



Liquid Crystal Display Television Service Manual

Chassis: MT5330

Product Type:


LHD19W57EU

LHD22W57EU

Ver 1.0

Hisense Electric Co., Ltd.

June, 2008

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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.

DANGERCAUTION 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.



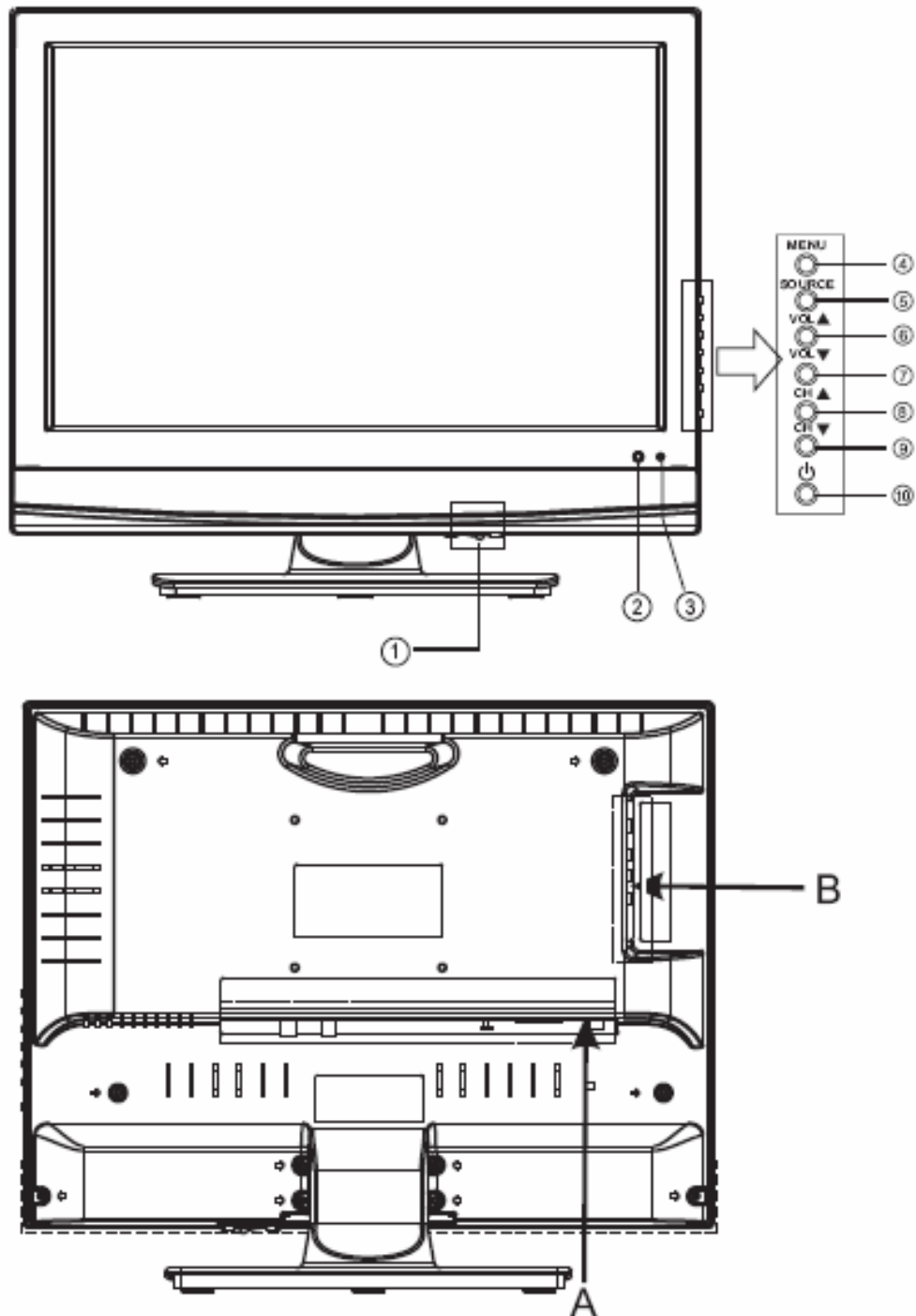
The lightning flash with arrowhead symbol, within an equilateral triangle is intended to alert the user to the presence of uninsulated dangerous voltage within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



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.

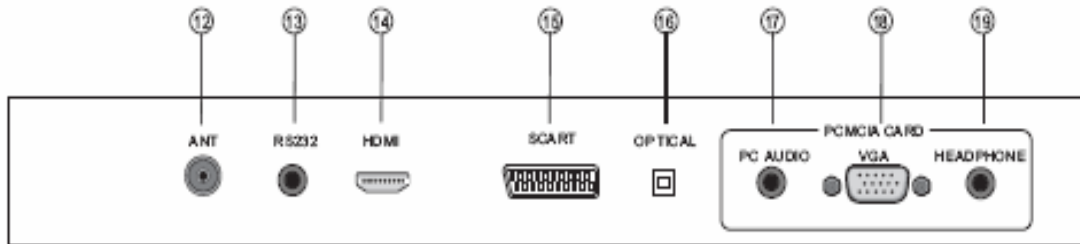
2. Product Function Specifications

2.1 Product Function

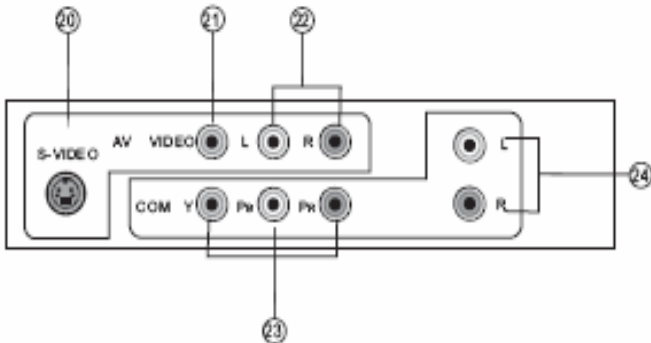


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A:



B:



- | | | |
|------------------------------|--------------------------------|----------------------------------|
| ① Power switch(on/off) | ⑪ Power line | ⑳ Video input |
| ② Remote sensing window | ⑫ Antenna input | ㉑ Audio in(for Video or S-video) |
| ③ Power indicator | ⑬ RS232(for software updating) | ㉒ YPBPR input |
| ④ Menu button | ⑭ HDMI input | ㉓ Audio in(for YPBPR) |
| ⑤ Source select | ⑮ SCART connector | |
| ⑥ Volume up / cursor right | ⑯ Optical output | |
| ⑦ Volume down / cursor left | ⑰ PC audio input | |
| ⑧ Channel up / cursor up | ⑱ VGA input | |
| ⑨ Channel down / cursor down | ㉔ Headphone output | |
| ⑩ Power button (standby) | ㉕ S-Video input | |

Note:

The above figures are for reference only, please refer to the actual units to determine their appearance.

2.2 Specifications

Native Resolution: 1440×900 Pixels(19") (corresponding to WXGA)
 1680×1050 Pixels(22") (corresponding to WXGA)
 Colour System: PAL/SECAM
 Sound System: B/G, D/K, I, L/L '
 Tuner: VHF/UHF:48.25~863.25MHz
 Antenna: 75 Ω VHF/UHF input
 Stereo: NICAM/A2

VIDEO INPUT:

SCART (Video and RGB) Video:1 Vp-p, negative sync, 75Ω input
 RGB:0.7 Vp-p, 75Ω input
 Video:1 Vp-p, negative sync, 75Ω input
 Audio in Stereo audio input for SCART
 COMPONENT RCA, 0.7 Vp-p/75Ω input
 (480I/60Hz, 480P/60Hz, 576I/50Hz, 576P/50Hz
 720P/60Hz, 1080I/50, 1080I/60Hz)
 Audio in RCA Stereo audio input

PC INPUT:

VGA 15 Pin , Analog RGB signal, 0.7Vp-p, 75Ω input
 (VGA, SVGA, XGA)
 Audio in Mini-jack(3.5φ)X1

MONITOR OUT

Audio/Video Output SCART CANAL+
 Power Requirement AC 100 to 240V, 50/60Hz

	19 "	22 "
Speaker Output	1.5W+1.5W	2W+2W
Power Consumption	45W	55W
Dimensions(mm) L/D/H (comprise pedestal)	468/178/399	530/178/436
Weight (comprise pedestal)	5kg	6kg

Allowable temperature of operation environment 0℃ to 40℃

ACCESSORIES

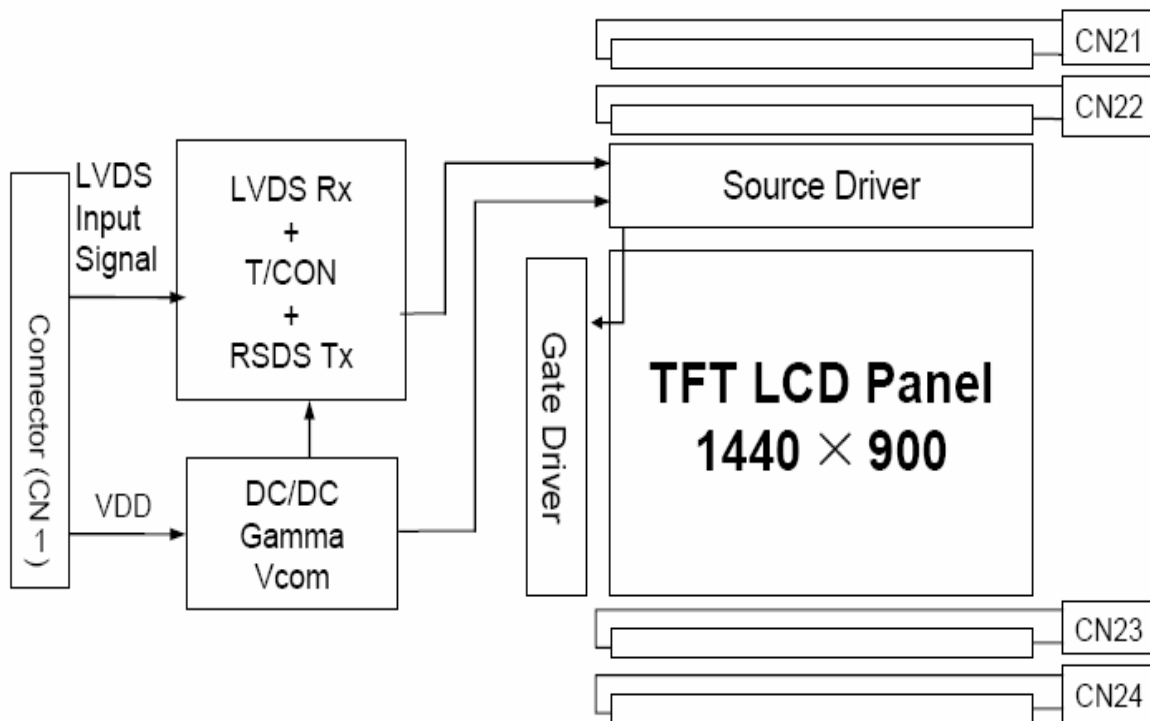
User' s Manual	1
Remote Control Unit	1
Dry Cell Battery	2

3. LCD Panel

3.1 HT190WG1-101 (PN: 1042399) BOE

HT190WG1-101 is a color active matrix TFT LCD module using amorphous silicon TFTs (Thin Film Transistors) as active switching devices. This module has a 19.0 inch diagonally measured active area with WXGA+ resolutions (1440 horizontal by 900 vertical pixel array). Each pixel is divided into RED, GREEN, BLUE dots which are arranged in vertical stripe and this module can display 16,7 M colors. The TFT-LCD panel used for this module is adapted for a low reflection and higher color type.

BLOCK DIAGRAM



General Features

GENERAL SPECIFICATIONS

Parameter	Specification	Unit	Remarks
Active area	408.24(H) * 255.15(V)	mm	
Number of pixels	1440(H) × 900(V)	pixels	
Pixel pitch	0.2835(H) × 0.2835(V)	mm	
Pixel arrangement	RGB Vertical stripe		
Display colors	16,777,216	colors	
Display mode	Normally White		
Dimensional outline	428.0(H) × 278.0(V) × 18.5(D) typ.	mm	± 0.5mm
Weight	2550 (max.)	g	
Surface Treatment	Haze 25%, 3H		
Back-light	Top/Bottom edge side, 4-CCFL type		

3.2 LTM220M1-L01 (PN: 1041814)

LTM220M1-L01 is a color active matrix liquid crystal display (LCD) that uses amorphous silicon TFT (Thin Film Transistor) as switching components. This model is composed of a TFT LCD panel, a driver circuit and a back light unit. The resolution of a 22" is 1680 x 1050 and this model can display up to 16.7 millions colors.

