

LCD Television

Service Manual

Chassis: MSD6886

Version: V 1.0

Hisense Electric Co., Ltd.

December 5, 2018

| REVISION HISTORY | | | |
|------------------|----------------|---------|-----------|
| Version | Revise content | Reviser | Date |
| V1.00 | First issued | | 2018-12-5 |
| | | | |
| | | | |

Contents

| | |
|--|--------|
| Contents | - 3 - |
| Service Manual | - 4 - |
| 1. Precautions and notices..... | - 4 - |
| 1.1 Warning..... | - 5 - |
| 1.2 Notes..... | - 7 - |
| 2. TV boards: | - 10 - |
| 2.1 Main board layout..... | - 10 - |
| 2.2 TV boards part list | - 16 - |
| 3. Factory/Service OSD Menu and Adjustment..... | - 17 - |
| 3.1 Remote Control..... | - 17 - |
| 3.2 How to enter the Factory OSD Menu | - 18 - |
| 3.3 Factory OSD Menu..... | - 19 - |
| 4. Software Upgrading..... | - 25 - |
| 4.1 USB Upgrade..... | - 25 - |
| 4.2 Mstar Tool upgrading..... | - 27 - |
| 5. Trouble shooting..... | - 41 - |
| 5.1 Troubleshooting for Remote Control | - 41 - |
| 5.2 Troubleshooting for Function Key..... | - 42 - |
| 5.3 TV won't Power On..... | - 43 - |
| 5.4 Troubleshooting for Audio..... | - 44 - |
| 5.5 Troubleshooting for TV/VGA/HDMI input..... | - 45 - |
| 5.6 Troubleshooting for YPbPr input..... | - 46 - |
| 5.7 Troubleshooting for Video input..... | - 47 - |
| 6. Signals Block Diagram & power assign & schematic diagram..... | - 48 - |

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

technician trained in the proper Television safety and service methods and procedures
Hereafter throughout this manual.

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.

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.

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 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

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 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.

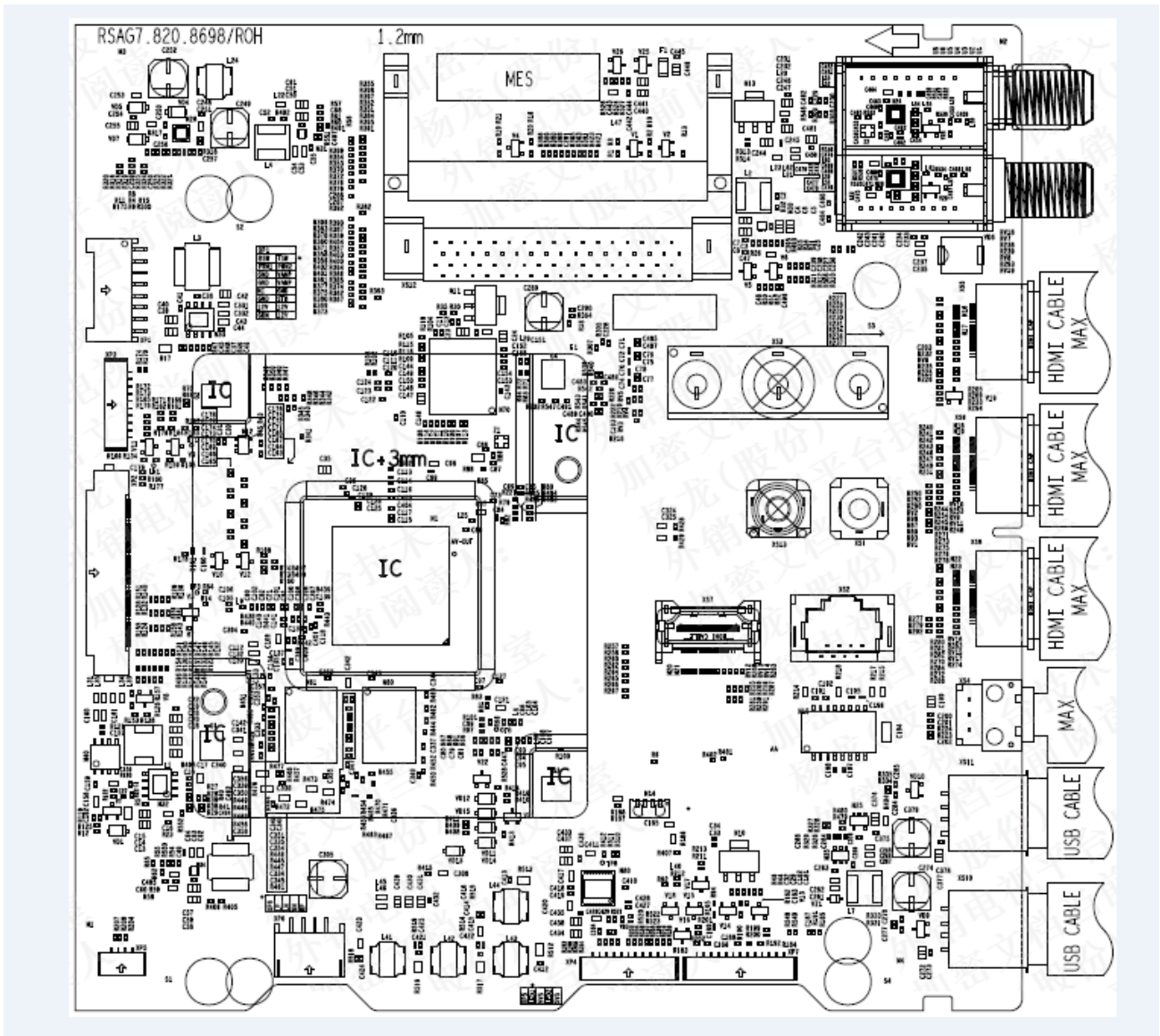


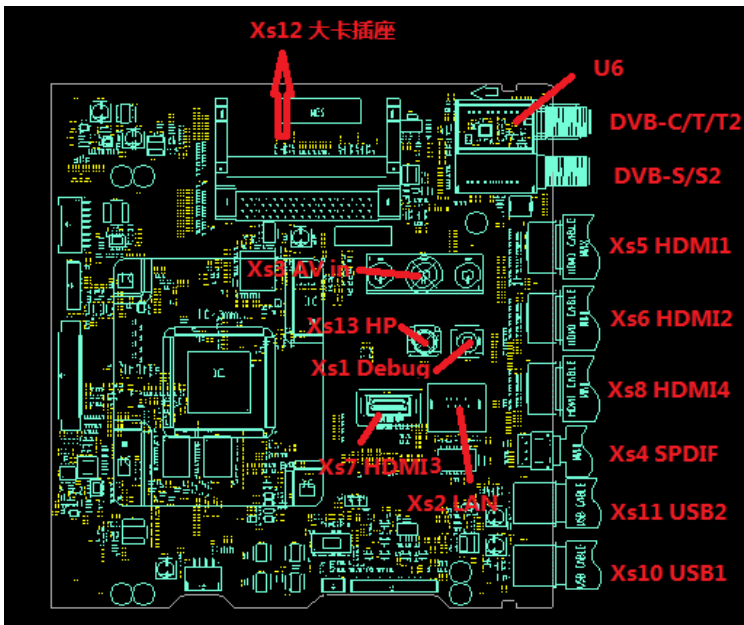
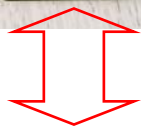
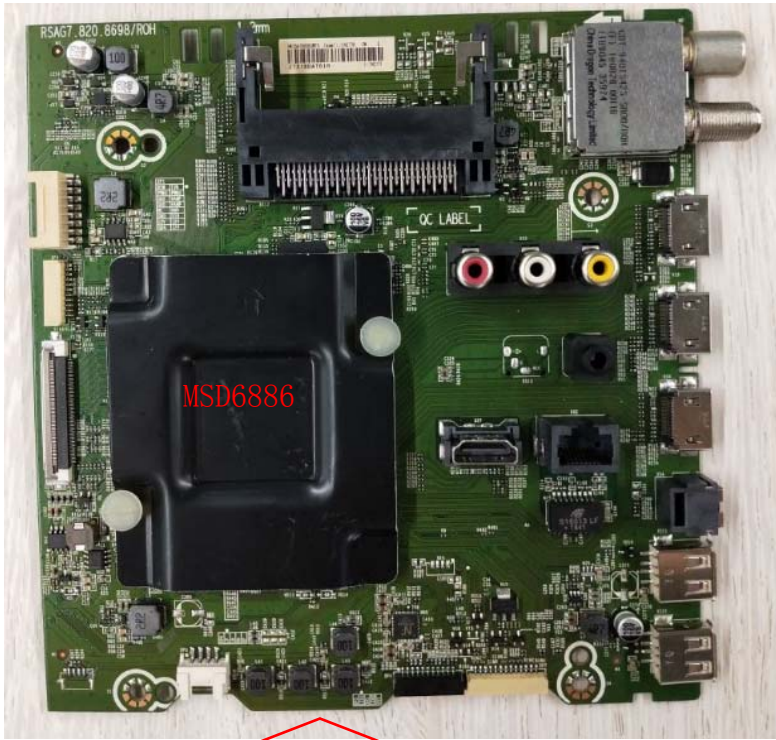
The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature. .

2. TV boards:

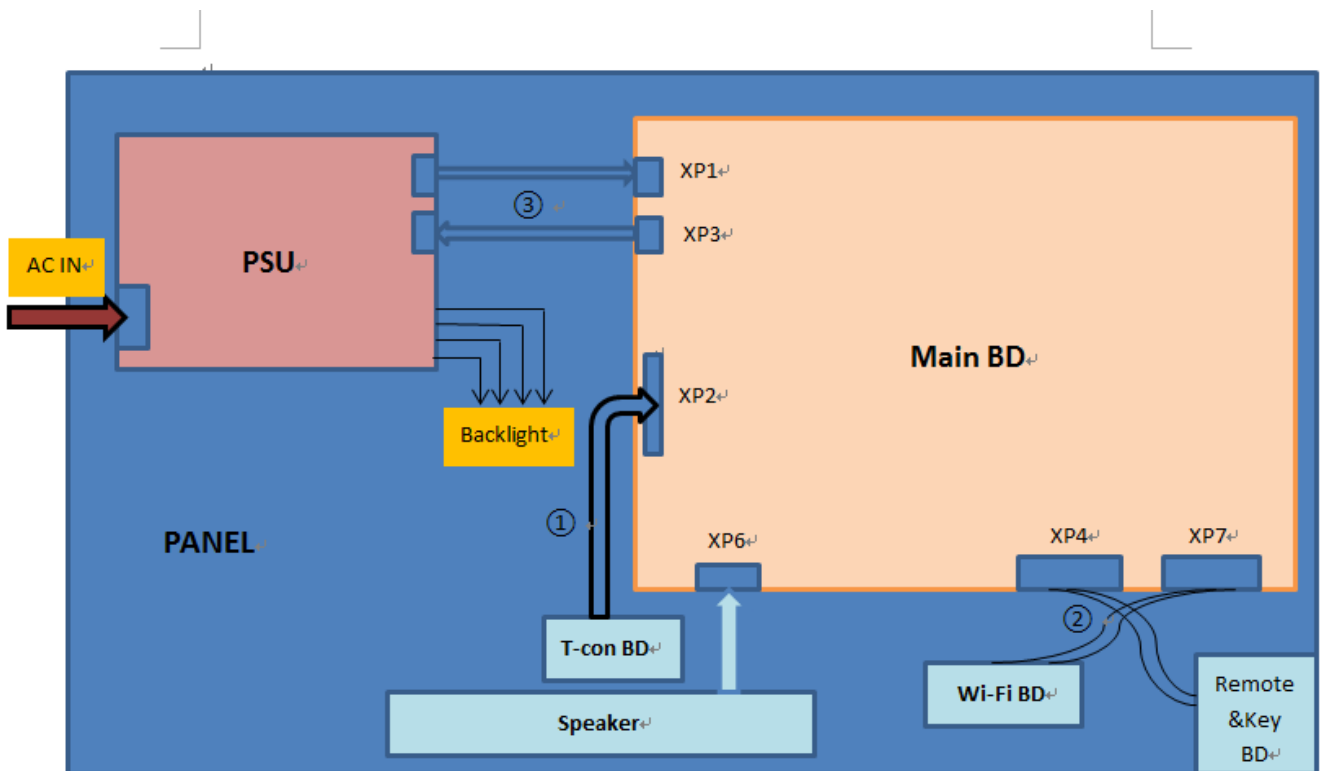
2.1 Main board layout

2.1.1 The top of main board (RSAG7.820.8698/ROH)





2.2 Wiring diagram(example for HE55A7000EUWUTS):



| No. | Description | Specification | Note |
|-----|---------------------------|-----------------------------|---|
| ① | Power supply & LD line | PHB-2x8Y-XHD-2x8Y-560-H-2\R | Main BD XP1 & XP3 <-> PSU XP813 & XP811 |
| ② | VB1 signal | FFC-L-51CP-552-Z3-1\552\ROH | Main BD XP2 <-> T-con BD XP1 |
| ③ | Wi-Fi & remote & key line | GH-13Y-10Y-70-H\ROH | Main BD XP4 & XP7 <-> Wi-Fi & remote & key BD |

XP1: Power for main board jacket

| Main board terminal | | Power board terminal | |
|---------------------|--------------------|----------------------|------------|
| Pin | definition | Pin | definition |
| 1 | GND | 15 | GND |
| 3 | DIMMING2/DIM1 | 13 | BL_ANA |
| 5 | VCC_A/ VCCA1 | 11 | 16V |
| 7 | VCC_A/ VCCA1 | 9 | 16V |
| 9 | GND | 7 | GND |
| 11 | POWER ON/OFF/ STB1 | 5 | STB |
| 13 | 12VS/ VCC3 | 3 | 12V |

| | | | |
|----|--------------|----|-----|
| 15 | 12VS/ VCC3 | 1 | 12V |
| 2 | BL_EN/SW1 | 16 | SW |
| 4 | DIMMING/PWM1 | 14 | PWM |
| 6 | GND | 12 | GND |
| 8 | GND | 10 | GND |
| 10 | x | 8 | NC |
| 12 | GND | 6 | GND |
| 14 | 12VS/ VCC2 | 4 | 12V |
| 16 | GND | 2 | GND |

XP3:Localdimming jacket

| 脚位 | definition | illustration | Electrical characteristics |
|----|--------------------------|---------------|----------------------------|
| 10 | GND | GND | 0V |
| 9 | 2D_3D | 2D/3D 切换 | 0V/3V |
| 8 | LDC_VSYNC | 场同步 | |
| 7 | 3D_GLASS_VSYNC/PWM/Error | 眼镜信号/PWM/报错 | 0V/3V |
| 6 | LD_HSYNC/I2C_SCL | 行同步/I2C 时钟 | |
| 5 | GND | GND | 0V |
| 4 | LDC_CLK | SPI 时钟 | |
| 3 | LDC_DATA_O | 主板->屏 | |
| 2 | LDC_DATA_I | 屏->主板 | |
| 1 | LD_CS/I2C_SDA | SPI 片选/I2C 数据 | |

XP2: 51pin VB1 jacket

| Panel terminal jacket definition | | | Main board terminal jacket definition | |
|----------------------------------|-----------------|----------------------------|---------------------------------------|-----------|
| Pin | definition | illustration | Pin | Config |
| 1 | V _{DD} | Power Supply Input Voltage | 51 | 12V-Panel |
| 2 | V _{DD} | Power Supply Input Voltage | 50 | 12V-Panel |
| 3 | V _{DD} | Power Supply Input Voltage | 49 | 12V-Panel |
| 4 | V _{DD} | Power Supply Input | 48 | 12V-Panel |

| | | | | |
|----|-----------------|--|----|---|
| | | Voltage | | |
| 5 | V _{DD} | Power Supply Input Voltage | 47 | 12V-Panel |
| 6 | V _{DD} | Power Supply Input Voltage | 46 | 12V-Panel |
| 7 | V _{DD} | Power Supply Input Voltage | 45 | 12V-Panel |
| 8 | V _{DD} | Power Supply Input Voltage | 44 | 12V-Panel |
| 9 | NC | No Connection | 43 | NC PCB上x |
| 10 | GND | Ground | 42 | R209上件0Ω |
| 11 | GND | Ground | 41 | R207上件0Ω |
| 12 | GND | Ground | 40 | R206上件0Ω |
| 13 | GND | Ground | 39 | R205上件0Ω |
| 14 | GND | Ground | 38 | R203上件0Ω |
| 15 | NC | No Connection | 37 | R600,R612,R620 NC |
| 16 | NC | No Connection | 36 | R602,R613,R621 NC |
| 17 | NC | No Connection | 35 | R601,R982,R983 NC |
| 18 | SDA | I ² C Data signal 模组确认 I ² C 有隔离 | 34 | V15上件,R195,R193上件0Ω |
| 19 | SCL | I ² C Data signal 模组确认 I ² C 有隔离 | 33 | V13,R210,R212上件10k,C245 NC |
| 20 | NC | Write Protection, L or OPEN: Protection; H: Writable | 32 | R190 NC ,V17 NC,R208 NC,R197 NC,R200 NC,R614 NC,R622 NC |
| 21 | VSYNC | VSYNC OUTPUT for local dimming | 31 | R616,R624 NC |
| 22 | NC | No Connection | 30 | R189,R611,R619 NC |
| 23 | NC | No Connection | 29 | R924,R915,R617,R625 NC |
| 24 | NC | No Connection | 28 | R623NC,R615,R916 NC |
| 25 | HTPDN | Vx1 HTPDN 模组确认无隔离 | 27 | V14上件,R179 NC |
| 26 | LOCKN | Vx1 LOCK 模组确认无隔离 | 26 | V16上件,R243,C246 NC, R211,R213上件10k |
| 27 | GND | Ground | 25 | Ground |
| 28 | RX0N | VX1 lane 0 | 24 | VRX0_N |
| 29 | RX0P | VX1 lane 0 | 23 | VRX0_P |
| 30 | GND | Ground | 22 | GND |
| 31 | RX1N | VX1 lane 1 | 21 | VRX1_N |
| 32 | RX1P | VX1 lane 1 | 20 | VRX1_P |
| 33 | GND | Ground | 19 | GND |
| 34 | RX2N | VX1 lane 2 | 18 | VRX2_N |

| | | | | |
|----|------|------------|----|--------|
| 35 | RX2P | VX1 lane 2 | 17 | VRX2_P |
| 36 | GND | Ground | 16 | VGND |
| 37 | RX3N | VX1 lane 3 | 15 | VRX3_N |
| 38 | RX3P | VX1 lane 3 | 14 | VRX3_P |
| 39 | GND | Ground | 13 | GND |
| 40 | RX4N | VX1 lane 4 | 12 | VRX4_N |
| 41 | RX4P | VX1 lane 4 | 11 | VRX4_P |
| 42 | GND | Ground | 10 | GND |
| 43 | RX5N | VX1 lane 5 | 9 | VRX5_N |
| 44 | RX5P | VX1 lane 5 | 8 | VRX5_P |
| 45 | GND | Ground | 7 | GND |
| 46 | RX6N | VX1 lane 6 | 6 | VRX6_N |
| 47 | RX6P | VX1 lane 6 | 5 | VRX6_P |
| 48 | GND | Ground | 4 | GND |
| 49 | RX7N | VX1 lane 7 | 3 | VRX7_N |
| 50 | RX7P | VX1 lane 7 | 2 | VRX7_P |
| 51 | GND | Ground | 1 | GND |

XP6: Speaker jacket

| Pin | definition | illustration | Wire color |
|-----|------------|-----------------------------|------------|
| 1 | L+ | Left speaker positive wire | 红 |
| 2 | L- | Left speaker negative wire | 白 |
| 3 | R- | right speaker negative wire | 白 |
| 4 | R+ | Right speaker positive wire | 红 |

2.3 Ties,clamps and tapes:

to show the positions where ties and clamps and tapes should be, for checking after servicing, Before disassemble the TV ,besure to take photos for the TV assembly example for HE55A7000EUWUTS.

