

LCD Television

Service Manual

Chassis: NT72690

Version: V 1.0

Hisense Visual Technology Co., Ltd.

Jan 29, 2023

REVISION HISTORY			
Version	Revise content	Reviser	Date
V1.00	First issued	Lixiantao	2023-01-29

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.....	- 18 -
3.1 Remote Control.....	- 18 -
3.2 Factory OSD Menu.....	- 19 -
4. Software Upgrading.....	- 25 -
4.1 USB Upgrade.....	- 25 -
4.2 Novatek Tool upgrading	- 27 -
5. Trouble shooting.....	- 31 -
5.1 Troubleshooting for Remote Control.....	- 31 -
5.2 Troubleshooting for Function Key.....	- 32 -
5.3 TV won't Power On.....	- 33 -
5.4 Troubleshooting for Audio.....	- 34 -
5.5 Troubleshooting for TV/VGA/HDMI input.....	- 35 -
5.6 Troubleshooting for YPbPr input.....	- 36 -
5.7 Troubleshooting for Video input.....	- 37 -
6. Signals Block Diagram & power assign & schematic diagram	- 38 -

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 assumes 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 strap. 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.

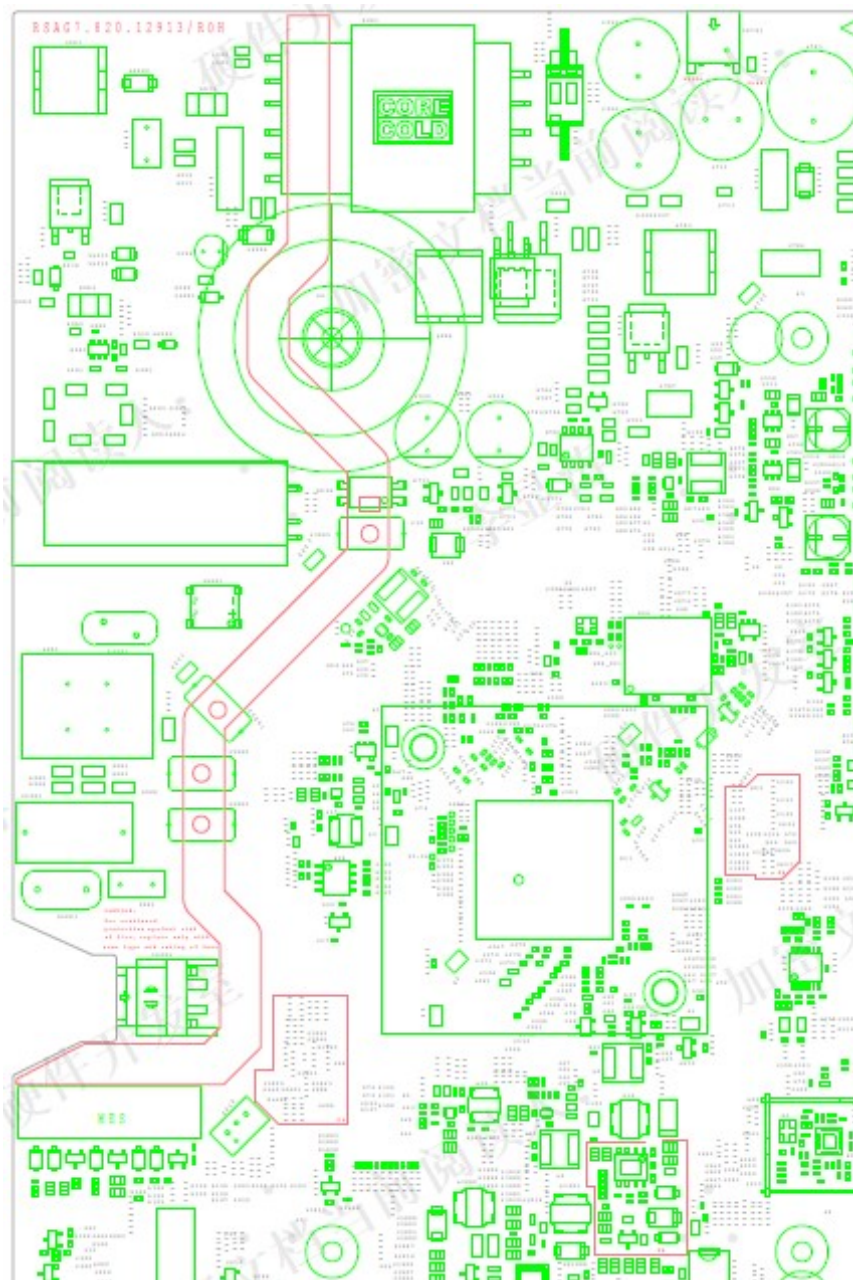


The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature. .

