



# **Liquid Crystal Display Television Service Manual**

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**Chassis: MT5331**

**Product Type: LHD4007EU**

**Ver 1.0**

**Hisense Electric Co., Ltd.**

**Aug. 2007**

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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.

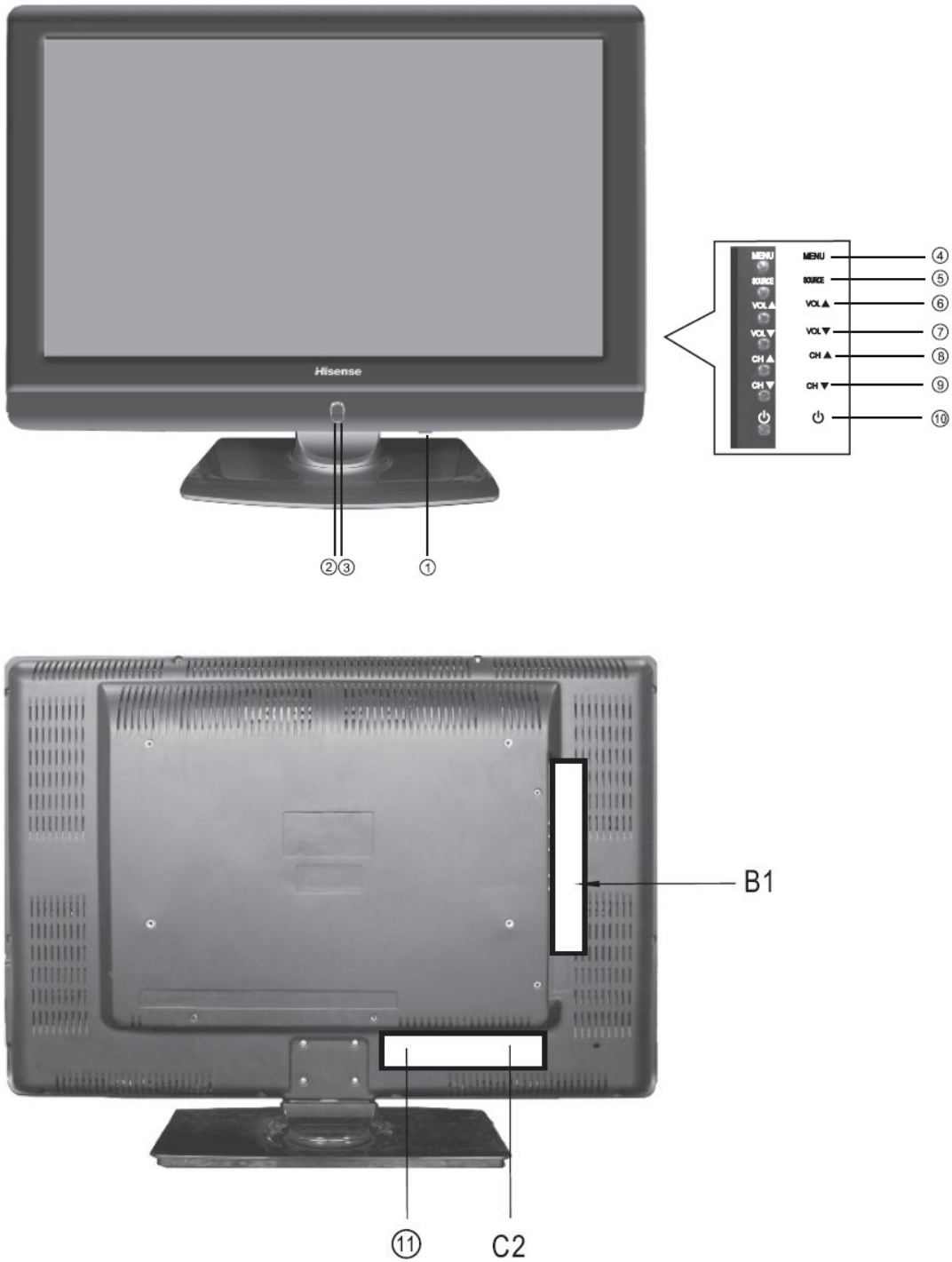


The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance

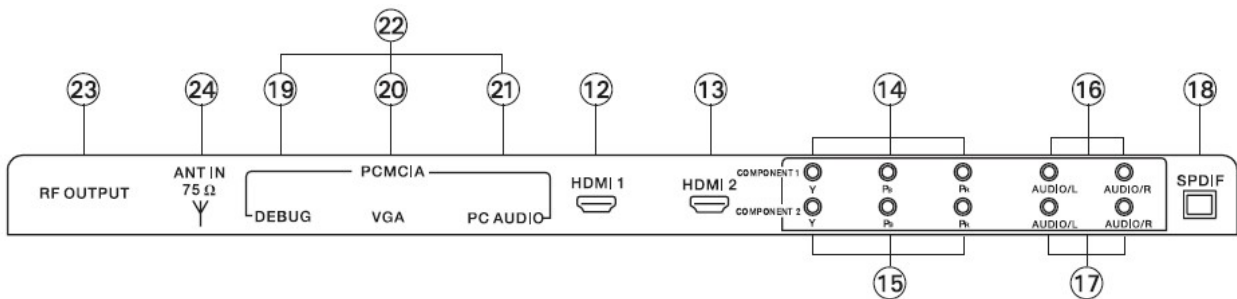
(servicing) instructions in the literature accompanying the set.

## 2. Product Function Specifications

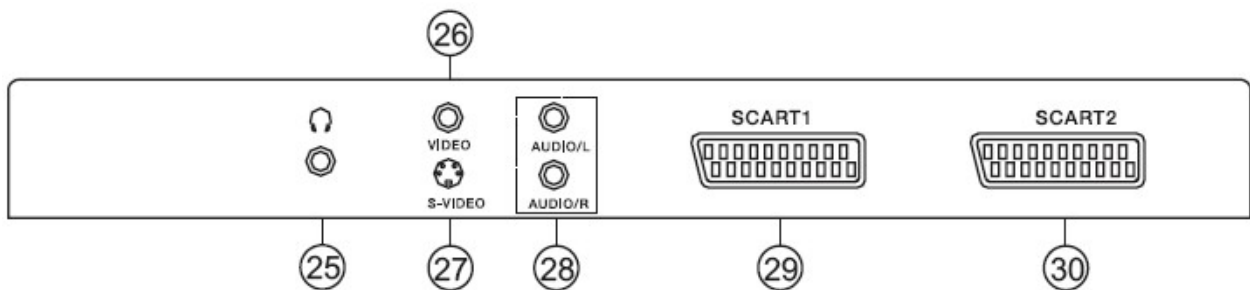
### 2.1 Product Function



## B1



## C2



- |                                |                                 |                                    |
|--------------------------------|---------------------------------|------------------------------------|
| ① Power switch (on/off)        | ⑪ AC power socket               | ②② PCMCIA socket                   |
| ② Remote sensing window        | ⑫ HDMI1 input                   | ②③ RF output                       |
| ③ Power indicator              | ⑬ HDMI2 input                   | ②④ RF input                        |
| ④ Menu button                  | ⑭ YPBPR input 1                 | ②⑤ Headphone output                |
| ⑤ Source select                | ⑮ YPBPR input 2                 | ②⑥ Video input                     |
| ⑥ Volume up/cursor right       | ⑯ Audio in1 (for YPBPR1 )       | ②⑦ S-Video input                   |
| ⑦ Volume down/cursor left      | ⑰ Audio in2 (for YPBPR2 )       | ②⑧ Audio in (for Video or S-video) |
| ⑧ Channel up/cursor up         | ⑱ SPDIF output                  | ②⑨ SCART1 connector                |
| ⑨ Channel down/<br>cursor down | ⑲ Debug (for software updating) | ③⑩ SCART2 connector                |
| ⑩ Power button (standby)       | ⑳ VGA input                     |                                    |
|                                | ㉑ PC audio                      |                                    |

## 2.2 Specifications

Native Resolution:	1366×768 Pixels (Corresponding to WXGA)
Color System:	PAL/SECAM
Sound System:	B/G, D/K, I, L/L'
Tuner:	VHF/UHF:48.25~863.25MHz
Antenna:	75ΩVHF/UHF input
Stereo:	NICAM/A2

### VIDEO INPUT:

SCART-1 (Video and RGB)	Video: 1 Vp-p, negative sync, 75Ω input RGB: 0.7 Vp-p, 75Ω input
SCART-2 (Video)	Video: 1 Vp-p, negative sync, 75Ω input
Audio in	Stereo audio input for SCART1 and SCART2
COMPONENT	RCA, 0.7 Vp-p/75Ω inputs (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	RCA Stereo audio input

### MONITOR OUT

Audio/Video Output	SCART1: CANAL+
Speaker Output	7W+7W
Power Requirement	AC 160 to 240V, 50/60Hz
Power Consumption	265W
Dimensions (mm)	993(L) 310(D) 719(H)
Weight (gross)	30kg
Allowable temperature of operation environment	0°C to 40°C

### ACCESSORIES

Operating Instructions	1
Remote Control Unit	1
Power Lead	1
Dry Cell Battery	2

NOTE: Specifications and design are subject to possible modifications without notice due to improvements.

### 3. LCD Panel Spec

#### 3.1 General Description

- LTA400WT-L17 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 40.0" is  $1366 \times 768$  and this model can display up to 16.7 million colors with wide viewing angle of  $89^\circ$  or higher in all directions. This panel is intended to support applications to provide a excellent performance for Flat Panel Display such as Home-alone Multimedia TFT-LCD TV, Display terminals for AV application products, and High Definition TV (HDTV).

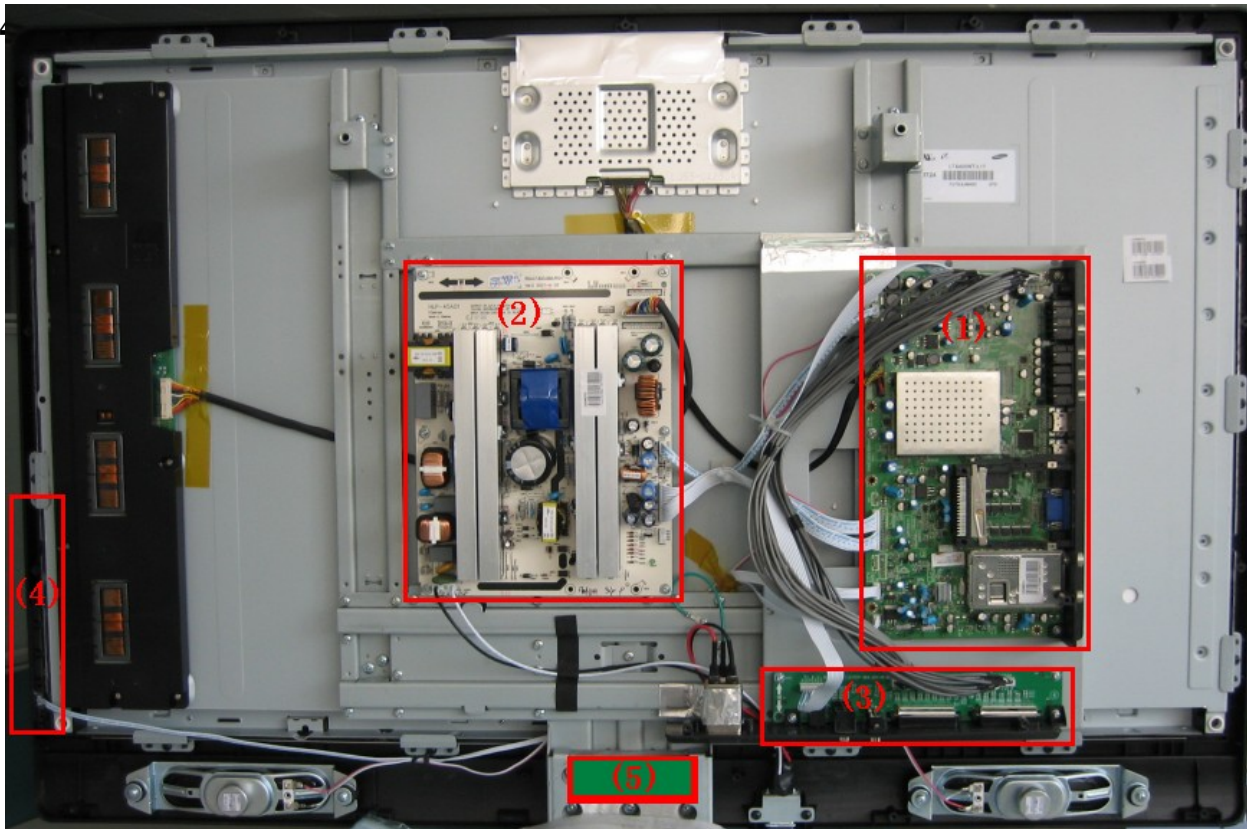
#### 3.2 General Features

- RoHS compliance(Pb-free)
- High contrast ratio, high aperture ratio, fast response time
- SPVA (Super Patterned Vertical Align ) mode
- Wide viewing angle ( $\pm 178^\circ$ )
- High speed response
- WXGA( $1366 \times 768$  pixels) resolution (16:9)
- Low power consumption
- Direct Type 16 CCFTs (Cold Cathode Fluorescent Tube)
- DE(Data Enable) mode
- LVDS (Low Voltage Differential Signaling) interface (1 pixel/clock)

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Items	Specification	Unit	Note
Module Size	952.0(H <sub>TYP</sub> ) x 551.0(V <sub>TYP</sub> )	mm	±1.0mm
	51.8(D <sub>MAX</sub> )		
Weight	11,000(Max.)	g	
Pixel Pitch	0.648(H) x 0.216(W)*3	mm	
Active Display Area	885.168(H) x 497.664(V)	mm	
Surface Treatment	Haze 44% , Hard-coating (3H)		
Display Colors	8 bit - 16.7M	colors	
Number of Pixels	1366 x 768	pixel	
Pixel Arrangement	RGB vertical stripe		
Display Mode	Normally Black		
Luminance of White	500 (Typ.)	cd/m <sup>2</sup>	