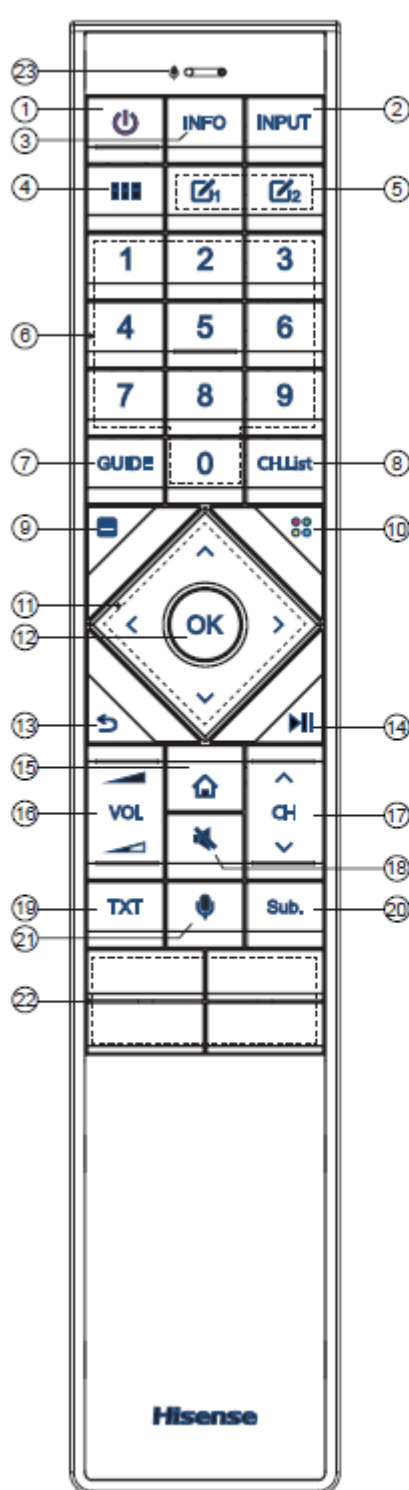


2.2 TV boards part list

| Main board | Boards function difference | Main chassis type | For Series |
|--------------------|--|-------------------|-----------------------------|
| RSAG7.820.8698\ROH | 1. Lateral terminal and vertical terminal. 2. TCON part not on the board. | MSD6886 | HE55A7000EUWTS 55A6500EE |
| | | | |
| | | | |

3. Factory/Service OSD Menu and Adjustment

3.1 Remote Control



- ① POWER: Switch the TV on or into standby mode
- ② INPUT: Select input sources
- ③ INFO: Display the present program information
- ④ All Apps
- ⑤ Custom button: To custom button to launch input or apps quickly
- ⑥ Channel Number: Direct channel selection or numbers input
- ⑦ GUIDE: Display the Electronic Program Guide (DTV mode)
- ⑧ CH.List: Display the Channel List on the screen
- ⑨ Display the Quick setup menu
- ⑩ Colour keys for direct selection of options
- ⑪ $\wedge / \vee / < / >$: Allows you to navigate the OSD menus and adjust the system settings to your preference
- ⑫ OK: Confirm the selection in the OSD menus
- ⑬ Return to previous menu
- ⑭ Playback keys
- ⑮ HOME: Enter the Smart
- ⑯ VOL $\blacktriangleleft / \blacktriangleright$: Adjust the volume
- ⑰ CH \wedge / \vee : Switch channel
- ⑱ MUTE: Mute or restore the TV sound
- ⑲ TXT: Turn on/off the teletext function
- ⑳ Sub.: Activate or deactivate the subtitle mode
- ㉑ Voice command
- ㉒ **NOTE: The information here will vary depending on the remote control model.**
App: Quick access to the app
Media: Enter the media mode
- ㉓ Receive the voice

Bluetooth remote control module specifications

WNF150




Frequency Range: 2.402~2.480GHz

Output Power(Max.): +4dBm


NOTE: The included remote control will vary depending on model, country. Check information according to the actual remote control in the accessory bag.

3.2 How to enter the Factory OSD Menu

. With user's RC

1. Power TV on
2. Press  button on the RC then call up "Menu" option.
3. Move   and "ok" button on RC to select **Sound-> Speaker ->Advanced setting -> Balance**
4. On the **Balance**, input figure 1->9->6->9 in sequence on RC.

Note: It is important to remember that the hand fingers can't shield the RC emitter diode.

5. Call up a "M" on the left-top of TV, then press  button again, the Factory menu appear then.
6. DC power off and DC power on the TV, which can exit Factory OSD.

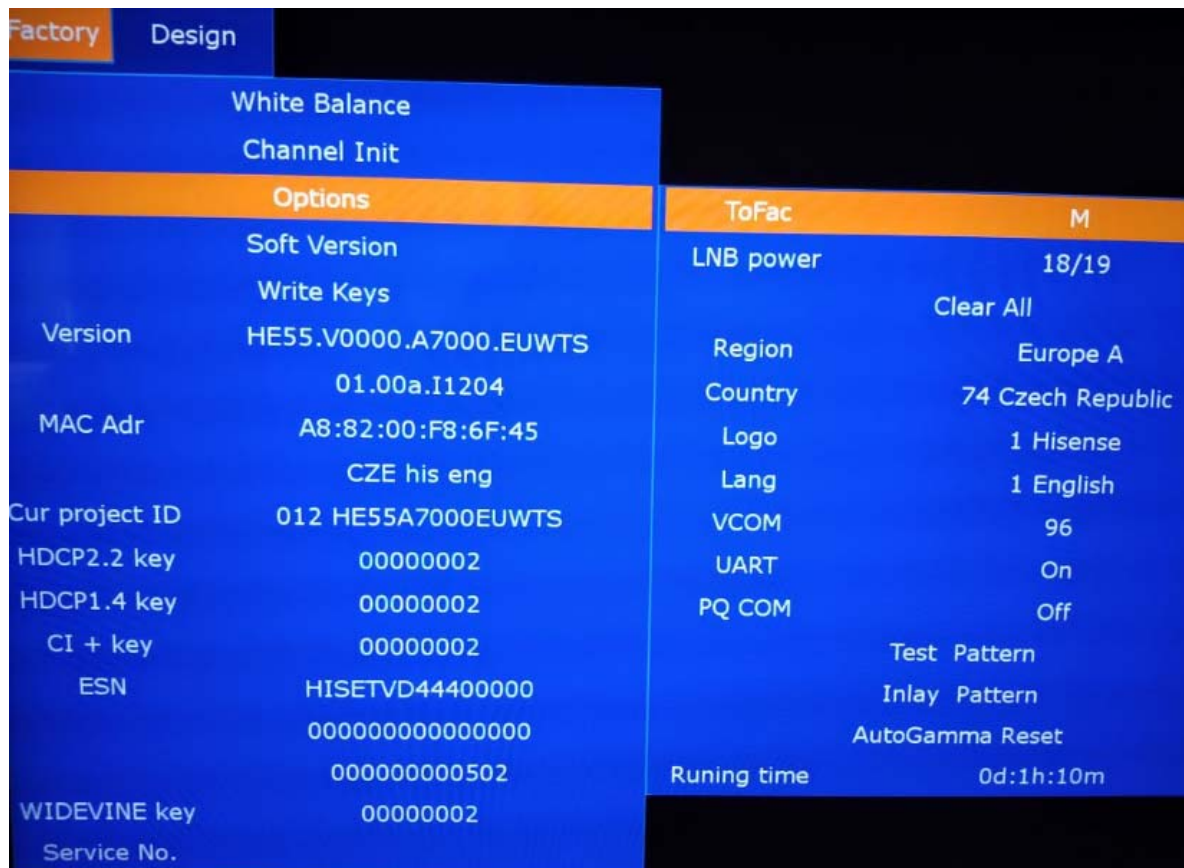
3.3 Factory OSD Menu



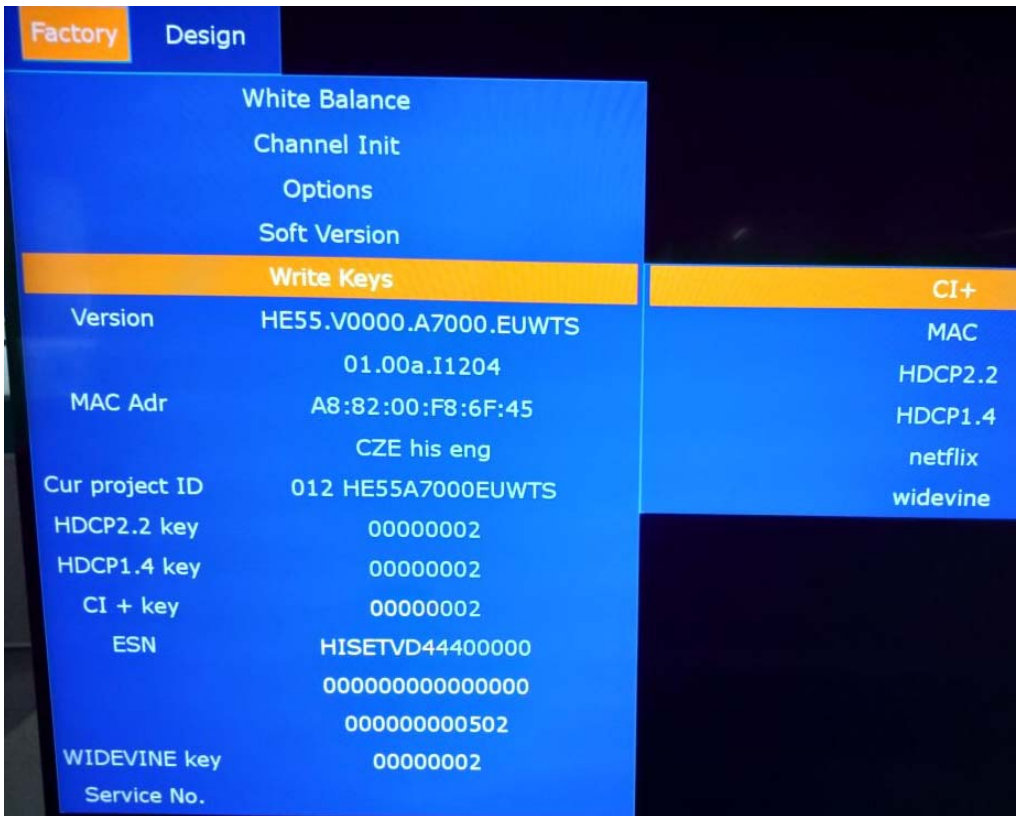
figure -1

Factory OSD menu list: if you want to learn more about TV, you'd better read it but would not adjust the value please. The Factory menu may be have difference for diverse market and customer. Take HE55A7000EUWTS for example.

Options:

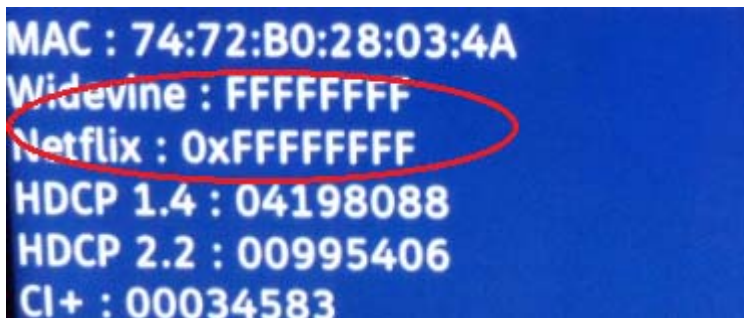


Write keys:










Note:







Check whether the Key information under the current Version is OK, if appears “NG” or such as following red surround irregular information then need rewrite the key.



| | Factory menu | Description | Remark |
|------|----------------------|--|---------------|
| Menu | White Balance | White Balance data adjusting, different source has different WB values. Before adjusting, please change to desired source. | |
| | channel init | TV Produce signal preset, during the factory produce using. | |
| | Option | Items can choose | |
| | Clear all | initial the TV , EEPROM reset | |
| | Soft version | current software version information | |
| | Version | Software Version information | |
| | MAC Adr | MAC address information | |
| | HDCP2.2 key | HDCP2.2 key information | |
| | ESN | The TV's electronic Serial number | |
| | WIDEVINE key | WIDEVINE key code | |
| | Service No. | LTDNXXXXXXXXY-P0001 | |

| | | |
|---------------|--|---------------------------------|
| White Balance | BIN B1  | can choose B1/B2/B3/B4/B5/B6 |
| | R Gain  128 | High Brightness Red |
| | G Gain  128 | High Brightness Green |
| | B Gain  128 | High Brightness Blue |
| | R Offset  128 | Low Brightness Red |
| | G Offset  128 | Low Brightness Green |
| | B Offset  128 | Low Brightness Blue |

| | | |
|--------------|--------------|---|
| Channel init | huangdao old | |
| | Qing Dao | TV Produce signal preset, during the factory produce using. |
| | huangdao new | |
| | | |

| | | |
|-------------------|---|---|
| Option | ToFAC M/U  | "M" used in factory product. "U" used in user state. |
| | LNB power | 13/14;18/19;Power off |
| | Region | North America |
| | country  | Country choose |
| | Logo  | Customer logo choose |
| | Language  | Language choose |
| | VCOM | Panel voltage, |
| | UART  | On/off (when choose "on" then can serial port connect with Tool successfully) |
| | PQ COM  | On/off |
| Write keys | CI+ | |
| | MAC | If MAC key code lost, you can write. |
| | HDCP2.2 | If HDCP key code lost, you can write . |
| | Netflix | If Netflix key code lost, you can write . |
| | Widevine | If Widevine key code lost, you can write . |


Note:

The Factory menu may be have difference for diverse market and customer, above Factory menu only for reference.

The factory menu data varies according to different sources. Incase changing the factory data by error, you can choose to “Clear all”, by which you can resume the default value.

To clean the EEPROM:

a. Select the item “**Option**”--“**Clear all**” in Factory mode.

b. Press  button to clear the EEPROM data.

-
- c. Close the OSD menu after 5 seconds.
 - d. Restart the TV.
 - e. Also the Keys information must be checked, if appear “NG”, then must rewrite key code.

4. Software Upgrading

4.1 USB Upgrade

Main software upgrade directly with USB

The main software can be upgraded with USB disk. It includes two modes: user mode、 factory mode. Take **HE55A7000EUWTS** for example.

4.1.1 TV in user mode:

- a. Decompress **MICALIDVB6886** _pkg_YYYYMMDD.tar.gz (YYYYMMDD is the year/month/day when the software is being built, such as **MICALIDVB6886** _pkg_201801204.tar.gz) and rename to MstarUpgrade.bin , then copy the MstarUpgrade.bin file to the USB root directory. Please make sure there are no other “*.bin” files in the root directory of USB disk .
- b. AC power off the TV, insert the USB disk, TV in standby status, next long press the “power key . If “Loading data.....” is shown on TV, it means TV successfully enters upgrading status..
- c. Waiting..... TV is trying to load the software and it will spend about 2 minutes. After that “UPGRADING SOFTWARE, PLEASE DO NOT TURN OFF” will be displayed and upgrade process bar will indicate the progress. It needs about s5 minutes to complete the whole software upgrade.
- d. After upgrade, TV can automatically reboot.
- e. Enter the Factory OSD Menu to check the main software version, and then choose “option”→“Clear All” to do clean up.

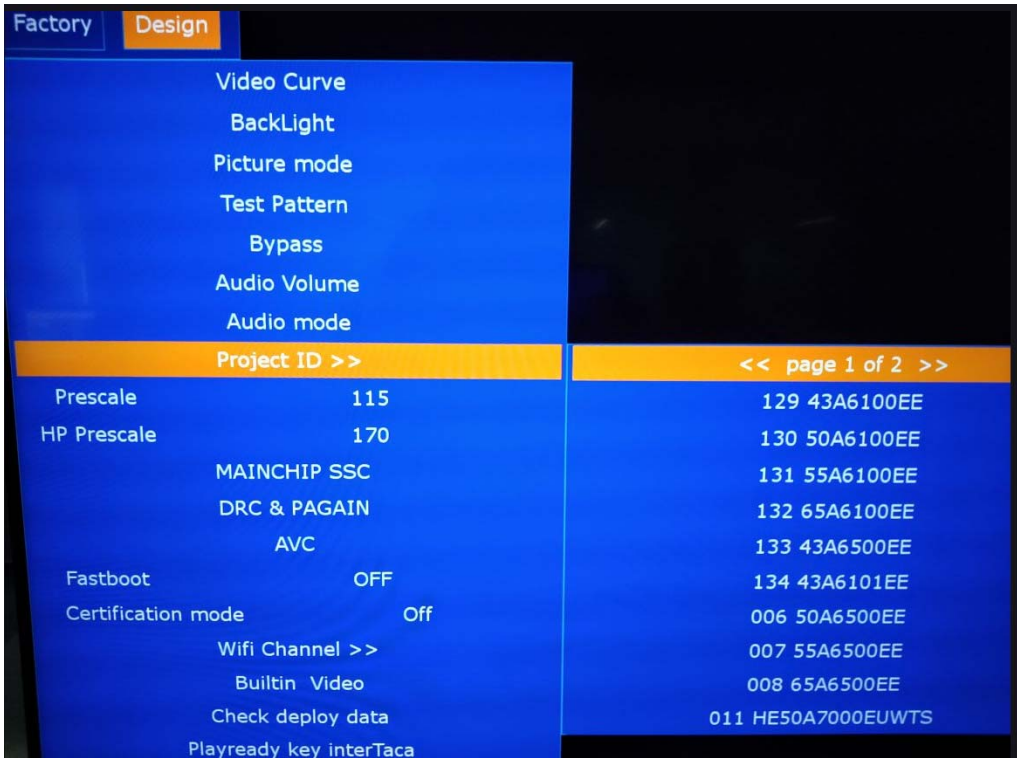
4.1.2 TV in factory mode:

- a. If TV is in Factory mode, only have difference from chapter 4.1.1 b. as following. others are same.
- b. TV is in factory mode, only AC power off TV and insert the USB disk, next AC power on, TV can identify automatically to update, till call up “Loading data.....” interface , update process bar is 1%.

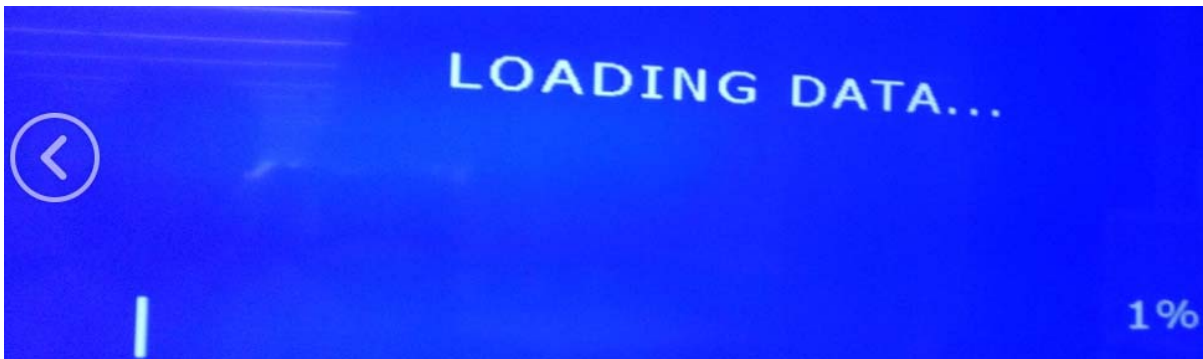
4.1.3 If the above USB upgrade methods fail, you can rename the upgrade software to MstarUpgrade.bin,next use serical “cu” to update

4.1.4 When upgrade successfully, We must ensure the TV mode of running correctly. Paths: Factory---Design –Project ID

Once choose another TV mode ,must AC power off and power on the TV to reboot.

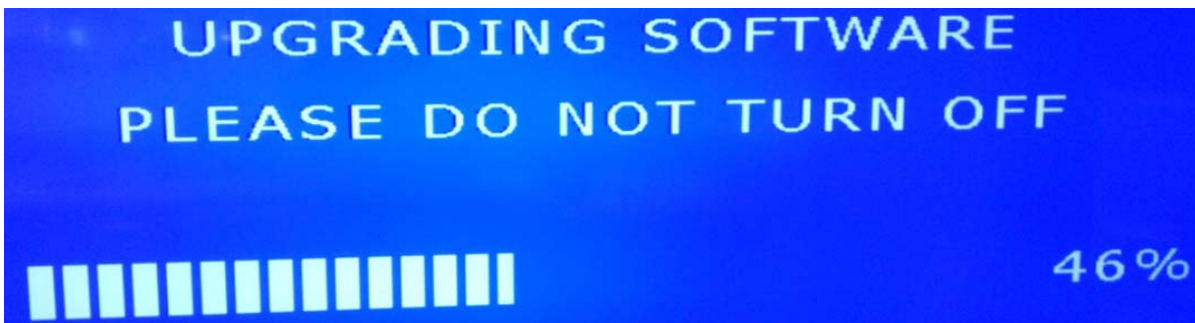


Firgure-1: Loading data



Firgure-1

Firgure-2 : Upgrading software



Firgure-2

Firgure-3 : Software upgrade complete,TV automatically reboot.