2. TV boards:

2.1 Main board layout

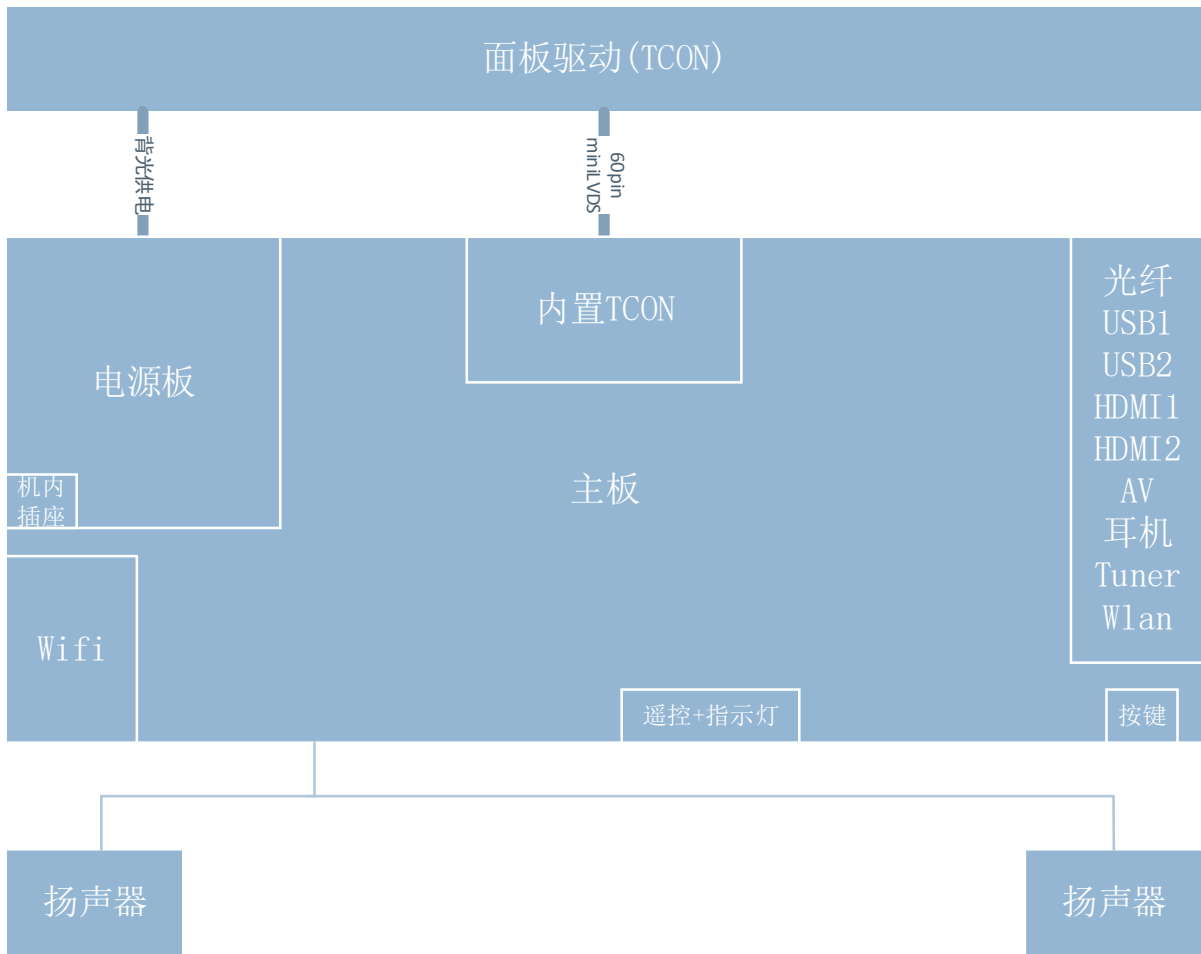
2.1.1 The top of main board (RSAG2.908.12913-01\ROH)







