

LCD Television

Service Manual

Chassis: NT72690

Version: V 1.0

Hisense Visual Technology Co., Ltd.

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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

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.

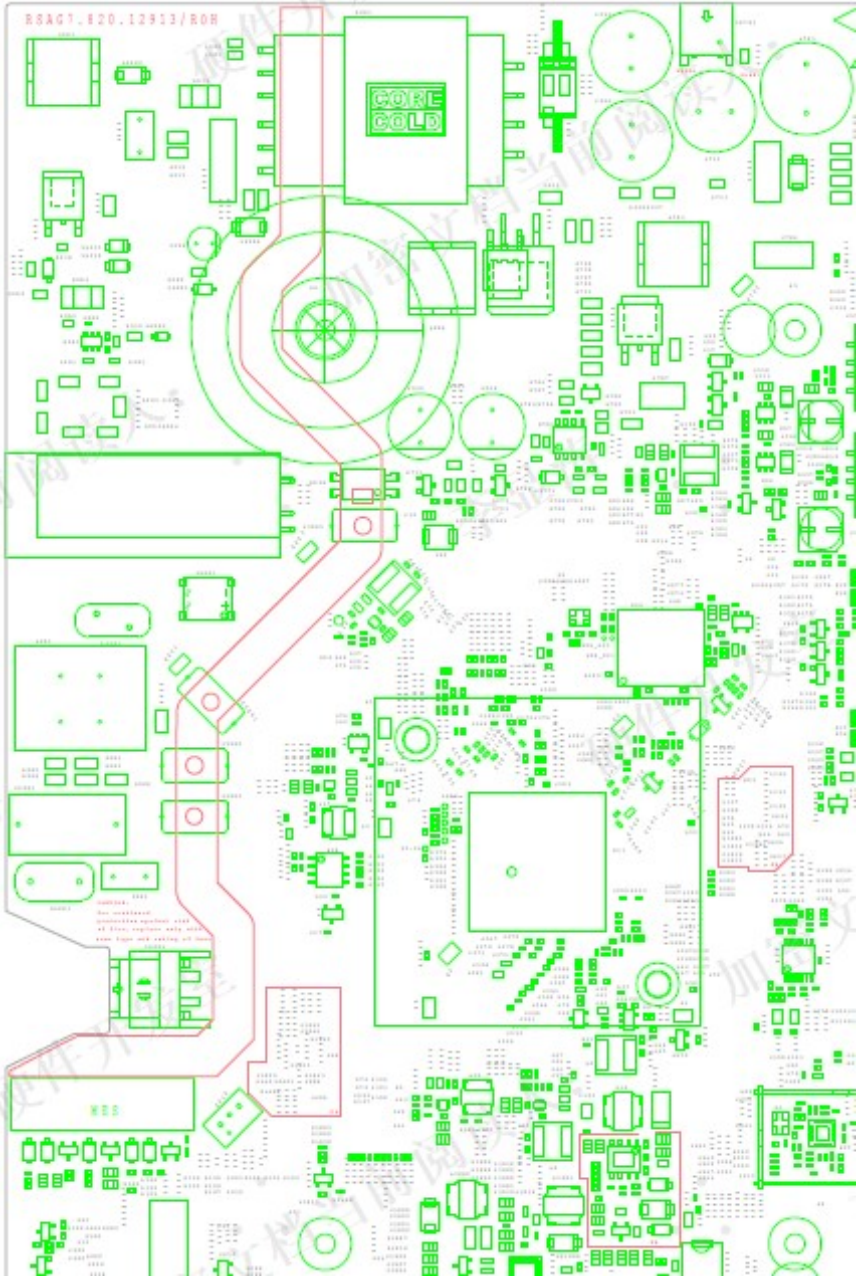


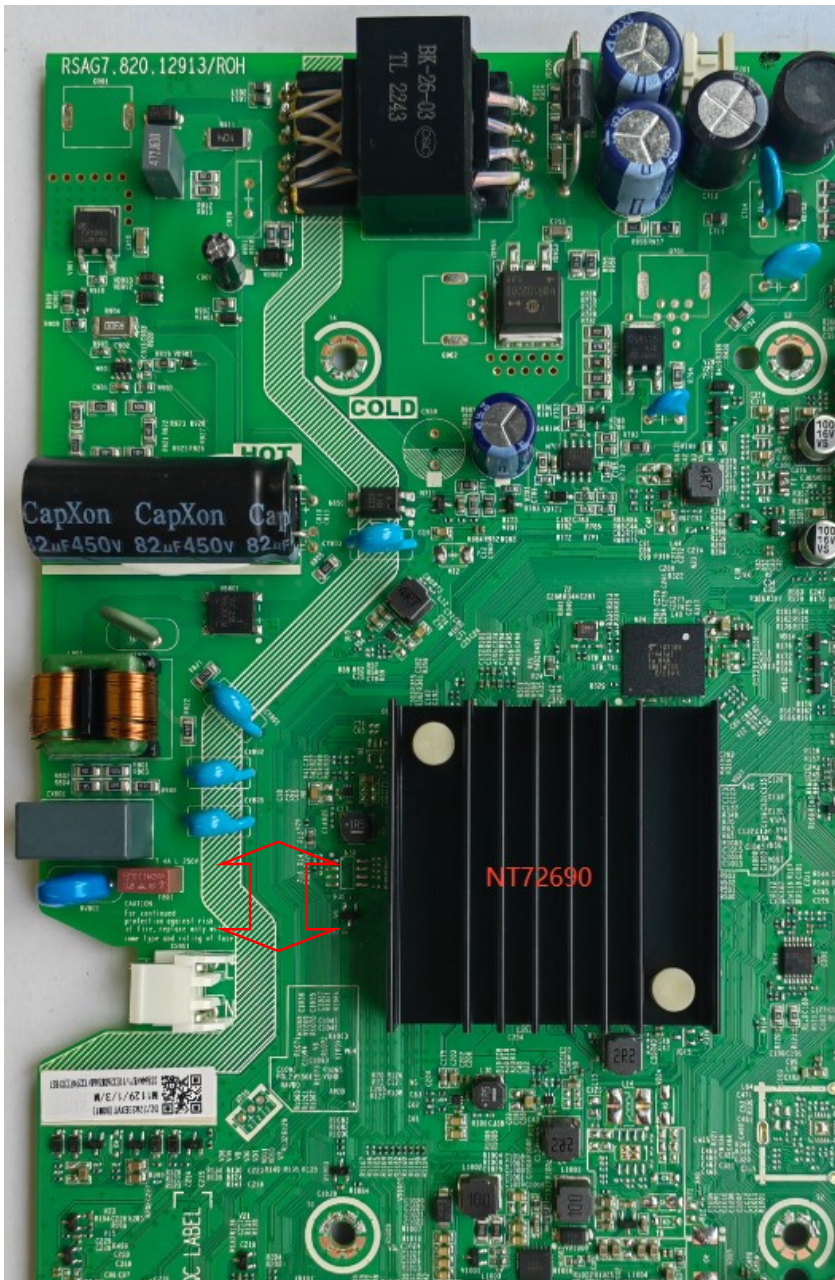
The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature. .

