to 1.0V  
 Estimated Power consumed : ??? A

$0.8 \times (1 + 0.51K/2K) = 1.0V$

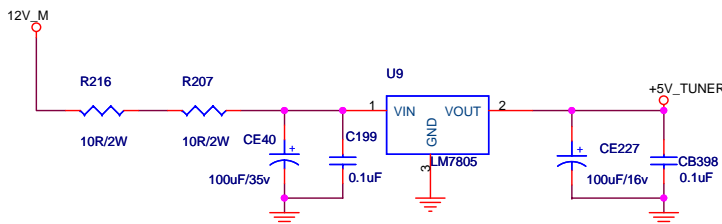
Works at normal mode

LDO#3



5V to DDRV  
 Estimated Power consumed : ??? A

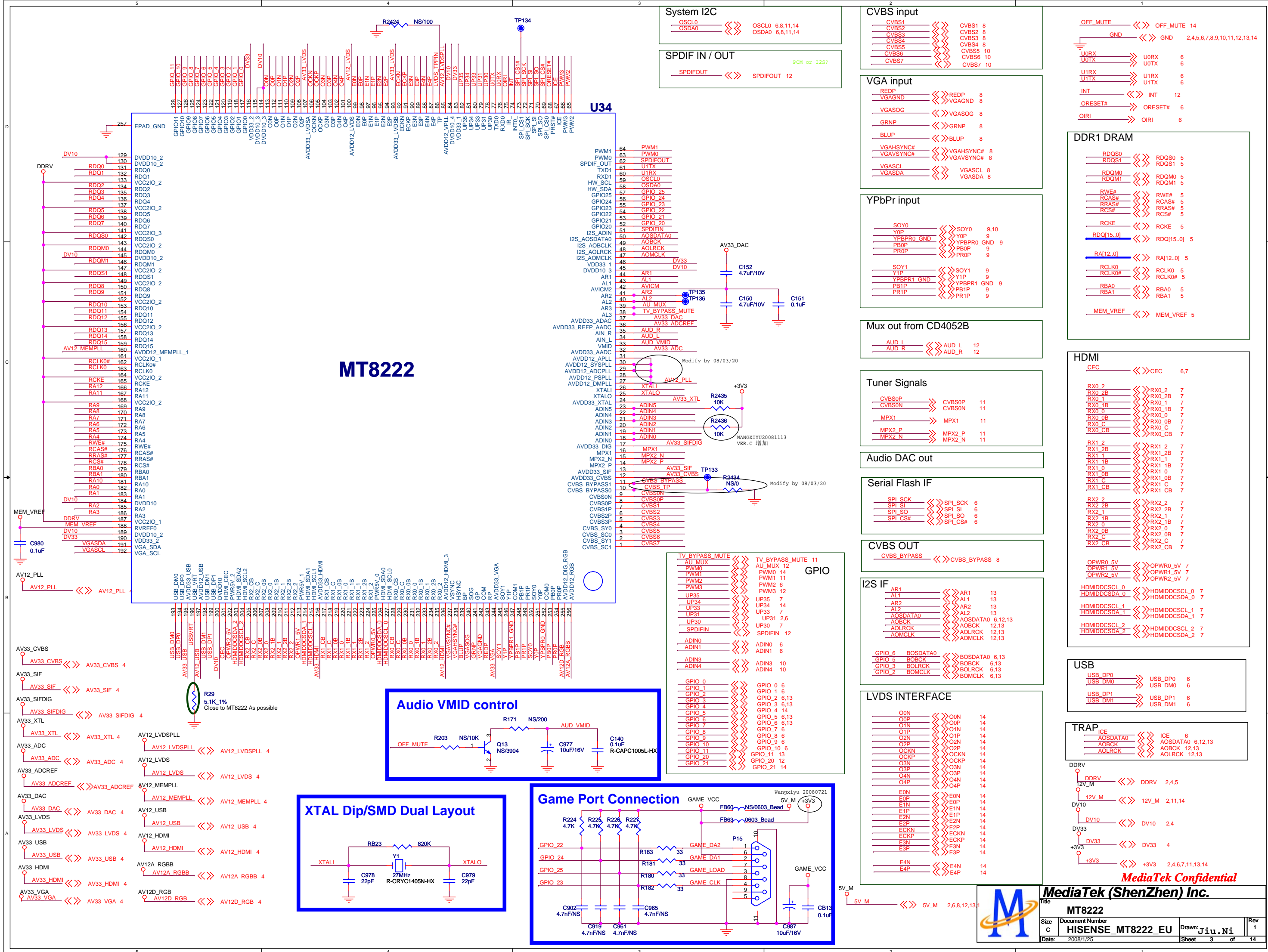
$V_{out} = 1.25 \times (1 + 110/110) = 2.5V$  for DDR200/266/333  
 $V_{out} = 1.25 \times (1 + 120/110) = 2.6V$  for DDR400/500



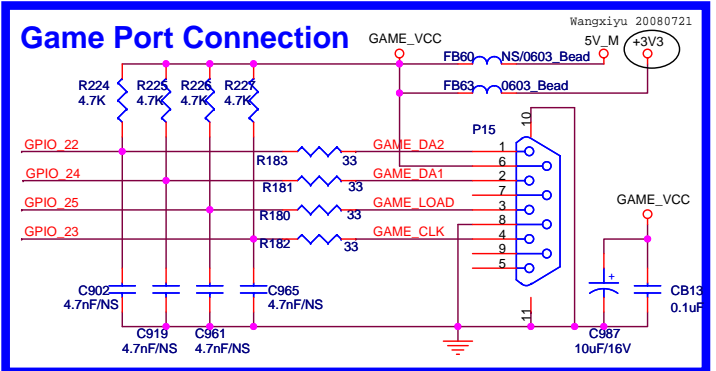
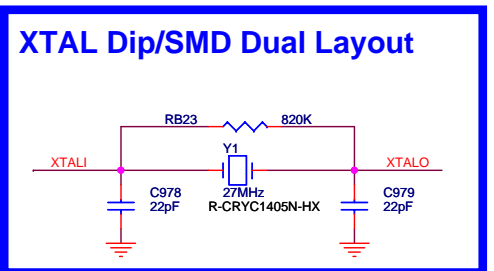
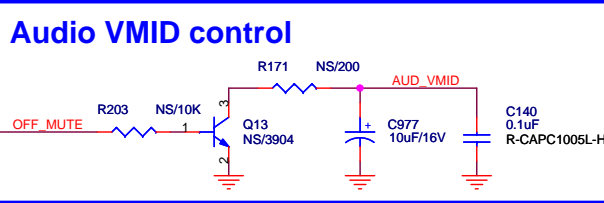
12V to 5V  
 For Tuner 5V power

If use sdram ,NC FB14  
 If use ddr ,NC FB14

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### MT8222



#### U34

PWM1	64	PWM1
PWM0	63	PWM0
SPDIF_OUT	62	SPDIFOUT
TXD1	61	U1TX
RXD1	60	U1RX
HW_SCL	59	OSCL0
HW_SDA	58	OSDA0
GPIO25	57	GPIO_25
GPIO24	56	GPIO_24
GPIO23	55	GPIO_23
GPIO22	54	GPIO_22
GPIO21	53	GPIO_21
GPIO20	52	GPIO_20
SPDIFIN	51	SPDIFIN
I2S_ADIN	50	AOSDATA0
I2S_AOSDATA0	49	AOSBCK
I2S_AOBCK	48	AOLRCK
I2S_AOLRCK	47	AOMCLK
I2S_AOMCLK	46	DV33
VDD33_1	45	DV10
DVDD10_3	44	AR1
AR1	43	AL1
AL1	42	AVICM
AVICM2	41	AR2
AR2	40	AL2
AL2	39	AU_MUX
AU_MUX	38	TV_BYPASS_MUTE
TV_BYPASS_MUTE	37	AV33_DAC
AV33_DAC	36	AV33_ADREF
AV33_ADREF	35	AUD_R
AUD_R	34	AUD_L
AUD_L	33	AUD_VMID
AUD_VMID	32	AV33_ADC
AV33_ADC	31	VMID
VMID	30	AVDD12_ADPC
AVDD12_ADPC	29	AVDD12_SYSPLL
AVDD12_SYSPLL	28	AVDD12_ADPLL
AVDD12_ADPLL	27	AVDD12_PSPLL
AVDD12_PSPLL	26	XTALI
XTALI	25	XTALO
XTALO	24	AVDD33_XTAL
AVDD33_XTAL	23	ADIN5
ADIN5	22	ADIN4
ADIN4	21	ADIN3
ADIN3	20	ADIN2
ADIN2	19	ADIN1
ADIN1	18	ADIN0
ADIN0	17	AV33_SIFDIG
AV33_SIFDIG	16	MPX1
MPX1	15	MPX2_N
MPX2_N	14	MPX2_P
MPX2_P	13	AV33_SIF
AV33_SIF	12	AV33_CVBS
AV33_CVBS	11	CVBS_BYPASS
CVBS_BYPASS	10	CVBS_TP
CVBS_TP	9	CVBS0N
CVBS0N	8	CVBS0P
CVBS0P	7	CVBS1P
CVBS1P	6	CVBS2P
CVBS2P	5	CVBS3P
CVBS3P	4	CVBS4
CVBS4	3	CVBS5
CVBS5	2	CVBS6
CVBS6	1	CVBS7

#### DDR1 DRAM

RDQS0	5	RDQS0
RDQS1	5	RDQS1
RDM0	5	RDM0
RDM1	5	RDM1
RWE#	5	RWE#
RCS#	5	RCS#
RRAS#	5	RRAS#
RCS#	5	RCS#
RCKE	5	RCKE
RDO[15..0]	5	RDO[15..0]
RA[12..0]	5	RA[12..0]
RCLK0	5	RCLK0
RCLK0#	5	RCLK0#
RBA0	5	RBA0
RBA1	5	RBA1
MEM_VREF	5	MEM_VREF

#### HDMI

CEC	6,7	CEC
RX0_2	7	RX0_2B
RX0_1	7	RX0_1B
RX0_1B	7	RX0_1B
RX0_0	7	RX0_0B
RX0_0B	7	RX0_0B
RX0_C	7	RX0_C
RX0_CB	7	RX0_CB
RX1_2	7	RX1_2B
RX1_2B	7	RX1_2B
RX1_1	7	RX1_1B
RX1_1B	7	RX1_1B
RX1_0	7	RX1_0B
RX1_0B	7	RX1_0B
RX1_C	7	RX1_C
RX1_CB	7	RX1_CB
RX2_2	7	RX2_2B
RX2_2B	7	RX2_2B
RX2_1	7	RX2_1B
RX2_1B	7	RX2_1B
RX2_0	7	RX2_0B
RX2_0B	7	RX2_0B
RX2_C	7	RX2_C
RX2_CB	7	RX2_CB
OPWR0_5V	7	OPWR0_5V
OPWR1_5V	7	OPWR1_5V
OPWR2_5V	7	OPWR2_5V
HDMIDDCSCL_0	7	HDMIDDCSCL_0
HDMIDDCSCL_0	7	HDMIDDCSCL_0
HDMIDDCSCL_1	7	HDMIDDCSCL_1
HDMIDDCSCL_1	7	HDMIDDCSCL_1
HDMIDDCSCL_2	7	HDMIDDCSCL_2
HDMIDDCSCL_2	7	HDMIDDCSCL_2

#### USB

USB_DP0	6	USB_DP0
USB_DM0	6	USB_DM0
USB_DP1	6	USB_DP1
USB_DM1	6	USB_DM1

#### TRAP

ICE	6	ICE
AOSDATA0	6,12,13	AOSDATA0
AOBCK	12,13	AOBCK
AOLRCK	12,13	AOLRCK

#### GPIO

GPIO_0	6	GPIO_0
GPIO_1	6	GPIO_1
GPIO_2	6,13	GPIO_2
GPIO_3	6,13	GPIO_3
GPIO_4	6,13	GPIO_4
GPIO_5	6,13	GPIO_5
GPIO_6	6,13	GPIO_6
GPIO_7	6,13	GPIO_7
GPIO_8	6	GPIO_8
GPIO_9	6	GPIO_9
GPIO_10	6	GPIO_10
GPIO_11	6	GPIO_11
GPIO_12	6	GPIO_12
GPIO_13	6	GPIO_13
GPIO_14	6	GPIO_14