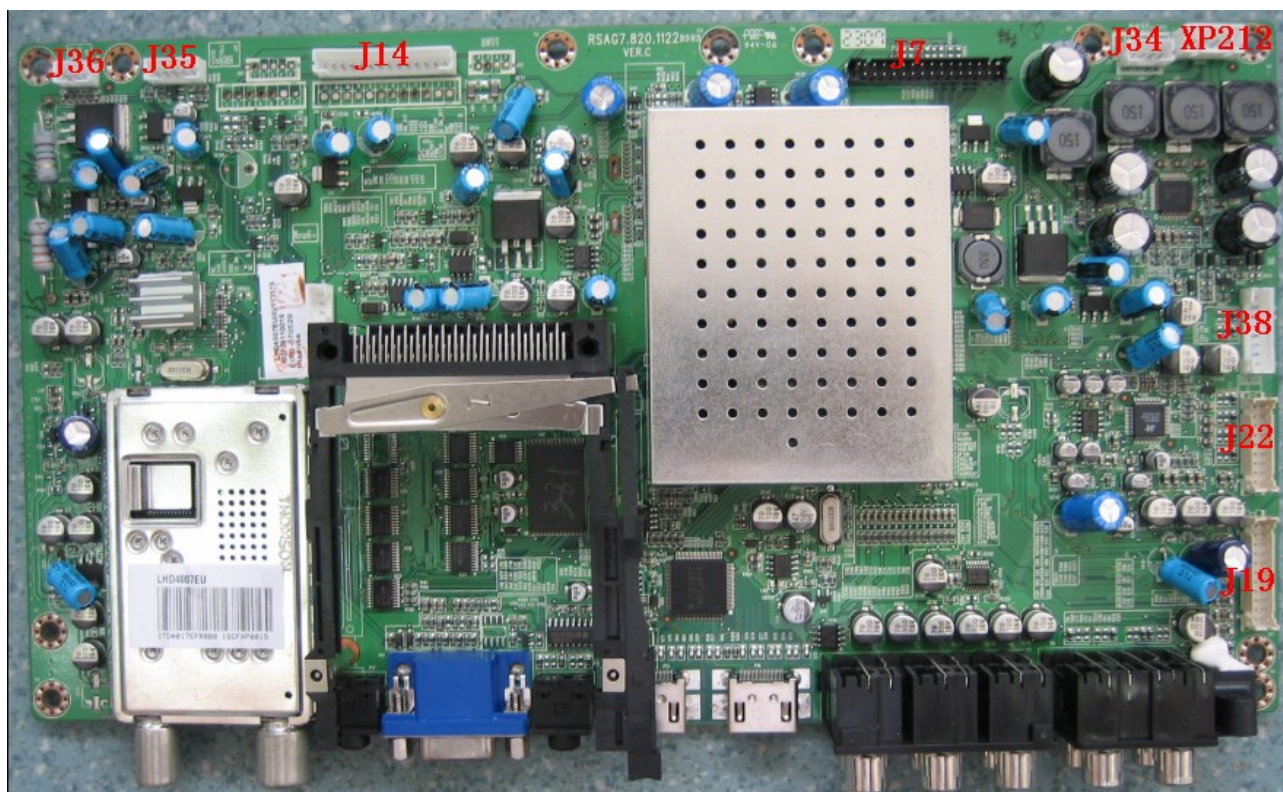
## 4. Chassis Layout and Overall Wiring Diagrams



No	Description	Part No	Type/Model
(1)	Main BD	113578	RSAG2.908.1098-1\ROH
(2)	Power BD	113197	RSAG2.908.982-3\ROH
(3)	Scart BD	113544	RSAG2.908.1107\ROH
(4)	Keypad PCA	112615	RSAG2.908.1030\ROH
(5)	LED / IR Board	112829	RSAG2.908.1048\ROH



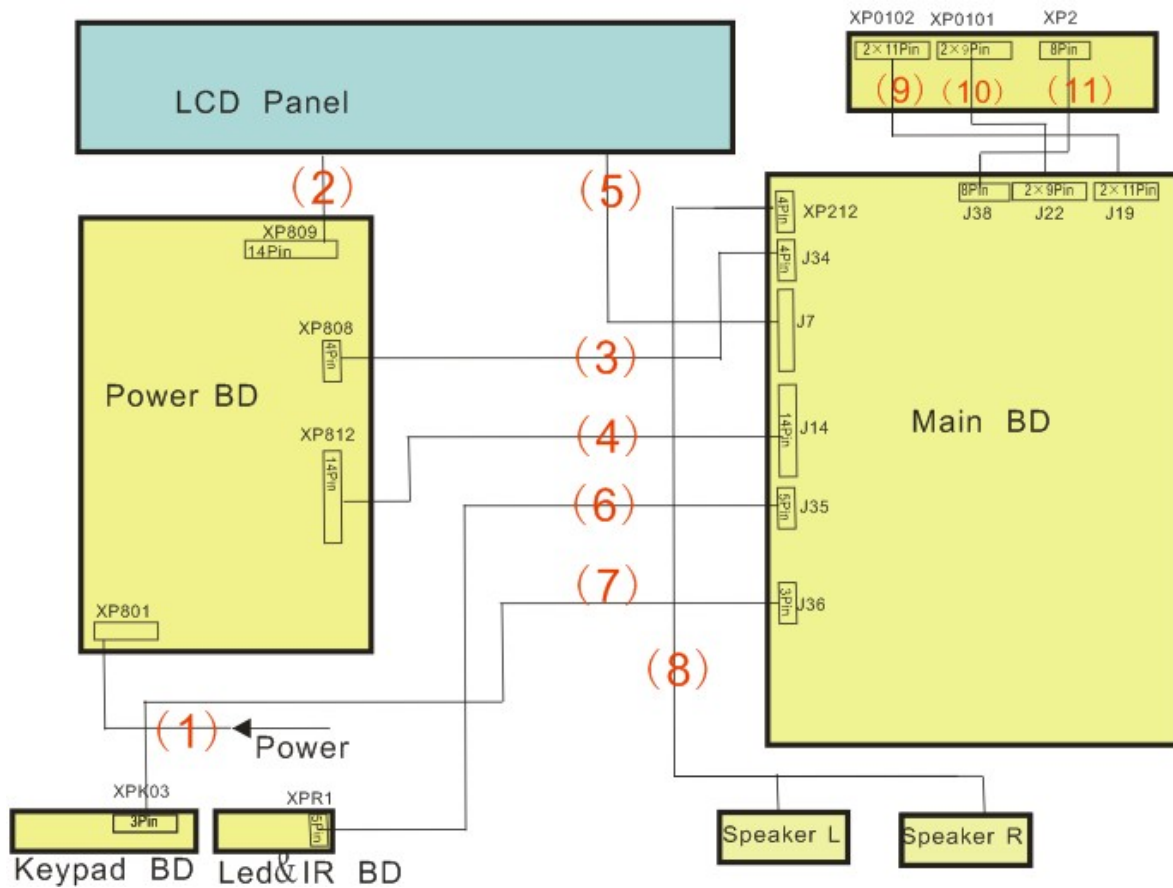
## 4.2 Main BD



Location No.	SPECIFICATION	Description
J36	TJC10-3A\ROH	Buttons (connect key BD and main BD)
J35	TJC10-5A\ROH	IR, LED
J14	TJC10-14A\ROH	5V,12V power
J34	TJC10-4A\ROH	Power 14V from power BD
XP212	TJC3-4A\ROH	Audio output
J38	TJC10-8A\ROH	Video, S-video, Headphone out
J22	A2600WSO-2X9P\ROH	Scart 2
J19	A2600WSO-2X11P\ROH	Scart 1
J7	FF-HX19-10\ROH	LVDS



### 4.3 Wires and Cables Overall Wiring Diagrams



No	DESCRIPTION	SPECIFICATION	NOTE
1	Main Power	TJC2-3Y-400-2-B\ROH	Power Inlet-->Power BD XP801
2	Back light power to panel	HX-3006B550\ROH	Power BD XP809<-->Panel
3	Power supply for amplifier	TJC10T-4Y-250\ROH	Power BD XP808<-->Main BD J34
4	5V,12V power and communication between Main BD and power BD	TJC10T-4Y-250\ROH	Power BD XP812<-->Main BD J14
5	LVDS signal	HX-0137	Main BD J7<-->Panel
6	LED & IR	TJC10T-5Y-350\ROH	Main BD J35<--> Keypad BD XPK03
7	Buttons	TJC10T-3Y-800\ROH	Main BD J36<--> LED&IR BD XPR1
8	Audio out put (R/L)	TJC3H-4Y-800-600\ROH	Main BD XP212<-->Speaker L/R
9	Video input connection (Scart 1)	HX-2022C500\ROH	Main BD J38<-->XP0102
10	Video input connection (Scart 2)	HX-2018C500\ROH	Main BD J22<-->XP0101
11	Video input connection (video, s-video) and headphone output	TJC10T-8Y-500\ROH	Main BD J19<-->XP2

## 5. Factory/Service OSD Menu and Adjustment

### 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. White Balance

	Item	Default Value		Range	Note
1	R Gain	124	CVBS	0-255	To adjust White Balance, High Brightness Red.
		124	Composite	0-255	
		124	S-Video	0-255	
		124	SCART1	0-255	
		124	SCART2	0-255	
		125	VGA	0-255	
		114	Component1	0-255	
		114	Component2	0-255	
		122	HDMI 1	0-255	
		122	HDMI 2	0-255	
2	G Gain	129	CVBS	0-255	To adjust White Balance, High Brightness Green.
		129	Composite	0-255	
		129	S-Video	0-255	
		129	SCART1	0-255	
		129	SCART2	0-255	
		129	VGA	0-255	
		120	Component1	0-255	
		120	Component2	0-255	

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		128	HDMI 1	0-255	
		128	HDMI 2	0-255	
3	B Gain	120	CVBS	0-255	To adjust White Balance, High Brightness Blue.
		120	Composite	0-255	
		120	S-Video	0-255	
		120	SCART1	0-255	
		120	SCART2	0-255	
		120	VGA	0-255	
		113	Component1	0-255	
		113	Component2	0-255	
		119	HDMI 1	0-255	
		119	HDMI 2	0-255	
4	R Offset	131	CVBS	0-255	To adjust White Balance, Low Brightness Red.
		131	Composite	0-255	
		131	S-Video	0-255	
		131	SCART1	0-255	
		131	SCART2	0-255	
		126	VGA	0-255	
		130	Component1	0-255	
		130	Component2	0-255	
		128	HDMI 1	0-255	
		128	HDMI 2	0-255	
5	G Offset	131	CVBS	0-255	To adjust White Balance, Low Brightness Green.
		131	Composite	0-255	
		131	S-Video	0-255	
		131	SCART1	0-255	
		131	SCART2	0-255	
		126	VGA	0-255	
		131	Component1	0-255	
		131	Component2	0-255	
		127	HDMI 1	0-255	
		127	HDMI 2	0-255	
6	B Offset	131	CVBS	0-255	To adjust White Balance, Low Brightness Blue.
		131	Composite	0-255	
		131	S-Video	0-255	
		131	SCART1	0-255	
		131	SCART2	0-255	
		127	VGA	0-255	
		128	Component1	0-255	
		128	Component2	0-255	
		128	HDMI 1	0-255	

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		128	HDMI2	0-255	
7	WBH Brightness	60		0-100	Adjust high brightness temporarily
8	WBH Contrast	60		0-100	Adjust high contrast temporarily
9	WBH Color	60		0-100	Adjust high color temporarily
10	WBL Brightness	40		0-100	Adjust low brightness temporarily
11	WBL Contrast	40		0-100	Adjust low contrast temporarily
12	WBL Color	40		0-100	Adjust low color temporarily

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

### 5.2.2. Set Channel

	Item	备注
1	<b>Zhong Shi</b>	Jiangxi Road factory
2	<b>Huang Dao</b>	Huangdao Industrial Park
3	<b>Gui Yang</b>	Gui Yang Industrial Park
4	<b>Liao Ning</b>	Liao Ning Industrial Park
5	<b>Hungary</b>	Hisense Hungary
6	<b>Australia</b>	Hisense Australia
7	<b>France</b>	Hisense France

### 5.2.3. Factory Option

	Item	Default	Options	Note
1	<b>MODE</b>	<b>M</b>	<b>M, U</b>	M-Can enter factory mode with factory RC or user RC. U-Can enter factory mode only with user' s RC.
2	<b>Test Time</b>	<b>5</b>	<b>1-30</b>	

**Note:** MODE “M” is only used for factory production.

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### 5-2-4. Version Info

	Item	Default	Options	Note
<b>1</b>	<b>Version</b>	<b>r1.00.SLA1</b>		<b>Software version</b>
<b>2</b>	<b>Date</b>	<b>-----</b>		<b>The date of current version</b>

**Note:** Software version info of the TV, readable only.

### 5.2.5. Clear the EEPROM

Item	Meaning	Note
<b>1</b>	<b>Clear partly</b>	WB data、Auto Color data
<b>2</b>	<b>Clear completely</b>	

**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:**

- Select the button “Clear All” .
- Press VOL+ button to clear the EEPROM data.
- When the “Clear All” button becomes white, turn off the power.
- Restart the TV.

## 5.3 Designer Menu

### 5.3.1 Color Temp

	Default	Item	Default Value		Range		Note
			Warm	Cool			
<b>1</b>	<b>Cool</b>	<b>R Gain</b>	<b>139</b>	<b>126</b>	<b>CVBS</b>	<b>0-255</b>	
			<b>139</b>	<b>126</b>	<b>Composite</b>	<b>0-255</b>	
			<b>139</b>	<b>126</b>	<b>S-Video</b>	<b>0-255</b>	
			<b>139</b>	<b>126</b>	<b>SCART1</b>	<b>0-255</b>	
			<b>139</b>	<b>126</b>	<b>SCART2</b>	<b>0-255</b>	
			<b>148</b>	<b>121</b>	<b>VGA</b>	<b>0-255</b>	
			<b>138</b>	<b>122</b>	<b>Component1</b>	<b>0-255</b>	
			<b>138</b>	<b>122</b>	<b>Component2</b>	<b>0-255</b>	
			<b>140</b>	<b>128</b>	<b>HDMI 1</b>	<b>0-255</b>	
			<b>140</b>	<b>128</b>	<b>HDMI 2</b>	<b>0-255</b>	
<b>2</b>		<b>G Gain</b>	<b>128</b>	<b>128</b>	<b>CVBS</b>	<b>0-255</b>	
			<b>128</b>	<b>128</b>	<b>Composite</b>	<b>0-255</b>	

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3			128	128	S-Video	0-255	
			128	128	SCART1	0-255	
			128	128	SCART2	0-255	
			128	128	VGA	0-255	
			128	128	Component1	0-255	
			128	128	Component2	0-255	
			128	128	HDMI1	0-255	
			128	128	HDMI2	0-255	
		B Gain	116	130	CVBS	0-255	
			116	130	Composite	0-255	
			116	130	S-Video	0-255	
			116	130	SCART1	0-255	
			116	130	SCART2	0-255	
			125	129	VGA	0-255	
			118	130	Component1	0-255	
			118	130	Component2	0-255	
			117	131	HDMI1	0-255	
			117	131	HDMI2	0-255	

### 5.3.2 Video

	Item		Default		range	Note
1	Video Curve	Brightness Min	0	CVBS	0-1000	Min Brightness
			0	Composite	0-1000	
			0	S-Video	0-1000	
			0	SCART1	0-1000	
			0	SCART2	0-1000	
			0	VGA	0-1000	
			0	Component1	0-1000	
			0	Component2	0-1000	
			0	HDMI1	0-1000	
			0	HDMI2	0-1000	
		Brightness Mid	555	CVBS	0-1000	Mid Brightness
			555	Composite	0-1000	
			555	S-Video	0-1000	
			555	SCART1	0-1000	
			555	SCART2	0-1000	
			515	VGA	0-1000	
			565	Component1	0-1000	
			565	Component2	0-1000	
			550	HDMI1	0-1000	

# LCD TV Service Manual

			550	HDMI2	0-1000	
		Brightness Max	650	CVBS	0-1000	Max Brightness
			650	Composite	0-1000	
			650	S-Video	0-1000	
			650	SCART1	0-1000	
			650	SCART2	0-1000	
			650	VGA	0-1000	
			650	Component1	0-1000	
			650	Component2	0-1000	
			650	HDMI1	0-1000	
			650	HDMI2	0-1000	
		Contrast Min	0	CVBS	0-1000	Min Contrast
			0	Composite	0-1000	
			0	S-Video	0-1000	
			0	SCART1	0-1000	
			0	SCART2	0-1000	
			0	VGA	0-1000	
			0	Component1	0-1000	
			0	Component2	0-1000	
			0	HDMI1	0-1000	
			0	HDMI2	0-1000	
		Contrast Mid	510	CVBS	0-1000	Mid Contrast
			510	Composite	0-1000	
			510	S-Video	0-1000	
			510	SCART1	0-1000	
			510	SCART2	0-1000	
			480	VGA	0-1000	
			510	Component1	0-1000	
			510	Component2	0-1000	
			510	HDMI1	0-1000	
			510	HDMI2	0-1000	
		Contrast Max	650	CVBS	0-1000	Max Contrast
			650	Composite	0-1000	
			650	S-Video	0-1000	
			650	SCART1	0-1000	
			650	SCART2	0-1000	
			630	VGA	0-1000	
			650	Component1	0-1000	
			650	Component2	0-1000	
			650	HDMI1	0-1000	
			650	HDMI2	0-1000	

