

# LCD Television

## Service Manual

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**Chassis:** MT5651HROI

**Product Type:**

**LHD32K366WCEU、LTDN40K366WCEU、LTDN50K366WCEU**

**Ver 1.0**

**November, 2013**

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# Service Manual

## 1. Precautions and notices

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

USE ONLY MANUFACTURER SPECIFIED REPLACEMENT PARTS WHEN SERVICING.

USE OF NON-AUTHORIZED PARTS WILL VOID THE MANUFACTURE'S WARRANTY

Proper service and repair is important to the safe, reliable operation of all Hisense 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 and pose risk of personal injury

. It is also important to understand that these CAUTIONS and NOTICES ARE NOT EXHAUSTIVE. Service should only be performed by an experienced electronics

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technician trained in the proper Television safety and service methods and procedures

Hereafter throughout this manual, HISENSE will be referred to.

## 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 non-manufacturer's recommended parts may create shock, fire, or other hazards. Under no circumstances should the original design be modified or altered without written permission from RCA. Hisense Eassumes no liability, express or implied, arising out of any unauthorized modification of design. Servicetech assumes all liability.

#### DANGER 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, be sure to use anti-static table mats and properly use a grounding wrist stra. Keep components and tools also at this same potential.

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**IMPORTANT:**

Always disconnect the power cord from AC outlet before replacing parts or modules.

1.1.3

To prevent electrical shock, use only a properly grounded 3 prong outlet or extension cord.

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 and will void the manufacturer's warranty.

1.1.5

Safety regulations require that after a repair the set must be returned in its original condition. In addition, prior to closing set, check that:

-Note:

>All wire harnesses and flex cables are properly routed and secured with factory tape and/or mounted cable clamps.

> All cables and connectors are properly insulated and do not have any bare wires/lead exposed

1.1.6

(1) Do not supply a voltage higher than that specified to this product. This may

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damage the product and may cause a fire.

(2) Do not use this product:

> High humidity areas

> In an area where any water could enter or splash into the unit.

High humidity and water could damage the product and cause fire.

(3) 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.

(4) 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.

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

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

(7) 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.

(8) 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.

(9) 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

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## 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 may trip the main 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

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matter.

- 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.
- 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.



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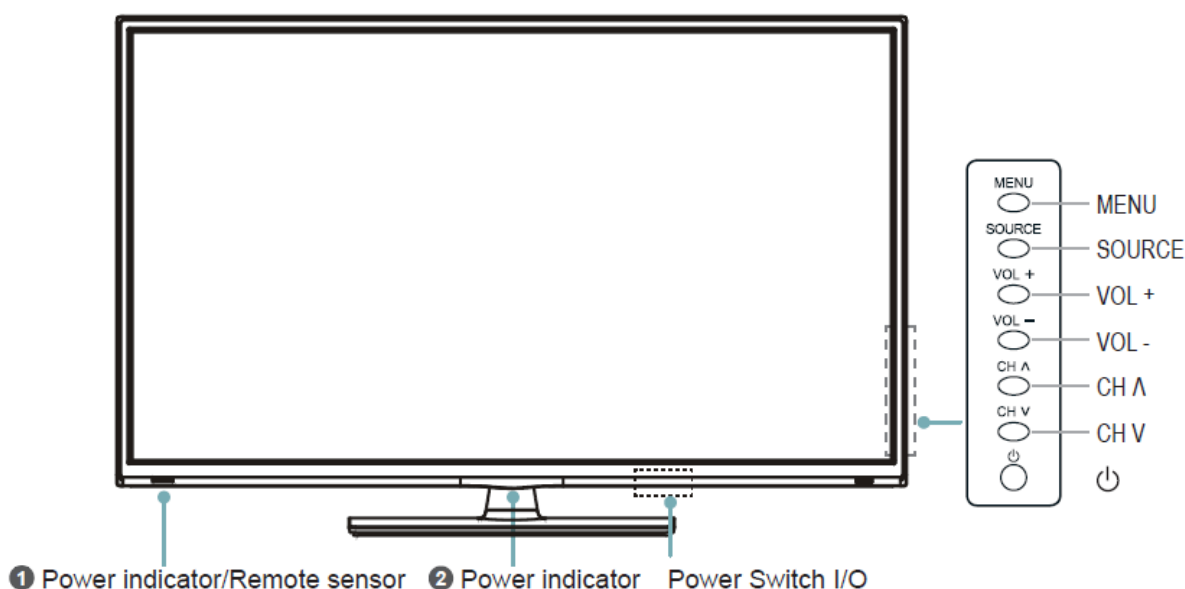
## 2. Product Function Specifications


### 2.1 Layout

#### K366 Series

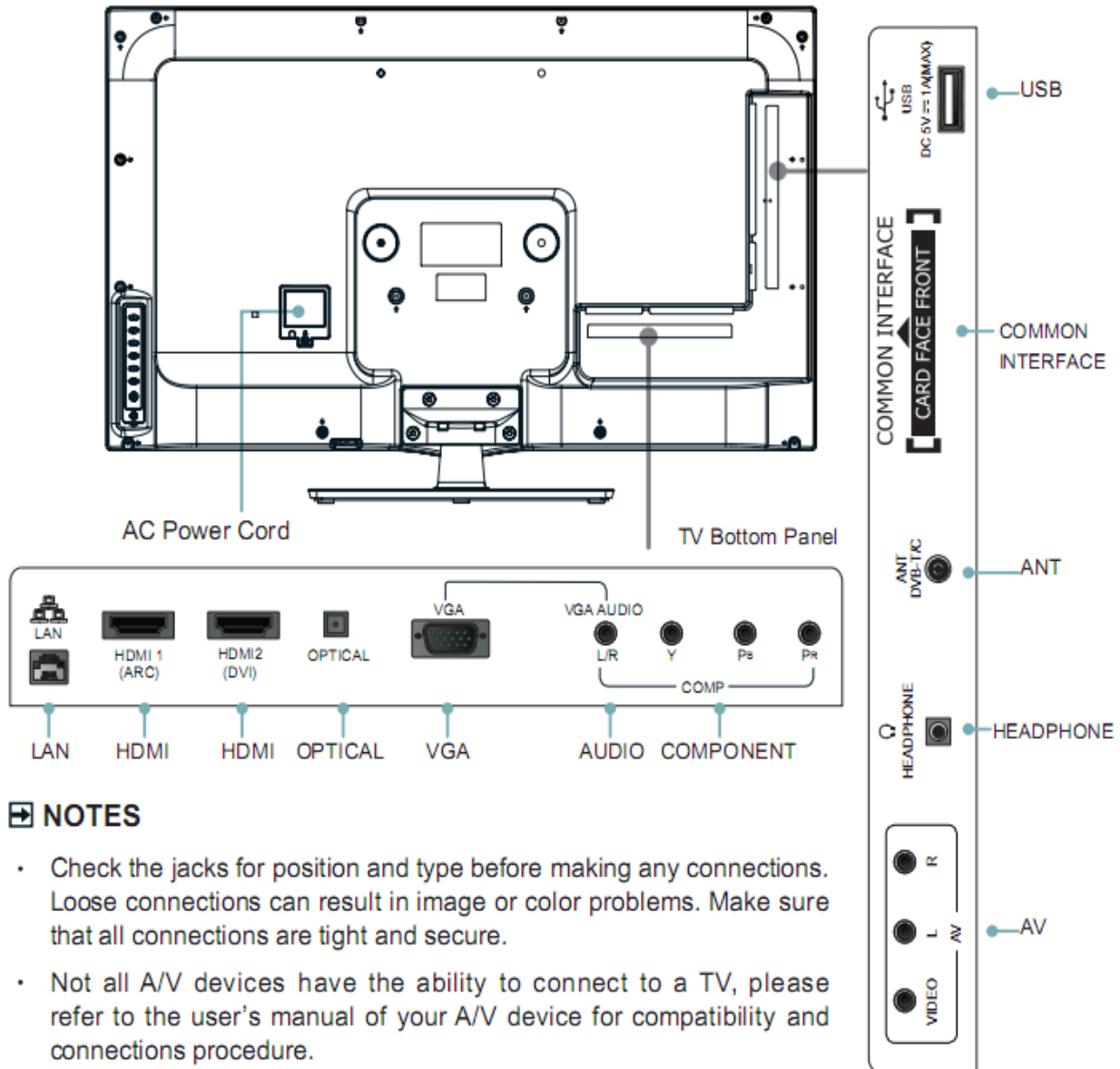
##### TV Front

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Item	Description
Power Switch I/O	Switch the I/O power ON or OFF.
Power indicator	<b>1</b> Red lights up in standby mode. <b>2</b> White lights up when the TV is switched on.
Remote sensor	Receives remote signals from the remote control. Do not put anything near the sensor, as its function may be affected.
MENU	Display an on-screen menu to setup your TV's features.
SOURCE	Select among the different input signal sources.
VOL + / -	Adjust the volume.
CH A / V	Switch between channels.
Power button 	Turn on the TV from the standby mode or switch the TV back to standby mode. <b>Caution: The TV consumes the power even in standby mode. Please turn the power off or unplug the power cord to save the power.</b>

## TVRear



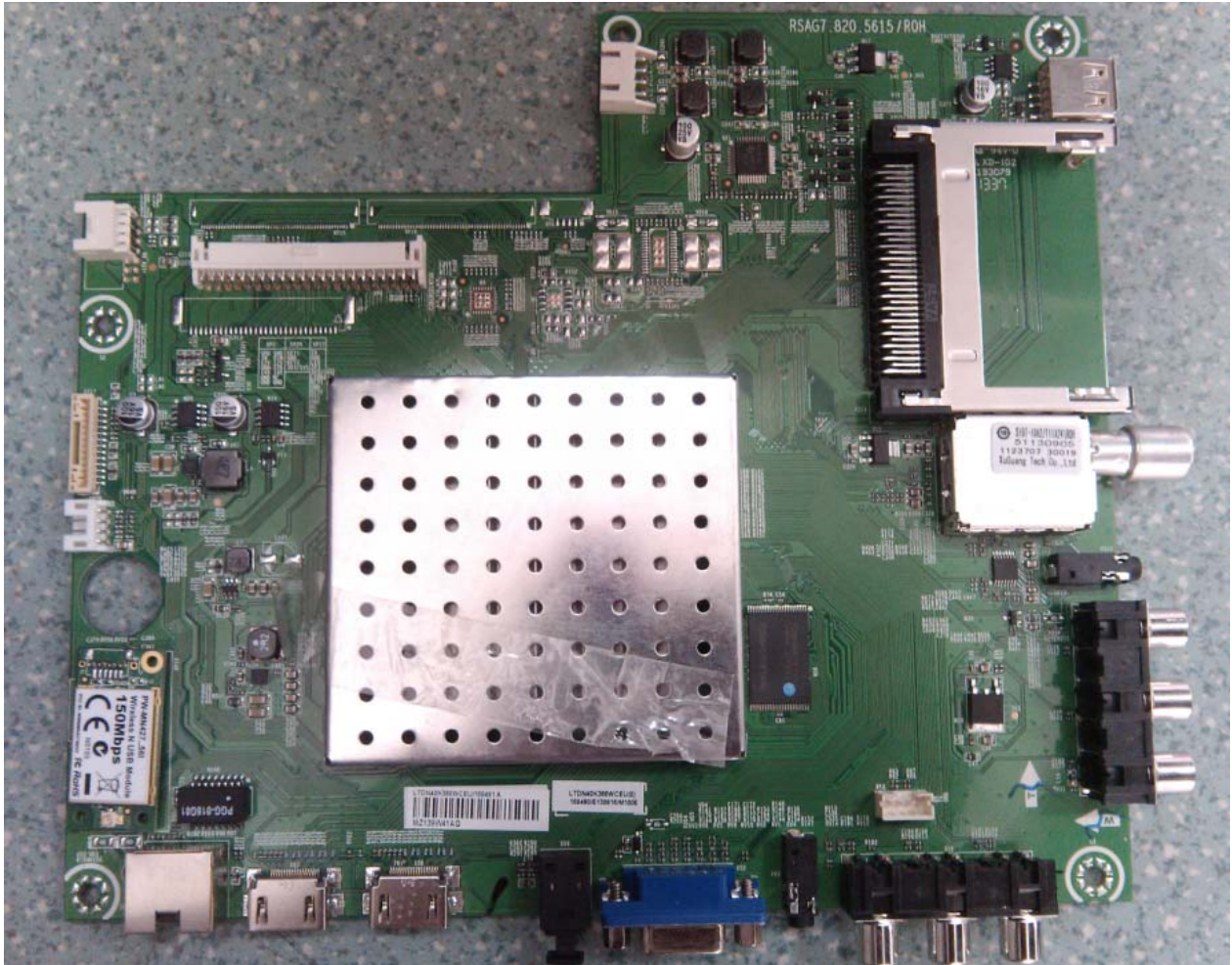
### NOTES

- Check the jacks for position and type before making any connections. Loose connections can result in image or color problems. Make sure that all connections are tight and secure.
- Not all A/V devices have the ability to connect to a TV, please refer to the user's manual of your A/V device for compatibility and connections procedure.
- Before connecting external equipment, remove the mains plug from the wall socket. This may cause electric shock.