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



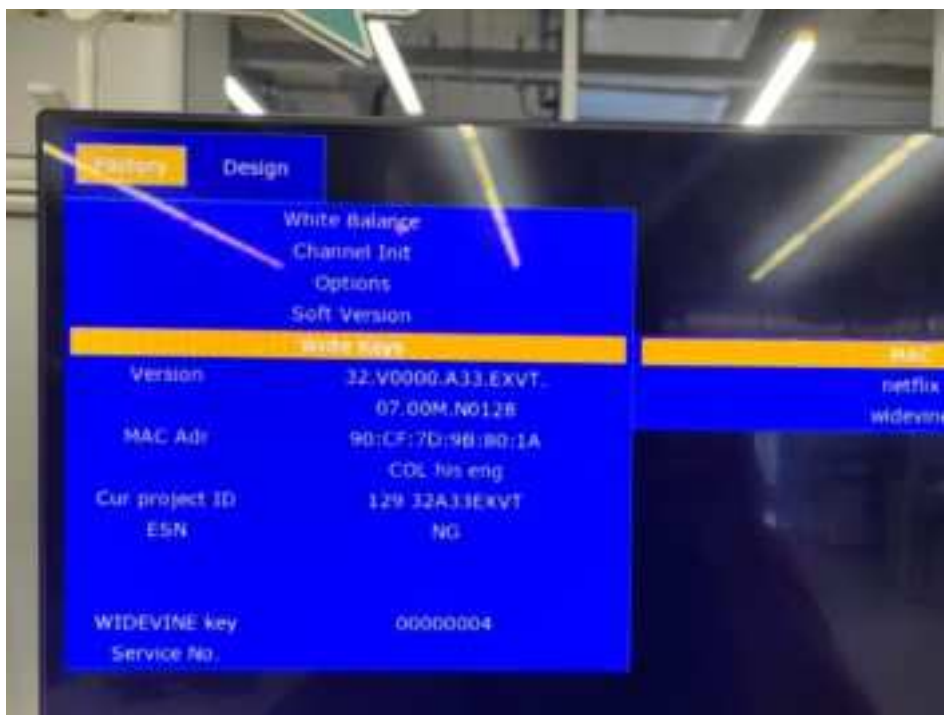
figure -1

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:



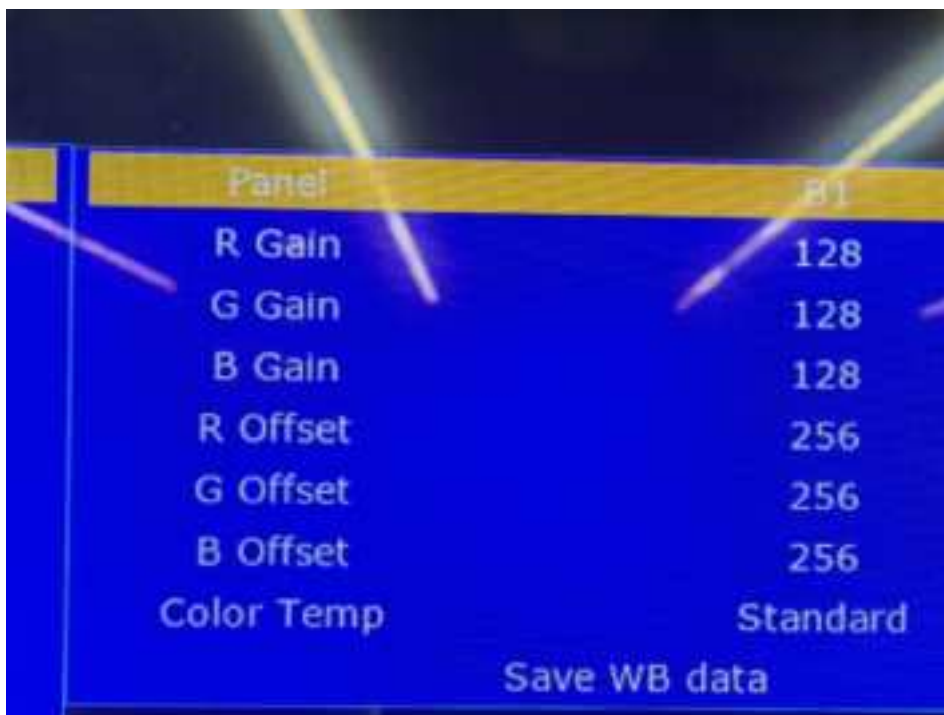
Write keys:



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:

- Select the item “**Option**”--“**Clear all**” in Factory mode.
- Press  button to clear the EEPROM data.
- Close the OSD menu after 5 seconds.
- Restart the TV.
- 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:

- 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 .
- 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..
- 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.
- After upgrade, TV can automatically reboot.
- 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:

- If TV is in Factory mode, only have difference from chapter 4.1.1 b. as following. others are same.
- 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

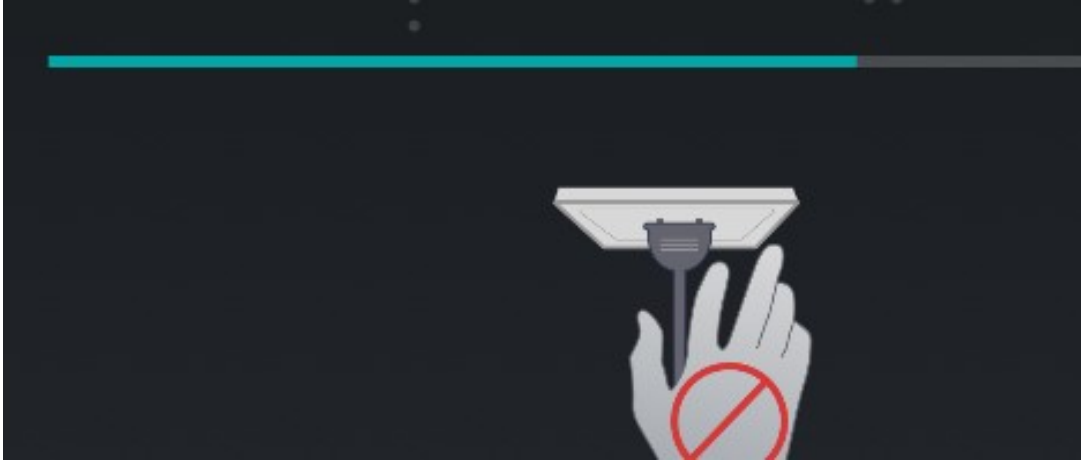


Figure-1

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 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:

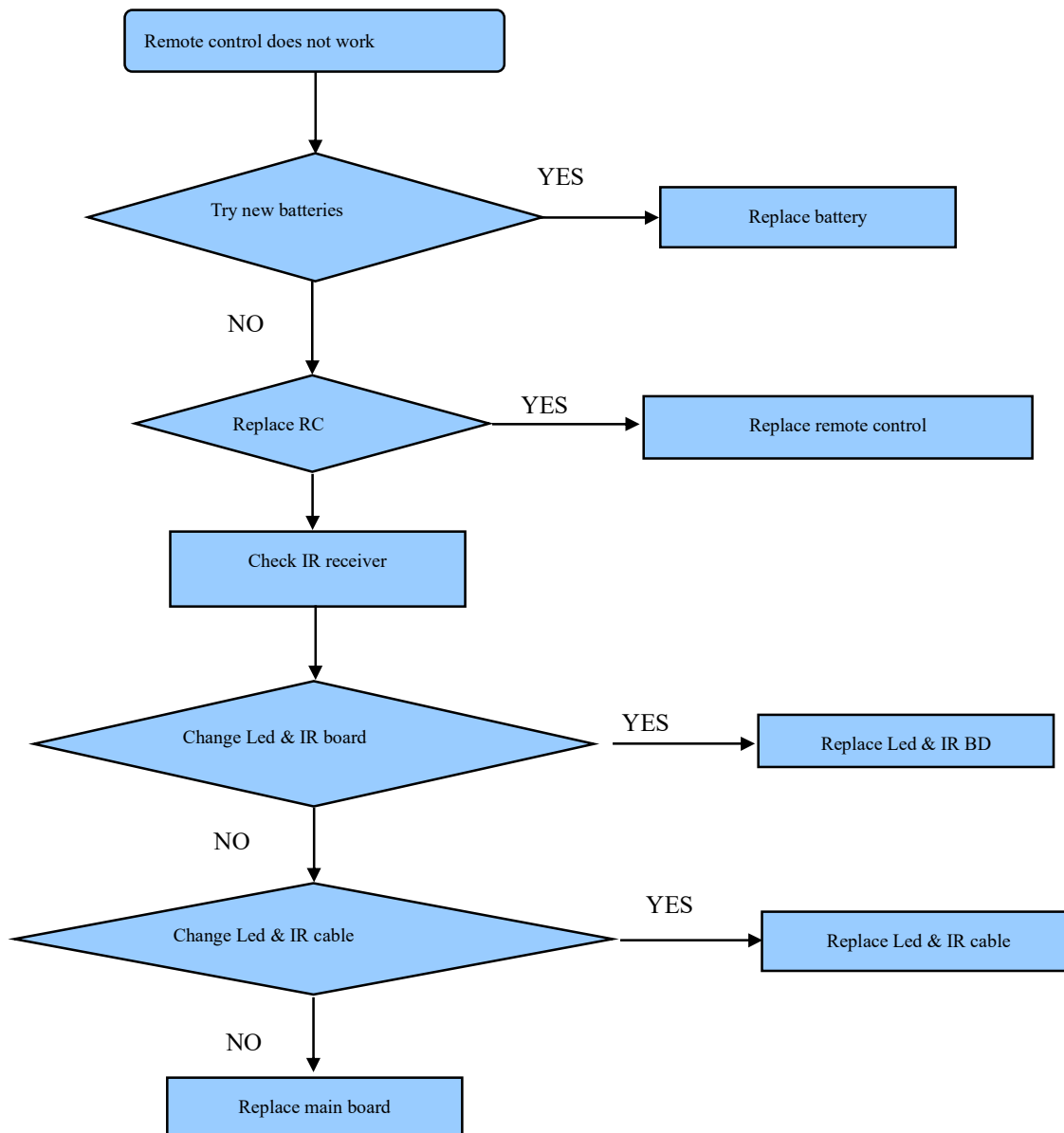
N62501_EMMC_SEC>

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

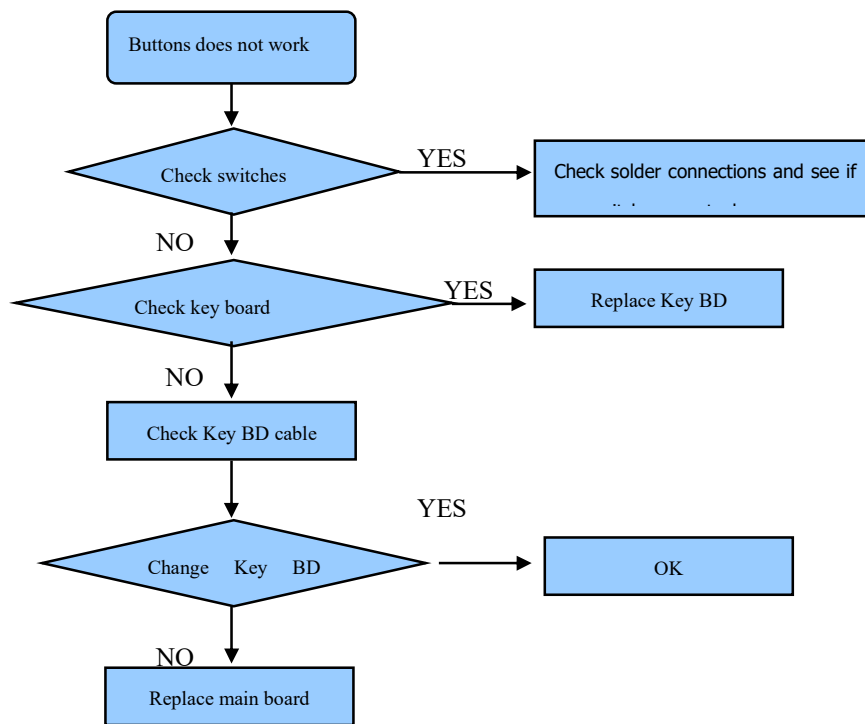
- 2) If no any print information with SecureCRT,then can directly close the SecureCRT window.