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**MediaTek (ShenZhen) Inc.**

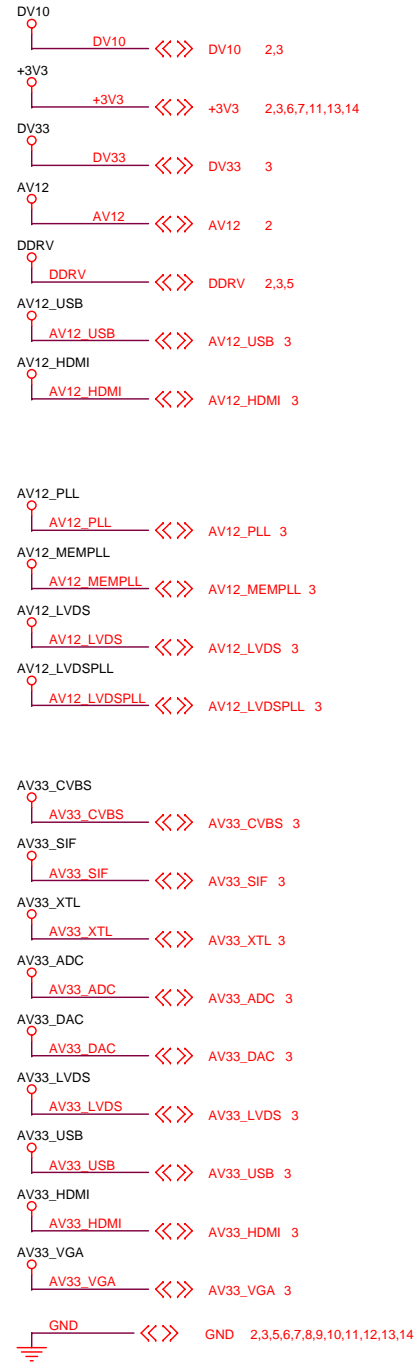
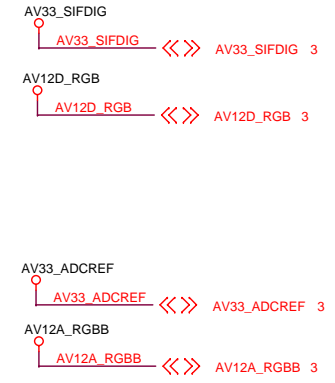
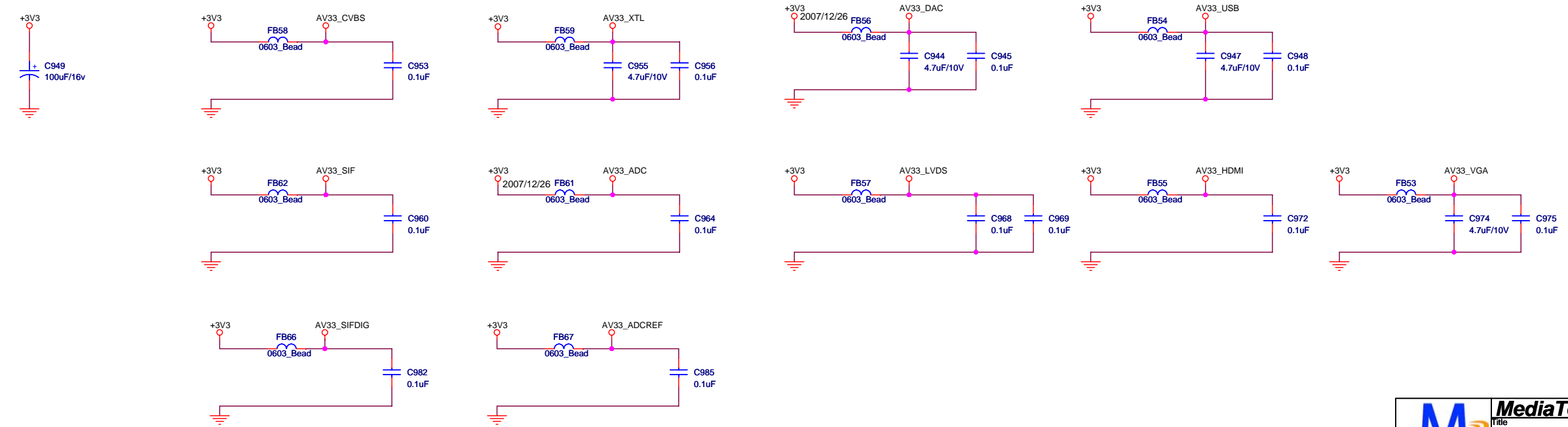
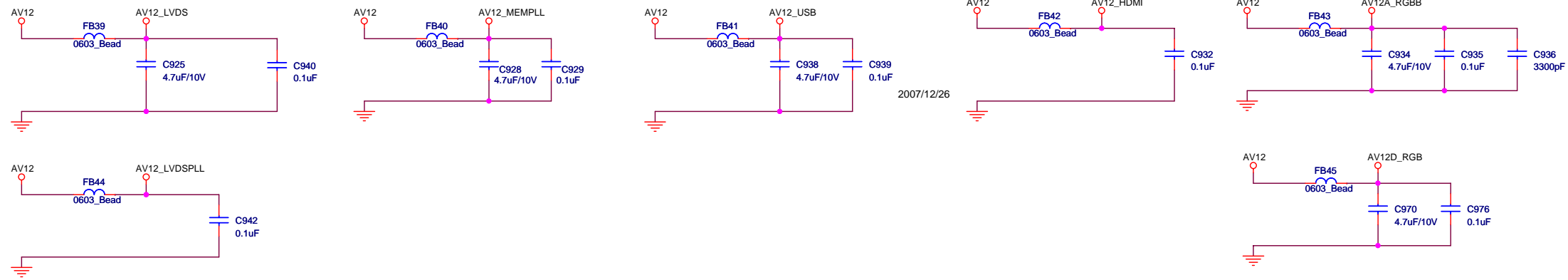
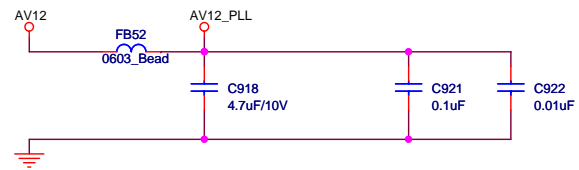
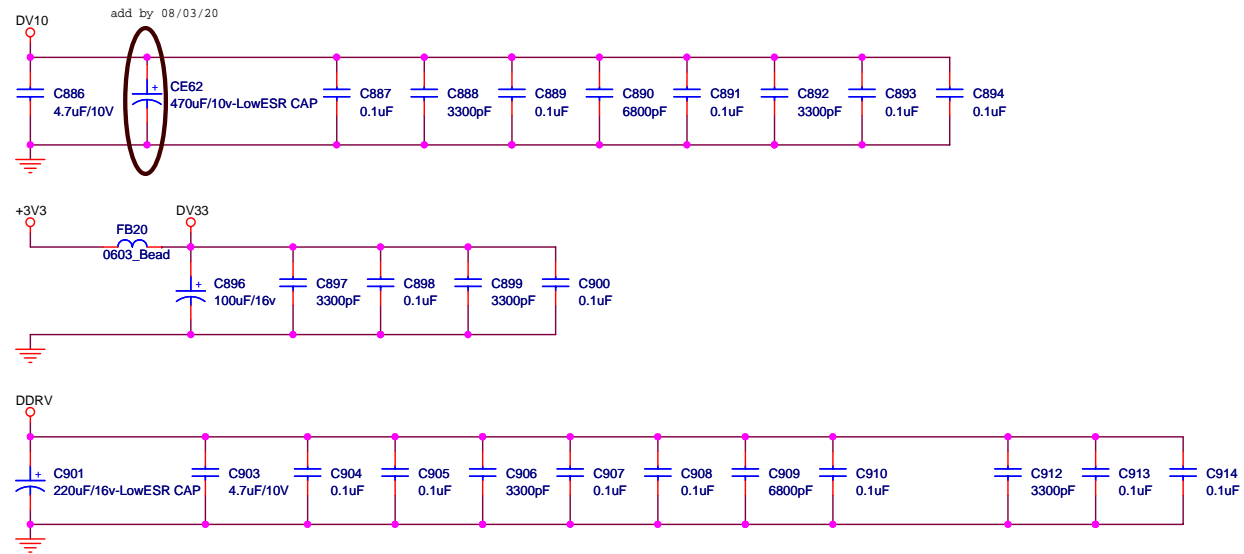
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Size: **C** Document Number: **HISENSE\_MT8222\_EU**

Date: **2008/1/25** Drawn: **Jiu.Ni** Rev: **1**

Sheet **3** of **14**

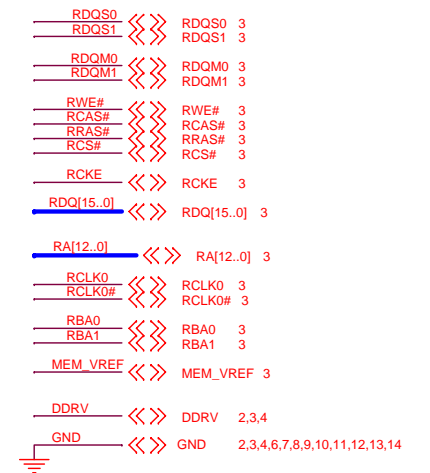
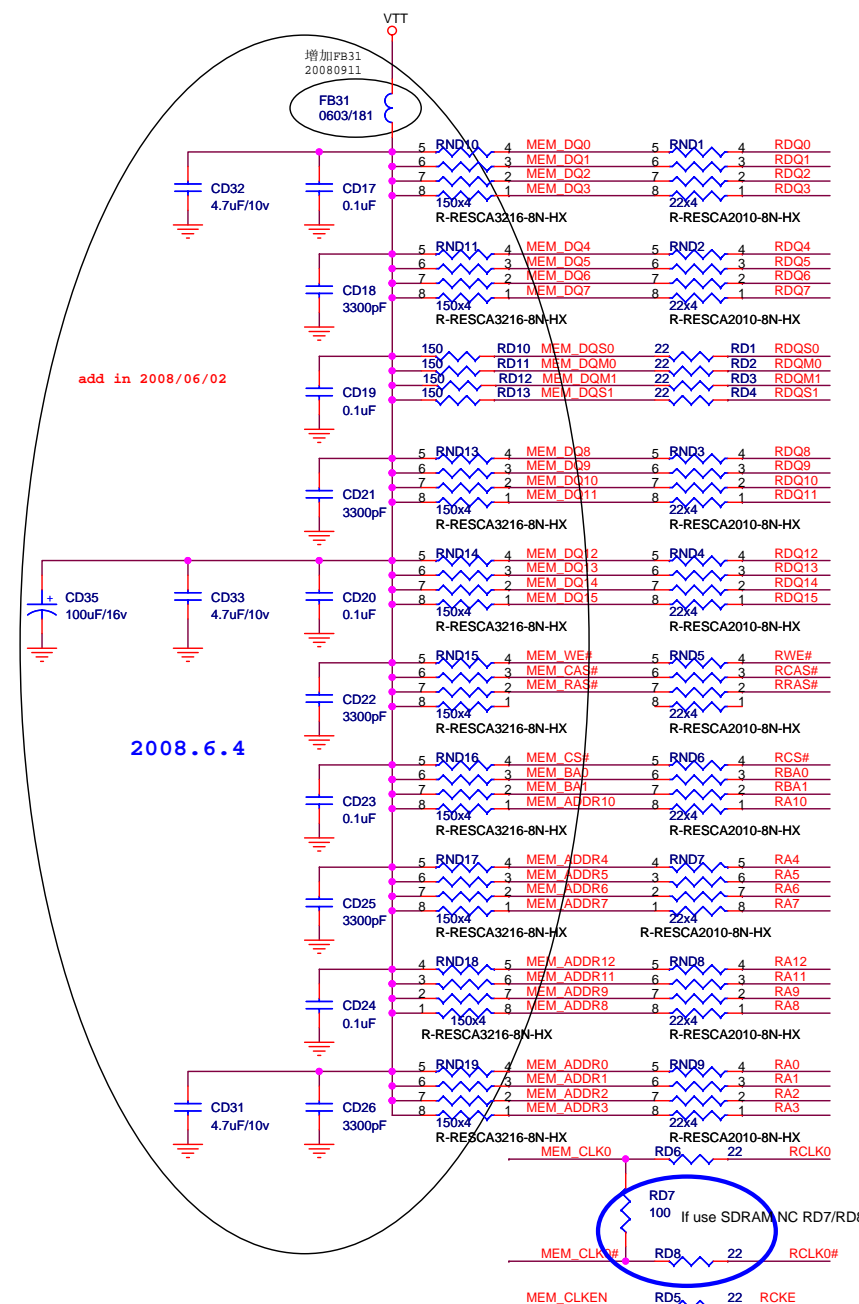
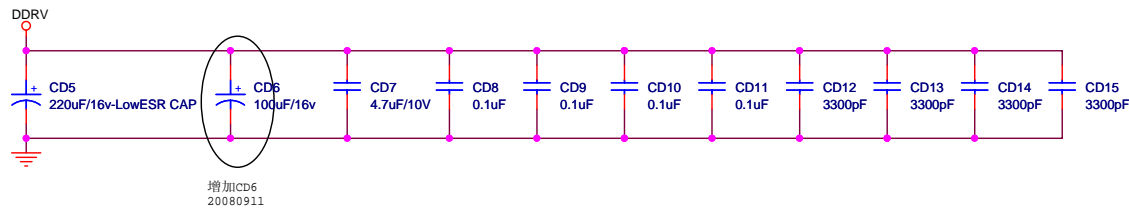
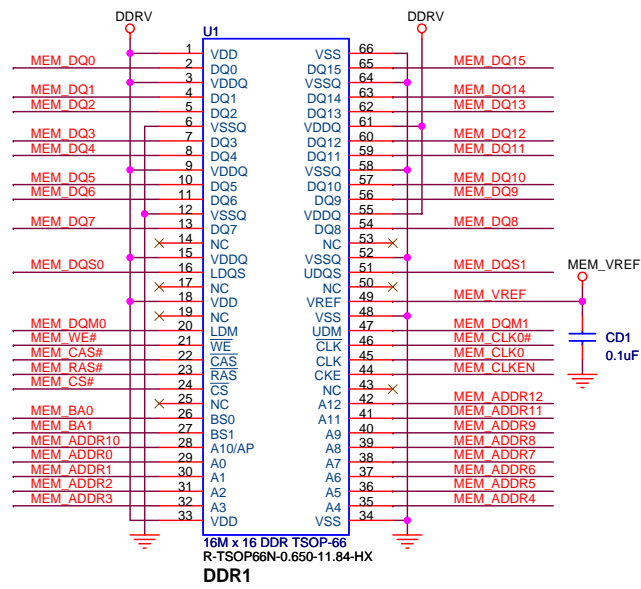
# ( Bypass CAPs arround MT8222 )