GENERAL SPECIFICATIONS

Items	Specification	Unit	Note
Pixel Pitch	0.282(H) x 0.282(W)	mm	
Active Display Area	473.76(H) x 296.1(V)	mm	
Surface Treatment	Haze 25% Hard coating (3H)		
Display Colors	16.7M (Hi-FRC)	colors	
Number of Pixels	1,680 x 1,050	pixel	
Pixel Arrangement	RGB vertical stripe		
Display Mode	Normally White		
Power Consumption	28.3 Watt (Typ)		
Luminance of White	300(Typ.)	cd/ m ²	

4. Chassis Layout and Overall Wiring Diagrams

4.1 Chassis Layout

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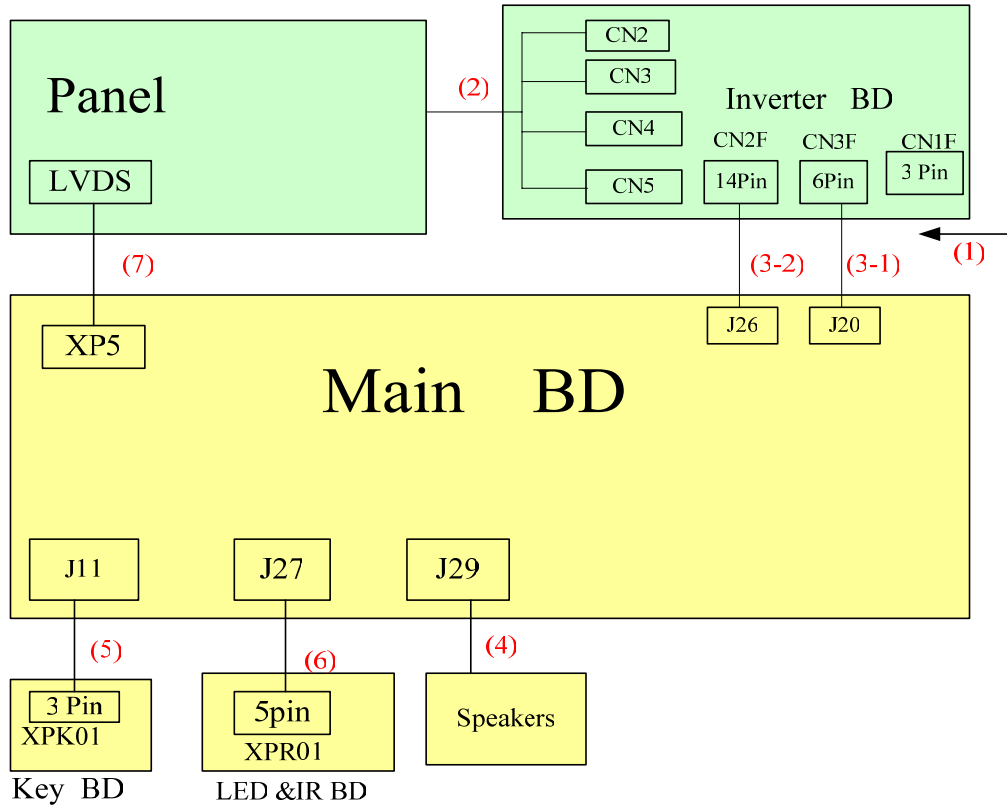
No	Description	Part No	Type/Model	PCB
(1)	Main Board	116016	RSAG2.908.1171-3\ROH	RSAG7.820.1188\VER.B\ROH
(2)	Inverter Board	1041467	JSI-190411B\ROH	Outsourcing
(3)	Keypad Board	114552	RSAG2.908.1168-2\ROH	RSAG7.820.1214\ROH
(4)	IR&Led Board	114175	RSAG2.908.1169	RSAG7.820.1213\ROH

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No	Description	Part No	Type/Model	PCB
(1)	Main Board	116538	RSAG2.908.1171-4\ROH	RSAG7.820.1188\VER.B\ROH
(2)	Inverter Board	1043506	JSI-220402\ROH\JK	
(3)	Keypad Board	114552	RSAG2.908.1168-2\ROH	RSAG7.820.1214\VER.A\ROH
(4)	IR&Led Board	114175	RSAG2.908.1169	RSAG7.820.1213\VER.A\ROH

4.2 Overall Wiring Diagrams

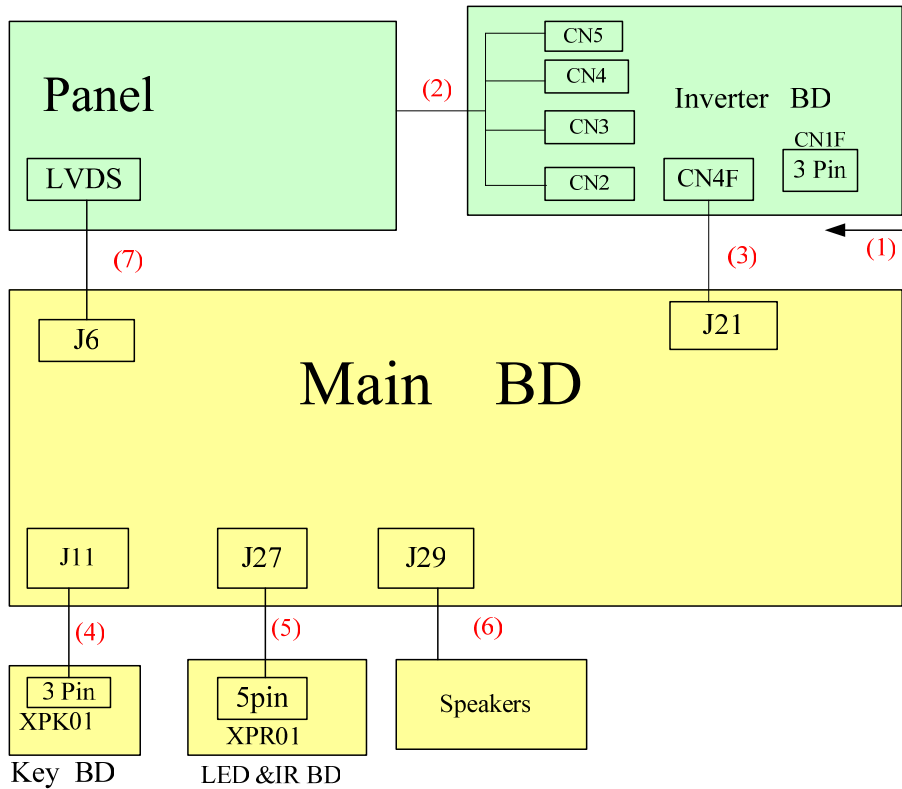
LHD19W57EU



No	DESCRIPTION	SPECIFICATION	NOTE
1	Main Power	TJC2-3Y-250-2\ROH	Power Inlet--> Inverter BD CN1F
2	Back light power to panel	the connectors on the panels	Inverter BD CN2、CN3、CN4、CN5<-->Panel
3-1	12V power and communication between Main BD and power BD	TJC10T-6Y-150\ROH	Inverter BD CN3F<-->Main BD J20
3-2	5V power and communication between Main BD and power BD	TJC3T-4Y-100\ROH	Inverter BD CN2F<-->Main BD J26
4	Audio output (L/R)	TJC3H-4Y-800-600\ROH	Main BD J29<-->Speaker L/R
5	Buttons	TJC10T-3Y-650\ROH	Main BD J11<--> Keypad BD XPK01
6	LED & IR	TJC10T-5Y-700\ROH	Main BD J27<--> Led & IR BD XPR01
7	LVDS signal	HX2-2X15NLB150-BOE\ROH	Main BD J6<-->Panel

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No	DESCRIPTION	SPECIFICATION	NOTE
1	Main Power	TJC2-3Y-250-2\ROH	Power Inlet--> Inverter BD CN1F
2	Back light power to panel	the connectors on the panels	Inverter BD CN2、CN3、CN4、CN5<-->Panel
3	12V power and communication between Main BD and power BD	TJC10T-6Y-150\ROH	Inverter BD CN4F<-->Main BD J21
4	Buttons	TJC10T-3Y-650\ROH	Main BD J11<--> Keypad BD XPK01
5	LED & IR	TJC10T-5Y-700\ROH	Main BD J27<--> LED&IR BD XPR01
6	Audio output (L/R)	TJC3H-4Y-800-600\ROH	Main BD J29<-->Speaker L/R
7	LVDS signal	HX2-2X15NLB150-BOE\ROH	Main BD J6<-->Panel

5. Factory/Service OSD Menu

5.1 To enter the Factory OSD Menu

- a. With factory RC (remote control)
 1. Press “M” button and enter factory mode.
 2. Press “Menu” button and enter factory OSD menu.
 3. Press “CH+”/“CH-” button select the function menu, press “VOL+”/“VOL-” enter the selected function menu. Press “VOL+”/“VOL-” button adjust values in the menu.
- b. With user’s RC
 1. Power TV On
 2. Press Menu button and call up User OSD Menu
 3. Select Sound-> Balance
 4. Enter 0->5->3 ->2 in sequence.
Note: If necessary, re-do number keys.
 5. Factory OSD appears.

5.2 Factory OSD Menu

5.2.1 Factory Menu

Item 0	Item 1	Note
White Balance	R Gain	High Brightness Red.
	G Gain	High Brightness Green
	B Gain	High Brightness Blue
	R Offset	Low Brightness Red.
	G Offset	Low Brightness Green
	B Offset	Low Brightness Blue
	WBH Brightness	Adjust high brightness temporarily
	WBH Contrast	Adjust high contrast temporarily
	WBH Color	Adjust high color temporarily
	WBL Brightness	Adjust low brightness temporarily
	WBL Contrast	Adjust low contrast temporarily
	WBL Color	Adjust low color temporarily

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

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Set Channel	Zhong Shi	Qingdao Jiangxi Road factory
	Huang Dao	Huangdao Industrial Park
	Gui Yang	Gui Yang Industrial Park
	Liao Ning	Liao Ning Industrial Park
	Hungary	Hisense Hungary
	Australia	Hisense Australia
	France	Hisense France
Auto Color		Available only in component and VGA source
Factory Option	To FAC	M-Can enter factory mode with factory RC or user RC. U-Can enter factory mode only with user's RC.
	Logo Option	Logo Selection
	Test Time	1~30 (default 5)
	Communication	ON/OFF (default ON)
	EDID Write	OFF/ON(default OFF)
	Hotel Mode	OFF/ON(default OFF)
	VOL MAX	0~100(default 50) Set the max sound value when TV working in hotel mode.
MODE "M" is only used for factory production.		
Version Info	Version	Software version
	Date	The date of current version
Note: Software version info of the TV, readable only.		
Clean Protected		WB data、Auto Color data
Clean All		

Note: The factory menu date varies according to different sources. Incase changing the factory data by error, you can choose to "clear the EEPROM", by which you can resume the default value.

To clear the EEPROM:

- a. Select the button "Clear All".
- b. Press VOL+ button to clear the EEPROM data.
- c. When the "Clear All" button becomes white, turn off the power.
- d. Restart the TV.

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5.2.1 Design Menu

Item 0	Item 1	Item 2	Note
Color Temp	Color Temp	Cool (default)/Warm	
	R Gain		
	G Gain		
	B Gain		
Video	Video Curve	Brightness Min	Min Brightness
		Brightness Mid	Mid Brightness
		Brightness Max	Max Brightness
		Contrast Min	Min Contrast
		Contrast Mid	Mid Contrast
		Contrast Max	Max Contrast s
		Saturation Min	Min Saturation
		Saturation Mid	Mid Saturation
		Saturation Max	Max Saturation
	Picture Mode	SOURCE	The current program source
		VIVID Brightness	Brightness of VIVID mode
		VIVID Contrast	Contrast of VIVID mode
		VIVID Saturation	Saturation of VIVID mode
		STD Brightness	Brightness of STD mode
		STD Contrast	Contrast of STD mode
		STD Saturation	Saturation of STD mode
		MOVIE Brightness	Brightness of Movie mode
		MOVIE Contrast	Contrast of Movie mode
		MOVIE Saturation	Saturation of Movie mode
Sound	Volume Curve	Volume Min	When value is 1 Think about the Audio out power before adjusting
		Volume 20	When value is 20 Think about the

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			Audio out power before adjusting
		Volume Mid	When value is 50 Think about the Audio out power before adjusting
		Volume 80	When value is 70 Think about the Audio out power before adjusting
		Volume Max	When value is 90 Think about the Audio out power before adjusting
	Audio Mode	Audio Mode	Standard, Speech, Music
		120HZ	Different frequencies for different Audio Mode
		500HZ	
		1.5kHz	
		5kHz	
		10kHz	

NOTE:

The above "Factory/Service OSD Menu" are reference only, please refer to the actual units to determine the appearances

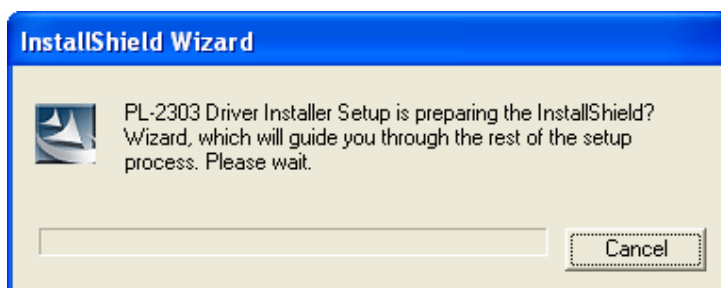
6. Software Upgrading

The software is upgraded by a burning tool-MtkTool, which can burn the program file *.bin to the main board of the unit.

6.1 Get ready for upgrading

6.1.1 Install the driver

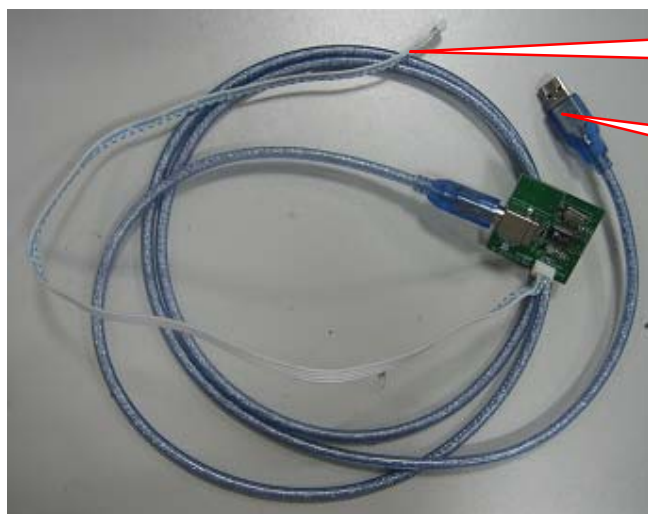
Double click the icon , install the driver.



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

6.1.2 Hardware connecting

Connect the unit to your pc with a USB-to-jack (4 pin) port cable. USB port connects to your pc, and the 4 pin-jack to the J3 of the main board.