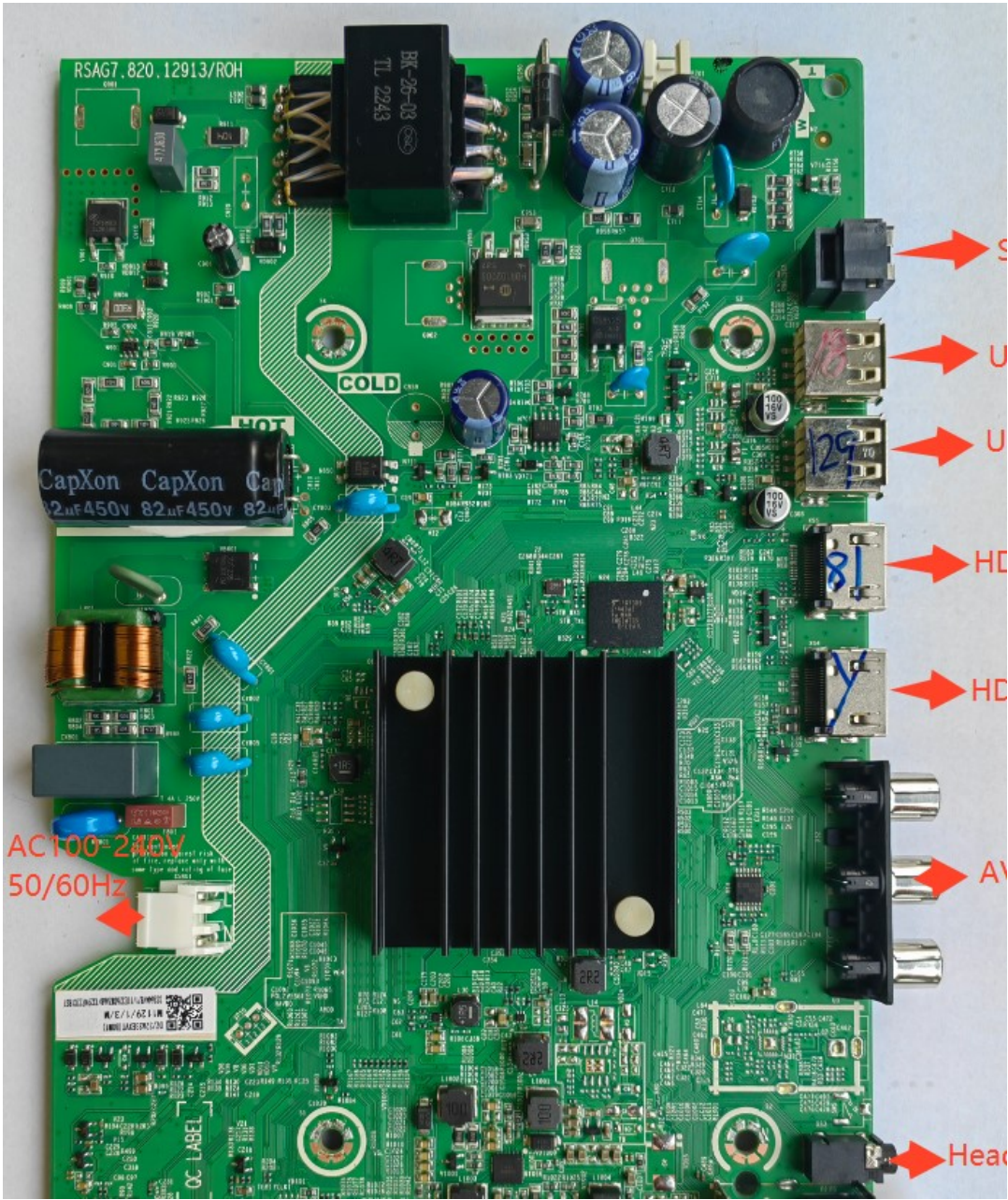
2. TV boards:

2.1 Main board layout

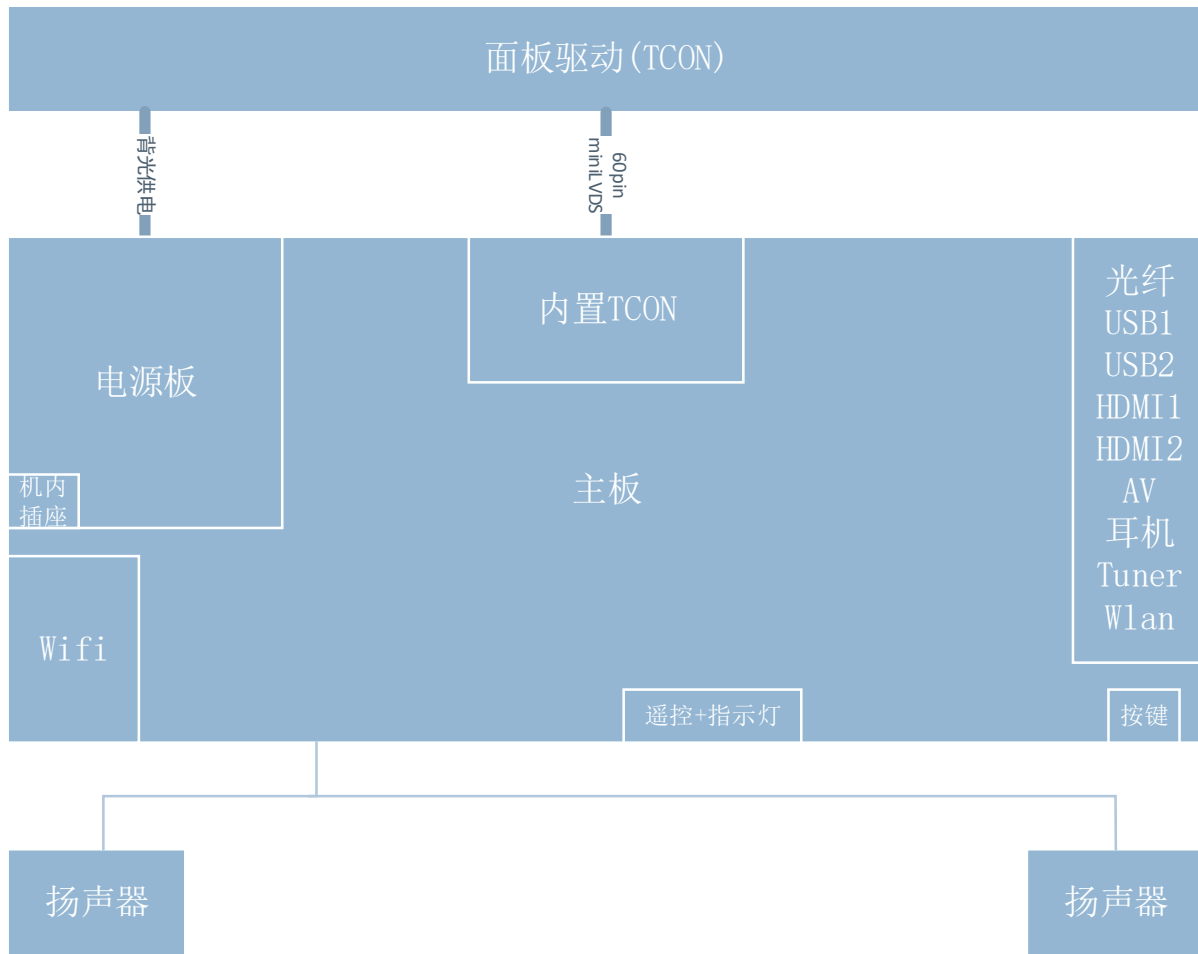
2.1.1 The top of main board (RSAG2.908.12913-01\ROH)







