



LCD Television

Service Manual

Chassis: MSD309BT

Include TV:

LHD32K160AU\ LTDN39K160AU\ LTDN42K160AU\ LTDN50K160GAU\ LTDN55K160GAU

(Above TVS add MHL function)

Ver 1.0

Hisense Electric Co., Ltd.
January, 2013

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Service Manual

1. Precautions and notices

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

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

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

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

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

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

1.1 Warning

1.1.1

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

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

DANGER CAUTION

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

1.1.2.

All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. When repairing, make sure

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

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

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

1.1.3

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

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

1.1.4

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

1.1.5

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

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

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

1.1.6

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

touch EMI ground part and Heat Sink of Film Filter.

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

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

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

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

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

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

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

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

otherwise, this can lead to fire or electric shock.

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

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

1.2 Notes

Notes on Safe Handling of the LCD panel and during service

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

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

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

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

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

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



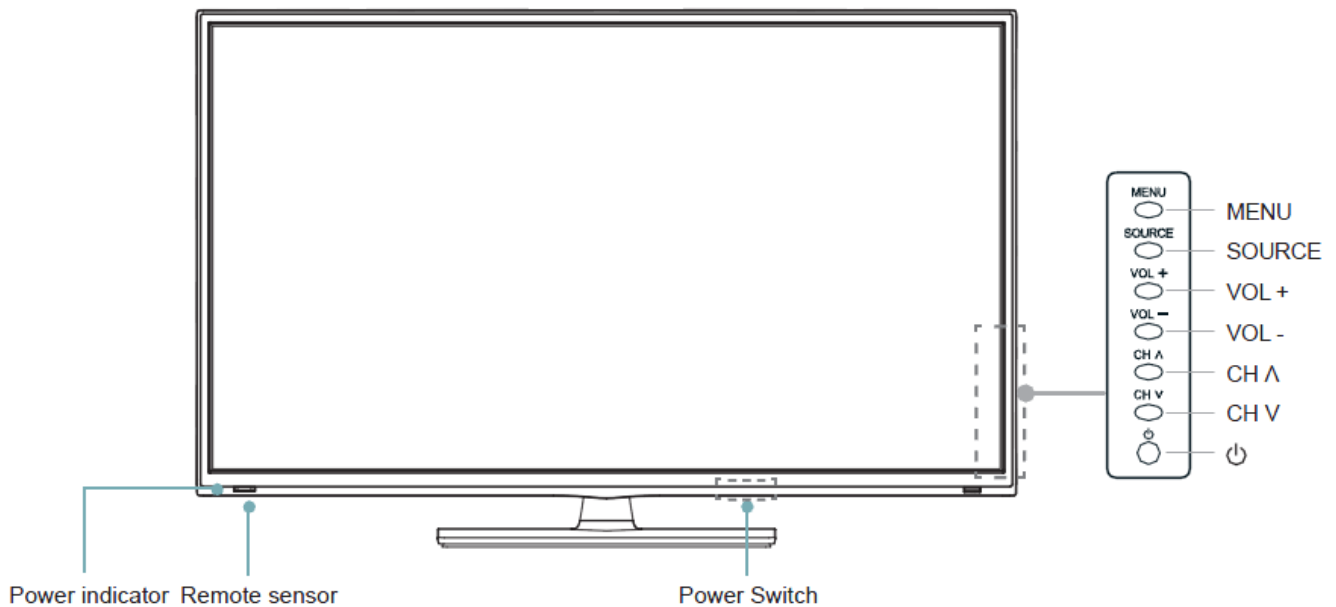
The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



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

2. Product Specifications:

2.1 TV Layout



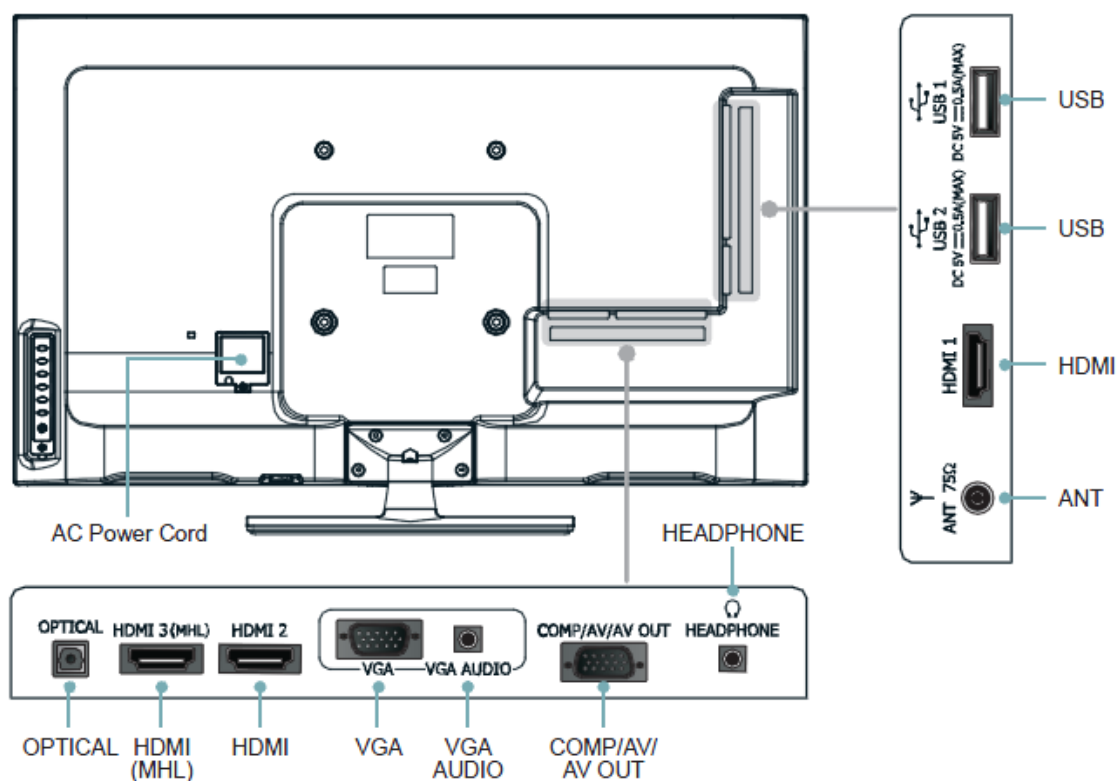
<i>Item</i>	<i>Description</i>
Power Switch	Turn the main power ON or OFF.
Power indicator	Light up when the power is on.
Remote sensor	Receives remote signals from the remote control. Do not put anything near the sensor, as its function may be affected.
MENU	Display an on-screen menu to setup your TV's features.
SOURCE	Select among the different input signal sources.
VOL + / -	Adjust the volume.
CH A / V	Select the channel.
Power Standby button ⏻	Turn on the TV or put the TV in standby mode. Caution: The TV continues to receive power even in standby mode. Unplug the power cord to disconnect power.

NOTE:

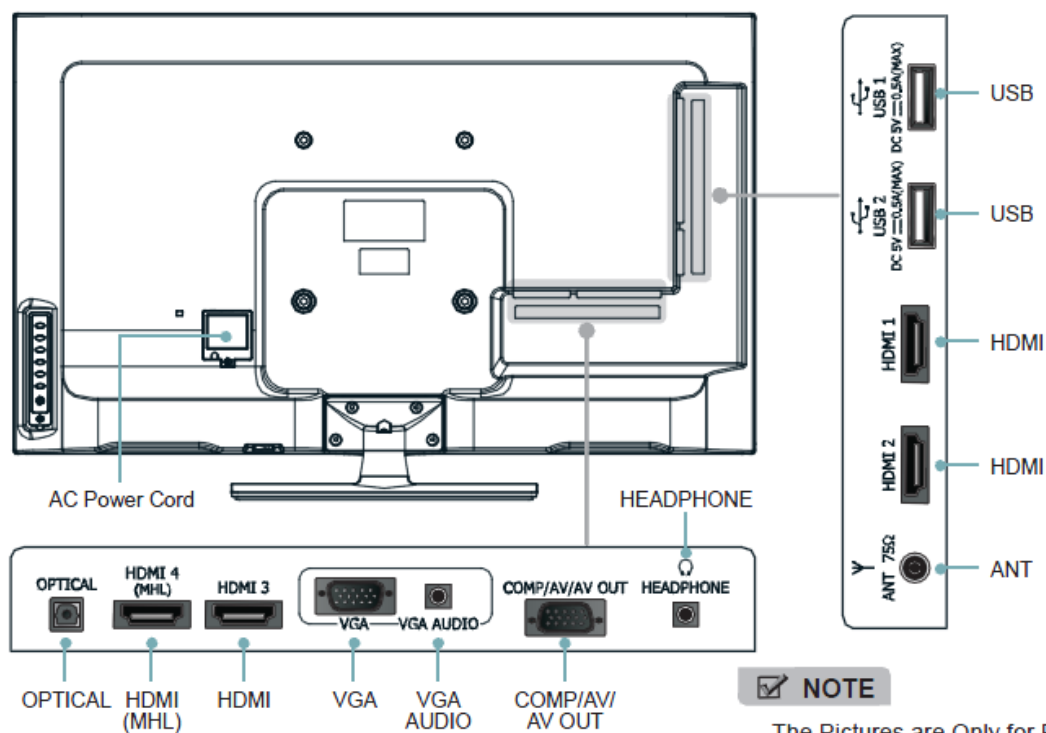
The above Specifications are reference only, other models refer to the actual User manual. Please.

TV Rear

HL32K160L



HL39K160PL / HL42K160PL / **HL50K160PL** / HL55K160PZL



NOTE

The Pictures are Only for Reference.

2.2 Specification

Technical Specifications

Colour System	PAL
Television System	PAL B DVB-T
Environmental Conditions	Temperature: 5°C - 35°C Humidity: 20% - 80% RH Atmospheric pressure: 86 kPa - 106 kPa
Component Mode	480I/60Hz, 480P/60Hz, 576I/50Hz, 576P/50Hz, 720P/50Hz, 720P/60Hz, 1080I/50Hz, 1080I/60Hz, 1080P/50Hz, 1080P/60Hz
VGA Mode	640×480, 800×600, 1024×768, 1280×1024 (Not available for HL32K160L) 60Hz
HDMI Mode	480I/60Hz, 480P/60Hz, 576I/50Hz, 576P/50Hz, 720P/50Hz, 720P/60Hz, 1080I/50Hz, 1080I/60Hz, 1080P/50Hz, 1080P/60Hz 640×480, 800×600, 1024×768, 1280×1024 (Not available for HL32K160L) 60Hz
Power Consumption	Refer to the rating label
Power Supply	Refer to the rating label

NOTE

Features, appearance and specifications are subject to change without notice.

Multimedia Compatibility

Extension	Container	Video Decoder	SPEC	Profile
*.ts	MPEG2-TS, H264-TS	MPEG2, H.264	1080P@30fps	20Mbit/sec
*.vob	MPEG2-PS	MPEG2		
*.mp4	AVI, MP4	MPEG4, Divx 3.11, Divx 4.12, Divx 5, Divx 6, Xvid 1.00, Xvid 1.04, Xvid 1.02, Xvid 1.03, Xvid 1.10-beta1/2, H.264		
*.mkv	MKV	H.264, MPEG1,2,4		
*.divx, *.avi	AVI(1.0,2.0), DMF0,1,2	MPEG2, MPEG4, Divx 3.11, Divx 4.12, Divx 5, Divx 6, Xvid 1.00, Xvid 1.04, Xvid 1.02, Xvid 1.03, Xvid 1.10-beta1/2, H.264		
*.flv	flash formats	H.264/AVC/Sorenson/H.263		

2.2 Main Board: 5115



Note:

The above “main board image” is only for reference, different models refer to the actual units to determine the boards.

Australia MSD309BT K160 Serical Chassis Series includes model:

Model	Panel Mode	LVDS (Main-Panel)	Main borad	Power board
LHD32K160AU	HE315GH-E71\PW1\ROH	HX2-2× 15KLB400-BOE\ROH	RSAG7. 820. 5115\ROH	2RSAG7. 820. 5023\ROH
LTDN39K160AU	HE390GF-E52\S6\PW1\ROH	HX2-2× 22KLB450P-CM0-02\ROH	RSAG7. 820. 5115\ROH	2RSAG7. 820. 4737\ROH
LTDN42K160AU	HE420GF-B51\S1\PW1\ROH	HX2-2× 22KLB500P-CM0-4\ROH	RSAG7. 820. 5115\ROH	2RSAG7. 820. 5030\ROH
LTDN50K160GAU	HE500HF-B52\PW1\ROH	HX2-2× 22KLB500P-CM0-4\ROH	RSAG7. 820. 5115\ROH	2RSAG7. 820. 5024\ROH
LTDN55K160GAU	HE550GF-B51\PW1\ROH	HX2-2× 22KLB500P-CM0-4\ROH	RSAG7. 820. 5115\ROH	RSAG2. 908. 5186\ROH

3. Factory/Service OSD Menu and Adjustment

3.1 To enter the Factory OSD Menu

a. With factory RC (remote control)

1. Press button “M” and enter factory mode.(Note1)
2. Press button “Menu” and enter factory OSD menu.
3. Press button “CH+”/“CH-” select the function menu, press “VOL+”/“VOL-” enter the selected function menu. Press “VOL+”/“VOL-” button adjust values in the menu.
4. Press button “M” exit factory mode in the factory OSD menu.