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## 2.2 Main board: 5615

The top:



## 2.3 Spec.

<b>Model Name</b>		<b>LHD32K366WCEU</b>	<b>LTDN40K366WCEU</b>	<b>LTDN50K366WCEU</b>
<b>Dimension</b>	<b>Without Stand (inches/mm)</b>	Width:29.0 / 737.5 Height: 17.5 / 445.3 Depth: 2.4 /59.8	Width:36.3 / 921.8 Height: 21.9 / 555.2 Depth: 2.3 /57.9	Width:44.3 / 1124 Height: 26.3 / 669 Depth: 2.5 /64
	<b>With Stand (inches/mm)</b>	Width: 29.0 / 737.5 Height: 20.0 /507.1 Depth: 7.8 /198	Width: 36.3 / 921.8 Height: 23.9 /608 Depth: 8.3 /210	Width: 44.3 / 1124 Height: 28.1 /714 Depth: 9.6 /245
<b>Weight</b>	<b>Without Stand</b>	16.1 lbs (7.3 kg)	25.4 lbs (11.5 kg)	39.7 lbs (18 kg)
	<b>With Stand</b>	21.6 lbs (9.8 kg)	32.0 lbs (14.5 kg)	48.5 lbs (22 kg)
<b>LED Panel Minimum size (diagonal)</b>		32 inches	40 inches	50 inches
<b>Screen resolution</b>		1366 × 768	1920 × 1080	1920 × 1080
<b>Audio power</b>		6W + 6W	7W + 7W	10W + 10W
<b>Power consumption</b>		Please refer to the rating label.		
<b>Power supply</b>		220-240V ~50Hz		
<b>Receiving systems</b>	<b>Analog</b>	PAL-D/K, B/G, I SECAM-D/K, B/G, L/L'		
	<b>Digital</b>	DVB-T, DVB-C, DVB-S/S2		
<b>Environmental conditions</b>		Temperature: 41°F - 95°F (5°C - 35°C) Humidity: 20% - 80% RH Atmospheric pressure: 86 kPa - 106 kPa		
<b>Component Input</b>		480 I / 60 Hz, 480 P / 60 Hz, 576 I / 50 Hz, 576 P / 50 Hz, 720 P / 50 Hz, 720 P / 60 Hz, 1080 I / 50 Hz, 1080 I / 60 Hz, 1080 P / 50 Hz, 1080 P / 60 Hz		
<b>VGA Input</b>		VGA (640×480 / 60 Hz), SVGA (800×600 / 60 Hz), XGA (1024×768 / 60 Hz)		
<b>HDMI Input</b>		RGB / 60 Hz (640×480, 800×600, 1024×768) YUV / 60 Hz (480 I, 480 P, 720 P, 1080 I, 1080 P) YUV / 50 Hz (576 I, 576 P, 720 P, 1080 I, 1080 P)		

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## 3. Factory/Service OSD Menu and Adjustment

### 3.1 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, when Balance is “0”
  4. Enter 1->9->6->9 in sequence.  
Note: If necessary, re-enter number keys.
  5. Factory OSD appears.
  6. Press Menu again and leave factory OSD.

### 3.2 Factory OSD Menu

(Take LTDN55K600XWSEU3D for example)

#### 3.2.1 White Balance

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

Factory	Design		
White Balance		Panel type	B2
Signal Prefabricate		R Gain	129
Pattern Test		G Gain	128
Factory Option		B Gain	126
Firmware Version		R Offset	128
Chip	MT5651	G Offset	128
Model	LTDN55K600XWSEU3D	B Offset	127
Version	V00.01.00a.D0809		
Mac	00:0C:E7:06:00:00		
CI+			
Please set MAC ADDR!			
Please set CI+ Credential!			



### 3.2.1 Signal prefabricate



### 3.2.3 Factory Option



	Item	Default	Options	Notes
1	MODE	M	M, U	M-Can enter factory mode with factory

				RC or user RC. U-Can enter factory mode only with user' s RC.
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Note: MODE “M” is only used for factory production.

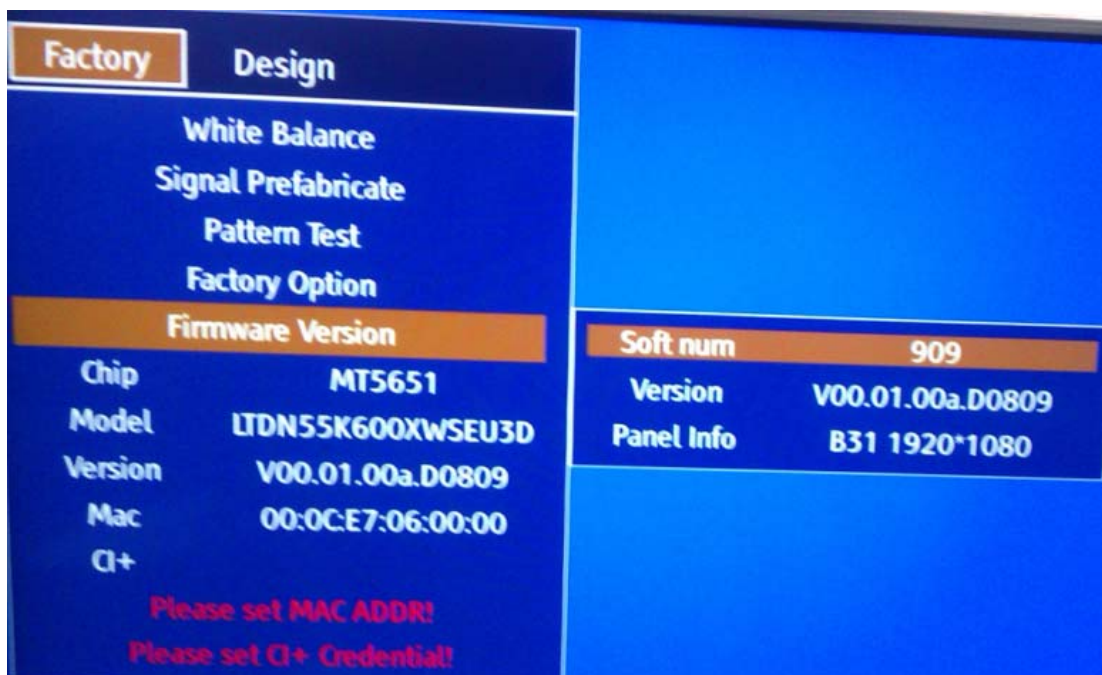
### Clear the EEPROM

Item	Meaning	Note
<b>Clean Protected</b>	<b>Clear partly</b>	Clean data except WB data and Auto Color data
<b>Clean All</b>	<b>Clear completely</b>	Clean all data

Update CI+Credential

Query CI+Credential

### 3.2.4 Firmware



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

**To clear the EEPROM:**

- Select the item “Clean Protected” .
- Press VOL+ button to clear the EEPROM data.

- 
- c. Close the OSD menu after 5 seconds.
  - d. Restart the TV.

### 3.3 Designer Menu



**Note:**

Above “Factory/Service OSD Menu” is reference for chassis MTK5651 , please refer to the actual units to determine the appearances.

## 4. Software Upgrading

**Before upgrading, read the following.**

First: Upgrade the software.

Second: To clear the EEPROM .

- A Select the item “Clear Unprotected”.
- B Press VOL+ button to clear the EEPROM data.
- C Close the OSD menu after 5 seconds.
- D Restart the TV.

Last: After the operation above all, necessarily, Re-search the channels for the users

### 4.1 USB Software Upgrading directly

The software can be upgraded by USB Disk.

- First, copy the upgrade\_loader.pkg file to USB Disk;.
- Second, make sure there is no other .pkg file in the root directory of USB Disk .
- Insert USB Disk to USB port, and then turn on the TV.
- The TV will identify the software and upgrade automatically.



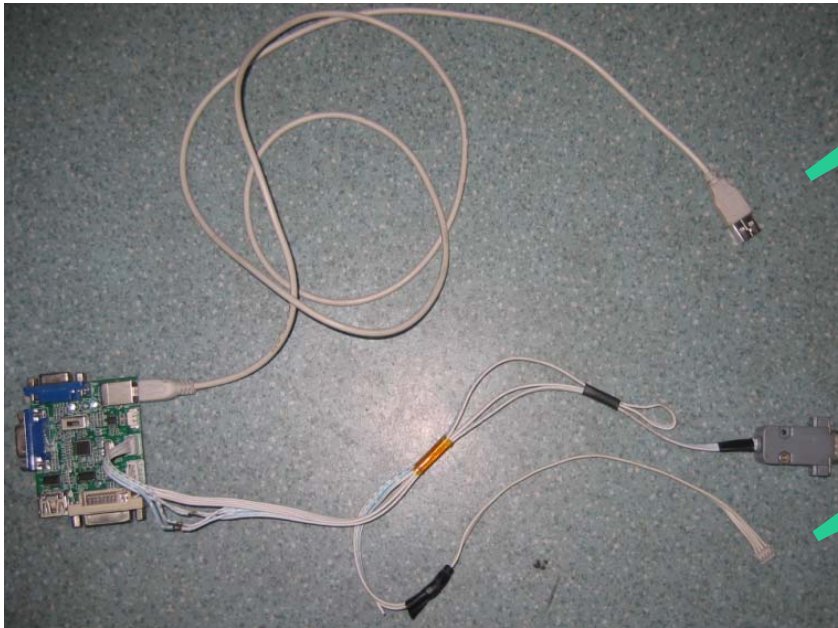
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## 4.2 USB upgrading unsuccessfully

If USB upgrading unsuccessfully, then need burning the Nand Flash program file“ \*.bin ”to the Nand Flash.

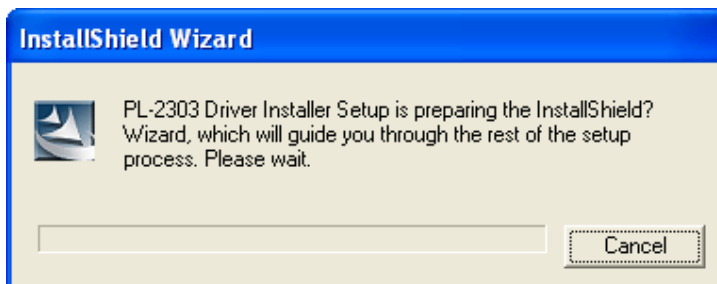
### Hardware connecting

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. As following

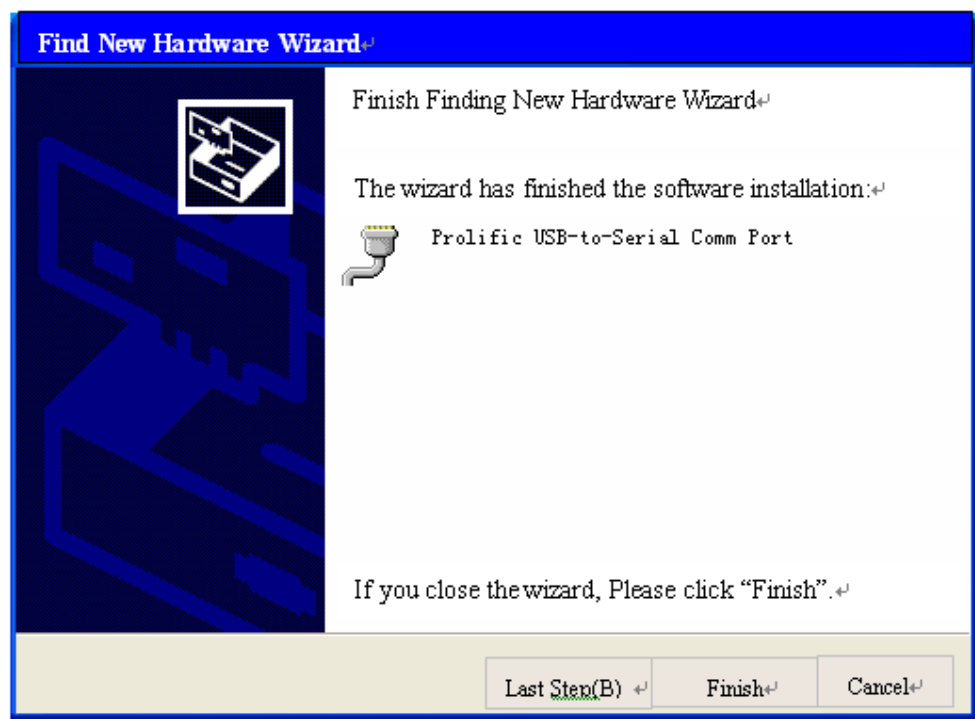
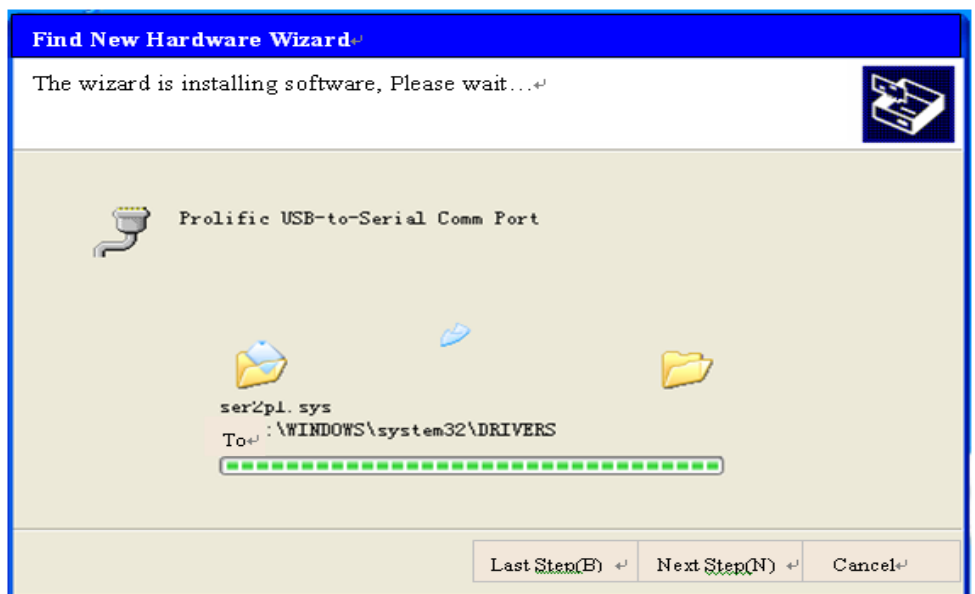


### 4.2.1 Install the driver

Double click the icon  **PL-2303 Driver Installer.exe**, install the driver.