2.2 Wiring diagram (example for 32A33EXVT):



XP1002: 60pin miniLVDS jacket

| Panel terminal jacket definition | | | Main board terminal jacket definition | |
|----------------------------------|------------|--------------|---------------------------------------|--------|
| Pin | definition | illustration | Pin | Config |
| 1 | NC | NC | 1 | NC |
| 2 | GND | GND | 2 | GND |
| 3 | NC | NC | 3 | MLVF5N |
| 4 | NC | NC | 4 | MLVF5P |
| 5 | NC | NC | 5 | MLVF4N |
| 6 | NC | NC | 6 | MLVF4P |
| 7 | NC | NC | 7 | MLVF3N |
| 8 | NC | NC | 8 | MLVF3N |
| 9 | GND | GND | 9 | GND |

| | | | | |
|----|----------|----------|----|----------|
| 10 | MLVFCLKN | MLVFCLKN | 10 | MLVFCLKN |
| 11 | MLVFCLKP | MLVFCLKP | 11 | MLVFCLKP |
| 12 | GND | GND | 12 | GND |
| 13 | MLVF2N | MLVF2N | 13 | MLVF2N |
| 14 | MLVF2P | MLVF2P | 14 | MLVF2P |
| 15 | MLVF1N | MLVF1N | 15 | MLVF1N |
| 16 | MLVF1P | MLVF1P | 16 | MLVF1P |
| 17 | MLVF0N | MLVF0N | 17 | MLVF0N |
| 18 | MLVF0N | MLVF0N | 18 | MLVF0N |
| 19 | GND | GND | 19 | GND |
| 20 | NC | NC | 20 | NC |
| 21 | I2C WP | I2C WP | 21 | WP_X |
| 22 | I2C SDA | I2C SDA | 22 | SDA_S |
| 23 | I2C SCL | I2C SCL | 23 | SCL_S |
| 24 | GND | GND | 24 | GND |
| 25 | NC | NC | 25 | NC |
| 26 | NC | NC | 26 | NC |
| 27 | VCC | VCC | 27 | VDDD |
| 28 | VCC | VCC | 28 | VDDD |
| 29 | NC | NC | 29 | NC |
| 30 | GND | GND | 30 | GND |
| 31 | HAVDD | HAVDD | 31 | HAVDD |
| 32 | HAVDD | HAVDD | 32 | HAVDD |
| 33 | AVDD | AVDD | 33 | AVDD |
| 34 | AVDD | AVDD | 34 | AVDD |
| 35 | AVDD | AVDD | 35 | AVDD |
| 36 | NC | NC | 36 | NC |
| 37 | NC | NC | 37 | NC |
| 38 | GND | GND | 38 | GND |
| 39 | GND | GND | 39 | GND |
| 40 | NC | NC | 40 | NC |
| 41 | XPOL | XPOL | 41 | POL |
| 42 | XSTB | XSTB | 42 | TP |
| 43 | GND | GND | 43 | GND |
| 44 | VSSG | VSSG | 44 | VSSG |
| 45 | VSSQ | VSSQ | 45 | VSSQ |
| 46 | LC2 | LC2 | 46 | LC2 |
| 47 | LC1 | LC1 | 47 | LC1 |
| 48 | NC | NC | 48 | NC |
| 49 | ST | ST | 49 | STV |
| 50 | GND | GND | 50 | GND |

| | | | | |
|----|------|------|----|------|
| 51 | VGHD | VGHD | 51 | VGHD |
| 52 | HC8 | HC8 | 52 | CLK8 |
| 53 | HC7 | HC7 | 53 | CLK7 |
| 54 | HC6 | HC6 | 54 | CLK6 |
| 55 | HC5 | HC5 | 55 | CLK5 |
| 56 | HC4 | HC4 | 56 | CLK4 |
| 57 | HC3 | HC3 | 57 | CLK3 |
| 58 | HC2 | HC2 | 58 | CLK2 |
| 59 | HC1 | HC1 | 59 | CLK1 |
| 60 | NC | NC | 60 | NC |

XP7: Speaker jacket

| Pin | definition | illustration | Wire color |
|-----|------------|-----------------------------|------------|
| 1 | L+ | Left speaker positive wire | 黑 |
| 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 32A33EXVT.



2.2 TV boards part list

| Main board | Boards function difference | Main chassis type | For Series |
|----------------------------|--|-------------------|------------|
| RSAG2.908.12913-01\ ROH | 1. Lateral terminal and vertical terminal. 2. TCON part on the board. | NT72690 | 32A33EXVT |
| | | | |











| | | | |
|--|--|--|--|
| | | | |
|--|--|--|--|



3. Factory/Service OSD Menu and Adjustment

3.1 Remote Control

► Buttons of remote control

| BUTTON | DESCRIPTION |
|---|--|
|  | Power on/ Standby |
| INPUT | Select input sources |
| Number button / 123 | Select a channel or input numbers |
| Four colour buttons /  | Special function buttons |
| GUIDE | Display the Electronic Program Guide (DTV n |
| CH.LIST | Display the Channel List on the screen |
|  | Playpad keys |
|  | Press to enter Menu |
| ^ / v / < / > | D-pad (up/down/left/right navigation buttons) |
| OK | Confirmation button |
|  | Under the Menu or App, return to the previous screen |
|  | Display the Home screen |
| VOL | Volume (up/down) |
| CH | Channel (up/down) |
|  | Mute and restore sound |
| EXIT | Exit the menu or exit the application |
|  | Activate the microphone |
| INFO | Display the current program information |
| SUBTITLE | Display subtitles in the Live TV |
| MEDIA | Enter the MEDIA |