When TV exit factory mode, user can not enter factory OSD menu with Factory Remote

Note:

1. In the “Factory Menu”, item “Function”->”TOFAC” ,you can select “M” or “U”, default is “U”.
----M-Means you can enter factory mode with factory RC or user RC.
----U-Means you can enter factory mode only with user’s RC.
2. Mode “M” is only used for factory production.

b. With user’s RC

Power on the TV.

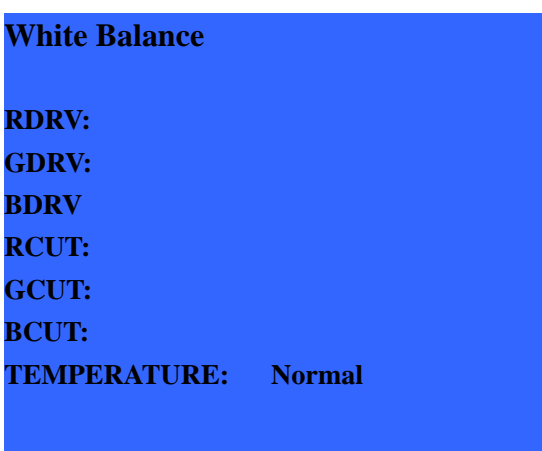
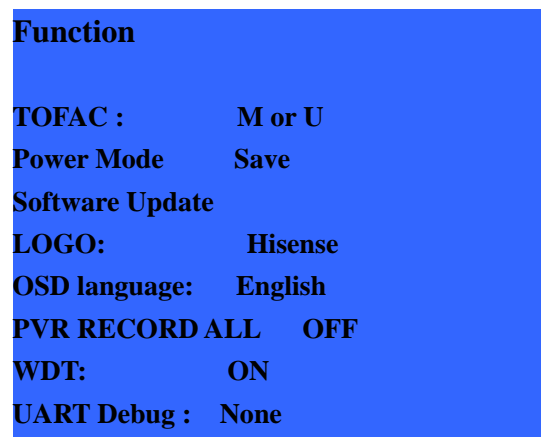
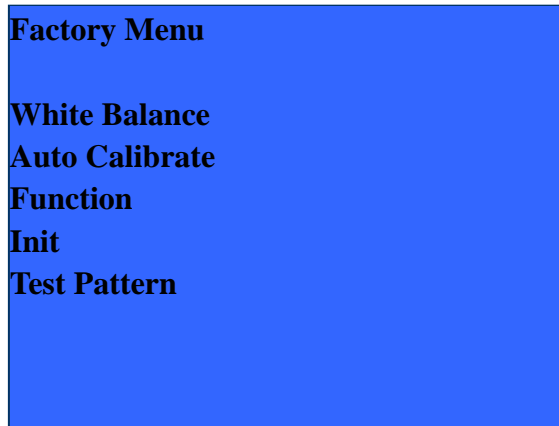
1. Press button “Menu” and call up User OSD Menu.
2. Select“ Sound” Menu-> “Balance” item.
3. Press number key 1->9->6 ->9 in sequence when “Balance” item is focused.
Note: If necessary, re-do number keys.
4. Factory OSD appears.

Note: Press the standby button then AC turn off and restart the TV, which can exit factory OSD menu.

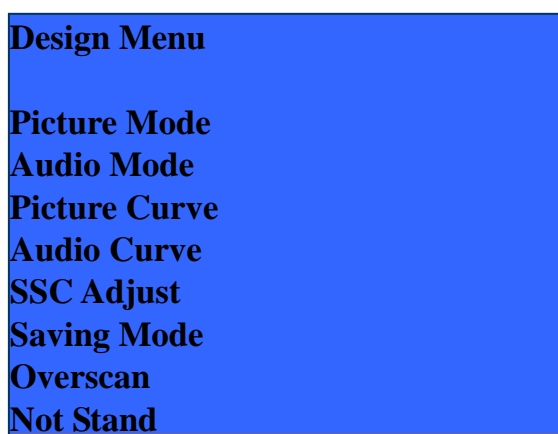
3.2 Factory OSD Menu

The Factory OSD Menu comprises Factory Menu and Design Menu .

3.2.1、 Factory Menu



3.2.2、Design Menu



Note:

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

4. Software Upgrading

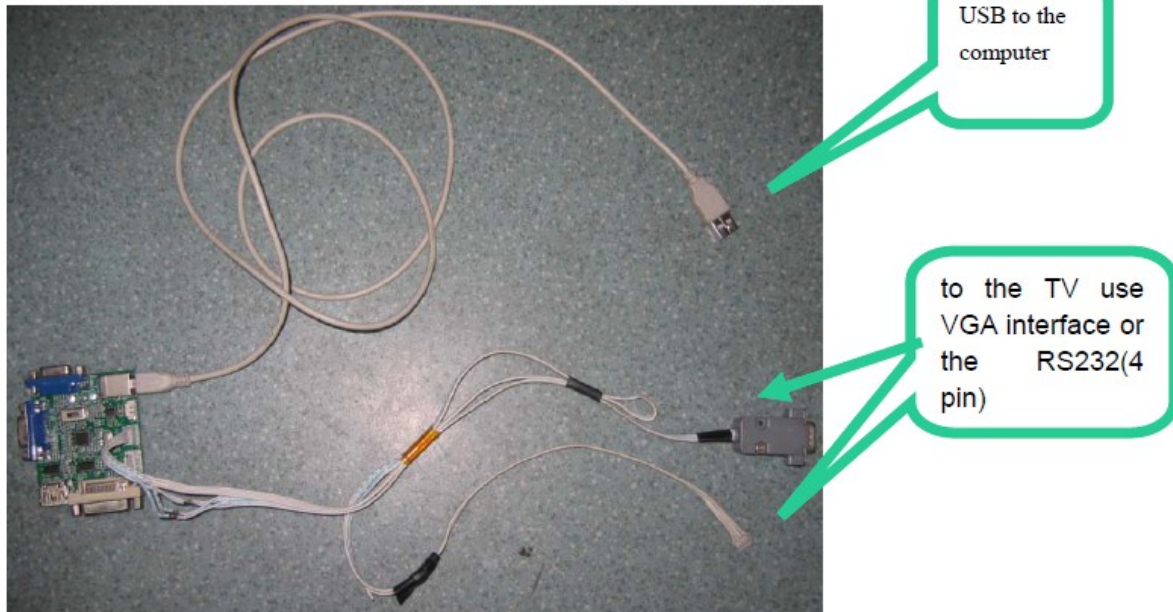
4.1 Upgrading with the ISP_TOOL

4.1.1 Hardware connecting

You can update the software through a special tool (as following)

Connect the Debug board to the TV use VGA interface or the RS232 (4 pin), the other USB port to the compute.

You can update the software through a special tool (as following)



4.1.2 Install the ISP_TOOL4.5.0.4-----only for the first time update.

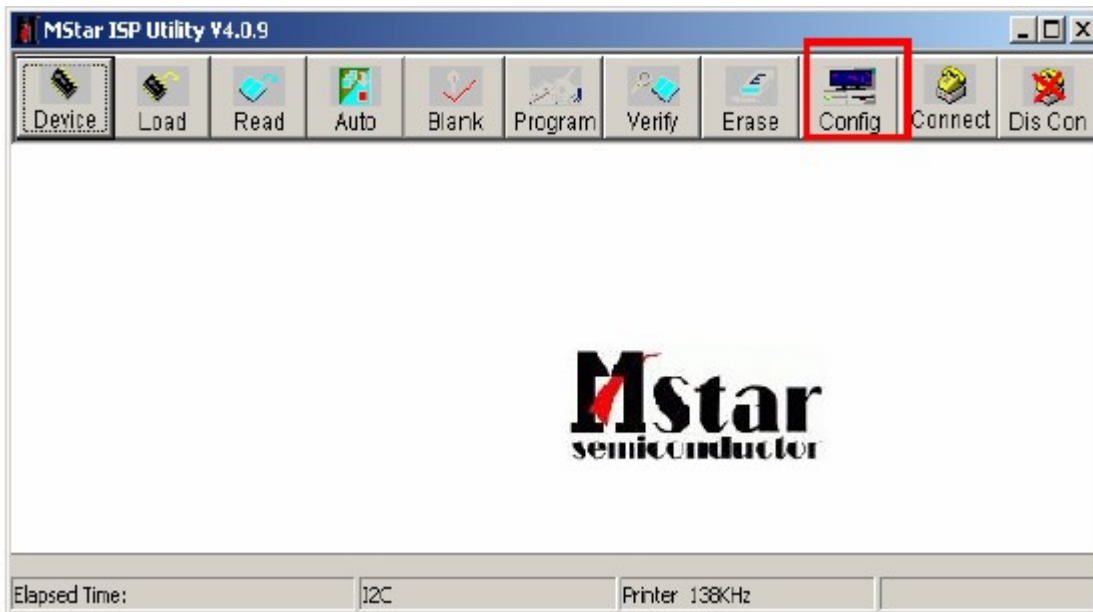
- 1、 The software is upgraded by a burning tool- ISP_TOOL.exe
- 2、 Find the folder where the ISP_TOOL4.5.0.4 lies in.



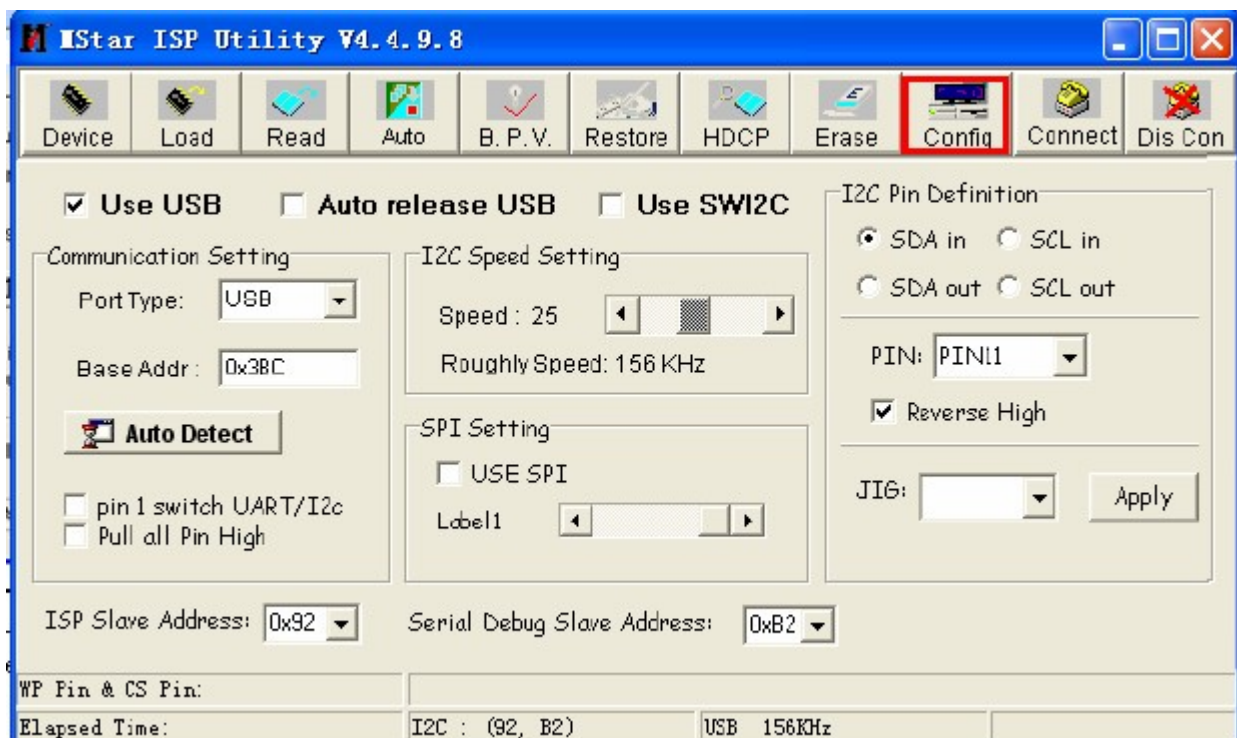
There are three folders/files in this folder together.

DLPORTIO.dll and FTD2XX.DLL must be in the same folder

3、 Double click the ISP_TOOL4.5.0.4 icon, and then a dialog window will show as below.



4、 Click the " **Config** "button. And then a dialog window will show as below.



Draw on the front of "Use USB"

Port Type setting is USB

Base Addr setting is 0x38C

ISP Slave Address choose 0x92

Serial Debug Slave Address choose 0xB2,

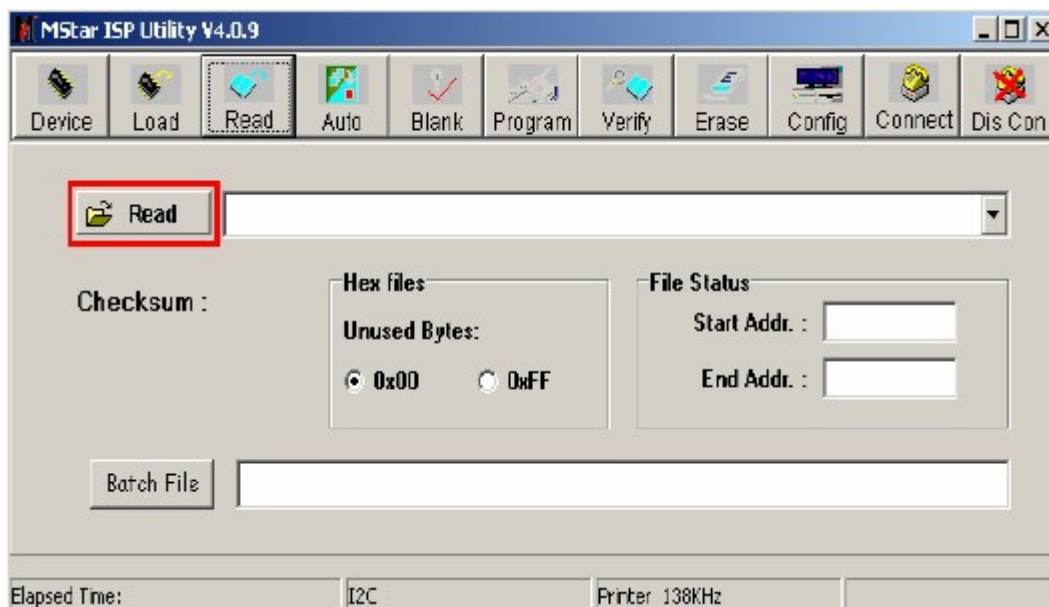
5、Click the “Connect” button, if appear the following figure, It indicates that the ISP_TOOL has connected.(According to the tv set,”Device Type” maybe different.)