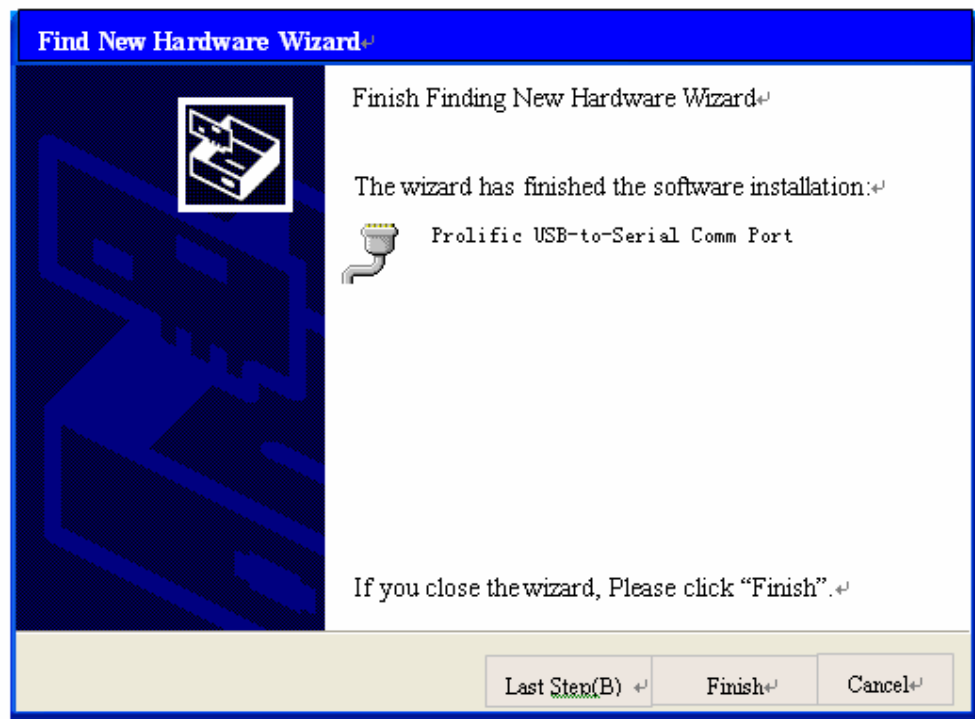
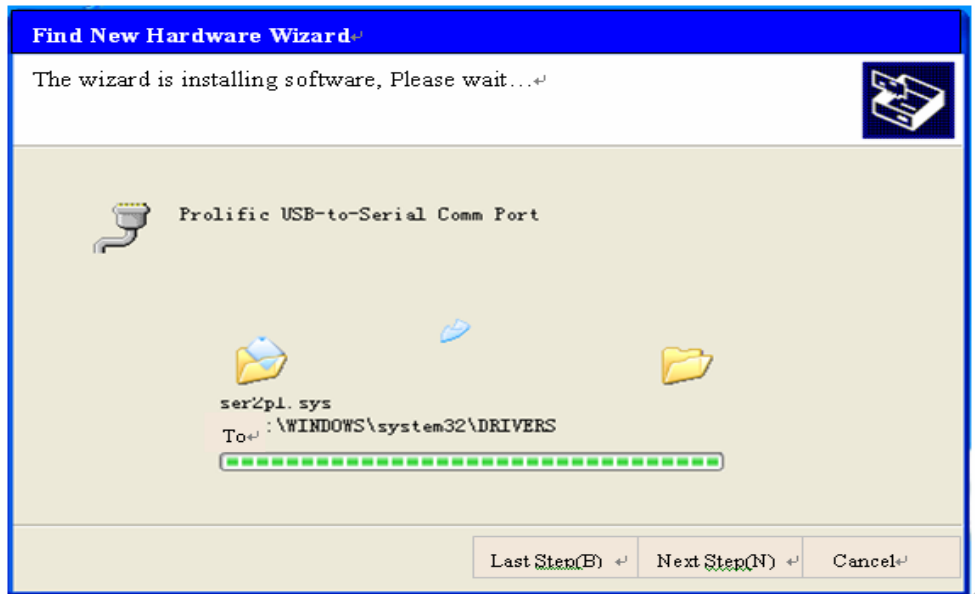


Connect to the TV's J3(4pin)

USB connects to pc

For the first connecting, the pc will recognize and automatically install the USB device. The process is just like the installation of a mini disk, see the following picture.

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6.2 Upgrading with the MtkTool

MTKtool is a green program needing no installation. It is saved in the folder



MTKTOOL_20061027

. There are five folders/files in this folder altogether.



MtkLog



flashinf.ini
配置设置
17 KB



MtkTool.exe

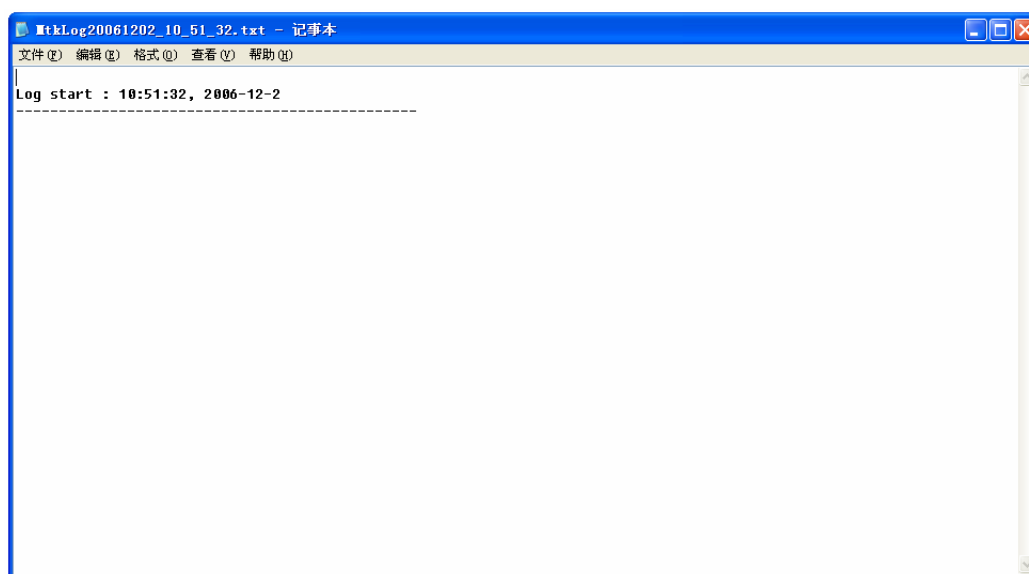


MtkTool.ini
配置设置
1 KB




Shortcut to
MtkTool.exe
快捷方式

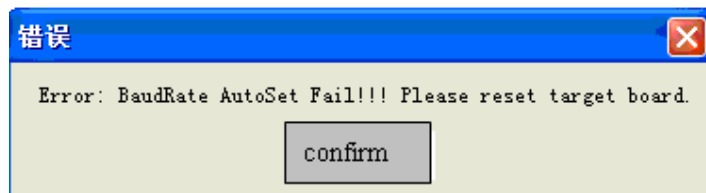
The MtkTool using log is restored in the MtkLog folder. It records the running time and date whenever the tool is used. The log will be a txt file named by the date and time.



MtkTool.exe

After connecting the TV with your PC, double click  icon, open the MtkTool.

If following error appears, it means the related port is not be set properly.



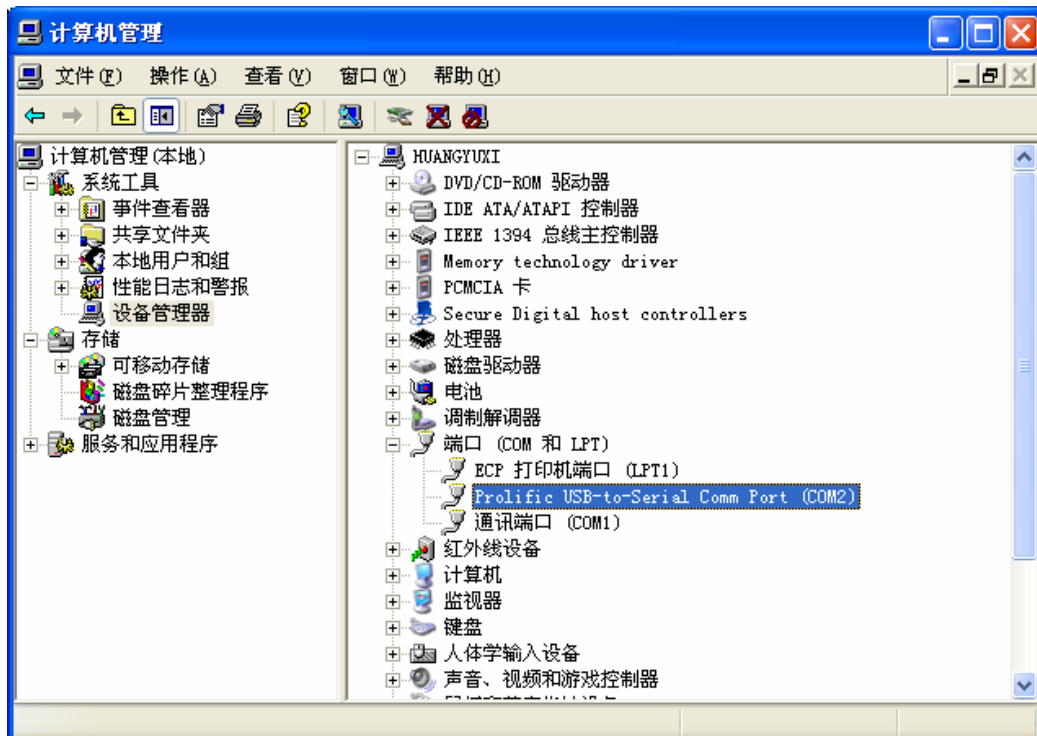
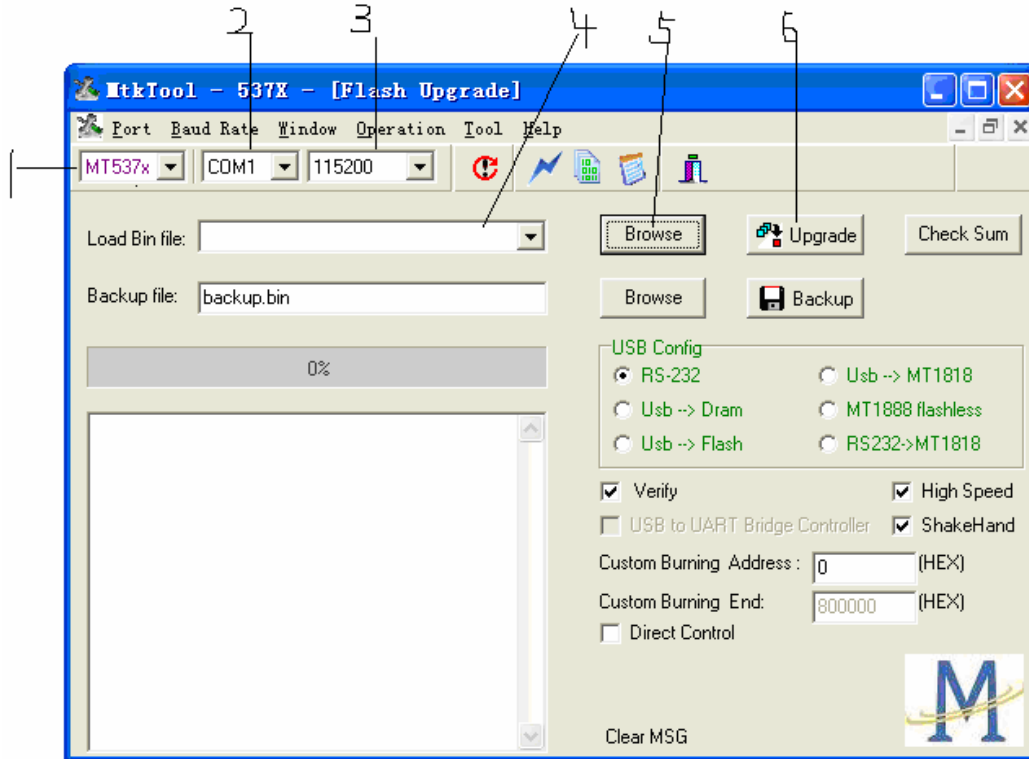
Ignore these errors, click “Confirm” and enter the MtkTool main interface, see the following picture.

1—Flash chip model

2—The port through which the PC communicate with the chip.

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- 3—The communicating baud rate
- 4—The new program file (*.bin) for upgrading.
- 5—Click this button can select the *.bin file to be used for upgrading.
- 6—Click to start upgrading.

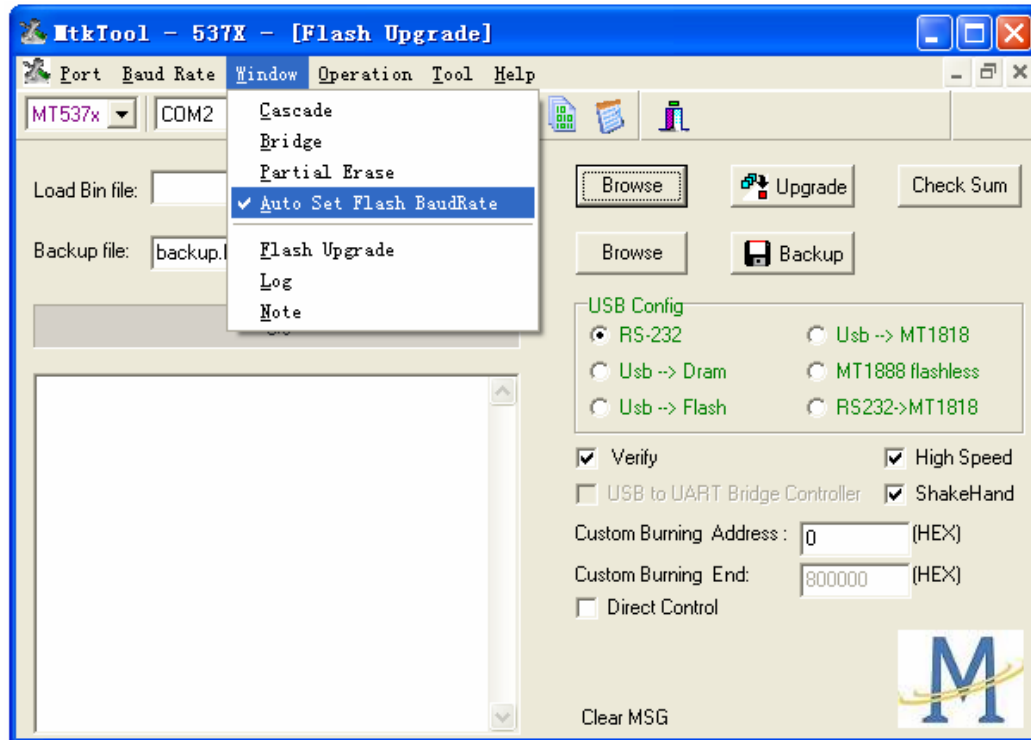


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Open “Device Manager” and find which port is connected with the TV. In above picture, COM2 is connected to the TV; so, select “COM2” in the MtkTool main interface. Select the right baud rate according to chip model. For this unit(chip model is **MT537X**), select **115200*2**.