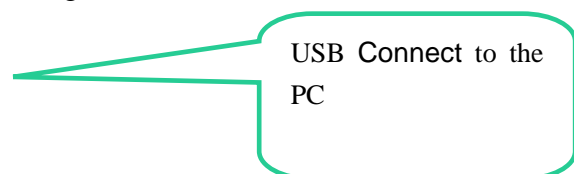
Firgure-3

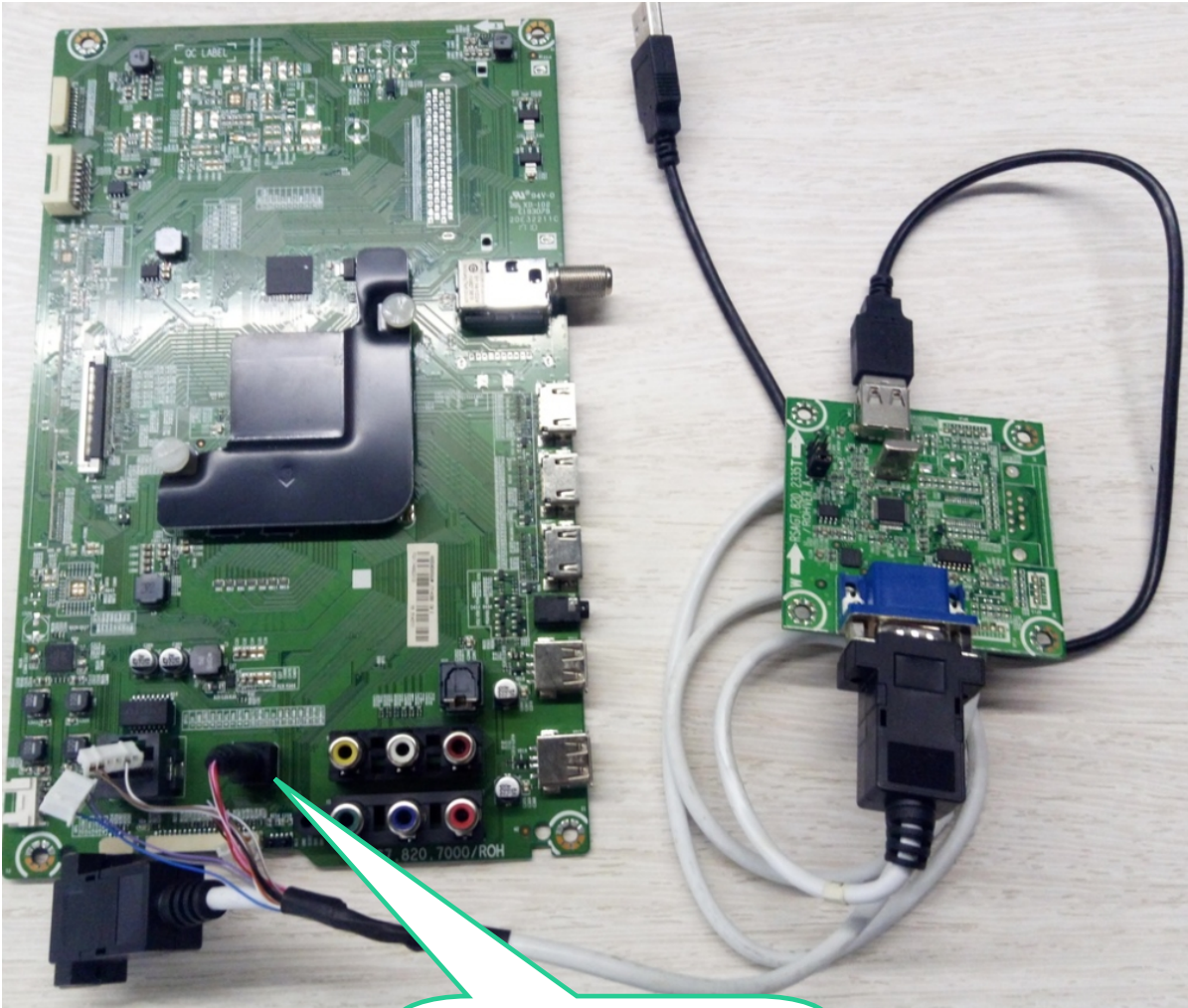
4.2 Mstar Tool upgrading

If USB upgrades failure, TV crashed and SecureCRT no print message. Repairer must read IC device ID code 、 decipher& burn the Mboot program the EMMC flash first. then USB disk to upgrade the “usb_HU55N3050UW.bin” file.

Hardware connecting

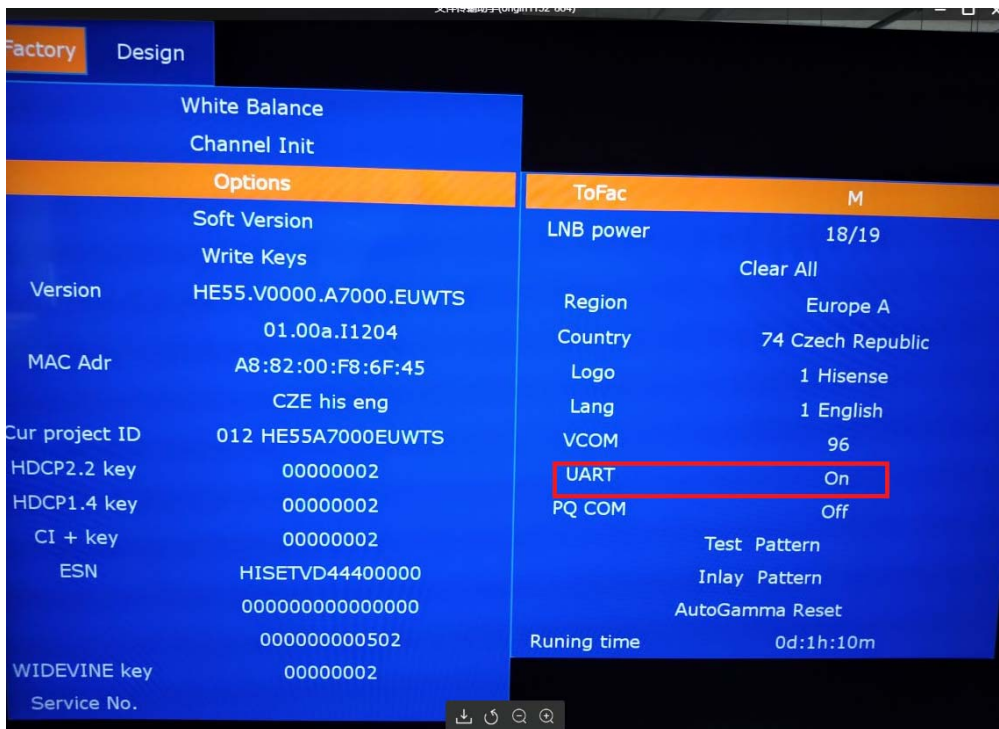
Connect the unit to your pc with Hisense USB-serial port cable. USB port connects to your PC and earphone port to TV’s CN7(earphone hole). As following.





Earphone port Connect to the TV earphone hole (CN7)

4.2.1 Open the UART serial option
UAR serial choose "on "
Menu: Factory-->Options-->UART-->on



If finish the updating and data adjust UART serial, UART choose "off "

4.2.2 Mstar USB-serial driver

If First use Mstar bebug Tool, you have to install drive software for bebug board.

If your PC is Windows XP system:

First install FTCUNIN.EXE of FTC100103(MSTAR) rar file in your PC.

This is a drive software of Mstar



Another:

If your PC is Win7 system, you will have to install CDM20802_Setup_WIN7 rar file, and then open the software of SecureCRT in your PC.

4.2.3 Stop board serial connect with SecureCRT

Run SecureCRT,printing information includes three status:Mboot\Supernova\no print information.

Current steps:

- 1) Run SecureCRT.exe
- 2) TV power on.
- 3) SecureCR tool print information can appear or not.

How to distribute the three status?

- 1) appearing “<< MStar >>#” that meaning is in Mboot status;
- 2) Rolling many information automatically that meaning is in Supernova status;
- 3) No any print information that meaning the eMMC of board is no program.

Stop board serial with SecureCRT

- 1) In mboot status:
 << MStar >>#
 Input “du” and “enter” key to ensure, then close the SecureCRT window.
- 2) In Supernova status:
 Input “00112233” and “enter” key to ensure, then close the SecureCRT window.
- 3) If no any print information with SecureCRT, then can directly close the SecureCRT window.

4.2.4 How to collect log files

- 1) TV AC power on
- 2) USB connect correctly
- 3) Mstar serial Tool connect correctly
- 4) When questions appear, computer run SecureCRT input lowercase ” getlog” ,if fails input another”05328087”.then rolls the lots of log print message.
- 5) Save the log print message to soft engineer.

4.2.4 Mstar Tool upgrading

Mstar Tool upgrading includes two states: one is TV board has had Mboot software,the other is TV board have no Mboot software.

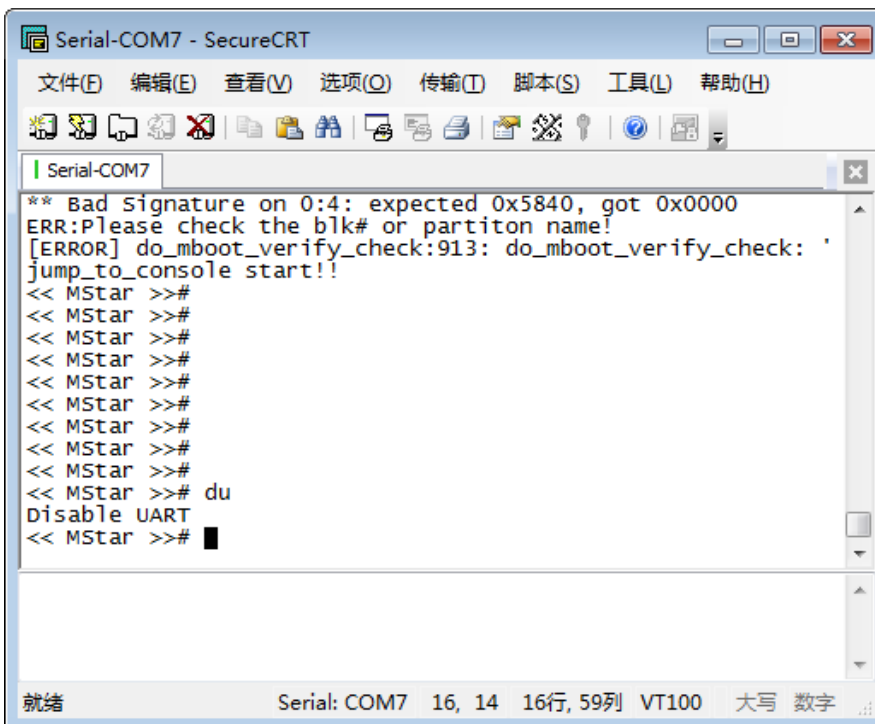
TV board has had Mboot software:

If TV board has had mboot software already, now need update a new one. It is important to stop serial port at first. as following.

Run the SecureCRT ,Pressing the “enter” key and at the same time AC power on the TV, then get into mboot interface to

appear <<MSTAR>># promoting character.

Behind the <<MSTAR>># input “du” then “enter” to ensure.



```
Serial-COM7 - SecureCRT
文件(F) 编辑(E) 查看(V) 选项(O) 传输(T) 脚本(S) 工具(L) 帮助(H)
Serial-COM7
** Bad Signature on 0:4: expected 0x5840, got 0x0000
ERR:Please check the blk# or partiton name!
[ERROR] do_mboot_verify_check:913: do_mboot_verify_check: '
jump_to_console start!!
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >># du
Disable UART
<< MStar >># █

就绪 Serial: COM7 16, 14 16行, 59列 VT100 大写 数字
```

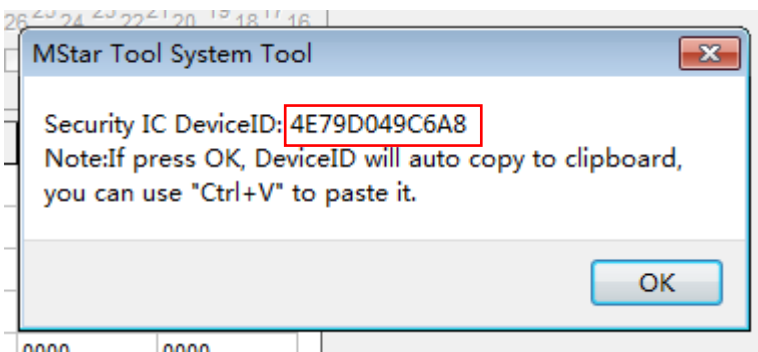
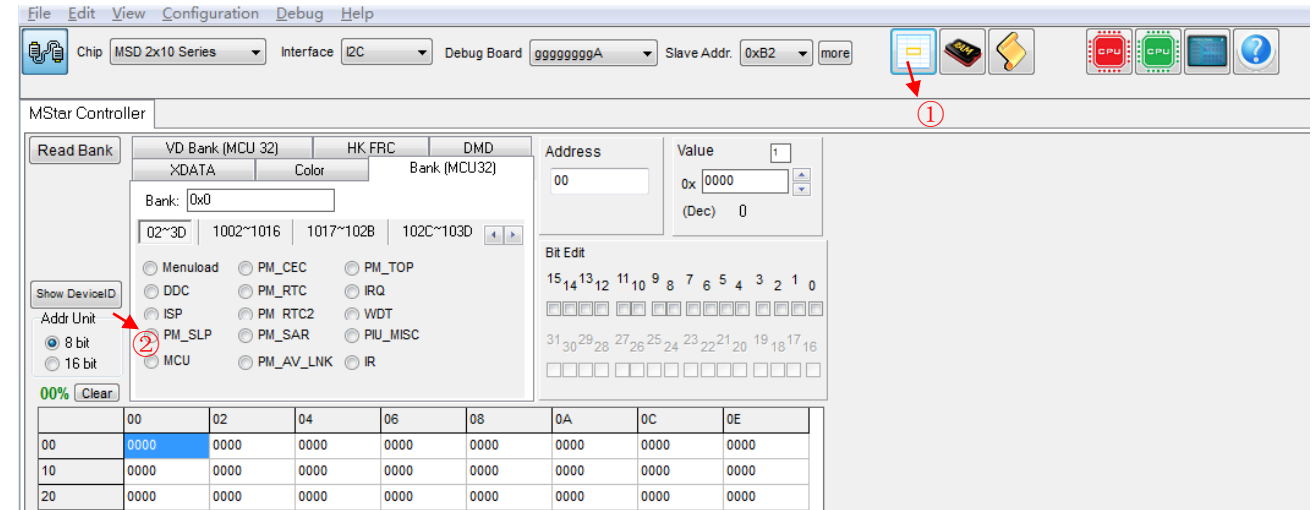
How to get the Device ID password?

- Connect the board with PC via to Hisense debug tool,With MSTVTool4.163 , run MSTV_Tool.exe



- Ensure “” button connected correctly, then click "Show DeviceID"button, you will get 12 bit device ID.

For example, A3C2DC130058 (12bit) ,. Read more again to contrast the IC Device whether has change.

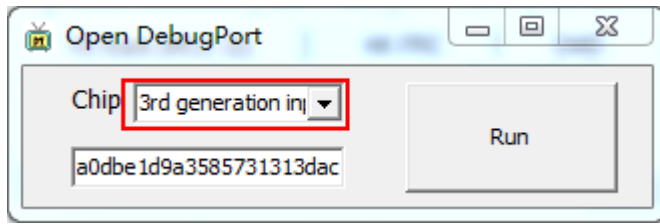


- Send the device ID to the IC developer , MSTAR max-sc lv(吕思成) max-sc.lv@mstarsemi.com security security@mstarsemi.com . Waiting for the feedback of ID password.

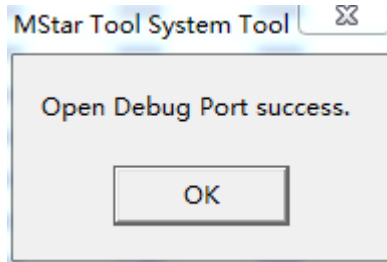
Deciphering

Method 1

- Use MSTV_Tool_4156_258303 tool ,run MSTV_Tool.exe, Click "Show DeviceID"button to inspect the Device ID.
- Click “View”->“Open DebugPort” choose “3rd generation input”, input the ID password from the IC developer then click “Run”



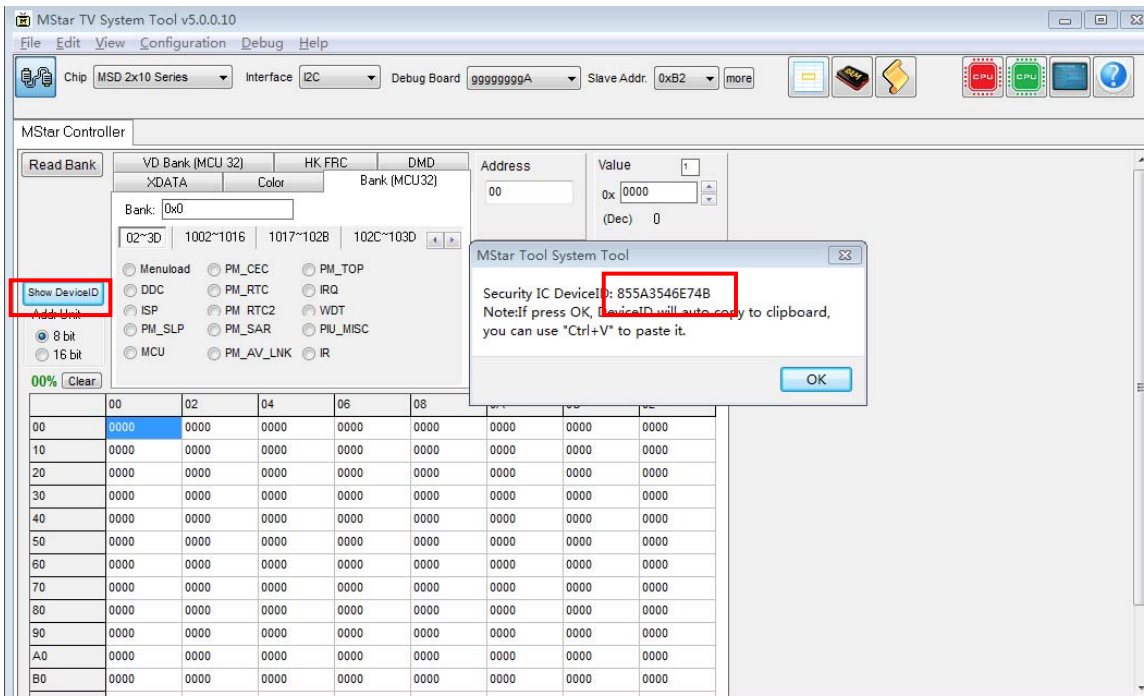
Click "Run"



Method 2

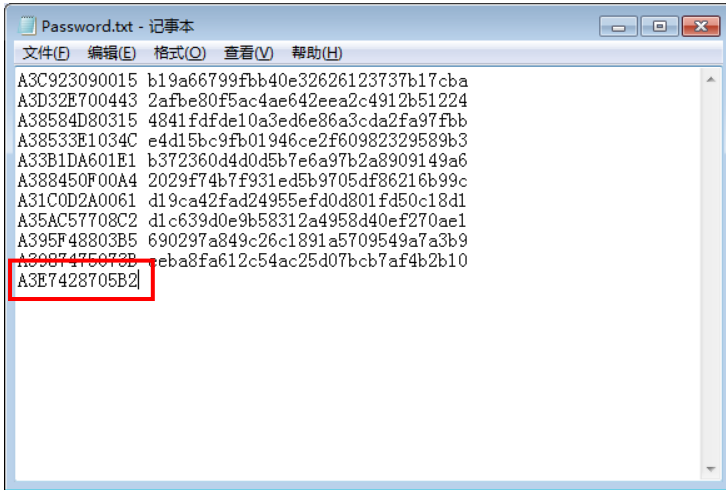
Store the Device ID

When click "Show DeviceID" button, you can get 12 bit device ID. Next click "OK" button to copy; Open the "Password.txt" file in the same direction of "MSTV_Tool.exe" to stick the Device ID.



Password .txt file

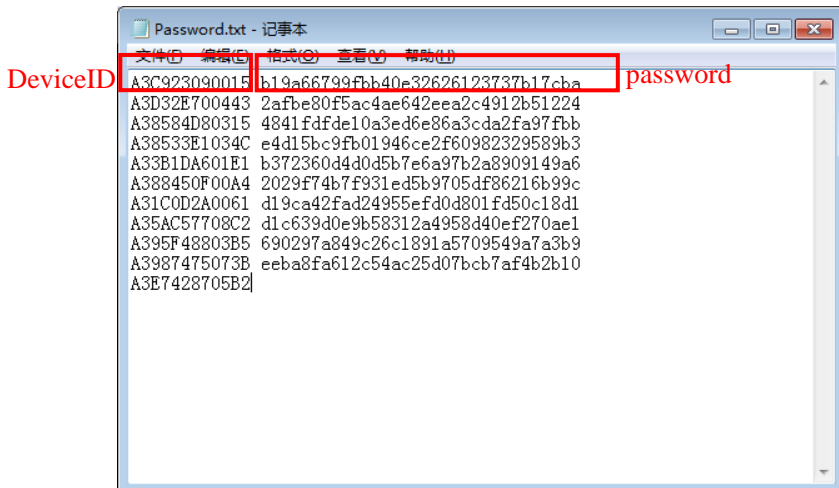
| 名称 | 修改日期 | 类型 | 大小 |
|---------------|-----------------|------|----------|
| DeviceID.txt | 2017/2/28 17:14 | 文本文档 | 1 KB |
| MSTV_Tool.exe | 2016/10/3 15:13 | 应用程序 | 3,432 KB |
| MSTV_Tool.INI | 2017/2/28 17:37 | 配置设置 | 2 KB |
| Password.txt | 2017/2/28 9:24 | 文本文档 | 1 KB |



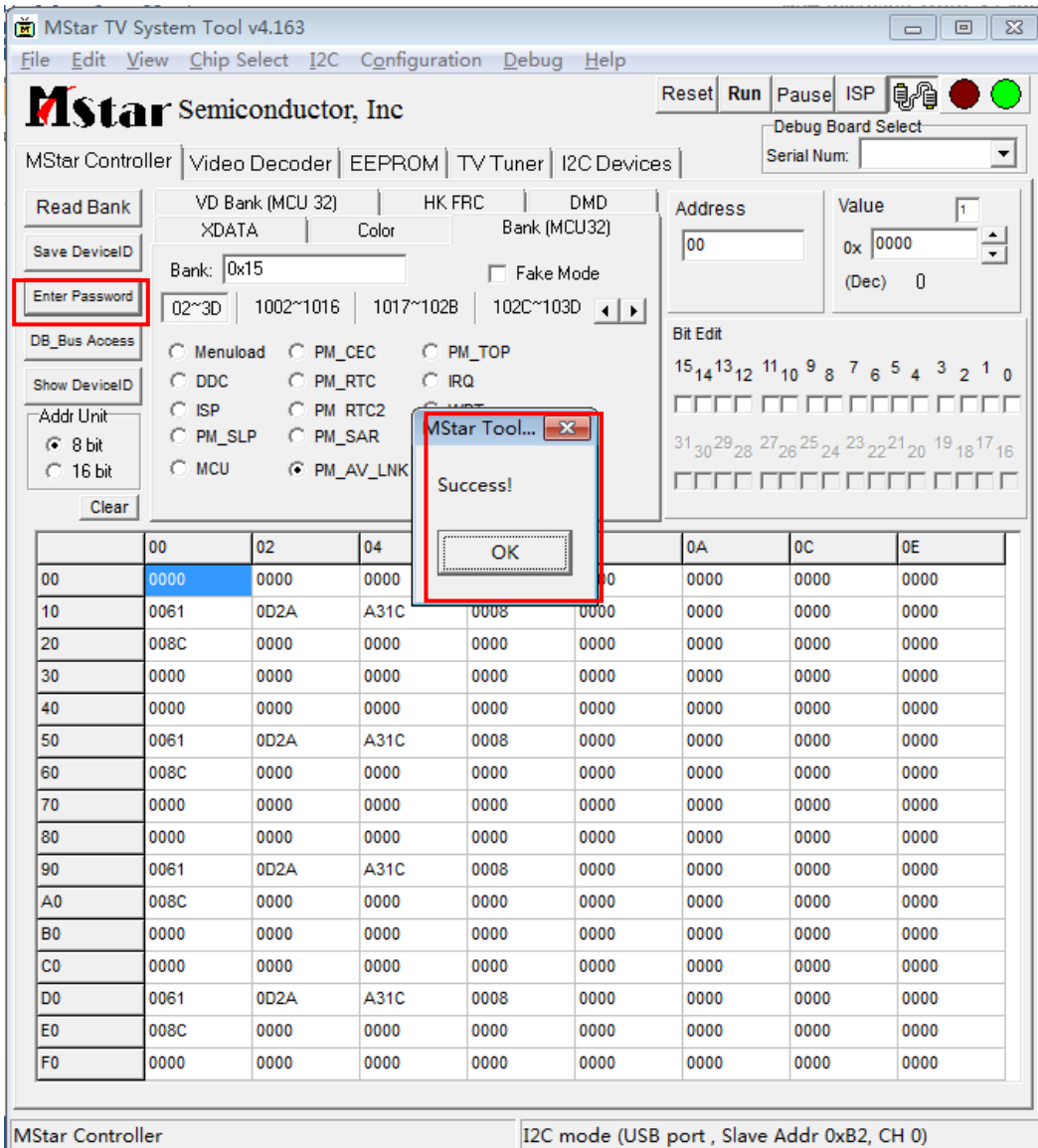
- Send the device ID to the IC developer , MSTAR max-sc lv(吕思成)max-sc.lv@mstarsemi.com securitysecurity@mstarsemi.com Waiting for the feedback of ID password.