# LCD TV Service Manual

		Saturation Min	0	CVBS	0-1000	Min Saturation
			0	Composite	0-1000	
			0	S-Video	0-1000	
			0	SCART1	0-1000	
			0	SCART2	0-1000	
			0	VGA	0-1000	
			0	Component1	0-1000	
			0	Component2	0-1000	
			0	HDMI 1	0-1000	
			0	HDMI2	0-1000	
		Saturation Mid	500	CVBS	0-1000	Mid Saturation
			500	Composite	0-1000	
			500	S-Video	0-1000	
			500	SCART1	0-1000	
			500	SCART2	0-1000	
			500	VGA	0-1000	
			500	Component1	0-1000	
			500	Component2	0-1000	
			500	HDMI 1	0-1000	
			500	HDMI 2	0-1000	
		Saturation Max	1000	CVBS	0-1000	Max Saturation
			1000	Composite	0-1000	
			1000	S-Video	0-1000	
			1000	SCART1	0-1000	
			1000	SCART2	0-1000	
			1000	VGA	0-1000	
			1000	Component1	0-1000	
			1000	Component2	0-1000	
			1000	HDMI 1	0-1000	
			1000	HDMI 2	0-1000	
2	Picture Mode	SOURCE	TV	CVBS		Display the current source
			Composite	Composite		
			S-Video	S-Video		
			SCART1	SCART1		
			SCART2	SCART2		
			VGA	VGA		
			Component1	Component1		
			Component2	Component2		
			HDMI1	HDMI1		
			HDMI2	HDMI2		
		VIVID	60	CVBS	0-100	Brightness of Vivid



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		Brightness	60	Composite	0-100	mode
			60	S-Video	0-100	
			60	SCART1	0-100	
			60	SCART2	0-100	
			60	VGA	0-100	
			60	Component1	0-100	
			60	Component2	0-100	
			60	HDMI 1	0-100	
			60	HDMI 2	0-100	
		VIVID Contrast	60	CVBS	0-100	Contrast of Vivid mode
			60	Composite	0-100	
			60	S-Video	0-100	
			60	SCART1	0-100	
			60	SCART2	0-100	
			60	VGA	0-100	
			60	Component1	0-100	
			60	Component2	0-100	
			60	HDMI 1	0-100	
			60	HDMI 2	0-100	
		VIVID Saturation	60	CVBS	0-100	Saturation of Vivid mode
			60	Composite	0-100	
			60	S-Video	0-100	
			60	SCART1	0-100	
			60	SCART2	0-100	
			60	VGA	0-100	
			60	Component1	0-100	
			60	Component2	0-100	
			60	HDMI 1	0-100	
			60	HDMI 2	0-100	
		STD Brightness	50	CVBS	0-100	Brightness of STD mode
			50	Composite	0-100	
			50	S-Video	0-100	
			50	SCART1	0-100	
			50	SCART2	0-100	
			50	VGA	0-100	
			50	Component1	0-100	
			50	Component2	0-100	
			50	HDMI 1	0-100	
			50	HDMI 2	0-100	
		STD Contrast	50	CVBS	0-100	Contrast of STD mode
			50	Composite	0-100	

# LCD TV Service Manual

			50	S-Video	0-100	
			50	SCART1	0-100	
			50	SCART2	0-100	
			50	VGA	0-100	
			50	Component1	0-100	
			50	Component2	0-100	
			50	HDMI1	0-100	
			50	HDMI2	0-100	
		STD Saturation	50	CVBS	0-100	Saturation of STD mode
			50	Composite	0-100	
			50	S-Video	0-100	
			50	SCART1	0-100	
			50	SCART2	0-100	
			50	VGA	0-100	
			50	Component1	0-100	
			50	Component2	0-100	
		MOVIE Brightness	45	CVBS	0-100	Brightness of Movie mode
			45	Composite	0-100	
			45	S-Video	0-100	
			45	SCART1	0-100	
			45	SCART2	0-100	
			45	VGA	0-100	
			45	Component1	0-100	
			45	Component2	0-100	
		MOVIE Contrast	45	HDMI1	0-100	Contrast of Movie mode
			45	HDMI2	0-100	
			45	CVBS	0-100	
			45	Composite	0-100	
			45	S-Video	0-100	
			45	SCART1	0-100	
			45	SCART2	0-100	
			45	VGA	0-100	
		MOVIE Saturation	45	Component1	0-100	Saturation of Movie mode
			45	Component2	0-100	
			45	HDMI1	0-100	
		MOVIE Saturation	45	HDMI2	0-100	Saturation of Movie mode
			45	CVBS	0-100	
			45	Composite	0-100	
		MOVIE Saturation	45	S-Video	0-100	Saturation of Movie mode
			45	Component1	0-100	
			45	Component2	0-100	

## LCD TV Service Manual

			45	SCART1	0-100	
			45	SCART2	0-100	
			45	VGA	0-100	
			45	Component1	0-100	
			45	Component2	0-100	
			45	HDMI 1	0-100	
			45	HDMI2	0-100	

### 5.3.3 Sound setting

	Item	Default		Range	Note
1	Volume Curve	0	Volume Min	0-90	When value is 1 Think about the Audio out power before adjusting
		20	Volume 20	0-90	When value is 20 Think about the Audio out power before adjusting
		50	Volume Mid	0-90	When value is 50 Think about the Audio out power before adjusting
		70	Volume 80	0-90	When value is 70 Think about the Audio out power before adjusting
		90	Volume Max	0-90	When value is 90 Think about the Audio out power before adjusting
2	Audio Mode	Music	Audio Mode	Standard, Speech, Music	Different frequencies for different Audio Mode
		8	120HZ	-10-10	
		0	500HZ	-10-10	
		-3	1.5kHz	-10-10	
		4	5kHz	-10-10	
		8	10kHz	-10-10	

## 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.

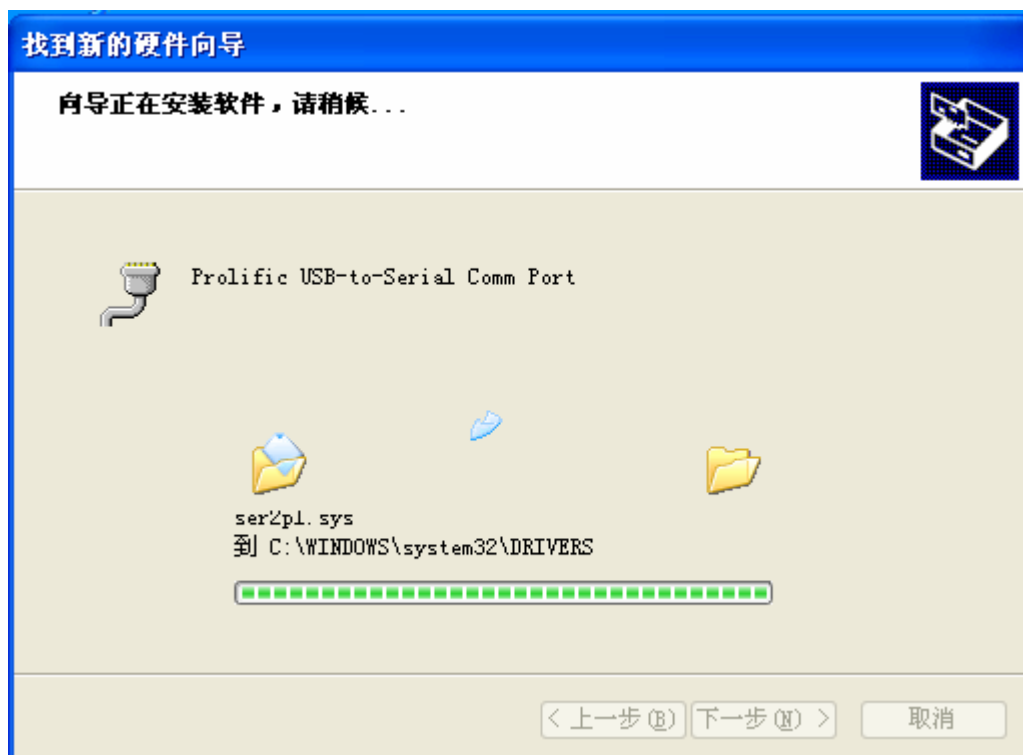


Select the default value, the driver will be installed step by step.

#### 6.1.2 Hardware connecting

Connect the unit to your pc with a USB-to-serial port cable. USB port connect to your pc, and serial port to the TV's RS232 port.

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.



## 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

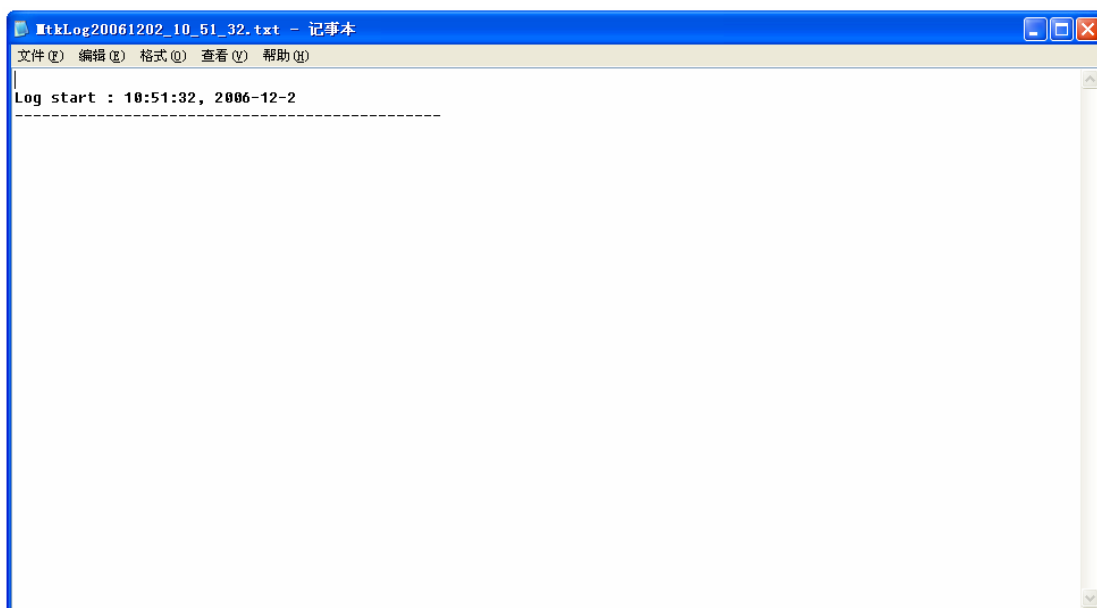


MtkTool.ini  
配置设置  
1 KB




Shortcut to  
MtkTool.exe  
快捷方式

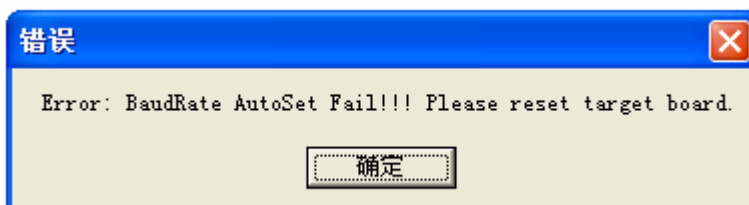
The MtkTool using log is restored in the MtkLog folder. It records the running time and date whenever the tool is used. The log will be a txt file named by the date and time.



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.

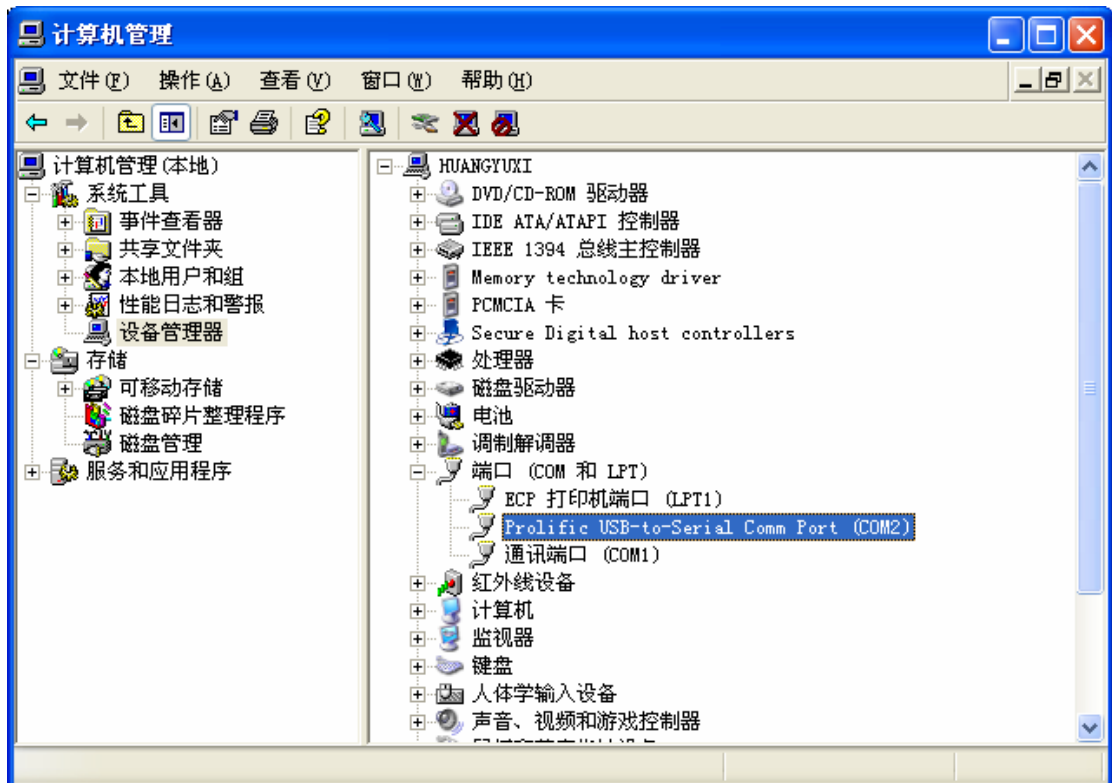
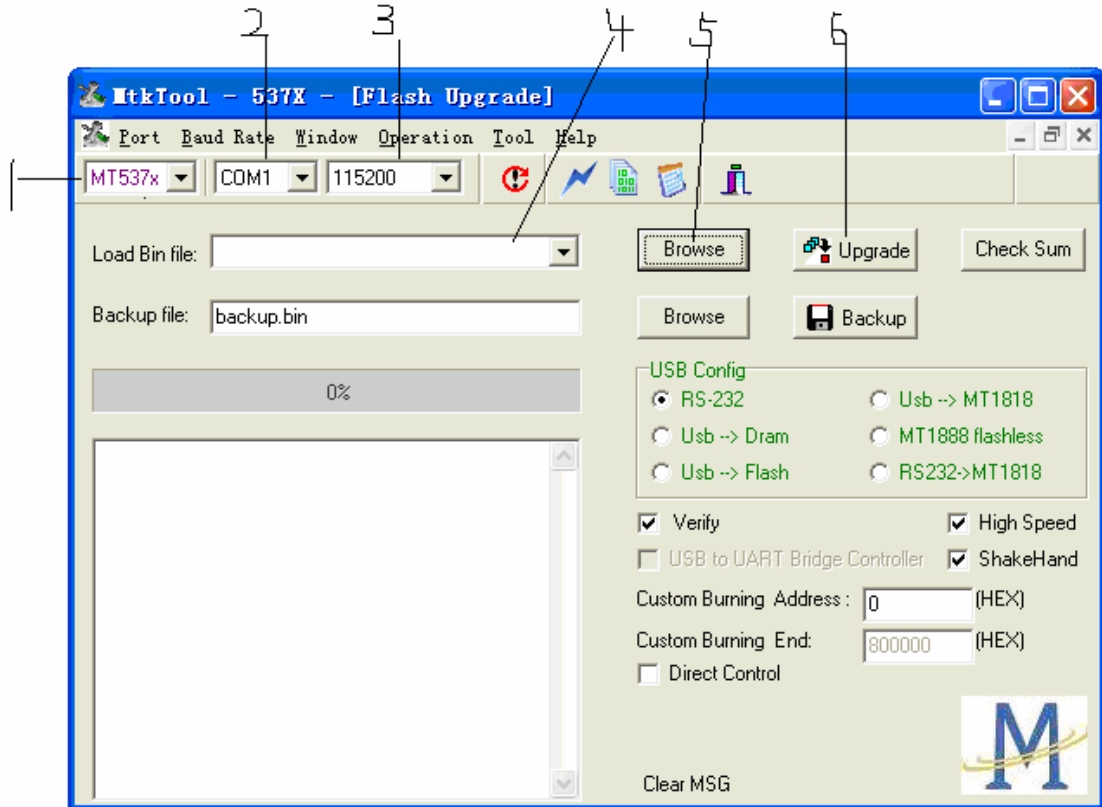


Ignore these errors, click “Confirm” and enter the MtkTool main interface, see the following picture.