3.2 Factory OSD Menu

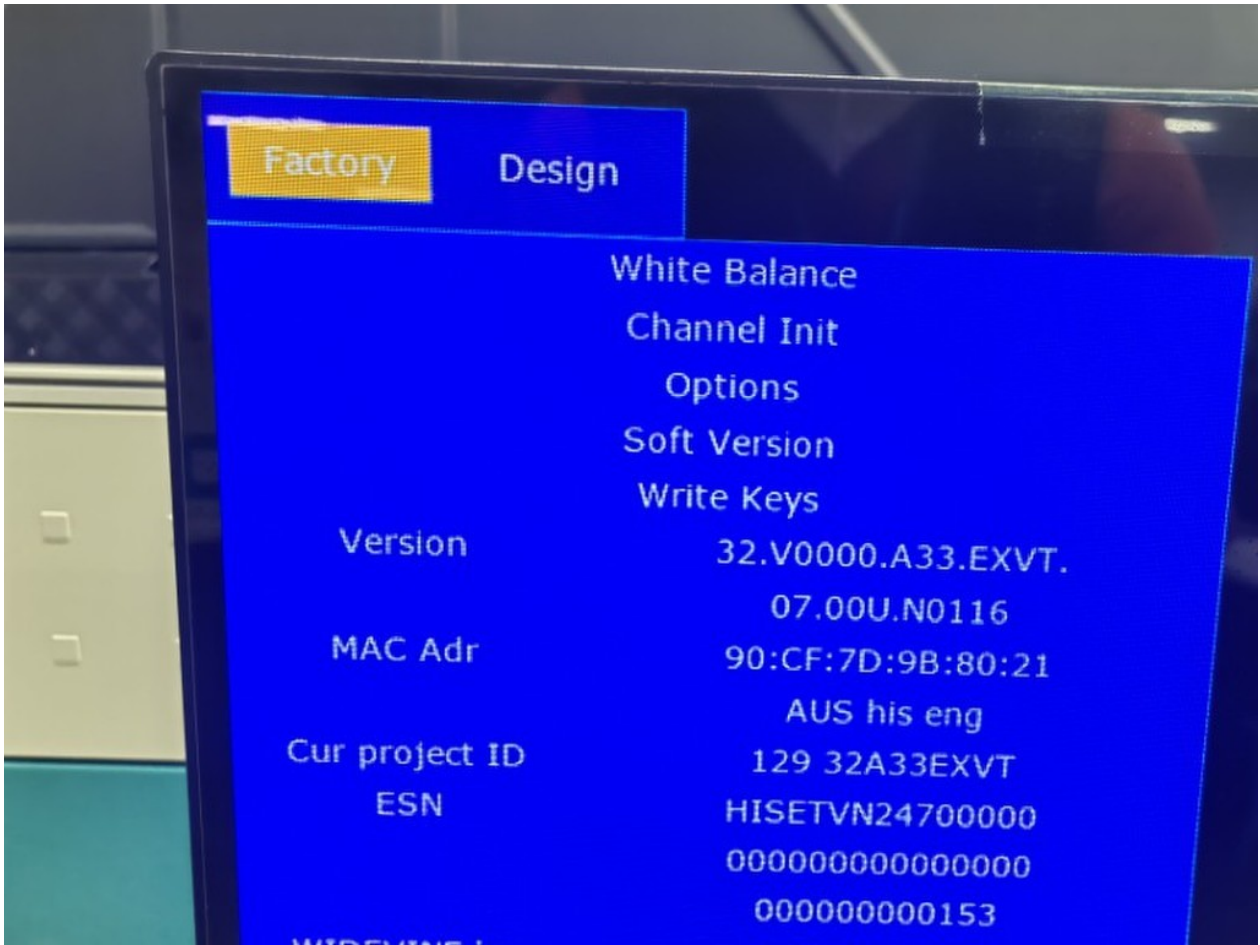
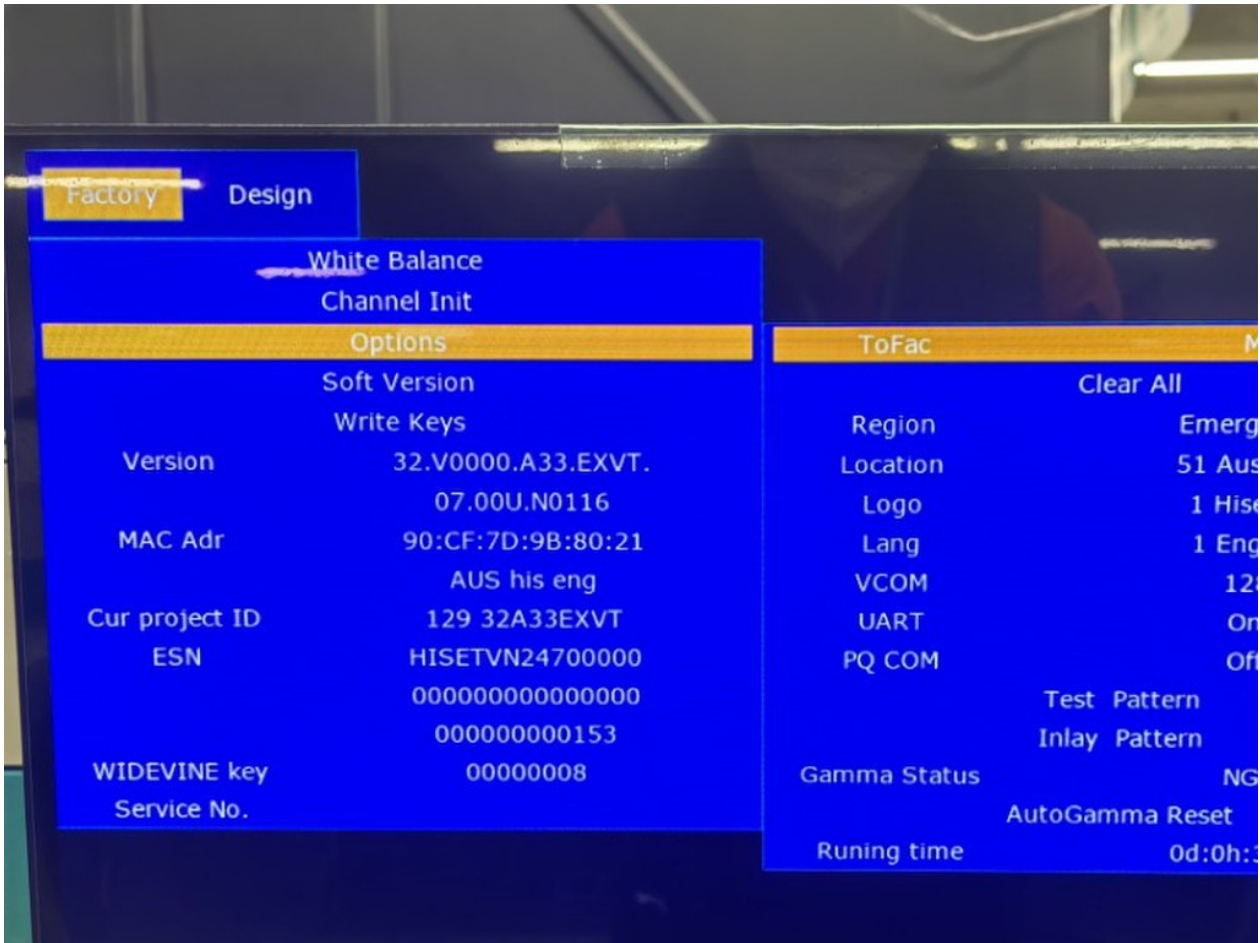


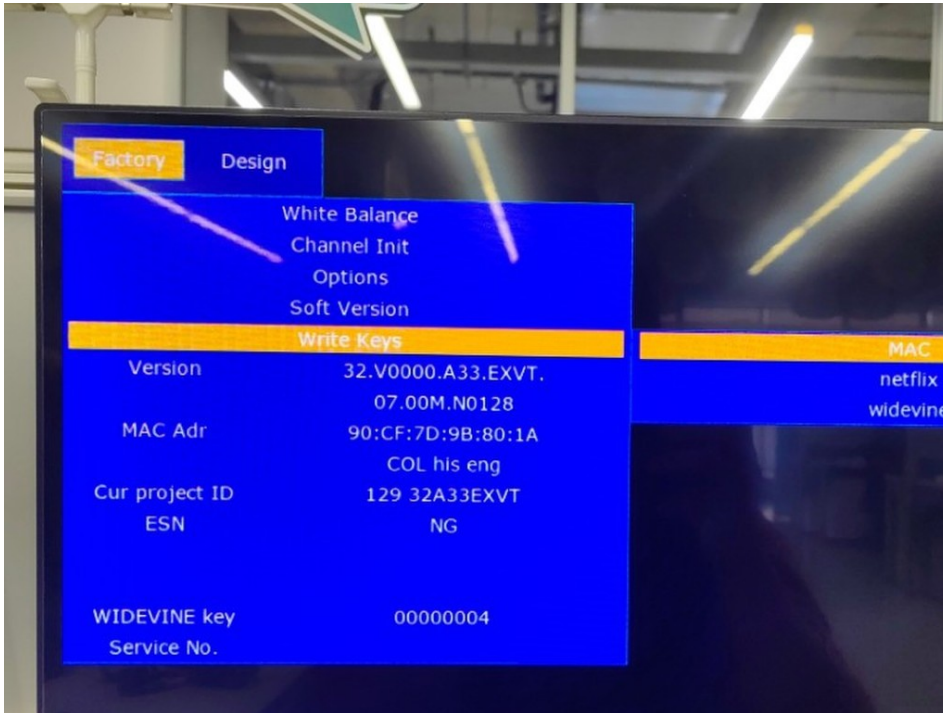
figure -1

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 32A33EXVT 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 | | |
| | ESN | The TV's electronic Serial number | |
| | WIDEVINE key | WIDEVINE key code | |
| | Service No. | LTDNXXXXXXXXY-P0001 | |



| | | |
|---------------------|--------------|---|
| 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. |
|------------|-----------|---|
| | Clear All | |
| | Region | Emerging |
| | 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 | |
| | 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 been 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 **32A33EXVT** for example.