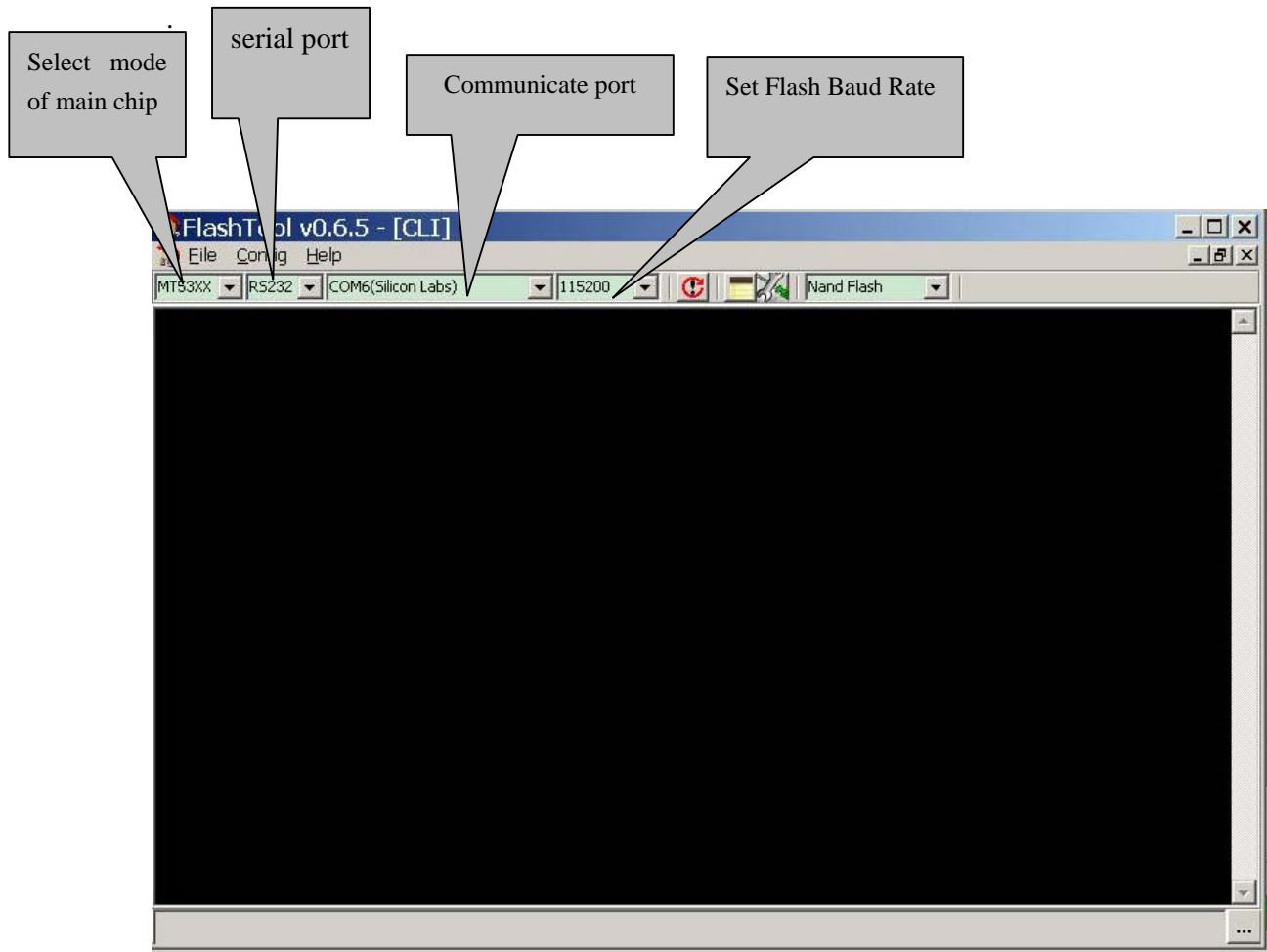
Select the default value, the driver will be installed step by step.



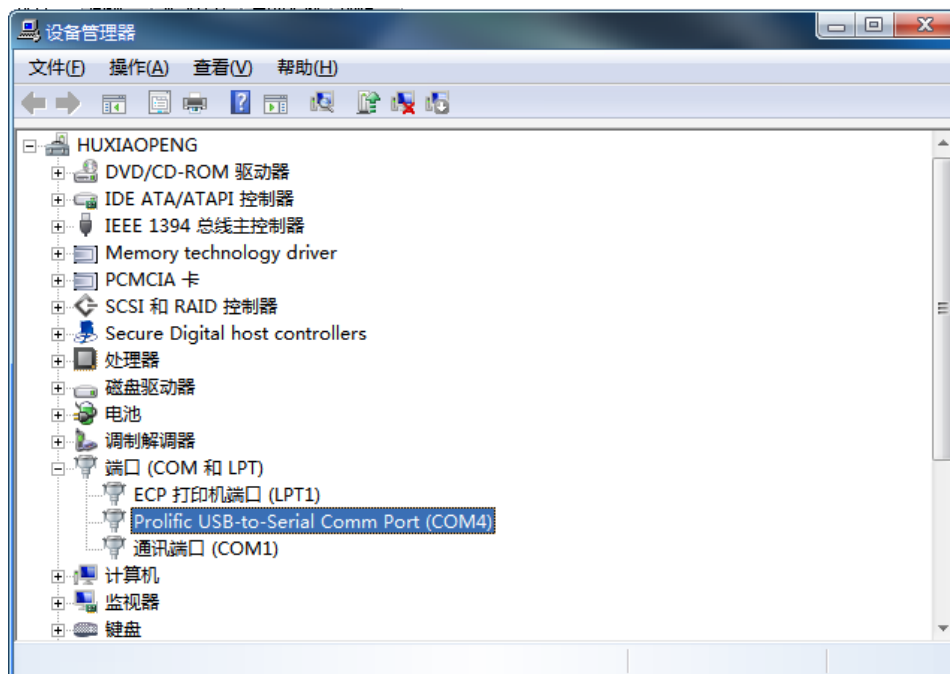
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### 4.3 Upgrading with the FlashTool0.6.0.exe




1、FlashTool is a green program needing no installation. After Connect the unit to your pc with a USB-to-serial port cable, run FlashTool0.6.0.exe. Please refer to the following steps to set.

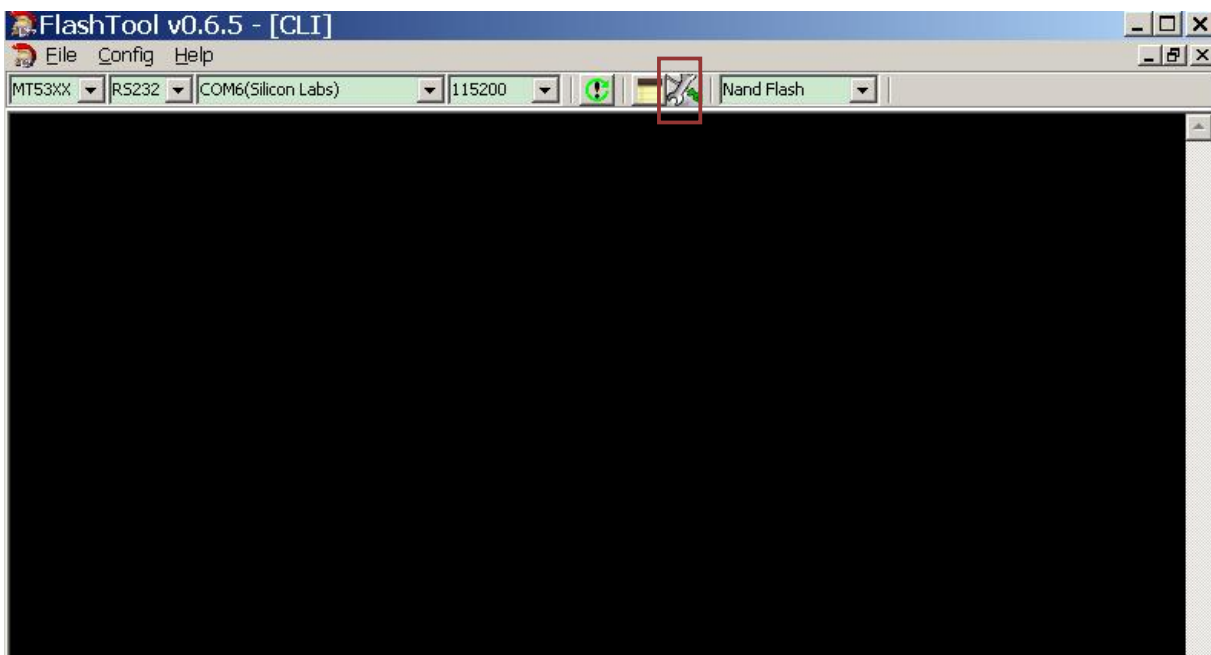


How to choose Communicate port and flash baud rate? See the following instruction..




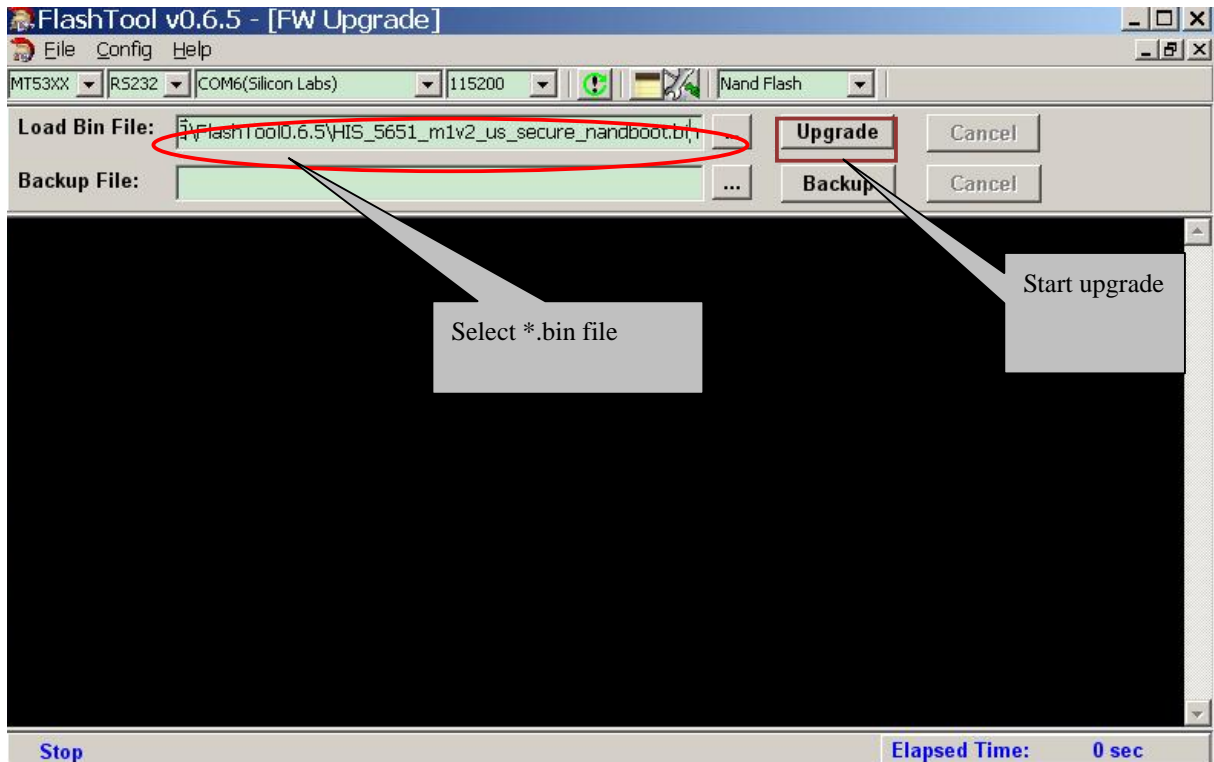
Open “Device Manager” and find which port is connected with the TV. In above picture, COM4 is connected to the TV, so, select “COM4” and if COM6 is connected to the TV, so select “COM6”. Select the right baud rate according to chip model. For this unit( chip model is MT5651), select 115200.

2、 Click  to connect, if connect successfully then button  from red turn green .



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Click , bounce the following dialog box. Load Bin File: find the upgrading program file, and select it. for example:HIS\_5651\_m1v2\_oceania\_secure\_nandboot.bin. Press “Upgrade” button and start upgrading., if update defeat, try again.



If bootloader Tool upgrading is ok, then need renew USB upgrading.reference to 4.1( **USB Software Upgrading directly**)

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## 4.4 Network updating

Network updating includes two ways. one is “Auto Upgrade ”the other is “Internet”. Whether Auto Upgrade is ON or Off, Network Upgrade is validated

Auto Upgrade---- When it is set to “on” , Turn on automatic check whether or not have any new updating file in servers when connects to the network. Customer can download and update according to the guide.

Internet” ---- Check the process and it will prompt you to upgrade the software.

### 1、Internet

Power on---Press “menu” key on RC, select as following.

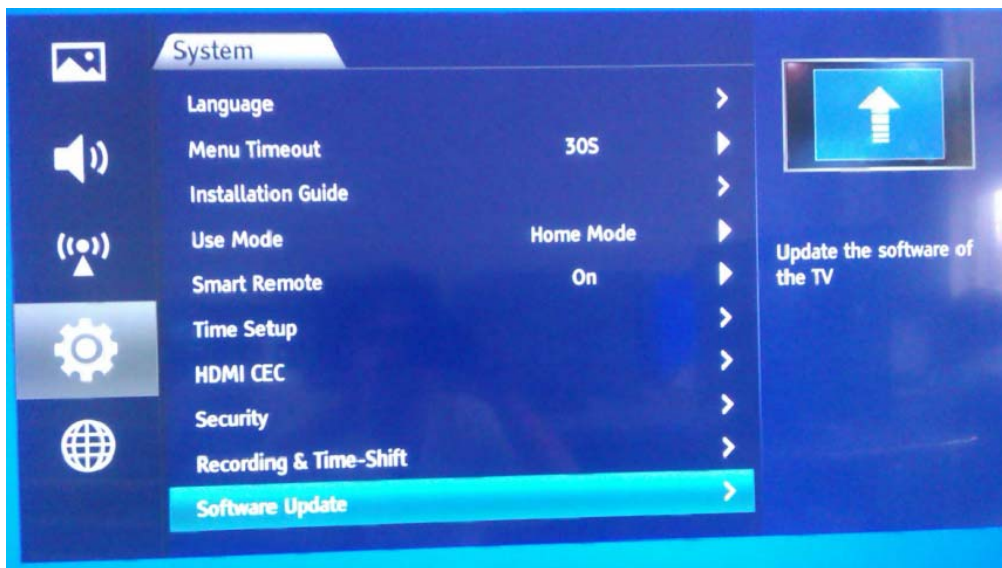


Figure-1

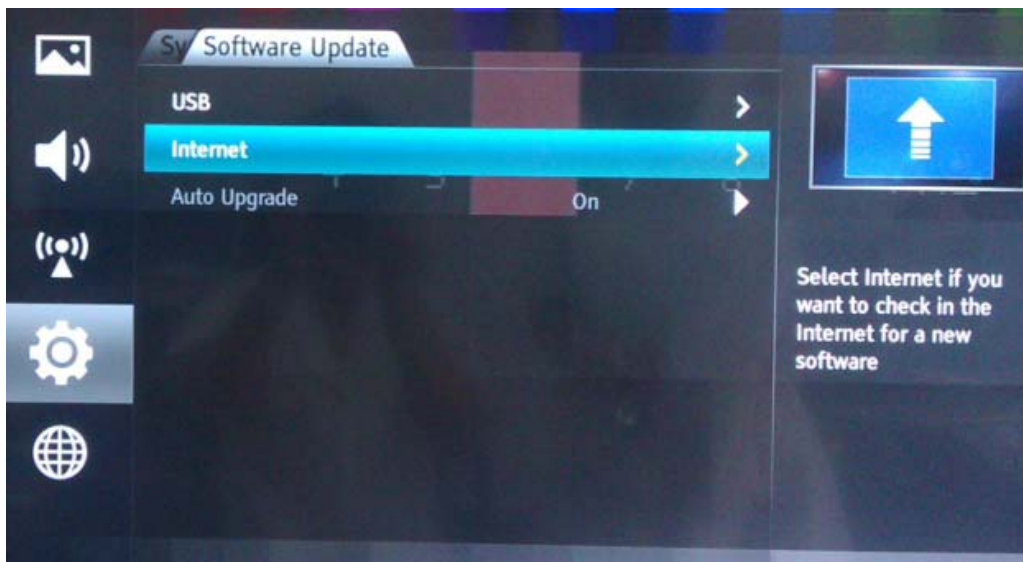


Figure-2

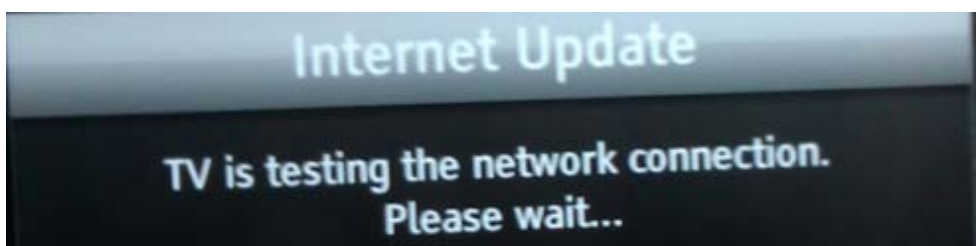


Figure-3

Check new version, then bounce the following .