- 1—Flash chip model (for LHD3233EU, it will be MT5331).
- 2—The port through which the PC communicate with the chip.

## LCD TV Service Manual

- 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.

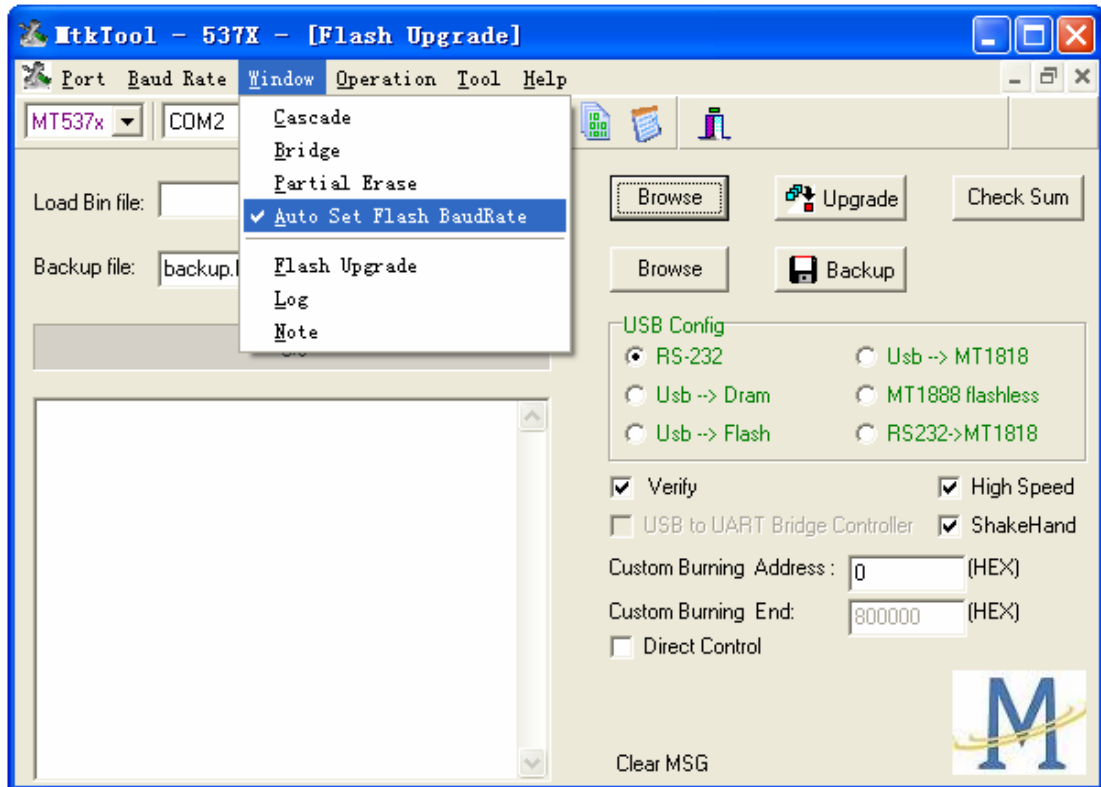


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Open “Device Manager” and find which port is connected with the TV. In above picture, COM2 is connected to the TV; so, select “COM2” in the MtkTool main interface. Select the right baud rate according to chip model. For this unit( chip model is MT5331), 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.

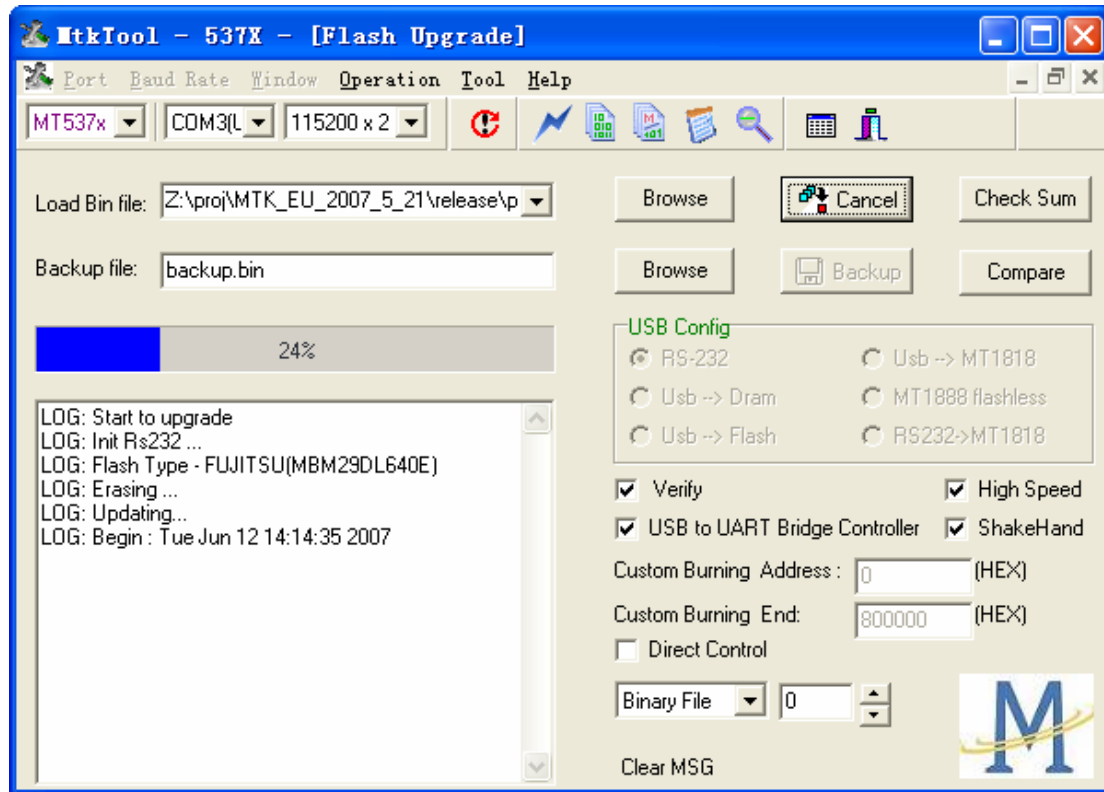


Click “Browse” button (5), find the upgrading program file, select it. Press “Upgrade” button and start upgrading.