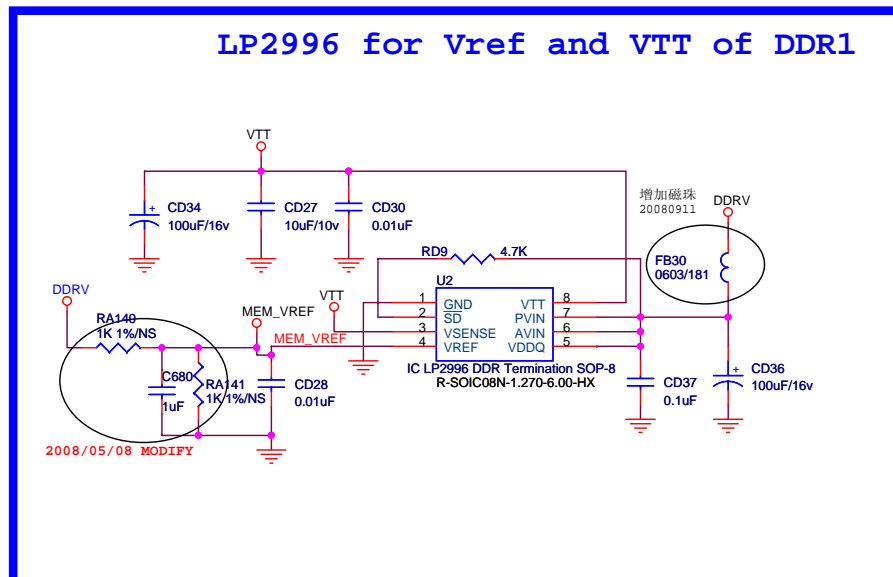
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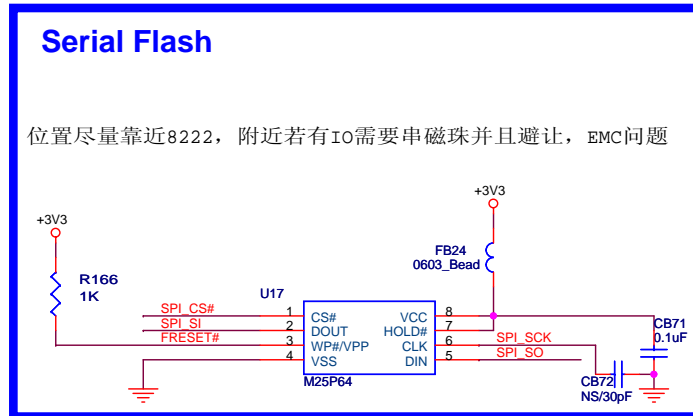
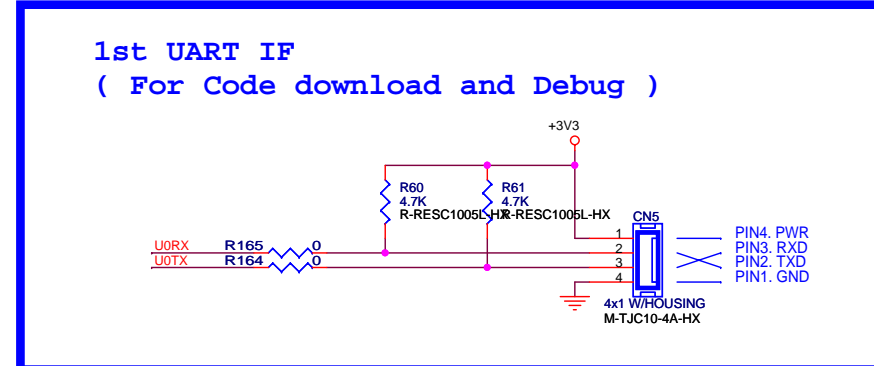
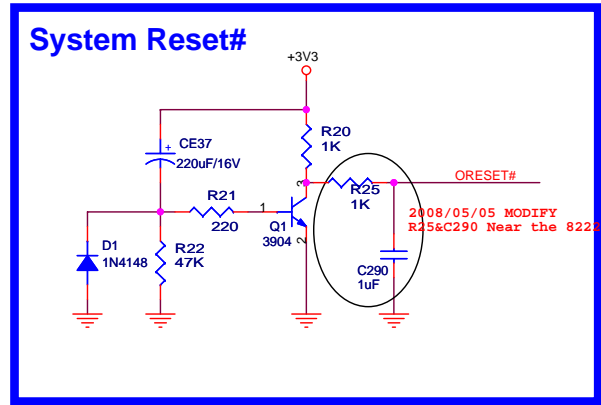
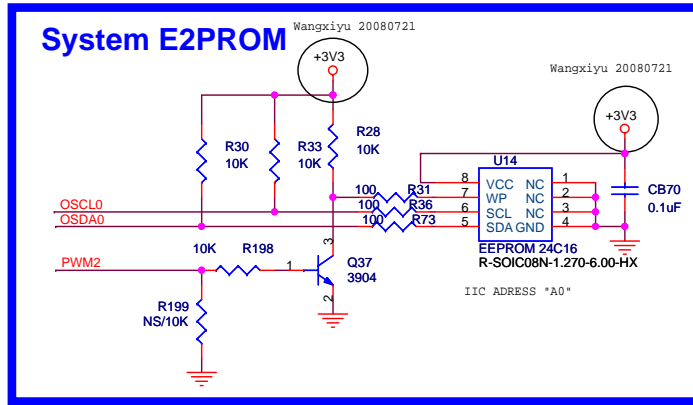
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	Title: MT8222 Bypass CAPs		
	Size: C	Document Number: HISENSE MT8222 EU	Drawn: Jiu.Ni
	Date: 2008/1/25	Sheet: 4	Rev: 1 of 14

( DDR1 DRAM With Termination )



If use sdram CD34 CD26 CD27 RD9 CD28 CD29 CD30 UD2 NC  
 If use ddr CD34 CD26 CD27 RD9 CD28 CD29 CD30 UD2 ON





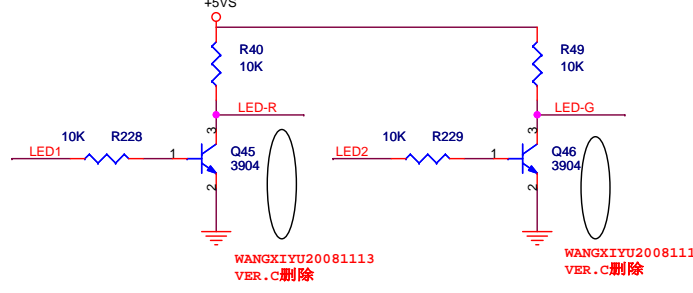
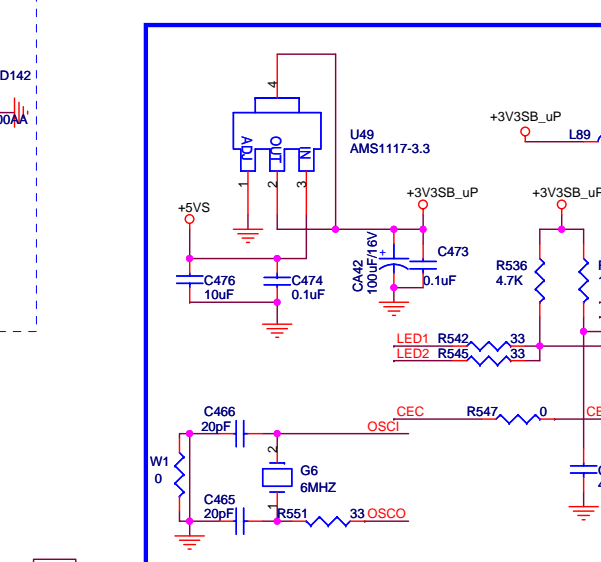
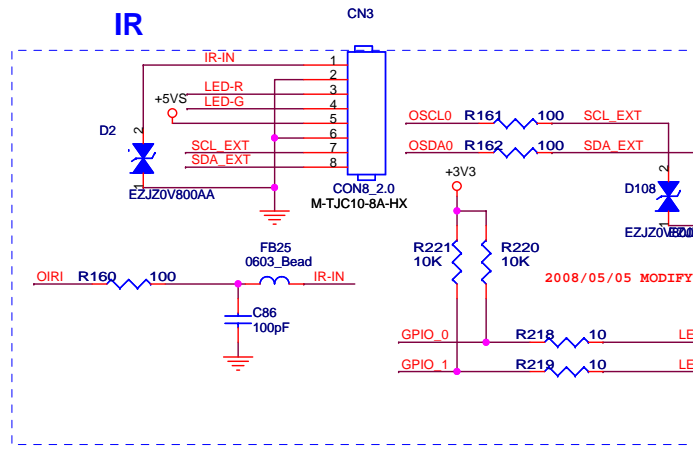
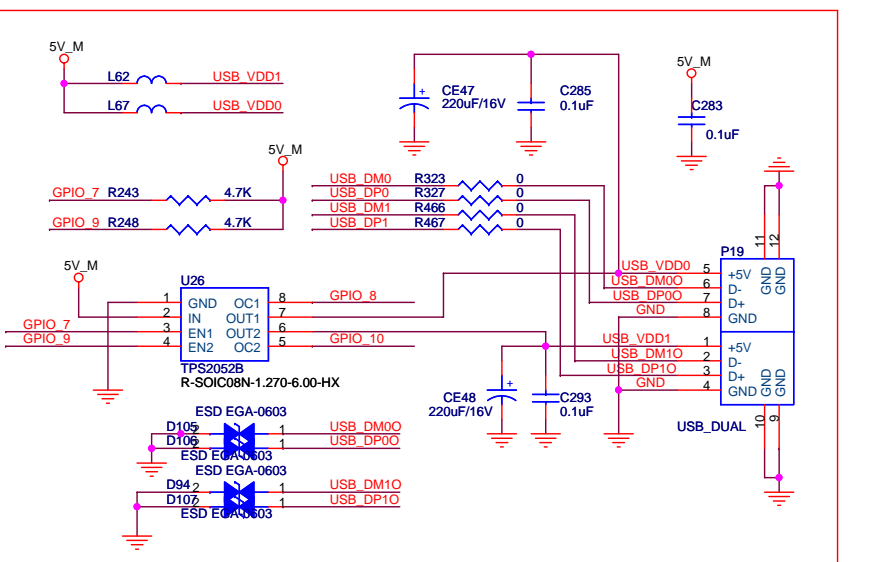
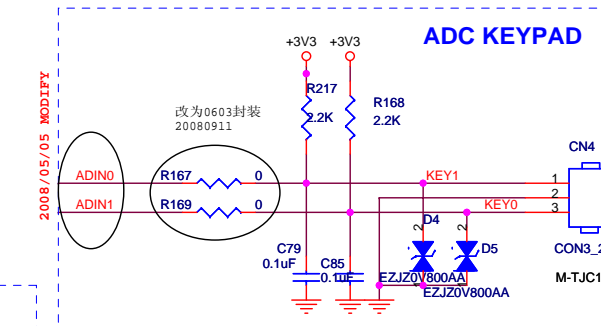
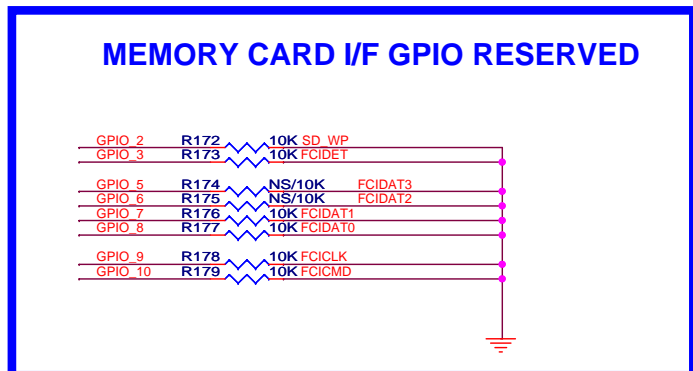
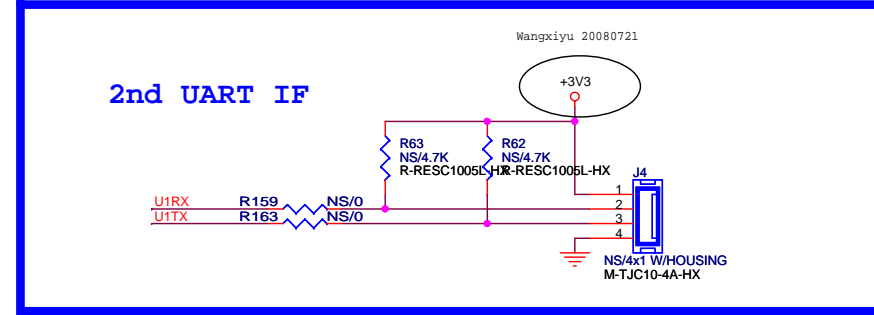
### MT8222 Trapping