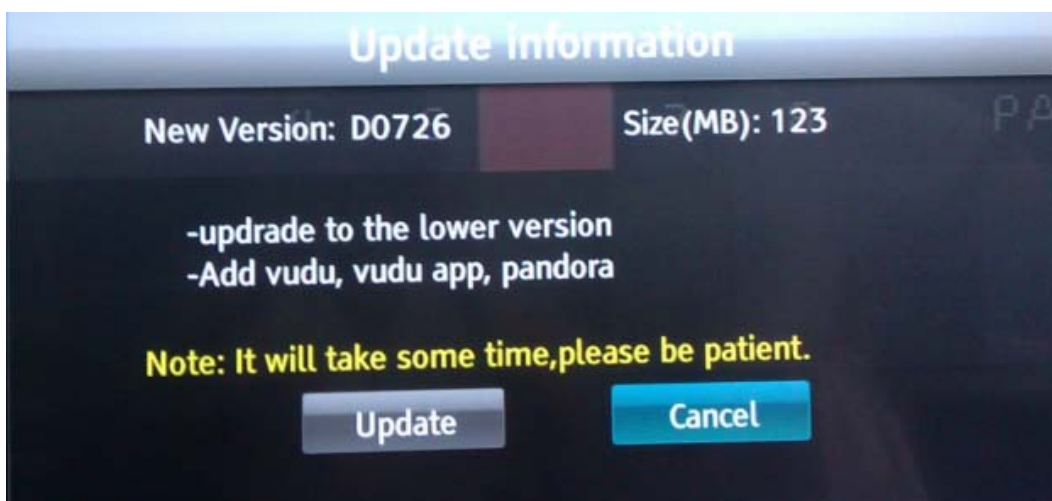


Figure-4



Select update to downloading.....

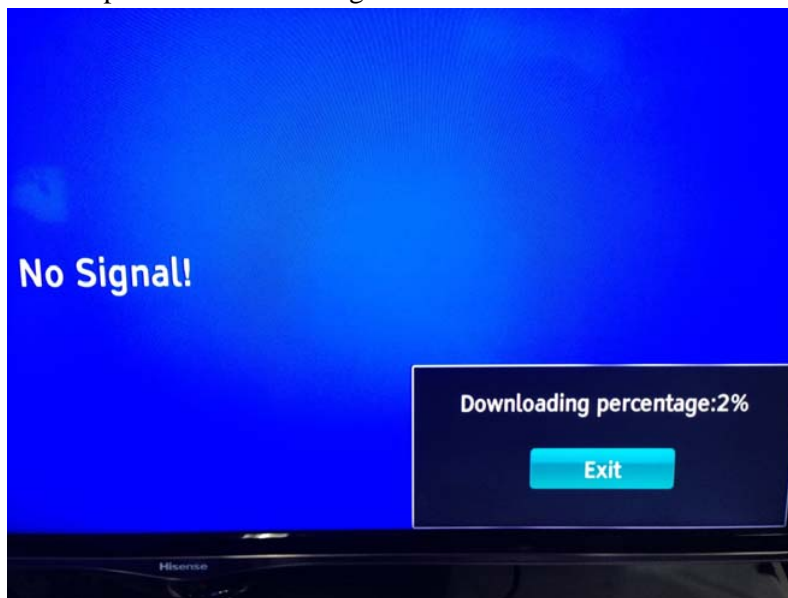


Figure-5

After verify, bounce dialog to select “yes” to sure to update the firmware. Waiting.....



Figure-6





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Bounding following interface that indicates firmware update is sussessful.

Figure-7

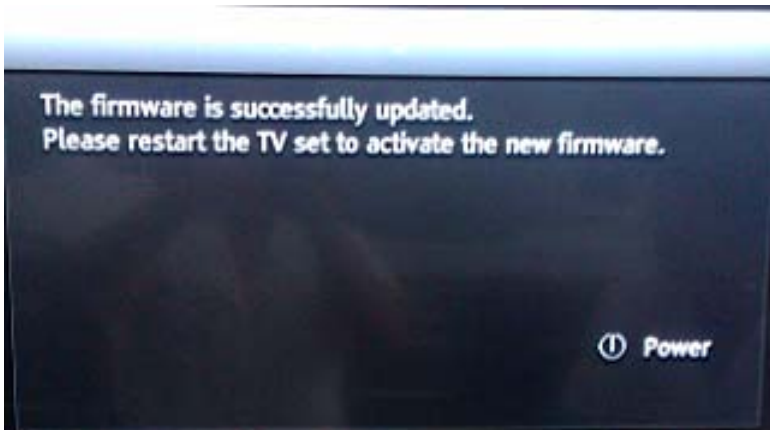


Figure-8

Upgrade successfully. power off and restart TV can bounce following prompt message. otherwise upgrade is defeat.

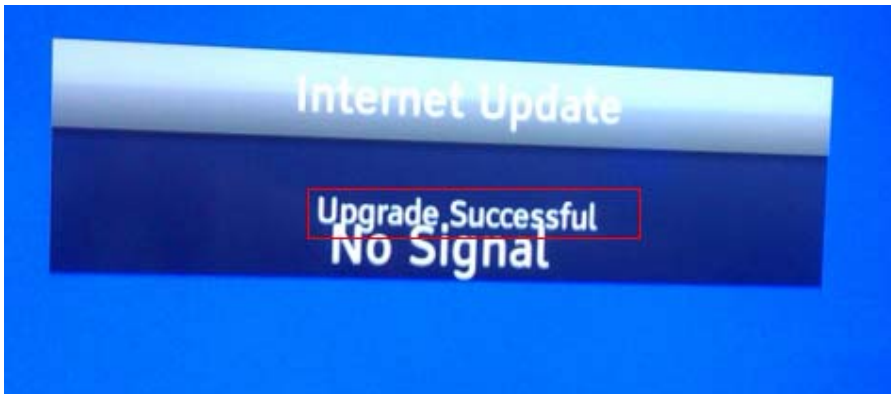


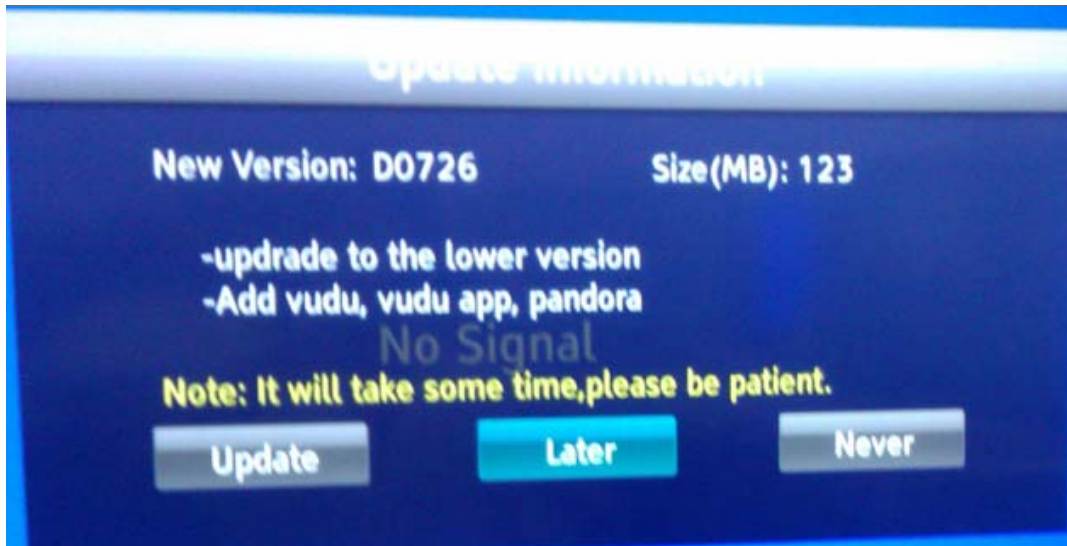
Figure-9

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## 2、 Auto upgrade

Auto upgrade and Network have little difference only in figure-4. As following

Auto Upgrade:



Network upgrade:

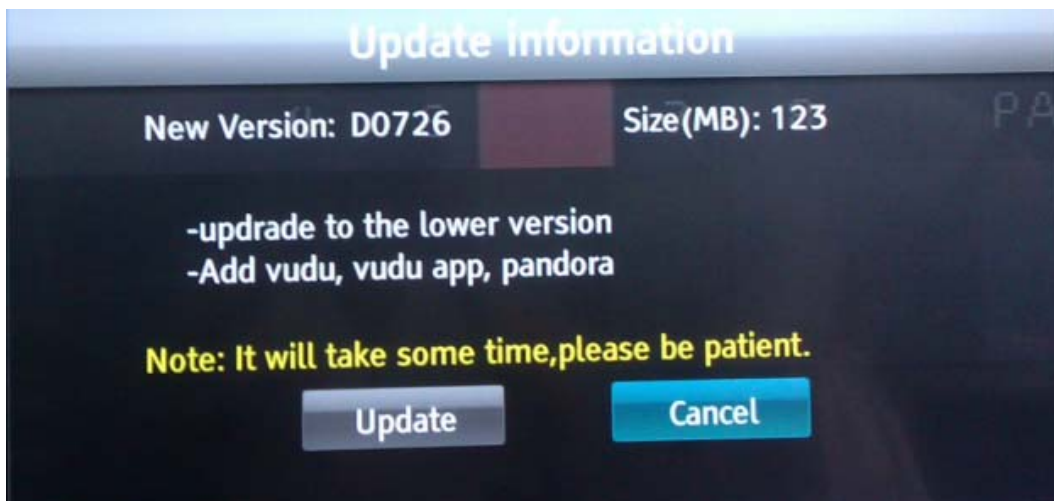


figure-2

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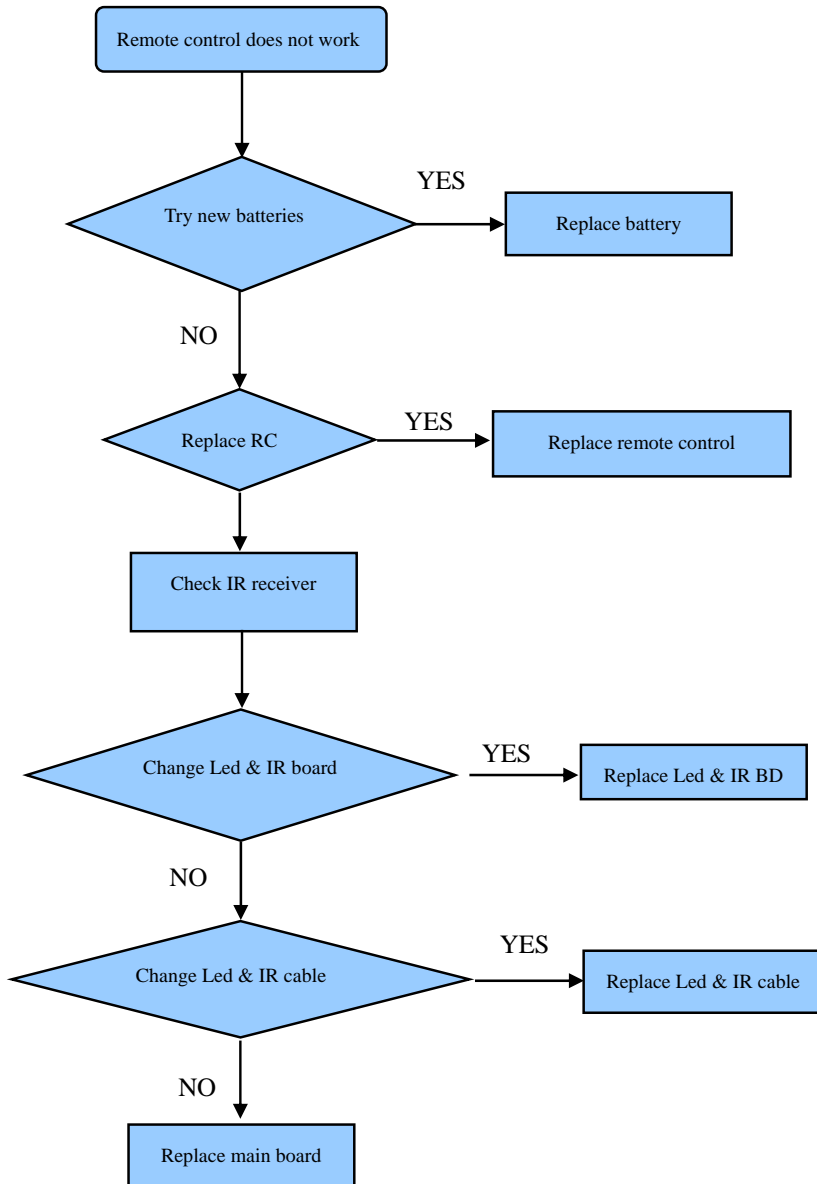
## 5. Trouble shooting

When there is something wrong with your TV, you can try turning off the TV and then restart it. You can also operate according to the follow chart. If the problems still can't be solved, please contact the profession technician.