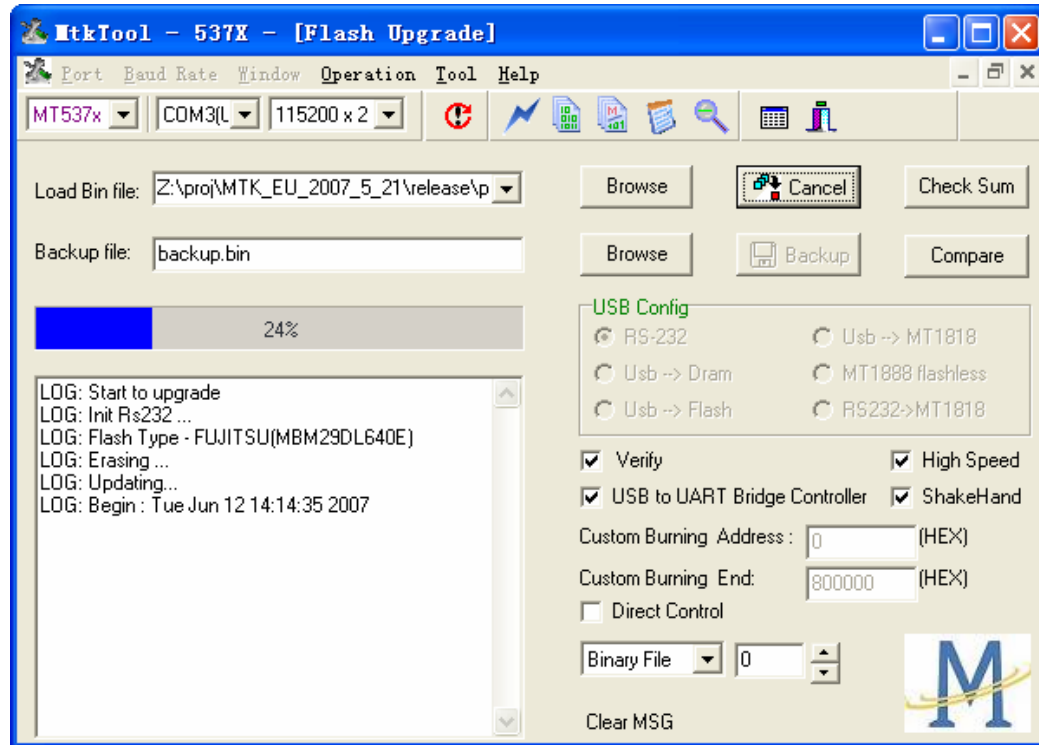
Note: Where or not click the “Auto Set Flash Baud Rate” in the “window” menu depends on the chip type. If the flash chip does not support high speed transport, do not select this option; otherwise, reserve the selected mood.



Click “Browse” button (5), find the upgrading program file, select it. Press “Upgrade” button and start upgrading.

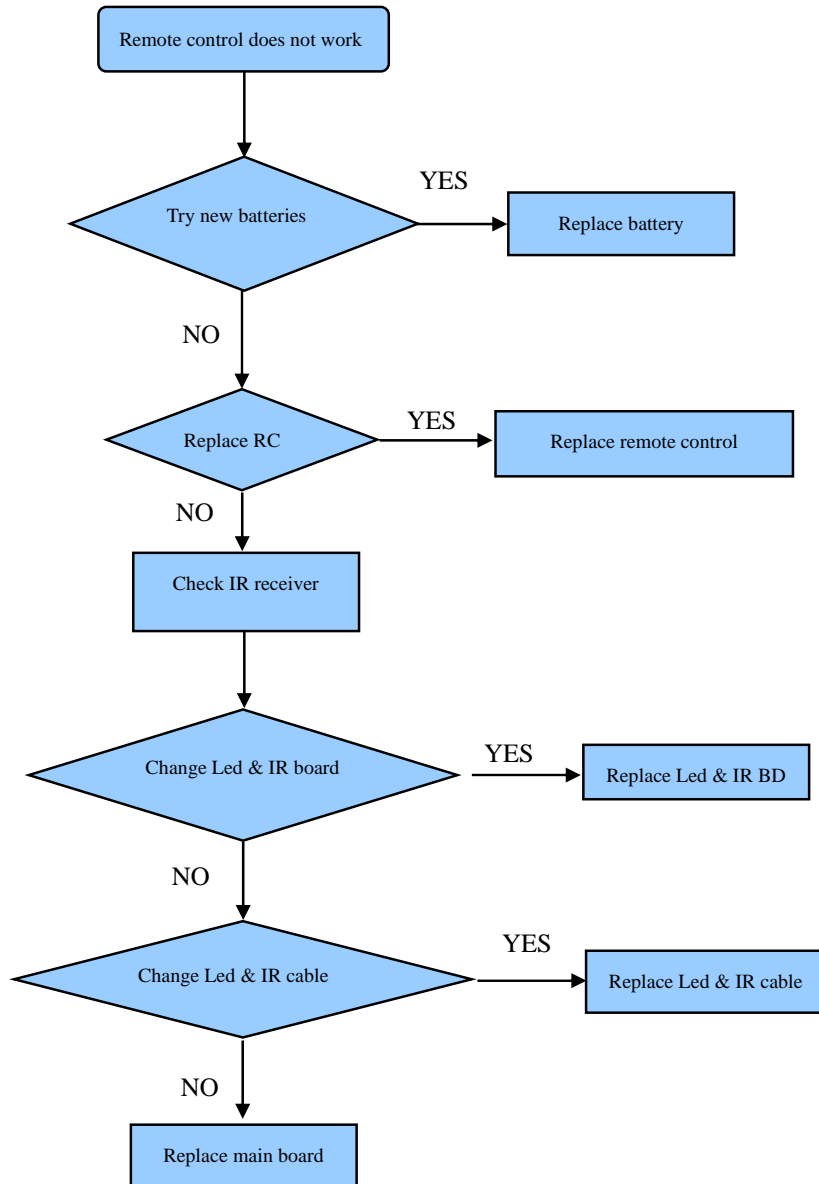
The following interface appears on the screen, indicating upgrading successfully.