Wangxiyu 20080721

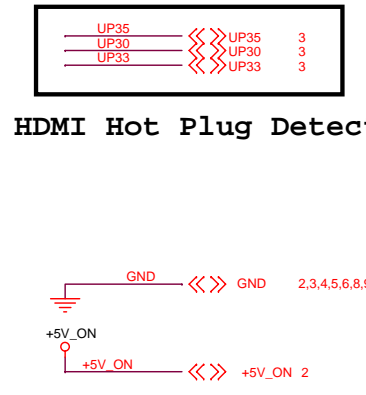
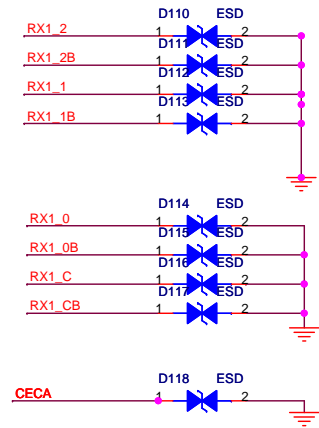
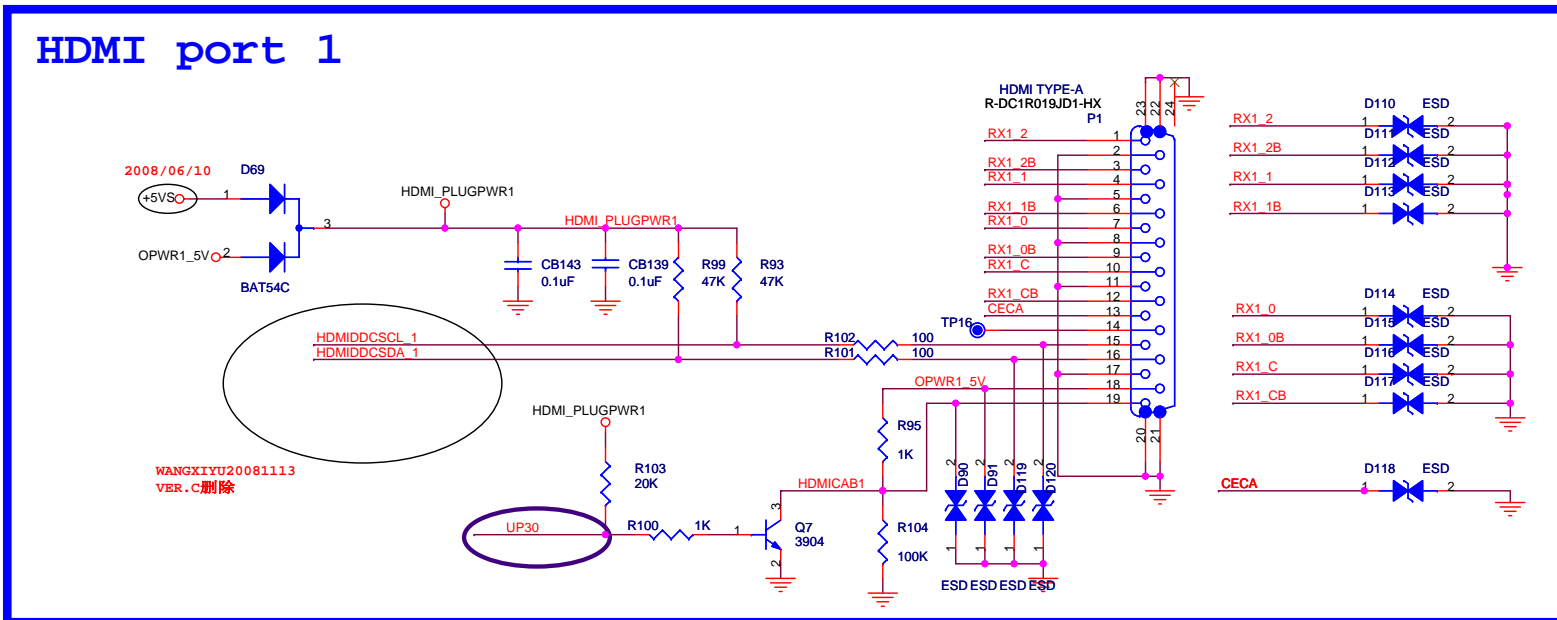
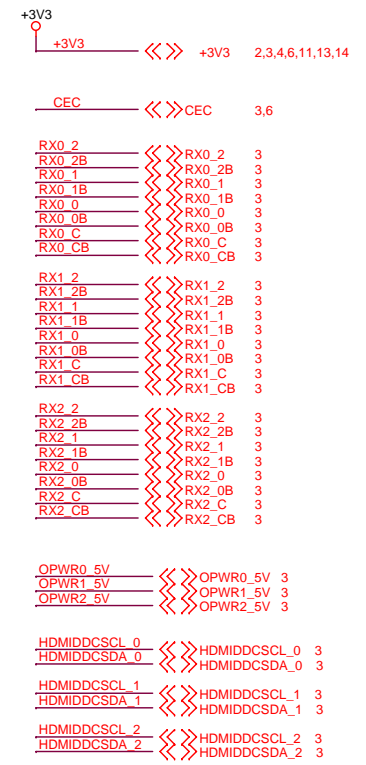
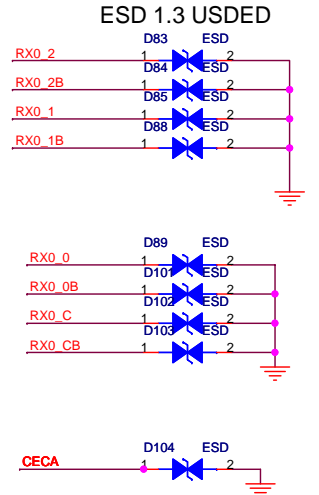
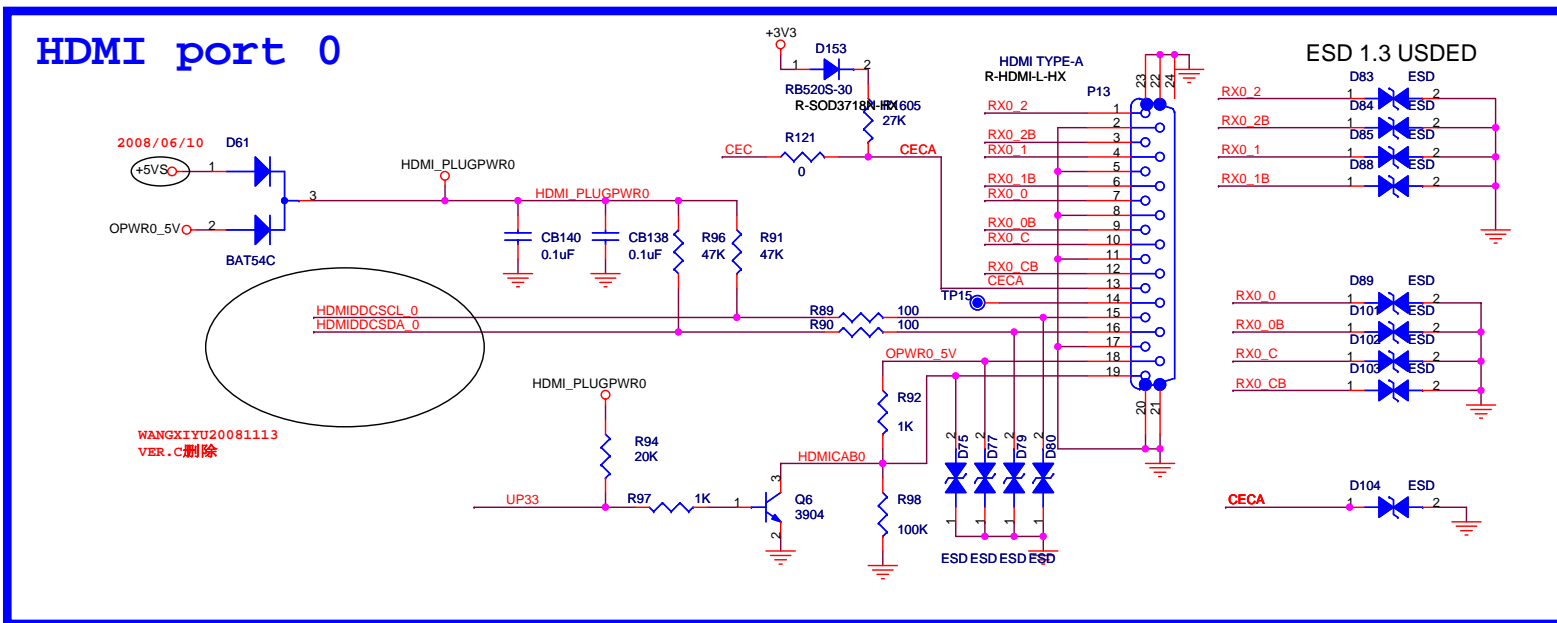
Status	ICE	AOBCLK	AOLRCK	Description
Normal	0	0	0	Normal operation ST/SST flash
TEST_ICE	1	0	0	ICE mode
TEST_CPU	1	0	1	Used in simulation and pattern generation
TEST_SCAN	1	1	0	Used to generate ATPG test patterns
OLT_MODE	1	1	1	OLT mode