3、Deciphering

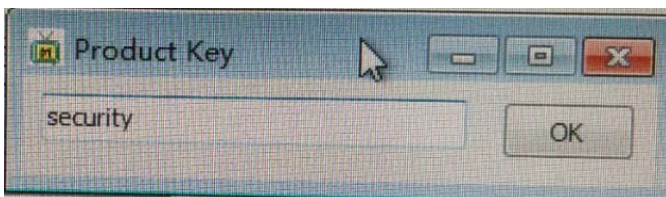
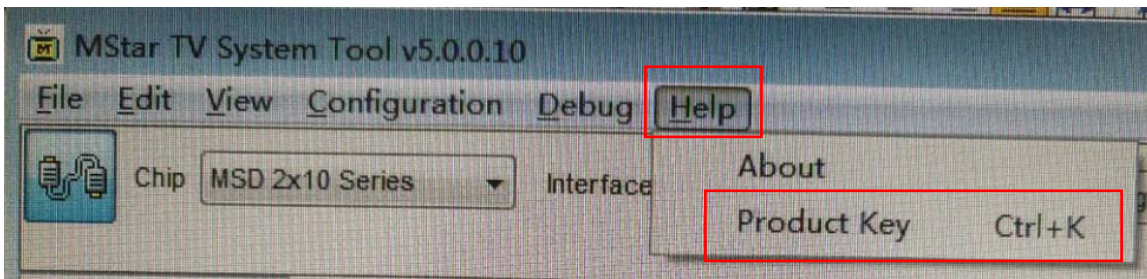
Receive the Device ID password ,copy it into the password.txt ,as following.



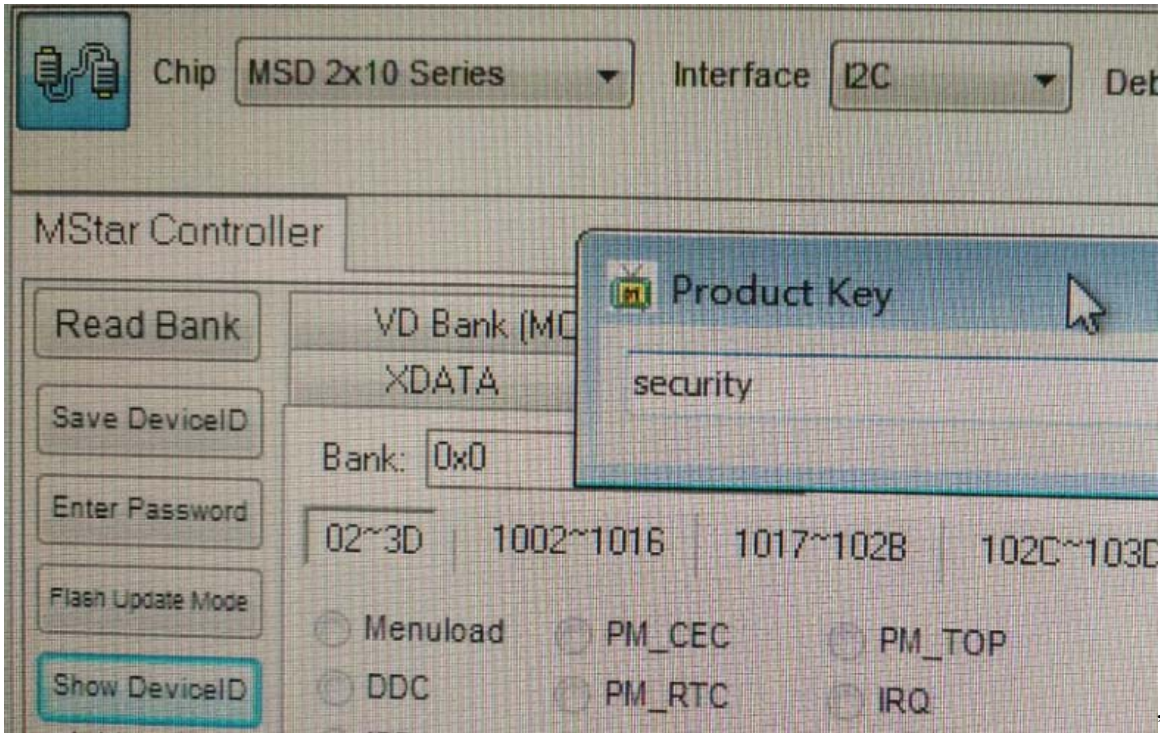
Click “ enter password”button then bounce “success”window, it indicates deciphering succeed.



Click “Help---Product Key”, enter “security”



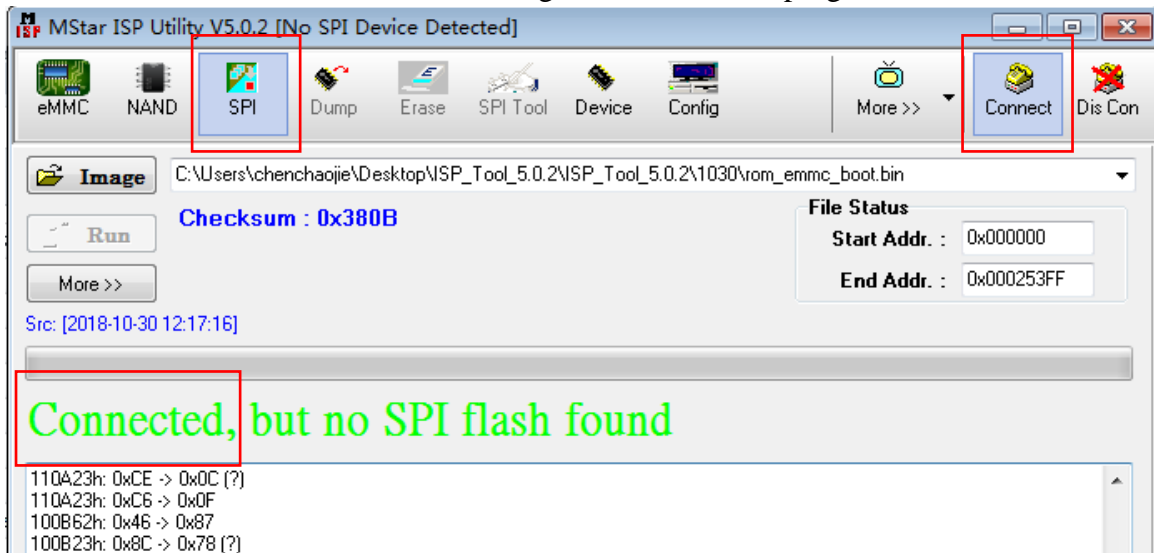
Click “Flash Update Mode”



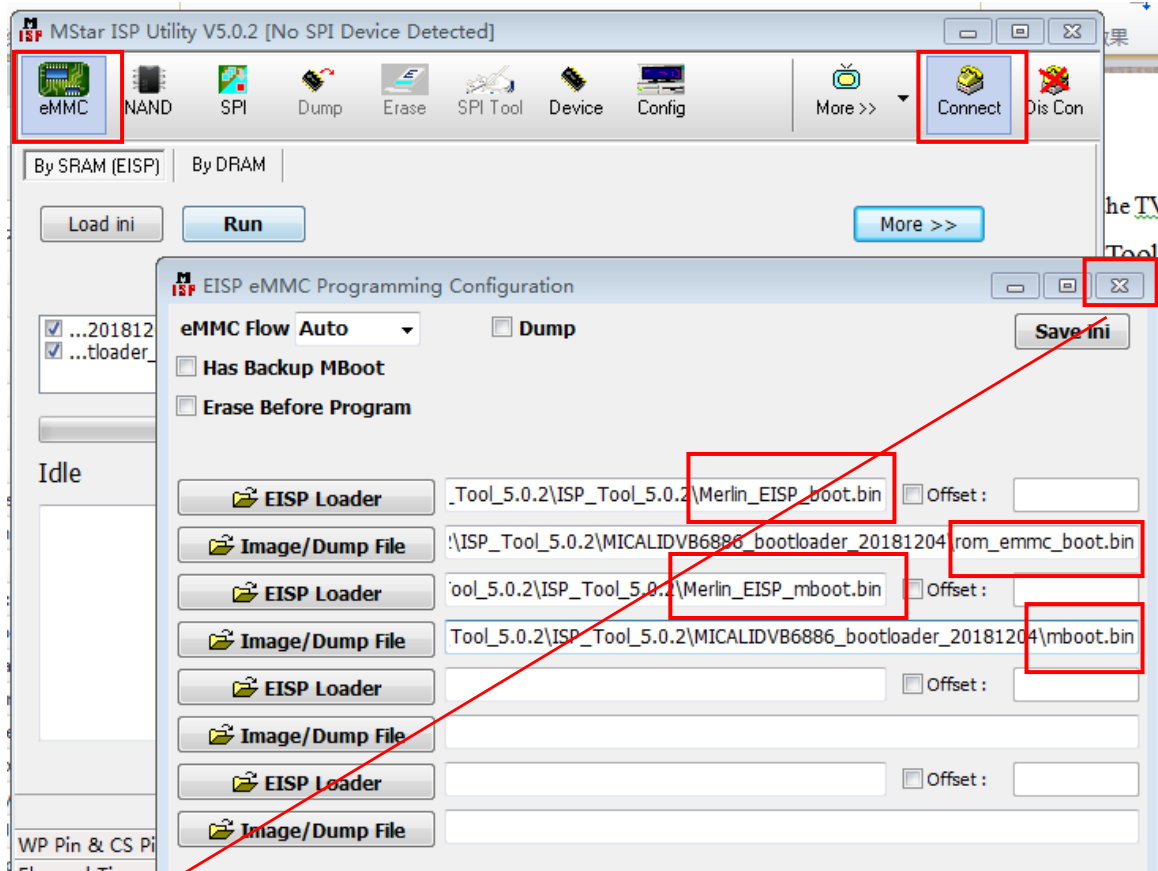
Now Deciphering has finished, Don't restart the TV .

3) Burn the mboot software with ISP_Tool_5.0.2.

Click "SPI" then click "Connect", drawing "✓" in front of "program /Exit ISP/Read file"

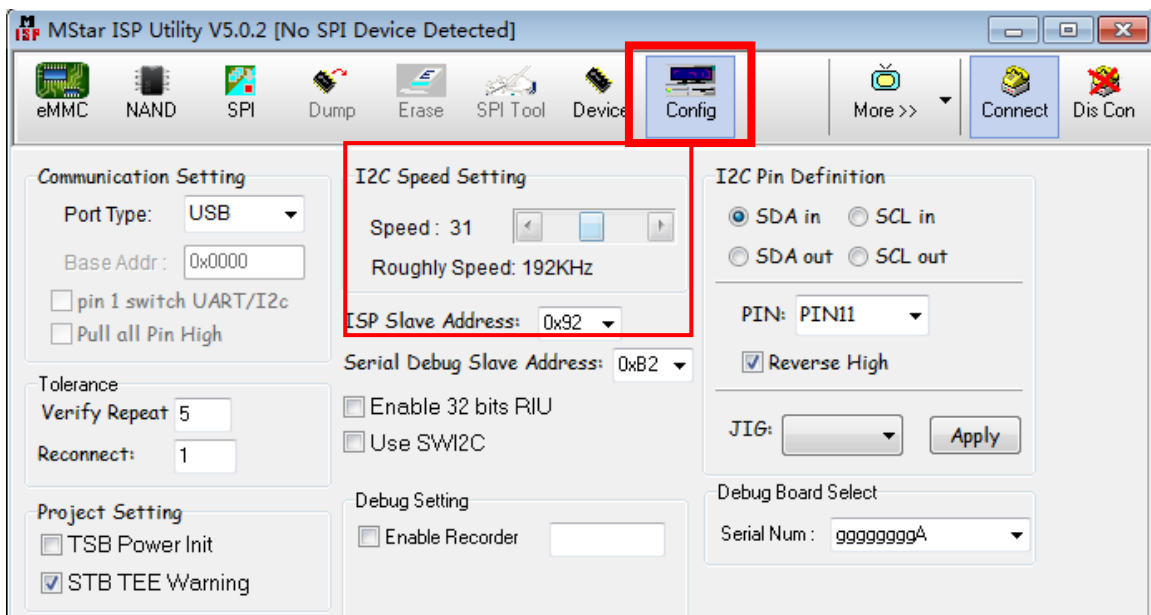


Click “eMMC” then click “More>>”and load following four burning files.
 Respectively graphic as following:

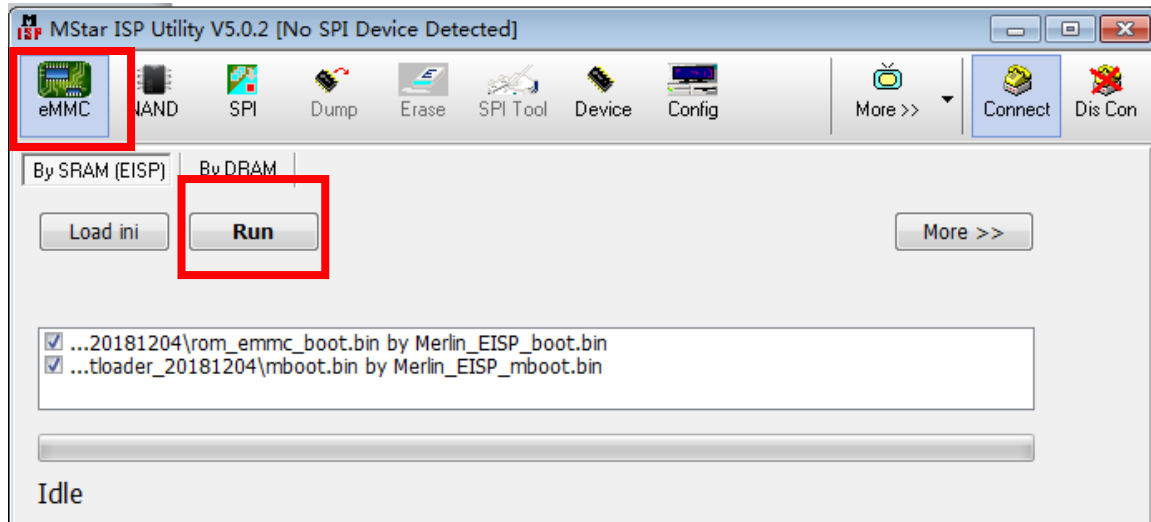


Click “X” button to close and save this setting.

“I2C speed setting”choose around 30 ,roughly speed around 200KHz, roughly speed not high otherwise can cause updating abnormality.



Return to “eMMC”. Then click **RUN** button to go on.



Waiting for about 6 minutes, a green “**Success to program**” appears on the screen, indicating upgrading successfully.



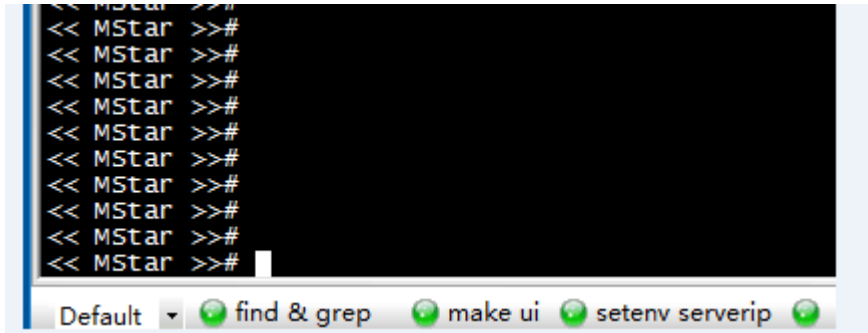
TV board have no mboot software:

Run SecureCRT , AC power on the TV.if nothing appears on screen then can indicates that the TV no Mboot software, next close the SecureCRT window directly.

4.2.5 USB upgrading

Copy the main software “usb_HU55N3050UW.bin” to the USB root Disk, ensure there are no other “*.bin” files in the root directory of USB Disk.

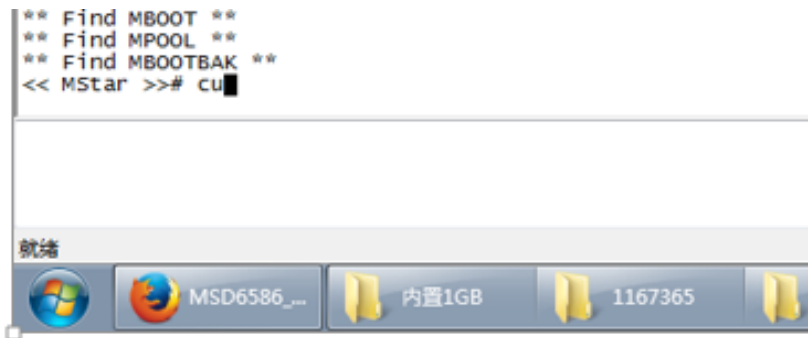
Run the SecureCRT ,Pressing the “enter” keypad and at the same time AC power on the TV, then appear mboot interface.



```
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
<< MStar >>#
```

Default find & grep make ui setenv serverip

Input lower-case letter “cu” then “enter” to update the main software.



```
** Find MBOOT **
** Find MPOOL **
** Find MBOOTBAK **
<< MStar >># cu
```

就绪

MSD6586_... 内置1GB 1167365

When main software update successfully, the TV can automatically restart. enter the Factory OSD Menu to check the main software version, and then choose “option”→“Clear All” to do clean up.

4.2.6 Next to check the Key information under the current Version whether is OK ,if NG must rewrite key code.

4.2.7 Before upgrade , write down the white balance data of different signal source.

4.2.8 Reset the Options of out of Factory if lost ,such as Region\Country/logo/language

4.2.9 Common error

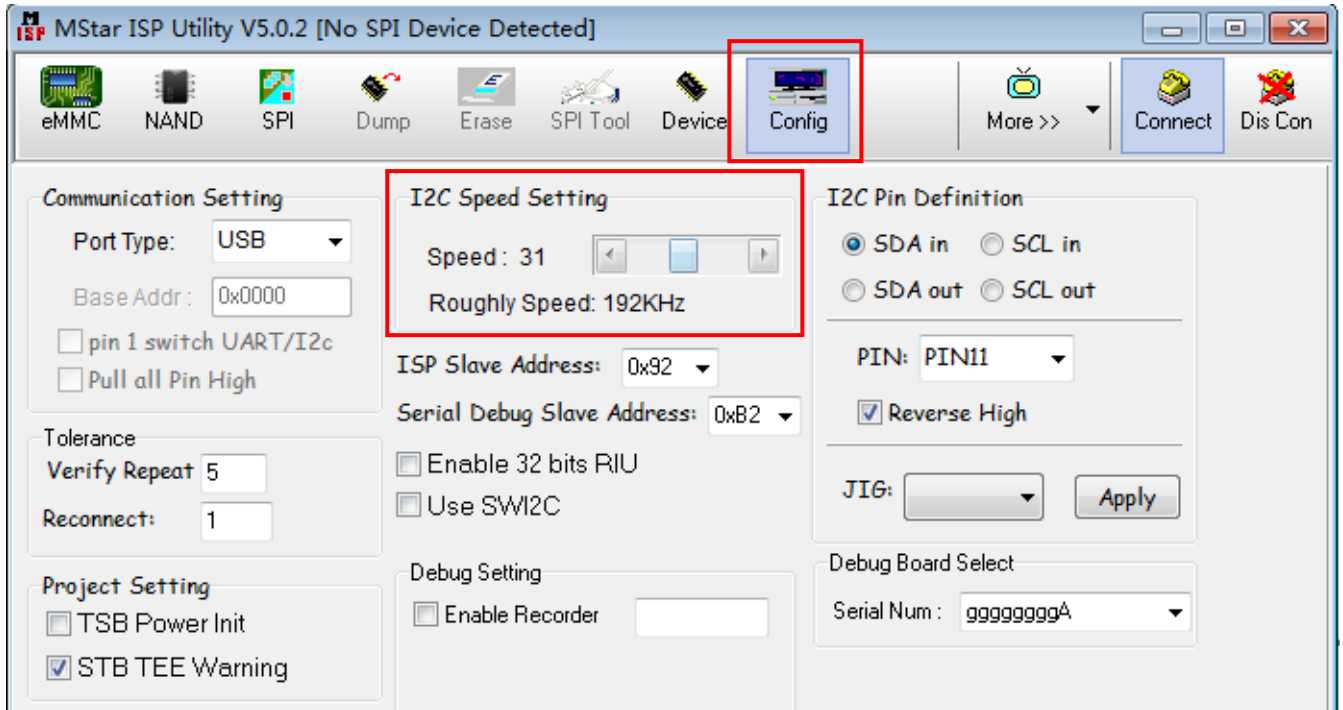
- 1、 Reading Device ID have different ID codes.
 - Check the SecureCRT window whether close.
- 2、 When input key, appear” Input format Error”
 - Check Mstv_tool --open debugport -- “3rd generation” whether selected .