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

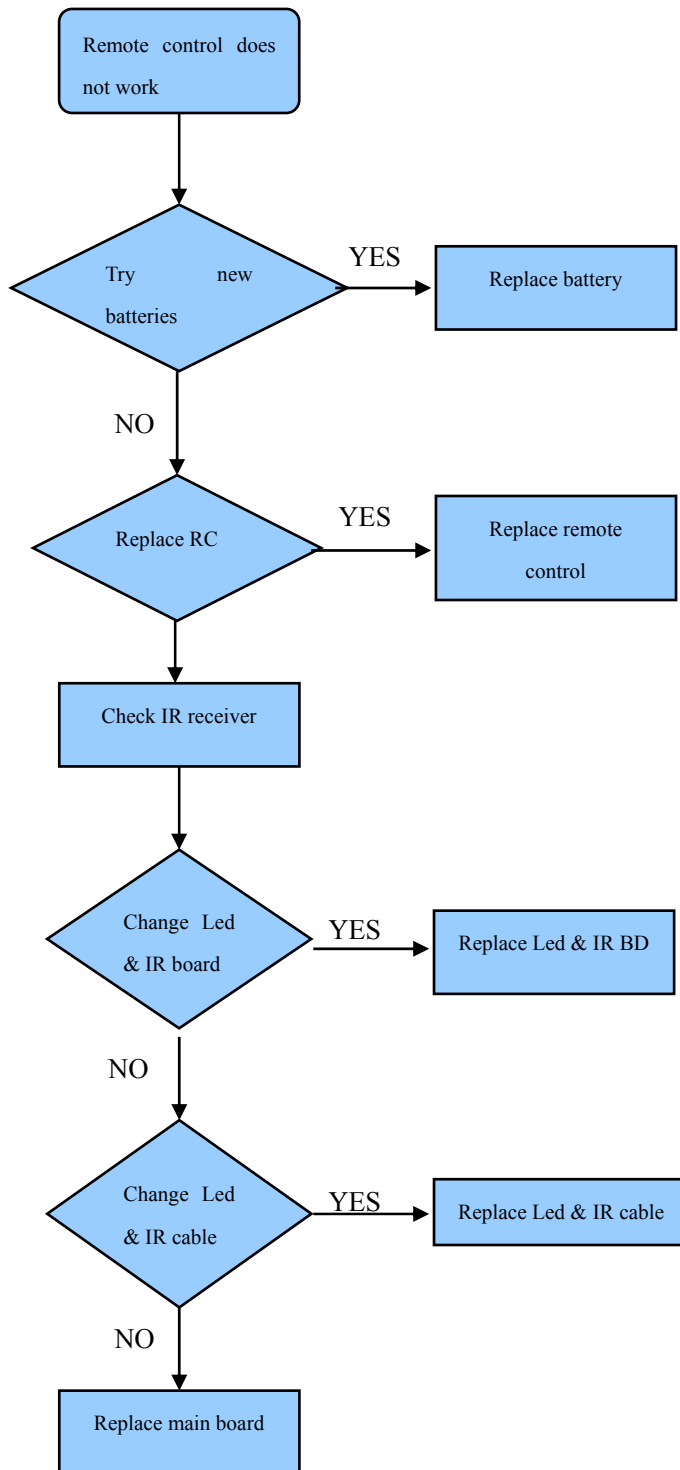


## LCD TV Service Manual

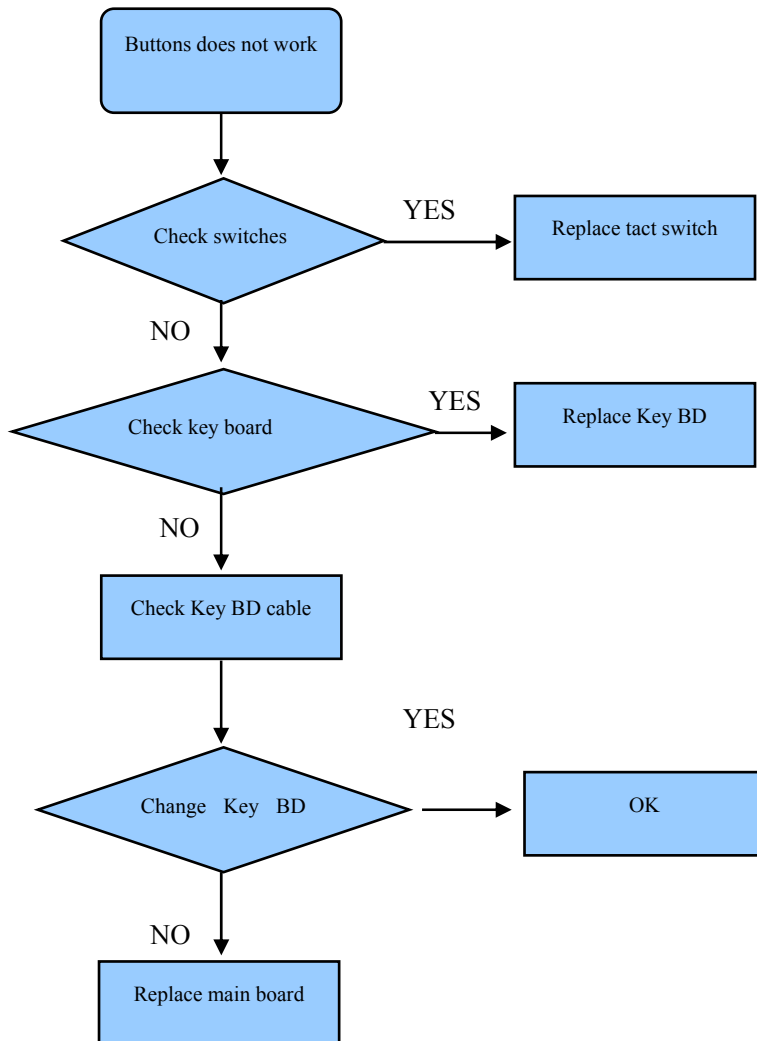


## 7. Troubleshooting

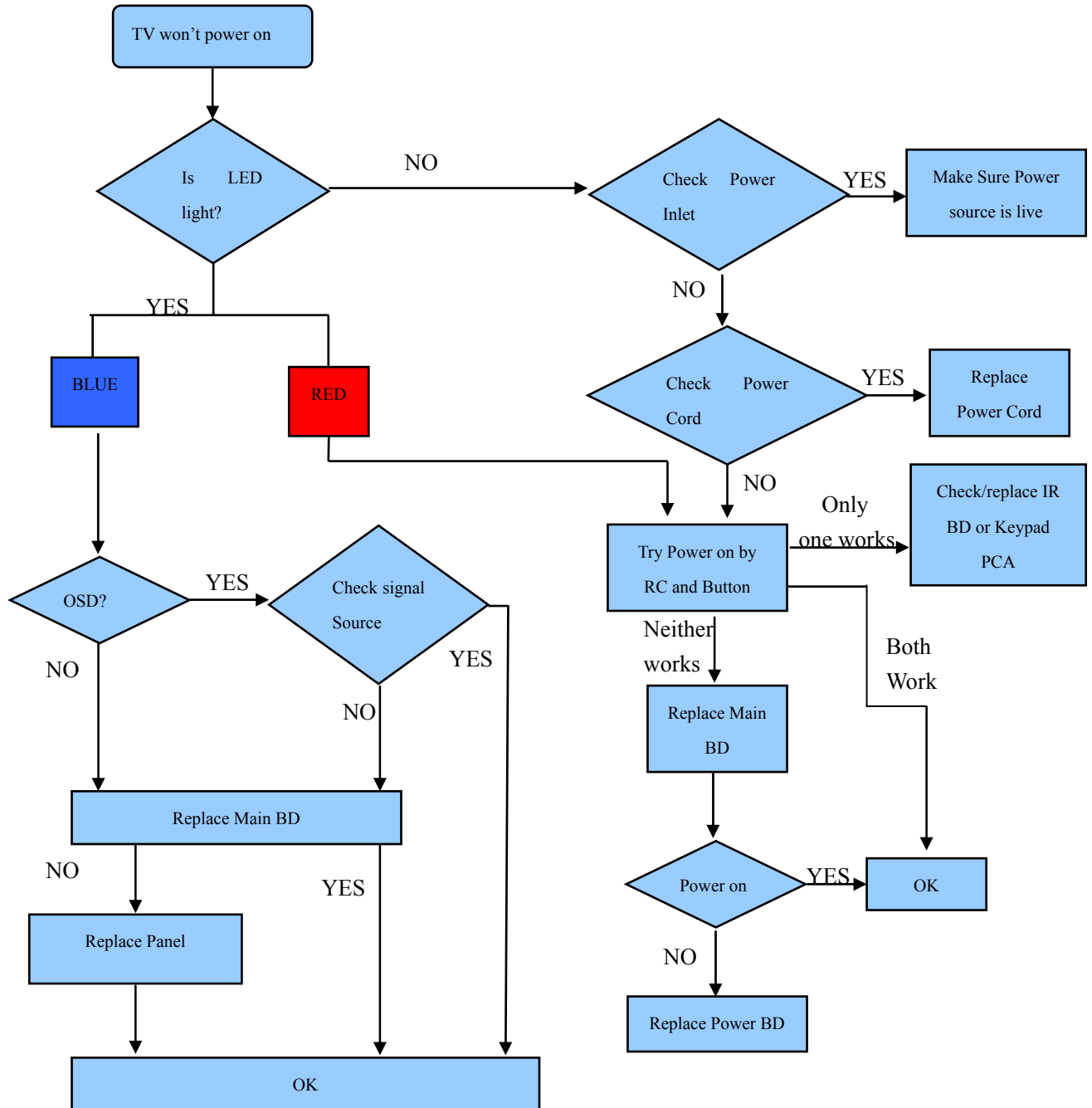
### 7.1 Troubleshooting for Remote Control



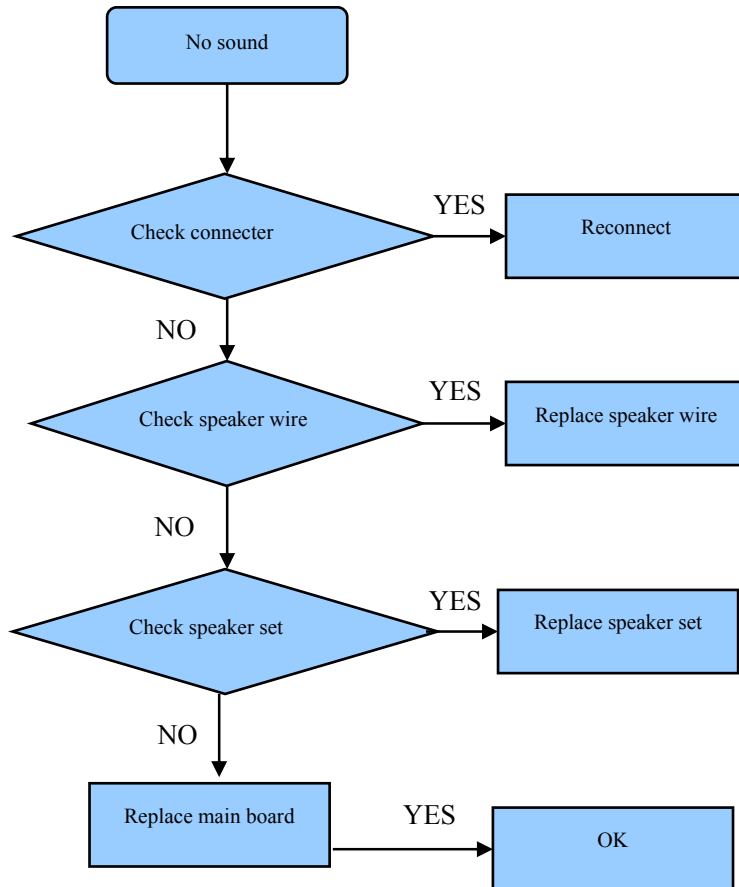
## 7.2 Troubleshooting for Function Key



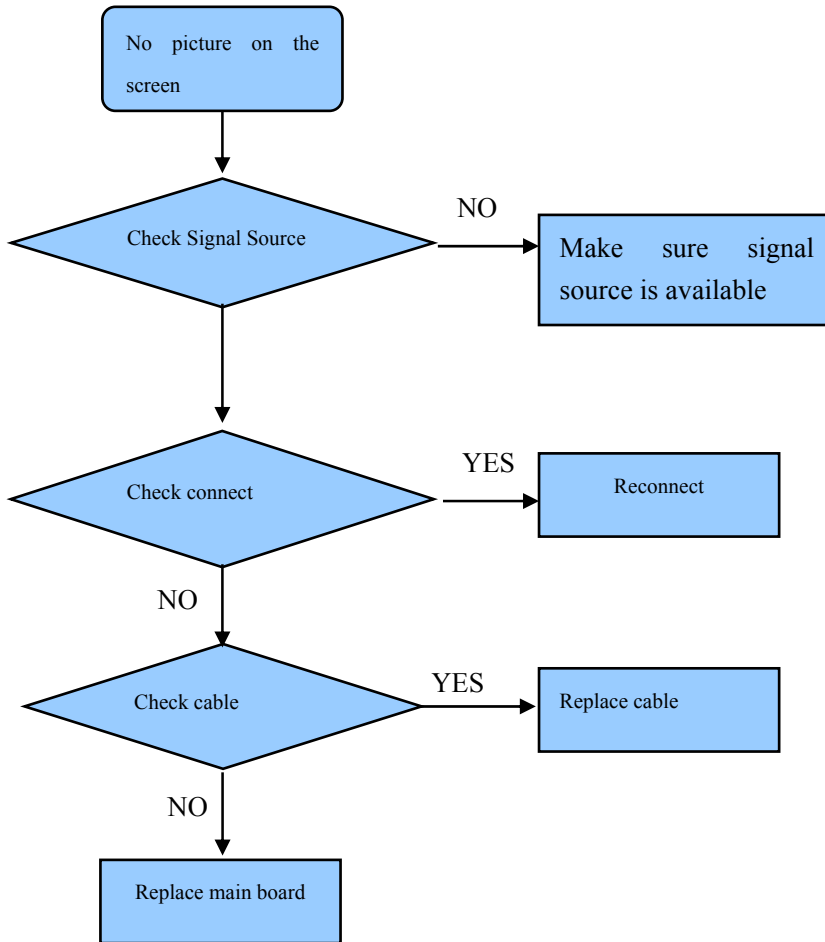
### 7.3 TV won't Power On



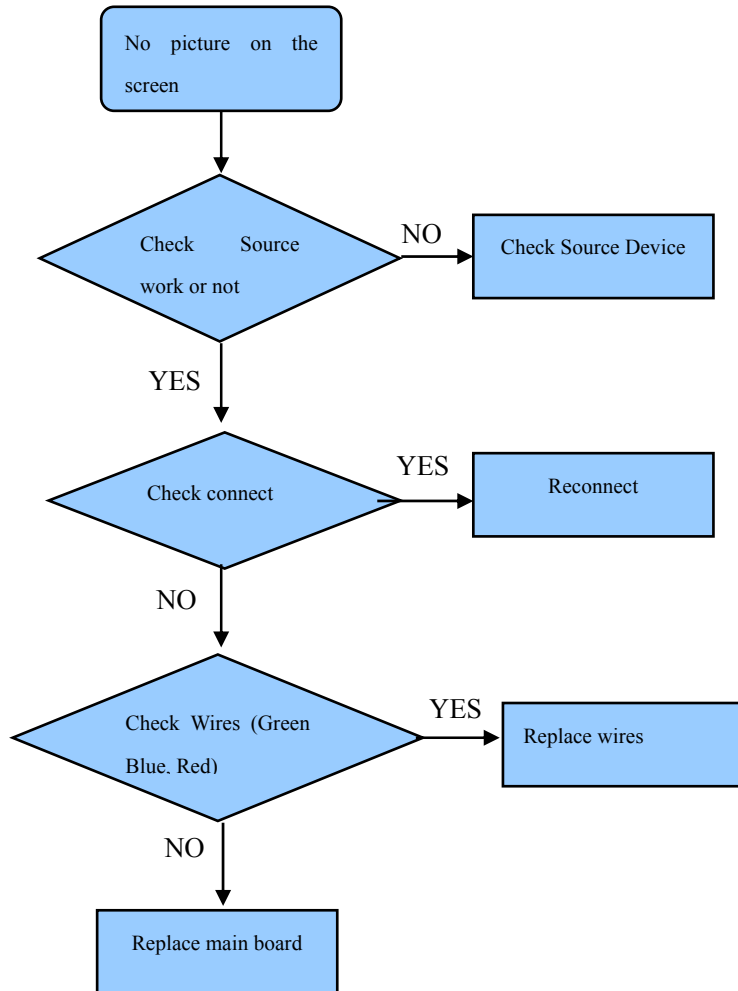
## 7.4 Troubleshooting for Audio



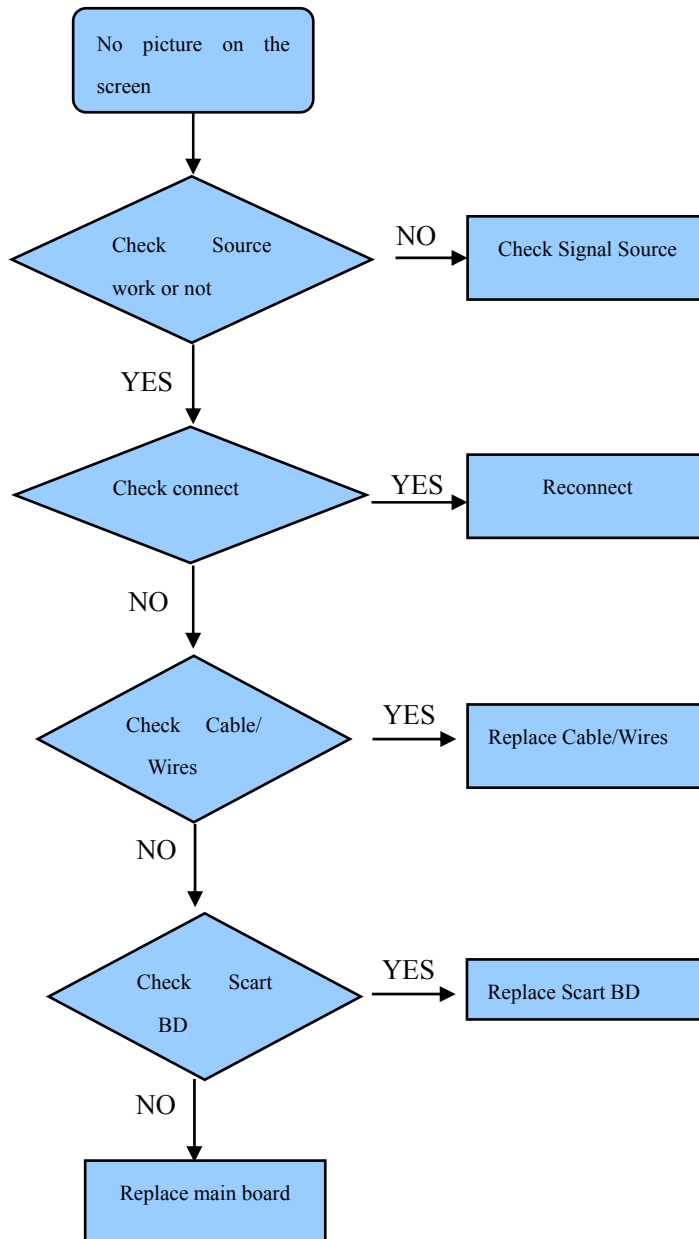
## 7.5 Troubleshooting for TV/VGA/HDMI input



## 7.6 Troubleshooting for YPbPr input

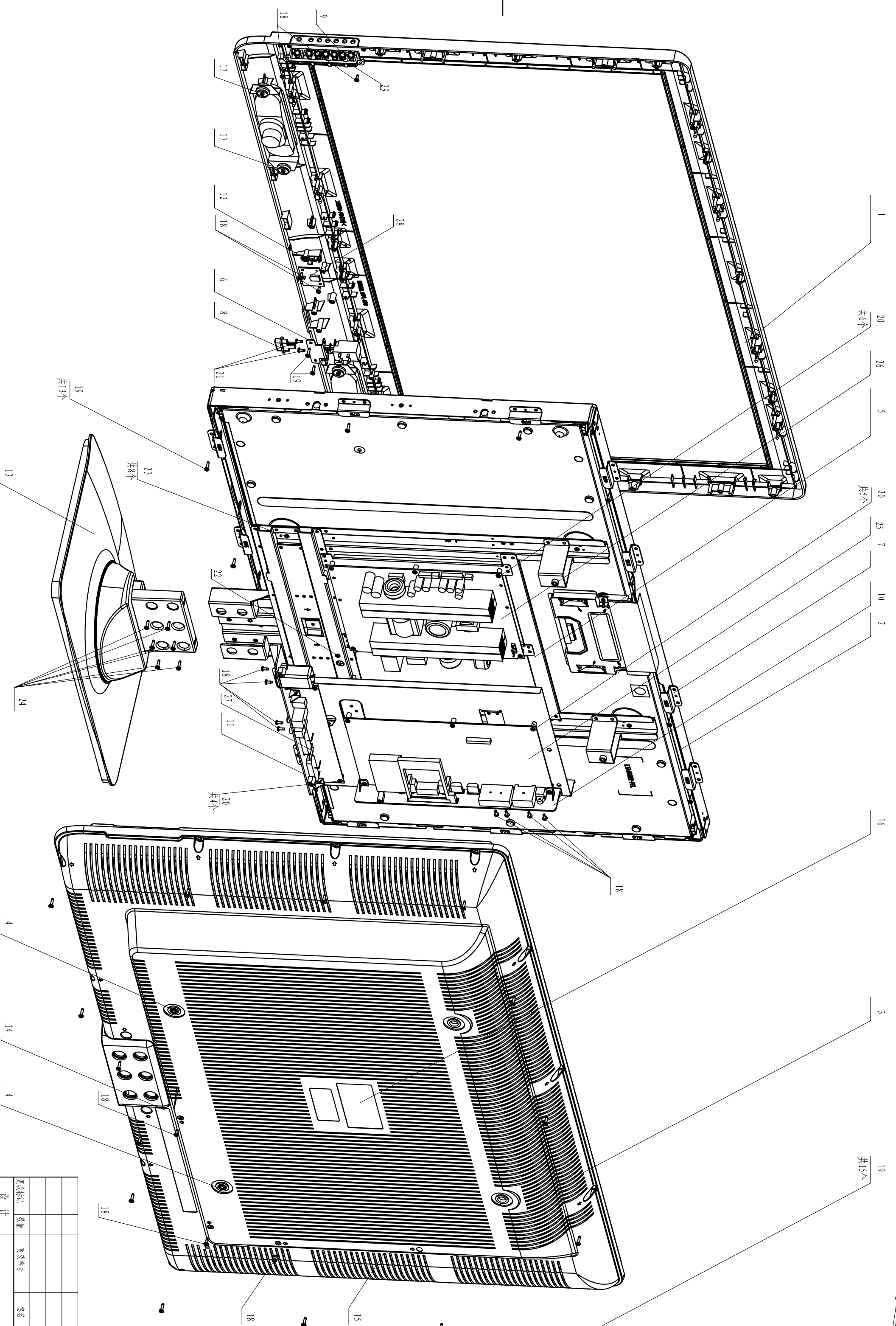
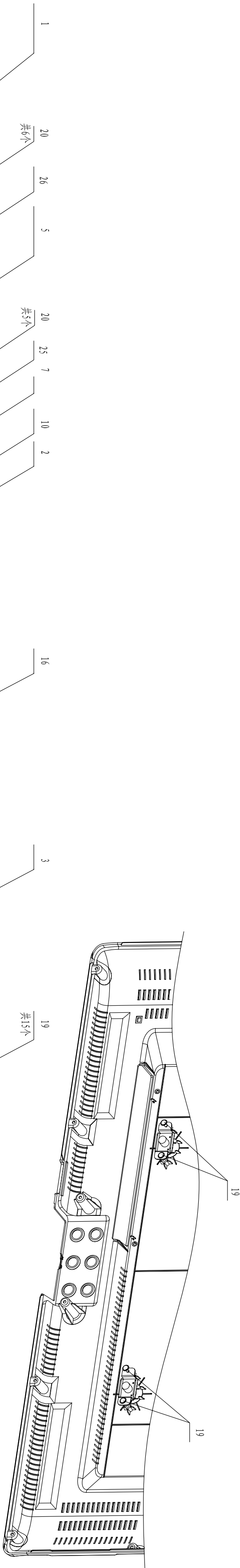