4.1.1 TV in user mode:

- a. Decompress NOVATEK_72690_EU_2K_pkg_YYYYMMDD.tar.gz (YYYYMMDD is the year/month/day when the software is being built, such as NOVATEK_72690_EU_2K_pkg_20230129.tar.gz) and copy usb_NOVATEK_DEV_EU.bin file to the USB root directory. Please make sure the USB disk format is Fat32, and there are no other “*.bin” files in the root directory of USB disk .
- b. AC power off the TV, insert the USB disk to the USB 2.0 port, 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 usb_NOVATEK_DEV_EU.bin,next use serial “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.

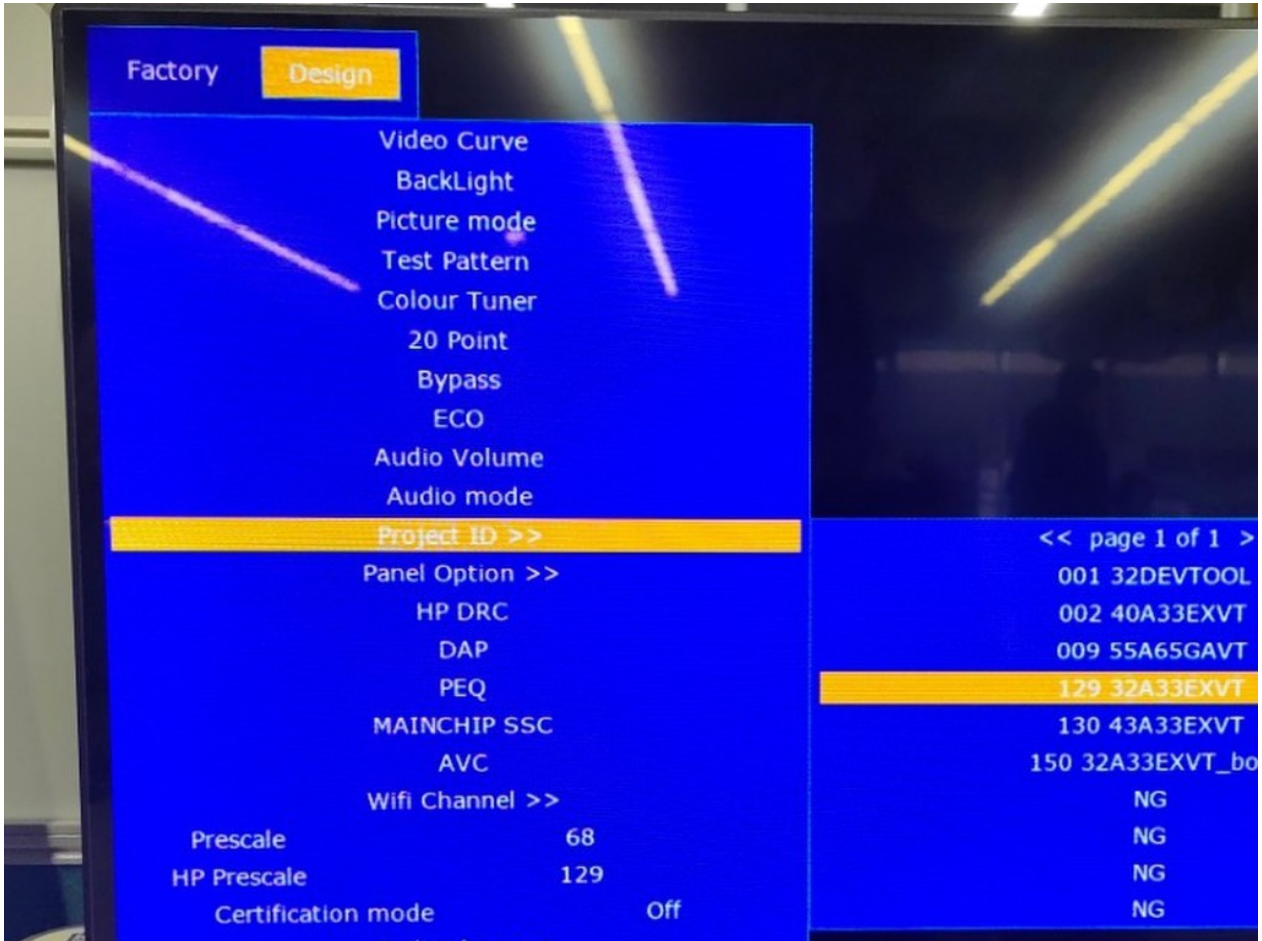


Figure-1: Upgrading software

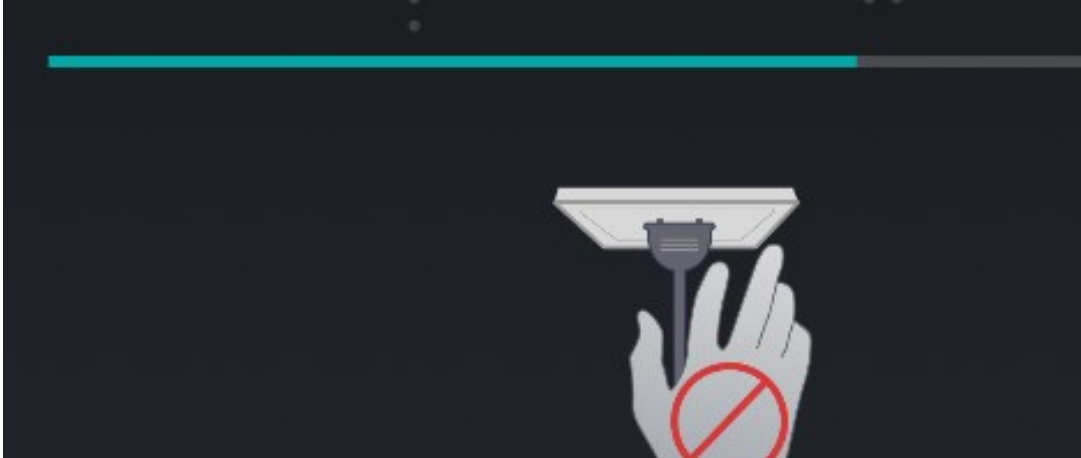


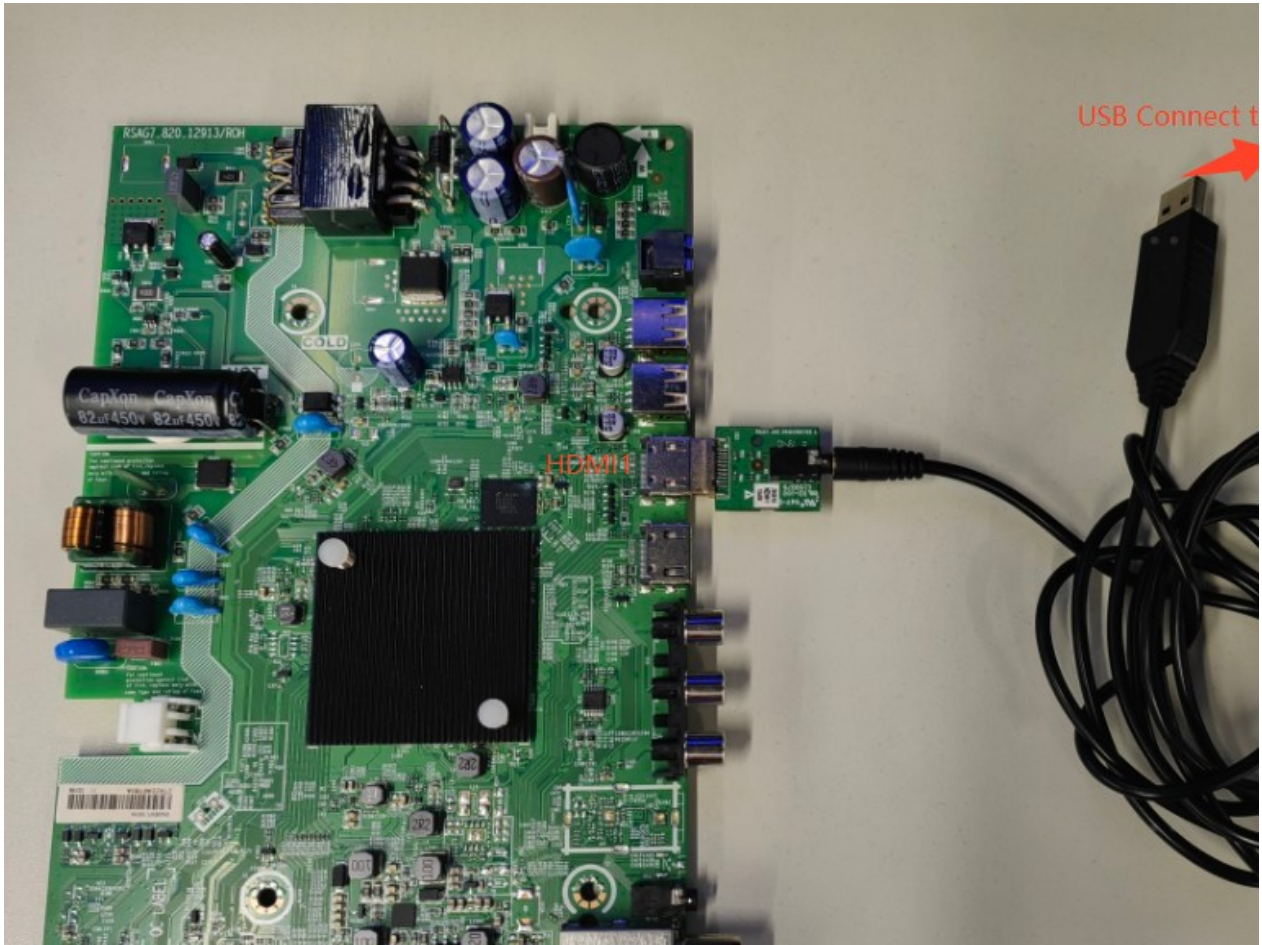
Figure-1

4.2 Novatek 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 “NOVATEK_72690_EU_2K_NOVATEK_ICCOPY_emmc_HD2K-HIS_20230129.tar.gz” 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 HDMI1. As following.