No sound or picture	<ol style="list-style-type: none"><li>1. Check if the power line is in the outlet and if it has electricity.</li><li>2. Check if you have pressed Power button on the TV or Power button on the remote control</li><li>3. Check the setting of picture brightness and contrast.</li><li>4. Check the volume.</li></ol>
The picture is normal but there is no sound	<ol style="list-style-type: none"><li>1. Check the volume.</li><li>2. Check if Mute mode is set.</li></ol>
No picture and white or black picture	<ol style="list-style-type: none"><li>1. Adjust Picture Setting.</li><li>2. Check Color System.</li></ol>
The sound and picture are interfered	<ol style="list-style-type: none"><li>1. Try to find the appliance affecting TV set, and move it far away from the TV set.</li><li>2. Try to insert the power plug of the TV set into another outlet.</li></ol>
Unclear picture or picture with snow	<ol style="list-style-type: none"><li>1. Check the direction, position and connection of your antenna.</li><li>2. Adjust the direction of your antenna or reset or fine tune the channel</li></ol>
The remote control does not work	<ol style="list-style-type: none"><li>1. Change the batteries in the remote control.</li><li>2. Clean the upper side of the remote control (radiating window)</li><li>3. Check the contacting points of the batteries.</li><li>4. Check if there is obstruction between the remote control and the monitor.</li><li>5. Check if the batteries are correctly installed.</li></ol>
H/V strip or the picture shaking	Check if there is an interfering source nearby, such as appliance or electric tools.
The cabinet of the TV makes "Click" sound	makes "Click" sound"Sometimes the room temperature change can cause the television cabinet to inflate or contra, which makes this sound. This does not mean the TV breaks down.

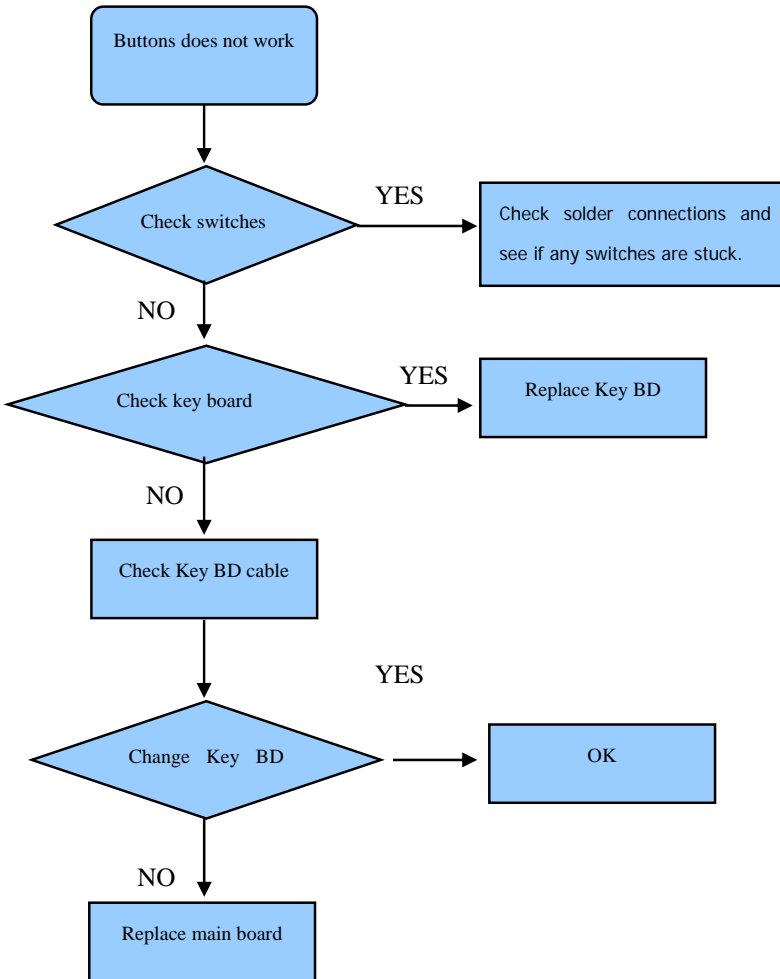
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## 5.1 Troubleshooting for Remote Control

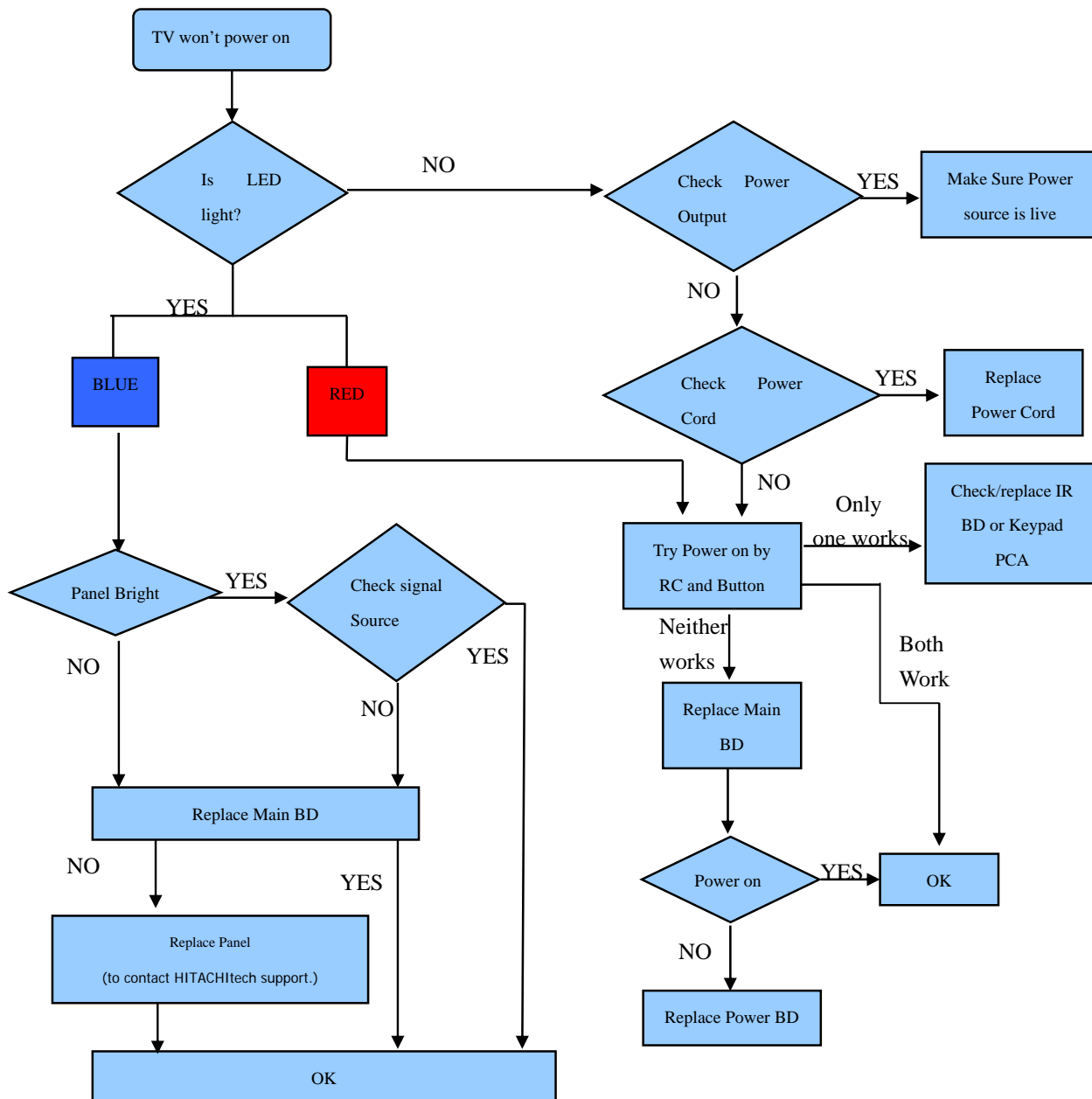


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## 5.2 Troubleshooting for Function Key

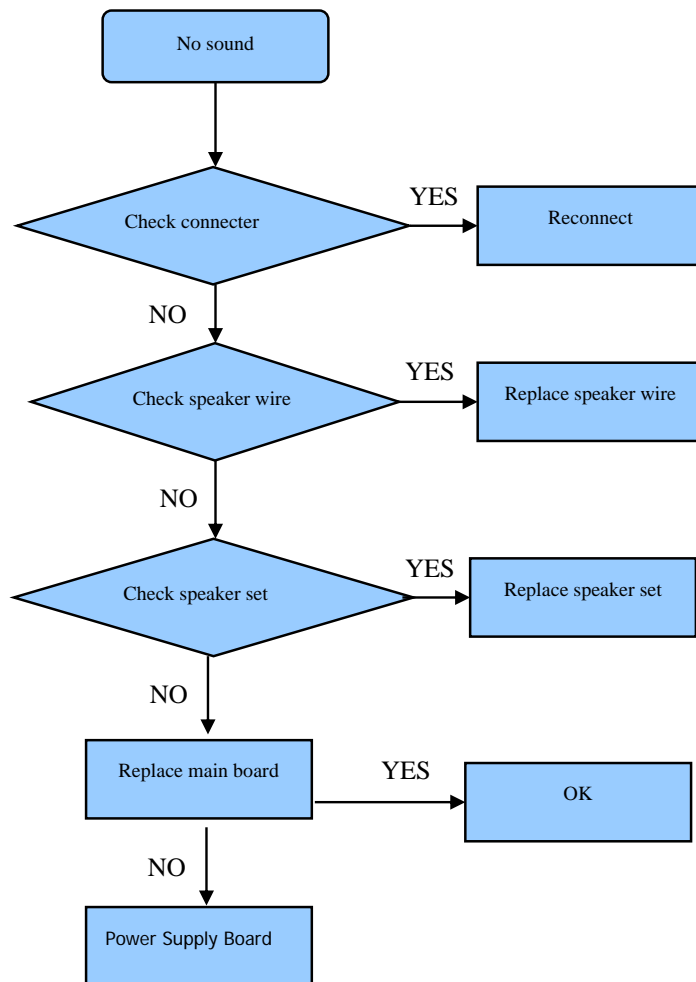


## 5.3 TV won't Power On



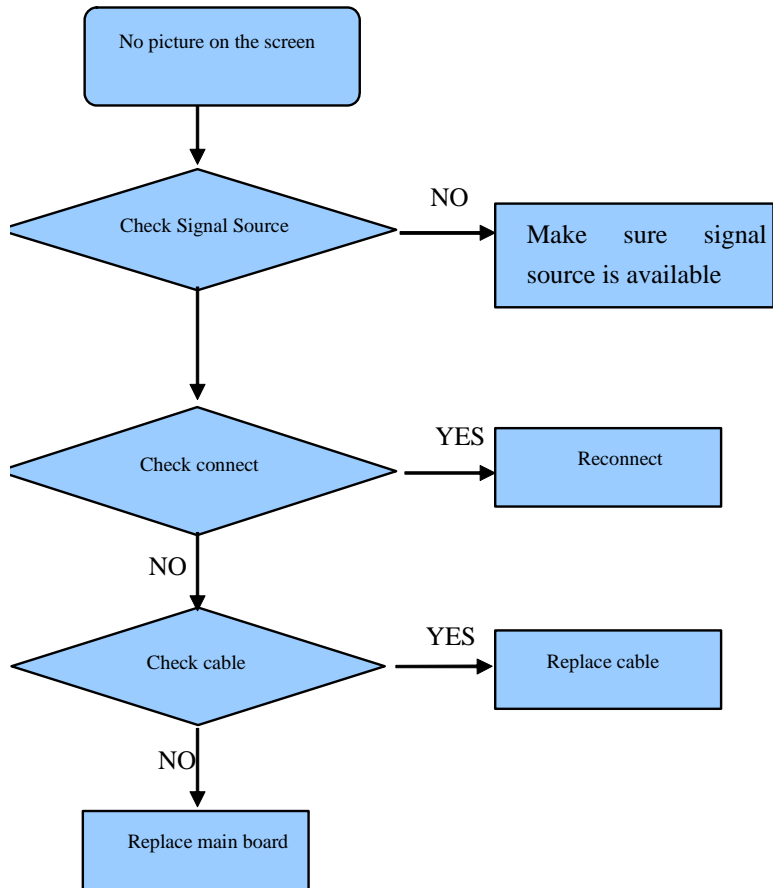
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## 5.4 Troubleshooting for Audio