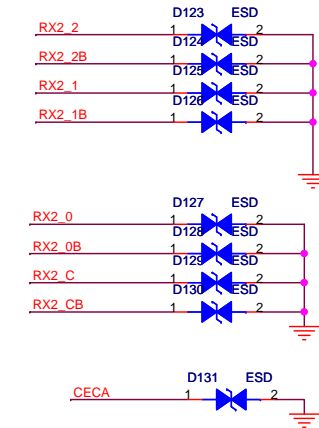
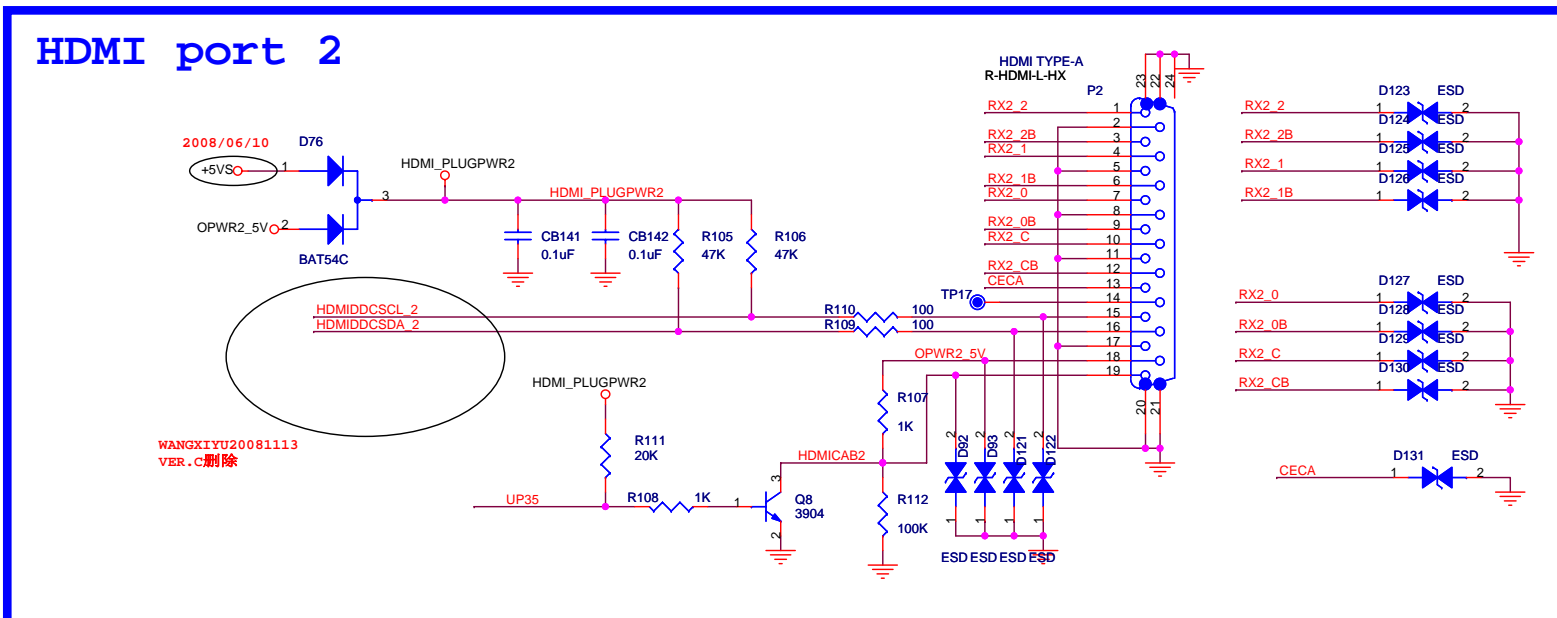
AOSDATA0	Description
0	ST/SST flash
1	ATMEL flash



- PWM2 >>> PWM2 3
- ORESET# >>> ORESET# 3
- OIRI >>> OIRI 3
- UORX >>> UORX 3
- UOTX >>> UOTX 3
- U1RX >>> U1RX 3
- U1TX >>> U1TX 3
- USB\_DP0 >>> USB\_DP0 3
- USB\_DM0 >>> USB\_DM0 3
- USB\_DP1 >>> USB\_DP1 3
- USB\_DM1 >>> USB\_DM1 3
- OSCL0 >>> OSCL0 3,8,11,14
- OSDA0 >>> OSDA0 3,8,11,14
- GPIO\_2 >>> GPIO\_2 3,13
- GPIO\_3 >>> GPIO\_3 3,13
- GPIO\_5 >>> GPIO\_5 3,13
- GPIO\_6 >>> GPIO\_6 3,13
- GPIO\_7 >>> GPIO\_7 3
- GPIO\_8 >>> GPIO\_8 3
- GPIO\_9 >>> GPIO\_9 3
- GPIO\_10 >>> GPIO\_10 3
- +3V3 >>> +3V3 2,3,4,7,11,13,14
- +5V\_ON >>> +5V\_ON 2
- 5V\_M >>> 5V\_M 2,3,8,12,13,14
- GND >>> GND 2,3,4,5,7,8,9,10,11,12,13,14
- ICE\_AOSDATA0 >>> ICE\_AOSDATA0 3,12,13
- ADIN0 >>> ADIN0 3
- ADIN1 >>> ADIN1 3
- GPIO\_0 >>> GPIO\_0 3
- GPIO\_1 >>> GPIO\_1 3
- CEC >>> CEC 3,7
- UP31 >>> UP31 2,3
- PW\_CTL1 >>> PW\_CTL1 2
- AMP-MUTE2 >>> AMP-MUTE2 14



( HDMI Hot Plug Detect )

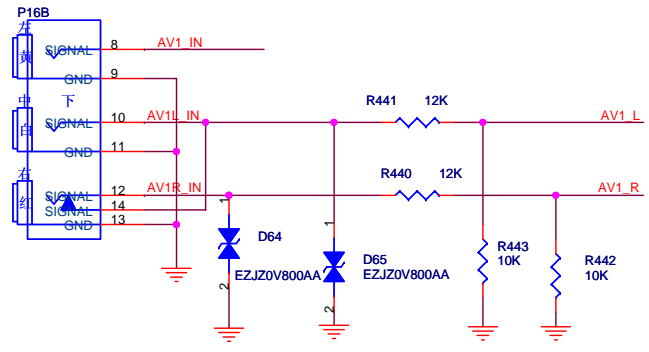


1. E2P供电更改  
2. 各信号上ESD器件更改

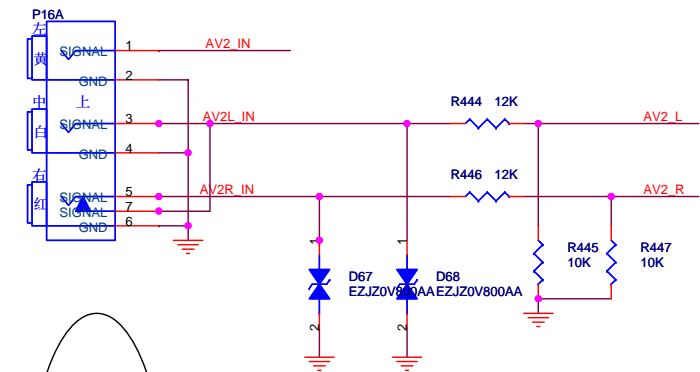
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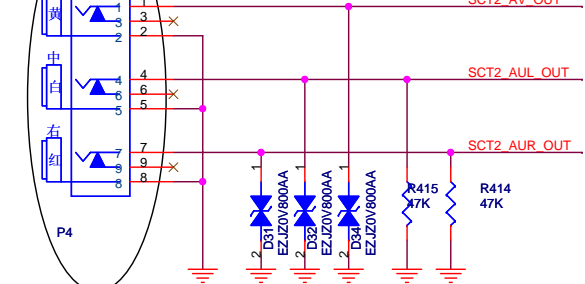
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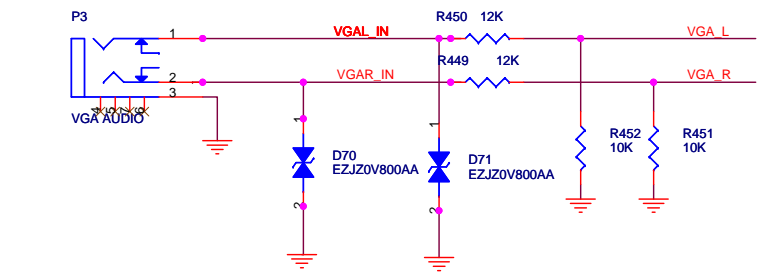
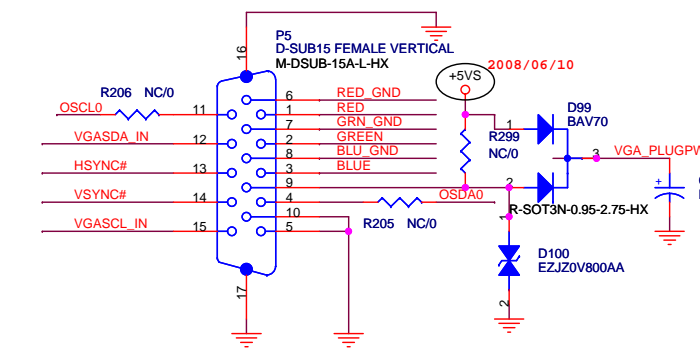
### AV2 Input