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 Novatek USB-serial driver

It's the same as Mstar bebug Tool.

If First use Mstar bebug Tool, you have to install drive software PL2303_Prolific_DriverInstaller_v1160 for bebug board.

If your PC is Windows XP system:

First install SecureCRTPortable file in your PC.

This is a drive software of Mstar



PL2303_Prolific_DriverInstaller_v1160



SecureCRTPortable.rar

Another:

If your PC is Win7 system, you will have to install PL2303_Prolific_DriverInstaller_v1160 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 “N62501_EMMC_SEC>” that meaning is in Mboot status;
- 2) Rolling many informmation 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:

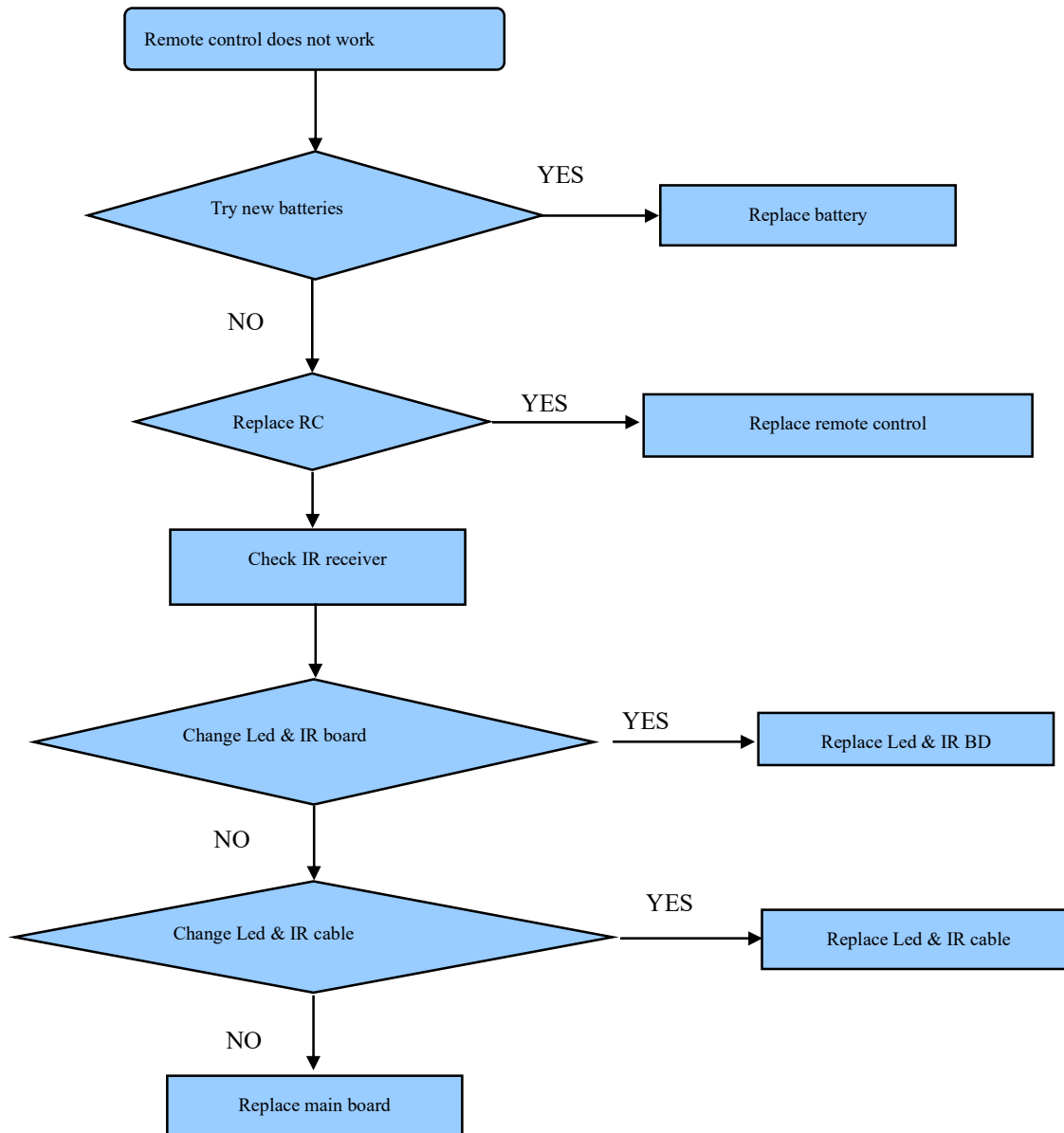
N62501_EMMC_SEC>

Input “shift” and “~” key to ensure, then close the SecureCRT window.