3、ISP_Tool connected failure

- Close the SecureCRT, check whether “ ✓ ” in front of “UseSWI2C” of “Config” .

4、 If ISP_Tool connected appear error “ Device not selected,yet”;

- Reduce the I2C speed setting figure lower “Roughly speed” about “200KHz” and have a try.



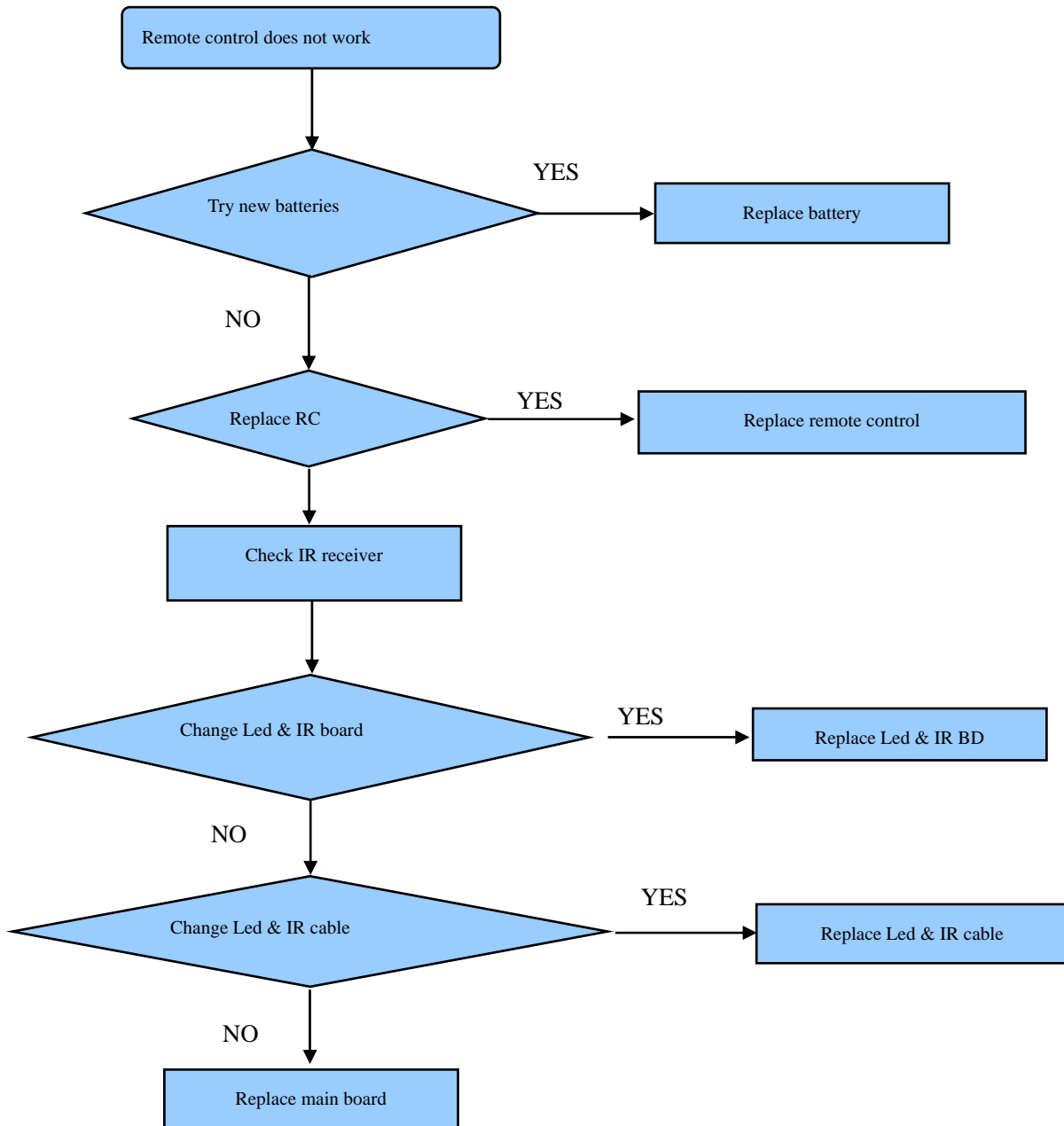
5、 After USB upgrade, appear “mtdoops: mtd device (mtddev=name/number) must be supplied, Kernel panic - not syncing: VFS: Unable to mount root fs on unknown-block(179,4)”

Reason: After burn mboot and before USB upgrade, forget to clear the zone schema.

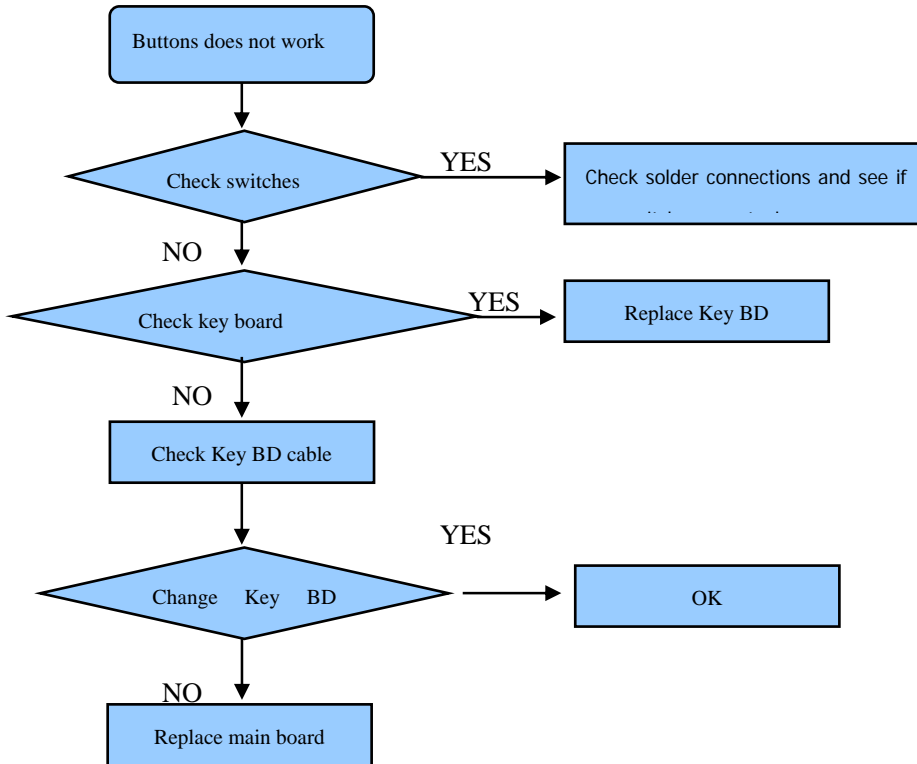
- Don't burn mboot again, ONLY restart TV with “cu” demand to USB upgrading again in mboot .

5. Trouble shooting

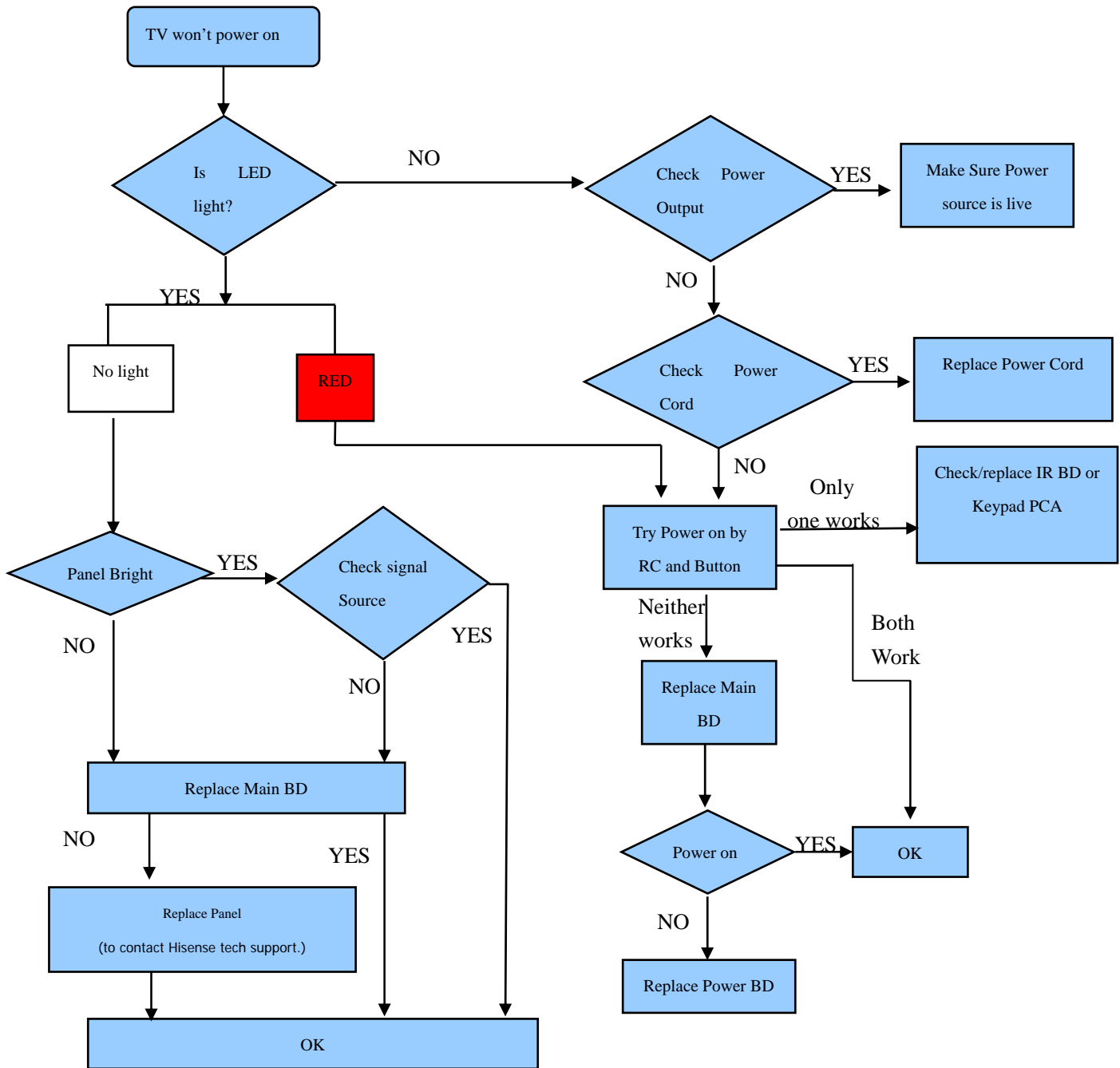
5.1 Troubleshooting for Remote Control



5.2 Troubleshooting for Function Key



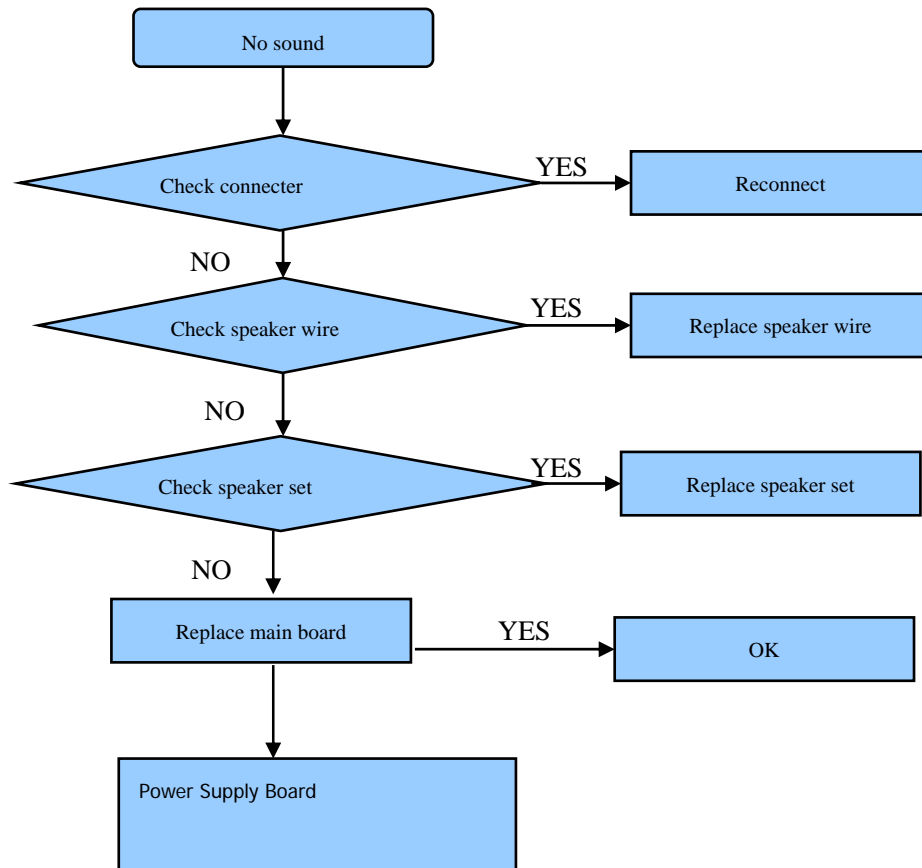
5.3 TV won't Power On



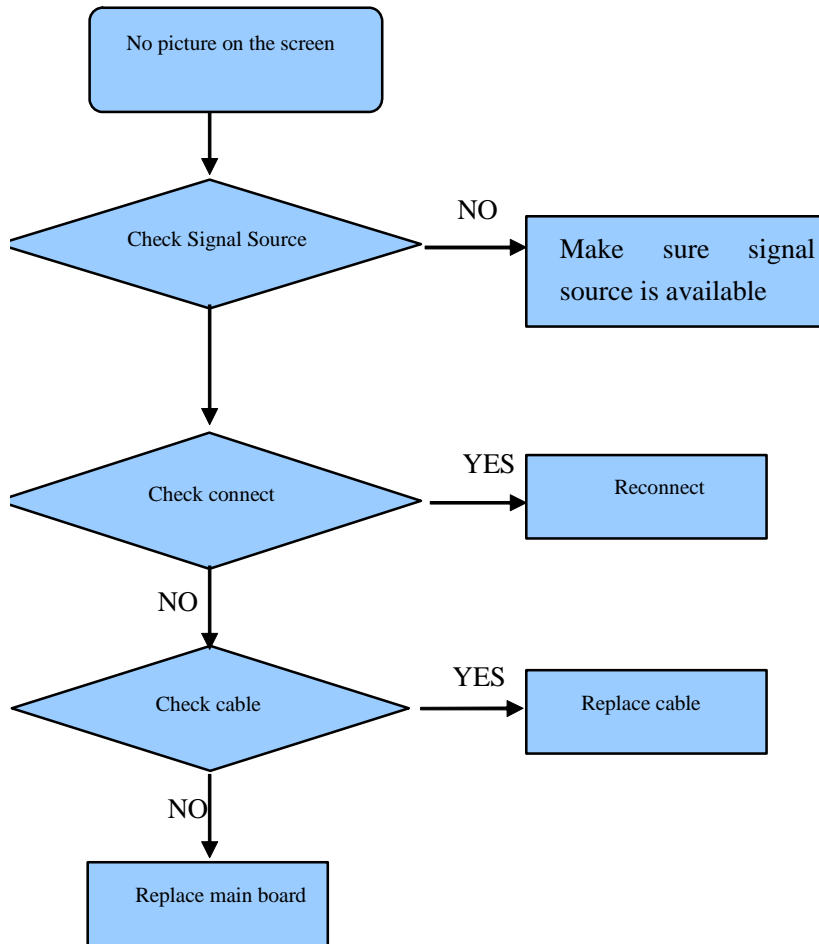
Notice:

MSD6586 Europe market:
 TV work normally indication led is no light.
 TV standby indication led is red.

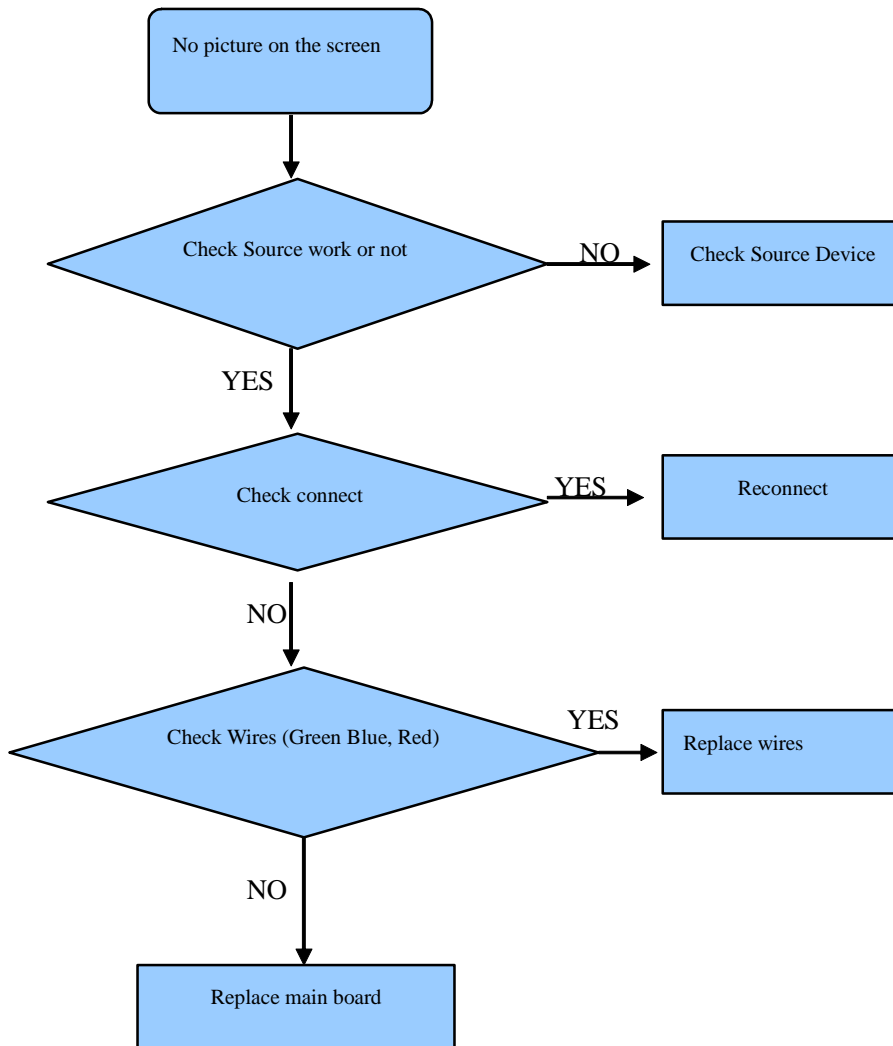
5.4 Troubleshooting for Audio



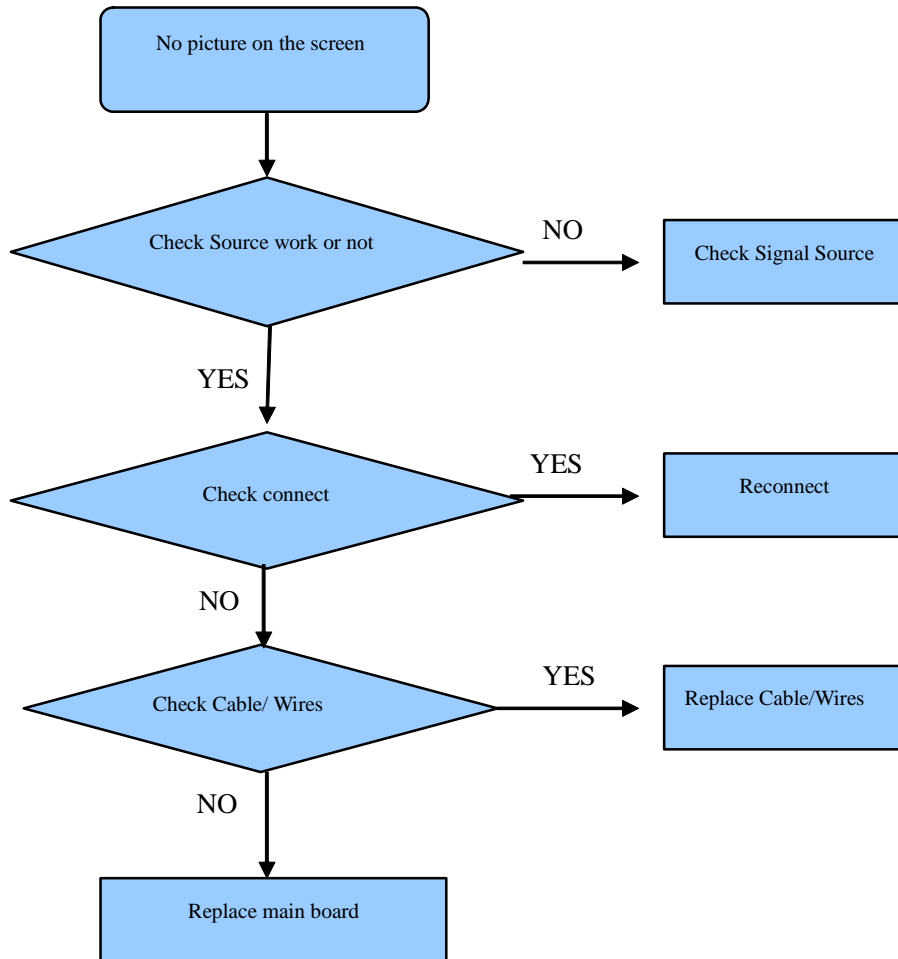
5.5 Troubleshooting for TV/VGA/HDMI input