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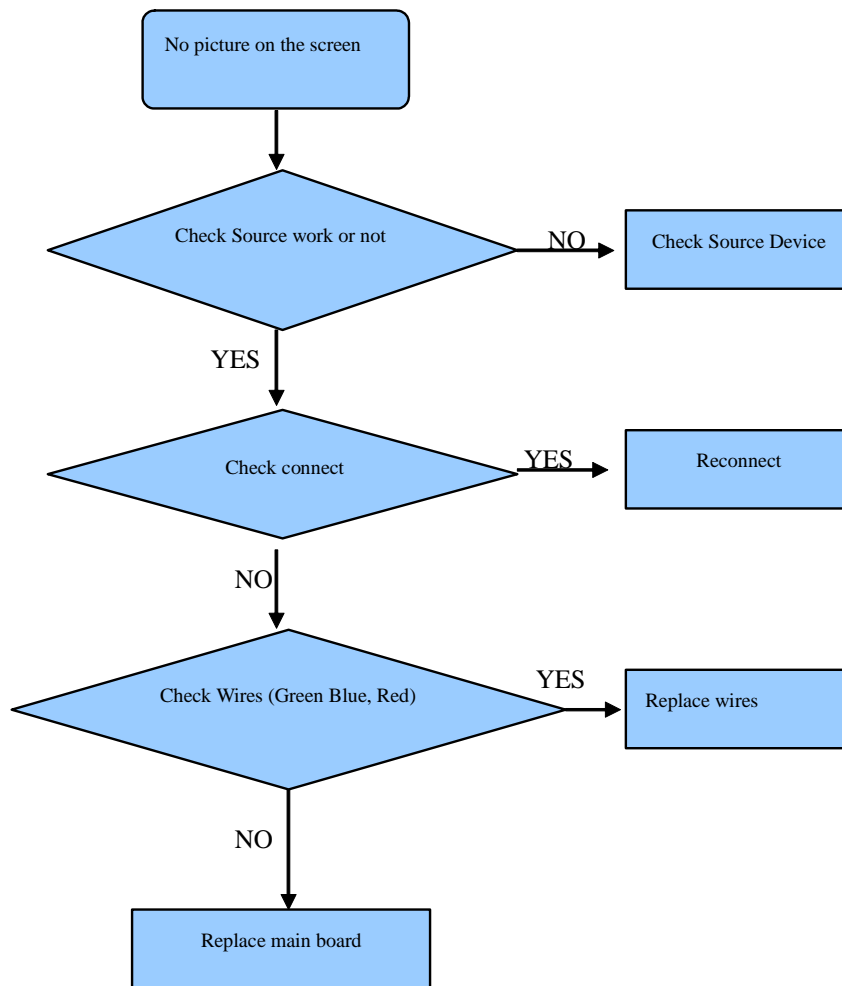
## 5.5 Troubleshooting for TV/VGA/HDMI input





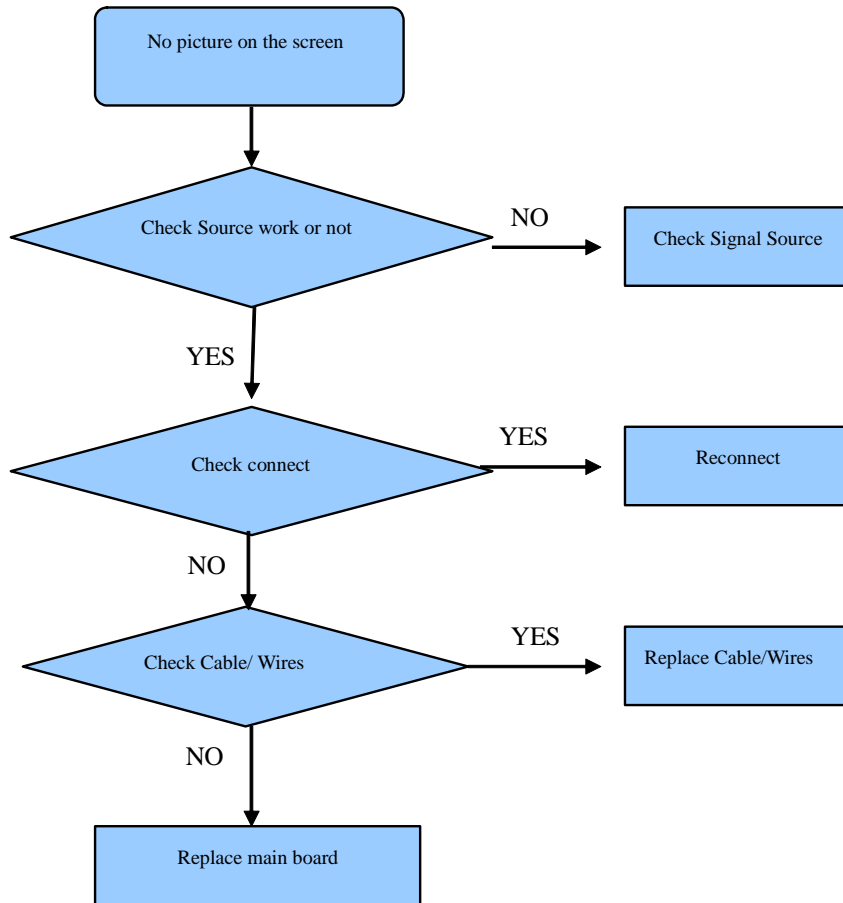
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## 5.6 Troubleshooting for YPbPr input



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## 5.7 Troubleshooting for Video input



### 6. Signals Block Diagram and power assign:

### 7. Schematic circuit diagram

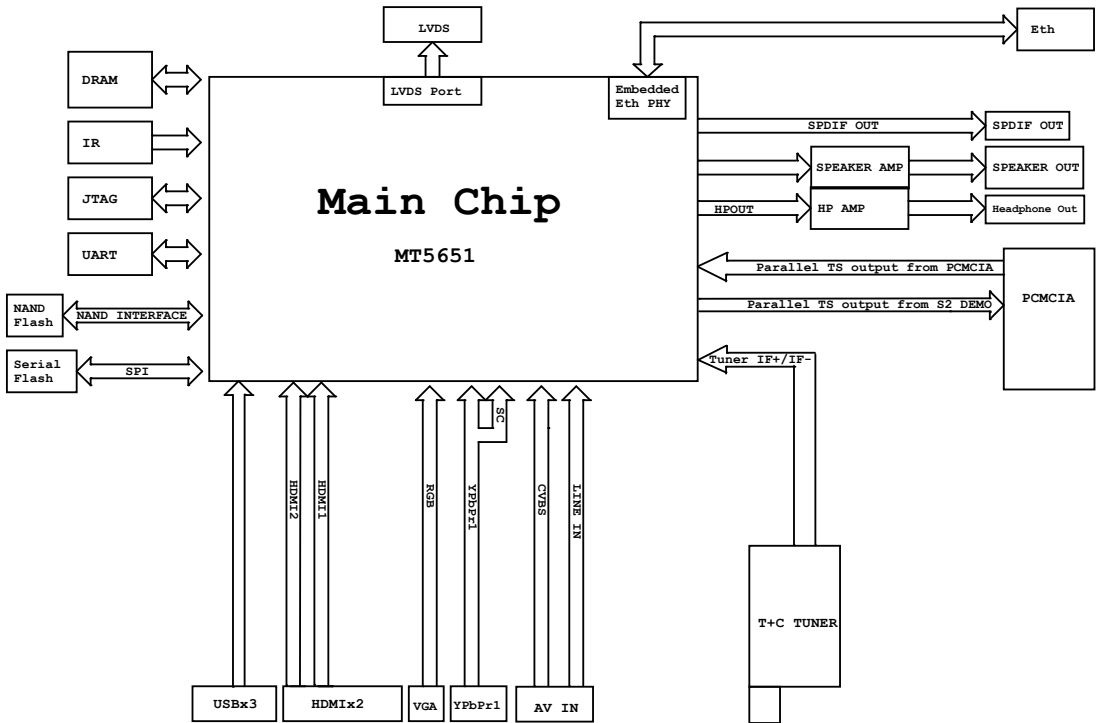
### 8. Explode View

# MT5651

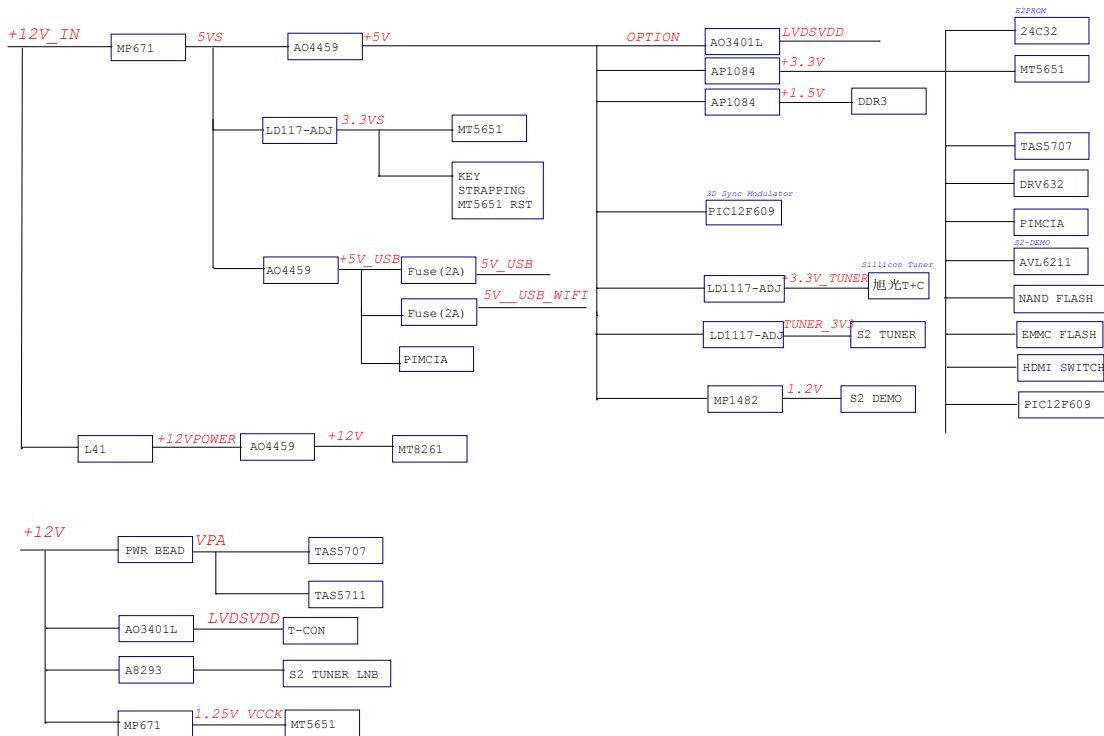
## GPIO LIST

PIN NAME	GPIO Function	Function define
GPIO_0		LOCAL_DIM_EN
GPIO_1		PWR_FAULT#
GPIO_2		LVDS_PWR_EN
GPIO_3		EMMC_RST
GPIO_4		WIFI_EN
GPIO_5		CI_PWR_EN
GPIO_6		
GPIO_7		
GPIO_8		
GPIO_9		
GPIO_10		HPDET#
GPIO_11		SYS_FEPROM_WP
ADIN0		
ADIN1		
ADIN2		ADIN0
ADIN3		ADIN1
ADIN4		LED_DX
ADIN5		POWER_LED
OPCTRL0		strap[1] / Flash_WP#
OPCTRL1		BL_ON/OFF
OPCTRL2		AMP_MUTE
OPCTRL3		strap[2]
OPCTRL4		strap[3] RST_AMP
OPWM0		
OPWM1		MEMC_ON/OFF
OPWM2		BL_DIMMING
OPWM3		MUTE_HP
OPWM4		
OPWM5		LED2/PHYAD2
OPWM6		LED3/PHYAD3
PACLE		strap[0]
AQSDATA1		
RF_AGC		CI_OCP

## Block Diagram

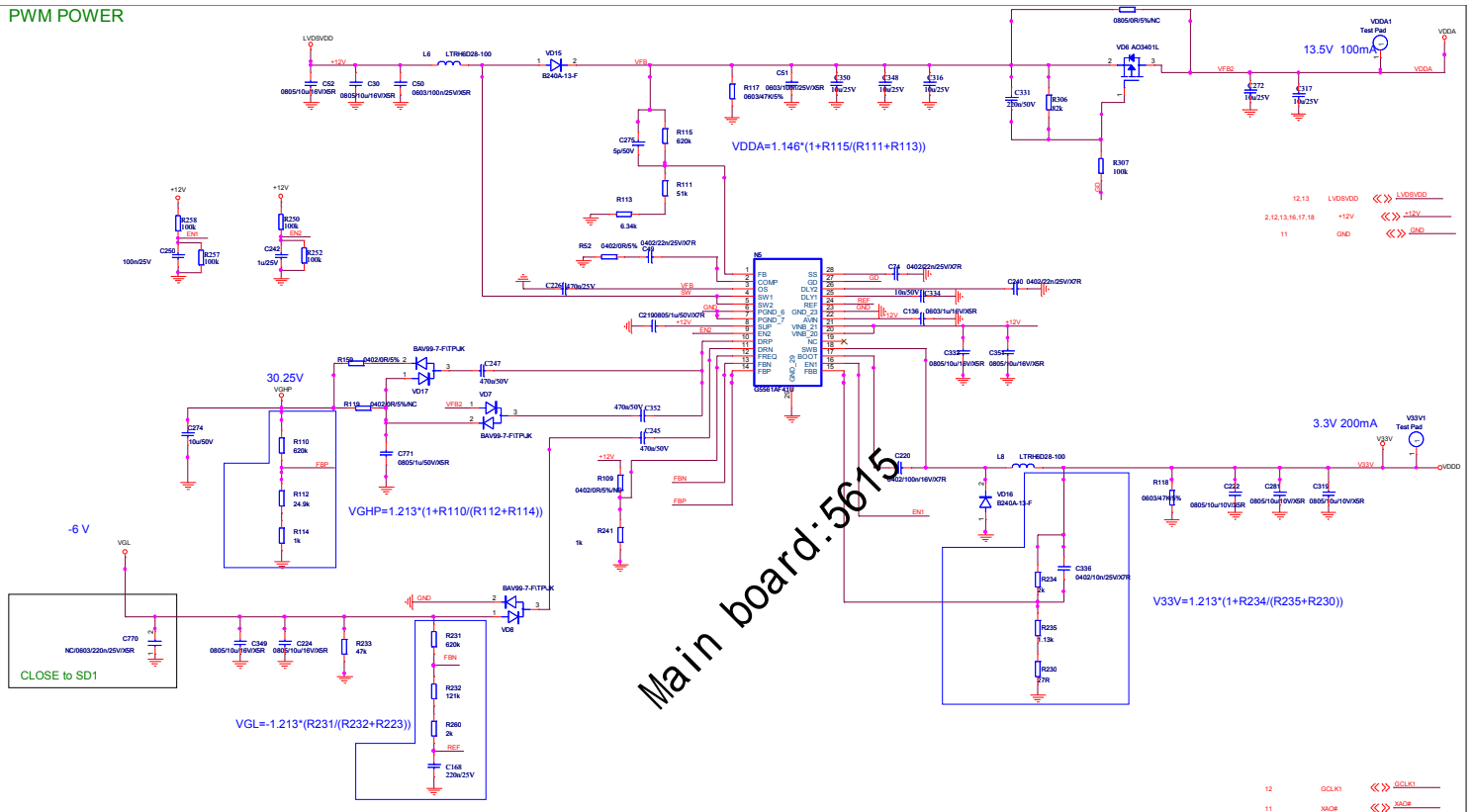


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Doc	Document Number		Rev
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Doc	Version	1.0	1.0