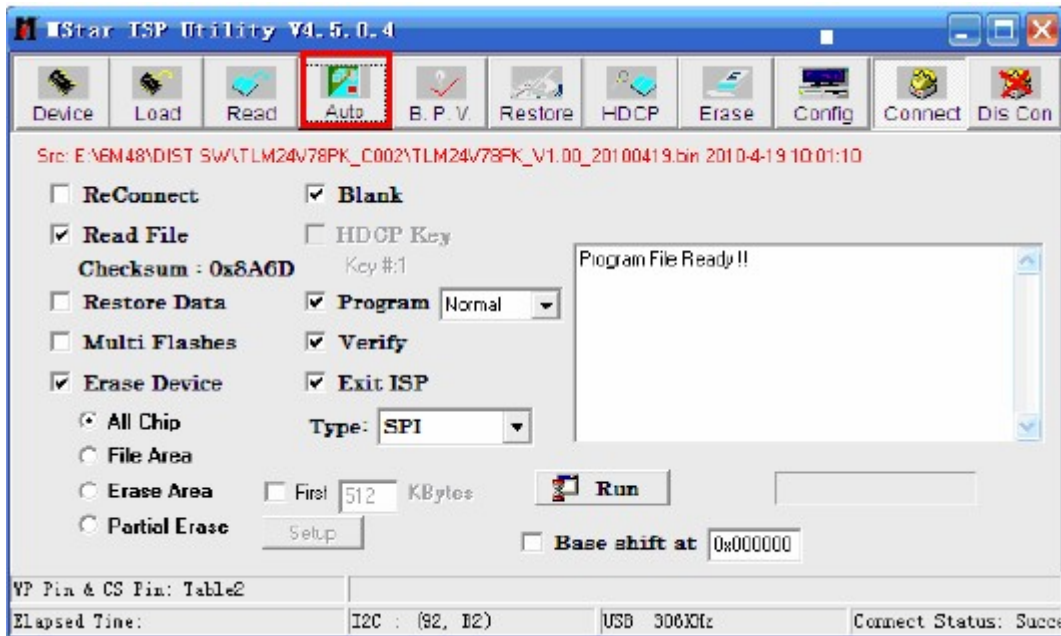
If appear the following figure, It indicates that the ISP_TOOL has not connected. Please click the “DisCon” button and “Connect” button to connect..



6、Click the “Read ” button, **Choose the correct update file。**



7、After the update file has been chosen successfully。
Click the “Auto” button and choose parameters as following。



8、Click the “Run” button and wait update end.

If show any error message , then do “Dis Con” >> “Connect”, and click the “Run” button again, till show the following dialog window。

4.2 Upgrading with the USB

Software can update with USB device:

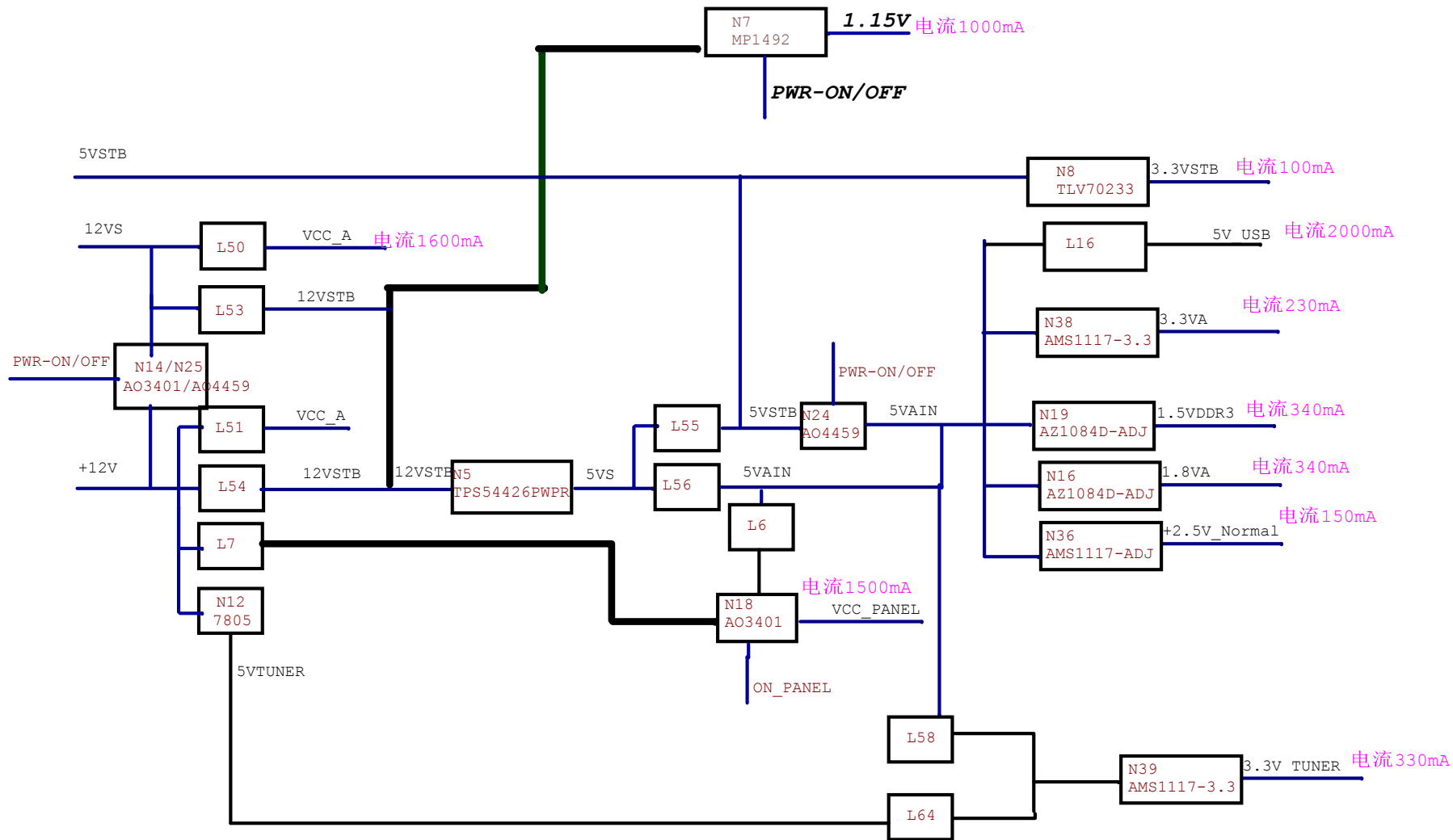
1. Copy the "*.BIN" file such as "MERGE.BIN" to the root directory of a USB disk.
2. Insert the USB disk into the USB slot of the TV SET.
3. Press "Menu" button and call up User OSD Menu, choose "Channel"->"Software Update(USB)" item. (Note 1)
4. Press "OK", it will show a confirm message box, Press [◀] button to select "yes" in the confirm message box, to start automatic update.
5. Then it will update the software automatically, Please don't power off during the updating process.
6. After the software is successfully upgraded, TV SET will restart automatically.

Note:

1. In some TV SET, "Software Update(USB)" item maybe in "OPTION" menu.
2. After updating, you must confirm the software version in the "Factory Menu" and you'd better do " **UnProtected Clear**" in the "Factory Menu".

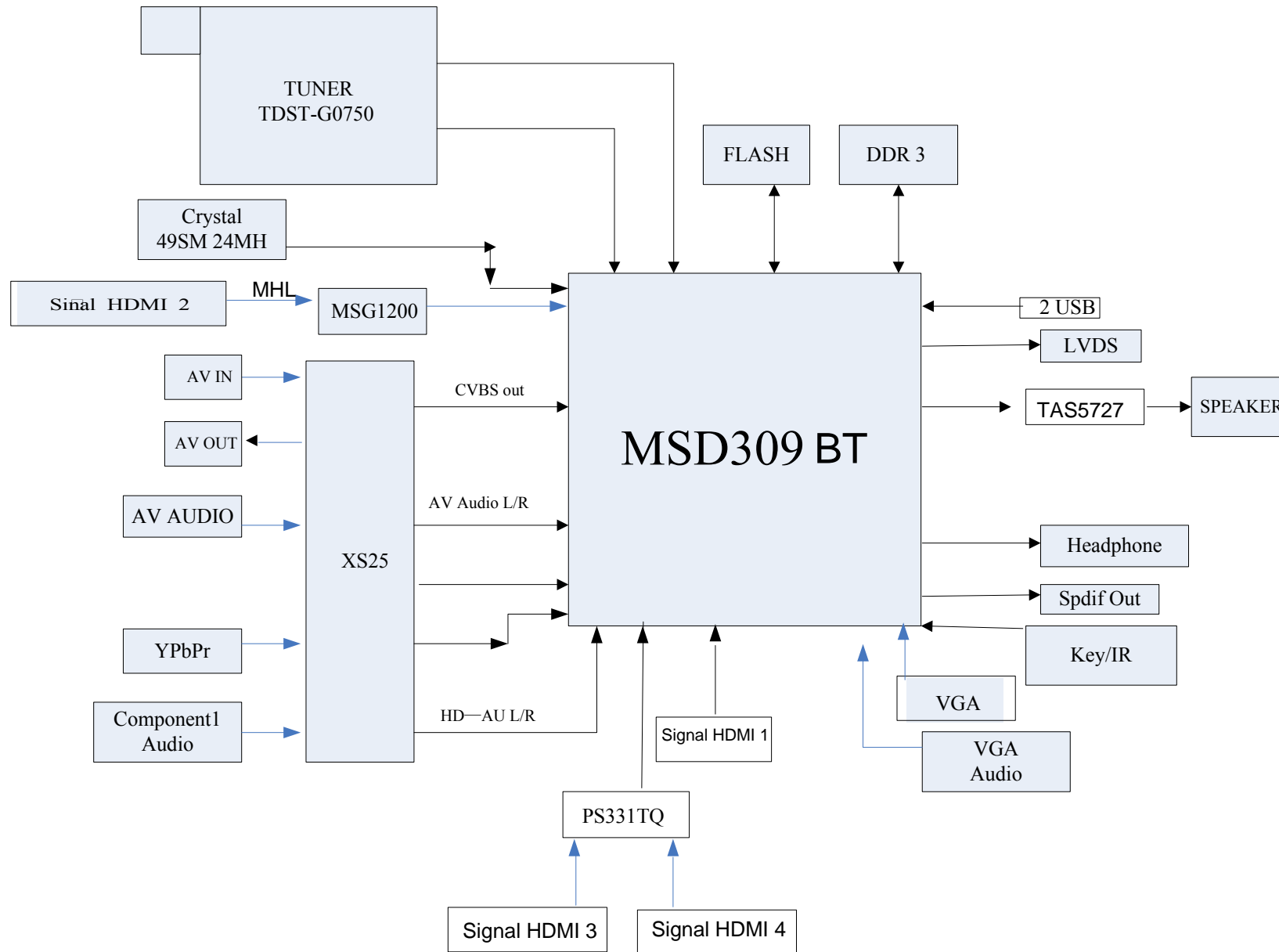
5. Circuit instruction

5.1 Main board power assign and block diagram



MSD309PX Australia

Signal Diagram

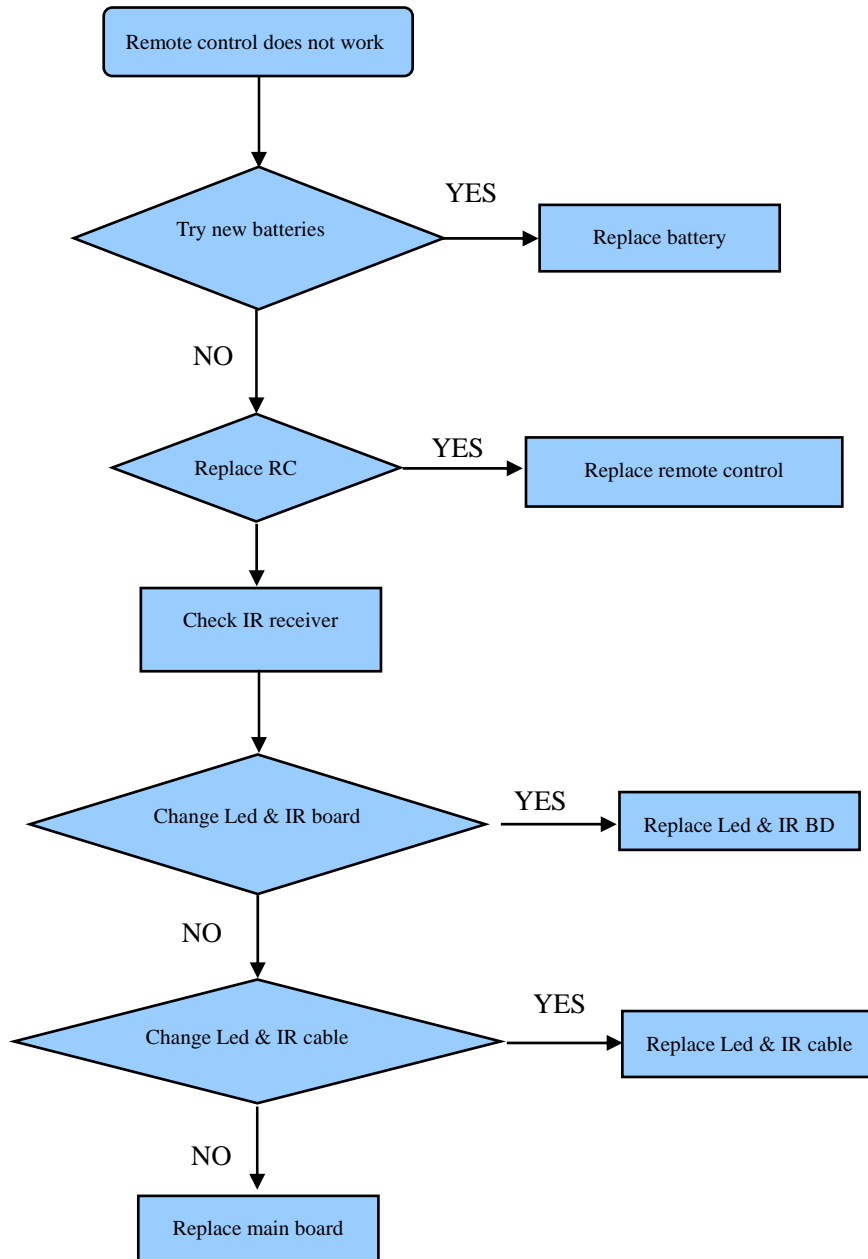


Note: The above diagram is only for reference. The TV has same chassis but different size, the Qty. of terminals have difference.