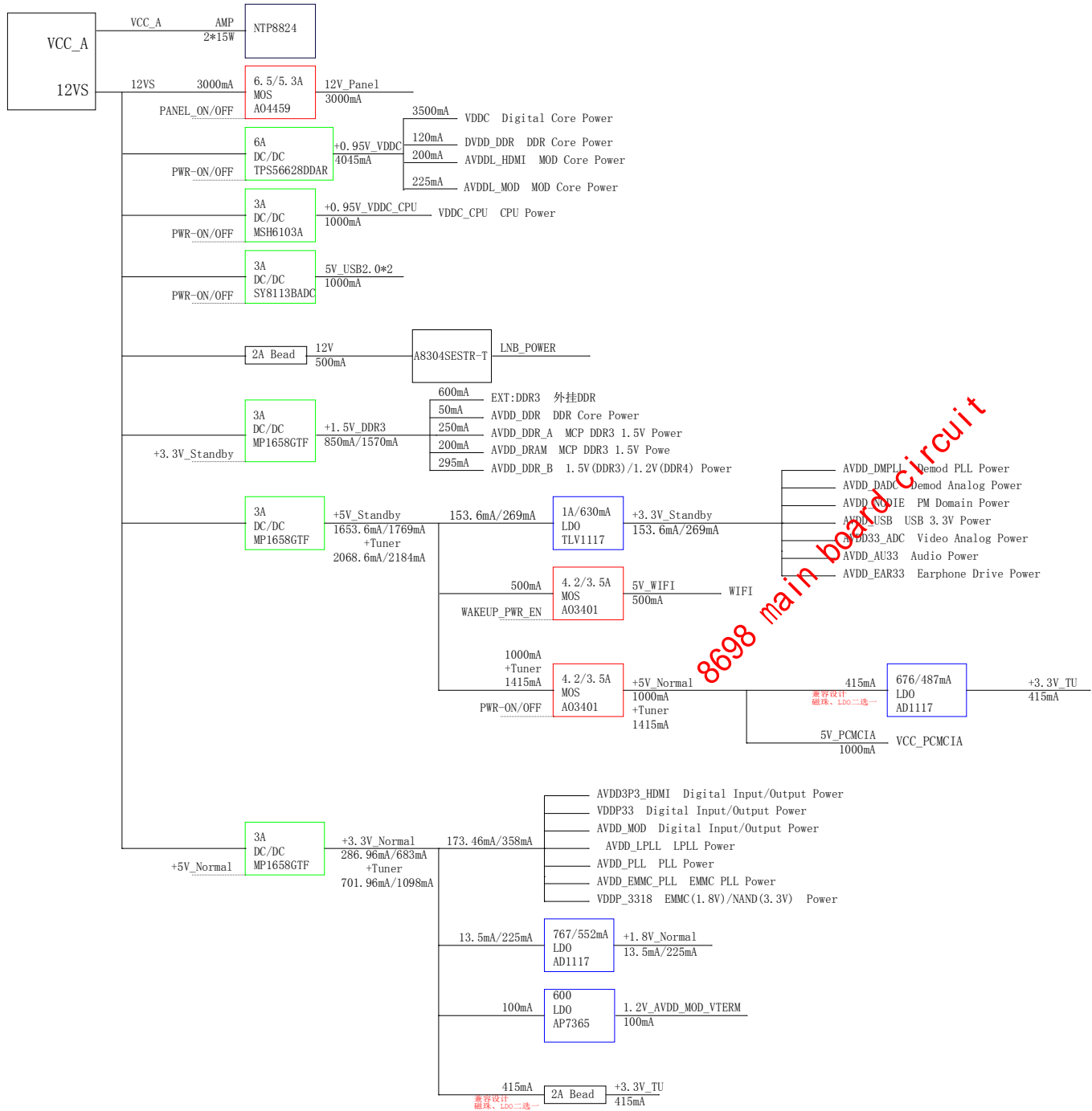
5.6 Troubleshooting for YPbPr input



5.7 Troubleshooting for Video input



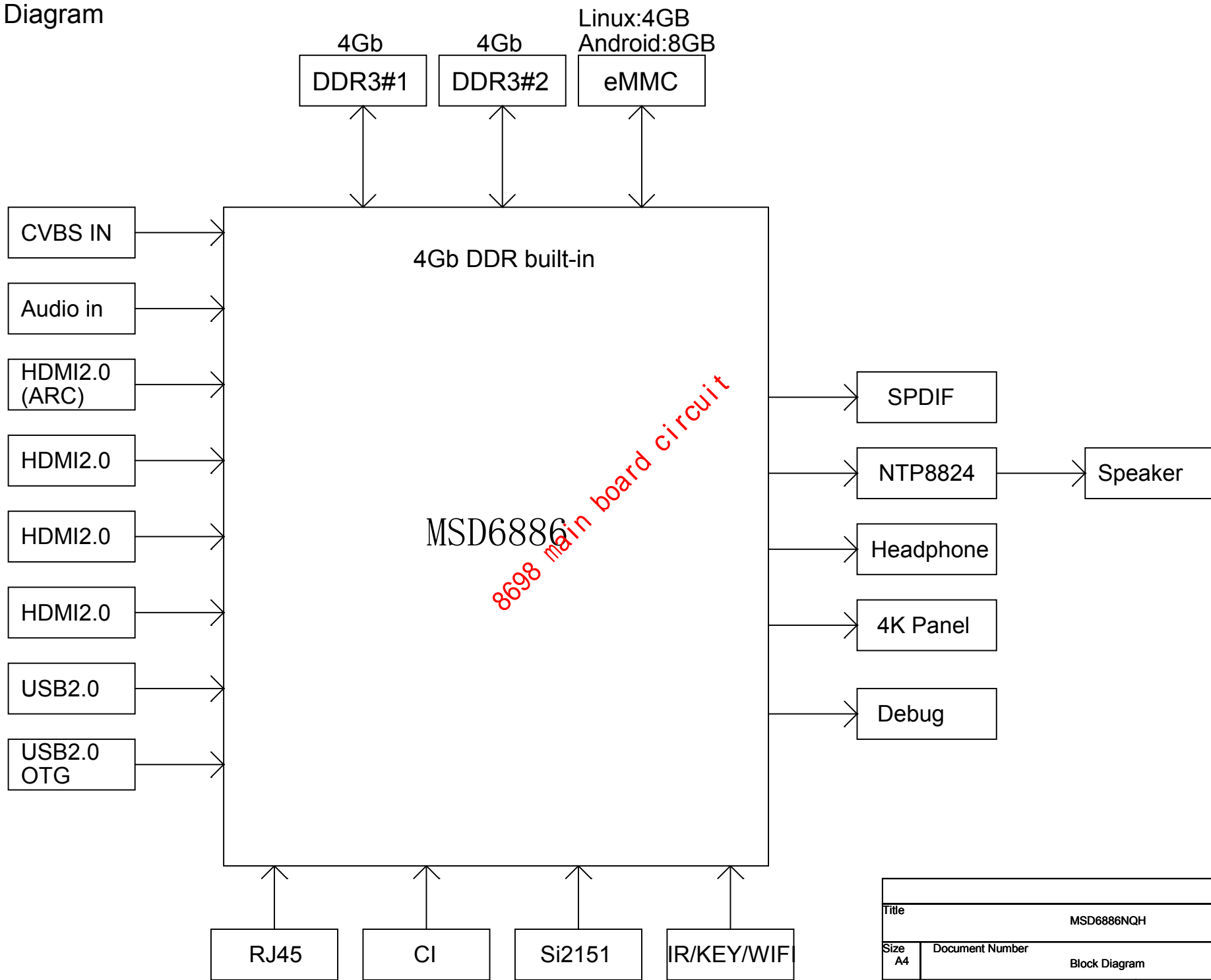
DC/DC LDO SW 电流 有效值/峰值



8698 main board circuit

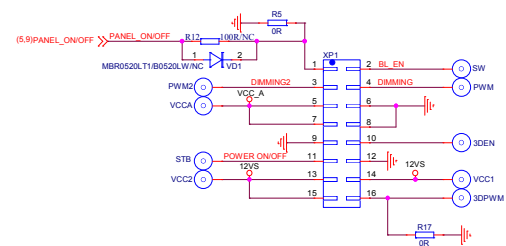
| | | | | |
|--------|----------------------------|------------|-----|------------|
| Title | | | | MSD6886NQH |
| Size | Document Number | Power tree | Rev | v1.0 |
| Custom | | | | |
| Date: | Tuesday, November 27, 2018 | Sheet | 2 | of 15 |

Block Diagram

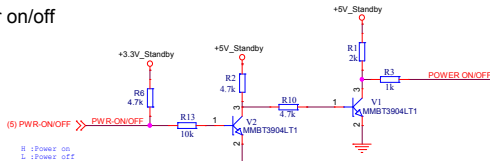


| | | | | | |
|-------|----------------------------|-------|------------|----|----|
| Title | | | MSD6886NQH | | |
| Size | Document Number | | Rev | | |
| A4 | Block Diagram | | v1.0 | | |
| Date: | Tuesday, November 20, 2018 | Sheet | 3 | of | 15 |

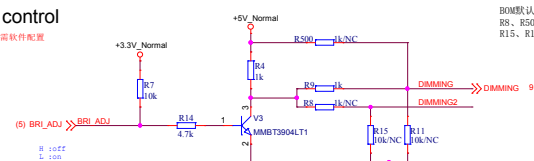
Main power connector



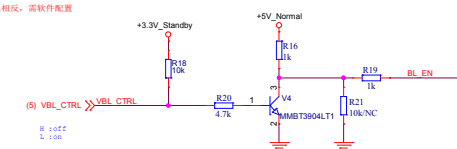
Power on/off



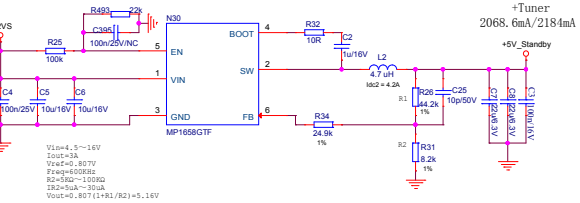
Backlight control



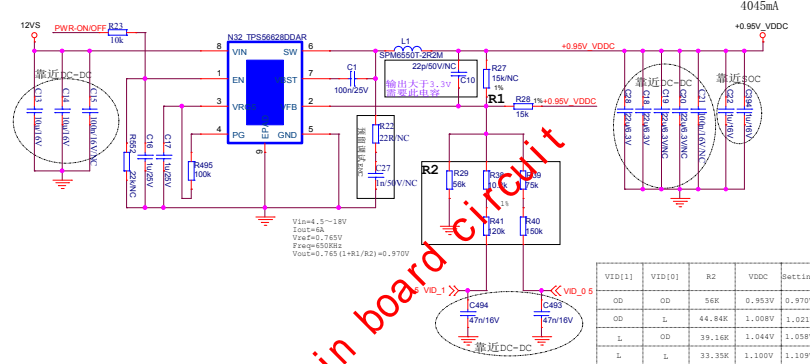
Backlight on/off



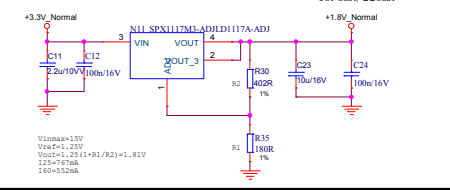
12VS-->5V_Standby



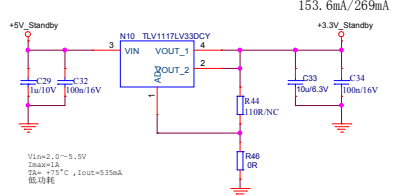
12VS-->0.95V VDDC



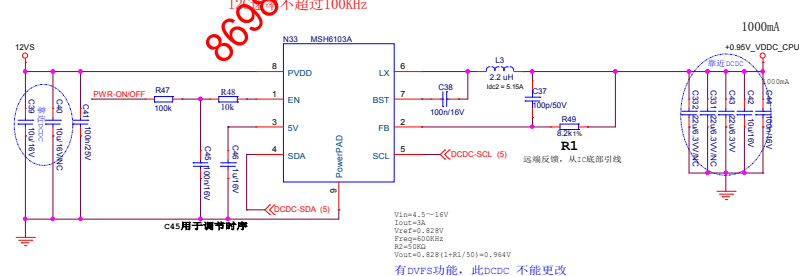
3.3V_Normal-->1.8V_Normal



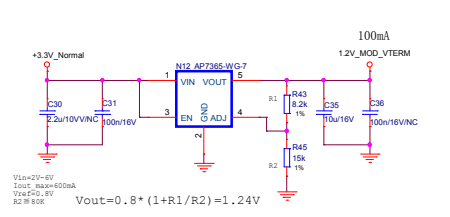
5V_Standby-->3.3V_Standby



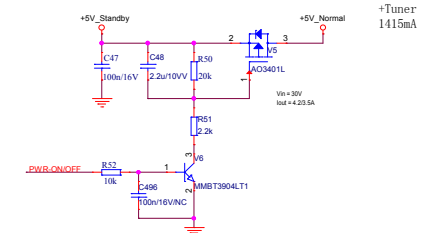
12VS-->0.95V VDDC CPU



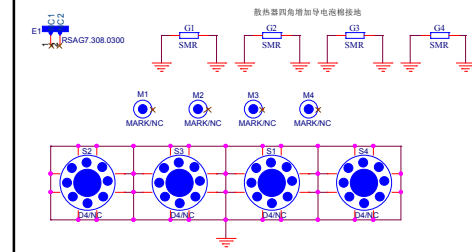
3.3V_Normal-->1.2V_MOD_VTERM



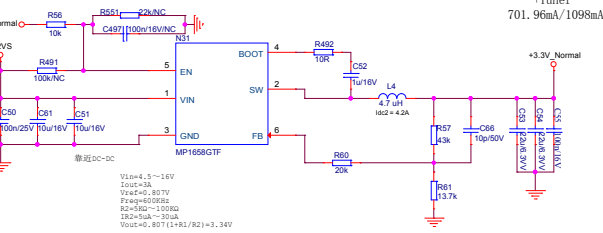
5V_Standby-->5V_Normal



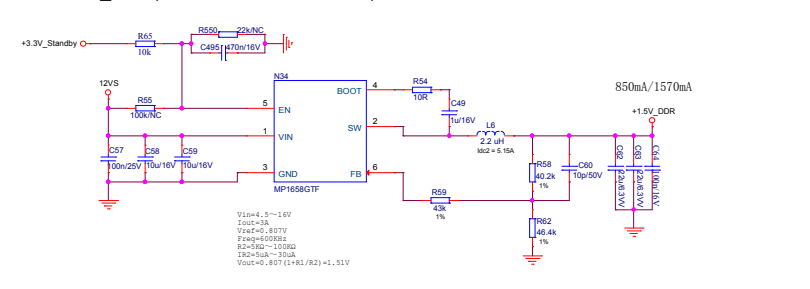
散热器&螺丝孔&Mark



12VS-->3.3V_Normal



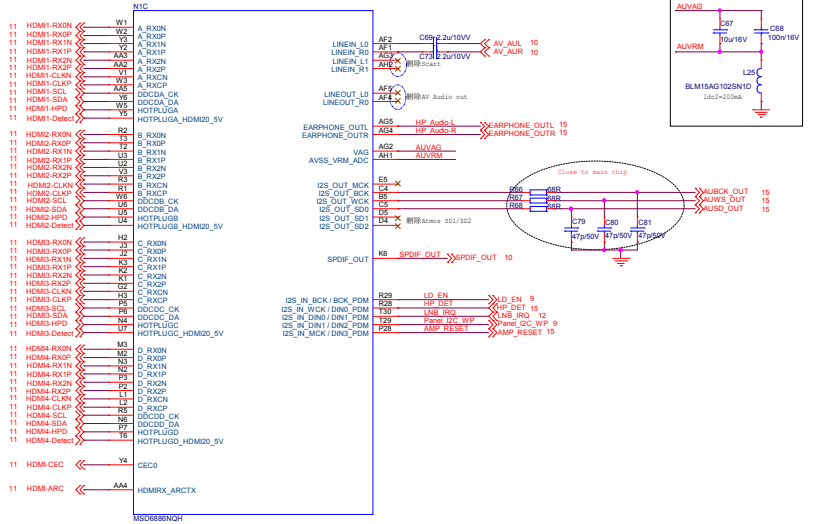
12VS-->+1.5V_DDR(内置两颗, 外置两颗供电)



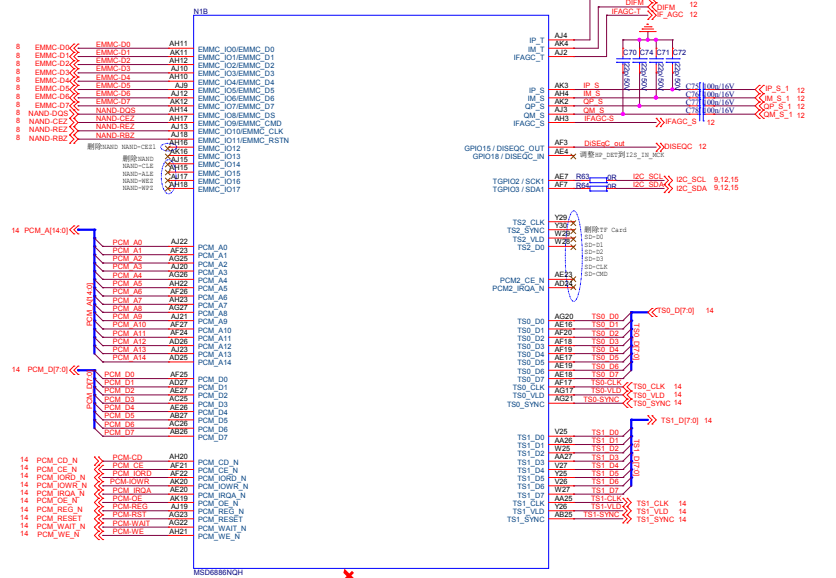
008默认上9V 按照PWM调光设计
R8、R500 作为模拟调光预留
R15、R11作为调整电压大小预留