LCD TV Service Manual

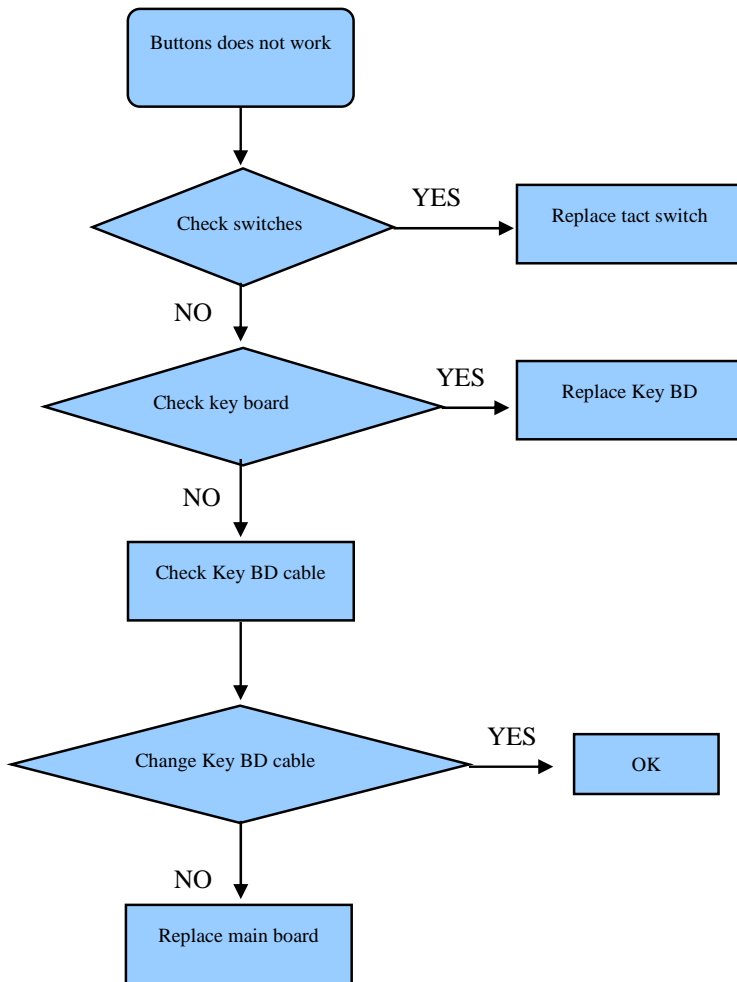


7. Troubleshooting

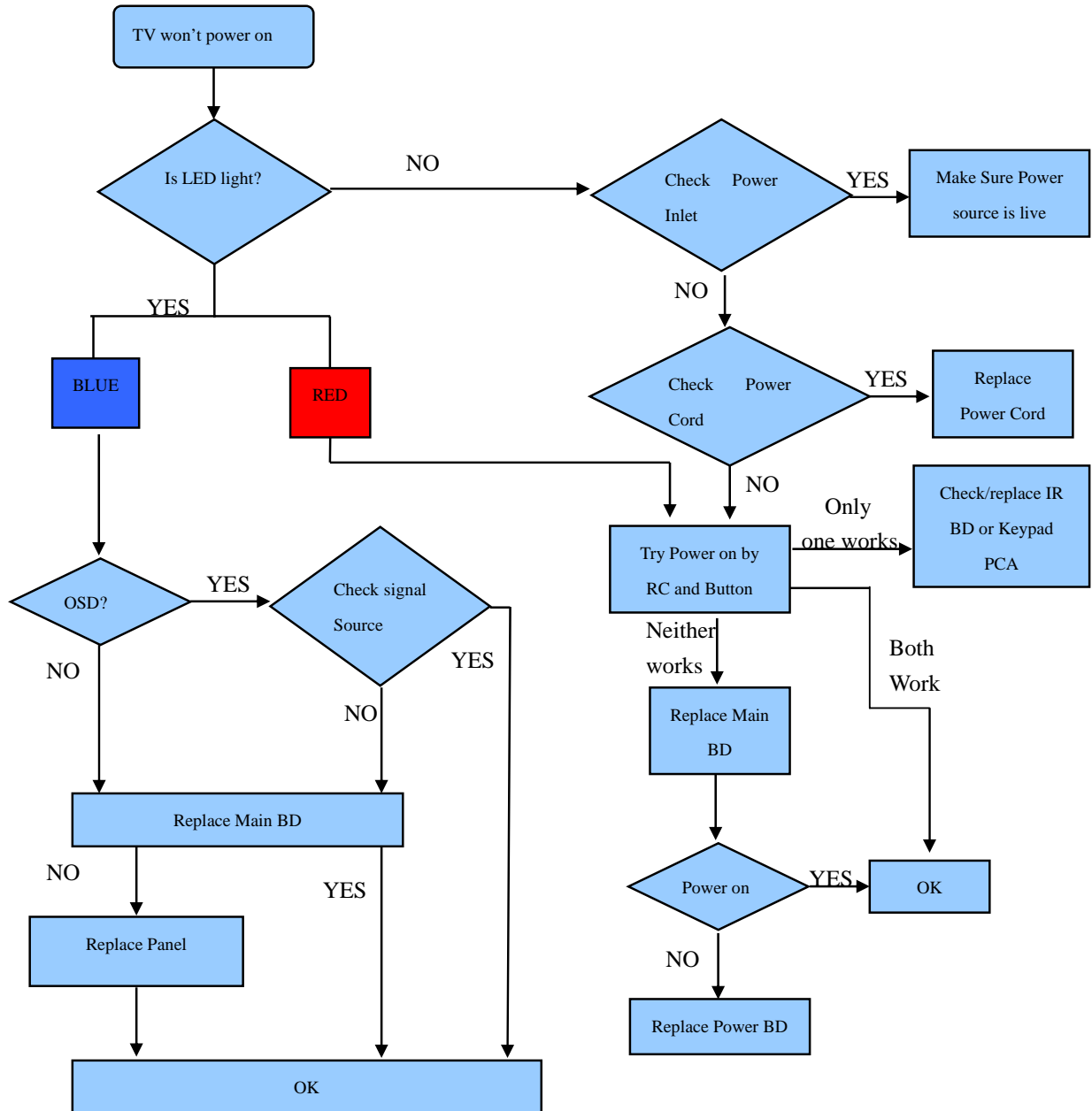
7.1 Troubleshooting for Remote Control



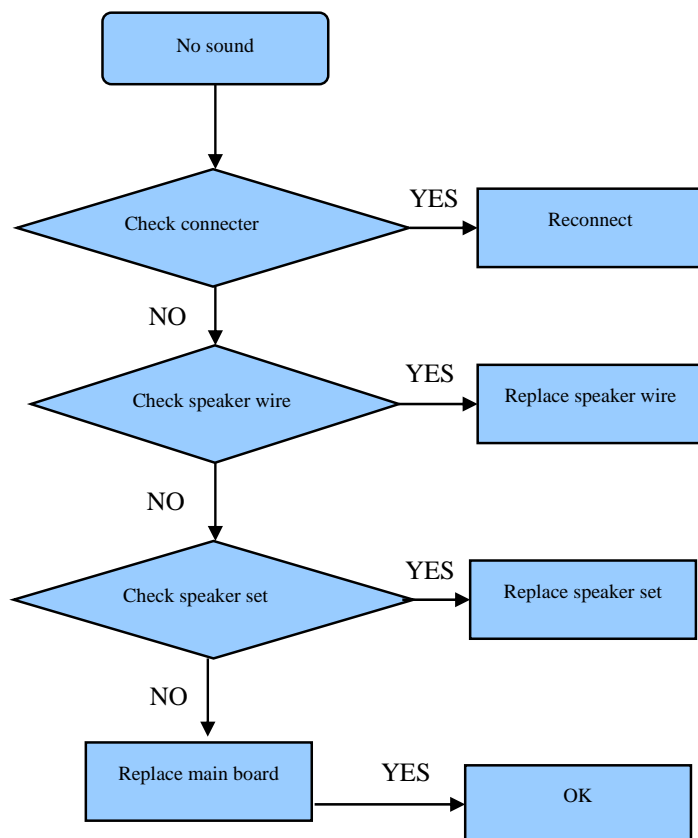
7.2 Troubleshooting for Function Key



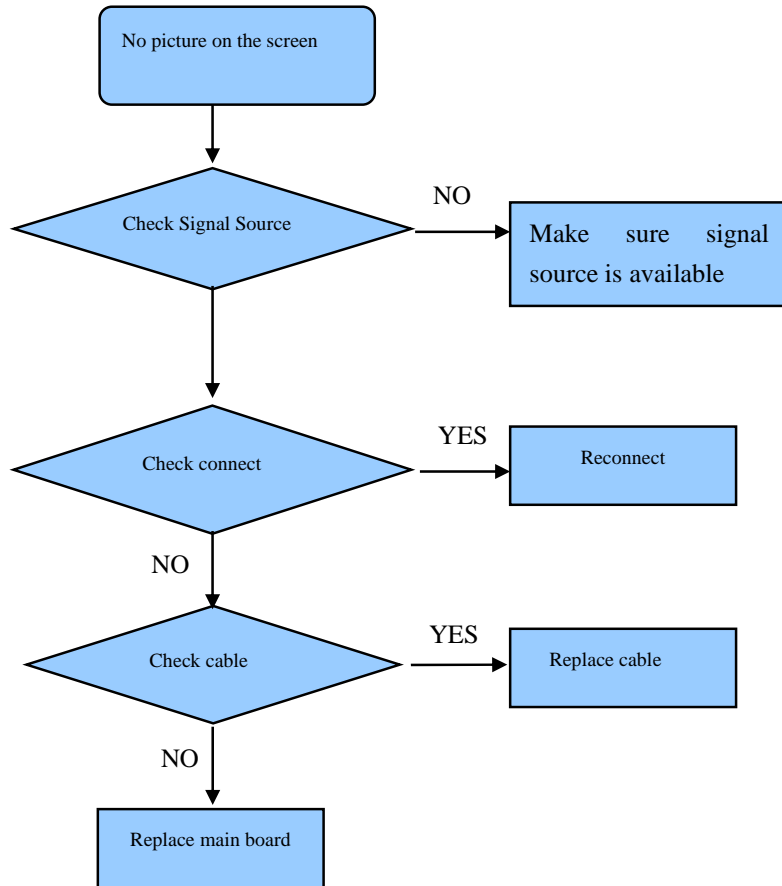
7.3 TV won't Power On



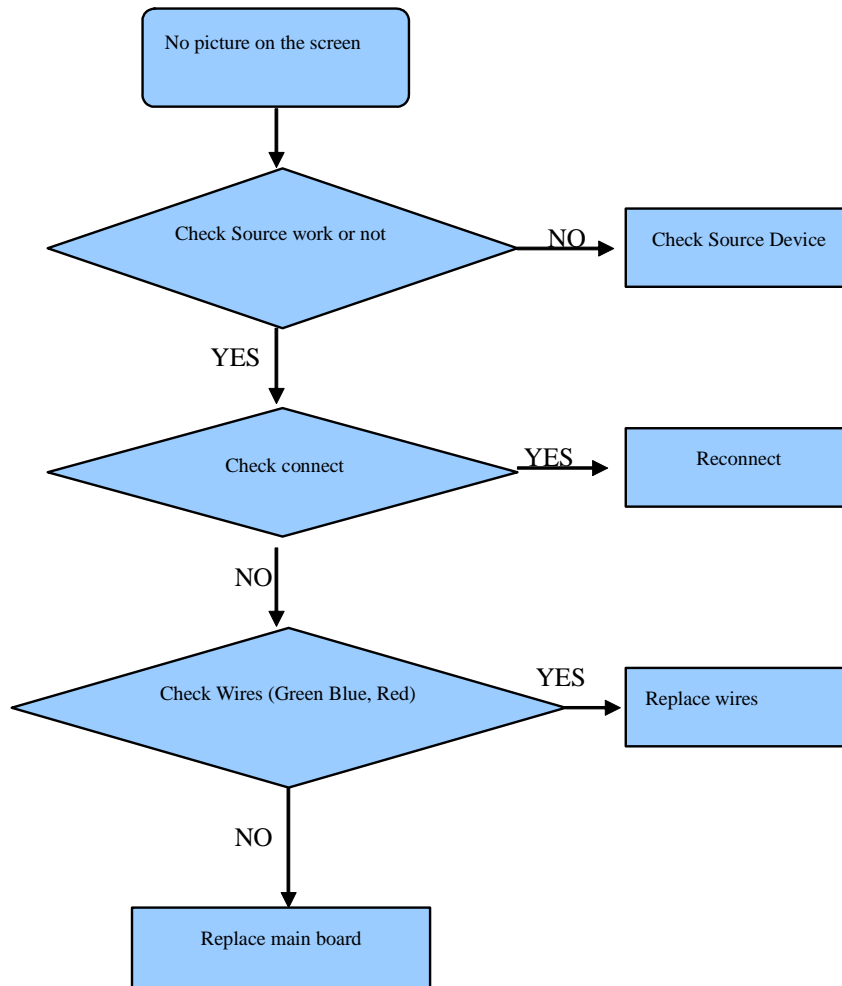
7.4 Troubleshooting for Audio



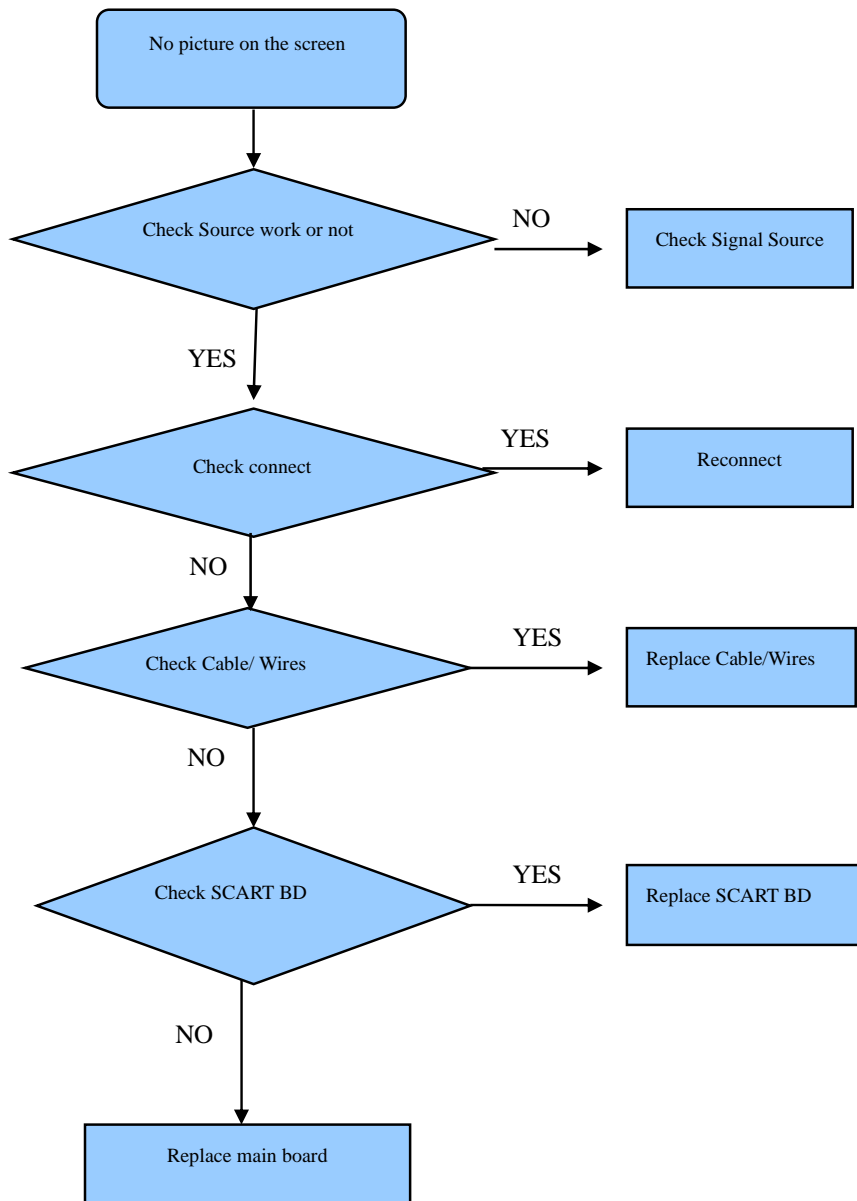
7.5 Troubleshooting for TV/VGA/HDMI input



7.6 Troubleshooting for YPbPr input











7.7 Troubleshooting for Video/S-Video/ SCART input







7.8 Other problems

Please check the following list prior to calling The Electronics Service Centre for assistance.

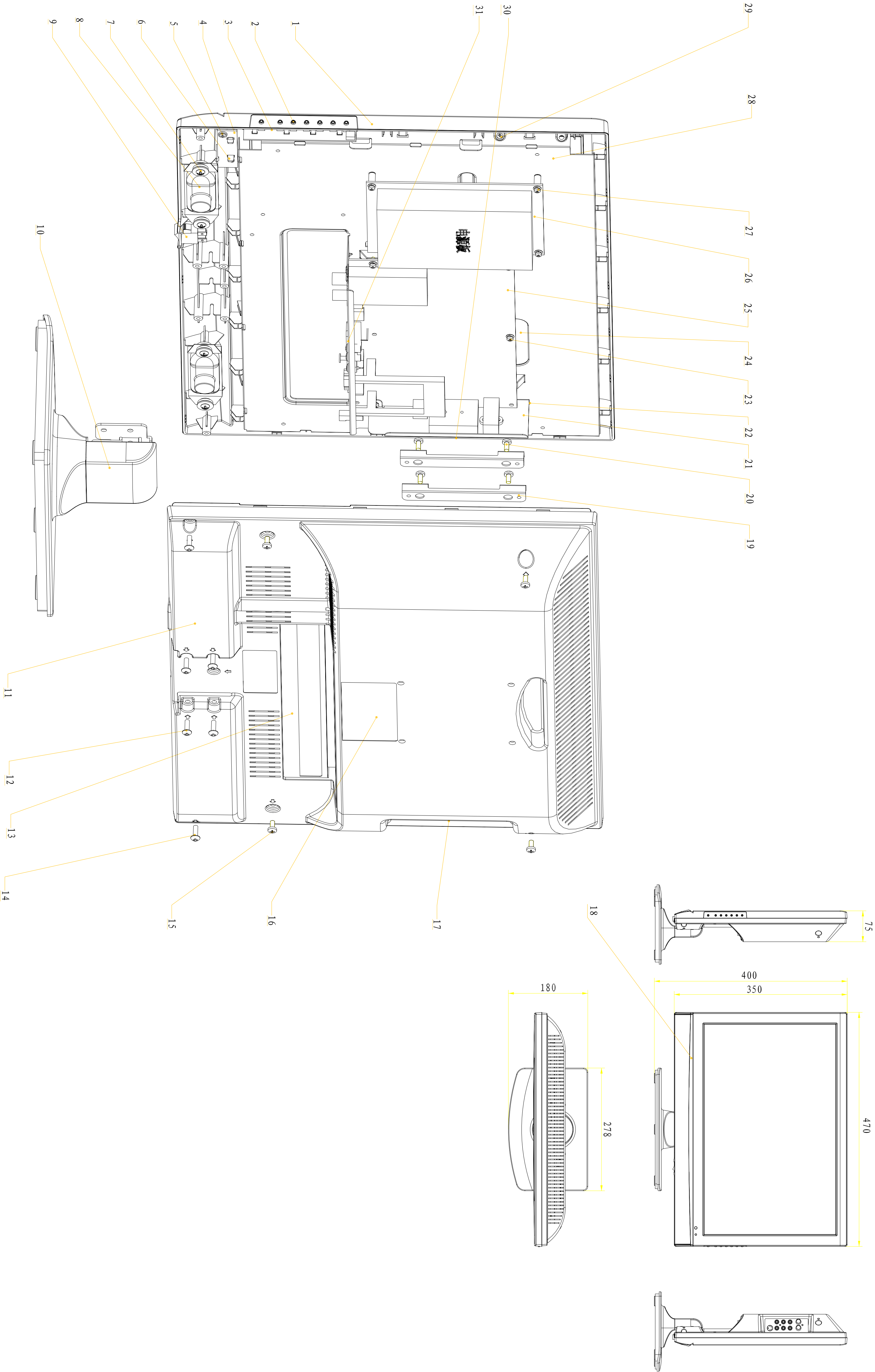
Symptom	Check items
Neither picture nor sound. 	<ul style="list-style-type: none"> - Check the contact of sockets is all right. - Check the TV main power is on.
Picture is OK but no sound. 	<ul style="list-style-type: none"> - Check the Volume control is set to minimum or mute.
Sound is OK, but no colour. 	<ul style="list-style-type: none"> - Check the colour control and adjust it properly. - Check the program is in colour and not in black & white.
The picture has no image. 	<ul style="list-style-type: none"> - Check the antenna is installed correctly and if not, adjust the overlapped antenna toward the broadcasting station.
Picture has "snow noise". 	<ul style="list-style-type: none"> - Check the antenna or its connection is correct and if not, correct the antenna fault or connection cable fault. - Check if car traffic or neon sign disturbs the sound effect.
Stripes on picture. 	<ul style="list-style-type: none"> - Check the susceptible interference by other electronic devices such as radio and television and keep magnetic or electronic devices away from the TV.
Bad stereo or Dual sound. 	<ul style="list-style-type: none"> - Long distance from the station or other radio waves can generate bad sound reception. If so, change the mode to Mono.
Remote control does not work. 	<ul style="list-style-type: none"> - Check if the batteries in the Remote control are dead. - Check if any object between IR sensor of the TV and the Remote control does not obstruct.

LCD TV Service Manual

Symptom	Check items
<p>"UNSUPPORTED" appears on the screen.</p> 	<ul style="list-style-type: none">- Check the resolution and frequency of your PC. Then, adjust them to optimum condition for LCD TV.- Refer to the table of PC mode input format (If registered resolution and frequency on the table no listed then no picture will be displayed.)
<p>"NO SIGNAL" appears on the screen.</p> 	<ul style="list-style-type: none">- Ensure that the signal cable is firmly connected to PC and TV.
<p>Image is not clear.</p> 	<ul style="list-style-type: none">- Adjust the PHASE control.
<p>Image is not centered.</p> 	<ul style="list-style-type: none">- Adjust the H-POSITION and V-POSITION control.