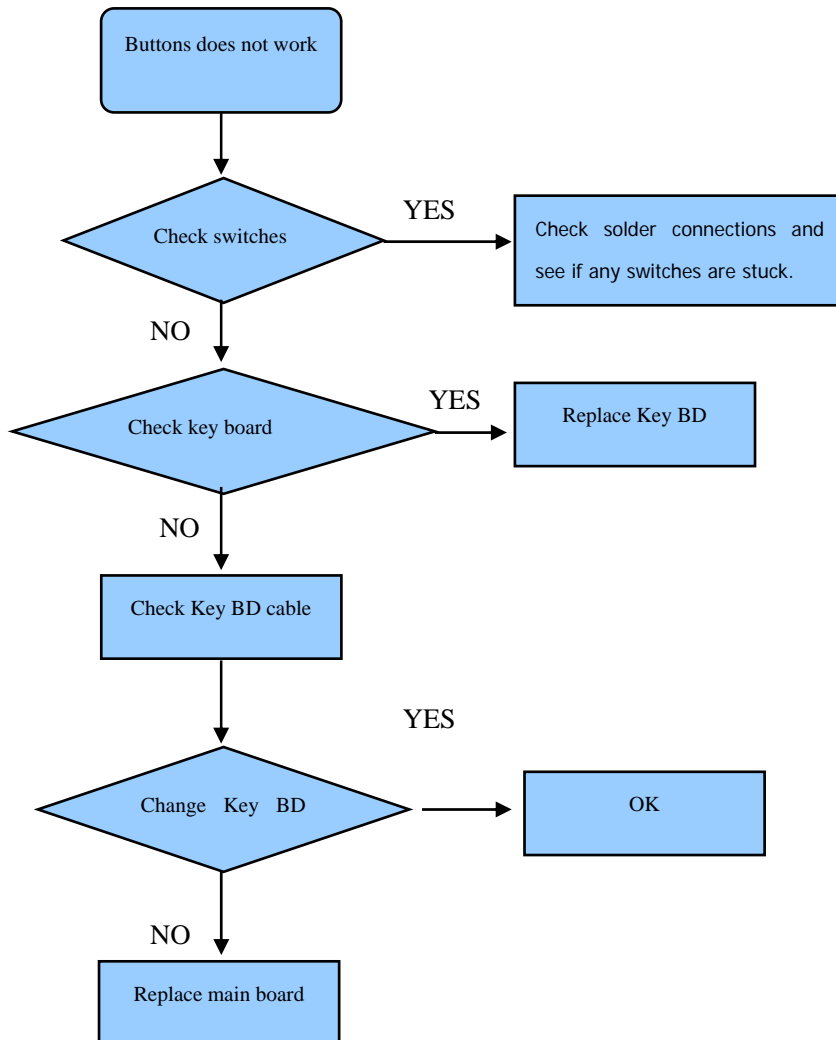
5.2 Troubleshooting

<i>SYMPTOMS</i>	<i>POSSIBLE SOLUTIONS</i>
No sound or picture.	<ul style="list-style-type: none">● Check if the power cord is plugged into a powered AC outlet.● A power switch on the right side bottom edge of the front panel must be turned on. Press the [POWER] button in the remote control to activate the unit from Standby.● Check to see if LED light is either red or blue. If illuminated, power to TV is OK.
I have connected an external source to my TV and I get no picture and/or sound.	<ul style="list-style-type: none">● Check for the correct output connection on the external source and for the correct input connection on the TV.● Make sure you have made the correct selection for the input mode for the incoming signal.
When I turn on my television, there is a few second delay before the picture appears. Is this normal?	Yes, this is normal. That is the TV searching for previous setting information and initializing the TV.
Picture is normal, but no sound.	<ul style="list-style-type: none">● Check the volume settings.● Check if Mute mode is set "on".
Sound but no picture or black and white picture.	<ul style="list-style-type: none">● If black and white picture first unplug TV from AC outlet and re-plug after 60 seconds.● Check that the Colour is set to 50 or higher.● Try different TV channels.
Sound and picture distorted or appear wavy.	<ul style="list-style-type: none">● An electrical appliance may be affecting TV set. Turn off any appliances, if interference goes away, move appliance farther away from TV.● Insert the power plug of the TV set into another power outlet.
Sound and picture is blurry or cuts out momentarily.	<ul style="list-style-type: none">● If using an external antenna, check the direction, position and connection of the antenna.● Adjust the direction of your antenna or reset or fine tune the channel.
Horizontal/vertical stripe on picture or picture is shaking.	Check if there is interfering source nearby, such as appliance or electric tool.
The plastic cabinet makes a "clicking" type of sound.	"Click" sound can be caused when the room temperature changes. This change causes the television cabinet to expand or contract, which makes the sound. This is normal and the TV is OK.
Remote control does not work.	<ul style="list-style-type: none">● Confirm that TV still has power and is operational.● Change the batteries in the remote control.● Check if the batteries are correctly installed.

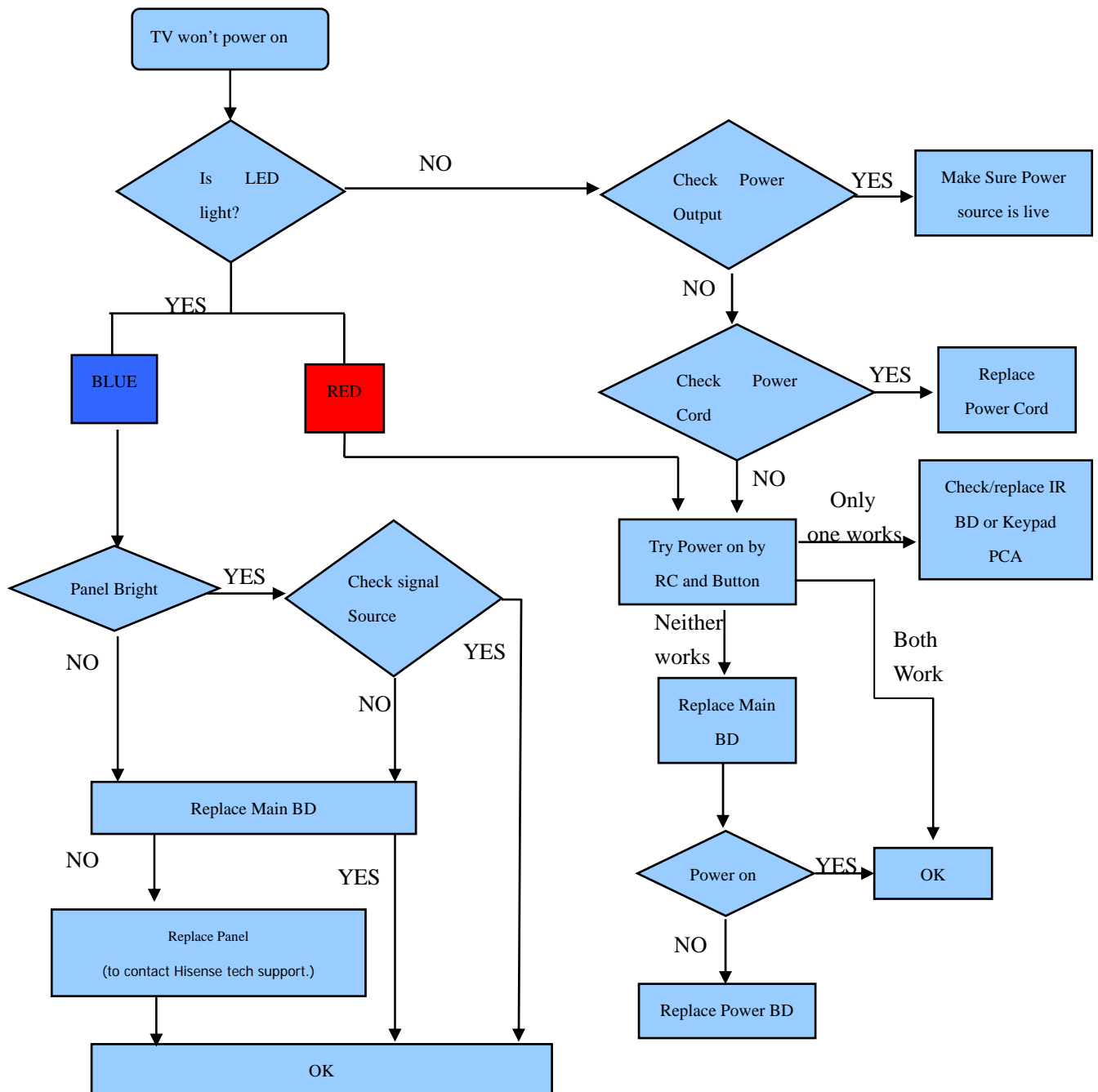
5.2.1 Troubleshooting for Remote Control