## 7.7 Troubleshooting for Video/S-Video/Scart input





## **8. Explode View and BOM**



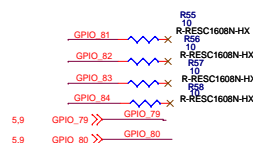
34			
33			
32			
31			
30			
29	控制板组件	RSAG2.908.1030	1
28	运行板组件	RSAG2.908.1048	1
27	端子板组件	RSAG2.908.1107	1
26	电源板组件	RSAG2.908.902-1	1
25	主板组件	RSAG2.908.1092-1	1
24	螺钉	GB/T 818-2000 M3X5.5 黑色	6
23	螺钉	GB/T 818-2000 M3X8 黑色	8
22	螺钉	S2129-2-47 M3X8 镀锌板白	1
21	螺钉	S2129-2-47 M3X8 镀锌板白	2
20	螺钉	S2129-2-47 M3X8 镀锌板白	15
19	自攻螺钉	S2129-2-47 STX12.7 黑色	34
18	螺钉	S2129-2-47 STX12.7 黑色	15
17	螺钉	S2129-2-47 STX12.7 黑色	4
16	垫圈	RSAG2.802.3131	1
15	垫圈	RSAG2.804.3034	1
14	垫圈	RSAG2.804.3033	1
13	底座	90x121.041	1
12	控制板组件	RSAG2.434.012	1
11	端子板	RSAG2.081.202	1
10	端子板	RSAG2.081.201	1
9	控制板	RSAG2.335.067	1
8	控制板	RSAG2.337.024	1
7	干架	RSAG2.048.P28	13
6	干架	RSAG2.038.461	1
5	干架组件	RSAG2.130.320	1
4	干架组件	RSAG2.130.320	2
3	后壳组件	RSAG2.170.177	1
2	后壳组件	17141007-47V1A	1
1	前壳	RSAG2.074.410	1

设计	审核	批准	日期
工艺			
标准			
批准			

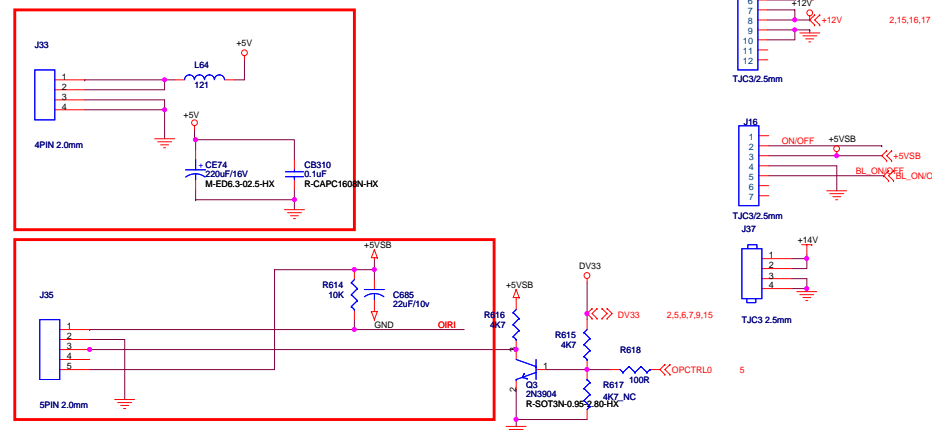
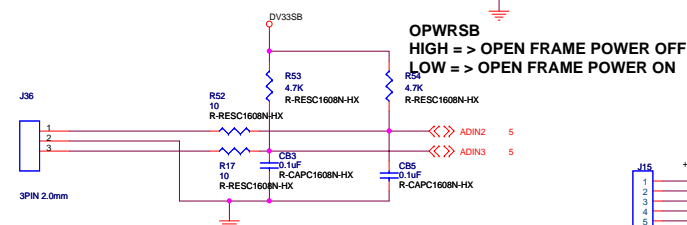
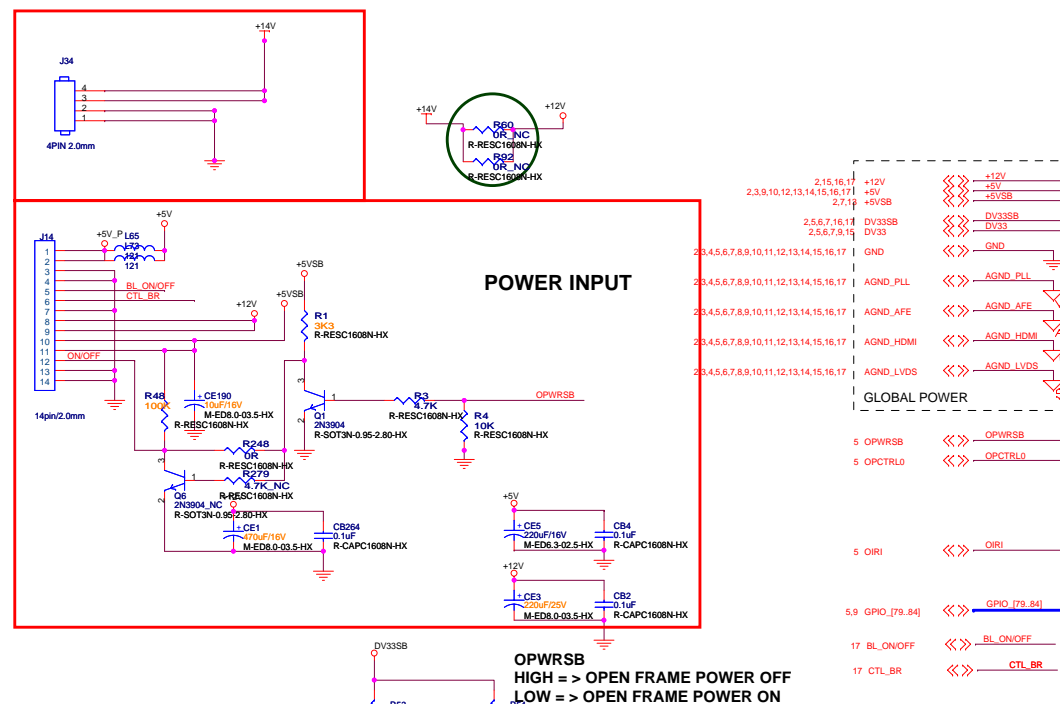
总装图	RSAG2.025.717
LMD4007EU	
第 1 页	共 1 页
青岛海信电器股份有限公司	
版次: 12	

## **9. Schematic circuit diagram**

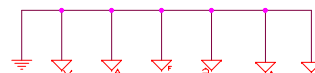
- GPIO DEPEND-ON YOUR APPLICATION  
WORKABLE IN STANDBY AND NORMAL MODE**

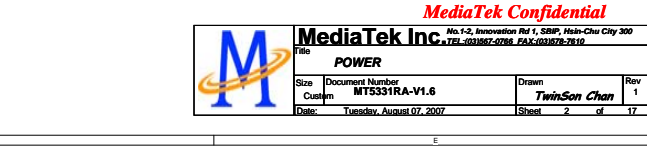
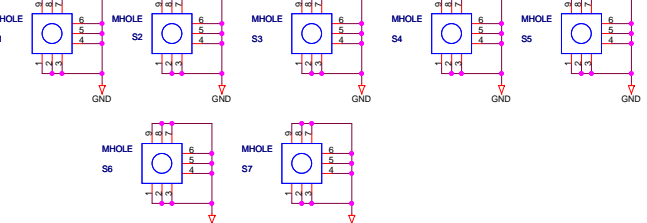
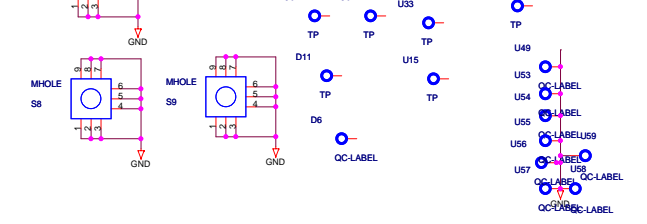
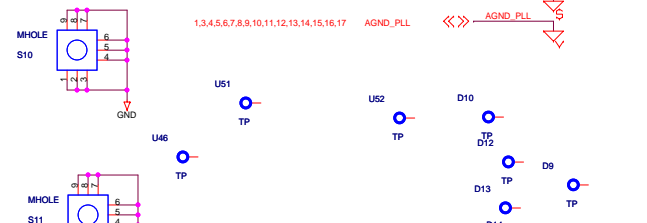
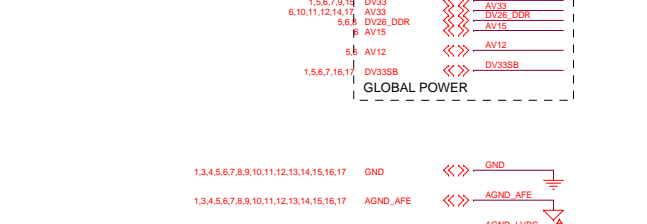
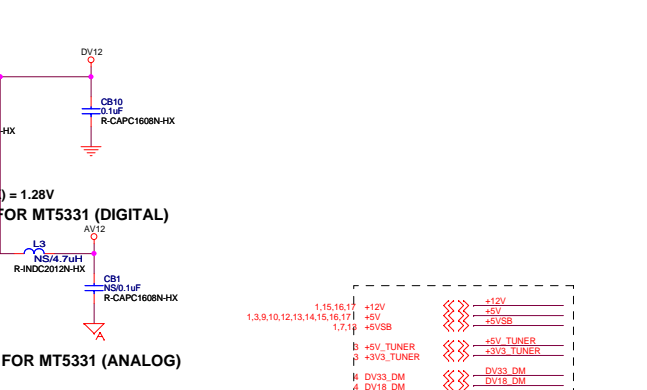
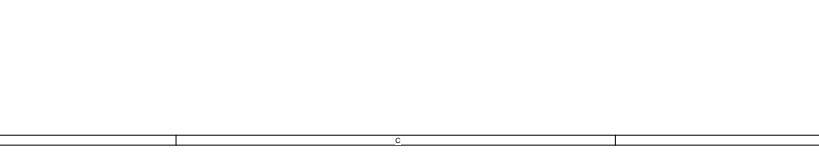
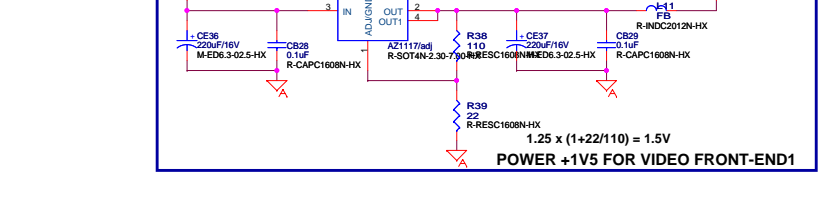
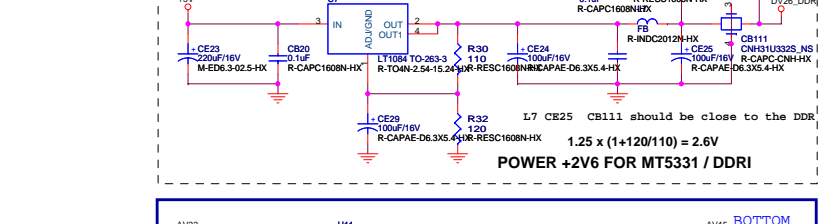
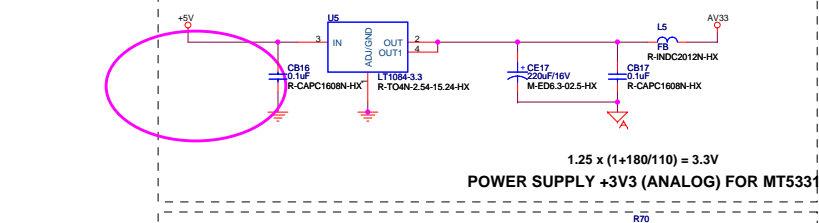
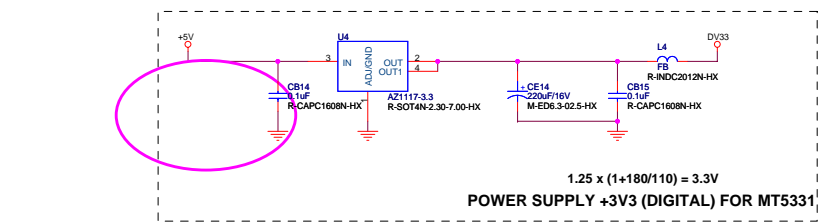
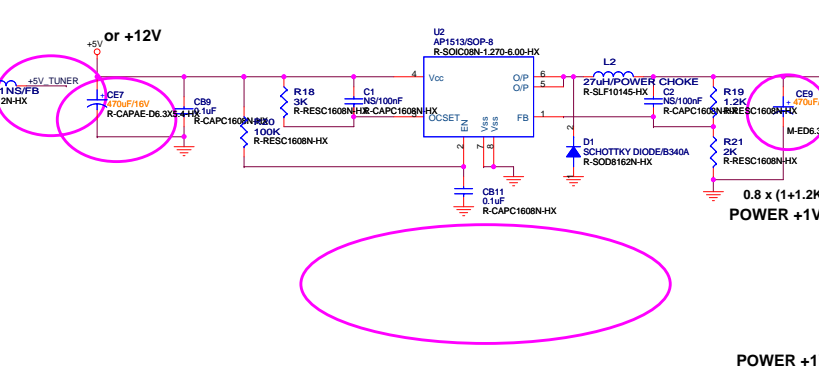
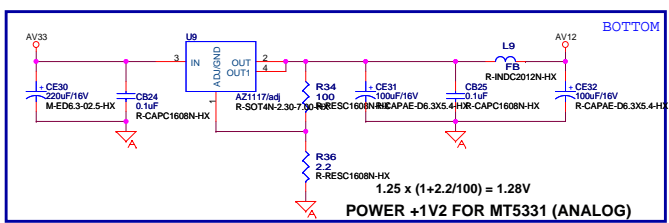
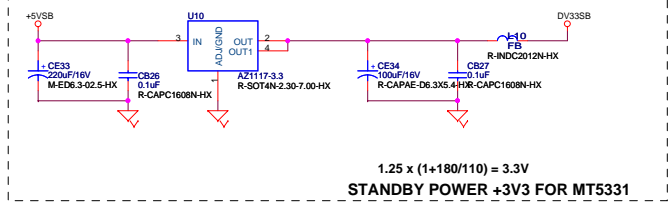
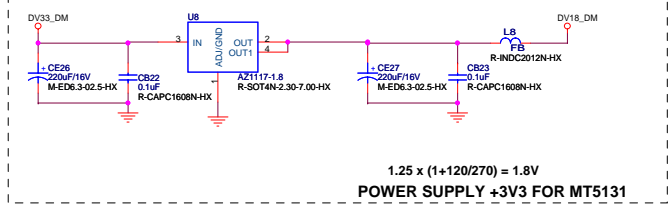
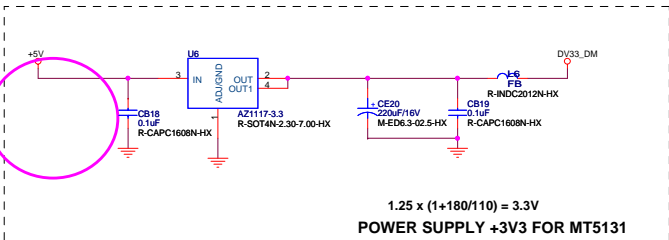
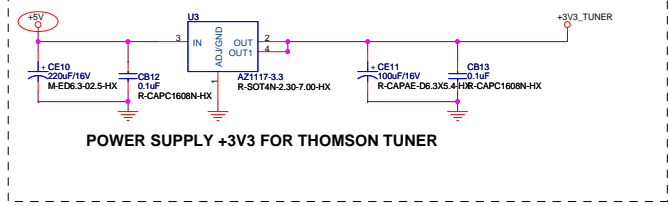
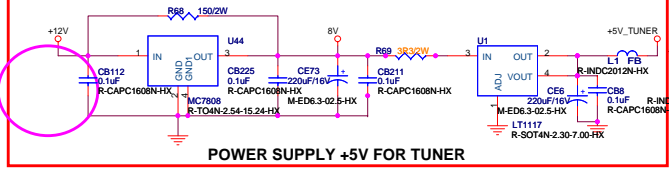