8698 Main board circuit

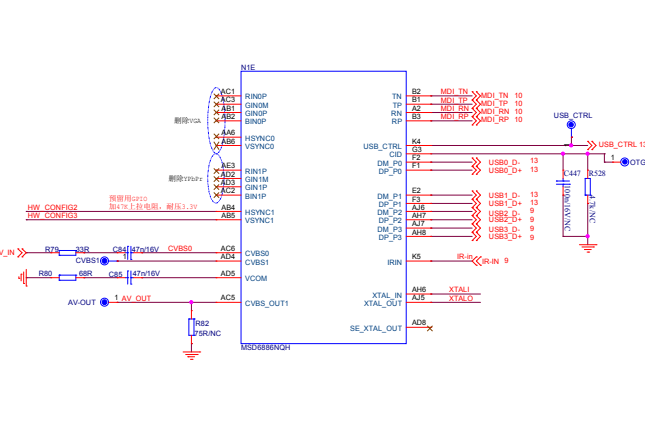
HDMI/Audio Block



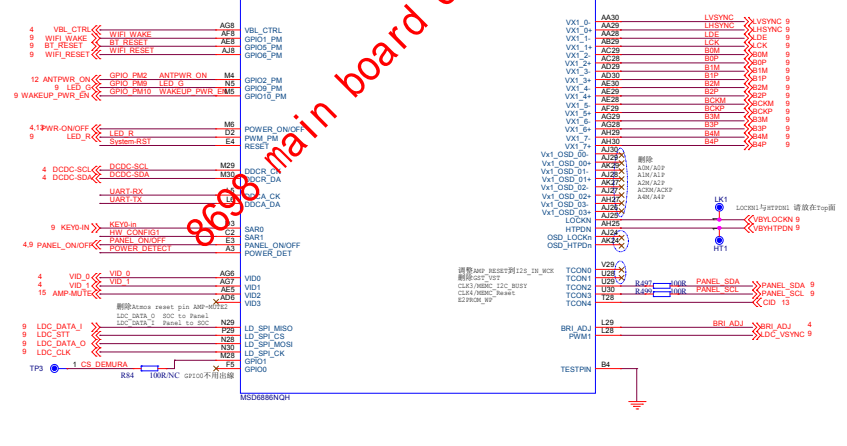
PCMCIA/TS/NAND/FE



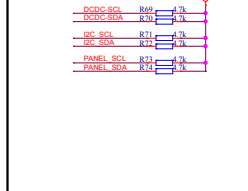
RGB/CVBS/PHY/USB Block



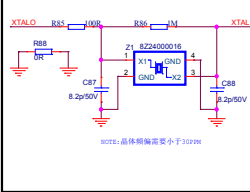
LVDS/GPIO



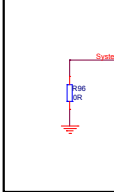
GPIO Pull up/down



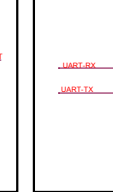
CRYSTAL



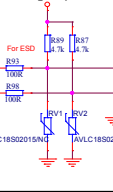
RESET



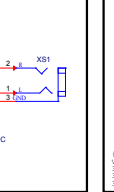
UART0



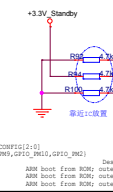
Config



eMMC protect

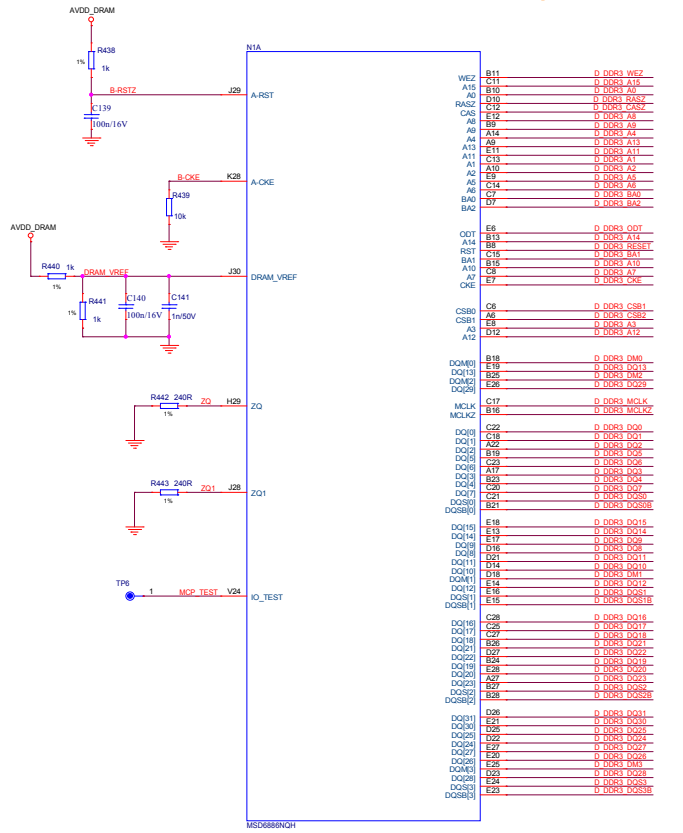


HW_CONFIG



| HW_CONFIG1 | Setting | HW_CONFIG2 | Setting | HW_CONFIG3 | Setting |
|------------|---------|------------|---------|------------|---------|
| 0 | 默认配置 | 0 | 默认配置 | 0 | 默认配置 |
| 1 | 默认配置 | 1 | 默认配置 | 1 | 默认配置 |

BA2,CSB1,CSB2 need GND shielding

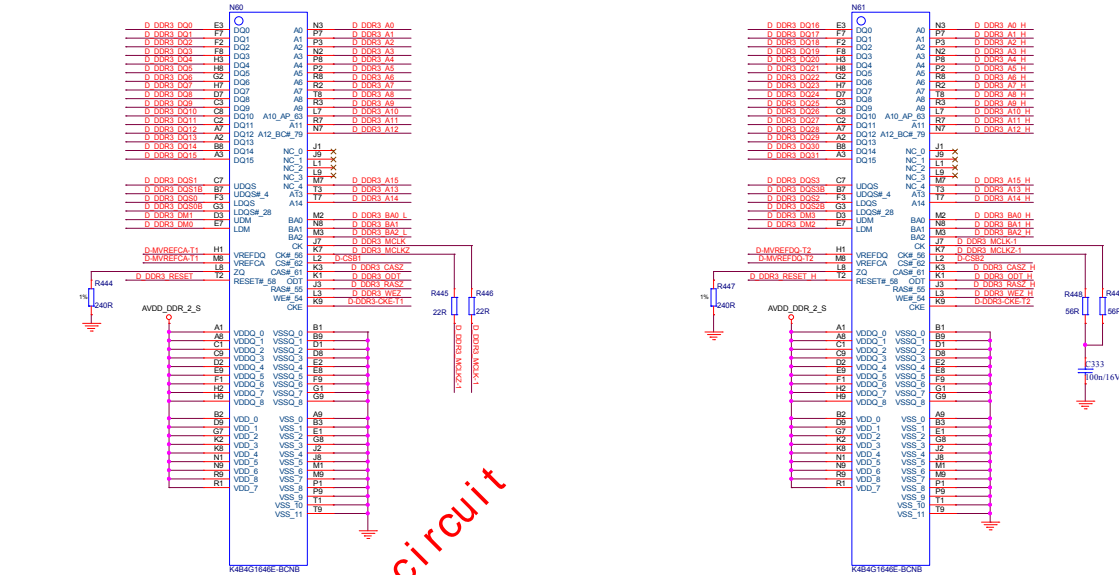


公版DDR A14、A15均NC, Hisense 只有A15 NC

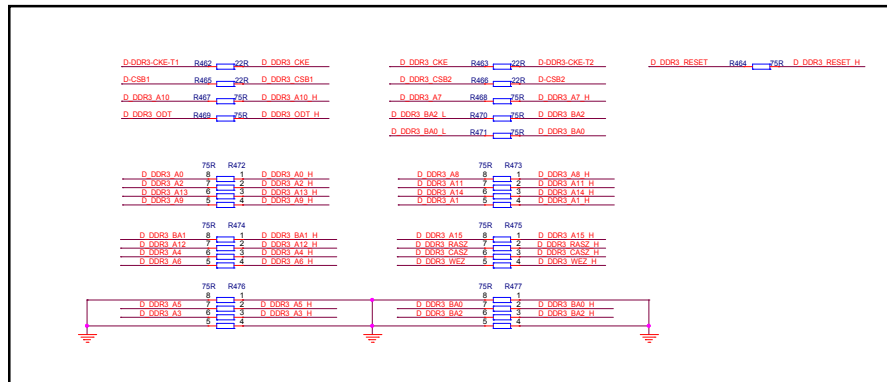
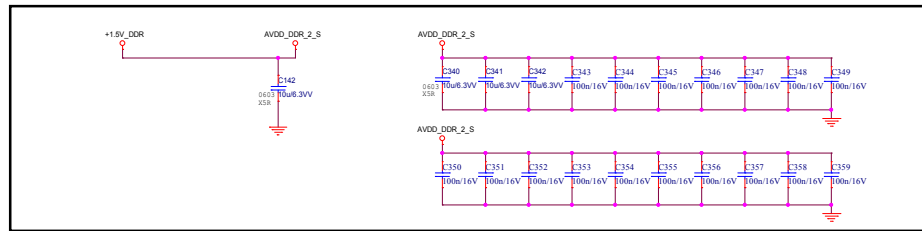
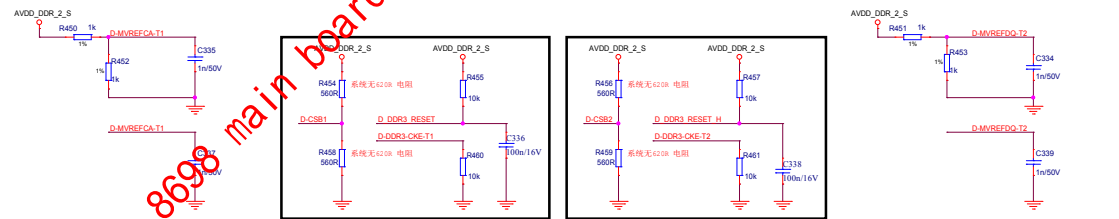
DDR3 4Gb+4Gb 2133MHz

DDR3#1

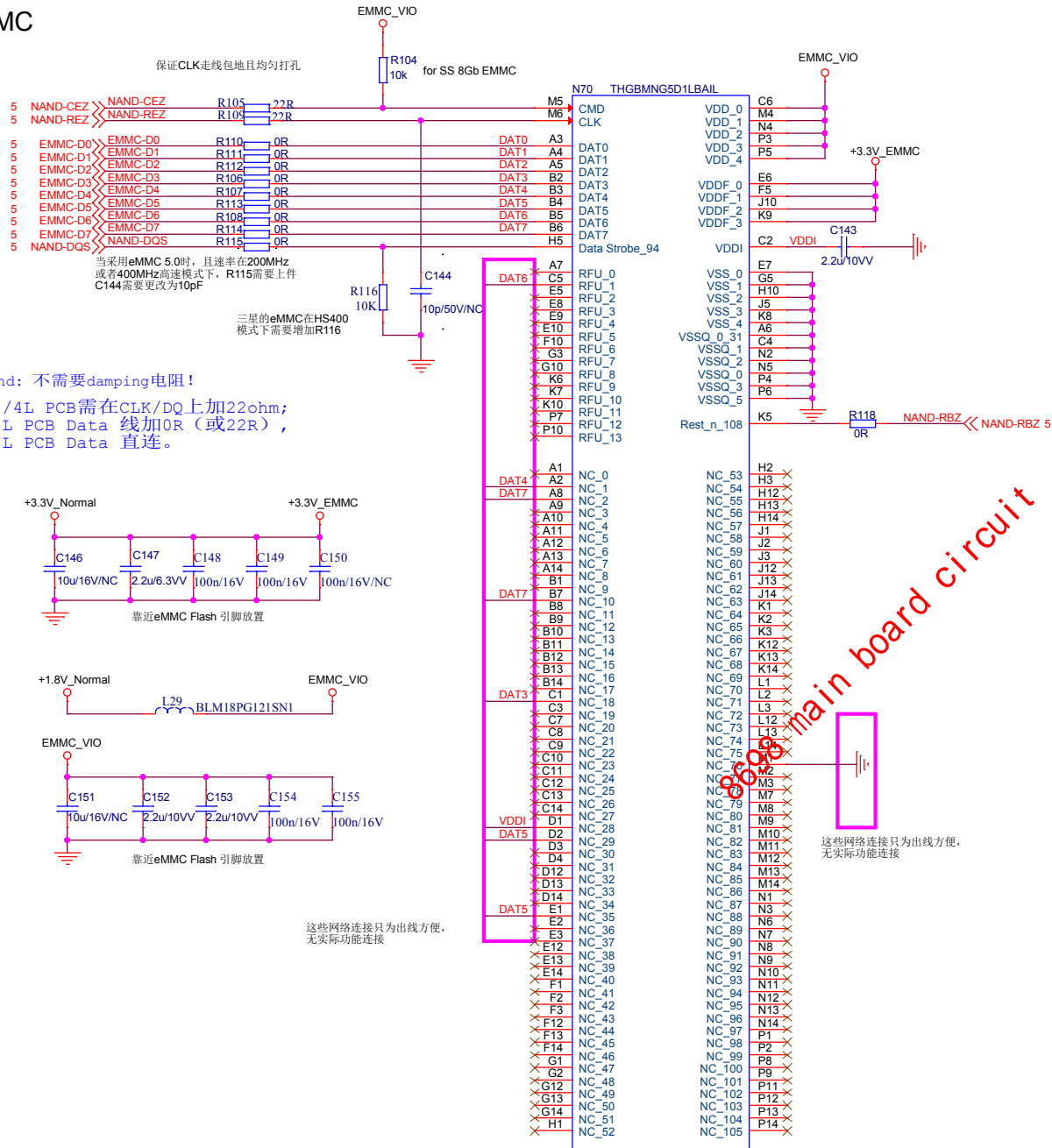
DDR3#2



8698 main board circuit



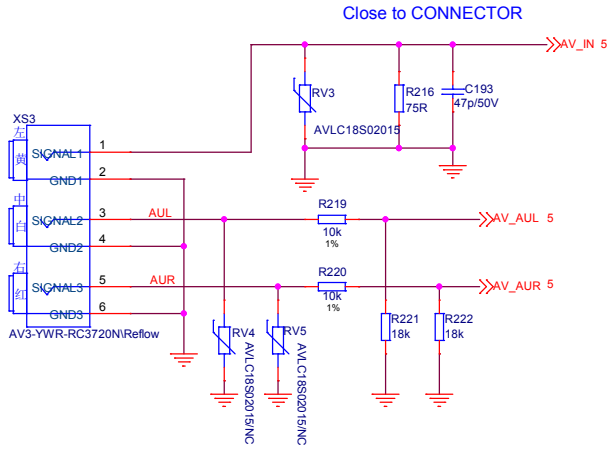
EMMC



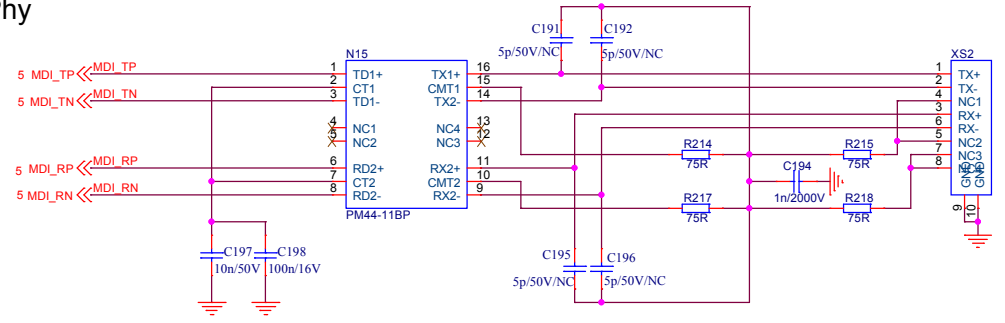
3.3V EMMC main board circuit

| | | | | | |
|--------|----------------------------|--|------------|---|-------|
| Title | | | MSD6886NQH | | |
| Size | Document Number | | | | Rev |
| Custom | EMMC | | | | v1.0 |
| Date: | Sunday, September 23, 2018 | | Sheet | 8 | of 15 |

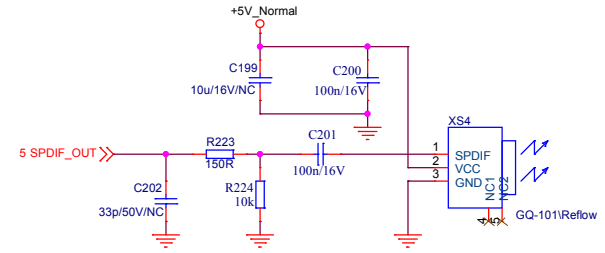
AV + AV Audio Input



Phy



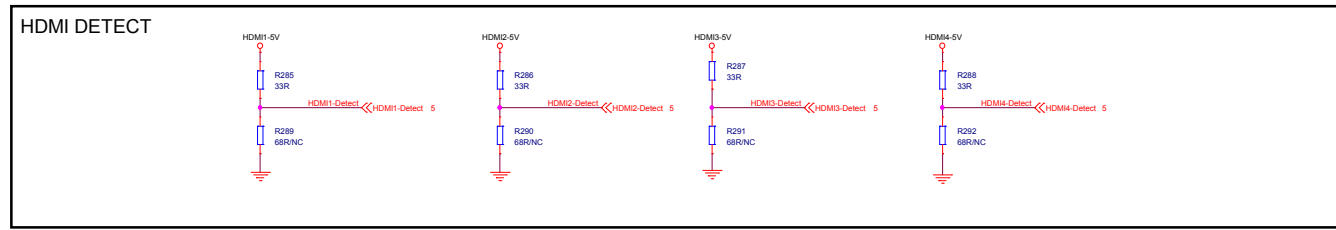
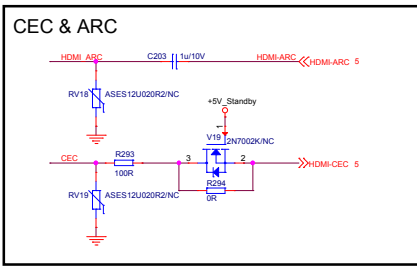
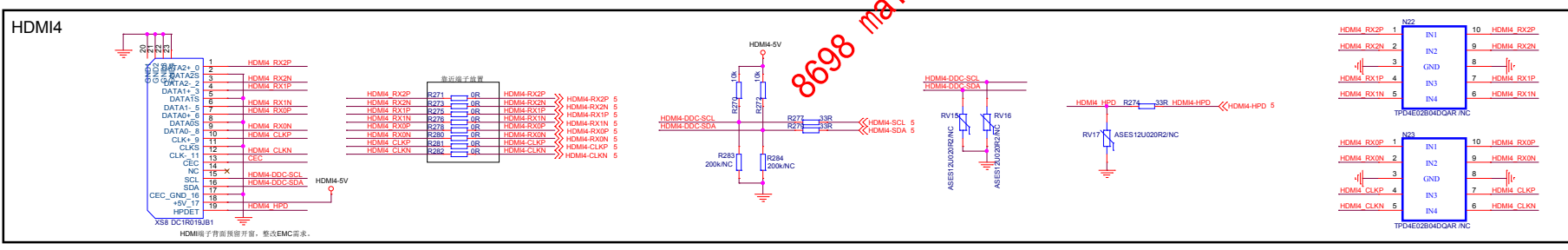
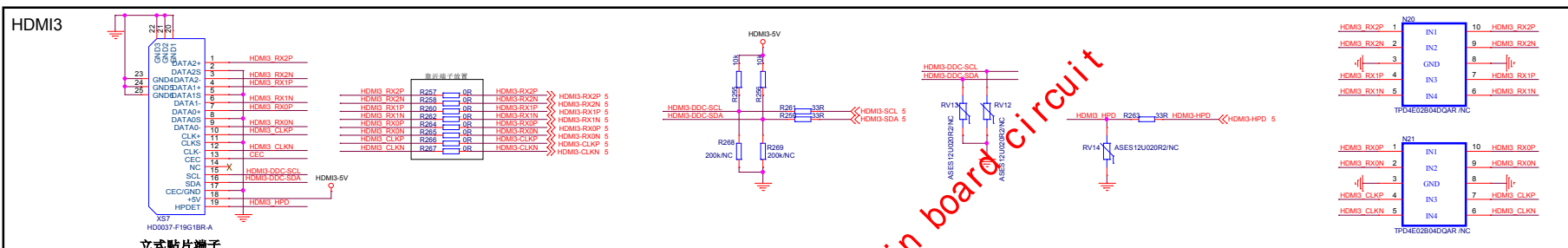
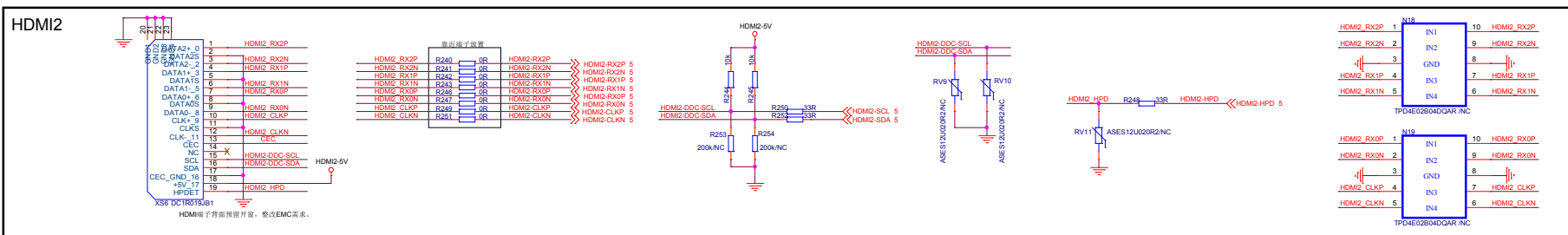
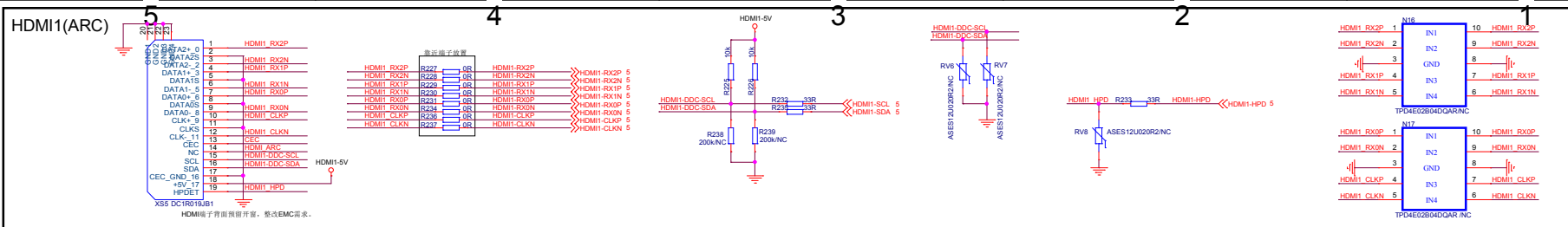
SPDIF OUT