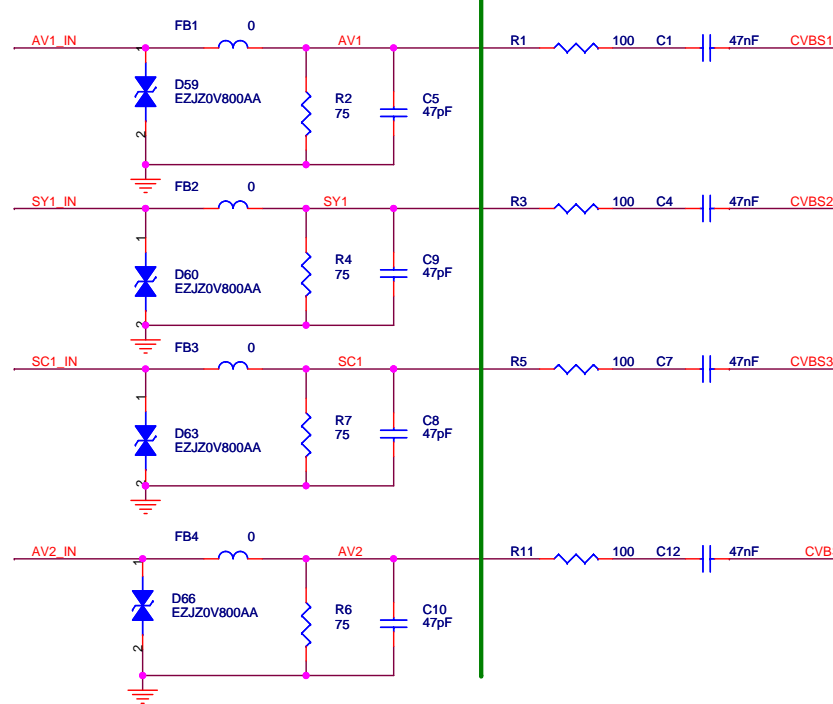
### AV OUTPUT



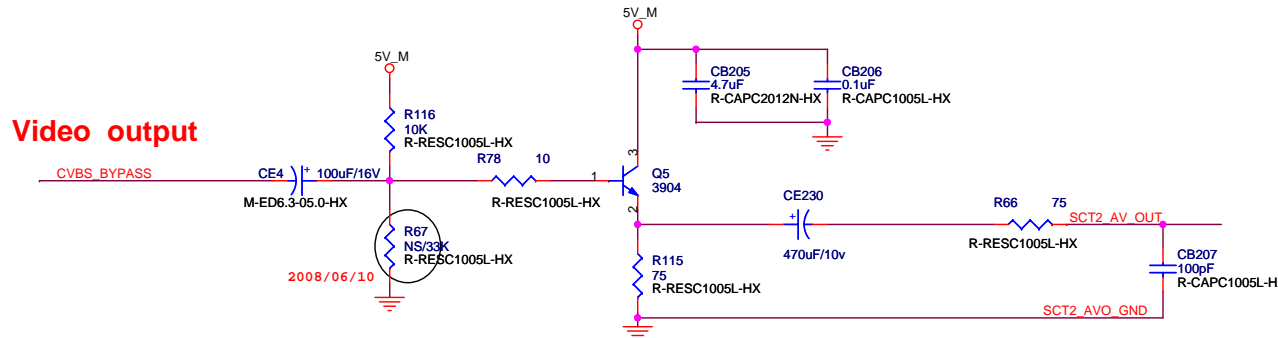
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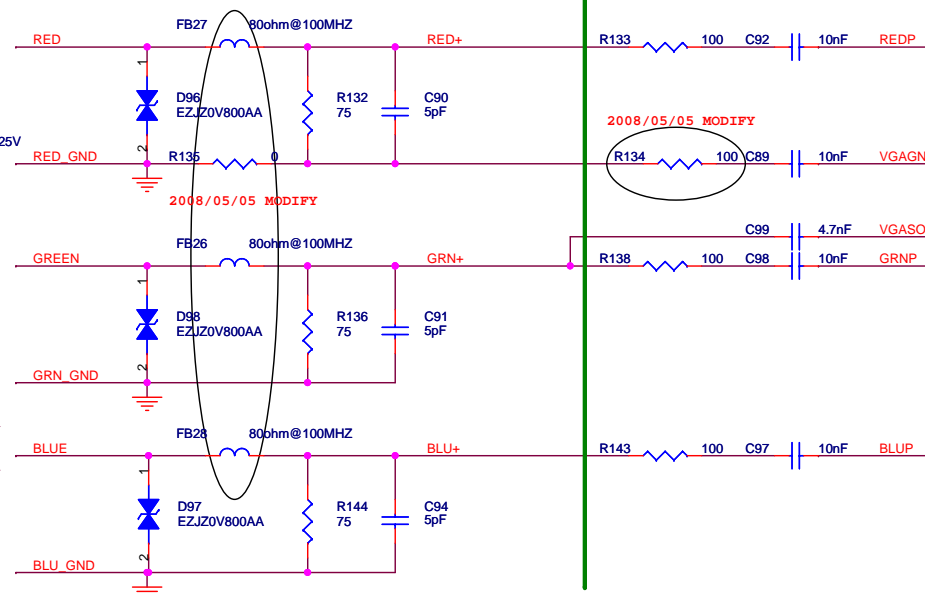
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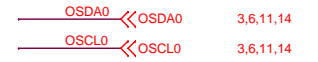
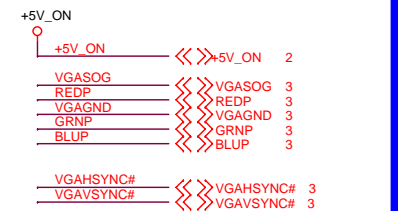
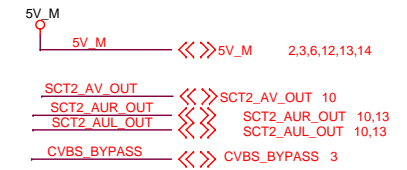
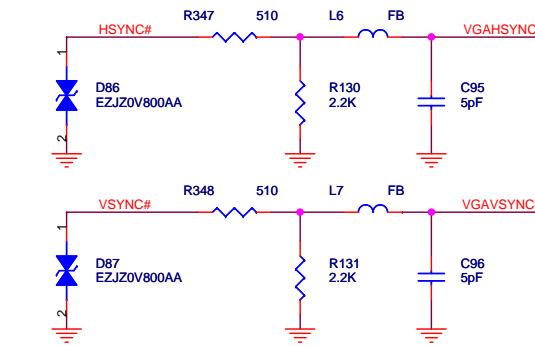
### NEAR IC



### NEAR CONNECTOR



### NEAR IC

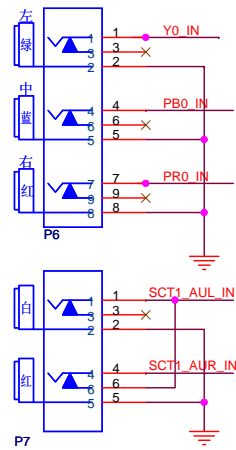


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	File: CVBS/ S-Video / VGA		
Size: C	Document Number: HISENSE MT8222 EU	Drawn: Jiu.Ni	Rev: 1
Date: 2008/17/25	Sheet: 8 of 14		

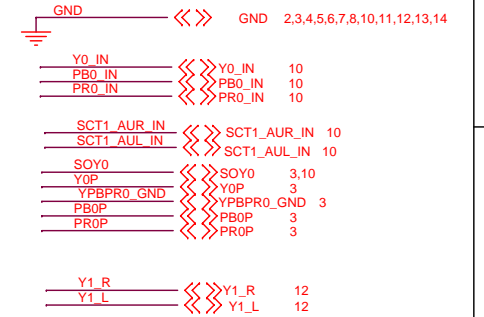
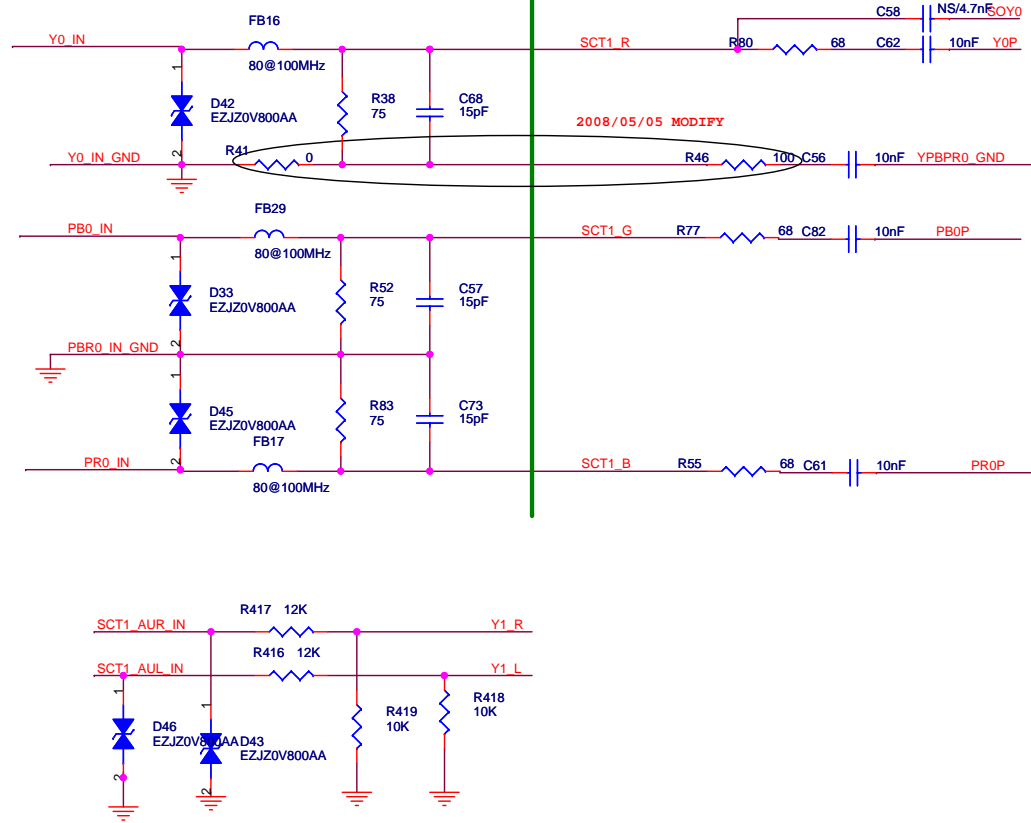
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YPbPr0 port

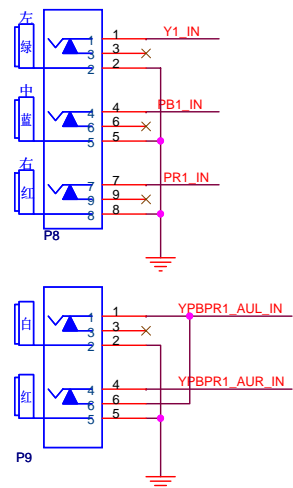


NEAR CONNECTOR

NEAR IC

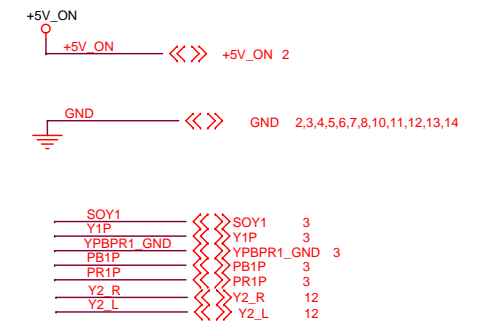
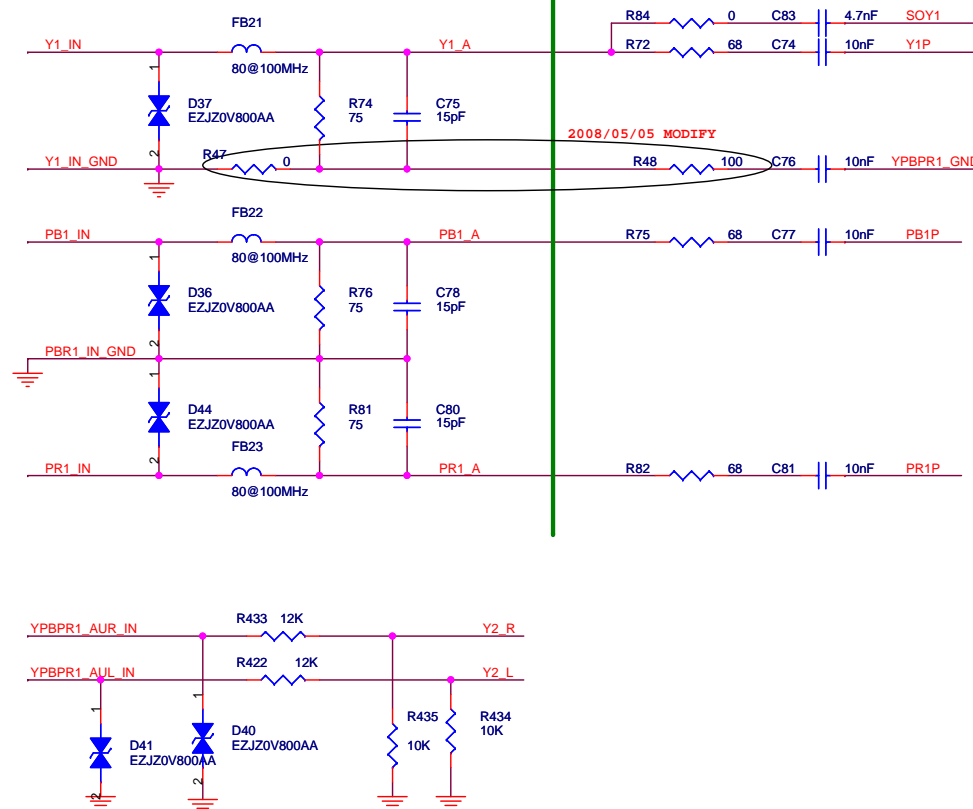