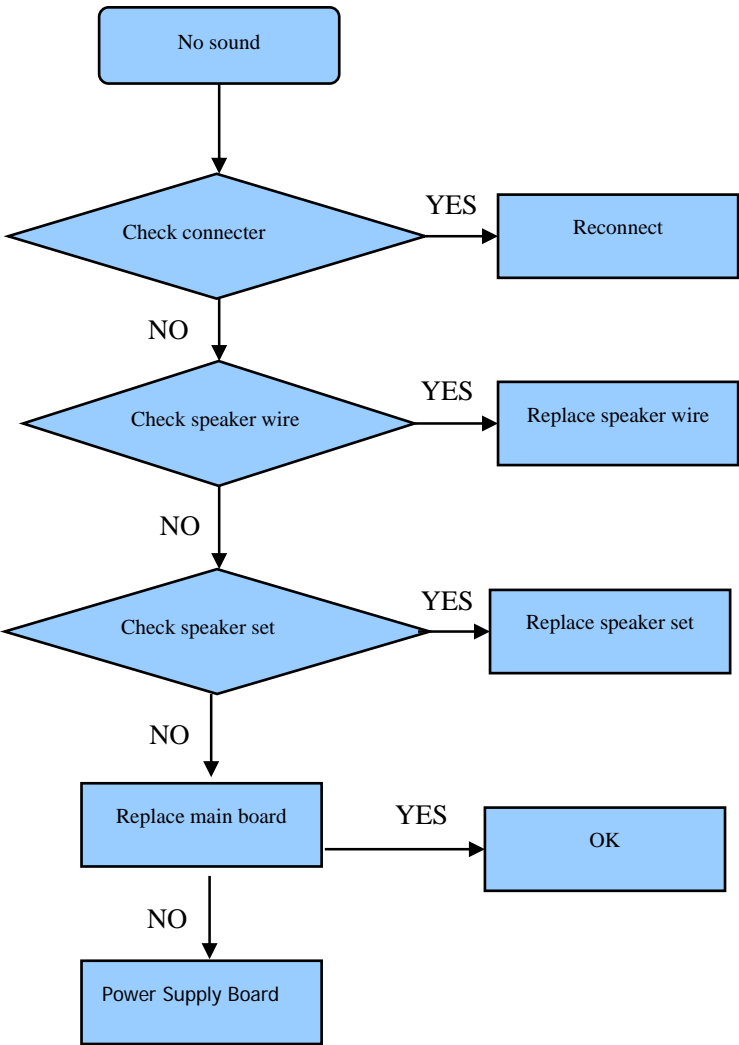
5.2.2 Troubleshooting for Function Key



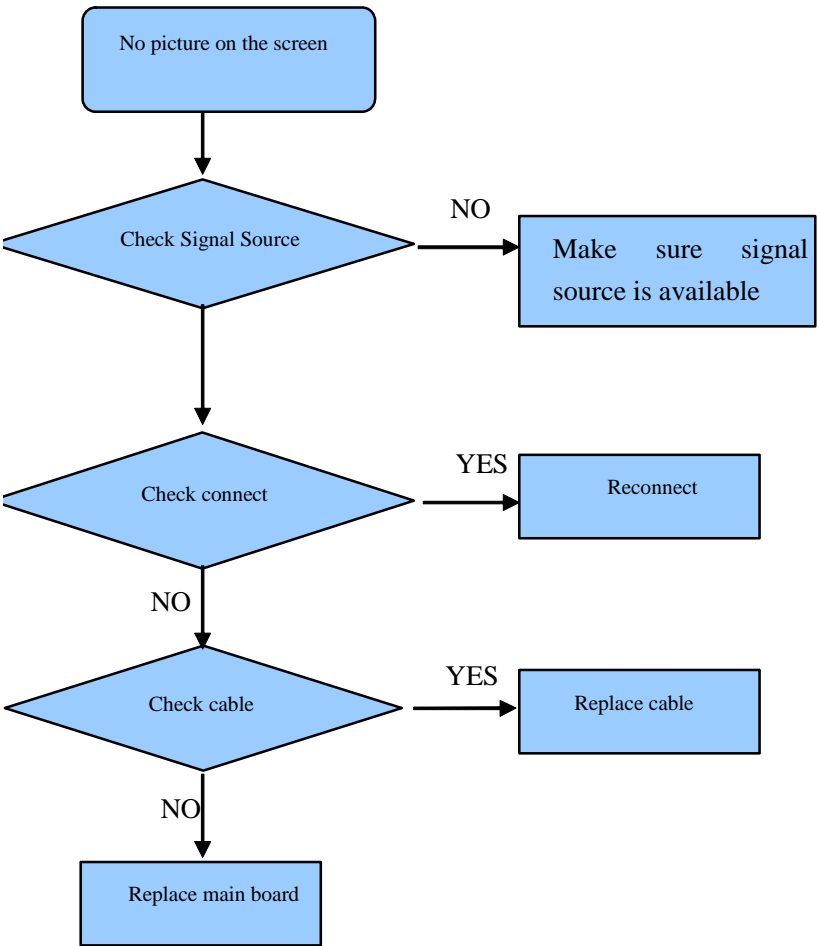
5.2.3 TV won't Power On



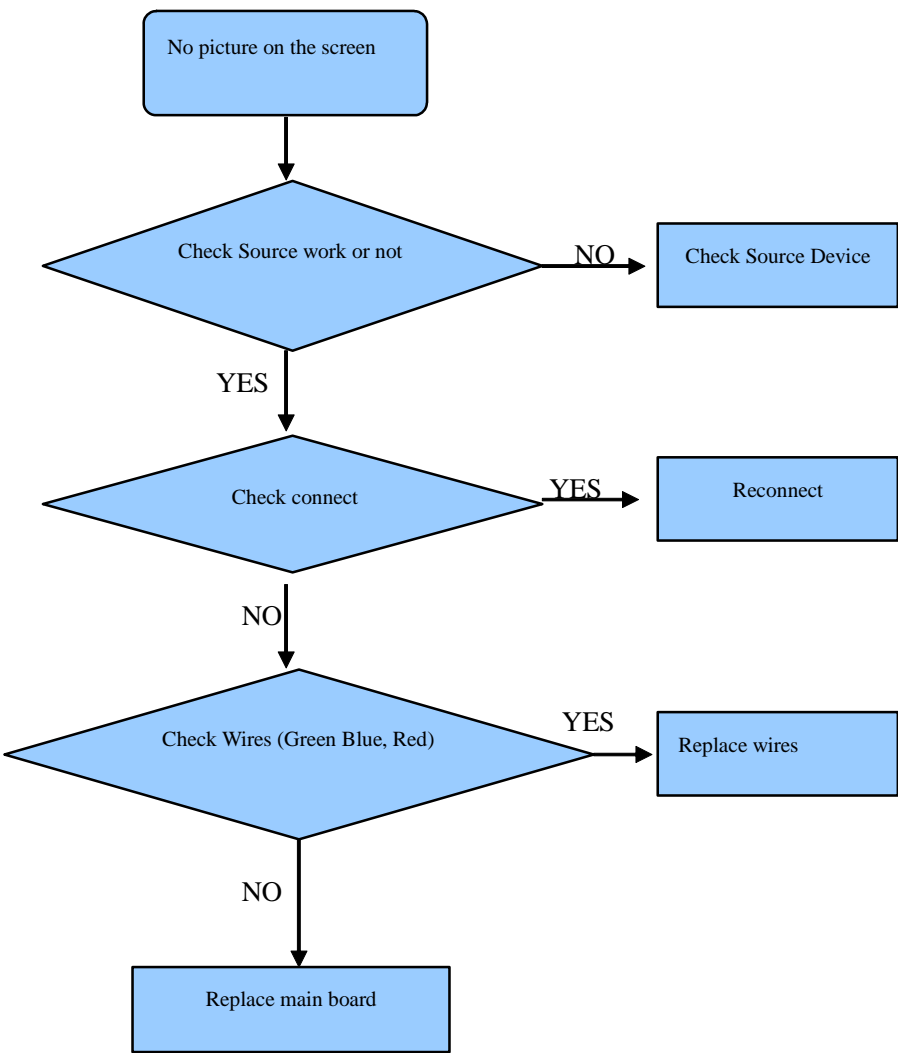
5.2.4 Troubleshooting for Audio



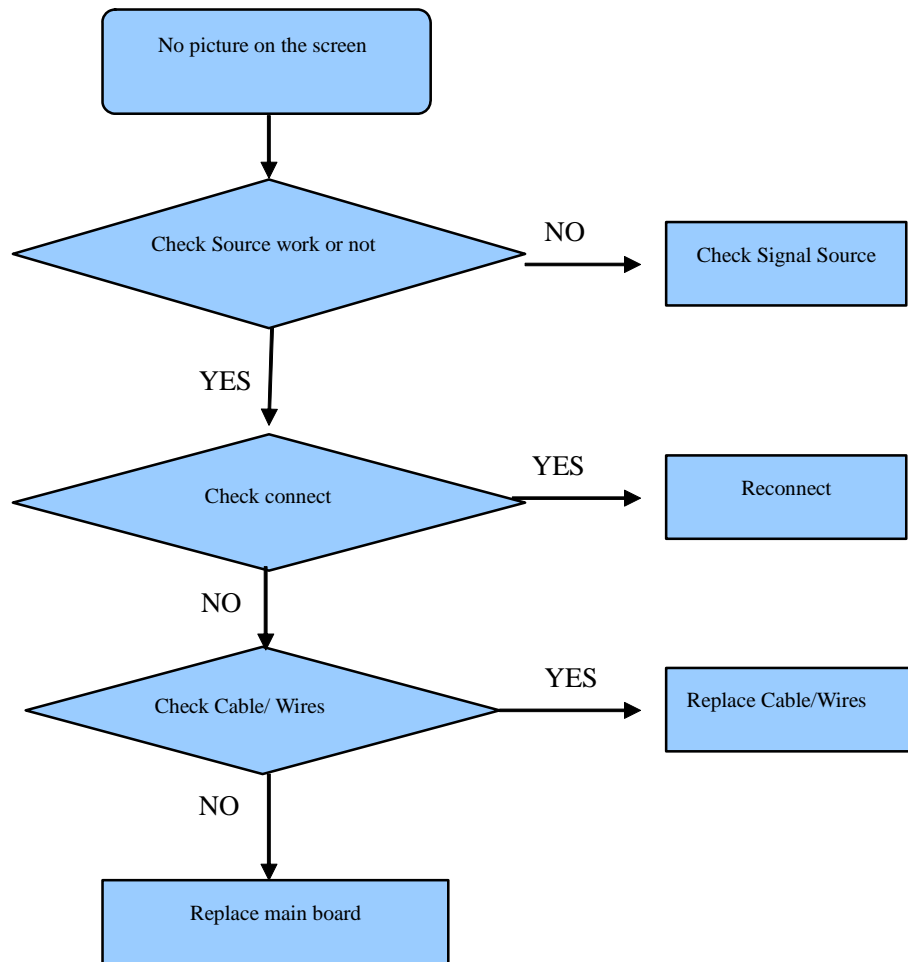
5.2.5 Troubleshooting for TV/VGA/HDMI input



5.2.6 Troubleshooting for YPbPr input



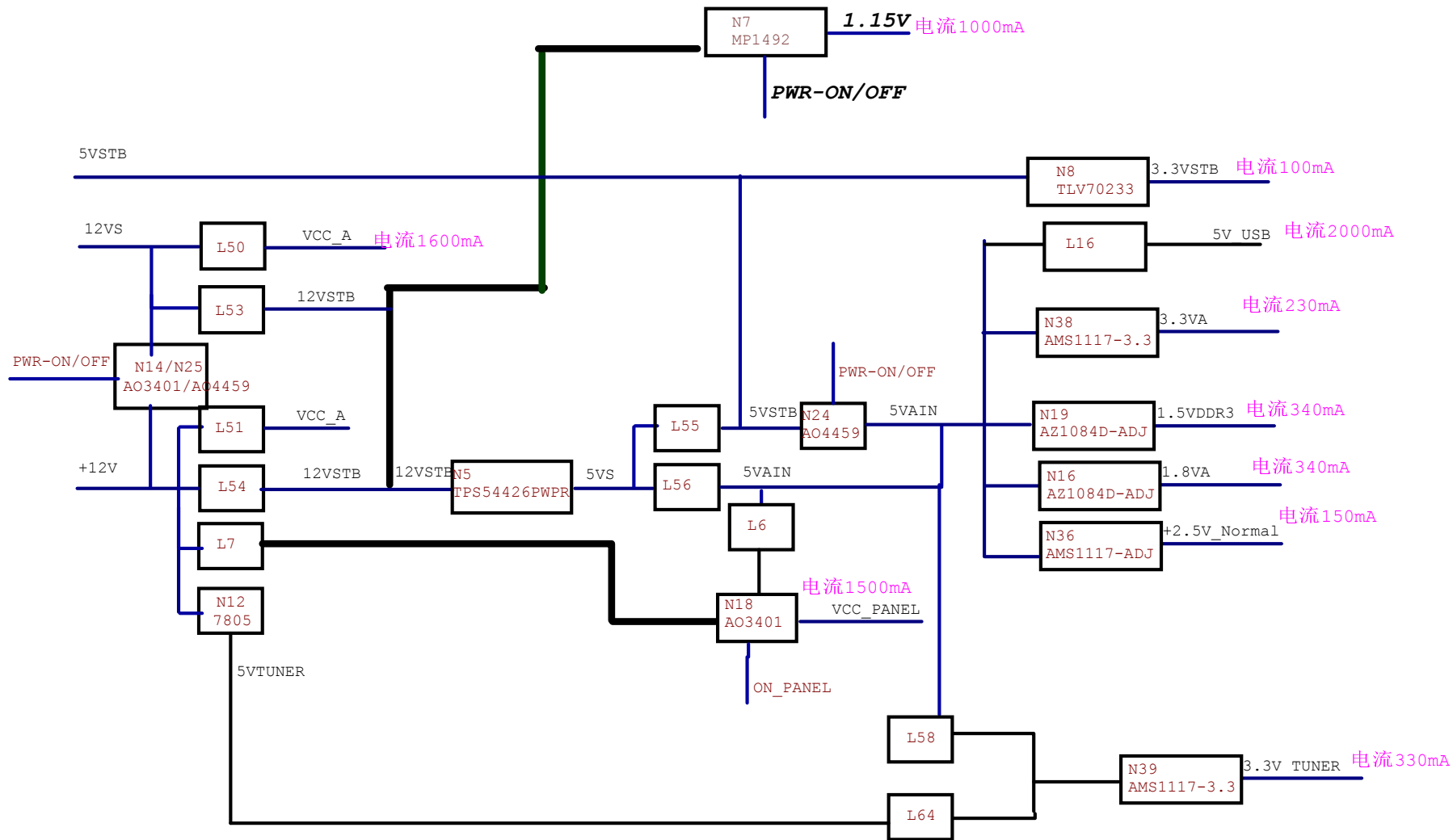
5.2.7 Troubleshooting for Video input




6. Schematic circuit diagram

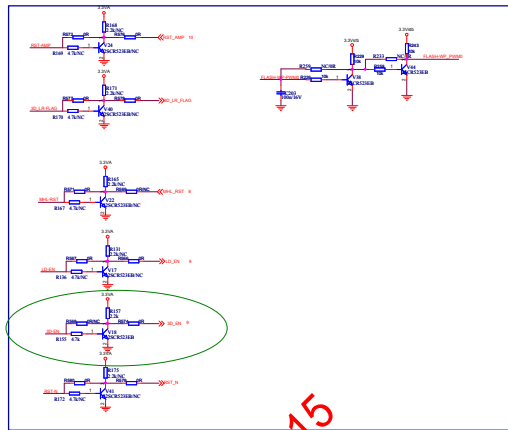
7. Explode View

Main board:5115



Main board:5115

		Hisense Electric Co.,Ltd. No.11,Jiangxi Road,Qingdao,China WWW.HISENSE.COM	
		Title Hisense MSD30XBT	
Size B	Schematic Name <Doc>		Rev 1.0
Date: Tuesday, November 06, 2012 Sheet 0 of 10			

[illegible][illegible][illegible]