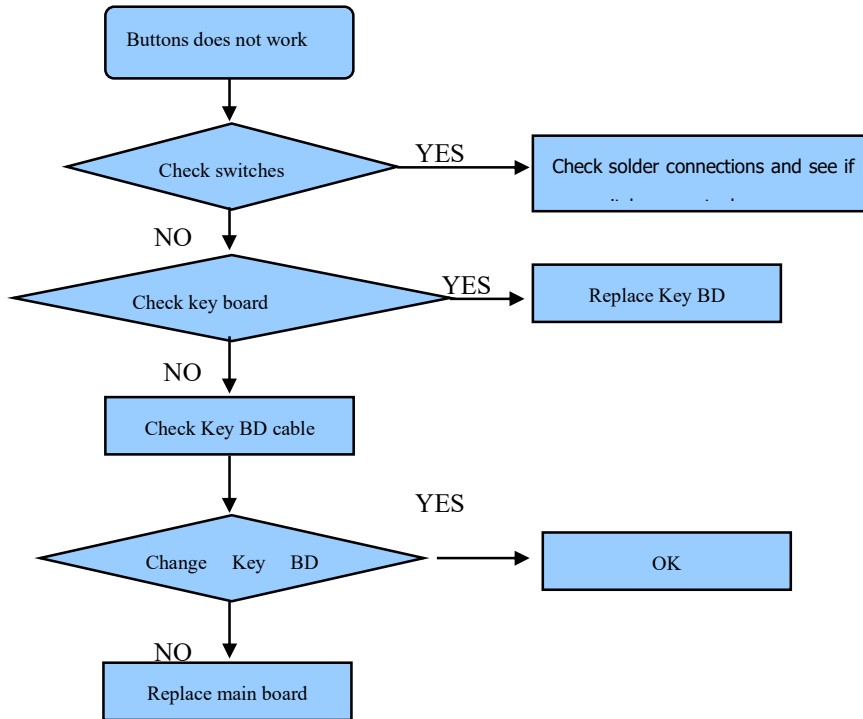
- 2) If no any print information with SecureCRT,then can directly close the SecureCRT window.