5. Trouble shooting

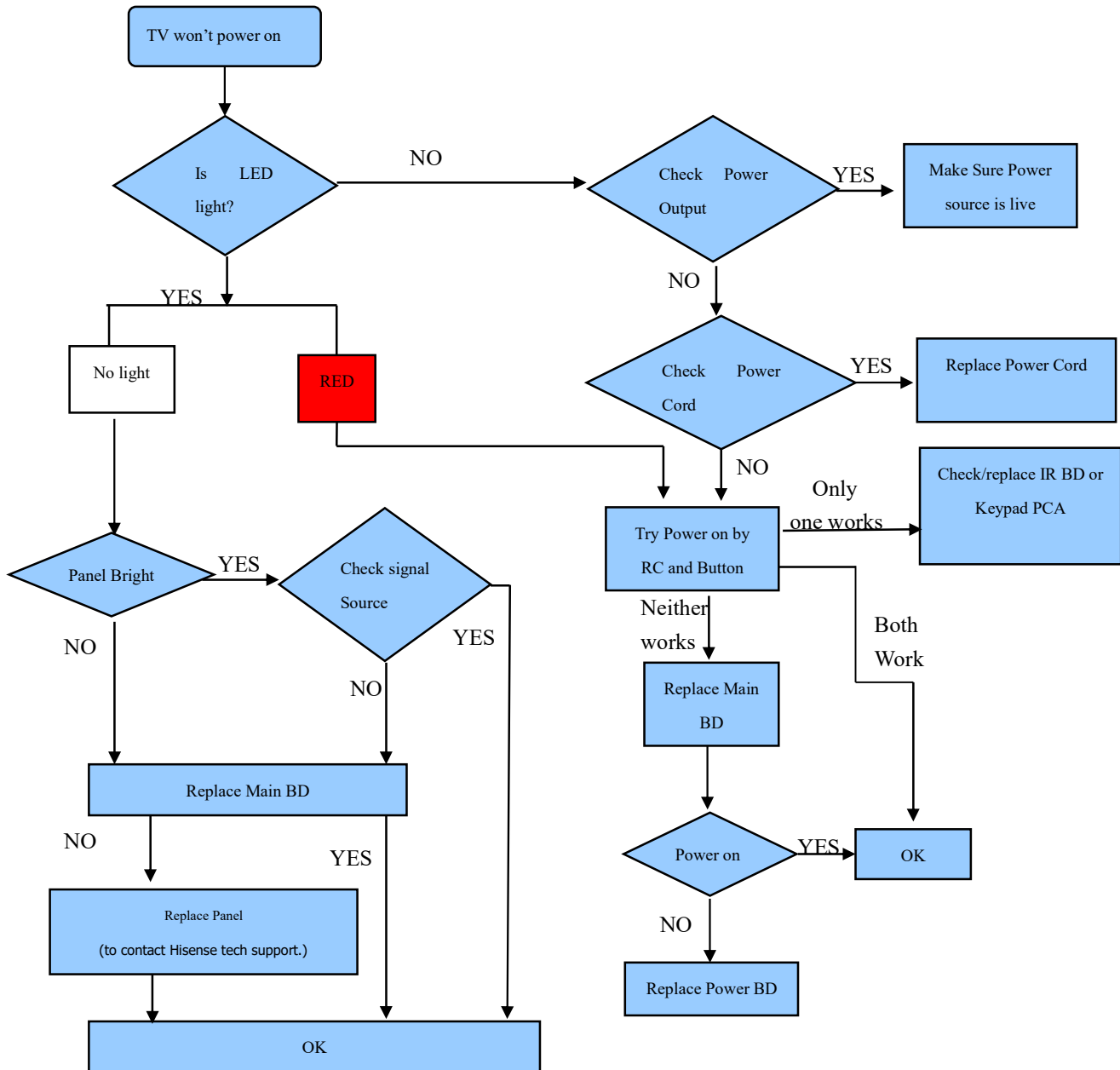
5.1 Troubleshooting for Remote Control



5.2 Troubleshooting for Function Key