Core power supply

VCC1 1.8V

VDDC

C164 10u/10V

C165 2.2u/10V

C166 10u/10V

C167 10u/10V

C168 10u/10V

C169 10u/10V

C170 10u/10V

C171 10u/10V

C172 10u/10V

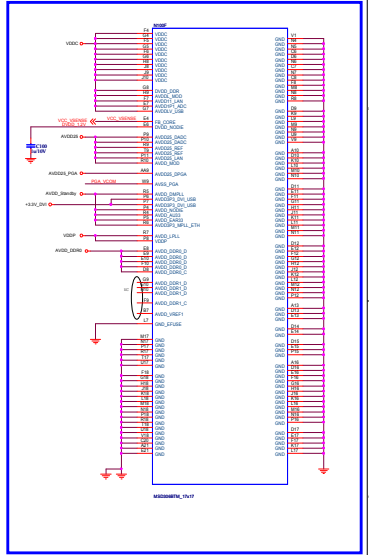
2.5V power for ADC

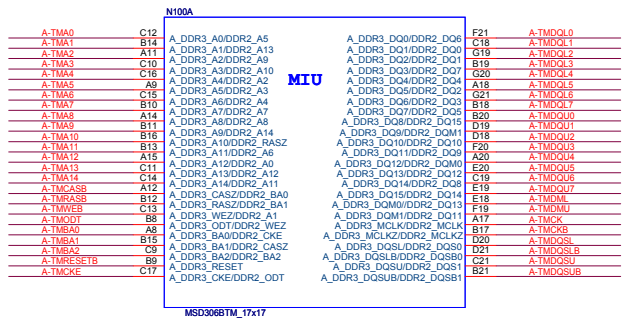
Standby Power 3.3V

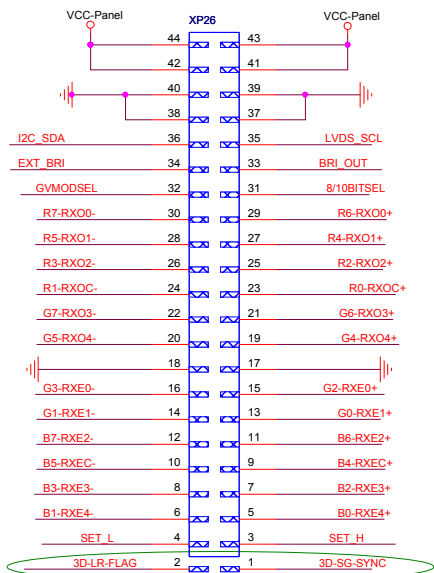
The diagram shows a 3.3V input connected to a series of capacitors: C112 (2.2u/50V), C157 (100n/16V), C158 (100n/16V), C159 (100n/16V), C180 (100n/16V), and C181 (100n/16V). The output is labeled AUD_Standby.

3.3.3rd power for HDMI

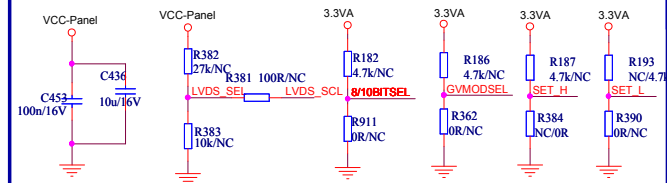
Figure 1 consists of six schematic diagrams labeled (a) through (f).
 (a) Main power stage: A full-bridge inverter with MOSFETs M1 and M2 on the primary side of transformer T1. The secondary side has MOSFET M3. The resonant tank includes a series capacitor C1 and a parallel inductor L1. The output is connected to a load through a diode D1 and capacitor C2.
 (b) Auxiliary power stage: A MOSFET M4 driving a transformer T2, which is coupled to the primary side of T1. The auxiliary winding has a series capacitor C3 and a parallel inductor L2.
 (c) Gate driver for M1 and M2: A bootstrap circuit using a MOSFET and a diode to drive the gates of M1 and M2 from a 10V source.
 (d) Gate driver for M3 and M4: A similar bootstrap circuit for the secondary MOSFETs.
 (e) Output filter: A series inductor L3 and a parallel capacitor C4 connected to the load.
 (f) Input filter: A series inductor L4 and a parallel capacitor C5 connected to the input.





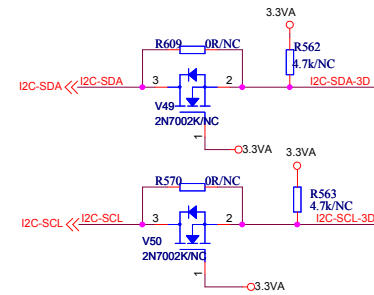
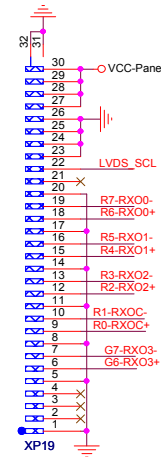
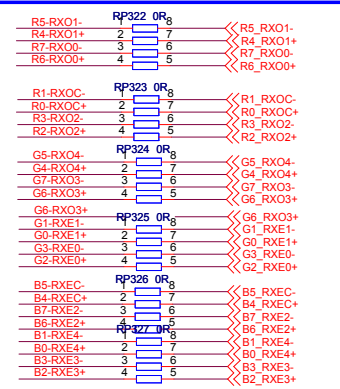
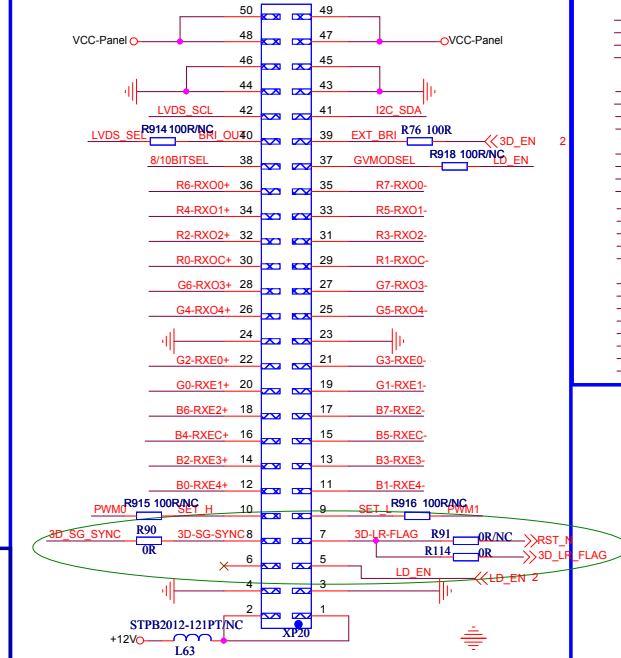


Power decouple

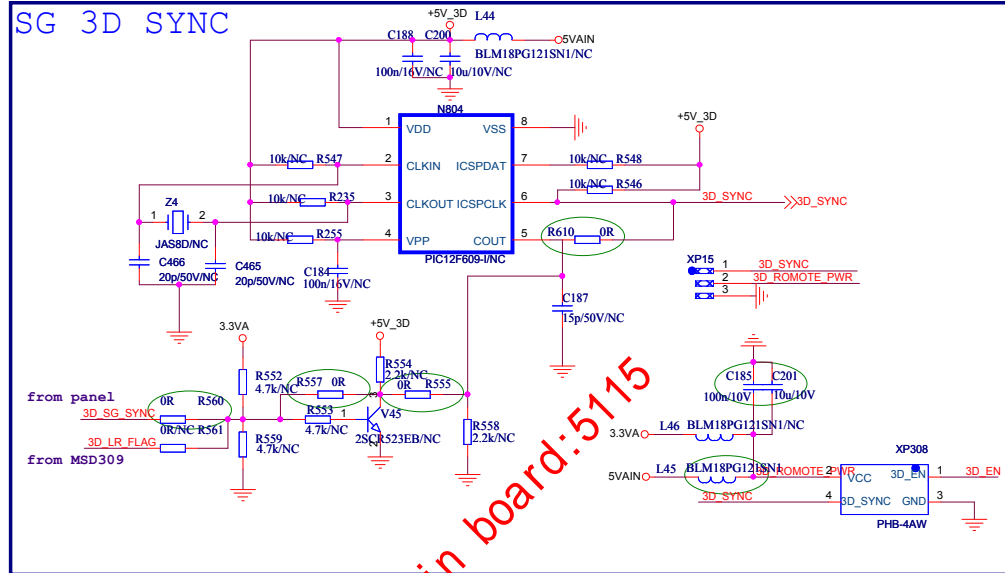


Note: 靠近LVDS插座

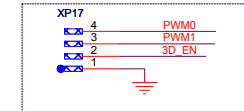
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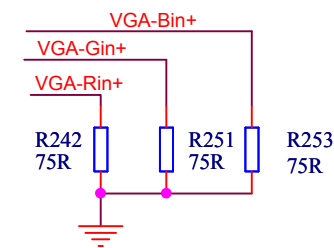
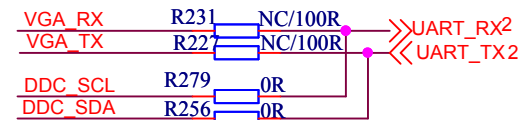
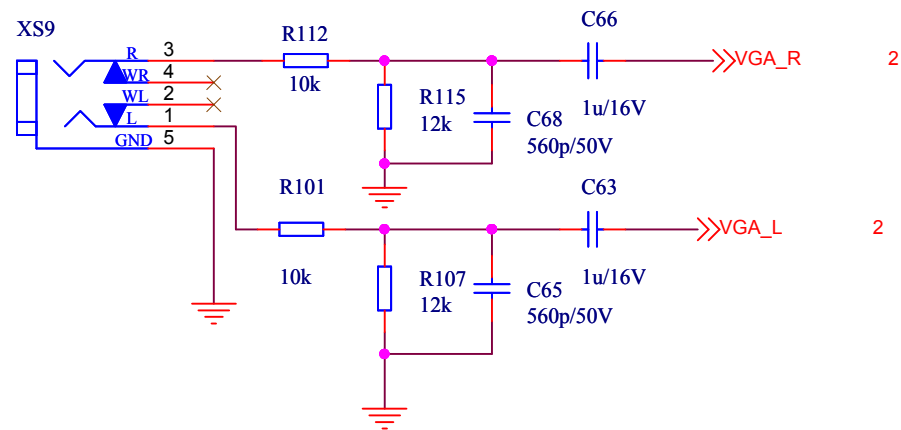
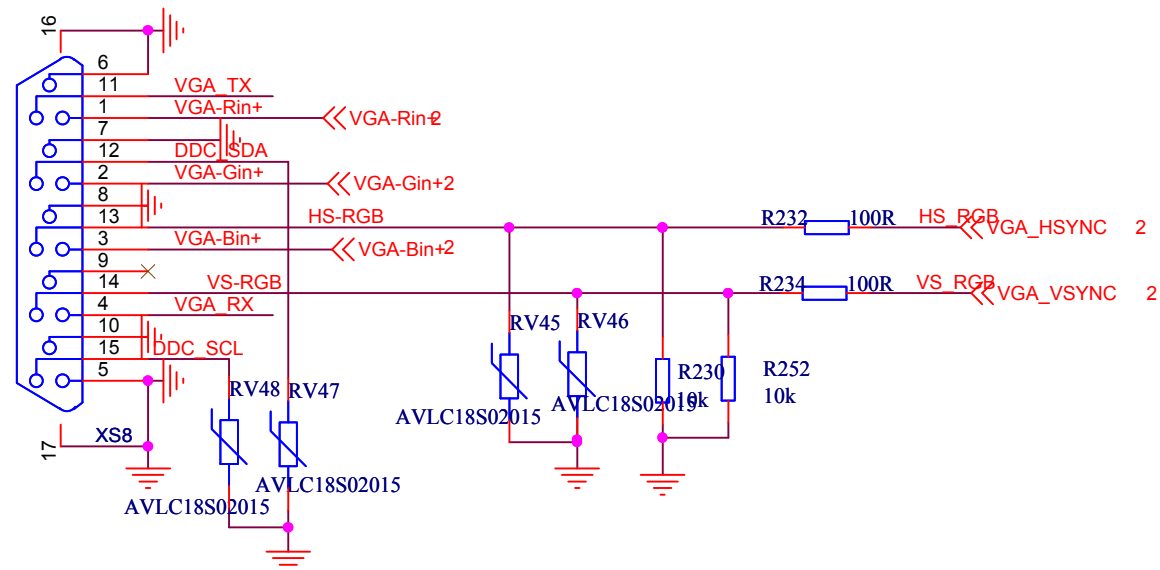
SG 3D SYNC



from Tcon to Power Board



VGA

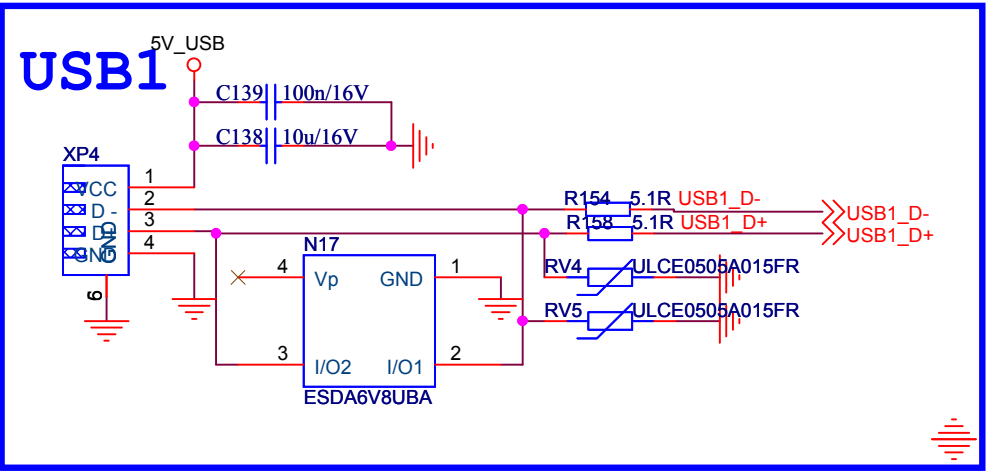
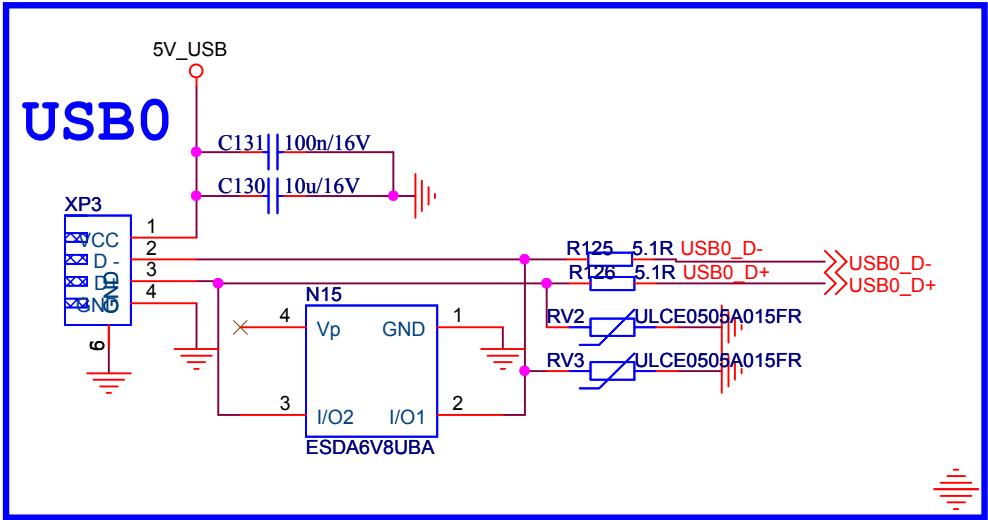