5. Trouble shooting

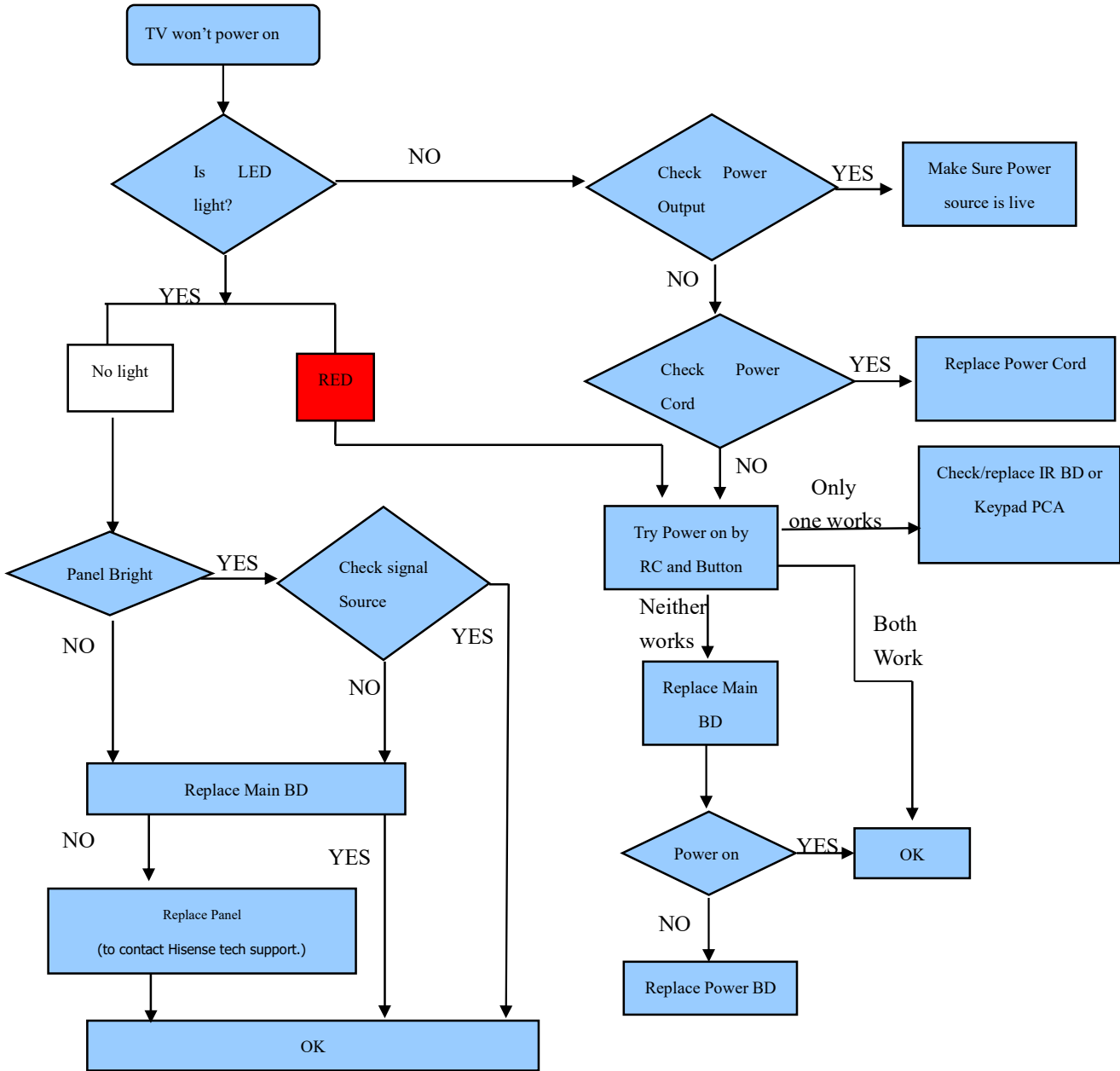
5.1 Troubleshooting for Remote Control



5.2 Troubleshooting for Function Key



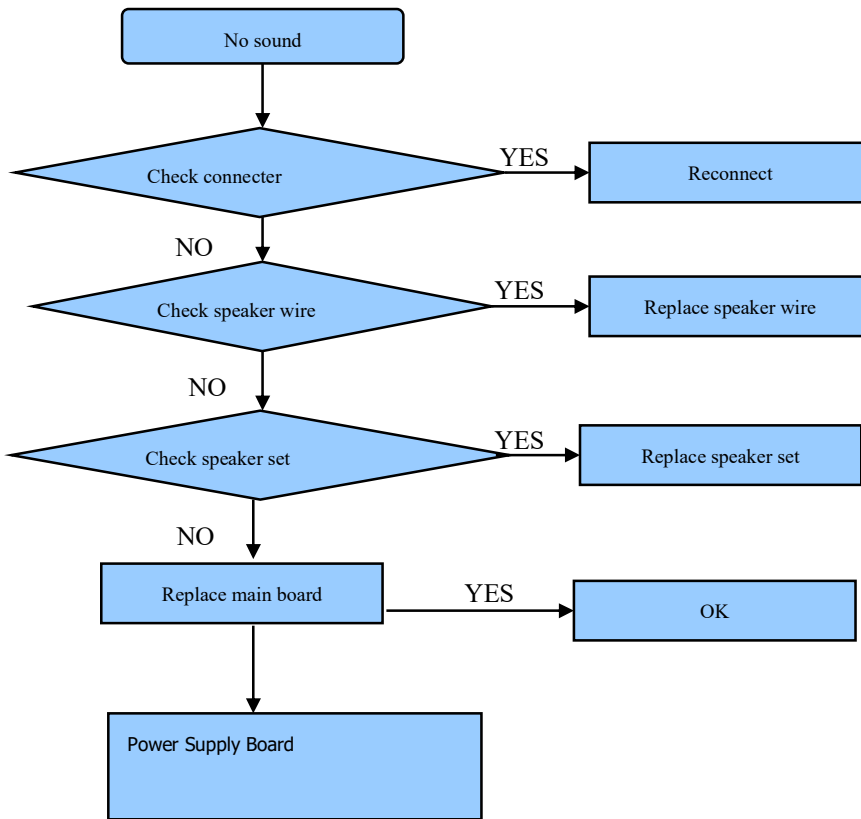
5.3 TV won't Power On



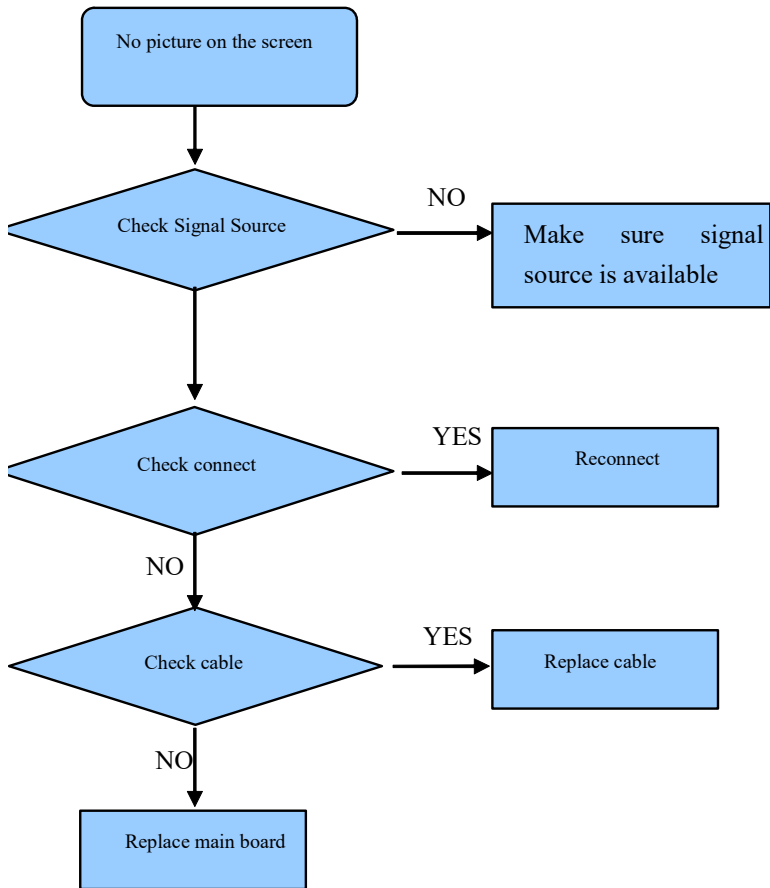
Notice:

NT72690 AU market:
 TV work normally indication led is no light.
 TV standby indication led is red.

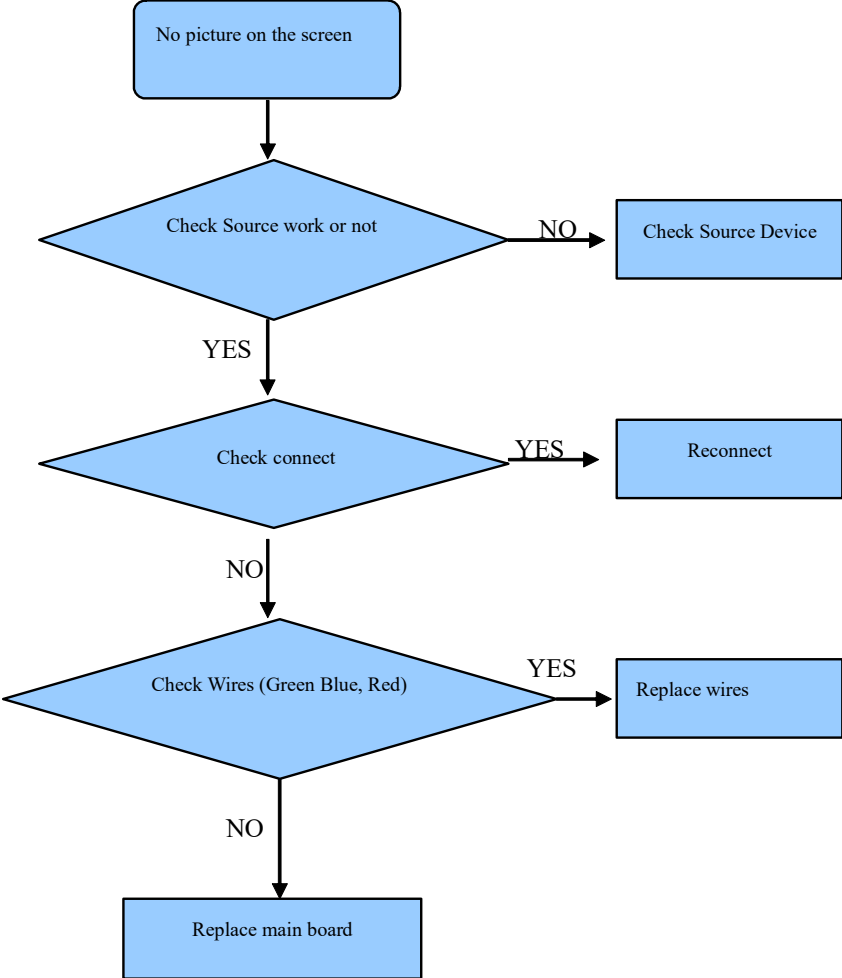
5.4 Troubleshooting for Audio



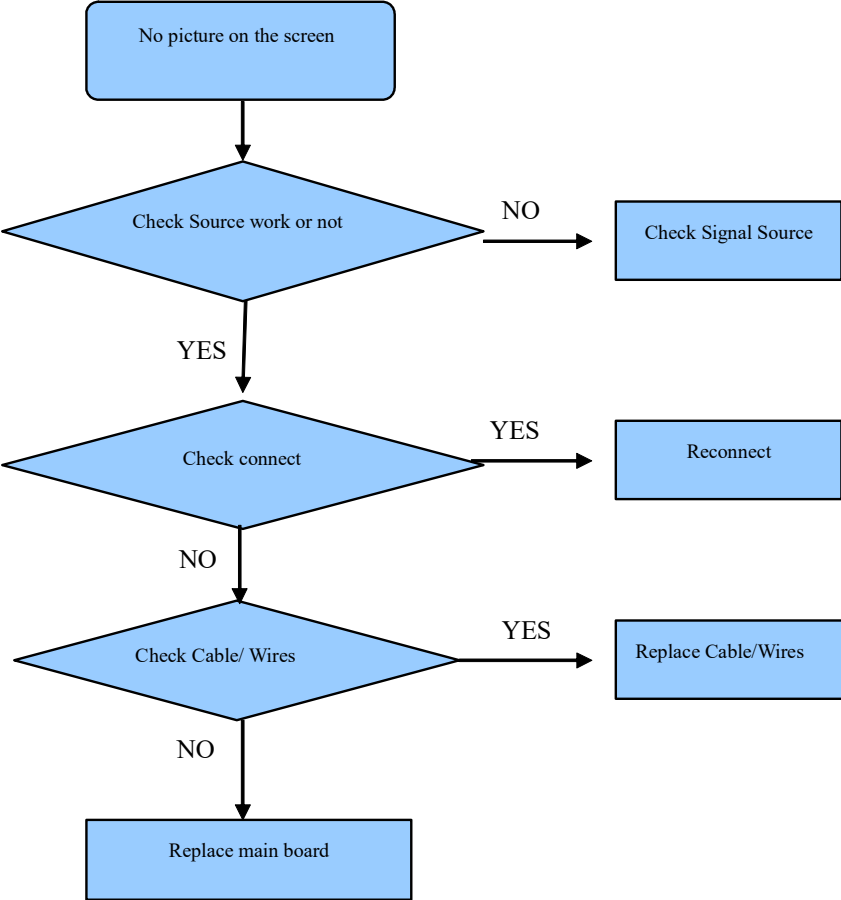
5.5 Troubleshooting for TV/VGA/HDMI input



5.6 Troubleshooting for YPbPr input



5.7 Troubleshooting for Video input



6. Signals Block Diagram & power assign & schematic diagram