8. Explode View

9. Schematic circuit diagram



31	S12325-87 ST1X12C	black\VOH\STD	screw	2	
30	S12325-87 ST1X12C	black\VOH\STD	screw	1	
29	S12336-87 KX18	silver\white\VOH\STD	screw	4	
28	GH/T 813. 1-2000 KX16	silver\VOH\STD	screw	4	
27	KS068. 130. 393\STD\VOH	black\VOH\STD	multi Bracket assembly	1	
26	S12336-87 KX18	silver\VOH\STD	screw	4	
25	255-5904113\VOH		power board assembly	1	
24	KS062. 2008. 1171\VOH		main board assembly	1	
23	BT190M1-10\1X\VOH		lcd panel	1	
22	S12331-87 ST1X18\VOH\STD		screw	5	
21	KS068. 108. 1200\VOH		terminal board	1	
20	S12324-87 ST1X8F	black\VOH\STD	screw	4	
19	KS068. 108. 1201\VOH		wall bracket	2	
18	KS068. 447. 258\VOH		decorate	1	
17	KS068. 304. 3127\VOH		scutcheon (side)	1	
16	KS068. 807. 3533\VOH		nameplate	1	
15	GH/T813. 2-2000 KX18	black\VOH\STD	screw	4	
14	S12325-87 ST1X12C	black\VOH\STD	screw	3	
13	KS068. 894. 3128\VOH (down)		scutcheon	1	
12	S12324-87 ST1X16C	black\VOH\STD	screw	4	
11	KS068. 074. 468\20\VOH		back cabinet	1	
10	W65. 121. 029		base assembly	1	
9	VD1371E-3908-8\VOH		particle	1	
8	S12336-87 ST1X12C. 1.1		speaker	2	
7	S12336-87 ST1X12C. 1.1		screw	4	
6	KS068. 846. 063\VOH		text	1	
5	S12325-87 ST1X12C	black\VOH\STD	screw	1	
4	KS062. 708. 1109		remote control board assembly	1	
3	KS062. 708. 1108-3\VOH		key	1	
2	KS068. 555. 070\黑色\20		bracket	1	
1	KS068. 074. 465\17+42\20\VOH		front cabinet	1	

更改历史记录				变更单号	签名	日期
设计						
审核						
工艺						
标准化						
批准						

LHD1929EU				RSAG2. 025. 799			
				修改记录	页 数	比例	
					第 1 页	共 1 页	1: 2

青岛海信电器股份有限公司

标准: A1

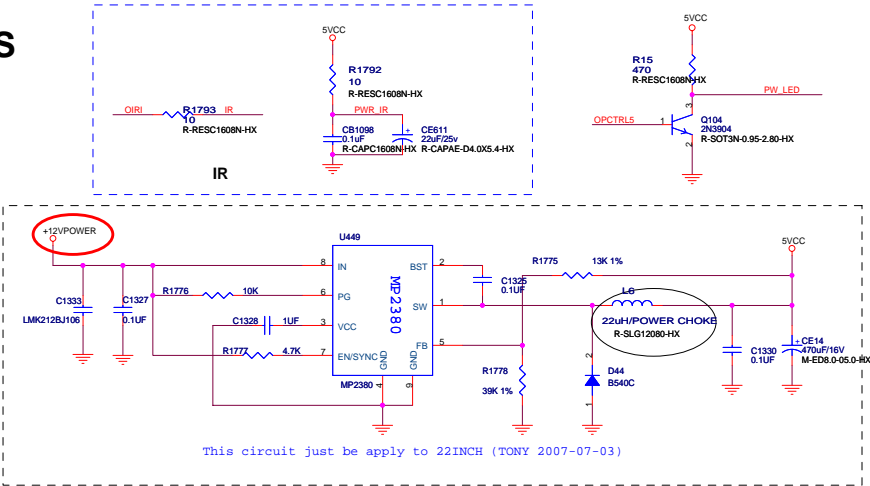
MT5331RAV1.7

MT5330 (PBGA) REFERENCE DESIGN - 2 LAYERS

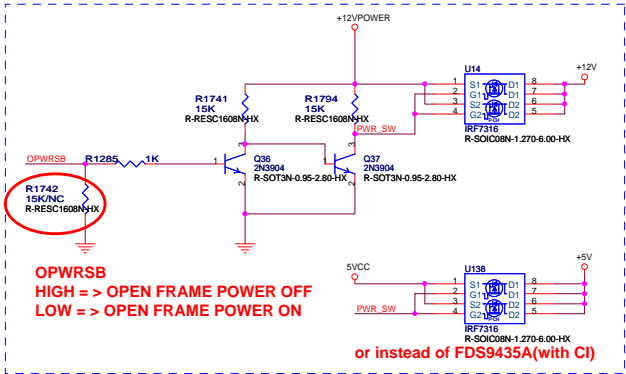
Rev	History	DATE
RA-V1	INITIAL VERSION	2006/07/05
RA-V1.2	ADDED DVB-CI INTERFACE	2006/09/20
RA-V1.3	REMOVE RF SWITCH (PAGE3) REMOVE POWER-ON STATUS CIRCUIT (PAGE7) CHANGE AUDIO CODEC CIRCUIT (PAGE16) CHANGE AUDIO AMP CIRCUIT (PAGE17)	2006/10/15
RA-V1.4	MODIFY MUTE CIRCUIT FOR MT8291 (PAGE16)	2006/10/28
RA-V1.7	CHANGE NOTE IS STATE ON THE DOCUMENT	2007/01/01
RA-V1.8	ADDED DVB-CI INTERFACE(PAGE4/PAGE5/PAGE14) MODIFY SCART INPUT(PAGE10) MODIFY YPBPR AUDIO INPUT(PAGE9) MODIFY VGA AUDIO INPUT(PAGE11 PAGE12) MODIFY KEY PAD CIRCUIT,CHANGE I/O PORT TO ADIN2 AND ADIN3(PAGE1) MODIFY VGA HSYNC AND VSYNC CIRCUIT(PAGE12) ADDED 12V-5V CIRCUIT(PAGE1)	2007/06/23 2007/06/25 2007/06/27

01. INDEX
02. POWER
03. TUNER
04. MT5131 ASIC
05. MT5331 ASIC
06. MT5331 BYPASS CAP.
07. MT5331 PERIPHERAL
08. DDR1 MEMORY
09. AV/S_VDIEO/YBPBR INPUT
10. SCART INPUT AND OUTPUT
11. VGA/HDMI INPUT
12. AUDIO CODEC
13. AMP
14. CI CARD

NAME	TYPE	DEVICE
+24V	POWER +24V	POWER SUPPLY
+12V	POWER +12V	POWER SUPPLY
+5V	POWER +5V	POWER SUPPLY
+5VSB	POWER +5V	POWER SUPPLY
DV33SB	POWER +3.3V	STANDBY POWER
+5V_TUENR	POWER +5V	TUNER POWER
DV33_DM	POWER +3.3V	MT5131 POWER AND ITS PERIPHERAL
DV18_DM	POWER +1.6V	MT5131 POWER
DV33	POWER +3.3V	MT5331 POWER AND ITS PERIPHERAL
AV33	POWER +3.3V	MT5331 ANALOG POWER
DV18_DDR	POWER +1.8V	MT5331 DDR POWER
AV15	POWER +1.5V	MT5331 VIDEO FRONT-END POWER
DV12	POWER +1.2V	MT5331 POWER
AV12	POWER +1.2V	MT5331 ANALOG POWER
GND	GROUND	DIGITAL GROUND
AGND_PLL	GROUND	ANALOG GROUND
AGND_AFE	GROUND	ANALOG GROUND
AGND_HDMI	GROUND	ANALOG GROUND
AGND_LVDS	GROUND	ANALOG GROUND

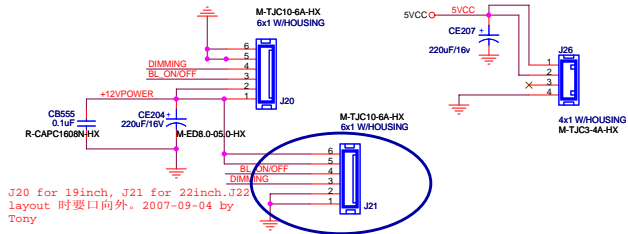


This circuit just be apply to 22INCH (TONY 2007-07-03)

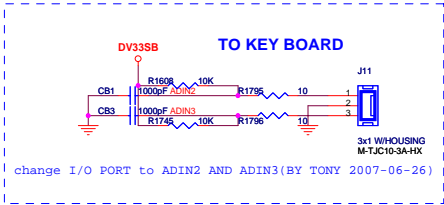


OPWRSB
HIGH => OPEN FRAME POWER OFF
LOW => OPEN FRAME POWER ON

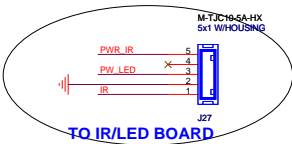
or instead of FDS9435A(with CI)



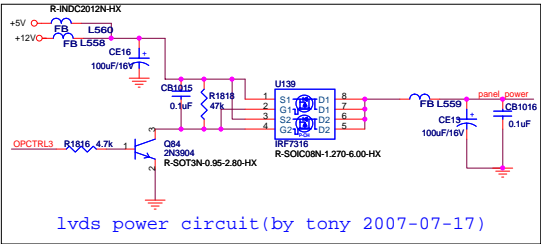
J20 for 19inch, J21 for 22inch.J22 layout 吋要口向外。2007-09-04 by Tony



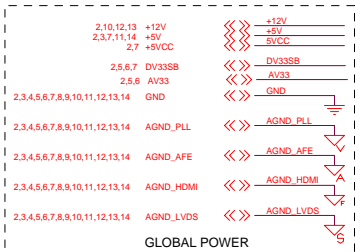
change I/O PORT to ADIN2 AND ADIN3(BY TONY 2007-06-26)



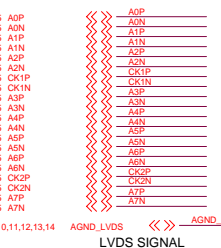
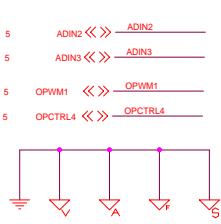
TO IR/LED BOARD



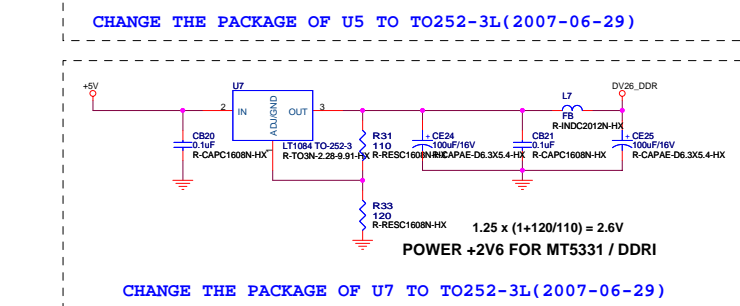
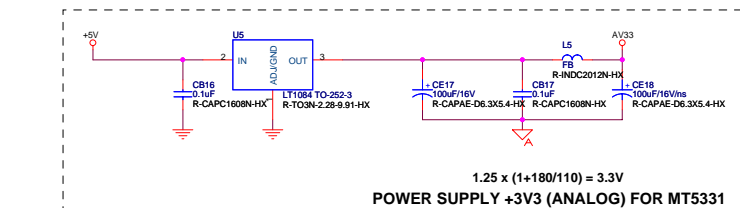
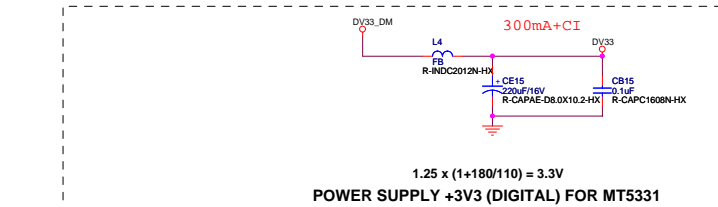
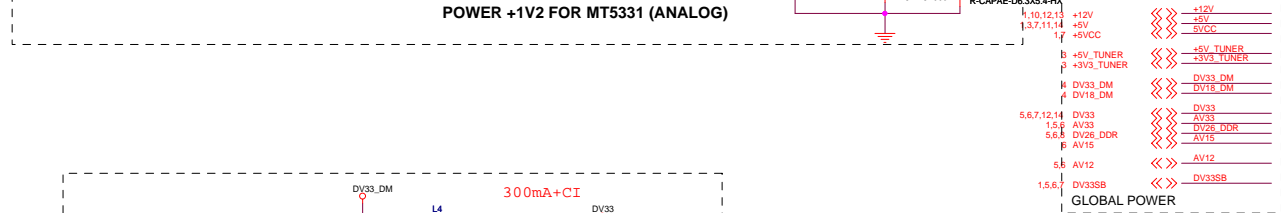
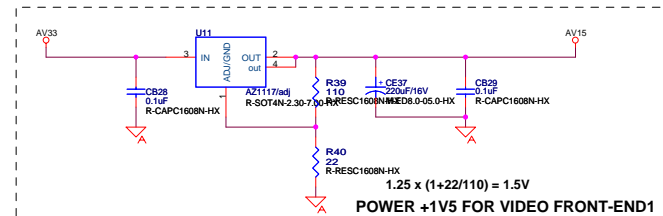
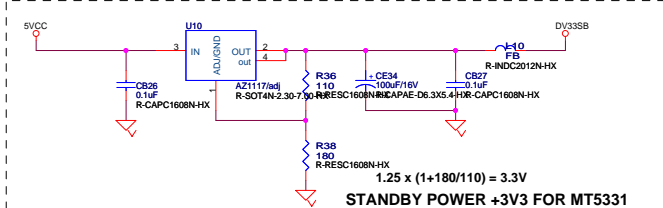
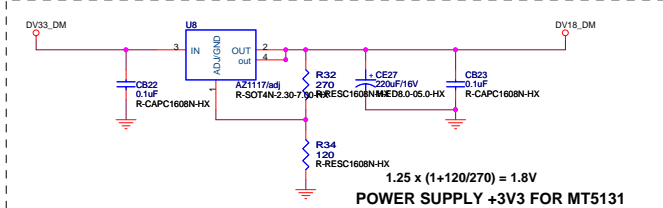
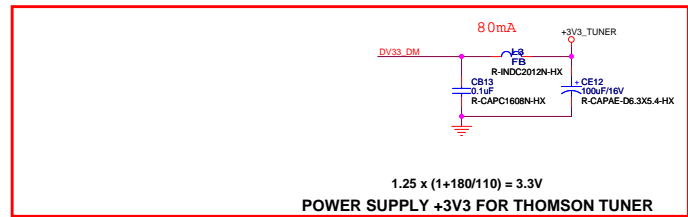
lvds power circuit(by tony 2007-07-17)