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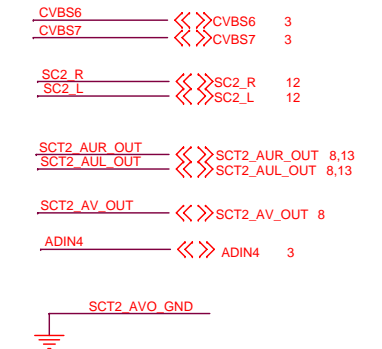
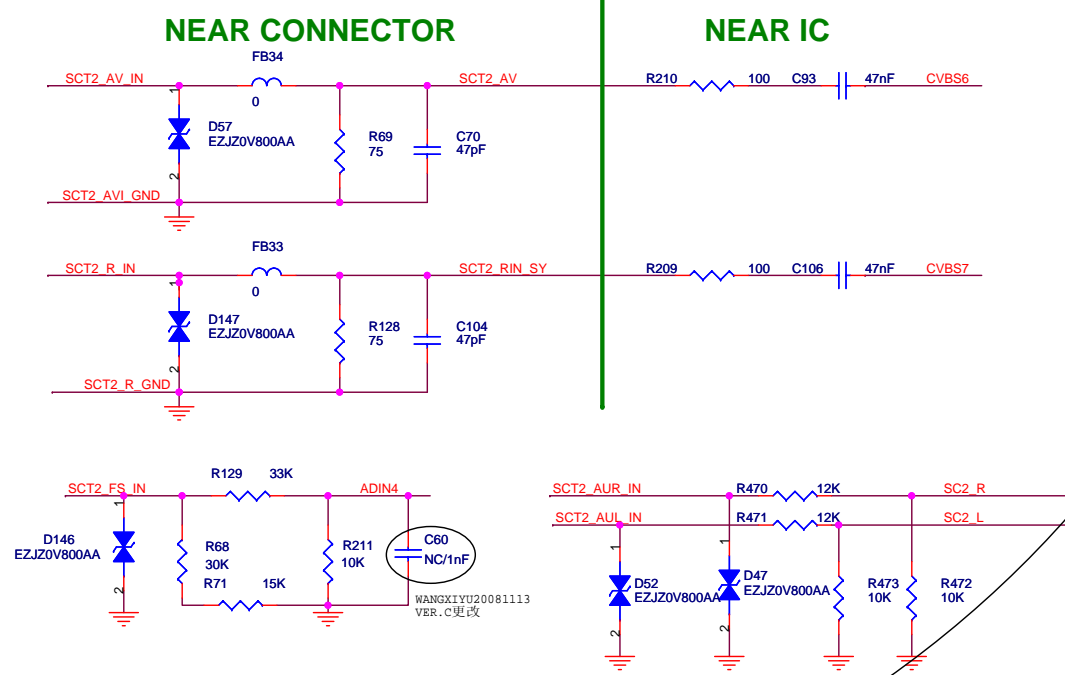
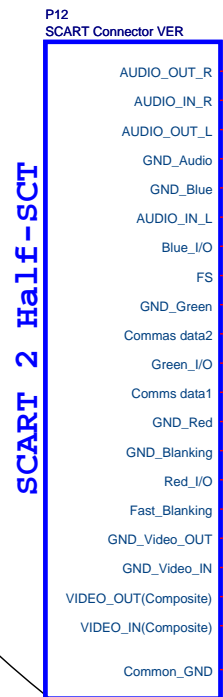
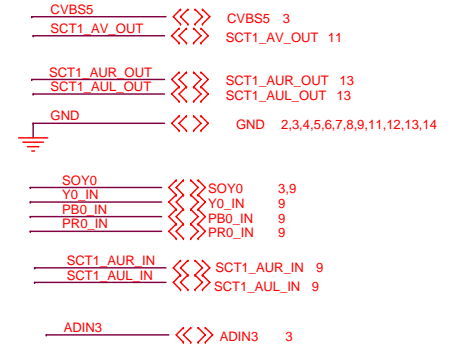
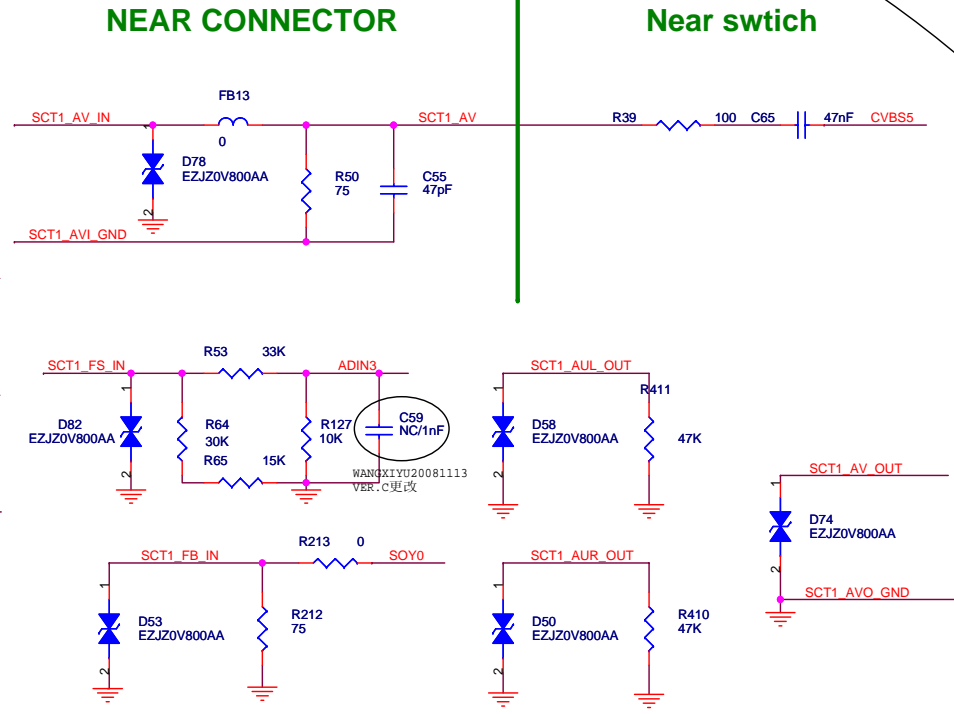
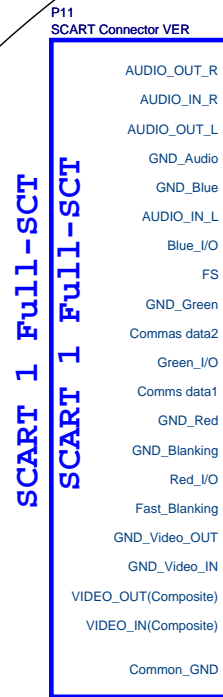
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NEAR IC