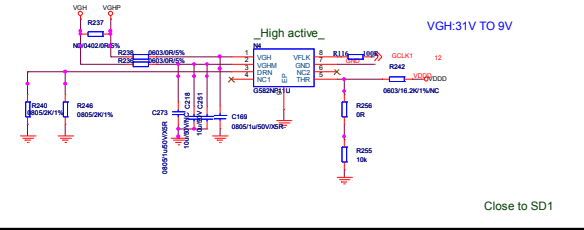


Hisense Electric Co.,LTD		
Title:		
Power Tree		

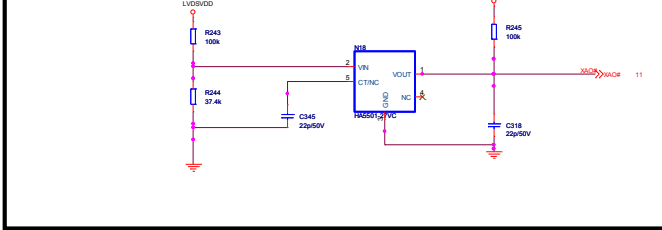
## PWM POWER



## VGH 3-State



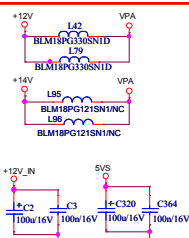
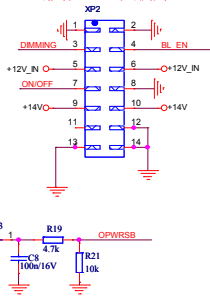
## Reset IC for XAO function





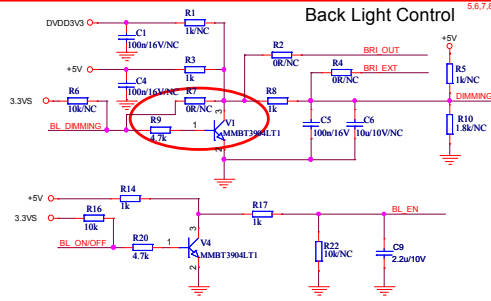
## MAIN POWER

### 兼容14Pin双排插座



OPWR5B  
HIGH => OPEN FRAME POWER OFF  
LOW => OPEN FRAME POWER ON

## Back Light Control

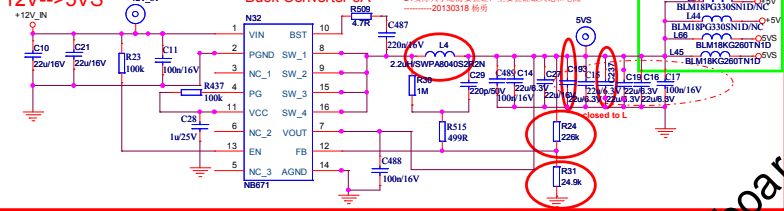


3,4,5,6,7,8,9,10,11,12,13,14,15,16,17	GND	<<< GND
5,6,7,8,9,10,11,12,13,14,15,16,17	+5V	<<< +5V
10,12,13,15,16,17,18	+12V	<<< +12V
17	+14V	<<< +14V
5,16	5VS	<<< 5VS
3,4,5,10,11	3.3VS	<<< 3.3VS
AVDD3V3	AVDD3V3	<<< AVDD3V3
AVDD1V2	AVDD1V2	<<< AVDD1V2
3,5,7,11,12,15,17,18	VCCA	<<< VCCA
8,10,12	VCCA	<<< VCCA
3,5	VPA	<<< VPA
3	OPWR5B	<<< OPWR5B
4	BL_DIMMING	<<< BL_DIMMING
4	BL_ON/OFF	<<< BL_ON/OFF
4	BRI_EXT	<<< BRI_EXT
4	BRI_OUT	<<< BRI_OUT

## 12V-->5VS

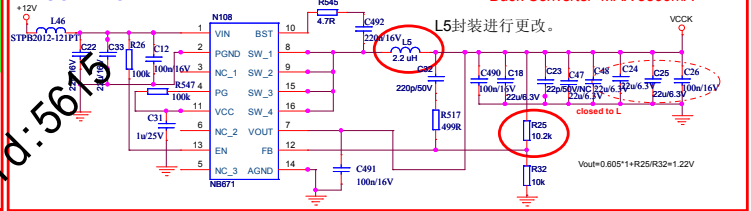
### Buck Converter 6A

L4实际大小还需要验证，主要验证最大电流和电感

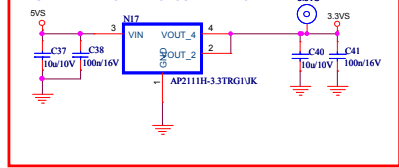


## CORE POWER 1.2V

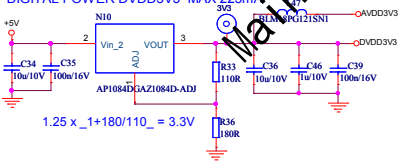
### Buck Converter MAX 3300mA



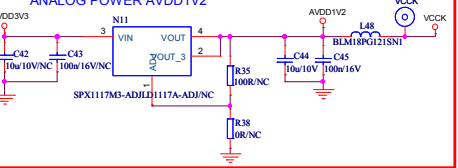
## STANDBY POWER 3V3SB MAX 15mA



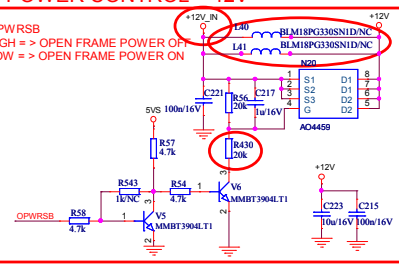
## DIGITAL POWER DVDD3V3 MAX 225mA



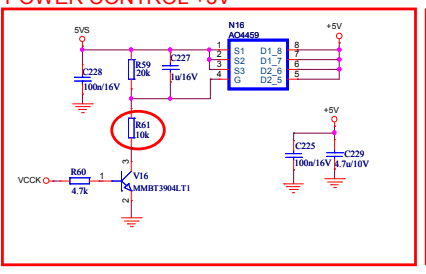
## ANALOG POWER AVDD1V2



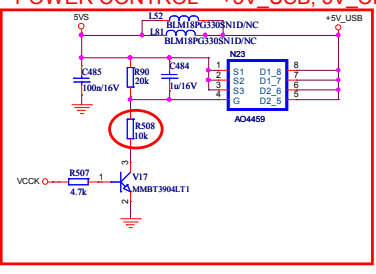
## POWER CONTROL +12V



## POWER CONTROL +5V



## POWER CONTROL +5V\_USB, 5V\_CI



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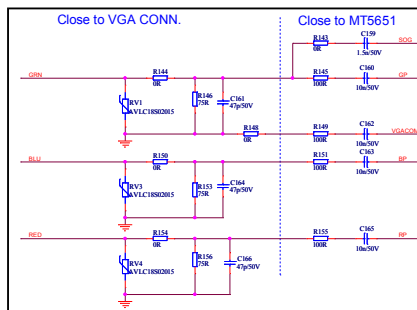
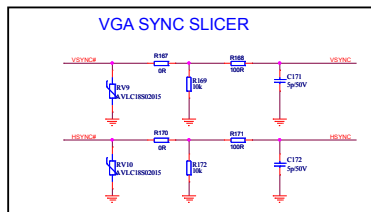
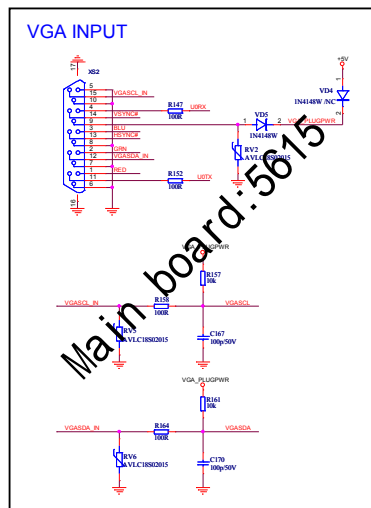
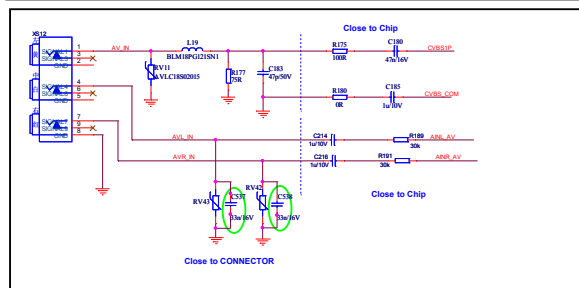
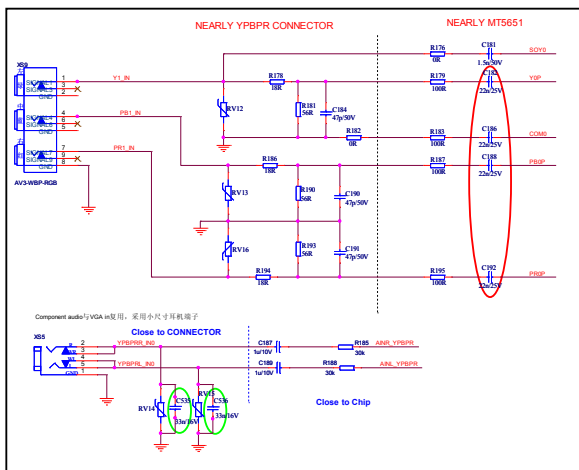
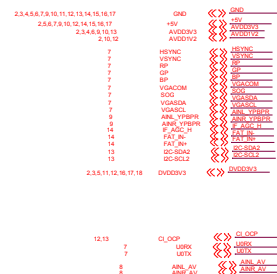