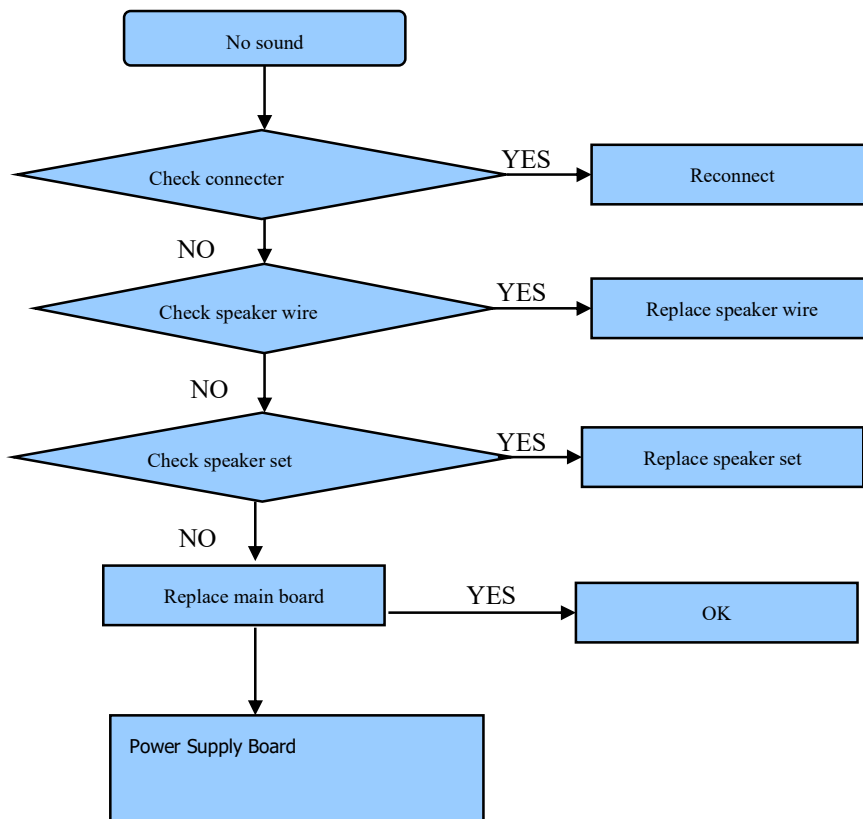
5.3 TV won't Power On



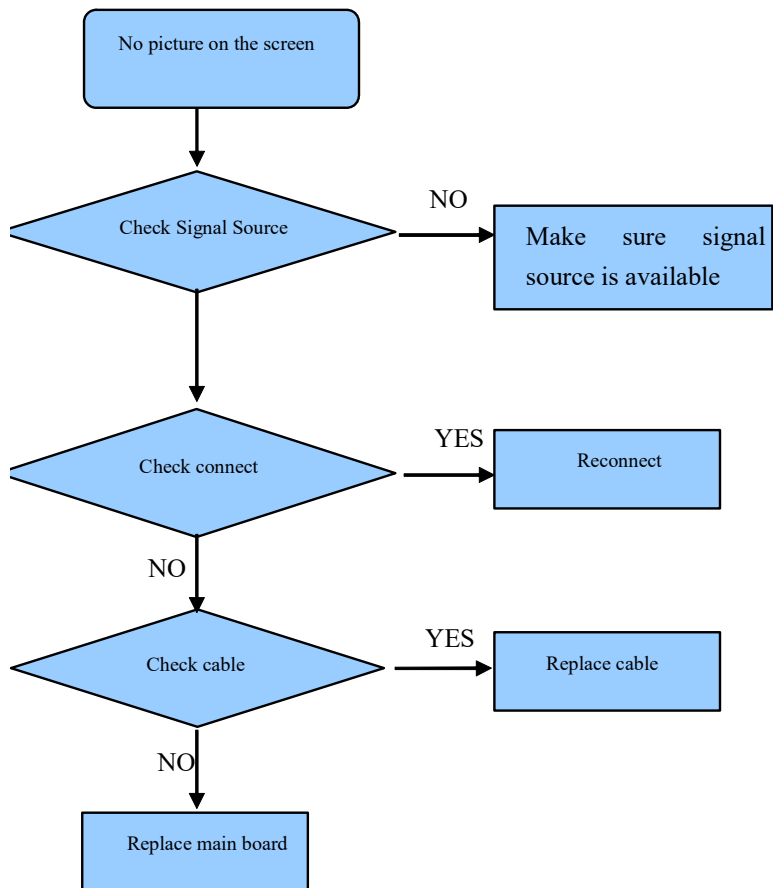
Notice:

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

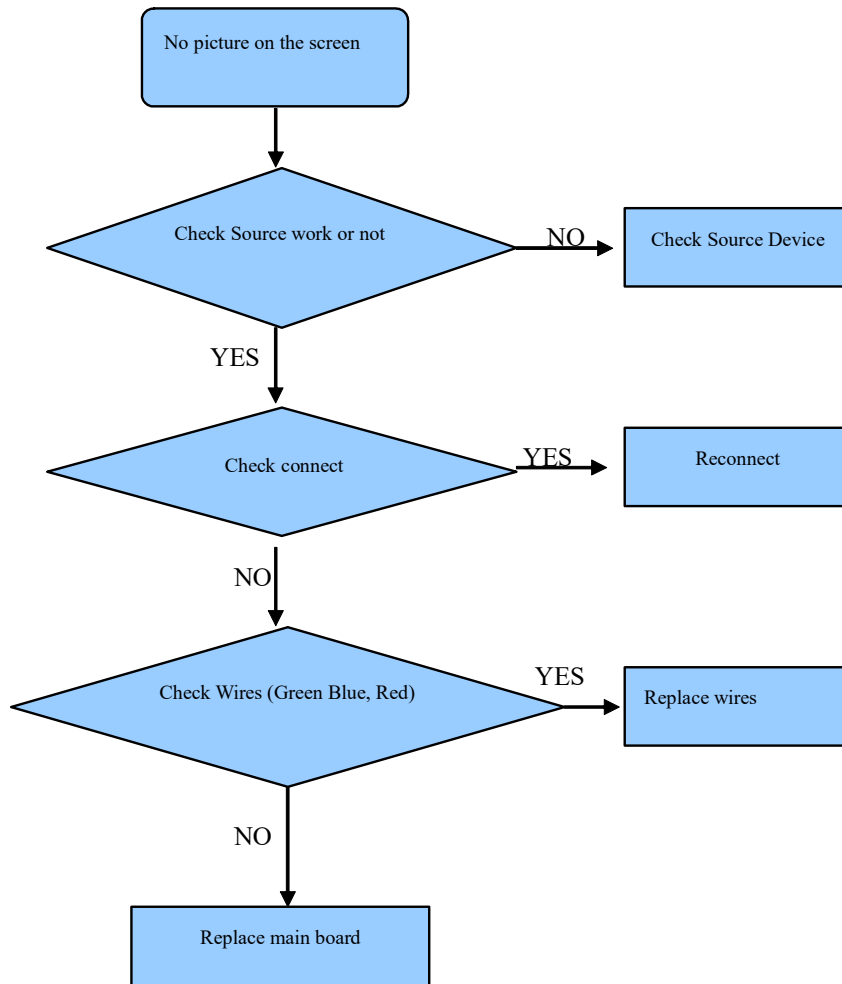
5.4 Troubleshooting for Audio



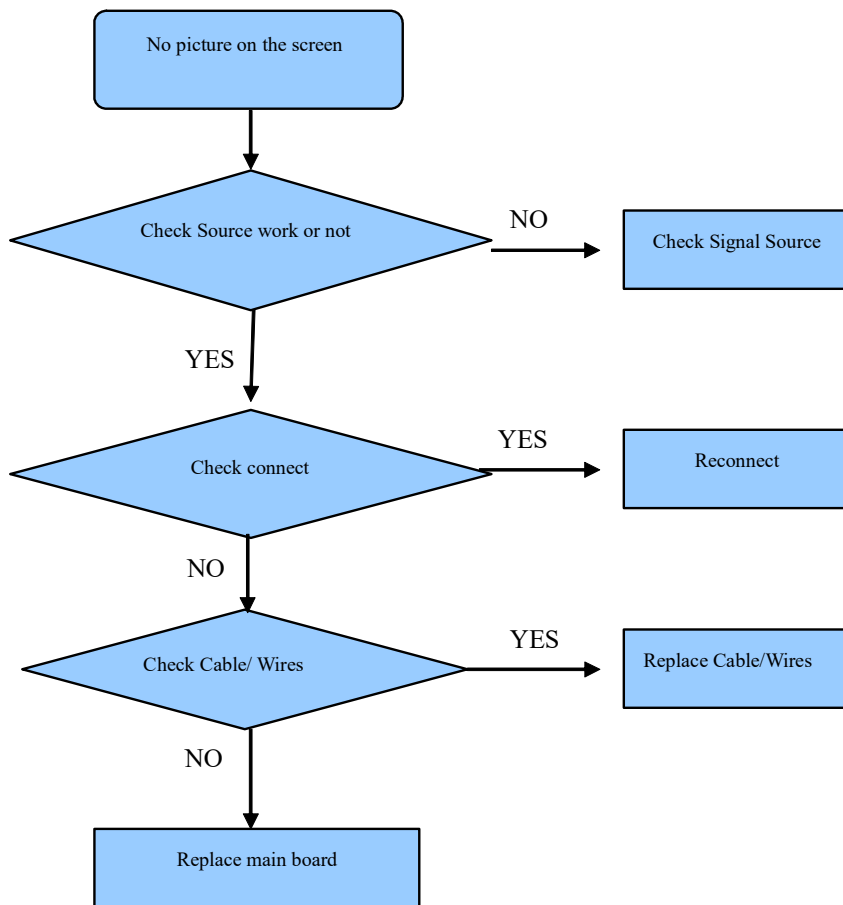
5.5 Troubleshooting for TV/VGA/HDMI input



5.6 Troubleshooting for YPbPr input



5.7 Troubleshooting for Video input



6. Signals Block Diagram & power assign & schematic diagram