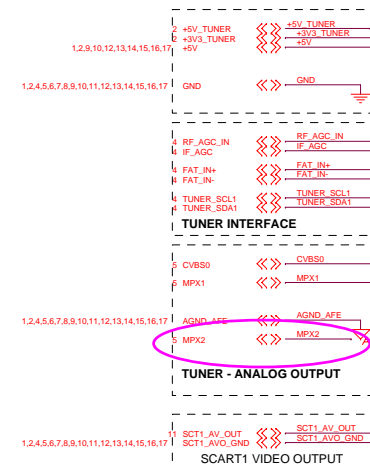
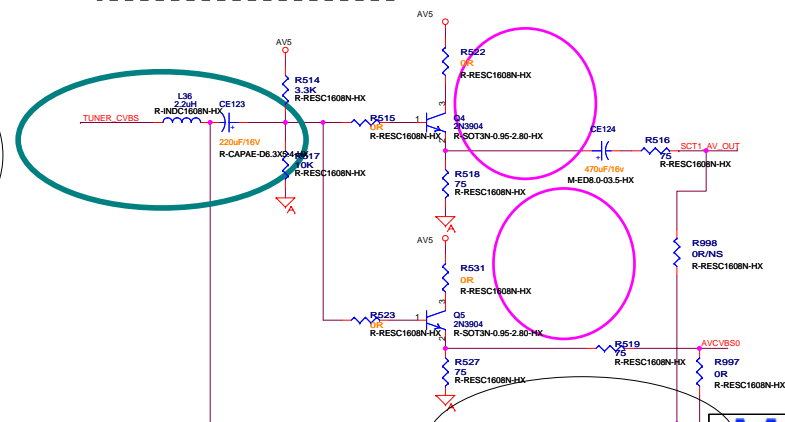
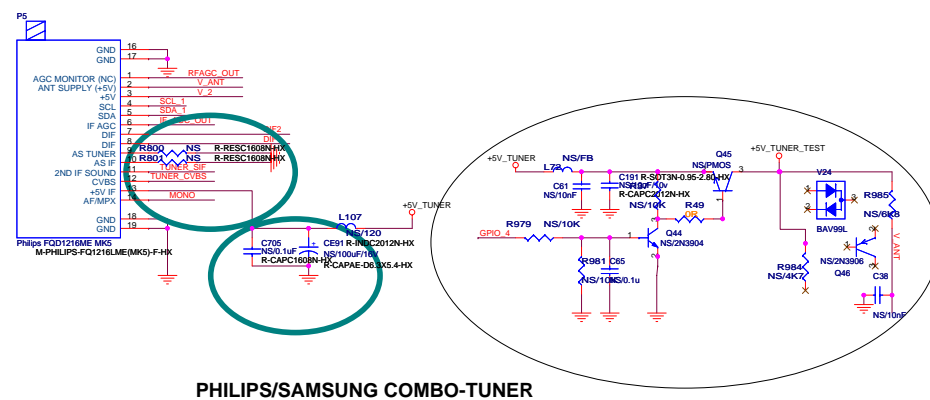
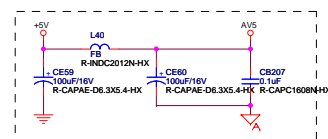
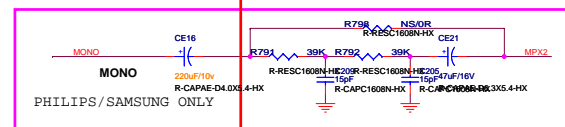
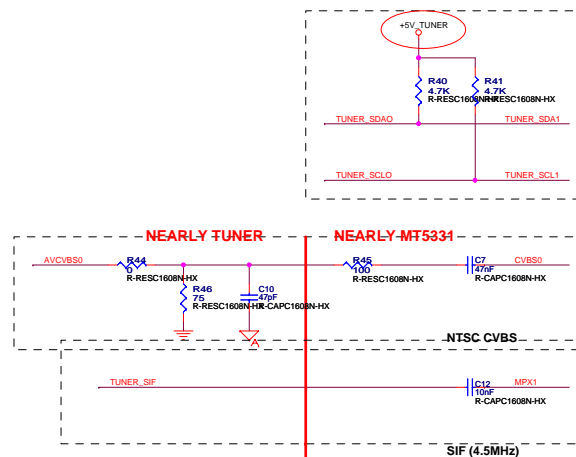
**GPIO DEPEND-ON YOUR APPLICATION  
WORKABLE IN NORMAL MODE ONLY**

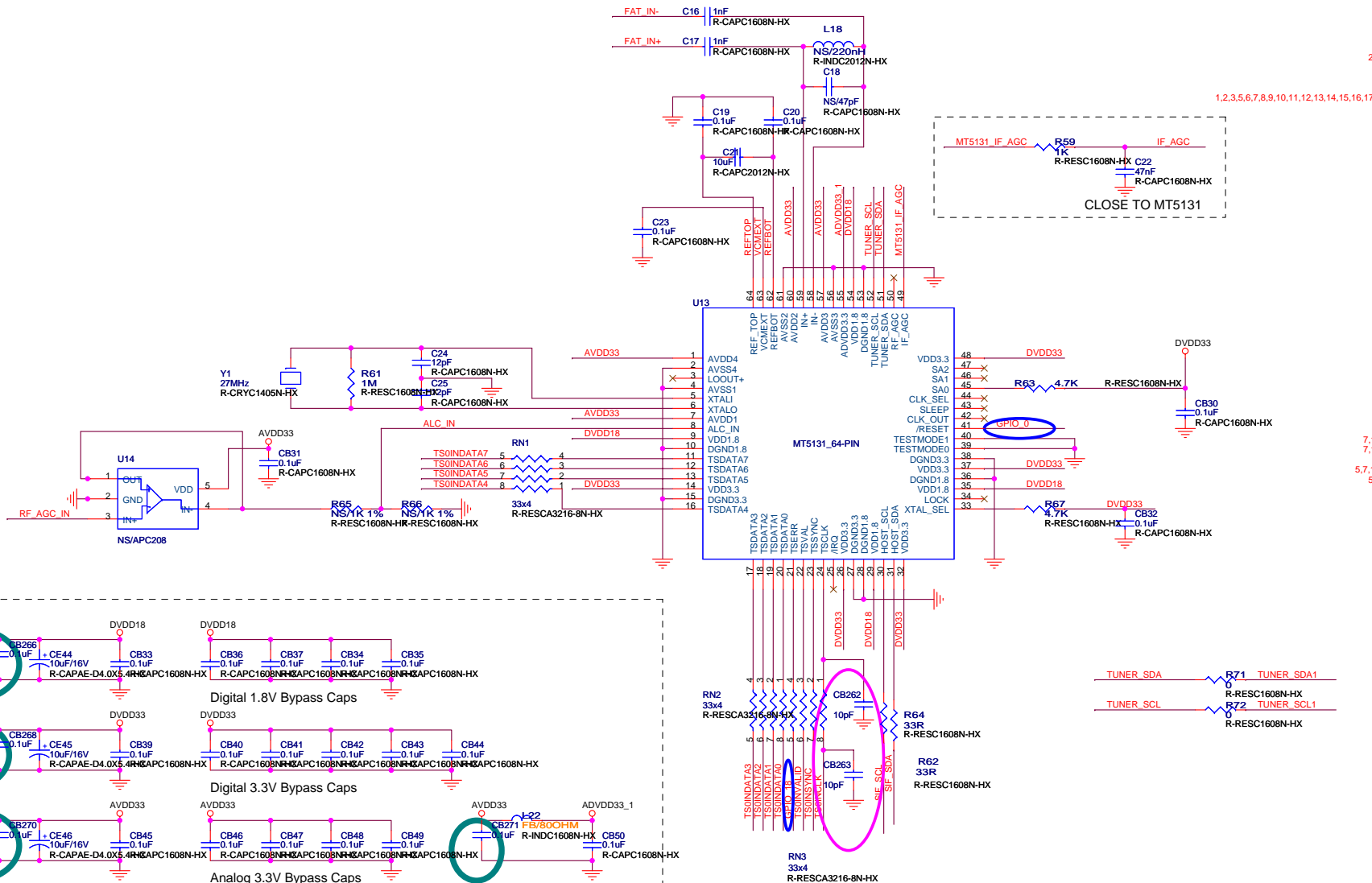


NAME	TYPE	DEVICE
+24V	POWER +24V	POWER SUPPLY
+12V	POWER +12V	POWER SUPPLY
+5V	POWER +5V	POWER SUPPLY
+5VSB	POWER +5V	POWER SUPPLY
DV33SB	POWER +3.3V	STANDBY POWER
+5V_TUENR	POWER +5V	TUNER POWER
DV33_DM	POWER +3.3V	MT5131 POWER AND ITS PERIPHERAL
DV18_DM	POWER +1.6V	MT5131 POWER
DV33	POWER +3.3V	MT5331 POWER AND ITS PERIPHERAL
AV33	POWER +3.3V	MT5331 ANALOG POWER
DV26_DDR	POWER +2.6V	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		DIGITAL GROUND
AGND_PLL	GROUND	ANALOG GROUND
AGND_AFE	GROUND	ANALOG GROUND
AGND_HDMI	GROUND	ANALOG GROUND
AGND_LVDS	GROUND	ANALOG GROUND