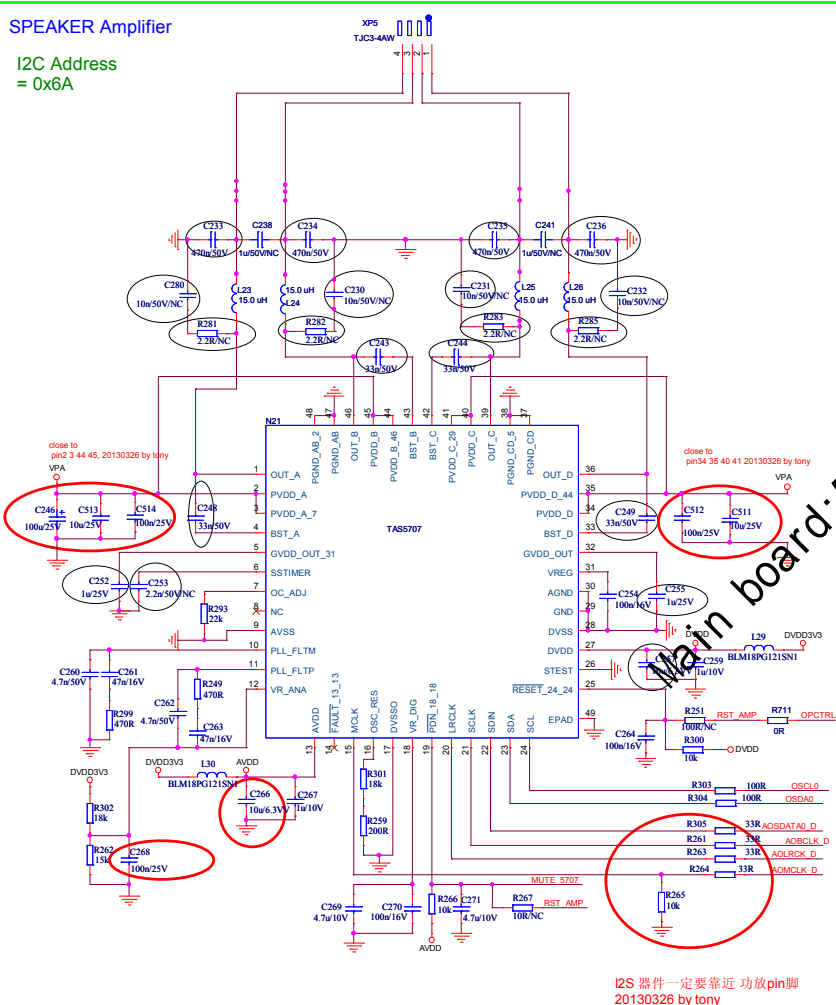




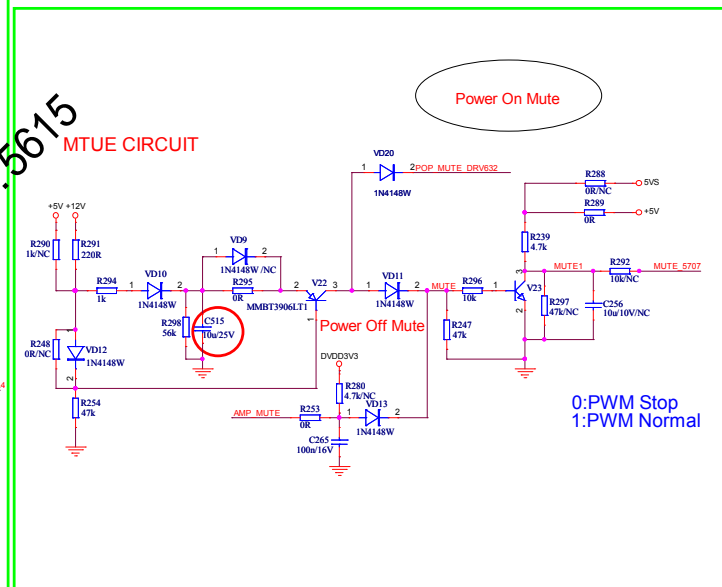




I2C Address  
= 0x6A

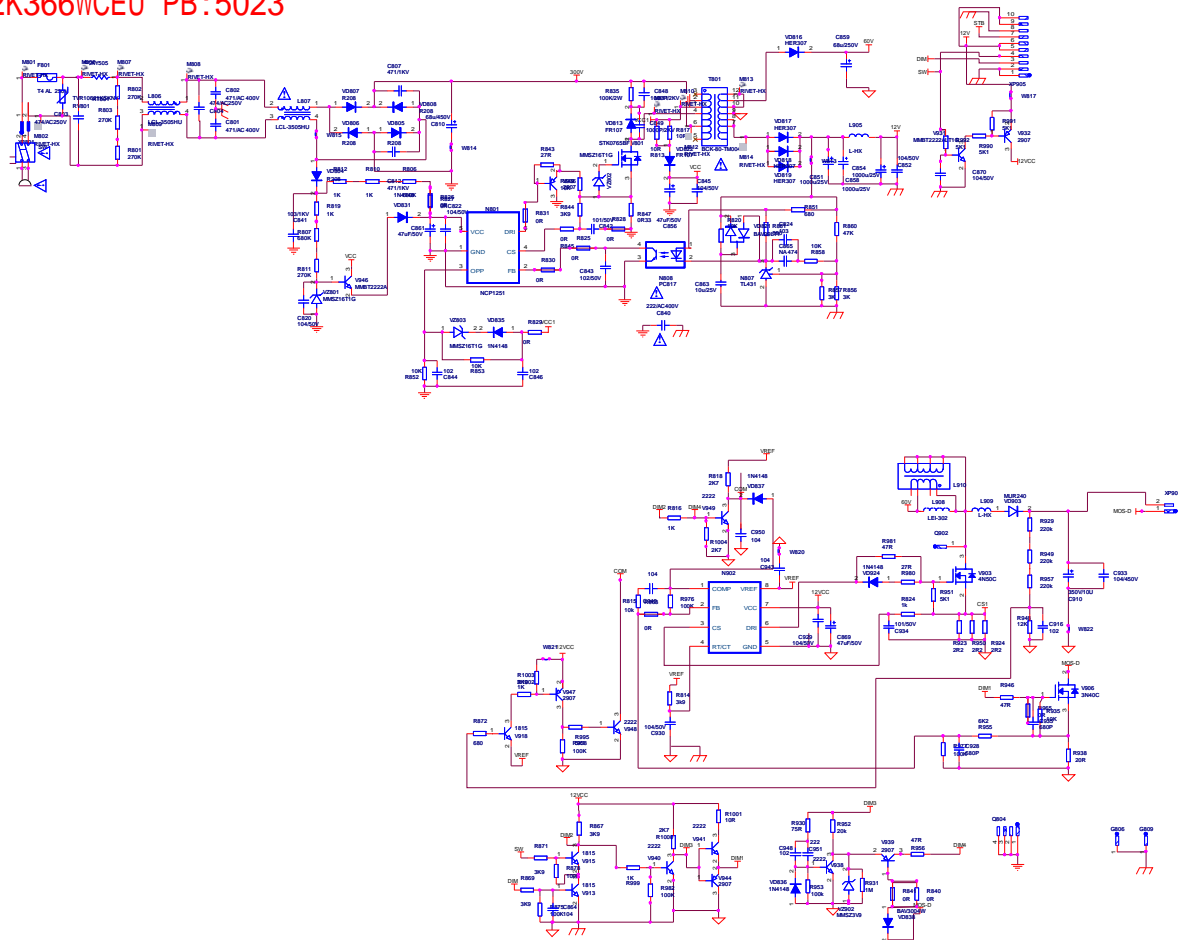


I2S 器件一定要靠近 功放pin脚  
20130326 by tony

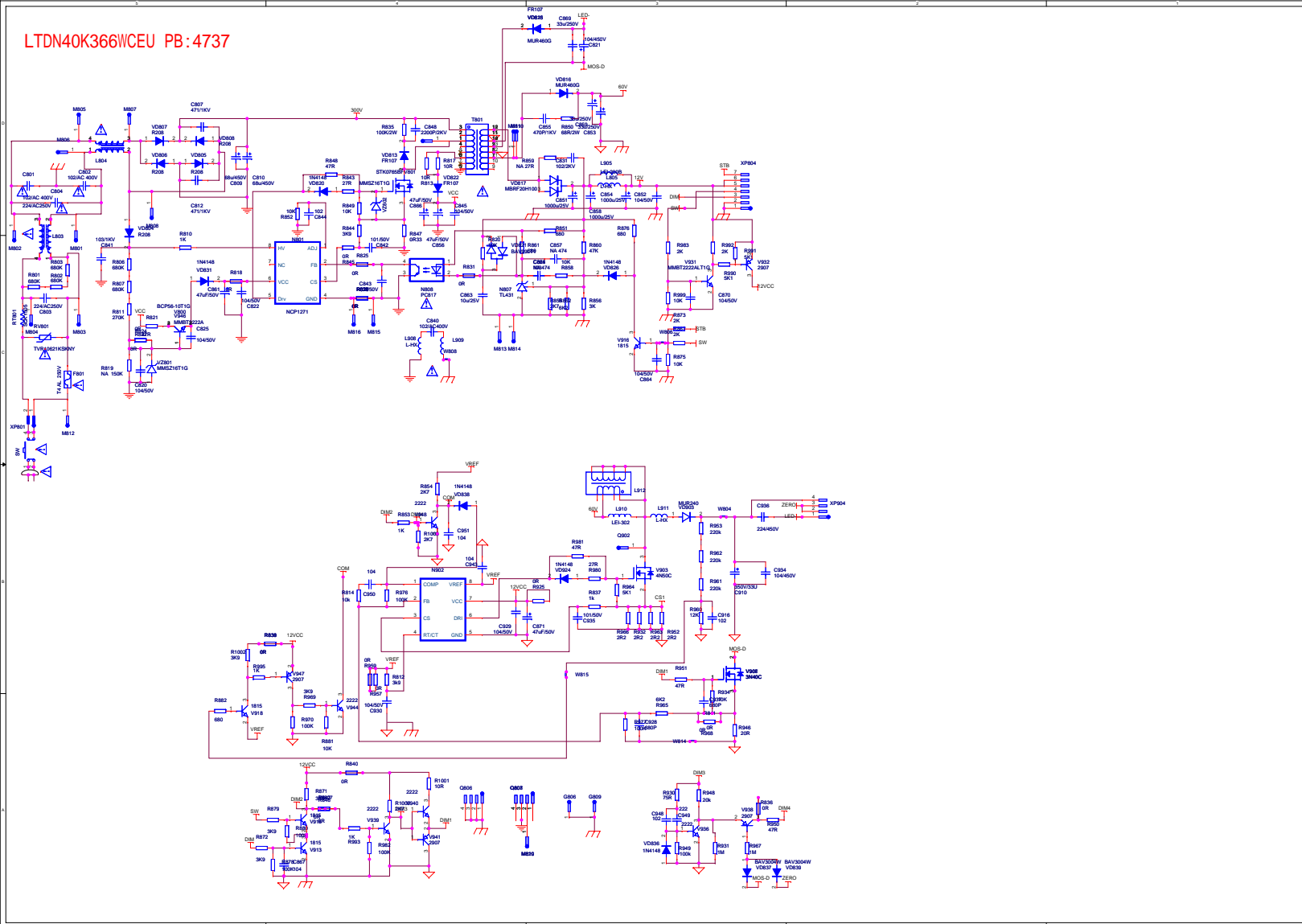


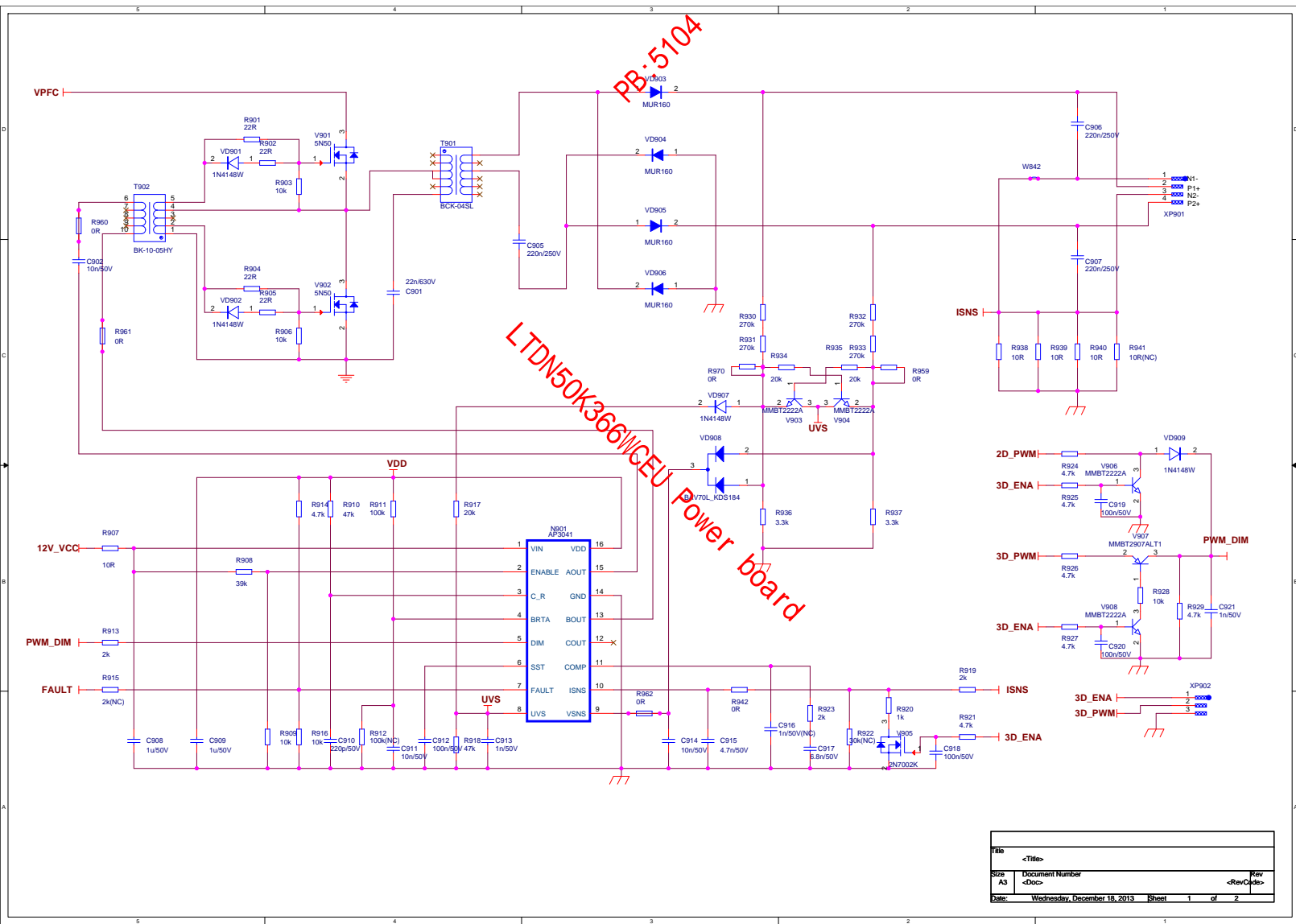
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SPEAKER/MUTE			
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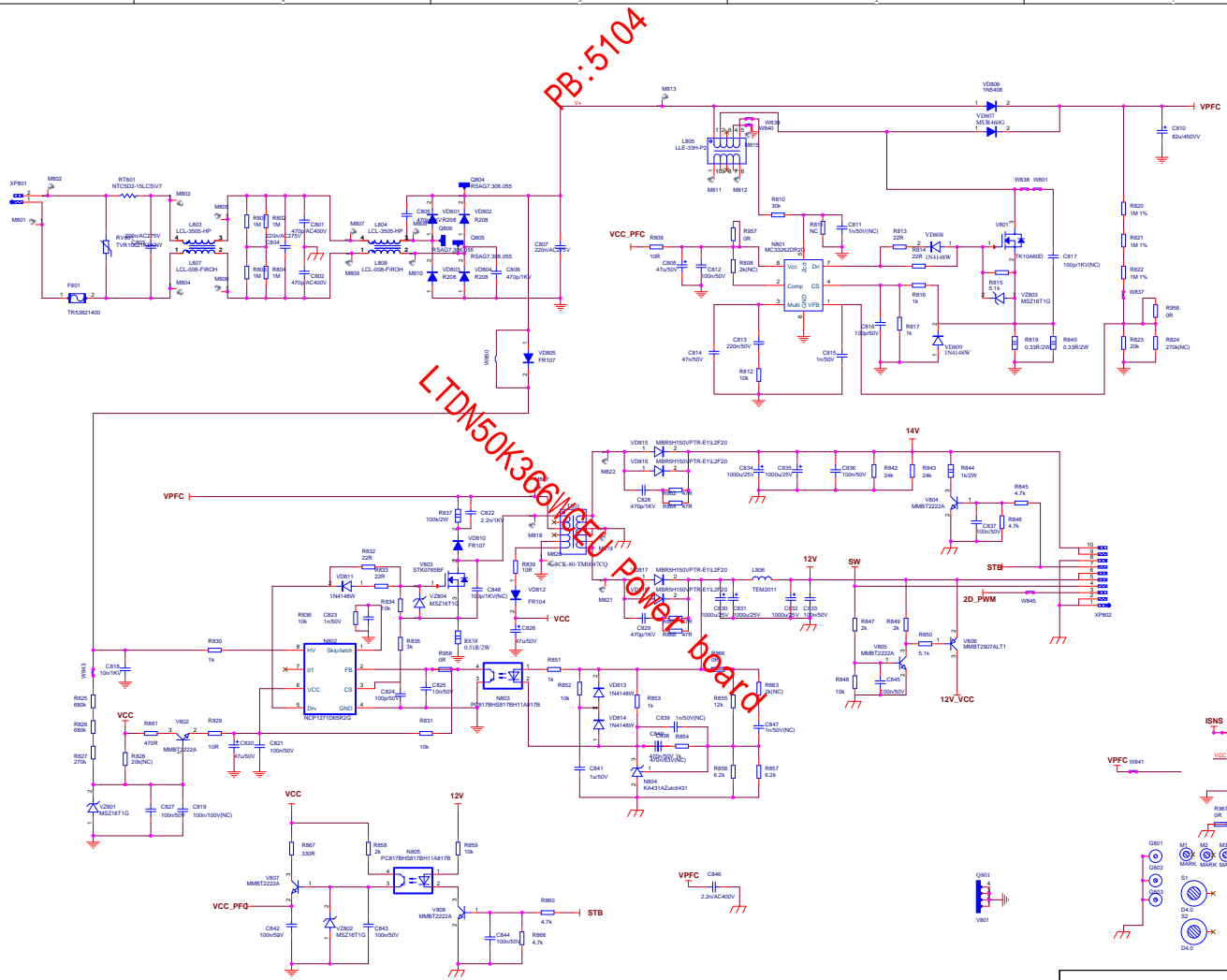


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