Main board: 5115



Hisense Electric Co., Ltd. No. 11, Jiangxi Road, Qingdao, China WWW.HISENSE.COM		
Title Hisense MSD30XBT		
Size A	Schematic Name <Doc>	Rev 1.0
Date: Tuesday, November 06, 2012	Sheet 6	of 10

USB INTERFACE

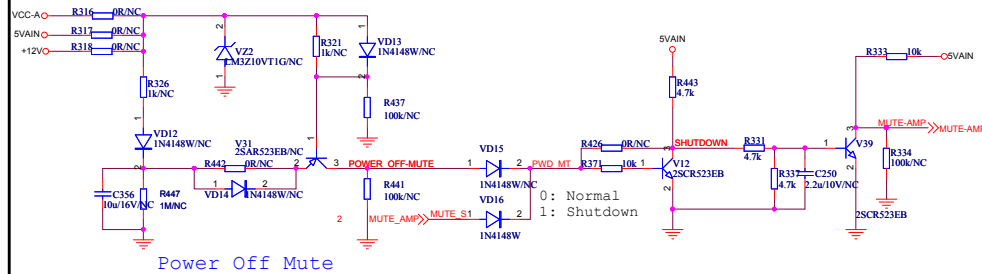


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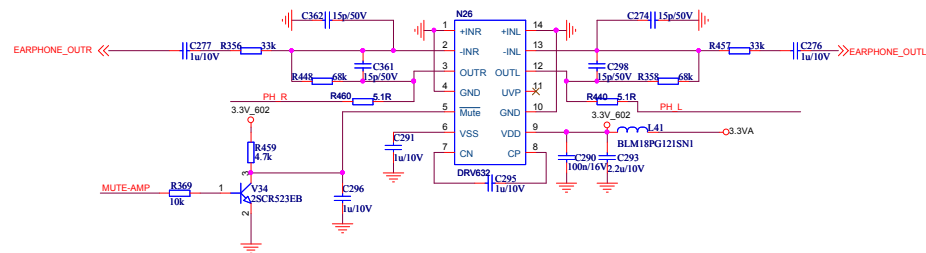


Hisense Electric Co.,Ltd. No.11,Jiangxi Road,Qingdao,China WWW.HISENSE.COM		
Title Hisense MSD30XBT		
Size	Schematic Name A <Doc>	Rev 1.0
Date:	Tuesday, November 06, 2012	Sheet 7 of 10

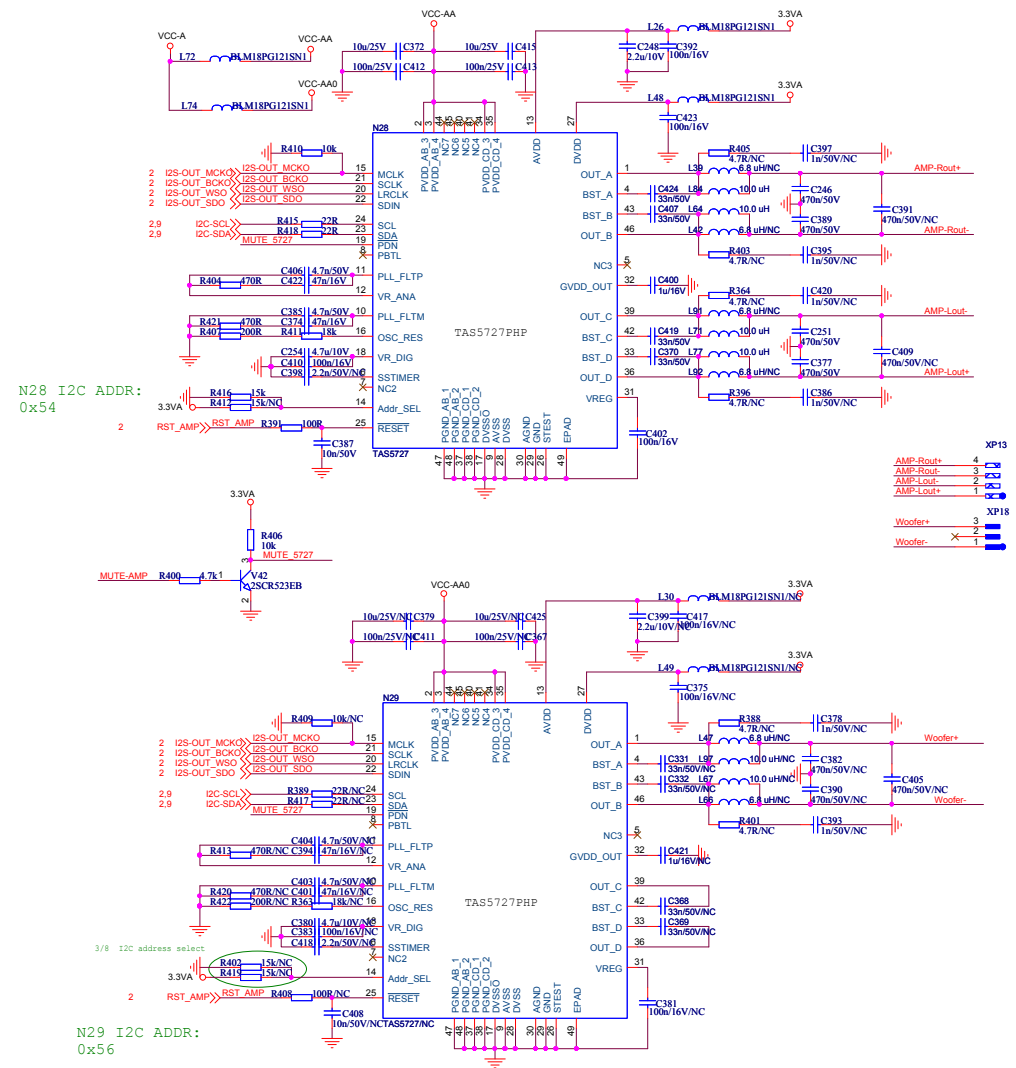
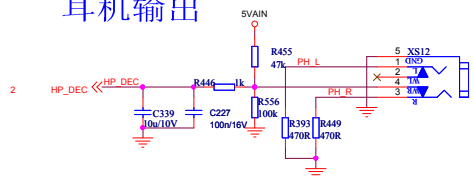
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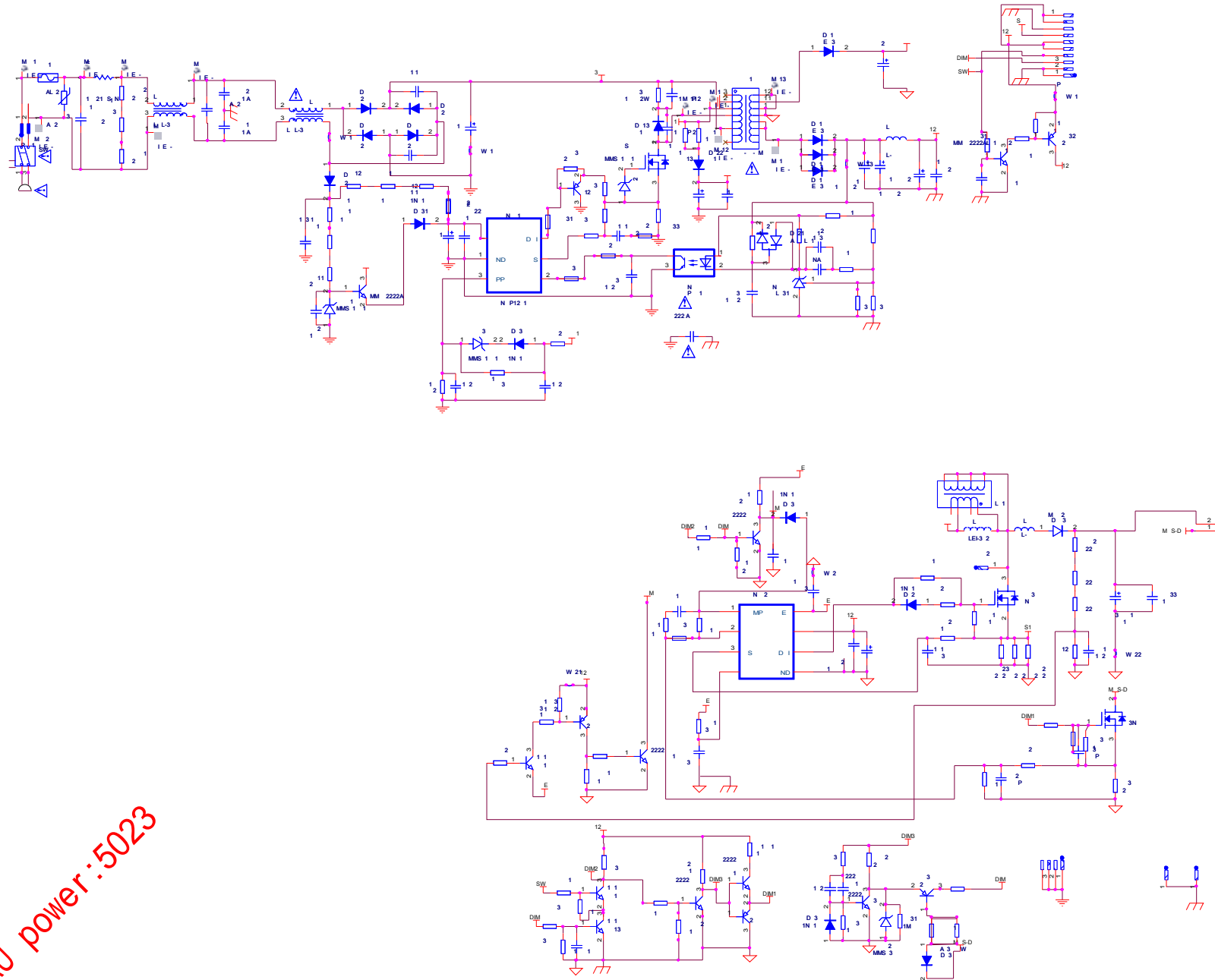
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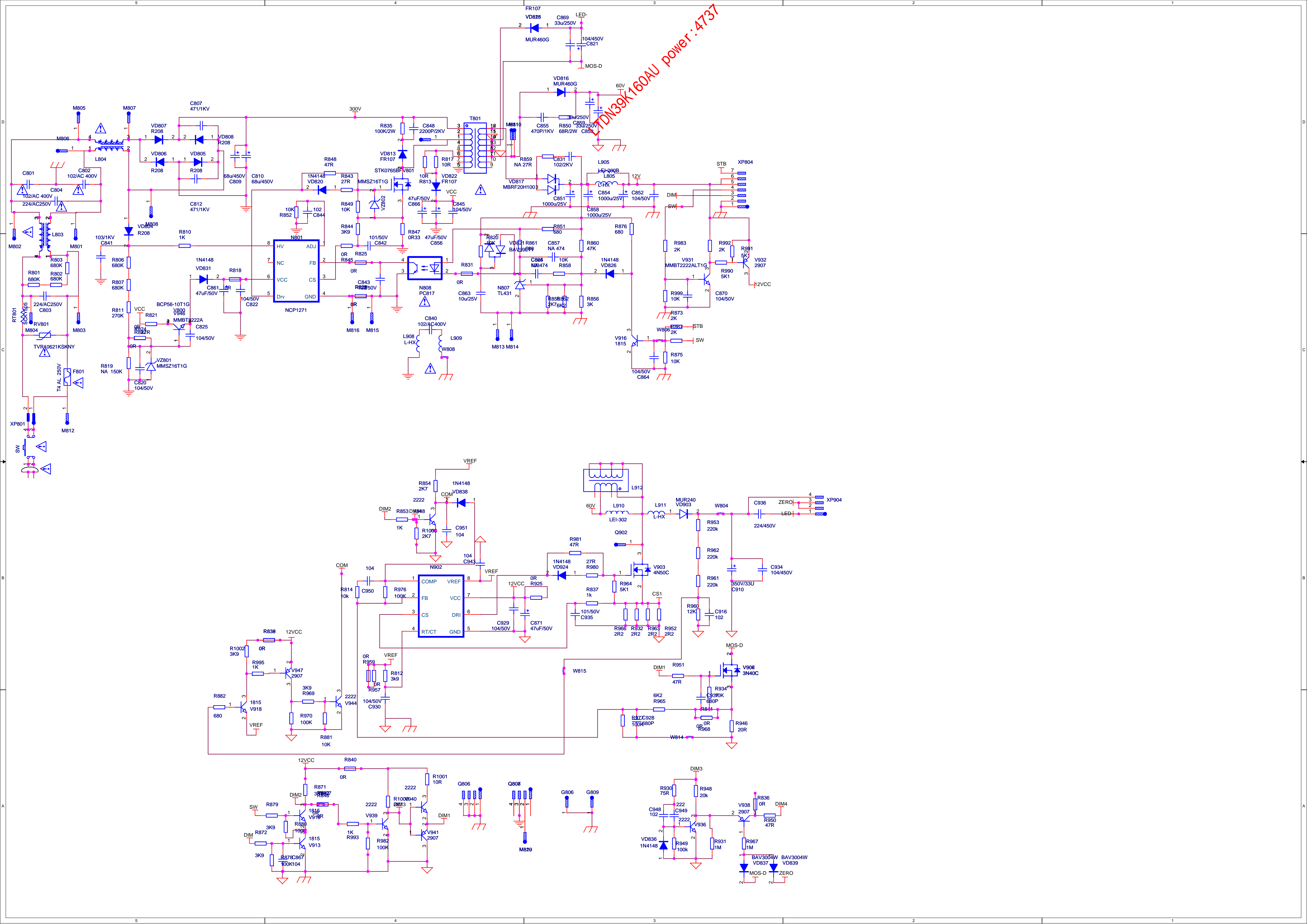
耳机输出