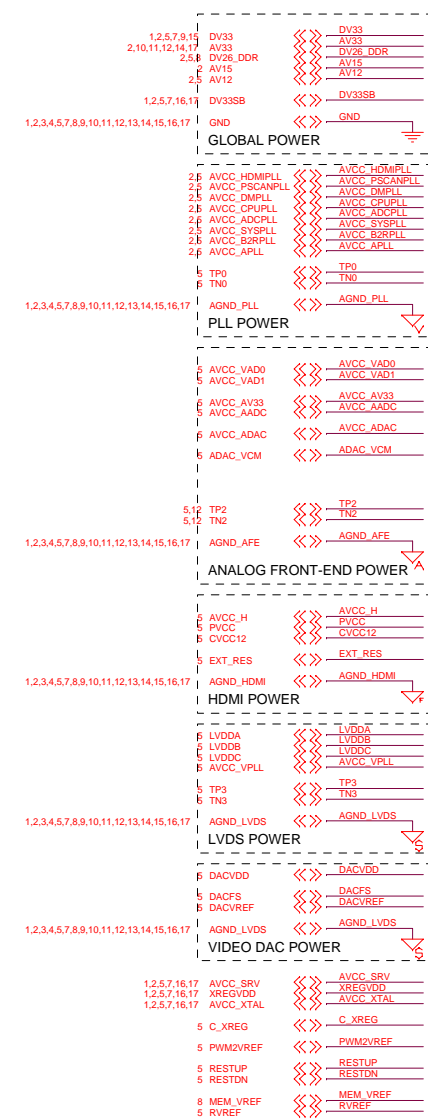
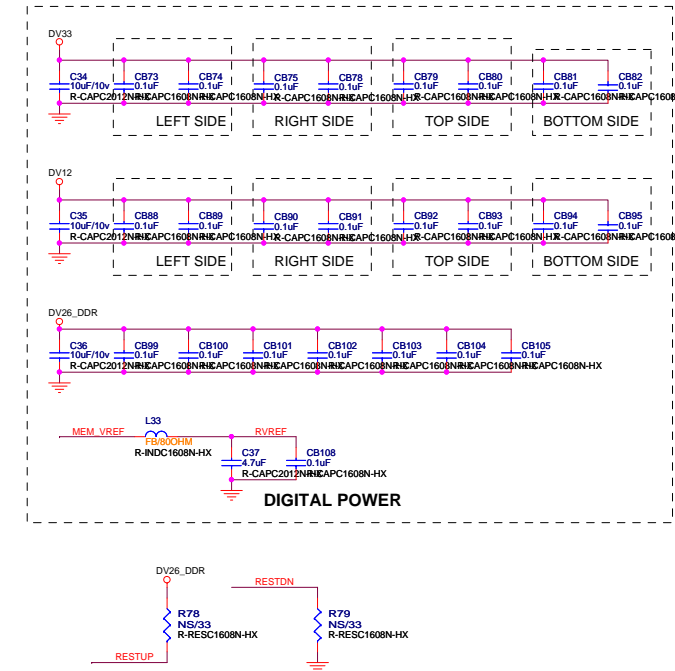
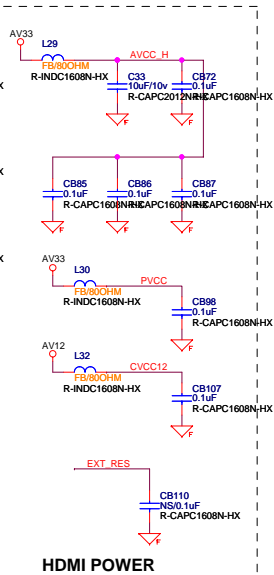
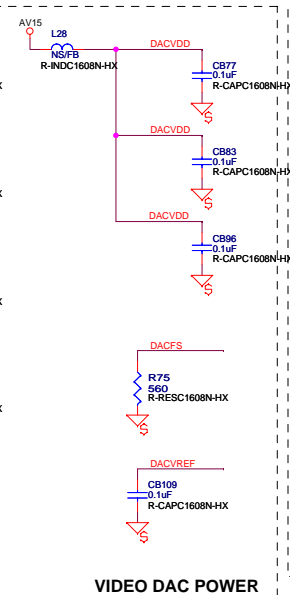
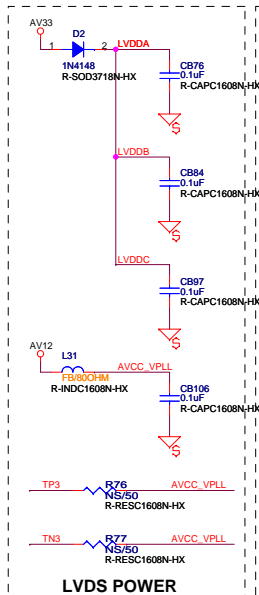
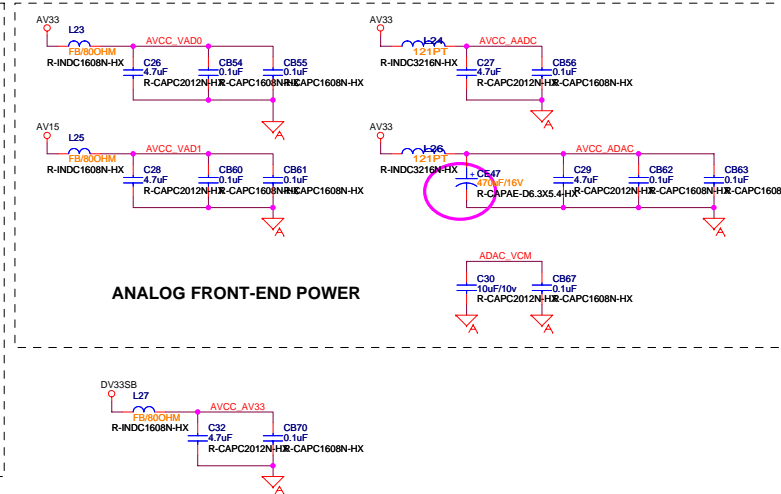
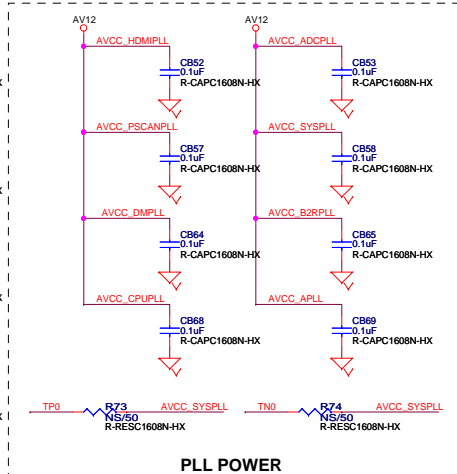
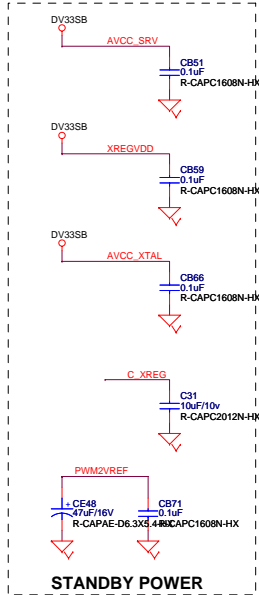


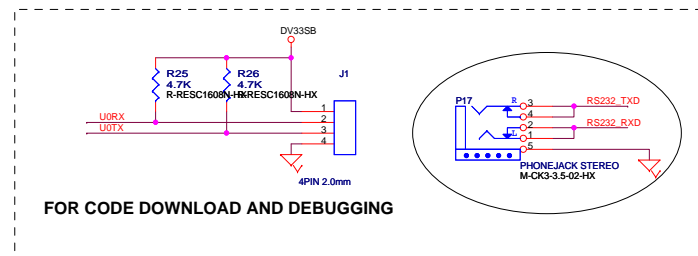
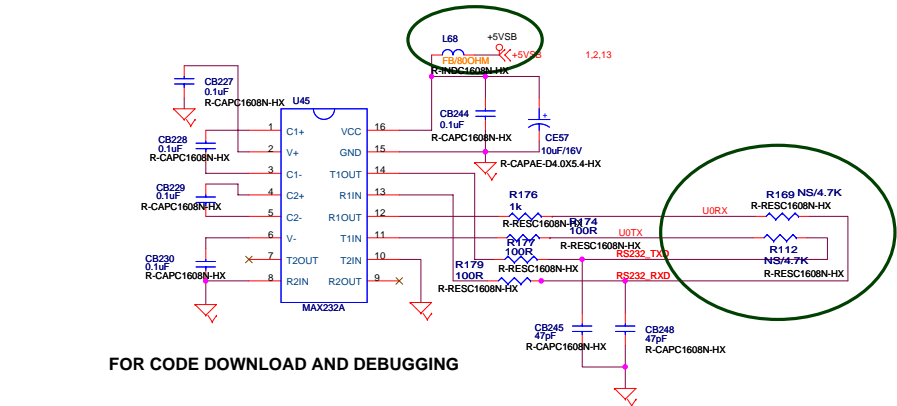
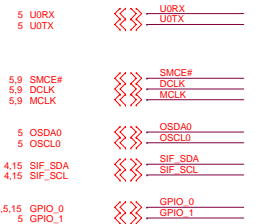
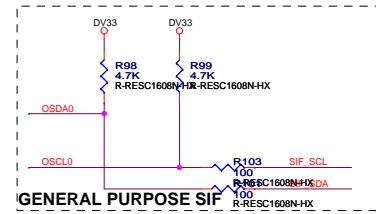
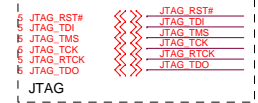
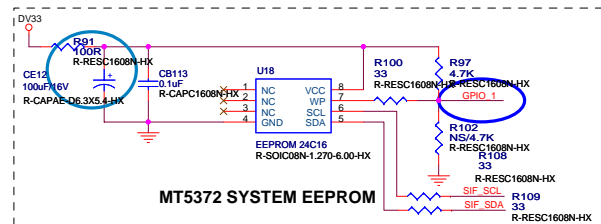
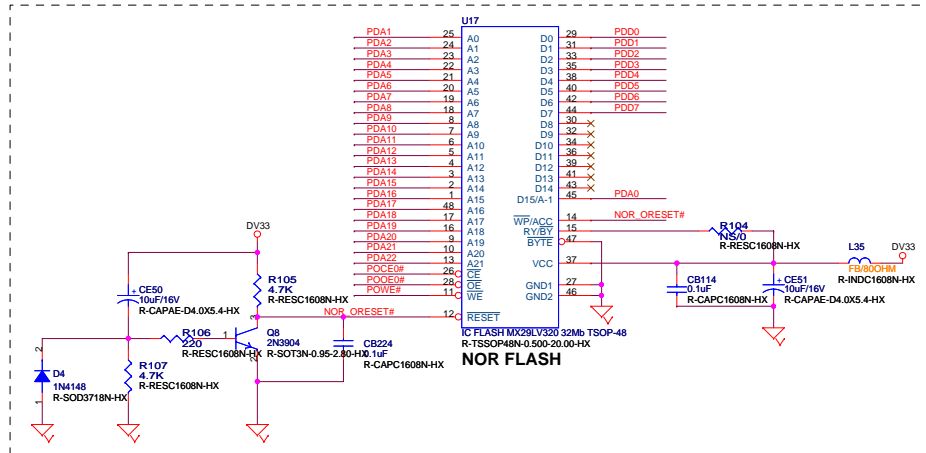
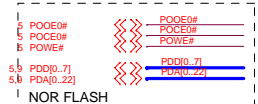
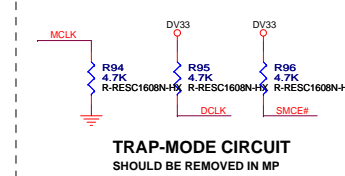
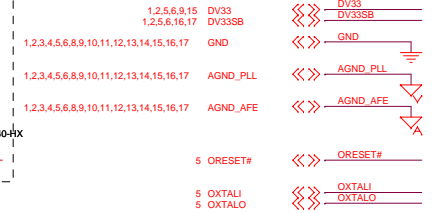
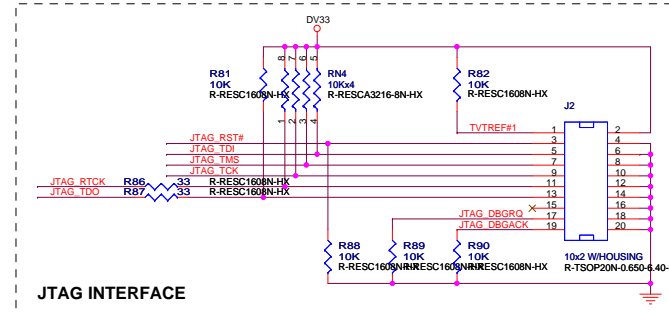
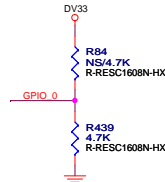
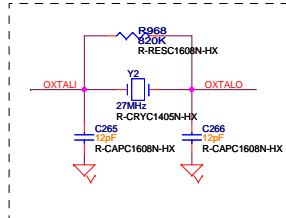
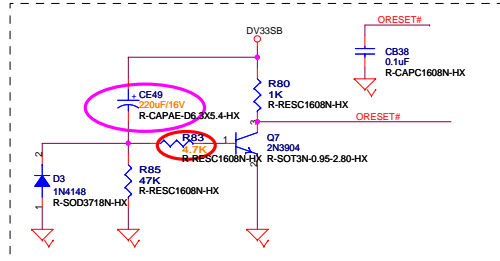
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	<b>Title</b> MT5131 ASIC			
	<b>Size</b> Document Number MT5331RA-V1.6	<b>Drawn</b> TwinSon Chan	<b>Rev</b> 1	
	<b>Date:</b> Monday, August 06, 2007	<b>Sheet</b> 4	<b>of</b> 17	









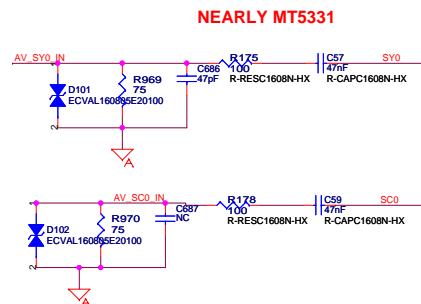
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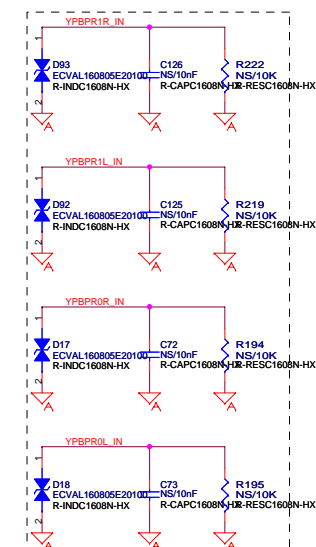
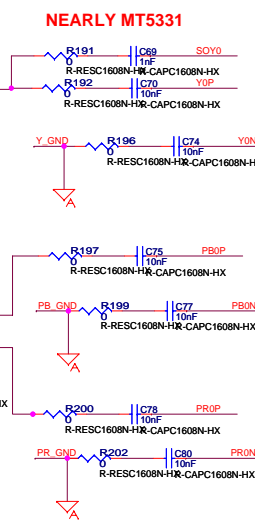
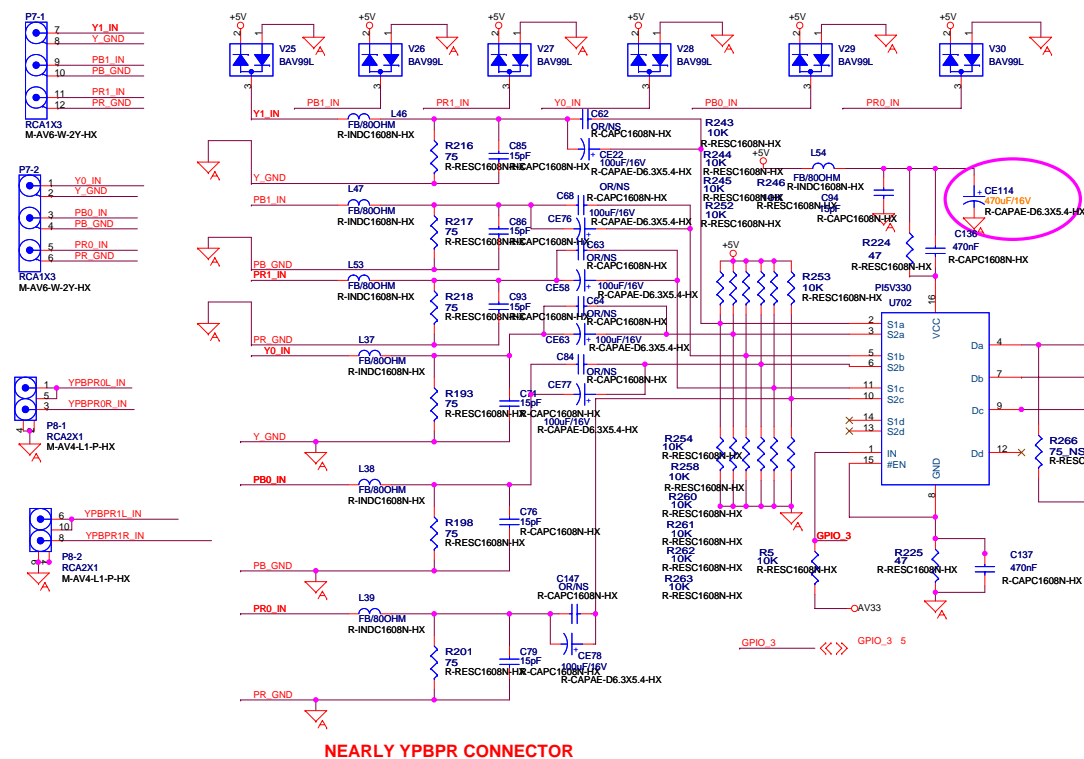
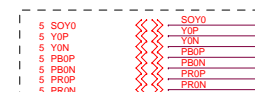
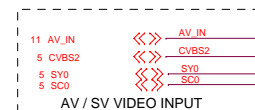
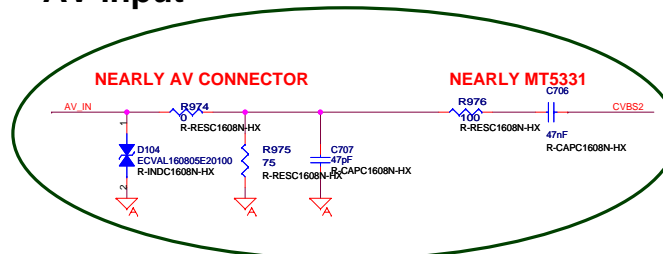




## S\_Video input



## AV input



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