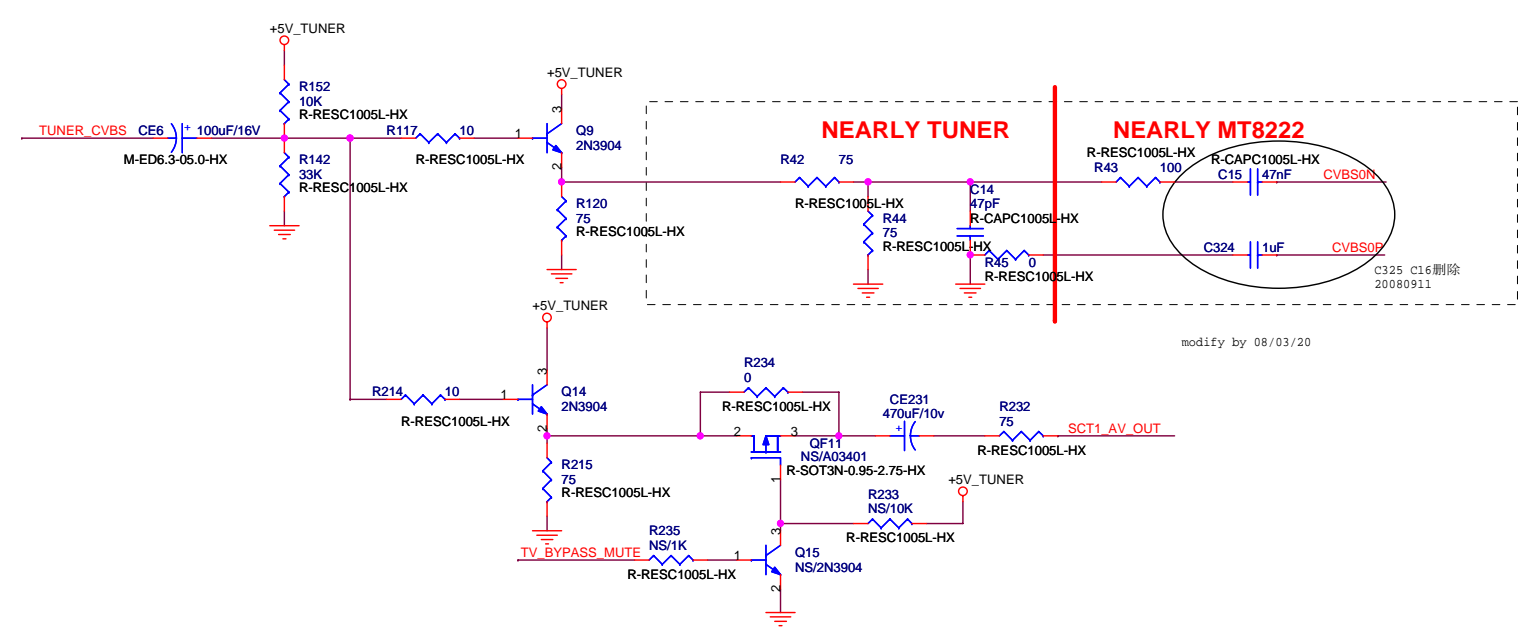
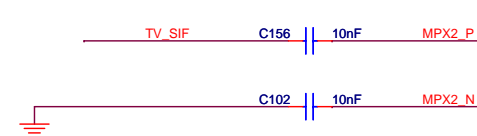
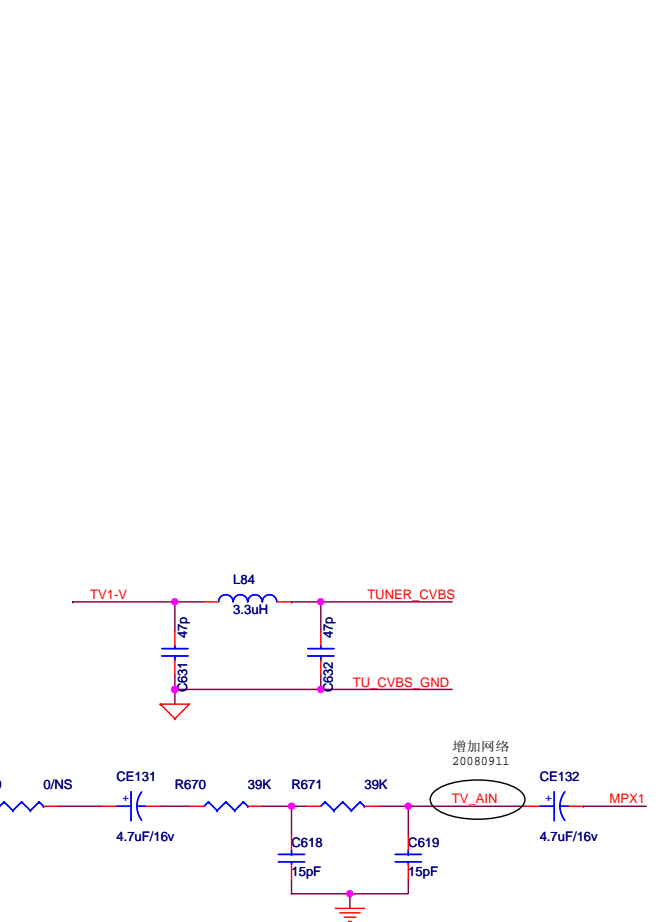
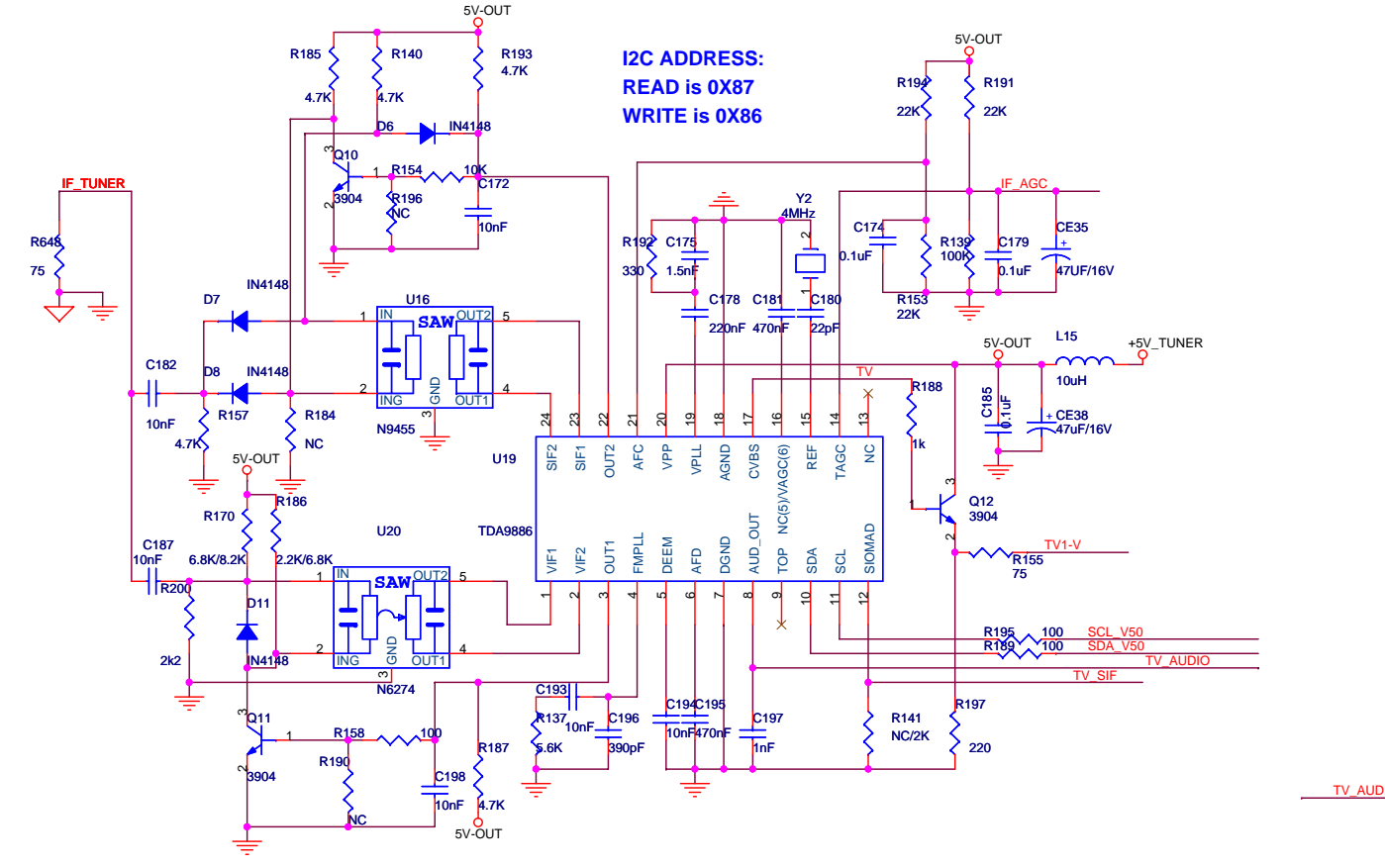
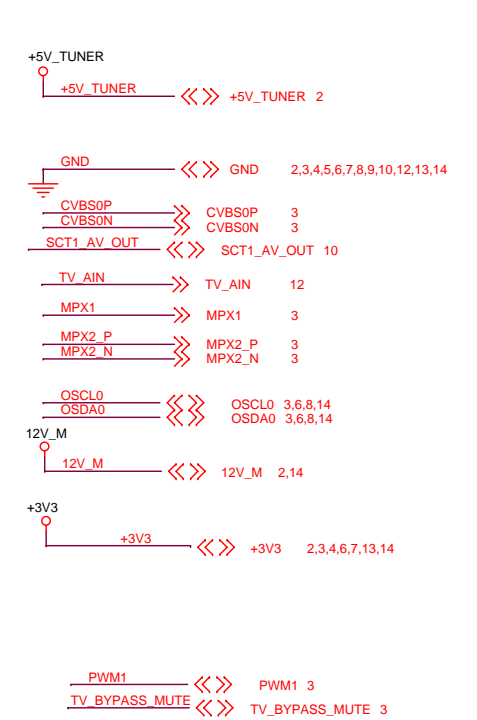
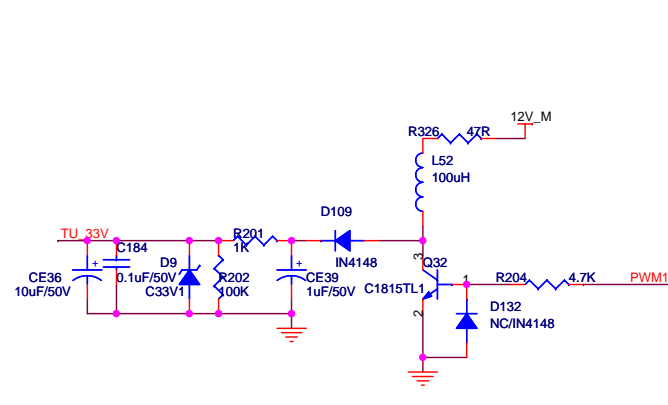
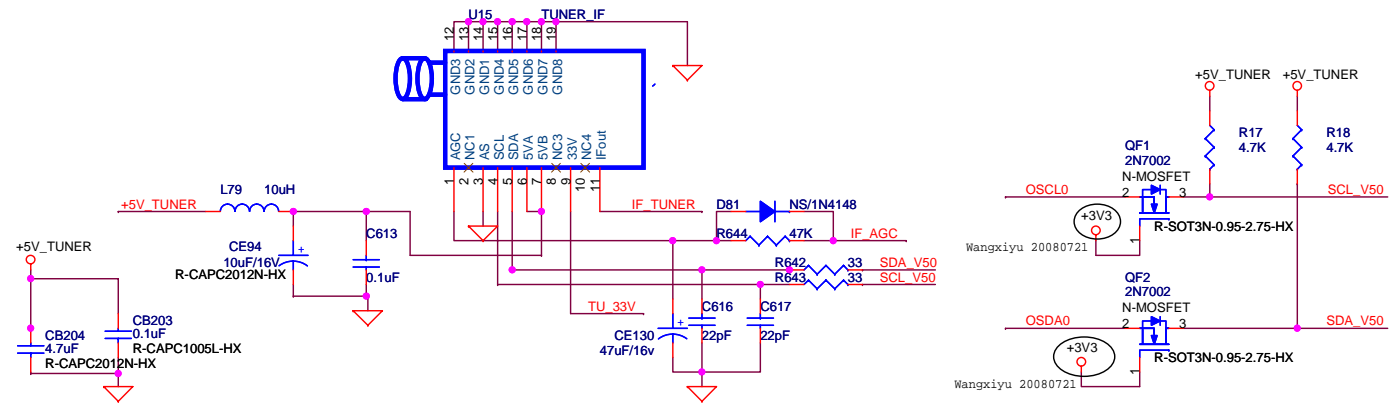


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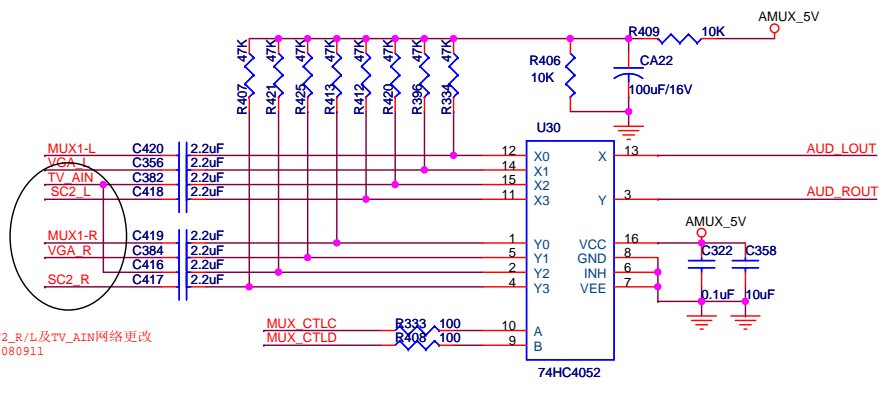
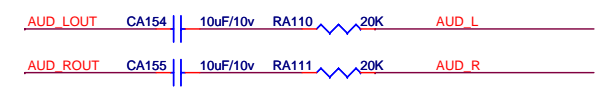
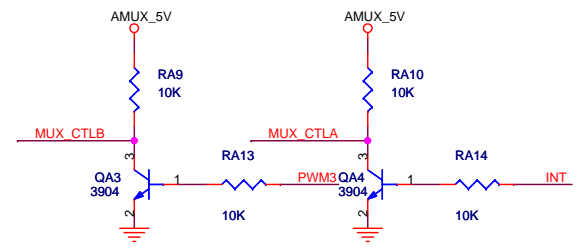
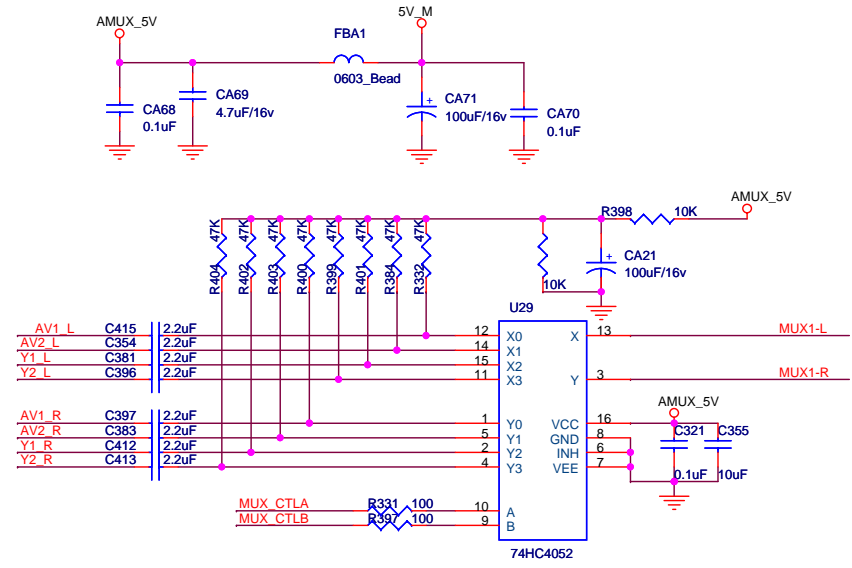
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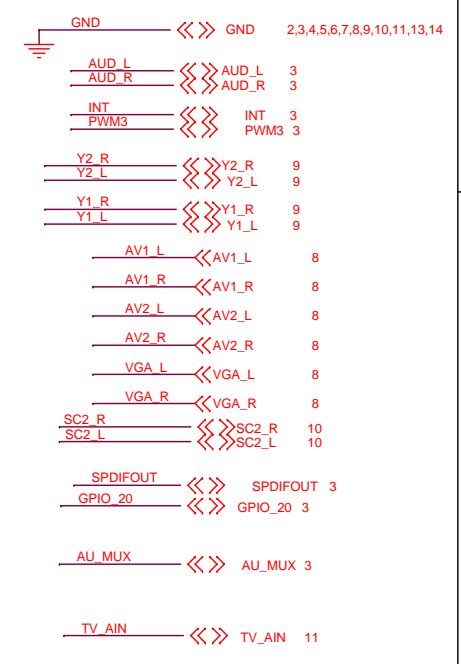
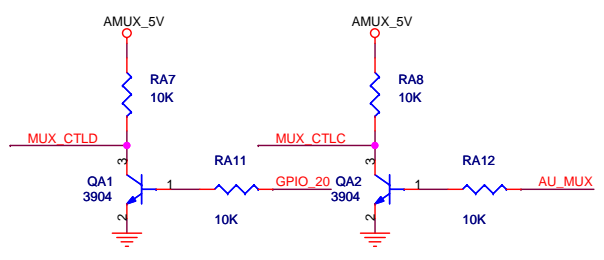
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SC2\_R/L及TV\_AIN网络更改  
20080911



PWM3	INT	GPIO_20	AU_MUX	AUDIO OUTPUT
1	1	1	1	AV1 OUT
1	0	1	1	AV2 OUT
0	1	1	1	YPBPR1 OUT
0	0	1	1	YPBPR2 OUT
X	X	1	0	VGA OUT
X	X	0	1	TV AUDIO OUT
X	X	0	0	SCART2 OUT