卧式光纤端子

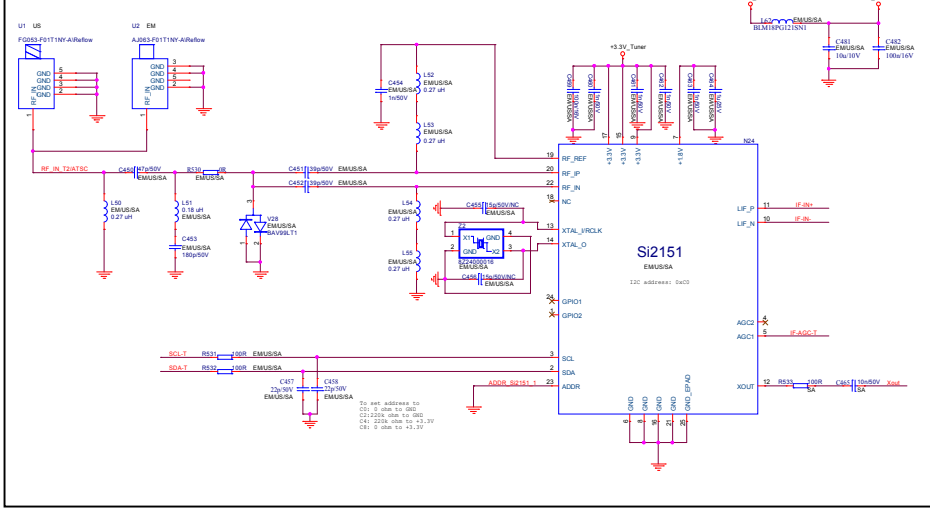
8698 main board circuit

| | | |
|--------|----------------------------|----------------|
| Title | MSD6886NQH | |
| Size | Document Number | Rev |
| Custom | Video & SPDIF & Net | v1.0 |
| Date: | Sunday, September 23, 2018 | Sheet 10 of 15 |

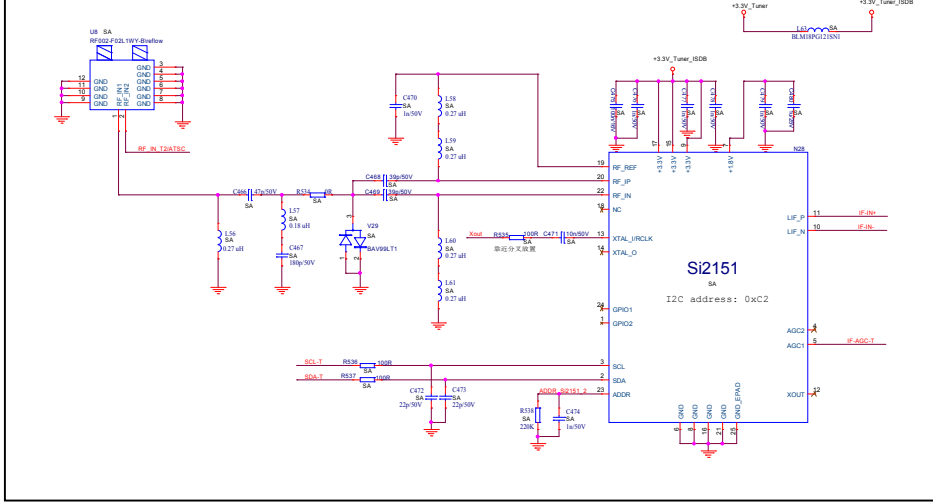


8698 main board circuit

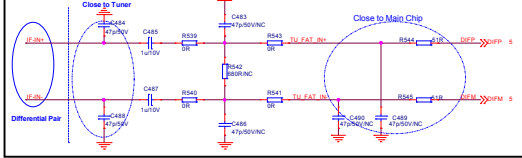
Tuner On Board for ATSC/DVB-T2/T/C/ SA Air



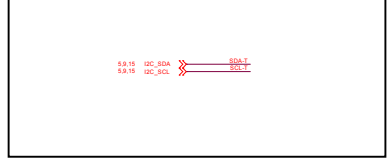
Tuner On Board for SA Cable 每个tuner预留14mm宽度,28.8mm长度范围内



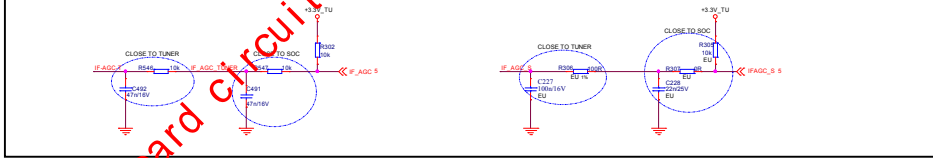
IF Interface Filter



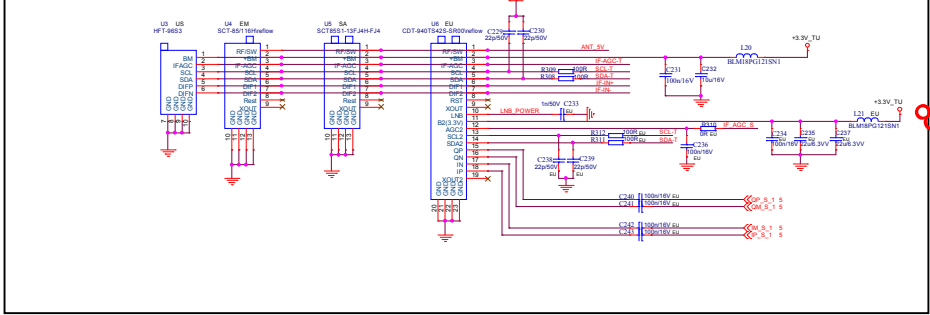
I2C



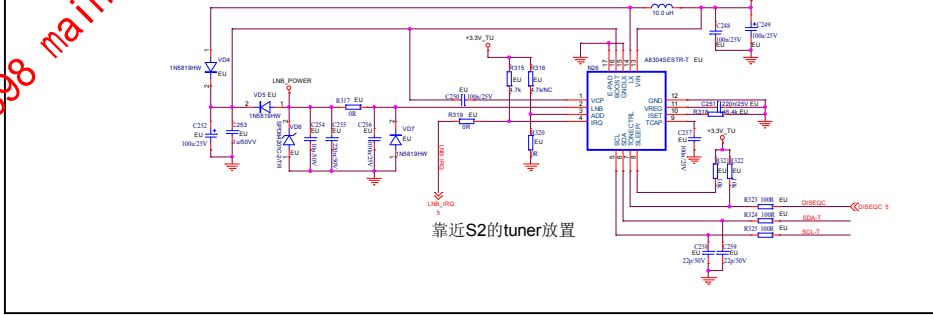
IFAGC / IFAGC-S Circuit



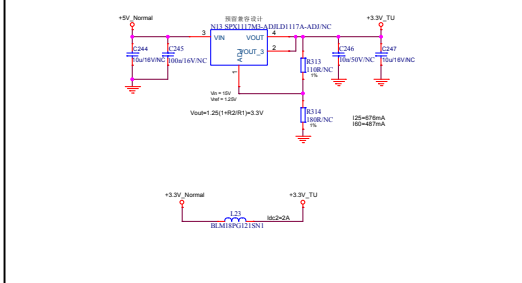
Can tuner for ATSC/DVB-T2/S2/T/S/C/ISDB



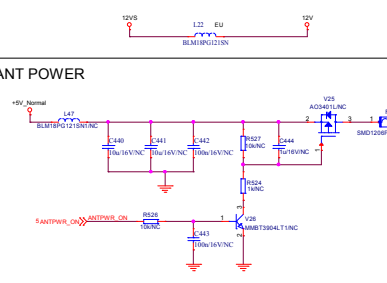
LNB POWER CONTROL I2C addr: 0x10



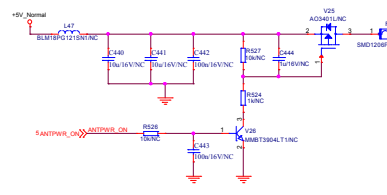
+5V_Normal->+3.3V_TU



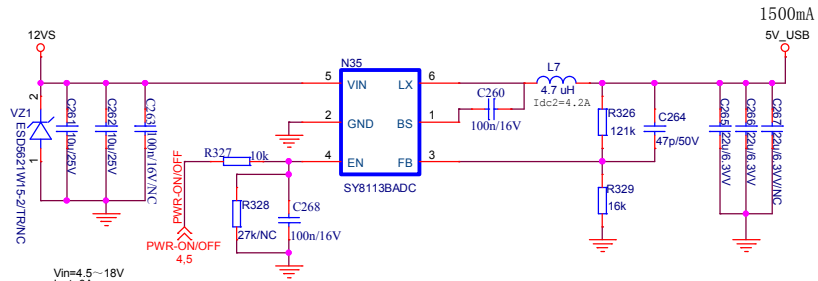
12VS->12V_LNB



ANT POWER



12VS-->5V_USB

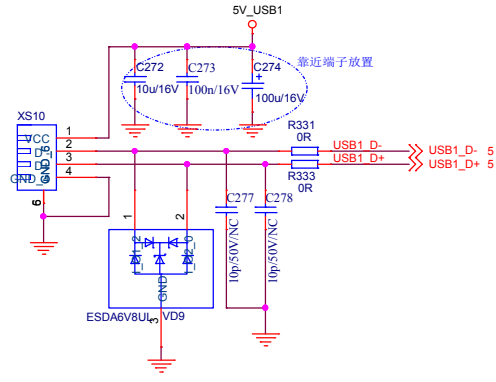


$V_{in}=4.5\sim 18V$
 $I_{out}=3A$
 $V_{ref}=0.6V$
 $Freq=500KHz$
 $V_{out}=0.6 \cdot (1+R1/R2)=5.13V$

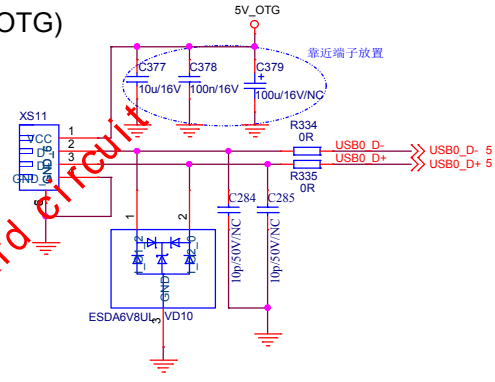
USB POWER



USB PORT 1



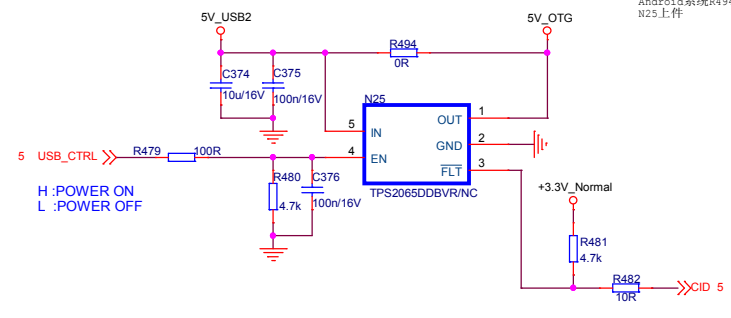
USB PORT 2(OTG)



OTG&CID

CID 为过流保护
 OTG Host和Device 切换方式待定

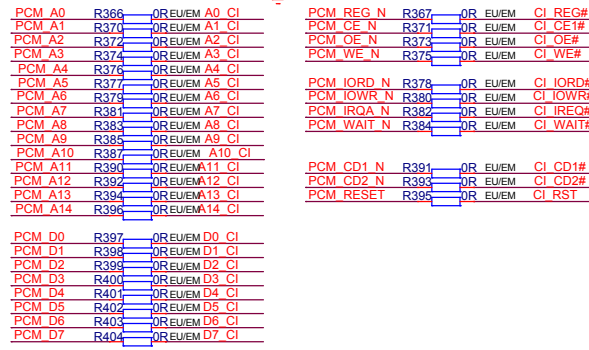
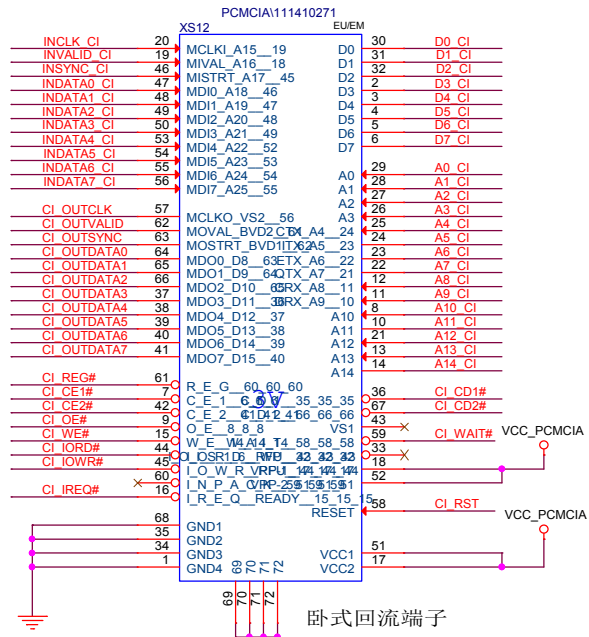
Linux系统R494上件
 N25 NC
 Android系统R494 NC
 N25上件



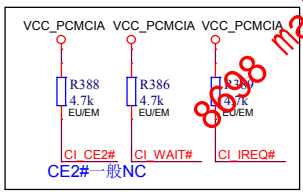
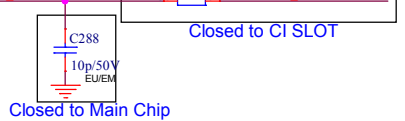
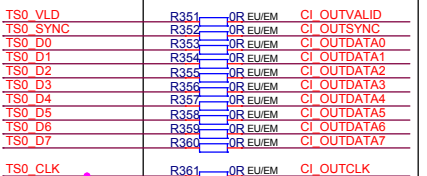
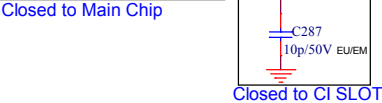
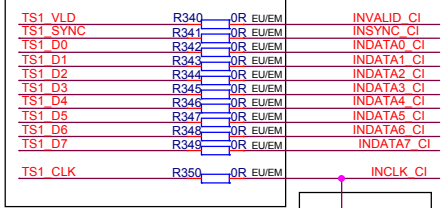
8698 main board circuit

| | | |
|------------|----------------------------|----------------|
| Title | | |
| MSD6886NQH | | |
| Size | Document Number | Rev |
| Custom | USB | v1.0 |
| Date: | Tuesday, November 20, 2018 | Sheet 13 of 15 |

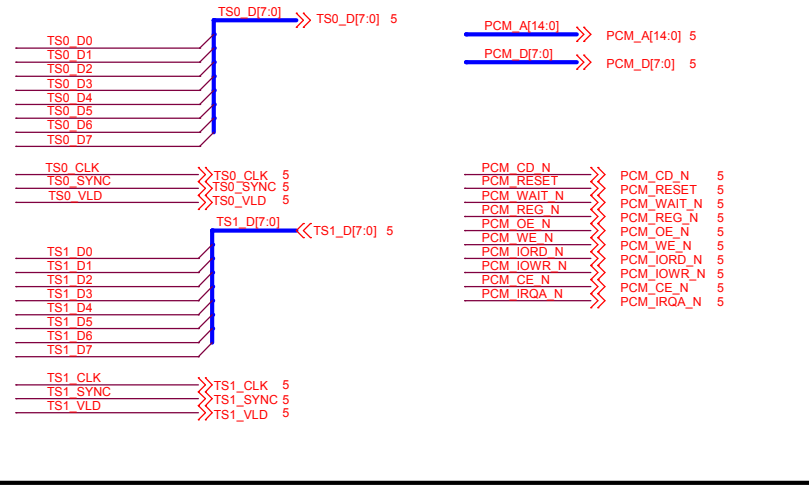
PCMCIA



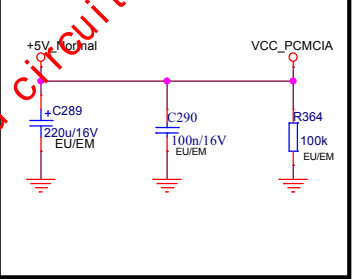
Parrel TS interface



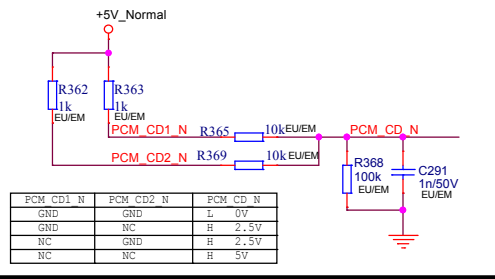
NET



CI Power



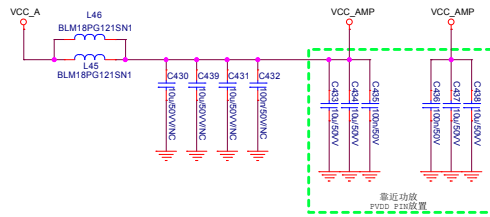
CARD DETECT



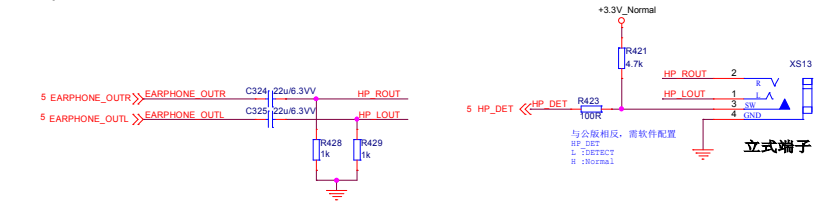
| | | |
|--------|----------------------------|----------------|
| Title | MSD6886NQH | |
| Size | Document Number | Rev |
| Custom | PCMCIA | v1.0 |
| Date: | Tuesday, November 27, 2018 | Sheet 14 of 15 |

8698 main board circuit

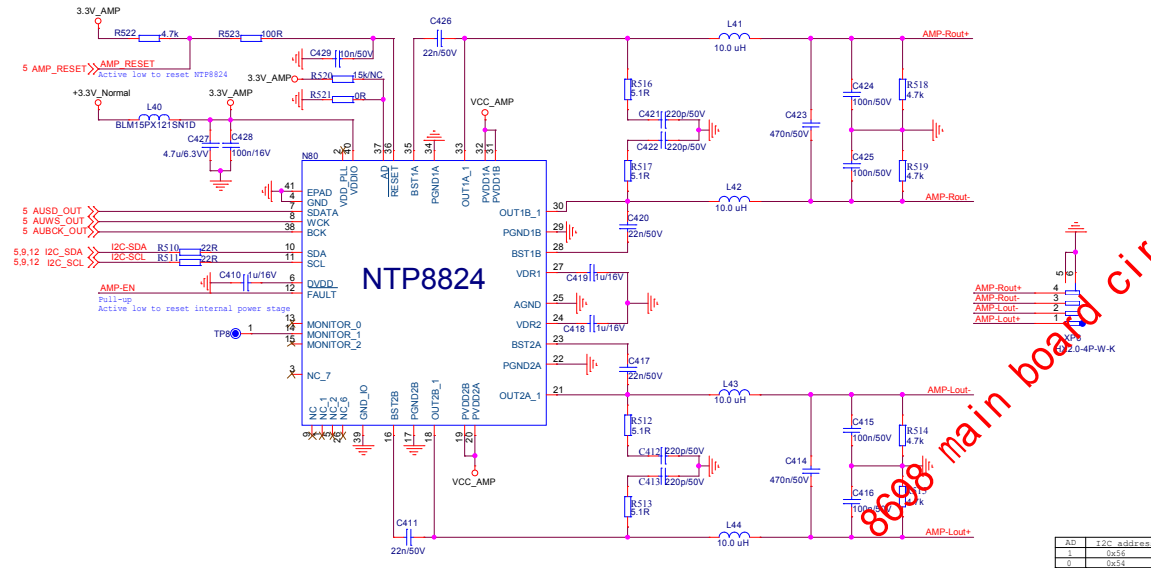
AMP Power



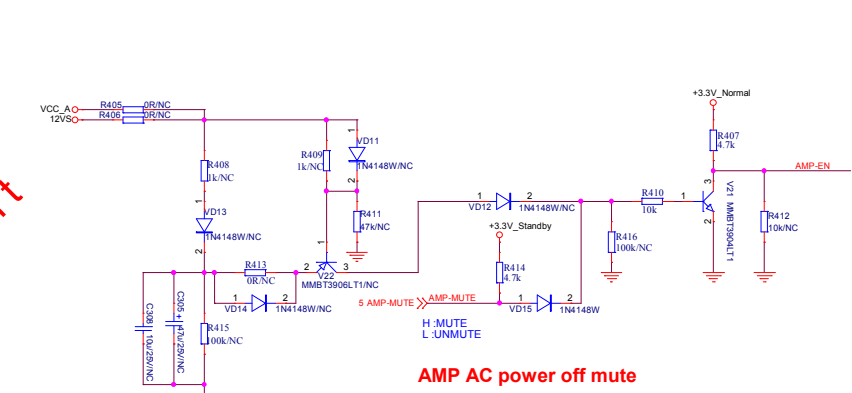
Headphone



SPEAKER Amplifier I2C address: 0x54



Mute Circuit 6586使用1218与5V_Normal 组合 需确认VCC_A与5V_Normal的快慢



| | | | |
|--------|----------------------------|------------|----------|
| Title | | MSD6886NQH | |
| Size | Document Number | Audio & Hp | Rev v1.0 |
| Custom | | | |
| Date: | Sunday, September 23, 2016 | Sheet | 15 of 15 |