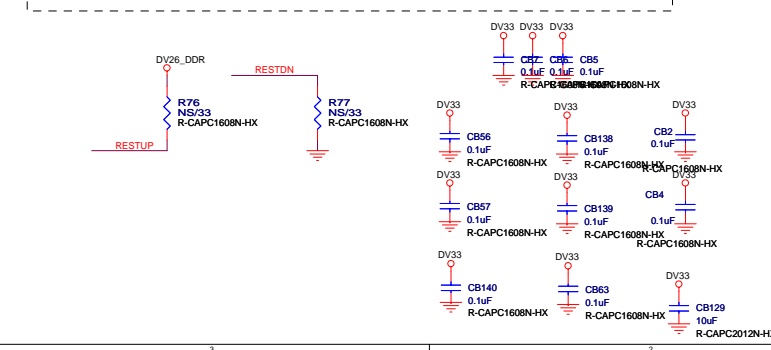
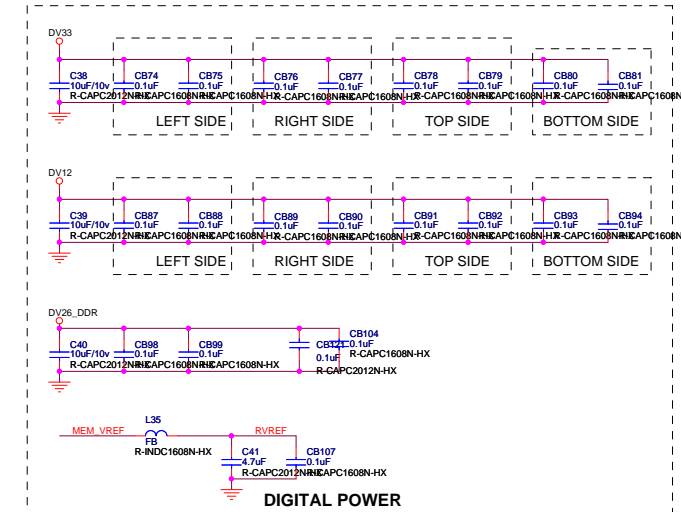
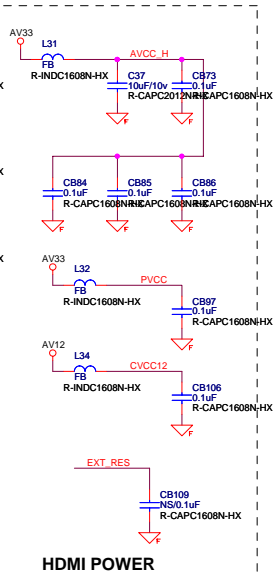
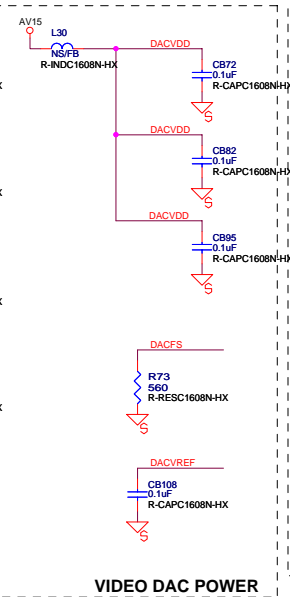
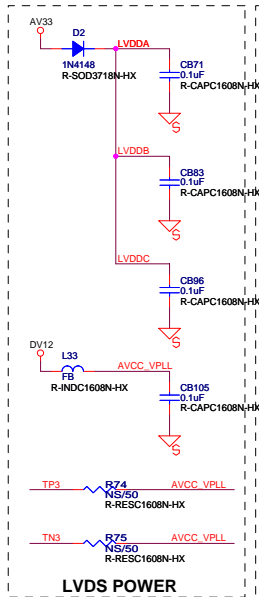
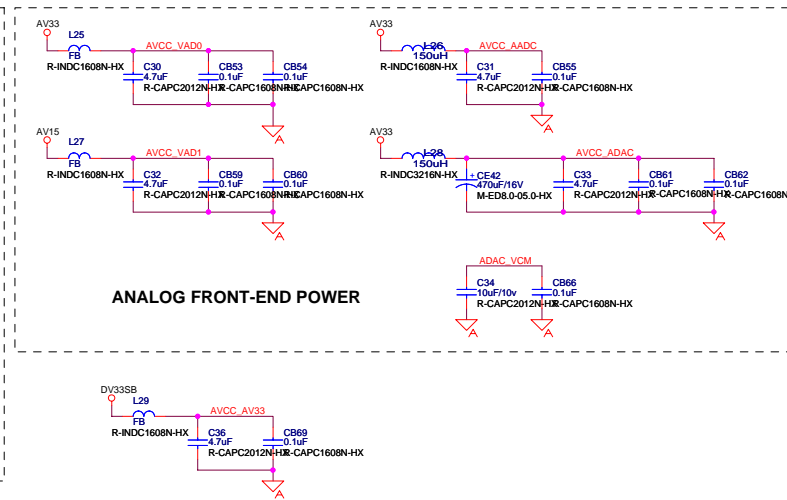
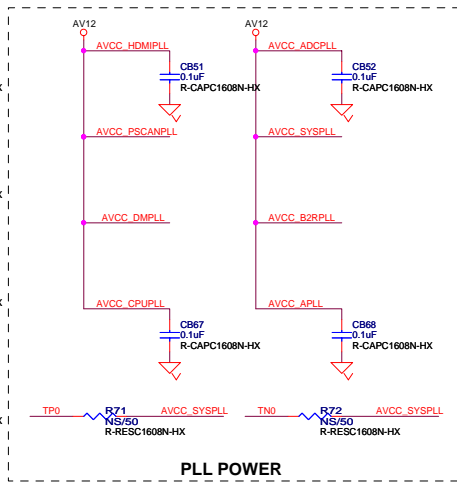
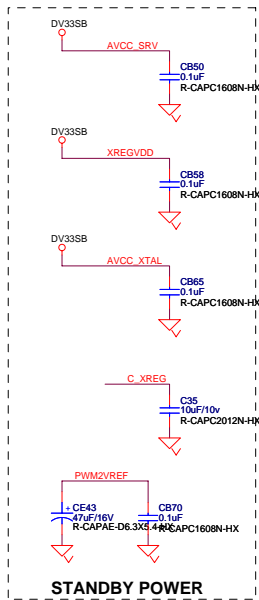


GLOBAL POWER

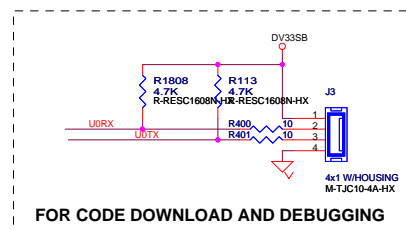
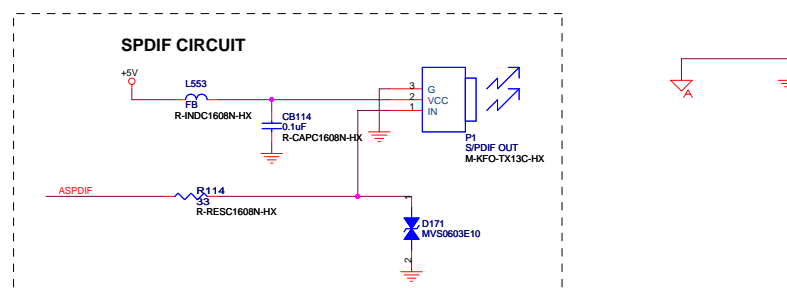
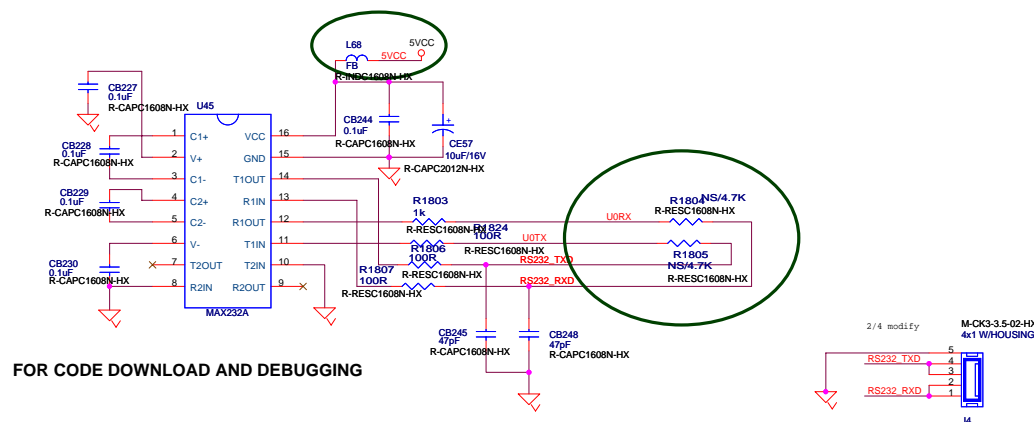
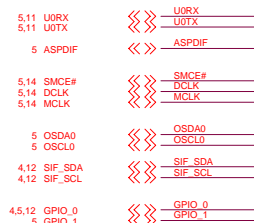
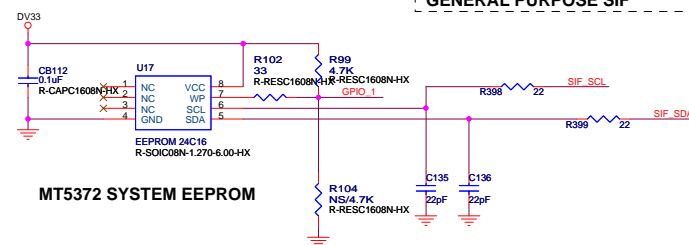
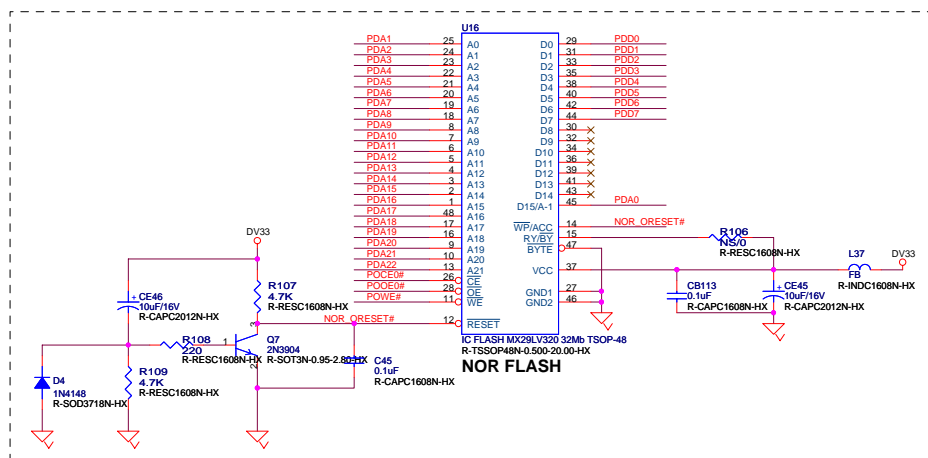
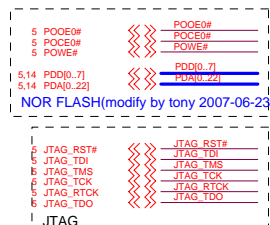
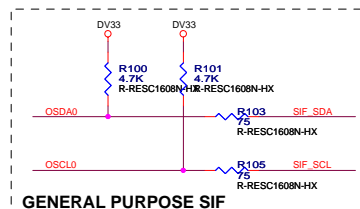
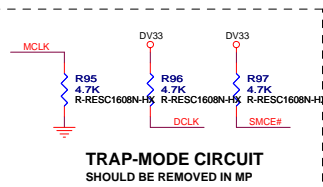
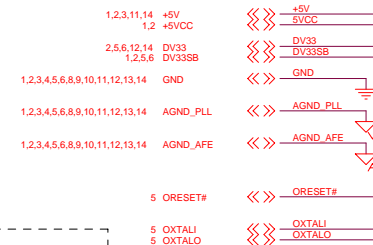
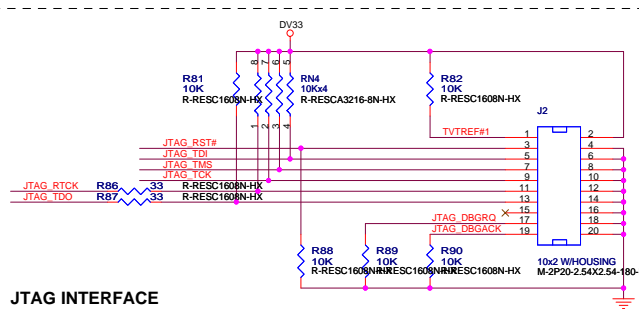
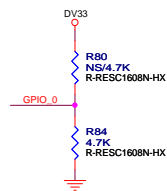
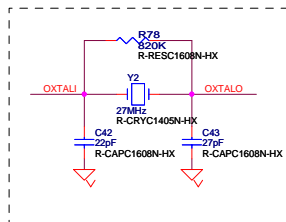


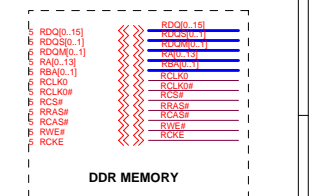
MediaTek Confidential

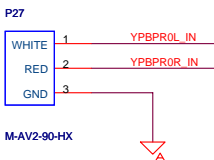
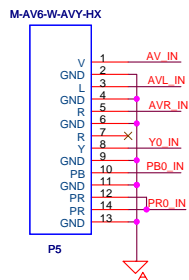