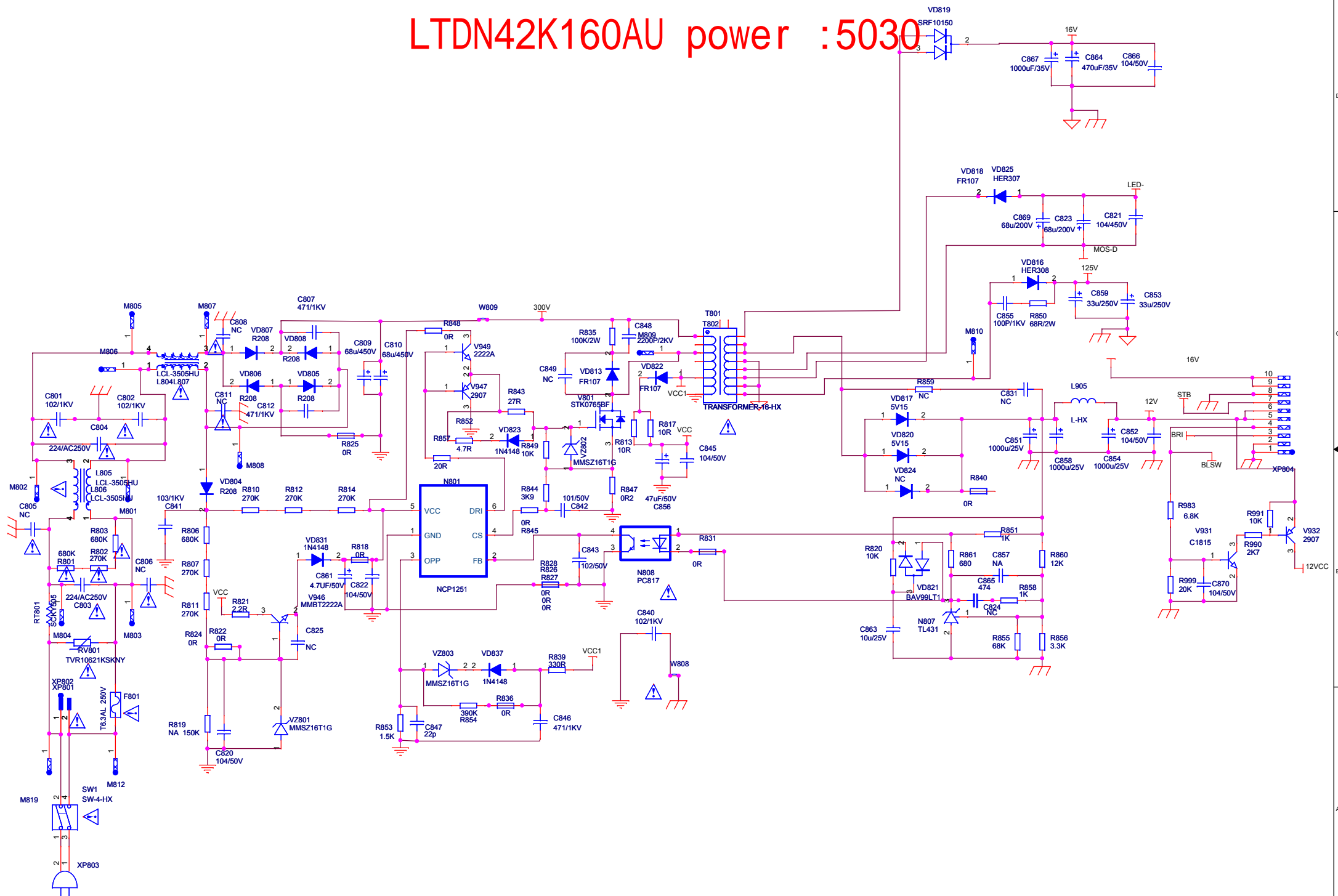
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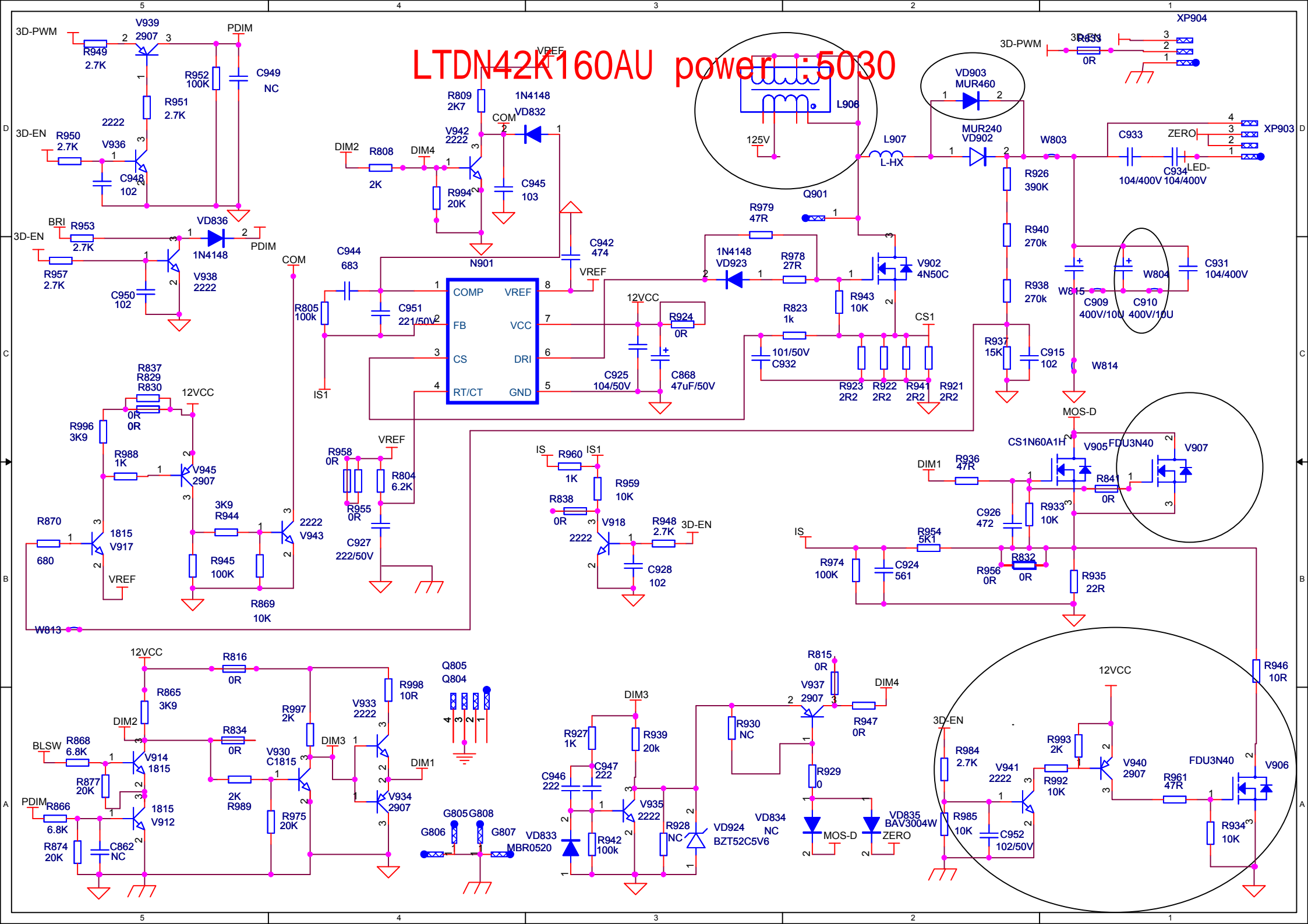
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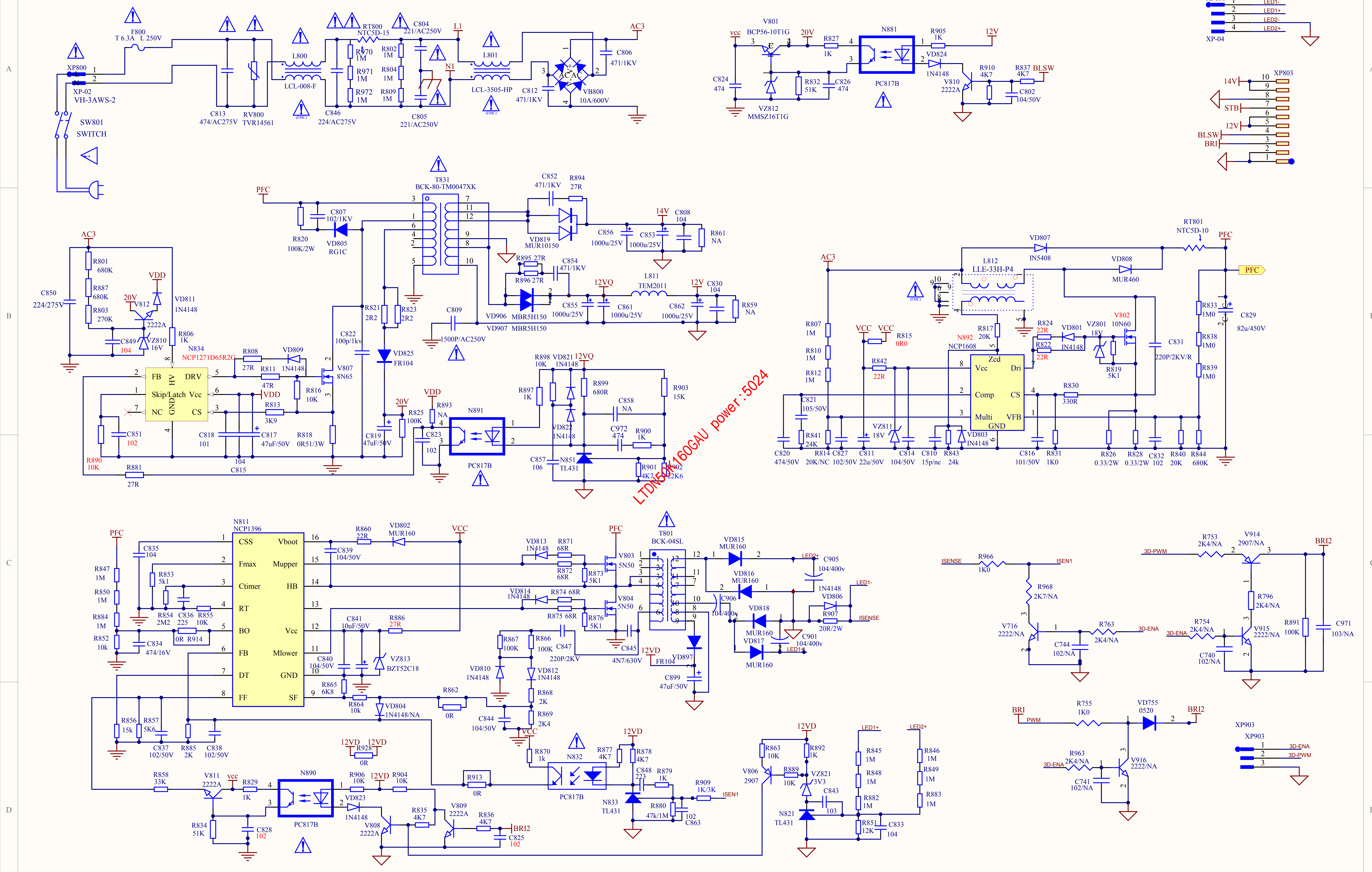
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power board:5024



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