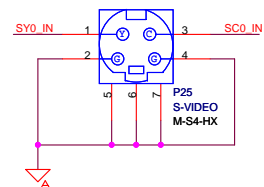
2.5,7,12,14	DV33	<<>>	DV33	
1,2,3	AV33	<<>>	AV33	
2,5,8	DV26_DDR	<<>>	DV26_DDR	
2	AV15	<<>>	AV15	
2,5	AV12	<<>>	AV12	
1,2,5,7	DV33SB	<<>>	DV33SB	
1,2,3,4,5,7,8,9,10,11,12,13,14	GND	<<>>	GND	
GLOBAL POWER				
2,6	AVCC_HDMIPLL	<<>>	AVCC_HDMIPLL	
2,6	AVCC_PSCANPLL	<<>>	AVCC_PSCANPLL	
2,6	AVCC_DMPPLL	<<>>	AVCC_DMPPLL	
2,6	AVCC_CPUPLL	<<>>	AVCC_CPUPLL	
2,6	AVCC_ADCPLL	<<>>	AVCC_ADCPLL	
2,6	AVCC_SYSPLL	<<>>	AVCC_SYSPLL	
2,6	AVCC_B2RPLL	<<>>	AVCC_B2RPLL	
2,6	AVCC_APLL	<<>>	AVCC_APLL	
5	TP0	<<>>	TP0	
5	TP1	<<>>	TP1	
5	TP2	<<>>	TP2	
5	TP3	<<>>	TP3	
5	TP38	<<>>	TP38	
1,2,3,4,5,7,8,9,10,11,12,13,14	AGND_PLL	<<>>	AGND_PLL	
PLL POWER				
5	AVCC_VAD0	<<>>	AVCC_VAD0	
5	AVCC_VAD1	<<>>	AVCC_VAD1	
5	AVCC_AADC	<<>>	AVCC_AADC	
5	AVCC_ADAC	<<>>	AVCC_ADAC	
5	ADAC_VCM	<<>>	ADAC_VCM	
5	TP1	<<>>	TP1	
5	TP2	<<>>	TP2	
5	TP3	<<>>	TP3	
5	TP38	<<>>	TP38	
1,2,3,4,5,7,8,9,10,11,12,13,14	AGND_AFE	<<>>	AGND_AFE	
ANALOG FRONT-END POWER				
5	AVCC_H	<<>>	AVCC_H	
5	PVCC	<<>>	PVCC	
5	CVCC12	<<>>	CVCC12	
5	EXT_RES	<<>>	EXT_RES	
1,2,3,4,5,7,8,9,10,11,12,13,14	AGND_HDMI	<<>>	AGND_HDMI	
HDMI POWER				
5	LVDDA	<<>>	LVDDA	
5	LVDDB	<<>>	LVDDB	
5	LVDDC	<<>>	LVDDC	
5	AVCC_VPLL	<<>>	AVCC_VPLL	
5	TP3	<<>>	TP3	
5	TP38	<<>>	TP38	
1,2,3,4,5,7,8,9,10,11,12,13,14	AGND_LVDS	<<>>	AGND_LVDS	
LVDS POWER				
5	DACVDD	<<>>	DACVDD	
5	DACFS	<<>>	DACFS	
5	DACVREF	<<>>	DACVREF	
1,2,3,4,5,7,8,9,10,11,12,13,14	AGND_LVDS	<<>>	AGND_LVDS	
VIDEO DAC POWER				
1,2,5,7	AVCC_SRV	<<>>	AVCC_SRV	
1,2,5,7	XREGVDD	<<>>	XREGVDD	
1,2,5,7	AVCC_XTAL	<<>>	AVCC_XTAL	
5	C_XREG	<<>>	C_XREG	
5	PWM2VREF	<<>>	PWM2VREF	
5	RESTUP	<<>>	RESTUP	
5	RESTDN	<<>>	RESTDN	
8	MEM_VREF	<<>>	MEM_VREF	
5	RVREF	<<>>	RVREF	



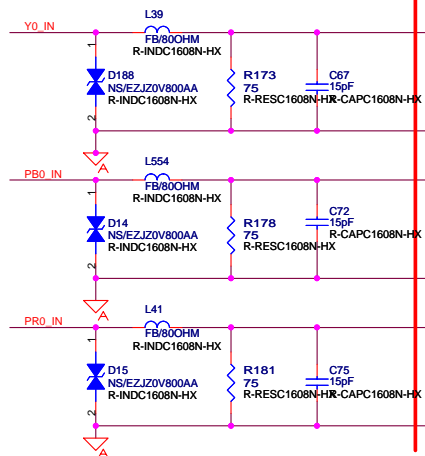




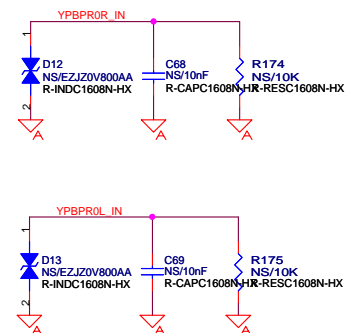
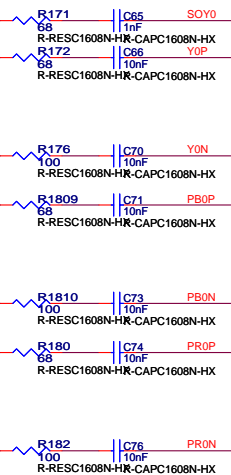
AUDIO INPUT FOR YPBPR by tony 2007-06-25



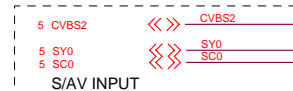
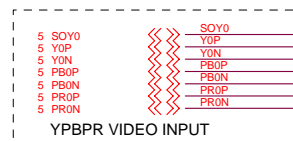
NEARLY YPBPR CONNECTOR



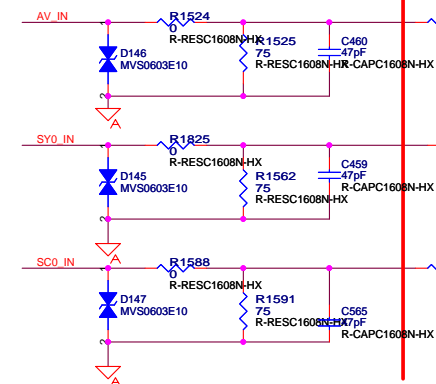
NEARLY MT5331



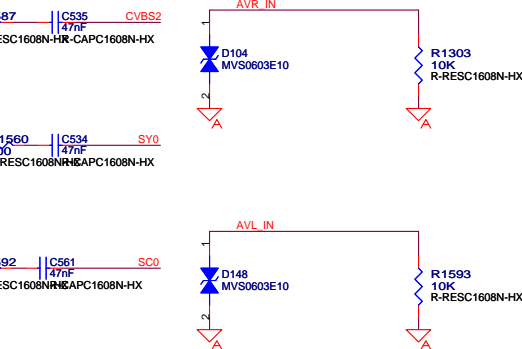
1,2,3,4,5,6,7,8,10,11,12,13,14 AGND_AFE <<>> AGND_AFE

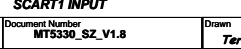
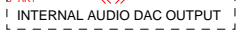
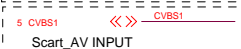
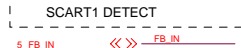
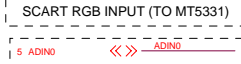
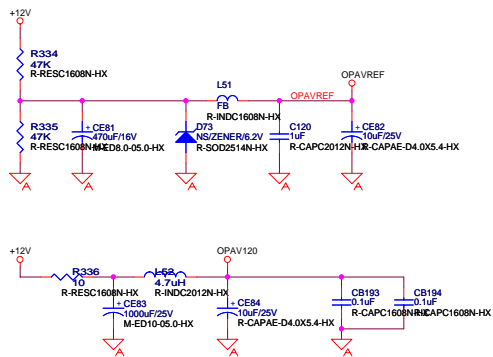
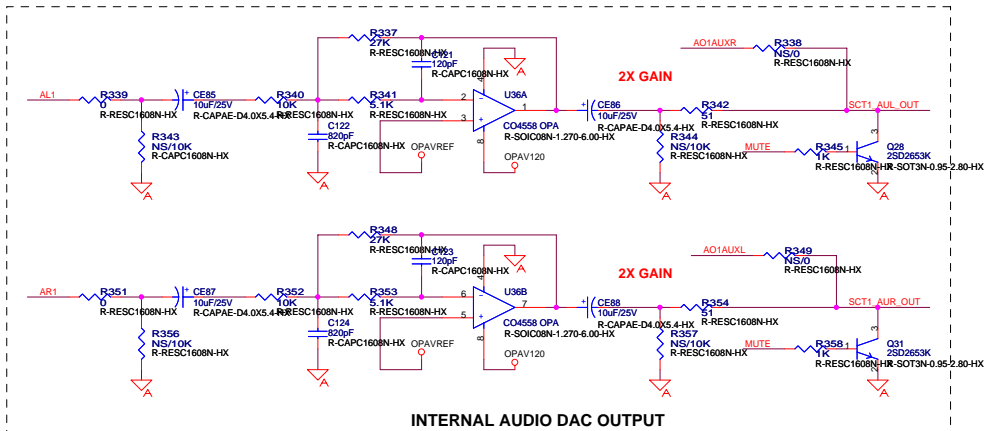
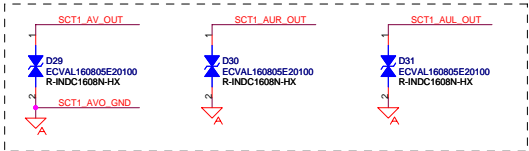
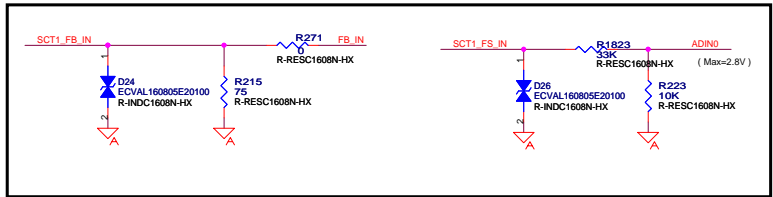
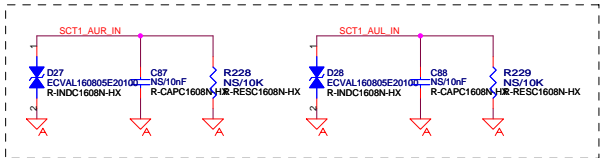
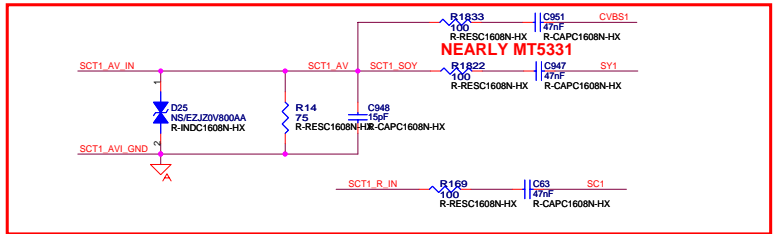
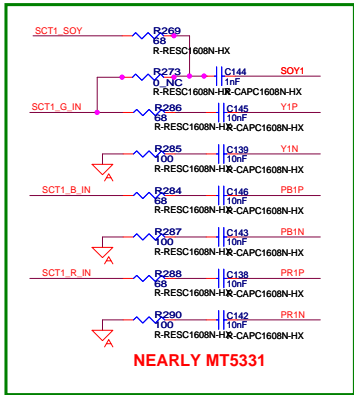
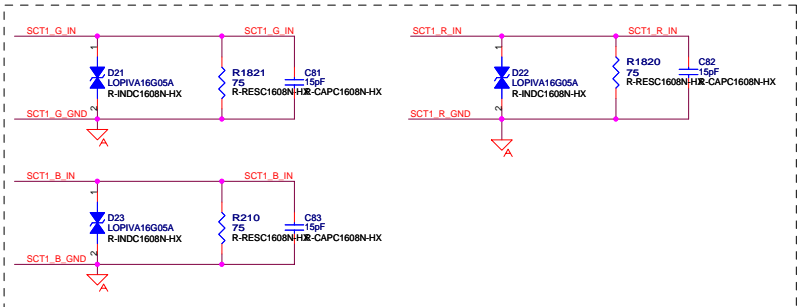


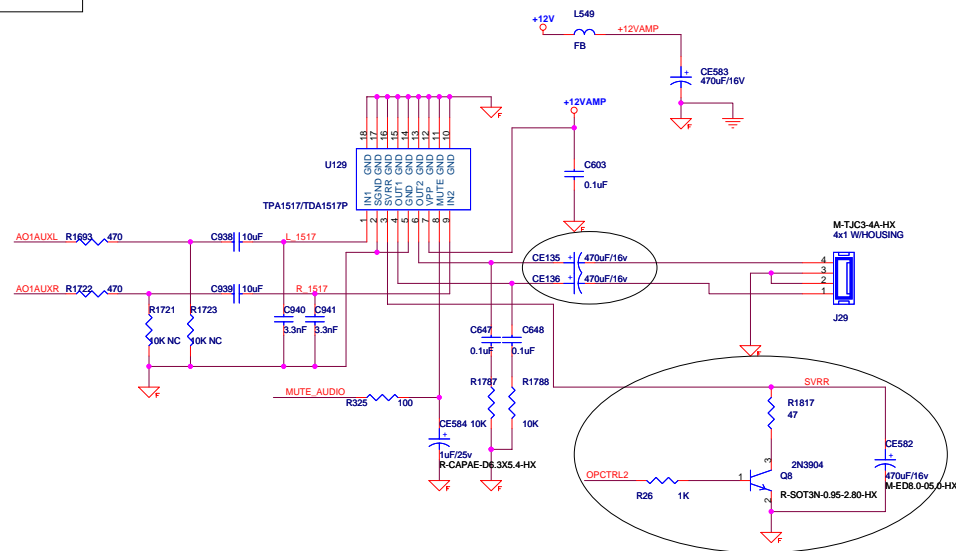
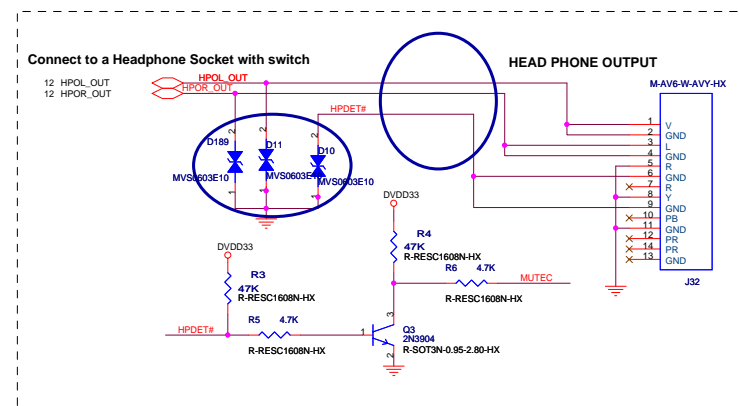
NEARLY AV CONNECTOR



NEARLY MT5370







	ON	MUTE	SB
GPIO19	L	H	H
GPIO20	L	L	H
	8.5-18V	3.3-6.4V	0-2V

